SURVEILLANCE REPORT

Salmonellosis

Annual Epidemiological Report for 2023

Key facts

- Salmonellosis is the second most commonly reported gastrointestinal infection in the European Union/European Economic Area (EU/EEA), and the most common cause of food-borne outbreaks with a known pathogen.
- In 2023, 78 307 laboratory-confirmed cases of salmonellosis were reported in the EU/EEA, of which 88 were fatal – a rate of 18.1 cases per 100 000 population.
- Case numbers almost returned to pre-pandemic levels in 2023, and statistically significant increasing trends were observed in seven countries between 2019 and 2023. Only one country observed a decreasing trend.
- The reported case rate was highest in young children (0–4 years old), with 91.3 cases per 100 000 population; this rate was nine times higher than in adults (25–64 years old).
- Eggs and egg products continue to be the highest risk foods in *Salmonella* outbreaks.
- Among the antimicrobials used to treat severe salmonellosis, resistance increased for fluoroquinolones in 18 of 26 countries between 2019 and 2023, but remained low and stable for third generation cephalosporins.

Introduction

Enteric infections due to non-typhoidal *Salmonella* serovars (any other serovar than *Salmonella* Typhi and *Salmonella* Paratyphi) are generally referred to as 'salmonellosis'. Various animals (especially poultry, pigs, cattle and reptiles) can be reservoirs for *Salmonella*. Humans usually become infected by eating uncooked or poorly cooked contaminated food. The incubation period and the symptoms depend primarily on the amount of bacteria present in the food and the immune status of the person who becomes infected. Most infections cause mild illness such as diarrhoea, stomach pain and fever; however, more severe symptoms may develop, such as urinary tract infections, bacteraemia or reactive arthritis. In the case of severe infections, antimicrobial treatment is necessary.

Methods

This report is based on data for 2023 retrieved from The European Surveillance System (TESSy) on 4 September 2024. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases.

For a detailed description of the methods used to produce this report, please refer to the Methods chapter in the 'Introduction to the Annual Epidemiological Report' [1]. An overview of the national surveillance systems is available online [2]. A subset of the data used for this report is available through ECDC's online 'Surveillance Atlas of Infectious Diseases' [3].

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Stockholm, October 2025

In 2023, 27 of the 30 reporting countries reported data using either the 2008, 2012 or 2018 EU case definitions for salmonellosis. Compared with the 2008 and 2012 EU case definitions, the 2018 EU case definition allows nucleic acid determination for laboratory confirmation and includes a requirement for antimicrobial susceptibility testing and reporting of results. Three countries (France, Germany and Italy) used another case definition, which was not specified.

Notification of non-typhoidal salmonellosis was mandatory in most EU/EEA countries in 2023. In three (Belgium, France and the Netherlands), reporting was voluntary. The surveillance systems for salmonellosis had national coverage in all but three countries (Belgium, the Netherlands and Spain). The population coverage in 2023 was estimated to be 85% in Belgium, 64% in the Netherlands and 80% in Spain. In France, the coverage increased from 48% in 2021 to full coverage from 2022 onwards, due to more laboratories sending isolates to the National Reference Centres. The variation in coverage was considered when calculating the notification rates. During the peak pandemic year of 2020, Spain did not receive data from all the regions that normally report cases, which may have contributed to a lower number of cases than expected. Spain could not provide any information on estimated coverage prior to 2021; therefore, no notification rates were calculated. All countries reported case-based data except Bulgaria, which reported aggregated data. Both reporting formats were included to calculate numbers of cases, notification rates, disease trends, and age and gender distributions.

In total, 29 EU/EEA countries reported antimicrobial resistance (AMR) data for *Salmonella* for 2023. Twenty-five countries reported phenotypic resistance data (21 as disk zones or minimum inhibitory concentration (MIC) values and four as interpretation with clinical breakpoints). Four countries reported whole genome sequences that were analysed by ECDC and interpreted as predicted wild type or predicted non-wild type.

Twenty-nine EU/EEA countries provided whole-genome sequencing (WGS) data for about 2 800 isolates from 2023. Sequences were submitted to support ongoing multi-country outbreak investigations, but the majority of WGS data in 2023 were from the ECDC sequencing support project on *Salmonella* and *Campylobacter* AMR or replaced the annual phenotypic data set a country would usually submit for AMR for *Salmonella* isolates.

Epidemiology

For 2023, 30 EU/EEA countries reported data on salmonellosis. A total of 78 307 confirmed cases were reported, with an EU/EEA notification rate of 18.1 cases per 100 000 population – an 18.2% increase compared with 2022 (15.6 cases per 100 000 population). In most countries, the notification rate was similar to or slightly below pre-pandemic levels (i.e. when compared to 2019) in 2023, but in some countries it was significantly higher.

The highest notification rates were reported by Slovakia (73.7 cases per 100 000 population) and Czechia (69.1), followed by Hungary (46.0) (Table 1 and Figure 1). The lowest rates were reported by Portugal (5.1 cases per 100 000 population), Latvia (5.4) and Italy (5.6).

Hospitalisation status was reported for 36 886 salmonellosis cases in 2023. Of these, 40.8% had been hospitalised. The countries reporting the highest proportion of hospitalised cases were Romania (100%), Cyprus (92.2%), Lithuania (81.4%) and Greece (80.1%). Of 45 440 cases with known outcome, 88 were reported to have died (case fatality rate (CFR): 0.19%).

Information on whether a patient was hospitalised or eventually died from the infection is often not available, as a large proportion of the surveillance data on salmonellosis is collected via laboratories. Therefore, specimen type can be used as an indicator of the severity of infection: isolation of the bacteria from a faecal sample indicates a milder gastrointestinal infection, a urine sample indicates a urinary tract infection, a blood sample indicates a blood infection/bacteraemia (which could lead to septic shock) and cerebrospinal fluid indicates meningitis. Among 58 252 cases with specimen type reported, 93.0% of *Salmonella* isolates were sampled from faeces, 3.0% from blood, 1.7% from urine, 0.1% from pus and 0.01% from cerebrospinal fluid. For the remaining 2.3%, specimen type was reported as 'other'.

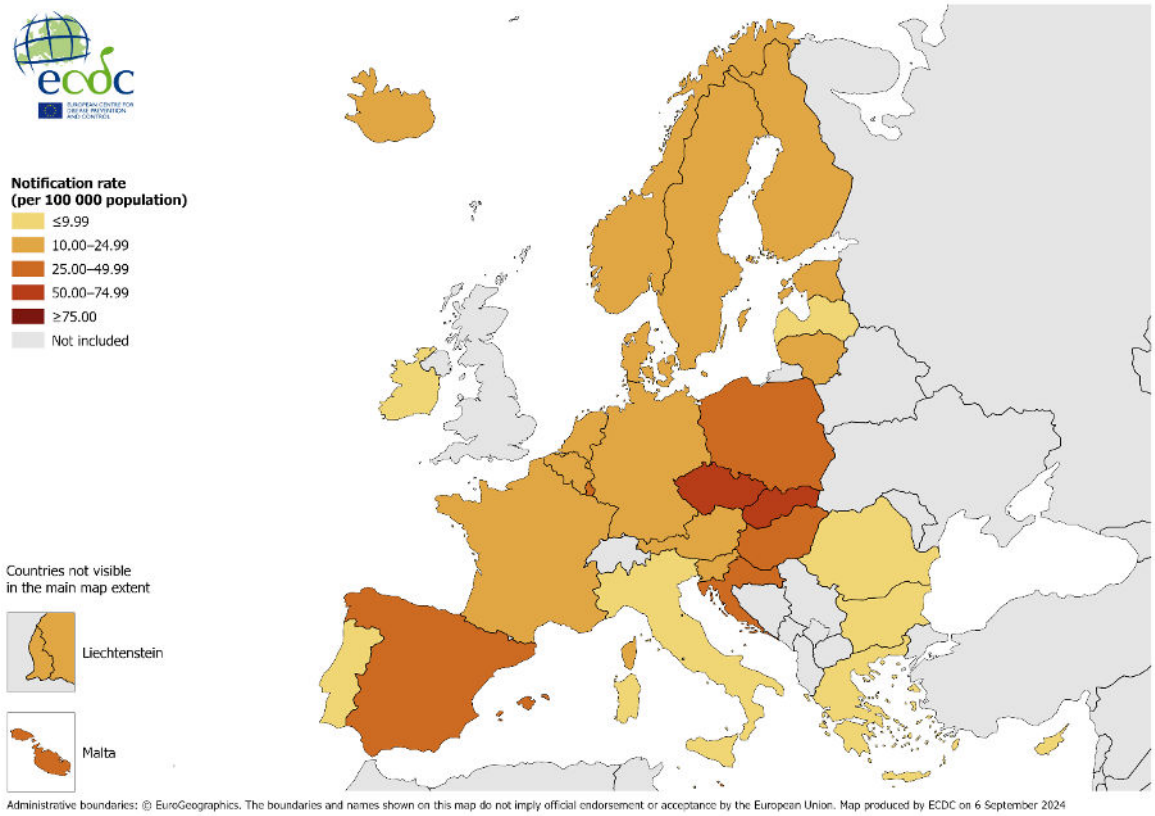
Of 52 672 cases with known travel history, 6 883 (13.0%) were reported as travel associated. Among countries reporting travel history for at least half of their cases, the highest proportions of travel-related cases were observed in Norway (62.8%), Luxembourg (54.5%) and Sweden (53.3%). Iceland, Denmark, Ireland and Finland also reported high proportions of travel-related cases (43.7–48.8%). Among the 6 592 travel-associated cases with information on the probable country of infection, Türkiye (accounting for 17.6%), Thailand (7.1%), Egypt (6.2%), Spain (6.0%) and Morocco (5.8%) were the most frequently reported travel destinations.

Table 1. Confirmed salmonellosis cases and rates per 100 000 population by country and year, EU/EEA, 2019–2023

Country	2019		2020		2021		2022		2023	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Austria	1 866	21.1	817	9.2	993	11.1	1 192	13.3	1 279	14.0
Belgium	2 527	22.1	1 595	13.8	2 084	18.0	2 375	24.1	2 040	20.4
Bulgaria	594	8.9	187	2.8	241	3.7	310	4.8	516	8.0
Croatia	1 308	33.0	786	20.0	593	15.2	1 047	27.1	1 270	33.0
Cyprus	62	7.1	70	7.9	41	4.6	66	7.3	64	7.0
Czechia	13 009	122.2	10 516	98.3	9 894	94.3	7 563	71.9	7 482	69.1
Denmark	1 119	19.3	614	10.5	692	11.8	898	15.3	1 206	20.3
Estonia	150	11.3	91	6.8	112	8.4	134	10.1	168	12.3
Finland	1 175	21.3	516	9.3	474	8.6	666	12.0	803	14.4
France	8 935	27.7	7 071	21.8	9 315	28.7	11 162	16.4	11 848	17.4
Germany	13 494	16.3	8 664	10.4	8 144	9.8	9 064	10.9	10 599	12.6
Greece	643	6.0	381	3.6	284	2.7	640	6.1	936	9.0
Hungary	4 452	45.6	2 964	30.3	3 298	33.9	3 249	33.5	4 416	46.0
Iceland	50	14.0	32	8.8	53	14.4	42	11.2	55	14.2
Ireland	347	7.1	214	4.3	173	3.5	340	6.7	402	7.6
Italy	3 256	5.4	2 713	4.5	3 768	6.4	3 572	6.1	3 333	5.6
Latvia	438	22.8	296	15.5	218	11.5	90	4.8	101	5.4
Liechtenstein	NDR	NRC	NDR	NRC	7	17.9	5	12.7	8	20.2
Lithuania	736	26.0	419	14.9	281	10.0	234	8.3	344	12.0
Luxembourg	131	21.3	93	14.9	133	21.0	161	24.9	167	25.3
Malta	131	26.5	176	34.2	249	48.2	199	38.2	169	31.2
Netherlands	1 197	10.8	695	6.2	862	7.7	1 027	9.1	1 456	12.8
Norway	1 092	20.5	441	8.2	389	7.2	712	13.1	757	13.8
Poland	8 373	22.0	5 192	13.7	7 708	20.8	6 054	16.4	9 196	25.0
Portugal	432	4.2	262	2.5	361	3.5	412	4.0	535	5.1
Romania	1 383	7.1	408	2.1	518	2.7	1 010	5.3	1 388	7.3
Slovakia	4 992	91.6	3 385	62.0	4 439	81.3	3 669	67.5	3 999	73.7
Slovenia	362	17.4	214	10.2	185	8.8	384	18.2	297	14.0
Spain	5 087	NRC	3 526	NRC	6 168	17.8	8 832	25.5	12 161	31.6
Sweden	1 990	19.5	825	8.0	933	9.0	1 128	10.8	1 312	12.5
EU/EEA (30 countries)	**79 331**	**20.9**	**53 163**	**14.2**	**62 610**	**16.7**	**66 237**	**15.6**	**78 307**	**18.1**
United Kingdom	9 718	14.6	NDR	NRC	NA	NA	NA	NA	NA	NA
EU/EEA (31 countries)	**89 049**	**20.0**	**53 163**	**14.2**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Source: Country reports
NA: not applicable; NDR: no data reported; NRC: no rate calculated.
The United Kingdom did not report any data between 2020 and 2023, due to its withdrawal from the EU on 31 January 2020.

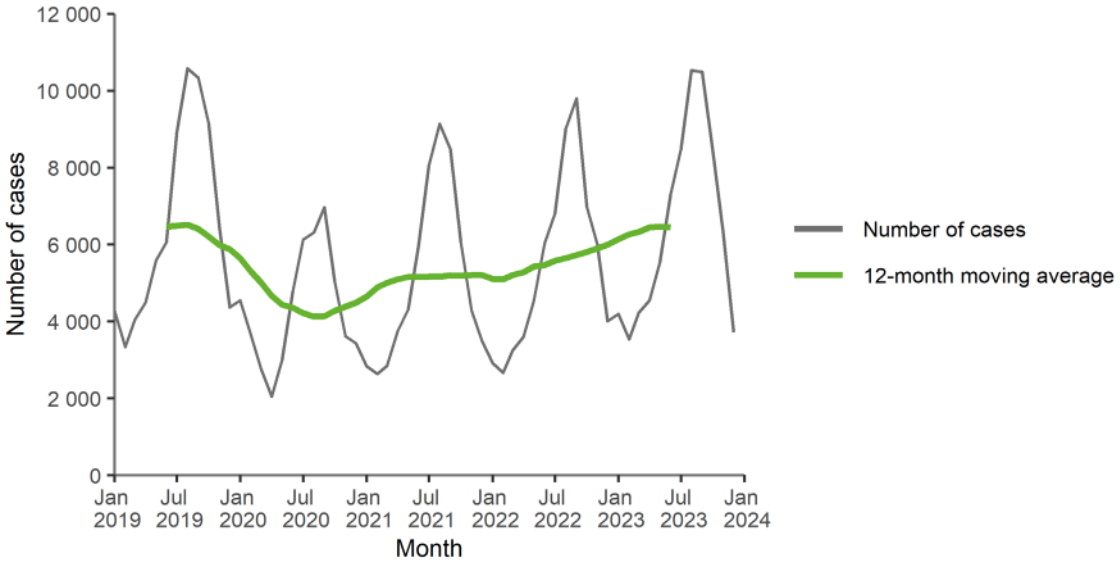
Figure 1. Confirmed salmonellosis cases per 100 000 population by country, EU/EEA, 2023



Source: Country reports

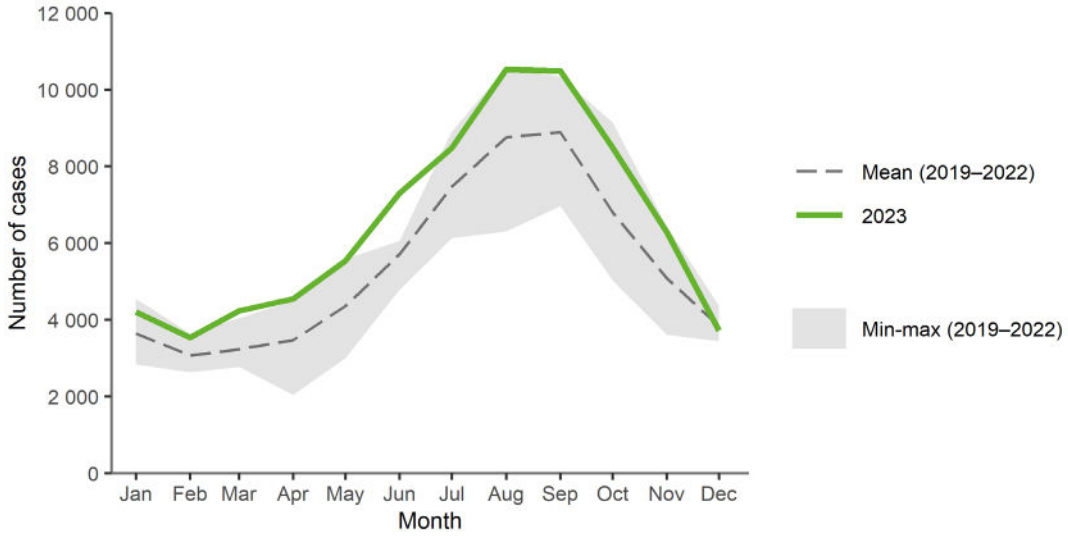
Salmonellosis cases follow a clear seasonal pattern, with a peak usually occurring from July to September (Figures 2 and 3). The effect of the COVID-19 pandemic on salmonellosis cases in the EU/EEA can be observed in the marked drop in cases in 2020. In 2023, the peak season started earlier and ended later when compared with the previous four years (Figure 3). While there were no statistically significant ($p<0.05$) increasing or decreasing trends in salmonellosis cases from 2019 to 2023 for the EU as a whole, significantly increasing trends were observed in seven countries (France, Greece, Ireland, Luxembourg, the Netherlands, Portugal and Spain) and a significant decreasing trend was observed in one country (Czechia) during this period.

Figure 2. Confirmed salmonellosis cases by month, EU/EEA, 2019–2023



Source: Country reports from Austria, Belgium, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

Figure 3. Confirmed salmonellosis cases by month, EU/EEA, 2023 and 2019–2022

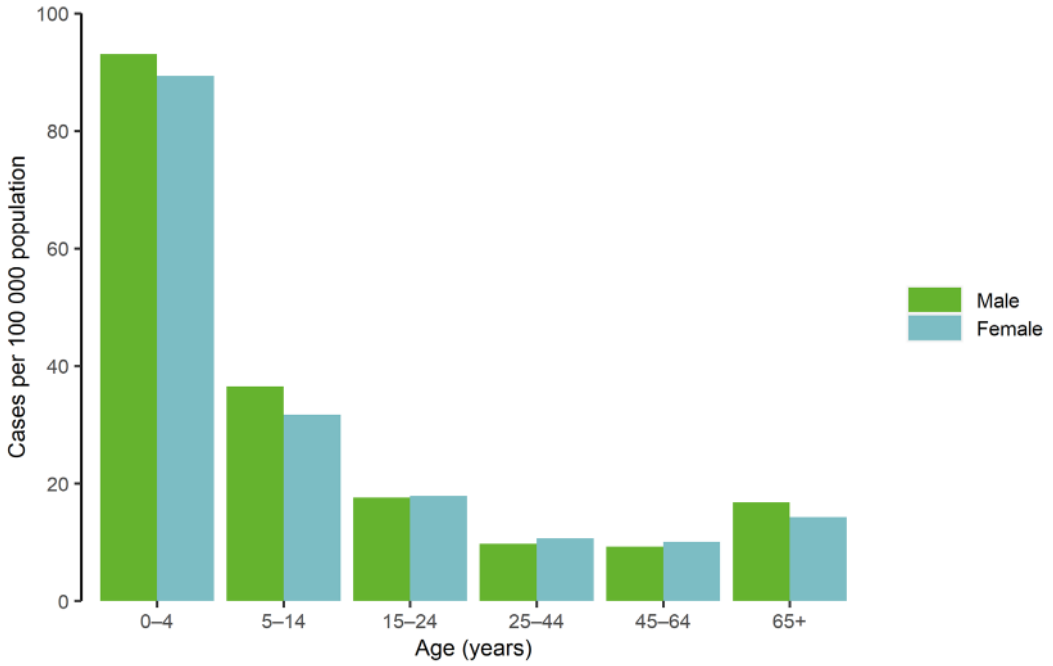


Source: Country reports from Austria, Belgium, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden.

Age and gender

There was no difference in salmonellosis notification rates by gender in the EU/EEA (male-female ratio: 1:1). By age, the highest notification rate was observed among young children (0–4 years old), with 91.3 cases per 100 000 population (Figure 4). The rate in young children was three times higher than in older children (5–14 years old), and nine times higher than in adults (25–64 years old). The countries with the largest differences in the rates between young children and adults, by increasing order of magnitude, were: Bulgaria, Cyprus, Hungary, Poland and Portugal. In these countries, the rates were 20–30 times higher in young children than in adults. The countries with the lowest notification rates in young children were Finland, Ireland, Sweden and Norway (rate: 17–22 cases per 100 000 population).

Figure 4. Confirmed salmonellosis cases per 100 000 population, by age and gender, EU/EEA, 2023



Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

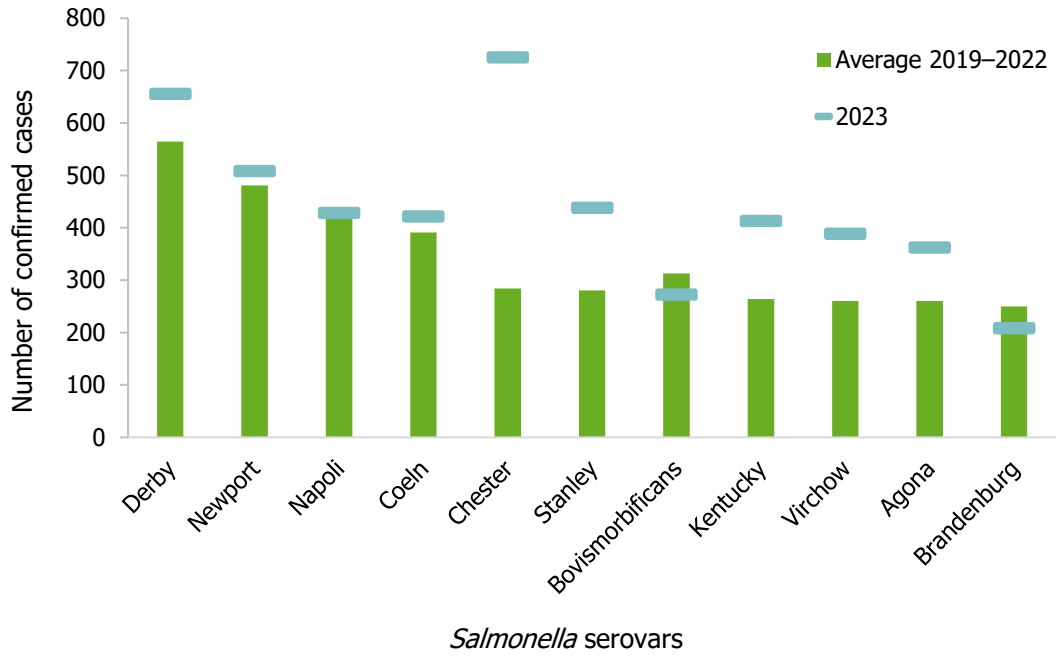
Microbial surveillance

Serovars

Information on *Salmonella* serovars and serogroups was available for 79.5% of confirmed cases from EU/EEA countries. As in previous years, the four most commonly reported *Salmonella* serovars in 2023 were *S.* Enteritidis (32 805 cases; 52.7% of isolates with known serovar), *S.* Typhimurium (5 946; 9.6%), monophasic *S.* Typhimurium (antigenic formula 1,4,[5],12:i:-; 5 136; 8.3%) and *S.* Infantis (1 324; 2.1%). Compared with the average number of cases reported in the preceding four years (2019–2022; United Kingdom (UK) data excluded), the number of cases in 2023 with *S.* Enteritidis increased by 13% and with *S.* Infantis by 5%. *S.* Typhimurium and its monophasic variant were reported at slightly lower levels in 2023.

The number of cases of the fifth to fifteenth most common serovars in 2023 are presented in Figure 5. From 2019 to 2023, 82 different serovars were identified in over 100 cases each. Twenty-eight of these serovars had their highest case numbers reported in 2023. For seven of these (Chester, Poona, Saintpaul, Senftenberg, Strathcona, Thompson and Virchow), multi-country or national outbreaks were reported in the European surveillance portal for infectious diseases (EpiPulse) (see the section 'Outbreaks and other threats').

Figure 5. Number of confirmed salmonellosis cases for the fifth to fifteenth most common serovars in 2023 and comparison with the average during 2019–2022, EU/EEA



Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

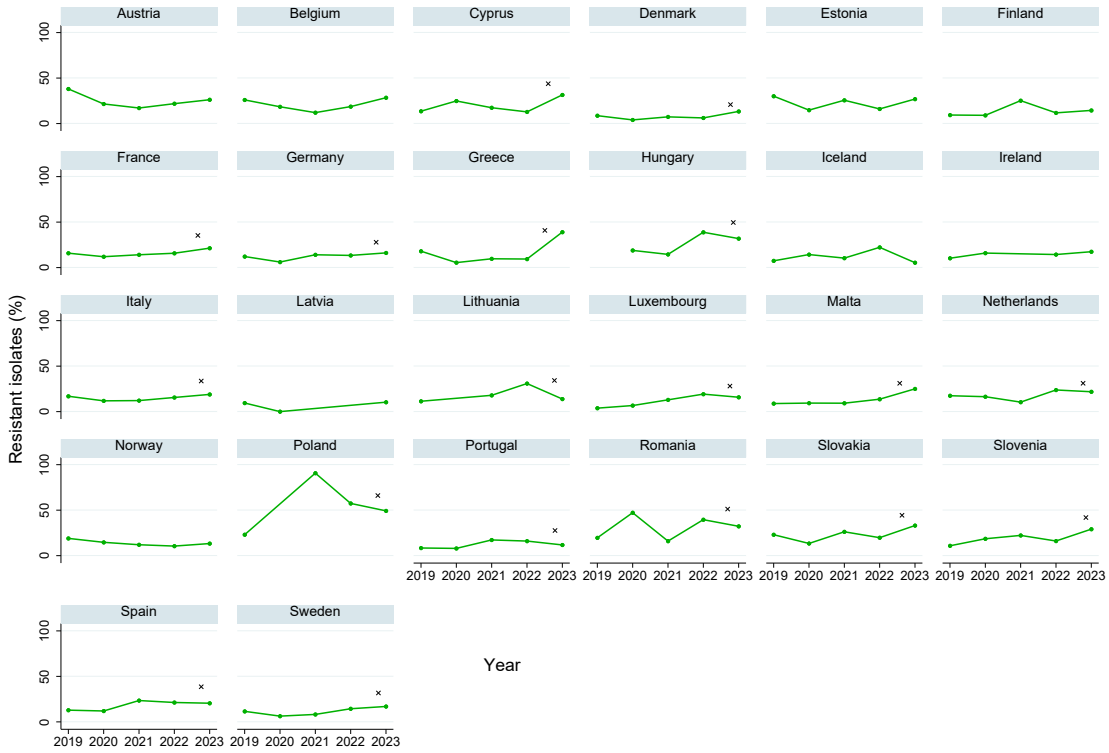
Antimicrobial resistance

Note that the analysis in this section was done using epidemiological cut-off values (ECOFFs) to describe microbiological/acquired resistance, which does not take antimicrobial dosing into account. The clinical resistance is often lower.

Antimicrobial resistance was commonly observed in *Salmonella* isolates from humans in 2023, with multidrug resistance in 19.1% of isolates (resistance to at least three of the nine monitored antimicrobial classes). Among the investigated serovars, multidrug resistance was most common in *S.* Kentucky (73.0%), monophasic *S.* Typhimurium (65.9%) and *S.* Infantis (42.4%). Resistance to the critically important antimicrobial classes for treatment was 21.8% for fluoroquinolones and 1.3–1.6% for third-generation cephalosporins; however, only a small proportion (1.1%) of the isolates were resistant to both. One exception was *S.* Kentucky, where 17.2% of isolates showed resistance to both critically important antimicrobial classes. The proportion of isolates resistant to fluoroquinolones increased significantly in 18 of 26 reporting countries in the 2019–2023 period (Figure 6).

This was particularly visible in *S.* Enteritidis (12/24 countries), but also in *S.* Typhimurium (7/26 countries). Statistically significant decreasing trends were observed in resistance to ampicillin and tetracycline in 14 and 10 EU/EEA countries, respectively, in the 2019–2023 period. The proportion of extended-spectrum β-lactamase (ESBL)-producing *Salmonella* isolates was at a low level (0.8%) in 2023, similar to previous years.

Figure 6. Trends in resistance to fluoroquinolones in *Salmonella* spp. from human infections (without known travel outside the country) in 26 reporting countries, 2019–2023



ˣ *Statistically significant (p<0.05) increasing trend*

Six countries reported six sporadic cases with carbapenem-resistant *Salmonella* in 2023, all in individuals who had no history of travel or an unknown travel status. Two of these cases were with monophasic *S.* Typhimurium and the remaining four were with *S.* Agona, *S.* Give, *S.* Kentucky and *S. enterica* subspecies *salamae*. Four of the isolates carried $bla_{\text{OXA-48}}$, one $bla_{\text{NDM-1}}$ and the sixth had not been genotyped. Levels of azithromycin resistance were low (<1%) overall.

Outbreaks and other threats

In 2023, 44 outbreaks of *Salmonella* infections were reported in EpiPulse. These were notified by 13 EU/EEA countries (37 outbreaks) and three countries outside of the EU/EEA (seven outbreaks total in Israel, the UK and the United States (US)). The outbreaks involved 23 different *Salmonella* serotypes, although almost half (20 outbreaks) were with *S.* Enteritidis, compared with eight in 2022. The number of outbreaks involving *S.* Typhimurium and its monophasic variant reported in EpiPulse decreased from 13 in 2022 to only two in 2023.

Twenty-eight outbreaks were multi-country (63.3%). Six of these were covered in three joint Rapid Outbreak Assessments (ROA) produced by ECDC and the European Food Safety Agency (EFSA) in 2023 [4–6], and one in a joint ECDC-EFSA ROA in 2024 [7]. The number of countries involved in each multi-country outbreak ranged from two to 19, with nine to over 1 000 laboratory-confirmed cases per outbreak, mostly linked through comparison of the bacterial genome by WGS.

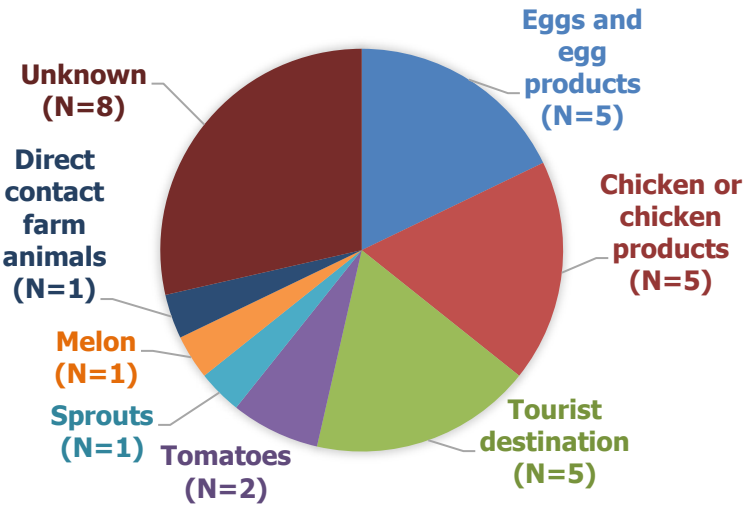
Five of the multi-country outbreaks reported to EpiPulse were linked to eggs and egg products. All of these were with *S.* Enteritidis, and involved more than 450 cases with sequencing information available for linking the cases to clusters (Figure 6). Five other multi-country outbreaks were linked to chicken kebab or chicken meatballs. One of these involved over 200 cases of *S.* Virchow in seven countries [4]; another involved three distinct clusters of *S.* Enteritidis and 335 cases – one of which was fatal – in 16 countries [6].

In some multi-country outbreaks, travel to a specific country was identified as the common exposure, without specific information on the source. The largest travel-related cluster was with *S.* Enteritidis ST11, where over 750 cases in 2023 and over 900 cases in 2024 – from 11 different countries – occurred in people who had fallen ill after travelling to Türkiye. In another outbreak, related to travel to Spain, national investigations revealed a substantial increase in cases with *S.* Chester with matching food isolates from chicken-derived food and broilers, but also from eggs and salmon-derived food [8].

Two multi-country outbreaks in 2023 were linked to consumption of small tomatoes. The first one, with *S.* Senftenberg ST14, was detected in 2023 (although the first cases fell ill in August 2022). The outbreak involved 92 cases in 11 EU/EEA countries, the UK and the US; 70% of the cases occurred in women and one person died. In three of the affected countries, case interviews identified cherry-like tomatoes as the most common food exposure among cases [5]. In the second outbreak, 261 cases of *S.* Strathcona ST2559 confirmed by WGS were identified between 1 January 2023 and 5 November 2024 in 16 EU/EEA countries, the UK and Canada [7]. Tomatoes were identified as the vehicle of infection in several national epidemiological investigations undertaken in response to the outbreak.

One multi-country outbreak of *S.* Saintpaul with 98 genetically related sequences was attributed to consumption of cantaloupe melon [9]. Most cases occurred in the UK, but identical sequences were also identified in a few EU countries, particularly Portugal. Almost half of the cases were in children under 10 years old.

Figure 7. Suspected vehicle of infection in multi-country salmonellosis outbreaks reported in EpiPulse in 2023 (N=28)



In 2023, 1 115 foodborne outbreaks caused by *Salmonella* were reported to EFSA [10]. As in previous years, *Salmonella* accounted for the largest proportion (19.6%) of these foodborne outbreaks.

The number of outbreaks caused by *Salmonella* increased by 10.1% compared with 2022, with a 38.9% increase in cases, 22.8% increase in hospitalisations and 100% increase in deaths. These increases were mainly attributed to more outbreaks with *S.* Enteritidis (147 more outbreaks than in 2022) [10]. The most frequently implicated food vehicles in strong-evidence salmonellosis food-borne outbreaks in 2023 were: 'mixed foods' (93 outbreaks), 'eggs and egg products' (87), 'meat and meat products' (61), 'milk and milk products' (13), 'foods of non-animal origin' (9) and 'fish and fishery products' (9) [11]. The most common setting for strong-evidence *Salmonella* outbreaks was domestic premises (122 outbreaks), followed by restaurants, pubs, street vendors, takeaways, etc. (84 outbreaks) [11].

Discussion

Salmonellosis remains the second most common food-borne infection in the EU/EEA, after campylobacteriosis. It affects children more often than adults, with on average a nine times higher notification rate in young children (0–4 years old) than in adults (25-64 years old). This is partly due to lower immunity in young children, resulting in a higher proportion of symptomatic infections in this group. It could also be due to an increased likelihood of parents taking children to see a doctor when sick and an increased likelihood of doctors taking samples. It is noteworthy that among the four countries with the lowest notification rates in young children, three (Finland, Sweden and Norway) have such low *Salmonella* prevalence in food-producing animals and food – with strict national *Salmonella* control programmes in place – that they have been granted 'special guarantees for *Salmonella*' by the European Commission [12].

There was a marked drop in salmonellosis cases in the EU/EEA during the COVID-19 pandemic in 2020; however, in 2023, the salmonellosis notification rate was almost back to the levels observed before the pandemic. France, Greece, Ireland, Luxembourg, the Netherlands, Portugal and Spain observed statistically significant increasing trends in cases between 2019 and 2023, while Czechia observed a significant decreasing trend. Czechia has made a concerted effort to inform consumers about food safety and risky food-handling procedures, which may be one reason for the decline (Email from M. Špačková, National Institute of Public Health, Czechia, 30 July 2024). In France, the observed increase was likely influenced by a stricter referral policy for *Salmonella* isolates since 2022, whereby the primary laboratories were required to include isolates when they notified cases to the National Reference Centre – as the reference laboratory reports all confirmed salmonellosis cases to ECDC (Email from N. Jourdan da Silva, Santé Publique, France, 30 July 2024). In Greece and the Netherlands, the increase was primarily due to more cases with *S*. Enteritidis (Email from T. Sideroglou, National Public Health Organization, Greece, 19 July 2024) [13].

S. Enteritidis accounted for more than half of all laboratory-confirmed salmonellosis cases in 2023. The number of cases with *S*. Enteritidis increased by 13% compared with 2022 and the number of outbreaks reported to EpiPulse with this serotype rose from eight to 20. *S*. Enteritidis is mainly found in eggs and poultry meat [10]. All five multi-country outbreaks reported to EpiPulse that related to eggs and egg products were with *S*. Enteritidis, as well as three of the five related to poultry meat products. In 2023, 557 outbreaks with *S*. Enteritidis – 147 more than in 2022 – were reported to EFSA [10]. The factors behind the increasing number of infections with *S*. Enteritidis are not known; however, in the Netherlands the increase has been associated with a 2.5 time increase in *S*. Enteritidis-positive laying hen flocks [13].

A large proportion (28/44) of the outbreaks reported to EpiPulse in 2023 were identified as multi-country (defined as cases occurring in at least two countries). This can be attributed to the increased use of WGS in EU/EEA countries. The benefits of WGS in facilitating the identification of linked cases in different countries and suspected food sources is promoted by ECDC, PulseNet International and the World Health Organization (WHO) [14, 15]. The ECDC and EFSA One Health WGS system, which was fully implemented in July 2022 [16], has proven very useful in identifying matches between food isolates and those from cases in foodborne outbreaks. Still, most *Salmonella* infections are not sequenced and therefore many cases will never be assigned to an outbreak and many clusters will remain undetected. The increasing use of WGS also allows for analysis of resistance determinants and has started to serve as an efficient tool for AMR surveillance within the EU/EEA.

While most *Salmonella* infections are mild and should be treated with fluid and electrolyte replacement, some infections might become more severe and require antimicrobial treatment. In 3.0% of cases reported from the EU/EEA in 2023, the infection resulted in bacteraemia. Fluoroquinolones and macrolides (azithromycin) are the primary treatment for severe infections in adults (for children, cephalosporins would be used instead of fluoroquinolones). Intravenous cephalosporins are recommended for invasive infections [17].

While resistance to third-generation cephalosporins and macrolides remains low, it is worrying that fluoroquinolone resistance in human salmonellosis infections increased in 18 of 26 EU/EEA countries in the 2019–2023 period. Almost 30% of all *Salmonella* infections were resistant to fluoroquinolones in 2023. The fact that the same trend was observed in such a large proportion of EU/EEA countries might indicate that the root cause could be something that affects the whole of the EU at the same time. This should be further investigated. In 2022, high to very high resistance to fluoroquinolones was observed in isolates from laying hens (24.7%), broilers (55.5%) and fattening turkeys (57.9%) [18].

Public health implications

The rates of salmonellosis vary between EU/EEA countries, reflecting differences in prevalence in food, animals used for food production, and animal and food trade between countries, as well as the proportion of travel-associated cases and the quality and coverage of surveillance systems.

Eggs and egg products continue to be the highest risk foods in *Salmonella* outbreaks [11], although several larger outbreaks from non-animal food sources were identified in 2023. Proper *Salmonella* control measures at the primary production level and sufficient laboratory capacity are prerequisites to reduce *Salmonella* prevalence in food-producing animals. Prudent use of antimicrobials should be adhered to in both humans and animals. Cross-sectoral collaboration is also key to successful identification and control of sources in food-borne outbreaks, and for prevention of new cases.

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