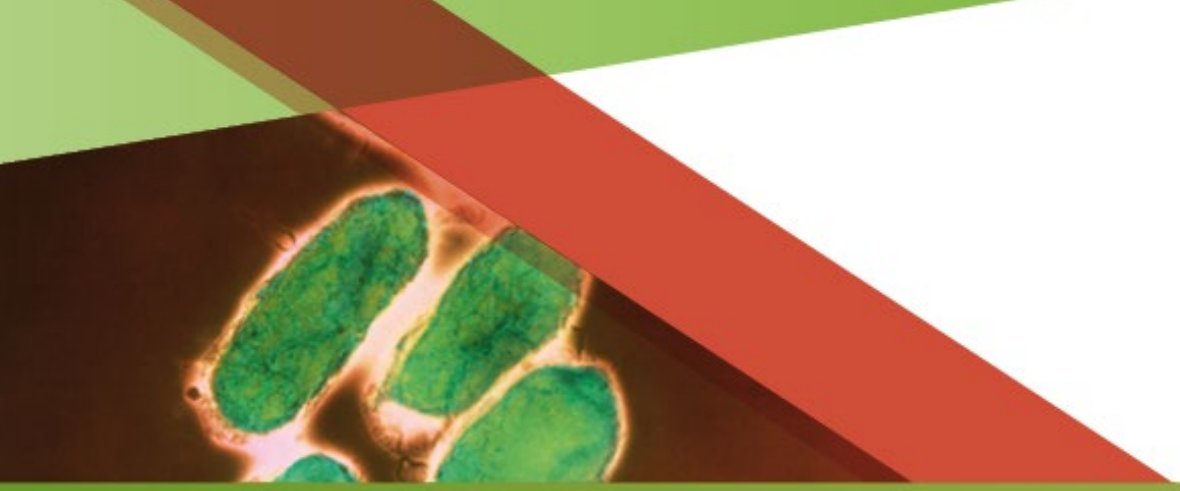

SURVEILLANCE REPORT

Yersiniosis

Annual Epidemiological Report for 2017

Key facts

- For 2017, 28 countries reported 6 890 confirmed yersiniosis cases in the EU/EEA.
- The overall notification rate was 1.8 per 100 000 population and remained stable from 2013–2017.
- The highest rate was detected in 0–4 year-old children (7.7 per 100 000 population).
- The highest rates were reported by Finland, Lithuania and the Czech Republic.

Methods

This report is based on data for 2017 retrieved from The European Surveillance System (TESSy) on 11 September 2018. The European Surveillance System is a system for the collection, analysis and dissemination of data on communicable diseases. For a detailed description of methods used to produce this report, please refer to the *Methods* chapter [1].

An overview of the national surveillance system 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].

For 2017, yersiniosis data were reported by 28 EU/EEA Member States. Data from France, Italy and Spain did not have national coverage. Twelve Member States used the 2012 EU case definition, nine countries used the 2008 definition, five Member States reported data based on another case definition and two countries did not specify the case definition used. The majority of Member States (25 of 28) undertook passive surveillance and 18 countries reported cases through both laboratories and physicians and/or hospitals. Twenty-six of the 28 Member States reported case-based data.

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Stockholm, January 2020

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Epidemiology

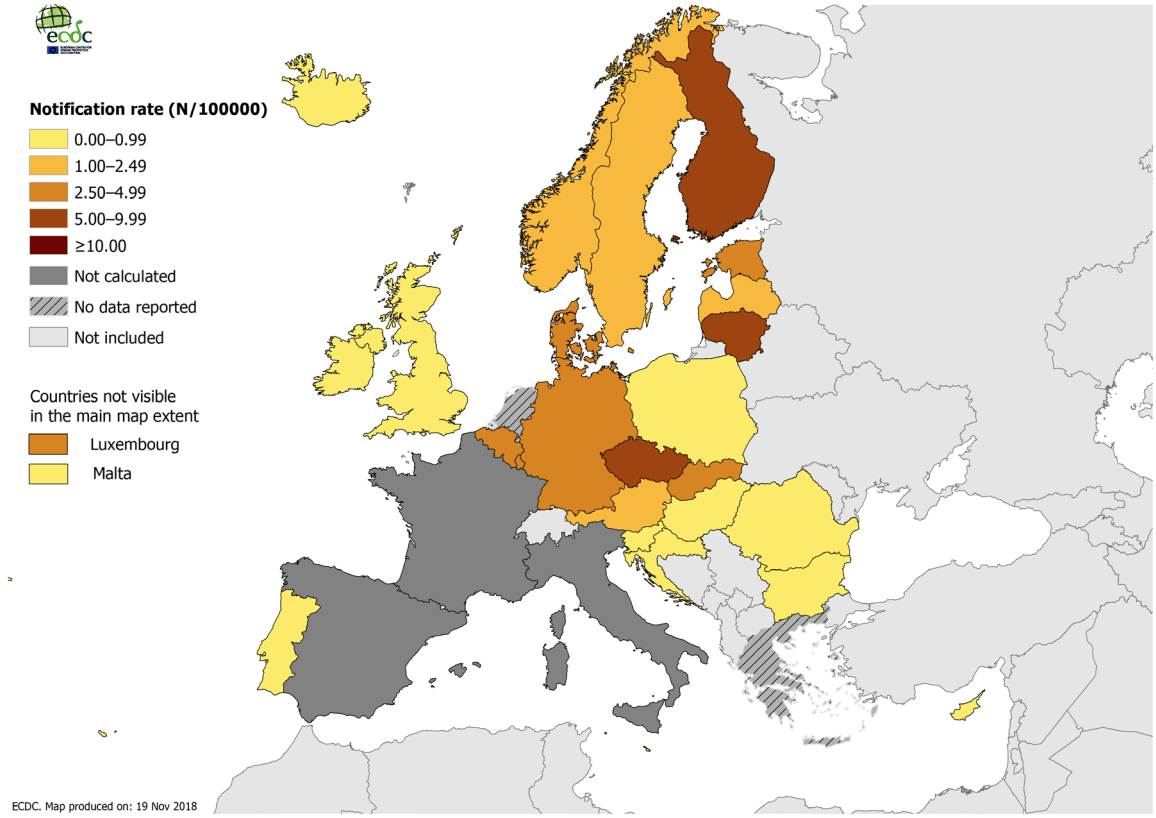
For 2017, 6 890 confirmed cases of yersiniosis were reported by 28 EU/EEA countries with an overall rate of 1.8 cases per 100 000 population (Table 1). As in previous years, Germany accounted for the highest number of cases in the EU/EEA (2 579 cases, 37.4% of all cases). Finland, Lithuania and the Czech Republic had the highest rates at 7.7, 6.1 and 5.8 cases per 100 000 population, respectively (Table 1, Figure 1).

Table 1. Distribution of confirmed yersiniosis cases and rates per 100 000 population by country and year, EU/EEA, 2013–2017

Country	2013		2014		2015		2016		2017			
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Confirmed cases	Rate	ASR	Reported cases
Austria	158	1.9	107	1.3	118	1.4	86	1.0	95	1.1	1.1	95
Belgium	350	-	309	-	350	3.1	355	3.1	317	2.8	2.7	317
Bulgaria	22	0.3	20	0.3	12	0.2	10	0.1	17	0.2	0.3	17
Croatia	0	0.0	20	0.5	16	0.4	22	0.5	29	0.7	0.7	29
Cyprus	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Czech Republic	526	5.0	557	5.3	678	6.4	608	5.8	611	5.8	6.1	611
Denmark	225	4.0	250	4.4	273	4.8	278	4.9	206	3.6	3.6	206
Estonia	72	5.5	62	4.7	53	4.0	45	3.4	43	3.3	3.3	43
Finland	549	10.1	579	10.6	582	10.6	407	7.4	423	7.7	8.1	423
France	430	-	574	-	624	-	735	-	738	-	-	738
Germany	2 579	3.2	2 470	3.1	2 741	3.4	2 763	3.4	2 579	3.1	3.6	2 586
Greece	.	.	.	.	.	.	.	.	.	.	.	.
Hungary	62	0.6	43	0.4	41	0.4	70	0.7	30	0.3	0.3	30
Iceland	0	0.0	3	0.9	1	0.3	1	0.3	0	0.0	0.0	0
Ireland	4	0.1	5	0.1	13	0.3	3	0.1	6	0.1	0.1	6
Italy	25	-	18	-	7	-	9	-	8	-	-	8
Latvia	25	1.2	28	1.4	64	3.2	47	2.4	47	2.4	2.4	47
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	262	8.8	197	6.7	165	5.6	155	5.4	174	6.1	6.3	174
Luxembourg	15	2.8	19	3.5	15	2.7	12	2.1	15	2.5	2.5	15
Malta	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Netherlands	.	.	.	.	.	.	.	.	.	.	.	.
Norway	55	1.1	211	4.1	76	1.5	57	1.1	67	1.3	1.3	67
Poland	199	0.5	212	0.6	172	0.5	167	0.4	191	0.5	0.5	191
Portugal	-	-	-	-	24	0.2	14	0.1	35	0.3	0.4	35
Romania	43	0.2	32	0.2	25	0.1	40	0.2	36	0.2	0.2	36
Slovakia	164	3.0	172	3.2	224	4.1	200	3.7	242	4.5	4.5	247
Slovenia	26	1.3	19	0.9	10	0.5	31	1.5	18	0.9	1.0	18
Spain	243	-	436	-	432	-	514	-	585	-	-	585
Sweden	313	3.3	248	2.6	245	2.5	230	2.3	236	2.4	2.4	243
United Kingdom	59	0.1	58	0.1	44	0.1	87	0.1	142	0.2	0.2	143
EU/EEA	**6 407**	**1.9**	**6 649**	**1.8**	**7 005**	**1.9**	**6 946**	**1.8**	**6 890**	**1.8**	**1.9**	**6 910**

Source: country reports.
.: no data reported
-: no rate calculated.

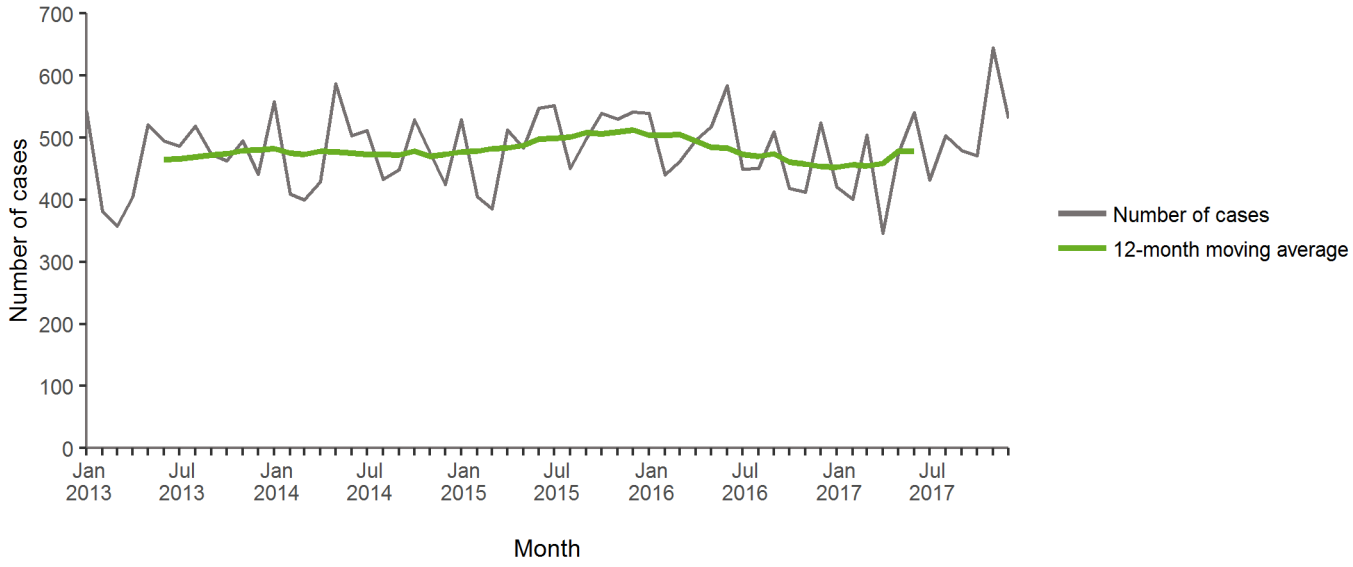
Figure 1. Distribution of confirmed yersiniosis cases per 100 000 population by country, EU/EEA, 2017



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

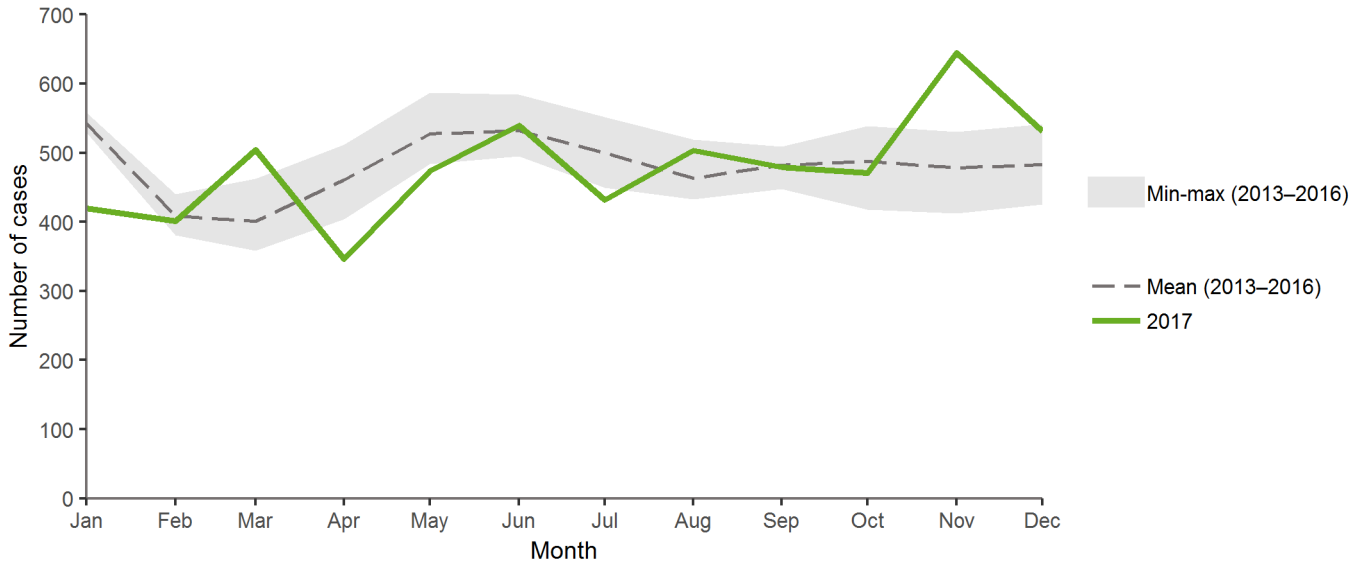
From 2013–2017, the yersiniosis trend remained stable in the EU/EEA (Figure 2). Among 17 Member States with data available for the whole period of 2008–2017, the Czech Republic, Slovakia, Spain and the United Kingdom reported significantly increasing trends ($p<0.01$), while Finland, Germany and Sweden reported decreasing trends ($p<0.01$) [4]. As in previous years, no seasonality of yersiniosis cases was noted in 2017 (Figure 3). The highest number of cases was reported in November.

Figure 2. Distribution of confirmed yersiniosis cases by month, EU/EEA, 2013–2017



Source: Country reports from Austria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

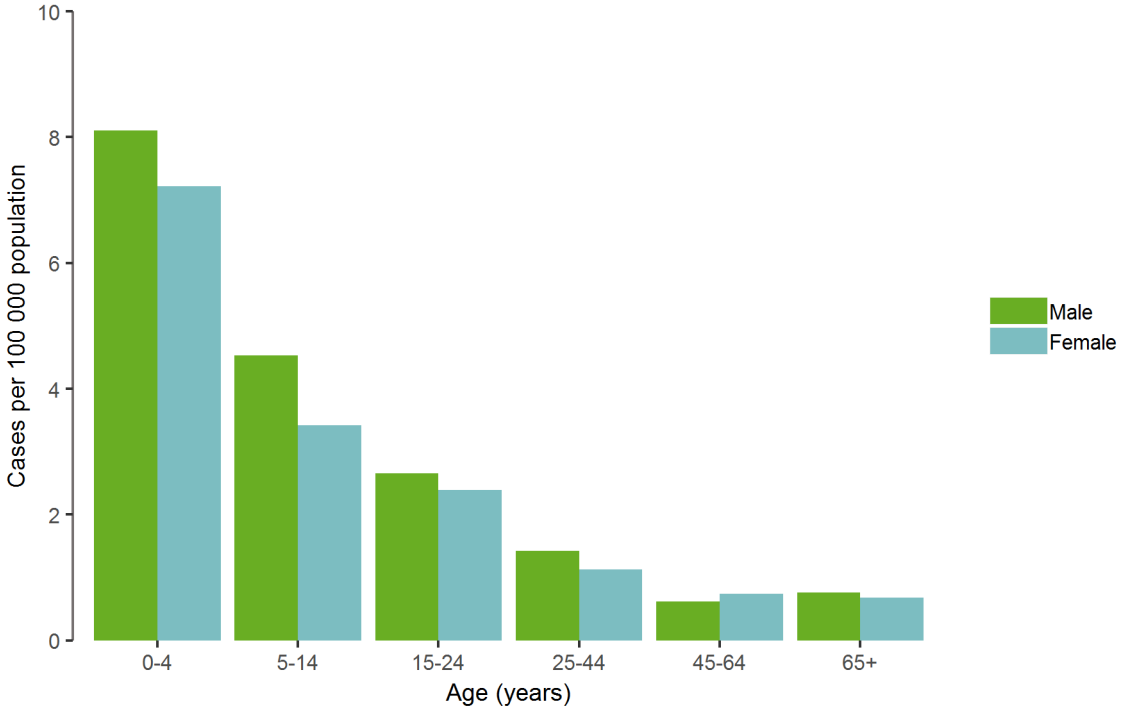
Figure 3. Distribution of confirmed yersiniosis cases by month, EU/EEA, 2017 and 2013–2016



Source: Country reports from Austria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Among the 6 874 confirmed cases for which gender was reported, 54.1% were males, with a male-to-female ratio of 1.2:1. Notification rates were highest in 0–4-year-old children, both in males and females (8.1 and 7.2 cases per 100 000 respectively) and decreased with age (Figure 4).

Figure 4. Distribution of confirmed yersiniosis cases per 100 000 population, by age and gender, EU/EEA, 2017



Multi-country outbreaks and other threats

No multi-country outbreaks or other threats related to yersiniosis were reported in 2017.

Discussion

In 2017, yersiniosis was the third most commonly reported zoonosis in the EU [4]. *Yersinia enterocolitica* was the most common causative species of *Yersinia* reported in the EU (99.3% of confirmed cases), whereas *Y. pseudotuberculosis* was only reported for 0.7% of confirmed cases. Biotype information, which is crucial for evaluating the pathogenicity of *Y. enterocolitica* isolates, was provided for 1 040 (16.8%) confirmed cases by six countries (Austria, Denmark, Finland, France, Lithuania and Poland), resulting in a threefold increase of biotyped cases compared with 2016. The most commonly reported biotypes in 2017 were biotype 4 (86.8%) followed by biotypes 2 (11.6%) and 1B (1.0%) [4]. As for the vast majority of food- and waterborne pathogens, whole genome sequencing (WGS) is also increasingly used to subtype *Y. enterocolitica* isolates. Benefits of WGS include the possibility to perform highly discriminatory analyses, as well as retrieving results for various genetic analyses from the same raw data [5].

The main reservoir for *Y. enterocolitica* in Europe are pigs and cattle, while for *Y. pseudotuberculosis,* it is wild animals [6]. Within the annual zoonosis data reporting to the European Food Safety Authority in 2017, eleven outbreaks caused by *Y. enterocolitica* were reported, including a large outbreak involving 80 patients in Denmark. Two of these outbreaks were general ones (i.e. not household outbreaks) and were reported as strong-evidence outbreaks with 'mixed foods' as the incriminated vehicle. One of these two was the before-mentioned Danish outbreak, which involved boarding school pupils attending a sport event during a weekend who were served dinner at the school consisting of pork cutlets in tomato sauce with rice and salad. Insufficient heat treatment and cross-contamination of the pork were considered possible contributing factors. Six students required hospitalisation. *Y. pseudotuberculosis* was the causative agent reported in one outbreak in Norway [4,7].

Public health implications

Pigs are the most important source of *Y. enterocolitica* infections [8,9] and many cases are considered to be related to the consumption of undercooked contaminated pork or cross-contamination of other food items during the handling and preparation of raw pork. Pork should only be consumed after adequate cooking, especially when given to young children. Proper kitchen hygiene is required to avoid cross-contamination.

References

1. European Centre for Disease Prevention and Control. Introduction to the Annual Epidemiological Report. In: ECDC. Annual epidemiological report for 2017 [Internet]. Stockholm: ECDC; 2017 [cited 11 September 2018]. Available from: http://ecdc.europa.eu/annual-epidemiological-reports/methods.
2. European Centre for Disease Prevention and Control. Surveillance systems overview for 2017 [Internet, downloadable spreadsheet]. Stockholm: ECDC; 2018 [cited 30 January 2018]. Available from: http://ecdc.europa.eu/publications-data/surveillance-systems-overview-2017
3. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases [Internet]. Stockholm: ECDC; 2018 [cited 30 January 2018]. Available from: http://atlas.ecdc.europa.eu
4. European Food Safety Authority and European Centre for Disease Prevention and Control. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal. 2018;16(12):5500. Available from https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2018.5500.
5. Inns T, Flanagan S, Greig DR, Jenkins C, Seddon K, Chin T, et al. First use of whole-genome sequencing to investigate a cluster of *Yersinia enterocolitica*, Liverpool, United Kingdom, 2017. J Med Microbiol. 2018 Dec;67(12):1747-1752.
6. European Food Safety Authority. Monitoring and identification of human enteropathogenic *Yersinia* spp. Scientific Opinion of the Panel on Biological Hazards (Question No EFSA-Q-2007-037) – Adopted by the BIOHAZ Panel on 6 December 2007. EFSA Journal. 2007;595:1-30. Available from: https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2007.595.
7. Anonymous, 2018. Annual Report on Zoonoses in Denmark 2017, National Food Institute, Technical University of Denmark. Available from: https://www.food.dtu.dk/english/-/media/Institutter/Foedevareinstituttet/Publikationer/Pub-2018/Rapport-Annual-Report-on-Zoonoses-2017.ashx?la=da&hash=4D9E579C2B146B6DDA569A12912652518AA0590F.
8. Boqvist S, Pettersson H, Svensson A, Andersson Y. Sources of sporadic *Yersinia enterocolitica* infection in children in Sweden, 2004: a case-control study. Epidemiol Infect. 2009 Jun;137(6):897-905.
9. Ostroff SM, Kapperud G, Hutwagner LC, Nesbakken T, Bean NH, Lassen J, et al. Sources of sporadic *Yersinia enterocolitica* infections in Norway: a prospective case-control study. Epidemiol Infect. 1994 Feb. 112:133-141.