

Legionnaires' disease

- Legionnaires' disease remains an uncommon, mainly sporadic respiratory infection with low notification rates in EU and EEA countries (overall 1.1 per 100 000 inhabitants).
- Six countries: Italy, France, Spain, Germany, the United Kingdom and the Netherlands accounted for 84% of all notified cases.
- One large outbreak occurred in Warstein (Germany), with approximately 160 cases recorded.
- Regular checks for *Legionella* and appropriate control measures in man-made water systems may prevent a significant proportion of Legionnaires' disease cases.

Legionnaires' disease is a pneumonia often associated with systemic symptoms and caused by gram-negative bacteria, *Legionella* spp., which are found in freshwater environments worldwide [1]. Humans are infected by inhalation of aerosols containing *Legionella* bacteria, which may result in severe pneumonia with a fatal outcome. Outbreaks commonly arise from contaminated man-made water systems e.g. cooling towers. Cases of Legionnaires' disease are mainly reported in persons in older age groups, especially males.

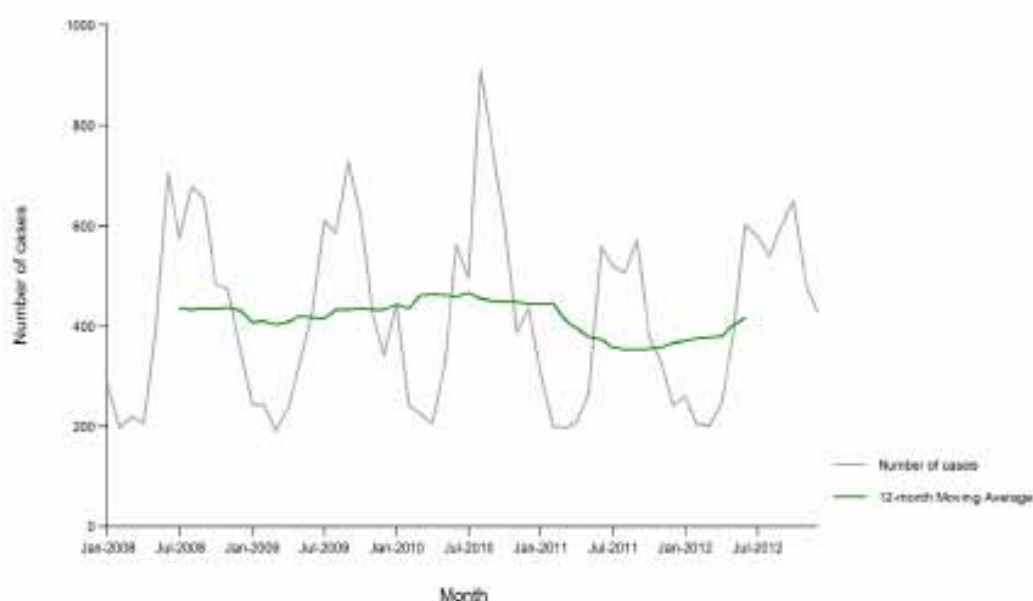
Epidemiological situation in 2012

In 2012, 5 856 cases were reported by 30 countries. Six countries (Italy, France, Spain, Germany, the United Kingdom and the Netherlands) in descending order of magnitude, accounted for 84% of all notified cases (Table 1). The overall notification rate was 1.1 per 100 000 inhabitants, remaining at the same level as in previous years (2008–2011). Very few cases were reported by eastern European countries such as Bulgaria, Poland or Romania. With the notable exception of an August peak in 2010, the average monthly number of reported cases has remained stable over the past five years (Figure 5). As in previous years, most cases were community-acquired (69%) while 20% were travel-associated, 8% were associated with healthcare facilities and 3% were associated with other settings. Of 4 149 cases with known outcome, 419 were reported to have died, giving a case fatality ratio (CFR) of 10%.

Table 1. Number and rates of Legionnaires' disease reported cases, EU/EEA, 2008–2012

Country	National data	Report type	2012				2011		2010		2009		2008	
			Total cases	Confirmed cases & rates			Confirmed cases & rates		Confirmed cases & rates		Confirmed cases & rates		Confirmed cases & rates	
				Cases	Crude rate	Std rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	104	97	1.15	1.09	74	0.88	76	0.91	83	0.99	97	1.17
Belgium	Y	C	106	85	0.77	0.47	72	0.66	89	0.82	64	0.60	0	0.00
Bulgaria	Y	C	0	0	0.00	0.00	0	0.00	1	0.01	2	0.03	1	0.01
Cyprus	Y	C	7	7	0.81	0.97	1	0.12	2	0.24	3	0.38	9	1.16
Czech Republic	Y	C	56	53	0.51	0.49	50	0.48	28	0.27	11	0.11	13	0.13
Denmark	Y	C	127	90	1.61	1.57	79	1.42	99	1.79	100	1.81	103	1.88
Estonia	Y	C	3	3	0.23	0.24	7	0.52	0	0.00	6	0.45	7	0.52
Finland	Y	C	10	4	0.07	0.07	9	0.17	10	0.19	8	0.15	5	0.09
France	Y	C	1298	1268	1.94	1.92	1150	1.77	1508	2.33	1181	1.84	1205	1.88
Germany	Y	C	628	454	0.56	0.49	468	0.57	550	0.67	378	0.46	406	0.50
Greece	Y	C	29	29	0.26	0.24	18	0.16	9	0.08	15	0.13	26	0.23
Hungary	Y	C	33	23	0.23	0.22	19	0.19	19	0.19	14	0.14	20	0.20
Ireland	Y	C	15	15	0.33	0.42	6	0.13	11	0.25	7	0.16	9	0.20
Italy	Y	C	1332	1307	2.20	1.92	990	1.63	1188	1.97	1159	1.93	1143	1.92
Latvia	Y	C	48	16	0.78	0.78	19	0.92	6	0.28	3	0.14	5	0.23
Lithuania	Y	C	9	9	0.30	0.31	2	0.07	1	0.03	0	0.00	2	0.06
Luxembourg	Y	C	5	4	0.76	0.82	6	1.17	10	1.99	5	1.01	4	0.83
Malta	Y	C	4	4	0.96	0.93	9	2.17	6	1.45	5	1.22	2	0.49
Netherlands	Y	C	304	265	1.58	1.55	266	1.60	412	2.49	214	1.30	309	1.88
Poland	Y	C	8	5	0.01	0.01	8	0.02	6	0.02	4	0.01	6	0.02
Portugal	Y	C	140	132	1.25	1.18	88	0.85	125	1.21	93	0.90	91	0.88
Romania	Y	C	3	3	0.02	0.02	0	0.00	1	0.01	1	0.01	1	0.01
Slovakia	Y	C	4	0	0.00	0.08	6	0.11	4	0.07	1	0.02	5	0.09
Slovenia	Y	C	81	81	3.94	3.74	44	2.15	50	2.44	61	3.00	44	2.19
Spain	Y	C	972	968	2.07	1.99	701	1.50	1142	2.46	1205	2.61	1220	2.67
Sweden	Y	C	102	77	0.81	0.77	83	0.88	87	0.93	114	1.23	153	1.67
United Kingdom	Y	C	401	376	0.60	0.59	243	0.39	369	0.59	374	0.61	394	0.64
EU Total	-	-	5829	5375	1.07	1.01	4418	0.88	5809	1.16	5111	1.03	5280	1.07
Iceland	Y	C	2	2	0.63	0.66	3	0.94	2	0.63	6	1.88	2	0.63
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	25	20	0.40	0.41	28	0.57	43	0.89	32	0.67	35	0.74
EU/EEA Total	-	-	5856	5397	1.07	1.00	4449	0.88	5854	1.16	5149	1.02	5317	1.06

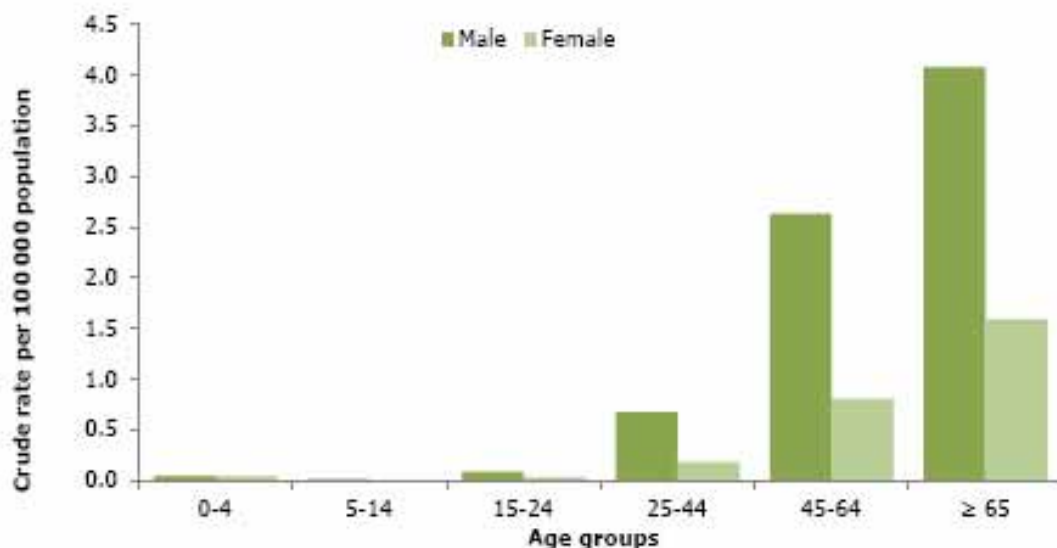
Source: Country reports; Y: Yes; N: No; A: Aggregated data report; C: Case-based data report; -: No report; U: Unspecified.

Figure 5. Distribution of confirmed Legionnaires' disease reported cases, EU/EEA, 2008–2012

Source: Country reports from Austria, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Malta, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

Age and gender distribution

In 2012, people aged 65 years and older accounted for 2 386 (44%) of 5 399 cases with known age. The male-to-female ratio was 2.5:1. Notification rate increased with age, from < 0.1 per 100 000 in those under 25 years of age to 2.6 in persons aged 65 years and above (4.1 per 100 000 in males and 1.6 in females) (Figure 6).

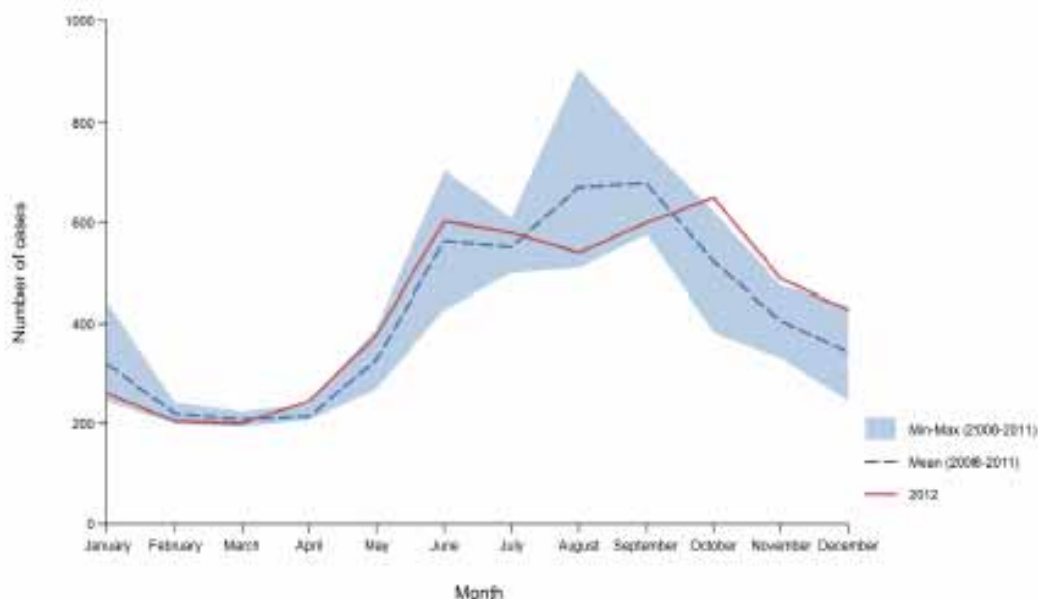
Figure 6. Rates of confirmed Legionnaires' disease, reported cases by age and gender, EU/EEA, 2012

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

Seasonality

The distribution of cases by month of onset showed a peak in summer, with 57% of all cases having a date of onset between June and October (Figure 7).

Figure 7. Seasonal distribution of Legionnaires' disease reported cases, EU/EEA, 2008–2012



Source: Country reports from Austria, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Malta, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

Enhanced surveillance in 2012

In addition to retrospective surveillance of Legionnaires' disease, the European Legionnaires' Disease Surveillance Network (ELDSNet) conducts daily surveillance of travel-associated cases. In 2012, 831 travel-associated cases were reported, which was 9% more than the number of cases reported in 2011 [2,3]. Ninety-nine new travel-associated clusters¹ were notified in 2012. In 44% of these clusters, the first two reported cases were from different countries, and the clusters were therefore unlikely to have been detected without ELDSNet. *Legionella* was found in 56 environmental cluster investigations. One of the 99 accommodation sites associated with clusters had its name published on the ECDC website due to unsatisfactory control measures.

Updates from epidemic intelligence in 2013

Between 1 January and 14 October 2013, ECDC monitored three threats related to Legionnaires' disease. In April 2013, a travel-associated rapidly evolving cluster² comprising three cases associated with the same hotel in Almería, Spain was reported through ELDSNet. In August, a large outbreak of approximately 160 community-acquired cases was reported in Warstein, Germany. Investigations pointed at cooling towers as the source of infection. ECDC also monitored a rapidly evolving cluster of seven travel-associated cases in Sardinia, Italy through ELDSNet.

Discussion

Following two unusual years, 2010 and its notable August–September peak and 2011 with its relatively low notification rate, 2012 was an average year for the epidemiology of Legionnaires' disease in Europe. At 1.1 cases per 100 000 population, the notification rate in 2012 was well within the 2008–2011 range. The demographics of cases, the seasonality and the distribution of probable settings of infection were all very similar to what has been observed in previous years. It is still not entirely clear if the variations observed over the years are merely random fluctuations or are due to external factors, the most likely being environmental conditions more favourable to *Legionella* spp [4,5]. Again, the number of cases reported in eastern European countries remains far below what would be expected.

¹ A cluster is defined as two or more cases that stayed at the same accommodation site in the two to ten days before onset of illness and whose onsets were within the same two-year period.

² A rapidly evolving cluster is defined as at three or more cases with dates of onset within a period of three months during the last six months.

The number of travel-associated Legionnaires' disease cases notified in 2012 was also within the range observed in previous years. With 44% of notified clusters unlikely to have been detected without ELDSNet, the daily surveillance of travel-associated cases continues to add European public health value.

Regular checks for the presence of *Legionella* bacteria and appropriate control measures in man-made water systems may prevent cases of Legionnaires' disease at tourist accommodation, in hospitals, long-term healthcare facilities or other settings which host an important population at higher risk [6]. However, sporadic community-acquired cases, which represent the majority of cases, cannot be easily prevented because sources are seldom identified, especially in rural settings. With an ageing European population, the number of cases is expected to rise in the coming years.

Surveillance systems overview

Country	Data source	Compulsory (Co)/Voluntary (V)/Other(O)	Comprehensive (Co)/Semi-comprehensive (Se)/Other(O)	Active (A)/Passive (P)	Case-based (C)/Aggregated (A)	Data reported by				National coverage	Case definition used
						Laboratories	Physicians	Hospitals	Others		
Austria	AT-Epidemiegesetz	Co	Co	P	C	Y	Y	Y	Y	Y	EU-2008
Belgium	BE-FLA_FRA_LABNET_REFLAB	Co	O	A	C	Y	Y	Y	-	Y	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Co	Co	P	A	Y	Y	Y	Y	Y	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Co	Co	P	C	N	Y	N	N	Y	EU-2008
Czech Republic	CZ-EPIDAT	Co	Co	A	C	N	Y	Y	N	Y	EU-2008
Denmark	DK-MIS	Co	Co	P	C	N	Y	N	N	Y	Other
Estonia	EE-LEGIONELLOSIS	Co	Co	P	C	Y	Y	Y	Y	Y	EU-2008
Finland	FI-NIDR	Co	Co	P	C	Y	Y	N	N	Y	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Co	Co	P	C	Y	Y	Y	Y	Y	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1	Co	Co	P	C	Y	N	N	Y	Y	Other
Greece	GR-NOTIFIABLE_DISEASES	Co	Co	P	C	Y	Y	Y	N	Y	EU-2008
Hungary	HU-EFRIR	Co	Co	P	C	Y	Y	Y	N	Y	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Co	Co	P	C	Y	Y	Y	N	Y	EU-2008
Ireland	IE-CIDR	Co	Co	P	C	Y	Y	Y	N	Y	EU-2012
Italy	IT-LEGIONELLOSIS	Co	Co	P	C	N	Y	Y	N	Y	Other
Latvia	LV-BSN	Co	Co	P	C	Y	Y	Y	Y	Y	EU-2012
Lithuania	LT-COMMUNICABLE_DISEASES	Co	Co	P	C	Y	Y	N	N	Y	EU-2008
Luxembourg	LU-SYSTEM1	Co	Co	P	C	N	Y	N	N	Y	EU-2002
Malta	MT-DISEASE_SURVEILLANCE	Co	Co	P	C	Y	Y	Y	Y	Y	EU-2008
Netherlands	NL-OSIRIS	Co	Co	P	C	Y	Y	N	N	Y	EU-2008
Norway	NO-MSIS_A	Co	Co	P	C	Y	Y	Y	N	Y	EU-2012
Poland	PL-NATIONAL_SURVEILLANCE	Co	Co	P	C	Y	Y	Y	N	Y	Other
Portugal	PT-LEGIONELLOSIS	Co	Co	P	C	Y	Y	N	N	Y	EU-2008
Romania	RO-RNSSy	Co	Co	P	C	N	N	Y	N	Y	EU-2008
Slovakia	SK-EPIS	Co	Co	A	C	Y	Y	Y	N	Y	EU-2008
Slovenia	SI-SURVIVAL	Co	Co	P	C	Y	Y	Y	N	Y	EU-2008
Spain	ES-STATUTORY_DISEASES	Co	Co	P	C	N	Y	Y	N	Y	EU-2008
Sweden	SE-SMINET	Co	Co	P	C	N	Y	N	N	Y	EU-2012
United Kingdom	UK-LEGIONELLOSIS	O	Co	A	C	Y	N	Y	Y	Y	EU-2012

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