



What are the potential health effects associated with *L. monocytogenes*?

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CHARACTERISTICS OF *LISTERIA MONOCYTOGENES*

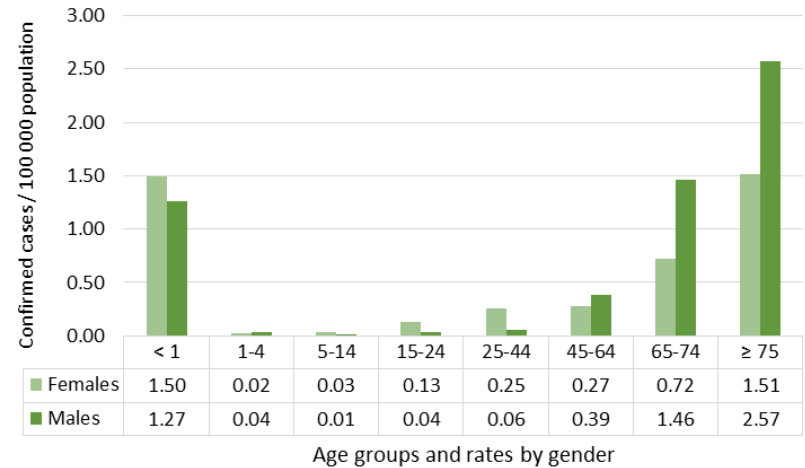
- 17 *Listeria* species: common bacteria in soil and environment
- *Listeria monocytogenes* important pathogenic species
- Causes disease in humans and animals (zoonotic)
- 99% of human infections transmitted via food

CLINICAL FORMS OF INVASIVE LISTERIOSIS IN EU/EEA

- EU surveillance focuses on invasive disease forms
 - Over 97% of reported cases hospitalised
 - 72% blood stream infections (45% in > 75 year-olds)
 - 19% central nervous system (CNS) infection (29% in middle-aged 45-64 year-olds)
 - 8% infections in other sterile sites (e.g. joints, eyes)
 - 1% of samples from non-sterile sites (pregnancies)
- Low estimated under-reporting and under-ascertainment: x 1.7-2.0

POPULATION AT RISK: ELDERLY AND CHILDREN < 1 Y

- Sepsis, CNS infections
- Double rates for males compared to females in age group over 65 years
- Males 65-74 years had 140 times higher rate than that of males in 5-14 years
- Respective rate ratio for females was 24

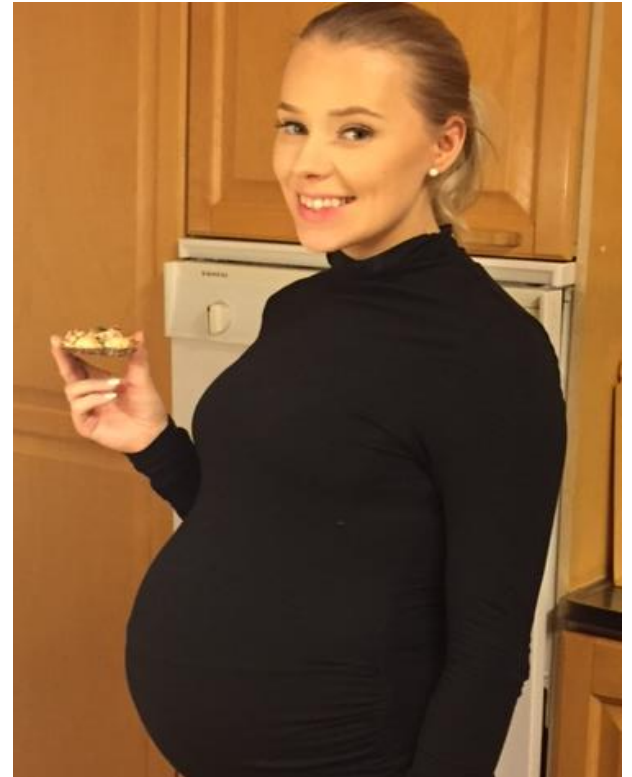


Number of confirmed human listeriosis cases / 100,000 population by age group and gender in the EU/EEA in 2015

Source: Data from the European Surveillance System – TESSy, 28 countries

POPULATION AT RISK: PREGNANT WOMEN

- Fetal death, premature birth => abortions, miscarriages
- Infected newborns => sepsis, meningitis
- Over years, 8% - 14% of all reported cases related to pregnancy
- About 50% of female cases in 15-44 year olds were pregnancy-associated infections
- In 15-24 year old women, pregnancy-associated cases increased from 50% in 2013 to 75% in 2015



POPULATION AT RISK: IMMUNOSUPPRESSED

- CNS infections and sepsis
- Predisposing factors:
 - Underlying conditions, e.g. cancer
 - Immunosuppressive medication



EPIDEMIOLOGY OF HUMAN LISTERIOSIS

- Changes in 2008-2015:
 - Notification rate increased **by 53%** from 0.30 / 100,000 to 0.46 / 100,000
 - Case reports increased **by 60%** (1,381 => 2,206)
 - Fatal cases increased by **100%** (134 => 270)
- Overall **case fatality rate 17.7%** in 2015
- Over 98% of infections acquired in EU/EEA countries
- Sporadic cases and small clusters/outbreaks

LISTERIOSIS OUTBREAKS IN EU/EEA 2008-2015

- 37 outbreaks with strong evidence
- 525 human cases (4% of all reported cases during the study period)
- 182 hospitalizations
- 37 deaths

PUBLIC HEALTH CONCERN: HIGH CASE FATALITY RATES

Age group (years)	Males (N=4,753)		Females (N=3,837)	
	Mean CFR%	95% CI	Mean CFR%	95% CI
< 1	12.7	[8.5 - 16.9]	11.6	[8.0 - 15.2]
1-20	7.6	[1.8 - 13.5]	5.4	[1.2 - 9.7]
21-44	12.6	[9.4 - 15.7]	3.4	[1.7 - 5.1]
45-64	17.7	[15.4 - 20.1]	16.1	[13.3 - 18.8]
65-74	16.0	[13.5 - 18.5]	19.3	[16.3 - 22.4]
≥ 75	20.3	[18.3 - 22.4]	22.5	[20.0 - 25.0]

CRF: case fatality rate, CI: confidence interval

Source: Data from the European Surveillance System - TESSy

CASE FATALITY RATES AND SEROGROUPS

Age (years)	Males (N=779)			Females (N=715)		
	Total	Death	CFR	Total	Death	CFR
1-44	36	6	0.17	105	6	0.06
45-64	204	47	0.23	142	26	0.18
65-74	219	38	0.17	157	37	0.24
>=75	320	58	0.18	311	68	0.22

Serogroup IIa

CFR: case fatality rate

Age (years)	Males (N=1025)			Females (N=789)		
	Total	Death	CFR	Total	Death	CFR
1-44	78	8	0.10	148	2	0.01
45-64	285	48	0.17	141	26	0.18
65-74	254	62	0.24	146	36	0.25
>=75	408	113	0.28	305	94	0.31

Serogroup IVb

CFR: case fatality rate

CONCLUSIONS

- Invasive listeriosis is severe but rare disease: 2,206 cases in 2015
- Case reports increased by 60% in 2008-2015
- 37 foodborne listeriosis outbreaks reported in 2008-2015
- Blood stream infections most common (72%)
- Risk populations: elderly, pregnant women, neonates, immunosuppressed
- Notification rate ("risk") double in males over 65 years compared to women of same age
- Pregnancy-associated cases increased in 15-24 year olds
- Case fatality rate (CFR) increases by age (overall 17,7%)
- Infections with *Listeria monocytogenes* serogroup IVb: notable increase in CFR by age