

SURVEILLANCE REPORT

Annual Epidemiological Report for 2016

Tetanus

Key facts

- In 2016, 89 cases of tetanus, including 48 confirmed cases, were reported in the EU/EEA.
- The number of reported cases has decreased since 2015.
- Adults aged 65 years and above were the most affected age group.
- Cases tended to occur more frequently in the warmer months, which are associated with higher levels of outdoor activity.
- The current epidemiology of tetanus in the EU/EEA may be explained by lower vaccination coverage or waning immunity in older populations.
- Due to the severity of tetanus, there is a need to maintain high vaccination rates in all age groups and continue implementing and developing strategies to protect specific groups, particularly the elderly, in countries with higher rates of disease.

Methods

This report is based on data for 2016 retrieved from The European Surveillance System (TESSy) on 7 February 2018. TESSy 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 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].

For 2016, 26 EU/EEA Member States reported data on tetanus cases to TESSy. All Member States except Denmark, France and Italy reported data on cases of tetanus in accordance with the 2008 or 2012 EU case definition [4].

The majority of Member States reported case-based data from comprehensive passive surveillance systems with national coverage. Tetanus is not under surveillance in Belgium and Finland. Germany has never reported tetanus data to ECDC and Austria last reported tetanus to ECDC in 2011. Bulgaria reported aggregated data for 2016.

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Epidemiology

In 2016, 26 EU/EEA countries reported 89 tetanus cases, of which 48 (54%) were classified as confirmed. Italy, Poland and Spain accounted for 57% of all notified cases (Table 1, Figure 1). Eleven countries reported no cases. There was a decrease in the number of cases reported since 2015.

The EU/EEA notification rate was 0.02 cases per 100 000 population, which is within the range of 0.02 and 0.03 per 100 000 population reported since 2012. The highest rate was reported by Slovenia (0.10 cases per 100 000 population).

Between 2012 and 2016, Italy reported 45% (n=252) of all cases (n=564) reported from 26 EU/EEA Member States, an average of 50 cases per year with a declining trend since 2013. Of the 252 cases reported by Italy, 82% occurred in the age group 65 years and above.

Table 1. Distribution of reported tetanus cases by country and year, EU/EEA, 2012–2016

Country	2012		2013		2014		2015		2016			
	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	ASR	Confirmed cases
Austria	.	.	.	.	.	.	.	.	.	.	.	.
Belgium	0	0.00	.	.	.	.	.	.	.	.	.	.
Bulgaria	2	0.03	1	0.01	0	0.00	0	0.00	4	0.06	0.05	3
Croatia	1	0.02	0	0.00	1	0.02	3	0.07	0	0.00	0.00	0
Cyprus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Czech Republic	0	0.00	0	0.00	0	0.00	1	0.01	1	0.01	0.01	1
Denmark	0	0.00	1	0.02	0	0.00	0	0.00	1	0.02	0.02	1
Estonia	0	0.00	1	0.08	0	0.00	0	0.00	0	0.00	0.00	0
Finland	.	.	.	.	.	.	.	.	.	.	.	.
France	5	0.01	10	0.02	4	0.01	12	0.02	4	0.01	0.01	4
Germany	.	.	.	.	.	.	.	.	.	.	.	.
Greece	7	0.06	5	0.05	2	0.02	6	0.06	3	0.03	0.03	0
Hungary	5	0.05	2	0.02	2	0.02	3	0.03	5	0.05	0.05	0
Iceland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Ireland	1	0.02	1	0.02	1	0.02	1	0.02	0	0.00	0.00	0
Italy	54	0.09	71	0.12	49	0.08	48	0.08	30	0.05	0.04	30
Latvia	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	2	0.07	2	0.07	1	0.03	2	0.07	2	0.07	0.06	0
Luxembourg	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Malta	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Netherlands	2	0.01	1	0.01	0	0.00	1	0.01	1	0.01	0.01	0
Norway	1	0.02	0	0.00	1	0.02	2	0.04	0	0.00	0.00	0
Poland	19	0.05	14	0.04	13	0.03	12	0.03	12	0.03	0.03	0
Portugal	3	0.03	1	0.01	2	0.02	1	0.01	0	0.00	0.00	0
Romania	7	0.03	6	0.03	3	0.02	7	0.04	6	0.03	0.03	6
Slovakia	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Slovenia	1	0.05	1	0.05	6	0.29	3	0.15	2	0.10	0.10	1
Spain	8	0.02	9	0.02	4	0.01	9	0.02	9	0.02	0.02	0
Sweden	0	0.00	3	0.03	2	0.02	0	0.00	3	0.03	0.03	1
United Kingdom	6	0.01	7	0.01	7	0.01	6	0.01	6	0.01	0.01	1
EU/EEA	124	0.03	136	0.03	98	0.02	117	0.03	89	0.02	0.02	48

Source: Country reports.

..: No data reported

ASR: Age-standardised rate.

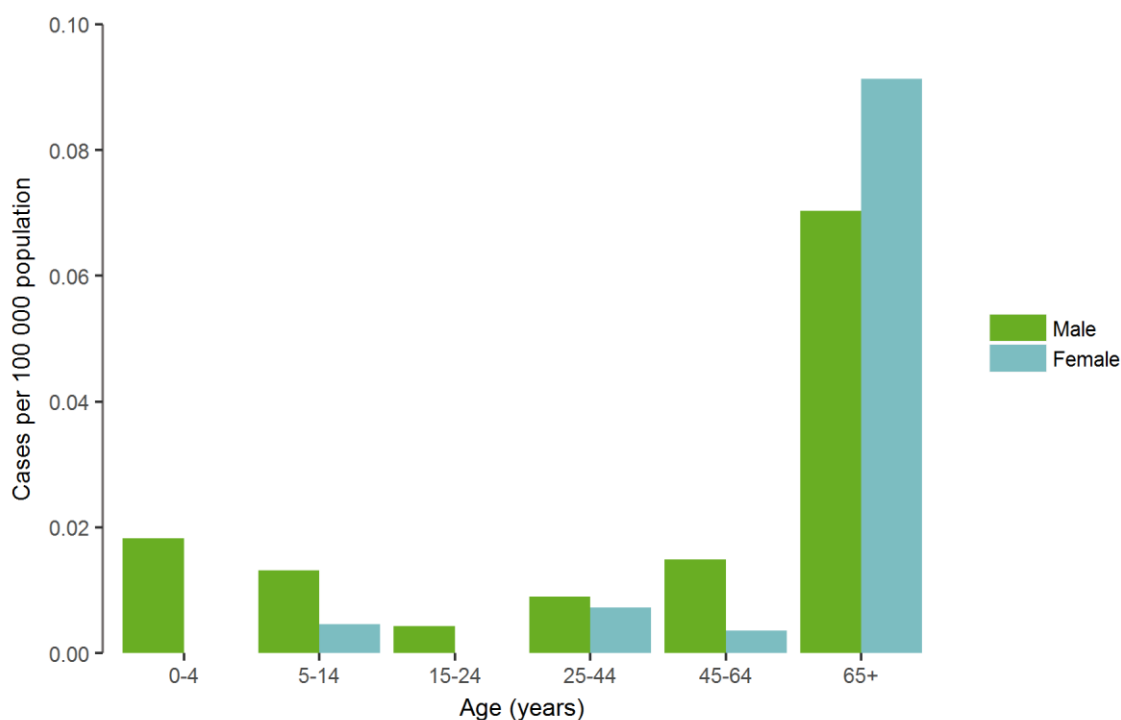
Figure 1. Distribution of tetanus cases by country, EU/EEA, 2016



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

Age and gender distribution

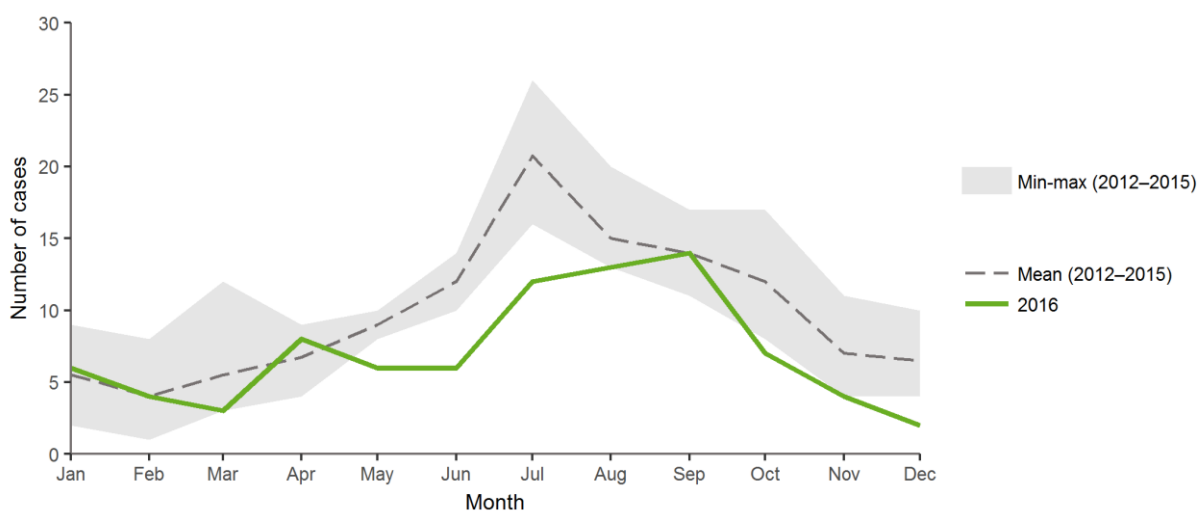
In 2016, persons aged 65 years or older were most affected (0.08 cases per 100 000 population) and accounted for 71% of all reported cases (Figure 2). Cases were more frequently reported among males in all age groups below 65 years. The overall male-to-female ratio was 0.8:1. Among those aged ≥65 years, 40 cases were reported among women and 23 among men.

Figure 2. Rate of tetanus cases per 100 000 population by age and gender, EU/EEA, 2016

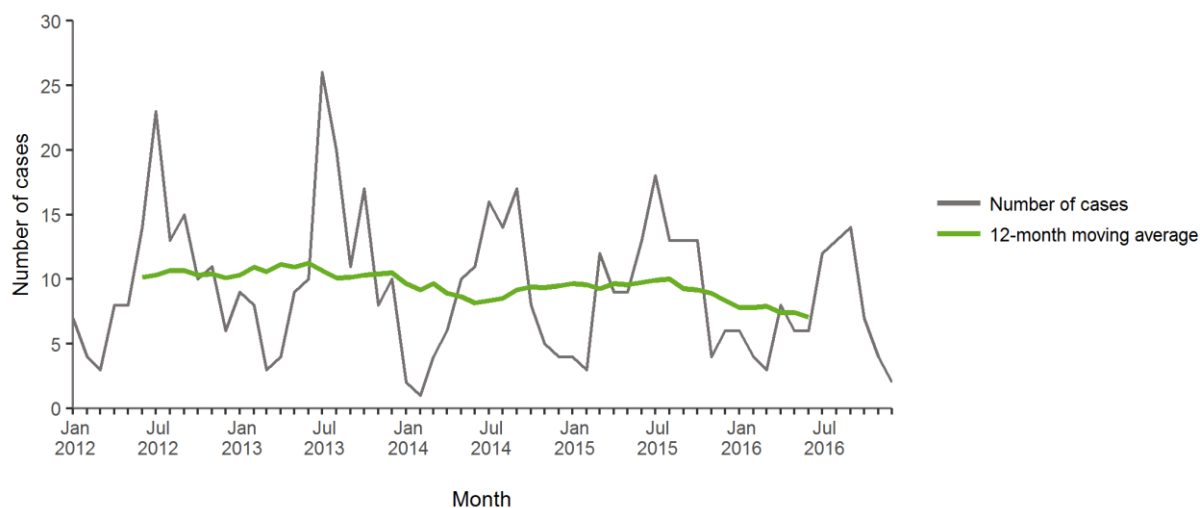
Source: Country reports from Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, France, Greece, Hungary, Italy, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

Seasonality and trend

In 2016, most tetanus cases were reported between June and October, with a peak in September. There was a slight decrease in the number of cases in 2016 compared with 2012 to 2015, when most cases were reported during the summer with a peak in July (Figures 3 and 4). In addition, there was a small peak in April 2016 with eight reported cases, four of which were reported from Italy.

Figure 3. Seasonal distribution of locally acquired tetanus cases by month, EU/EEA, 2016 and 2012 to 2015

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

Figure 4. Trend and number of tetanus cases by month, EU/EEA, 2012–2016

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

Outcome

Of the 85 cases with data available, 14 (n=16%) were fatal. The fatal cases were between 10 and 93 years old, with 12 of 14 older than 65 years of age. Case fatality in the age group over 65 years was 38%.

Discussion

The majority of reported tetanus cases worldwide are birth-associated, occurring in low-income countries among unvaccinated mothers and their newborn infants following unhygienic deliveries and abortions and poor postnatal hygiene practices [5]. Case fatality may vary from 10% to 70% depending on the treatment, age and general health of the patient [5]. In the youngest and oldest age groups and in the absence of intensive care, case fatality approached 100% [5].

In the EU/EEA, the number of cases was lower than in any of the years from 2012 to 2015. Most cases were reported in the elderly, probably related to lower vaccination coverage or waning immunity in this population, with higher notification rates observed in women. It is likely that women above 65 years old had fewer opportunities to get vaccinated compared with men of the same age who in many countries received the vaccine during compulsory military service [6]. Underreporting has been suggested by the use of enhanced surveillance due to the fact that partially immunised patients may present with very mild tetanus [7]. This is particularly important considering the fact that tetanus has become increasingly rare.

The peak in cases observed during the summer and early autumn months may be related to more outdoor activities during this time of year. According to a study from the UK, the majority of cases were associated with injuries that occurred while at home or in the garden [7]. The authors suggested that this may be due to a lack of public awareness of the risk of acquiring tetanus following minor injuries if not fully vaccinated and the lack of knowledge of one's tetanus immunisation status.

Italy accounted for almost half of the cases reported from 2012 to 2016. Italy uses case definitions that are different from the EU case definition [6], where clinical cases are considered as 'confirmed' due to the specificity of the clinical presentation. In the EU case definition, clinical cases are considered 'probable cases', while cases classified as 'confirmed' are required to be laboratory-confirmed.

The notification rate for tetanus in EU/EEA countries remains very low. In the EU/EEA, tetanus vaccination is initiated as part of the infant primary immunisation schedule (3 to 4 doses in the first 2 years of life) [8]. Booster doses are recommended at different ages depending on the country. All countries also recommend booster doses for children and teenagers after completing the priming vaccinations. The majority of Member States recommend a booster for adults who have reached or are above 18 years of age [8]. According to the most recent WHO position paper on tetanus vaccines [5], a three-dose primary series and three booster doses are recommended in order to provide lifelong protection against tetanus, ideally with at least four years between booster doses. Protective immunity persisting for 20 to 30 years after a sixth dose of tetanus-containing vaccine has been suggested in several studies.

Public health implications

Due to its severity, tetanus poses a risk to unvaccinated or insufficiently vaccinated people. There is a need to maintain high vaccine-induced immunity in all age groups and awareness of the potential threat to the minority of non- and under-immunised. Strategies to protect specific groups, the elderly in particular, need to be considered in countries with higher rates of disease.

References

1. European Centre for Disease Prevention and Control. Introduction to the Annual epidemiological report for 2016. In: ECDC. Annual epidemiological report for 2016. Stockholm: ECDC; 2017. Available from: <https://ecdc.europa.eu/en/annual-epidemiological-reports-2016/methods>.
2. European Centre for Disease Prevention and Control. Surveillance systems overview [Internet, downloadable spreadsheet]. Stockholm: ECDC; 2018 [cited 7 February 2018]. Available from: <https://ecdc.europa.eu/en/publications-data/surveillance-systems-overview-2016>.
3. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases [Internet]. Stockholm: ECDC; 2017 [cited 30 January 2018]. Available from: <http://atlas.ecdc.europa.eu>.
4. European Centre for Disease Prevention and Control. EU case definitions [Internet]. Stockholm: ECDC; 2017 [cited 29 May 2018]. Available from: http://ecdc.europa.eu/en/aboutus/what-we-do/surveillance/Pages/case_definitions.aspx.
5. World Health Organization. Tetanus vaccines: WHO position paper – February 2017. Wkly Epidemiol Rec. 2017 Feb 10;92(6):53-76. Available from: <http://apps.who.int/iris/bitstream/10665/254582/1/WER9206.pdf>.
6. Filia A, Bella A, von Hunolstein C, Pinto A, Alfarone G, Declich S, et al. Tetanus in Italy 2001-2010: a continuing threat in older adults. Vaccine. 2014 Feb 3;32(6):639-44.
7. Collins S, Amirthalingam G, Beeching NJ, Chand MA, Godbole G, Ramsay ME, et al. Current epidemiology of tetanus in England, 2001-2014. Epidemiol Infect. 2016 Aug 18;1-11.
8. European Centre for Disease Prevention and Control. Vaccine scheduler [Internet]. Stockholm: ECDC; 2017 [cited 8 February 2018]. Available from: <http://vaccine-schedule.ecdc.europa.eu/Pages/Scheduler.aspx>.