

# Tetanus

## Annual Epidemiological Report for 2018

### Key facts

- In 2018, 92 cases of tetanus were reported in the EU/EEA, of which 48 were confirmed cases.
- The number of reported cases was similar to the number of cases reported in 2017.
- Adults aged 65 years and above were the most affected age group, with women accounting for the majority of cases.
- Cases occurred 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/developing strategies to protect specific groups, particularly the elderly, in countries with higher rates of disease.

### Methods

This report is based on data for 2018 retrieved from The European Surveillance System (TESSy) on 11 March 2020 [1]. The European Surveillance System is a system for the collection, analysis and dissemination of data on communicable diseases.

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 2018, 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 definitions [4].

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

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# Epidemiology

For 2018, 26 EU/EEA countries reported 92 tetanus cases, of which 48 (52.2%) were classified as confirmed. Italy accounted for 39.1% of all notified cases (Table 1, Figure 1). Poland, Romania, Spain and the United Kingdom accounted for 29.3% of all notified cases (Table 1 and Figure 1). Five countries reported no cases. The number of cases reported in 2018 was similar to the number reported in 2017 (82 cases).

The crude EU/EEA notification rate was 0.02 cases per 100 000 population, which is within the range reported since 2012. The highest rate was reported by Cyprus (0.12 cases per 100 000), followed by Estonia (0.08 cases per 100 000 population) and Croatia (0.7 cases per 100 000 population).

Between 2014 and 2018, Italy reported 41% (n=196) of all cases reported from 26 EU/EEA Member States (n=478), with an average of 39.2 cases per year and a declining trend since 2014. Of the 196 cases reported by Italy, 91.7% occurred in the age group 65 years and above.

**Table 1. Distribution of tetanus cases and rates per 100 000 population by country, EU/EEA, 2014-2018**

Country	2014		2015		2016		2017		2018			
	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	ASR	Confirmed cases
Austria	.	.	.	.	.	.	.	.	.	.	.	.
Belgium	.	.	.	.	.	.	.	.	.	.	.	.
Bulgaria	0	0.00	0	0.00	4	0.06	0	0.00	1	0.01	0.01	0
Croatia	1	0.02	3	0.07	0	0.00	2	0.05	3	0.07	0.06	1
Cyprus	0	0.00	0	0.00	0	0.00	0	0.00	1	0.12	0.12	1
Czech Republic	0	0.00	1	0.01	1	0.01	0	0.00	0	0.00	0.00	0
Denmark	0	0.00	0	0.00	1	0.02	2	0.03	2	0.03	0.03	2
Estonia	0	0.00	0	0.00	0	0.00	1	0.08	1	0.08	0.07	0
Finland	.	.	.	.	.	.	.	.	.	.	.	.
France	4	0.01	12	0.02	4	0.01	4	0.01	2	0.00	0.00	2
Germany	.	.	.	.	.	.	.	.	.	.	.	.
Greece	2	0.02	6	0.06	3	0.03	2	0.02	4	0.04	0.03	0
Hungary	2	0.02	3	0.03	5	0.05	0	0.00	1	0.01	0.01	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	0	0.00	1	0.02	0	0.00	0.00	0
Italy	49	0.08	48	0.08	30	0.05	33	0.05	36	0.06	0.04	36
Latvia	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	1	0.03	2	0.07	2	0.07	3	0.11	1	0.04	0.03	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	1	0.22	0	0.00	0.00	0
Netherlands	0	0.00	1	0.01	1	0.01	1	0.01	1	0.01	0.01	0
Norway	1	0.02	2	0.04	0	0.00	0	0.00	3	0.06	0.06	3
Poland	13	0.03	12	0.03	12	0.03	11	0.03	8	0.02	0.02	0
Portugal	2	0.02	1	0.01	0	0.00	0	0.00	2	0.02	0.02	0
Romania	3	0.02	7	0.04	6	0.03	7	0.04	6	0.03	0.03	1
Slovakia	0	0.00	0	0.00	0	0.00	1	0.02	1	0.02	0.02	0
Slovenia	6	0.29	3	0.15	2	0.10	0	0.00	2	0.10	0.08	0
Spain	4	0.01	9	0.02	9	0.02	6	0.01	6	0.01	0.01	0
Sweden	2	0.02	0	0.00	3	0.03	2	0.02	4	0.04	0.04	2
United Kingdom	7	0.01	6	0.01	6	0.01	5	0.01	7	0.01	0.01	0
<b>EU/EEA</b>	<b>98</b>	<b>0.02</b>	<b>117</b>	<b>0.03</b>	<b>89</b>	<b>0.02</b>	<b>82</b>	<b>0.02</b>	<b>92</b>	<b>0.02</b>	<b>0.02</b>	<b>48</b>

Source: country reports.

ASR: age-standardised rate

..: no data reported.

**Figure 1. Distribution of tetanus cases by country, EU/EEA, 2018**

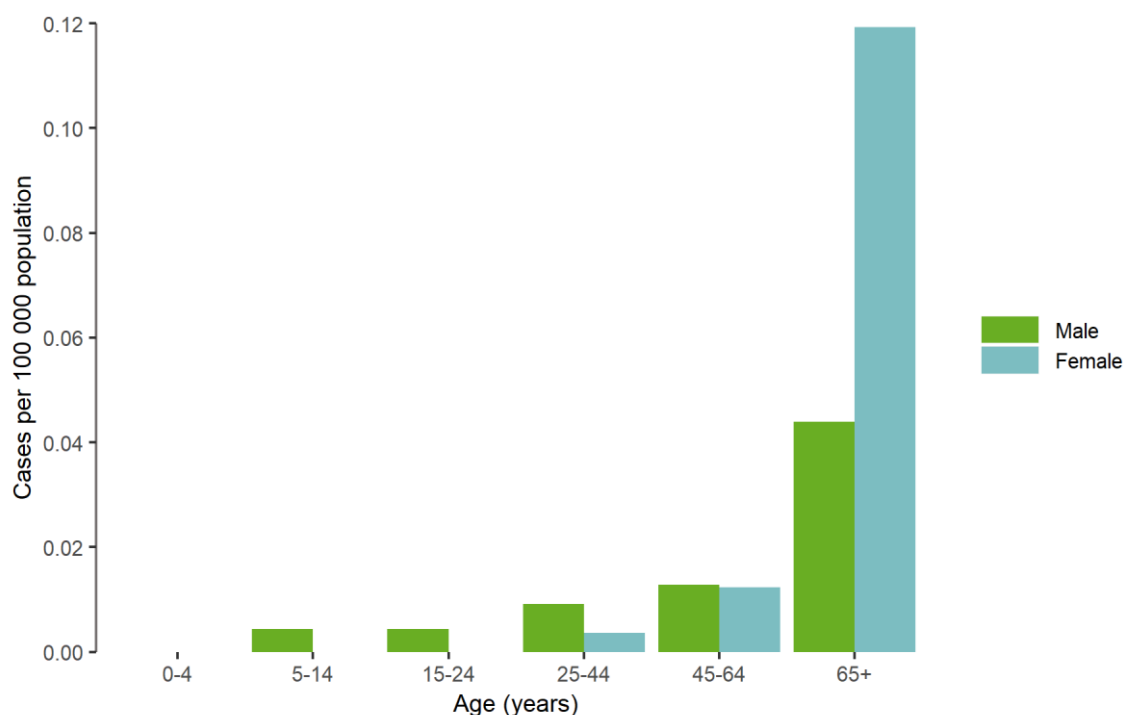
Source: Country reports from Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

## Age and gender distribution

In 2018, persons aged 65 years or older were most affected (0.09 cases per 100 000 population) and accounted for 75% of all reported cases (Figure 2). A total of 14 cases aged 45-64 years were reported and seven aged 25-44 years, while two cases were reported in the age group from 5-24 years old.

More than two thirds of the reported cases were women (68.5%). However, men were more frequently reported in the younger age groups of 25-44 and 45-64 years. Among those aged  $\geq 65$  years, 54 cases were reported among women and 15 among men. The overall female-to-male ratio was 1:0.4.

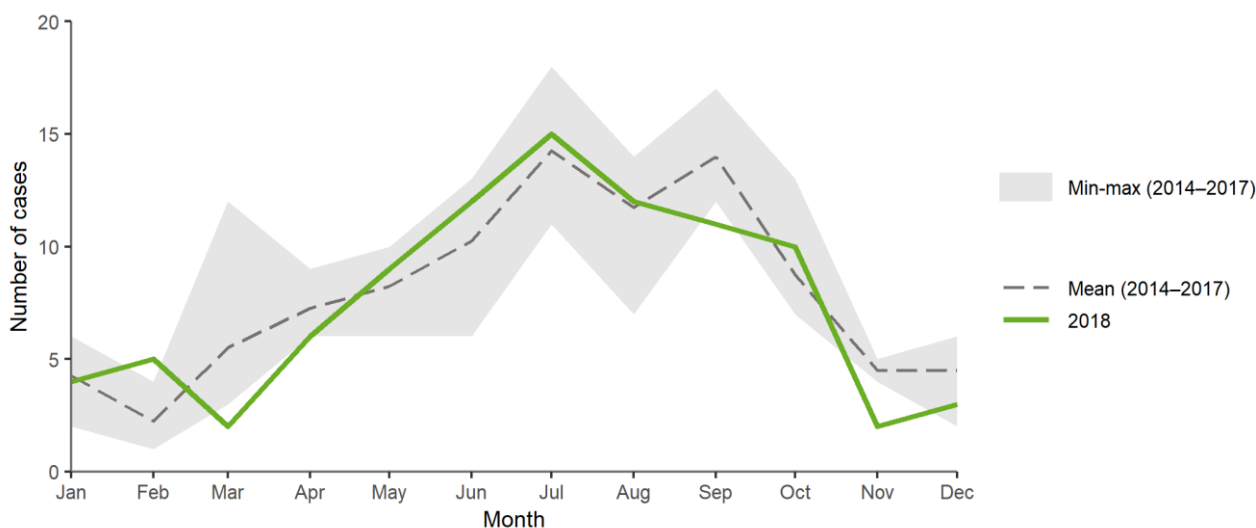
**Figure 2. Distribution of tetanus cases per 100 000 population, by age and gender, EU/EEA, 2018**



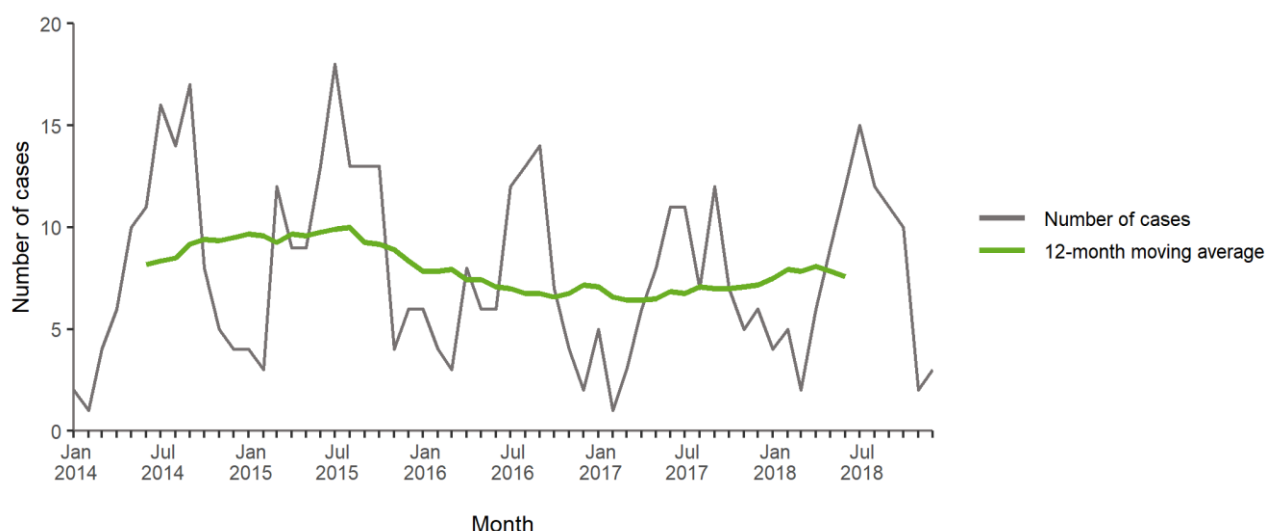
## Seasonality

In 2018, most tetanus cases were reported between June and October, with a peak in July. This peak in July was also observed in previous years. There was a slight increase in the number of cases in 2018 compared with 2017 and 2016, but overall the cases reported can be considered in the same range as 2018 (Figures 3-4). In 2018, the number of reported cases decreased after July and a second peak that had been observed in September between 2014-2017 (mean) was not seen.

**Figure 3. Distribution of tetanus cases by month, EU/EEA, 2018 and 2014–2017**



Countries included CY, CZ, DK, EE, EL, ES, FR, HR, HU, IE, IS, IT, LT, LU, LV, MT, NL, NO, PL, PT, RO, SE, SI, SK, UK  
 Source: Country reports from Croatia, Cyprus, the Czech Republic, Denmark, Estonia, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

**Figure 4. Distribution of tetanus cases by month, EU/EEA, 2014–2018**

Countries included CY, CZ, DK, EE, EL, ES, FR, HR, HU, IE, IS, IT, LT, LU, LV, MT, NL, NO, PL, PT, RO, SE, SI, SK, UK

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

## Outcome

Of the 49 cases with a reported known outcome, 13 (n=26.5%) were fatal. Of all cases with a fatal outcome, 84.6% (n=11) were in those older than 65 years. Of these, seven cases were older than 80 years. The other two cases were aged 29 years old and 64 years old.

The number of cases with a reported fatal outcome almost doubled from 2017 (n=7) but is similar to the number of reported fatal cases in 2016 (n=14).

## Discussion

The majority of reported tetanus cases worldwide are birth/delivery associated, occurring in low-income countries and mainly among unvaccinated mothers and their newborn infants following unhygienic deliveries or abortions, and due to poor postnatal hygiene practices [5]. Case fatality may vary from 10%–70% depending on 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 can approach 100% [5].

In the EU/EEA, the trend in the number of cases reported from 2016–2018 is stable. 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 of age had fewer opportunities for vaccination compared with men of the same age who received the vaccine during compulsory military service in many countries [6]. Collection of vaccination status, which is currently not implemented, would help to better describe the characteristics of this population.

Additionally, the fact that partially immunised patients may present with very mild disease could have led to under-reporting tetanus [7]. This is particularly important considering that tetanus has become increasingly rare.

The peak in cases observed during the summer and early autumn 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 discussed that this may be due to a lack of public awareness of the tetanus risk following minor injuries if not fully vaccinated and the lack of knowledge of one's tetanus immunisation status.

Italy accounted for more than one third (n=196) of the cases reported from 2014–2018 (n=478). Italy uses national 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 which are classified as 'confirmed' are required to be laboratory confirmed.

The overall notification rate for tetanus in EU/EEA countries remains very low. In the EU/EEA, tetanus vaccination is part of the infant primary immunisation schedule (3–4 doses in the first two 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 their priming vaccinations. The majority of Member States recommend a booster for adults who have reached 18 years of age or above [8]. According to the most recent WHO position paper on tetanus vaccines [5], a three-dose primary series is recommended in order to provide lifelong protection against tetanus, with the first dose administered from six weeks of age and subsequent doses given with a minimum interval of four weeks between doses, as well as three booster doses. Ideally, there should be at least four years between booster doses given at 12–23 months of age; 4–7 years of age; and 9–15 years of age. Indeed, protective immunity persisting for 20–30 years after a sixth dose of tetanus-containing vaccine has been suggested in several studies [5,9,10].

A recent WHO expert consultation reviewing the available evidence on immunogenicity and safety of Td vaccine use in 4–7 year old children concluded that the Td vaccine given at ages 4–7 years, as a second booster dose in a six-dose series, would provide adequate protection against diphtheria and tetanus, and recommended steps to include this change in age extension listed in the package insert. At present, the the current WHO programmatic advice to use Td vaccine in ages  $\geq 4$  years is, in effect, an off-label recommendation [11].

## Public health

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 people. Strategies to protect specific groups, particularly the elderly, need to be considered in countries with higher rates of disease.

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