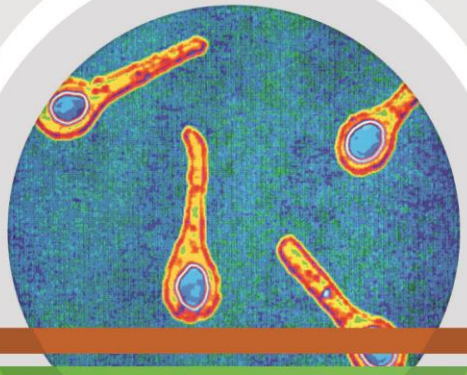


SURVEILLANCE REPORT

Annual Epidemiological Report for 2015

# Tetanus

## Key facts

- In 2015, 117 cases of tetanus, including 67 confirmed cases, were reported to TESSy.
- The notification rate was 0.03 cases per 100 000 population, slightly higher than in the previous year.
- Adults aged 65 and above were the most affected age group; in this age group, the notification rate for women was almost double that for men.
- 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 to continue implementing/developing strategies to protect specific groups, and in particular the elderly, in countries with higher rates of disease.

## Methods

This report is based on data for 2015 retrieved from The European Surveillance System (TESSy) on 26 October 2016. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.

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].

Additional data on this disease are accessible from ECDC's online *Surveillance atlas of infectious diseases* [3].

In 2015, 26 EU/EEA Member States reported data on cases of tetanus to TESSy. All Member States except Denmark, France and Italy report data on cases of tetanus in accordance with the 2008 or 2012 EU case definition (Commission Implementing Decision 2012/506/EU of 8 August 2012 of the European Parliament and of the Council) [4].

Suggested citation: European Centre for Disease Prevention and Control. Tetanus. In: ECDC. Annual epidemiological report for 2015. Stockholm: ECDC; 2017.

Stockholm, November 2017

The majority of Member States report data from comprehensive, passive surveillance systems with national coverage.

# Epidemiology

In 2015, 117 cases, including 67 confirmed cases, were reported by 26 EU/EEA countries. Tetanus is not under surveillance in Finland and Belgium. Germany has never reported tetanus data to ECDC, and Austria last reported tetanus to ECDC in 2011.

Italy reported 41% of all cases (n=48), France and Poland both reported 12 cases (10%). The overall confirmed rate was 0.03 cases per 100 000 population. The highest rate was reported by Slovenia (0.15 cases per 100 000 population). Since 2011, there has been a decreasing trend in the notification rate in the EU/EEA. In 2015, however, the rate was slightly higher than in 2014 (0.03 vs. 0.02 cases per 100 000 population). Ten of the 26 reporting countries reported zero cases.

From 2011 to 2015, Italy's share of all cases (n=617) reported from the 26 EU/EEA Member States amounted to 45.4% (n=280) – an average of 56 cases per year, with small variations every year. Of the 280 cases reported by Italy, 83.5% occurred in the age group 65 years and above.

**Table 1. Distribution of reported tetanus cases, EU/EEA, 2011–2015**

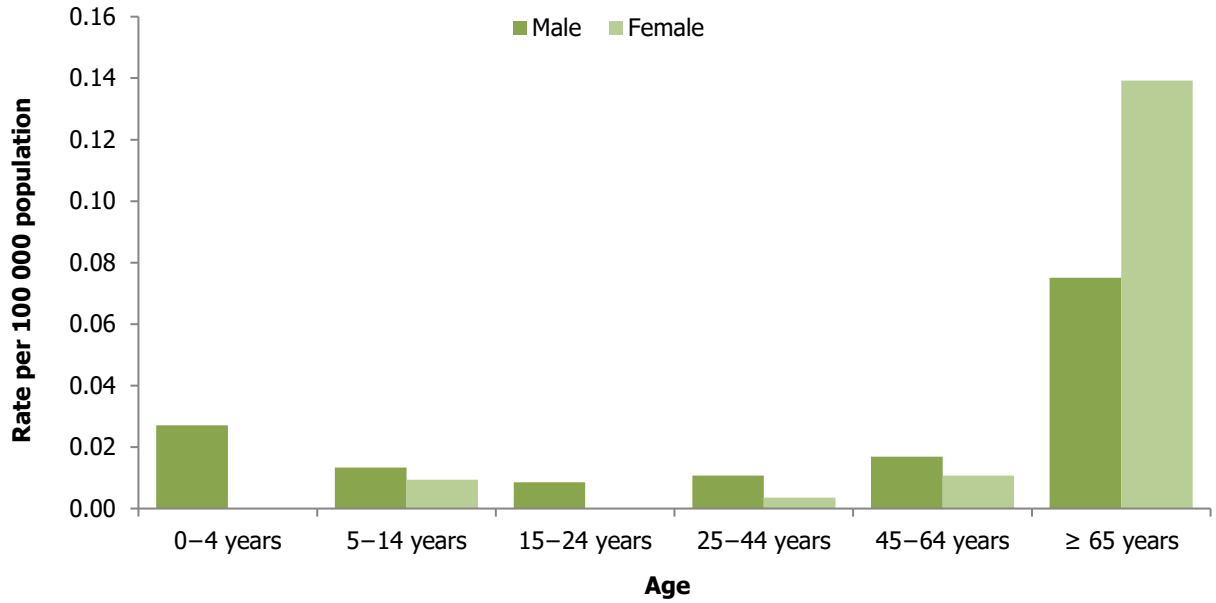
| Country | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Reported cases | | Reported cases | | Reported cases | | Reported cases | | National | Reported cases | | | Confirmed |
| | Number | Rate | Number | Rate | Number | Rate | Number | Rate | coverage | Number | Rate | ASR | cases |
| Austria | 0 | 0.00 | . | . | . | . | . | . | . | . | . | . | . |
| Belgium | 0 | 0.00 | 0 | 0.00 | . | . | . | . | . | . | . | . | . |
| Bulgaria | 4 | 0.05 | 2 | 0.03 | 1 | 0.01 | 0 | 0.00 | Y | 0 | 0.00 | 0.00 | 0 |
| Croatia | . | . | 1 | 0.02 | 0 | 0.00 | 1 | 0.02 | Y | 3 | 0.07 | 0.06 | 0 |
| Cyprus | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | Y | 0 | 0.00 | 0.00 | 0 |
| Czech Republic | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | Y | 1 | 0.01 | 0.01 | 1 |
| Denmark | 0 | 0.00 | 0 | 0.00 | 1 | 0.02 | 0 | 0.00 | Y | 0 | 0.00 | 0.00 | 0 |
| Estonia | 2 | 0.15 | 0 | 0.00 | 1 | 0.08 | 0 | 0.00 | Y | 0 | 0.00 | 0.00 | 0 |
| Finland | . | . | . | . | . | . | . | . | . | . | . | . | . |
| France | 9 | 0.01 | 5 | 0.01 | 10 | 0.02 | 4 | 0.01 | Y | 12 | 0.02 | 0.02 | 12 |
| Germany | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Greece | 11 | 0.10 | 7 | 0.06 | 5 | 0.05 | 2 | 0.02 | Y | 6 | 0.06 | 0.04 | 0 |
| Hungary | 4 | 0.04 | 5 | 0.05 | 2 | 0.02 | 2 | 0.02 | Y | 3 | 0.03 | 0.03 | 0 |
| Ireland | 0 | 0.00 | 1 | 0.02 | 1 | 0.02 | 1 | 0.02 | Y | 1 | 0.02 | 0.02 | 1 |
| Italy | 58 | 0.10 | 54 | 0.09 | 71 | 0.12 | 49 | 0.08 | Y | 48 | 0.08 | 0.06 | 42 |
| Latvia | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | Y | 0 | 0.00 | 0.00 | 0 |
| Lithuania | 2 | 0.07 | 2 | 0.07 | 2 | 0.07 | 1 | 0.03 | Y | 2 | 0.07 | 0.07 | 0 |
| Luxembourg | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | Y | 0 | 0.00 | 0.00 | 0 |
| Malta | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | Y | 0 | 0.00 | 0.00 | 0 |
| Netherlands | 6 | 0.04 | 2 | 0.01 | 1 | 0.01 | 0 | 0.00 | Y | 1 | 0.01 | 0.01 | 0 |
| Poland | 14 | 0.04 | 19 | 0.05 | 14 | 0.04 | 13 | 0.03 | Y | 12 | 0.03 | 0.03 | 0 |
| Portugal | 0 | 0.00 | 3 | 0.03 | 1 | 0.01 | 2 | 0.02 | Y | 1 | 0.01 | 0.01 | 0 |
| Romania | 20 | 0.10 | 7 | 0.03 | 6 | 0.03 | 3 | 0.02 | Y | 7 | 0.04 | 0.04 | 6 |
| Slovakia | 1 | 0.02 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | Y | 0 | 0.00 | 0.00 | 0 |
| Slovenia | 2 | 0.10 | 1 | 0.05 | 1 | 0.05 | 6 | 0.29 | Y | 3 | 0.15 | 0.14 | 1 |
| Spain | 10 | 0.02 | 8 | 0.02 | 9 | 0.02 | 4 | 0.01 | Y | 9 | 0.02 | 0.02 | 2 |
| Sweden | 3 | 0.03 | 0 | 0.00 | 3 | 0.03 | 2 | 0.02 | Y | 0 | 0.00 | 0.00 | 0 |
| United Kingdom | 3 | 0.00 | 6 | 0.01 | 7 | 0.01 | 7 | 0.01 | Y | 6 | 0.01 | 0.01 | 0 |
| **EU** | **149** | **0.04** | **123** | **0.03** | **136** | **0.03** | **97** | **0.02** | **.** | **115** | **0.03** | **0.03** | **65** |
| Iceland | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | Y | 0 | 0.00 | 0.00 | 0 |
| Liechtenstein | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Norway | 0 | 0.00 | 1 | 0.02 | 0 | 0.00 | 1 | 0.02 | Y | 2 | 0.04 | 0.04 | 2 |
| **EU/EEA** | **149** | **0.04** | **124** | **0.03** | **136** | **0.03** | **98** | **0.02** | **.** | **117** | **0.03** | **0.03** | **67** |

*Source: Country reports. Legend: Y = yes, N = no, C = case based, · = no report, ASR: age-standardised rate*

# Age and gender distribution

In 2015, the most affected group was the elderly (≥ 65 years) (0.11 cases per 100 000 population), which accounted for 72% of all cases reported (n=84), followed by those aged 45–64 years (0.01 cases per 100 000 population, n=15) and 0–4 years (0.01 cases per 100 000 population, n=3) (Figure 1). The three cases reported below the age of five were all males. Overall, the male-to-female ratio was 0.7:1. In the age group >65 years, which was the group with the highest notification rate, the notification rate for women was almost double that for men. In this age group a total of 60 women and 24 men were reported.

**Figure 1. Rate per 100 000 population of reported tetanus cases in EU/EEA by age and gender, 2015**

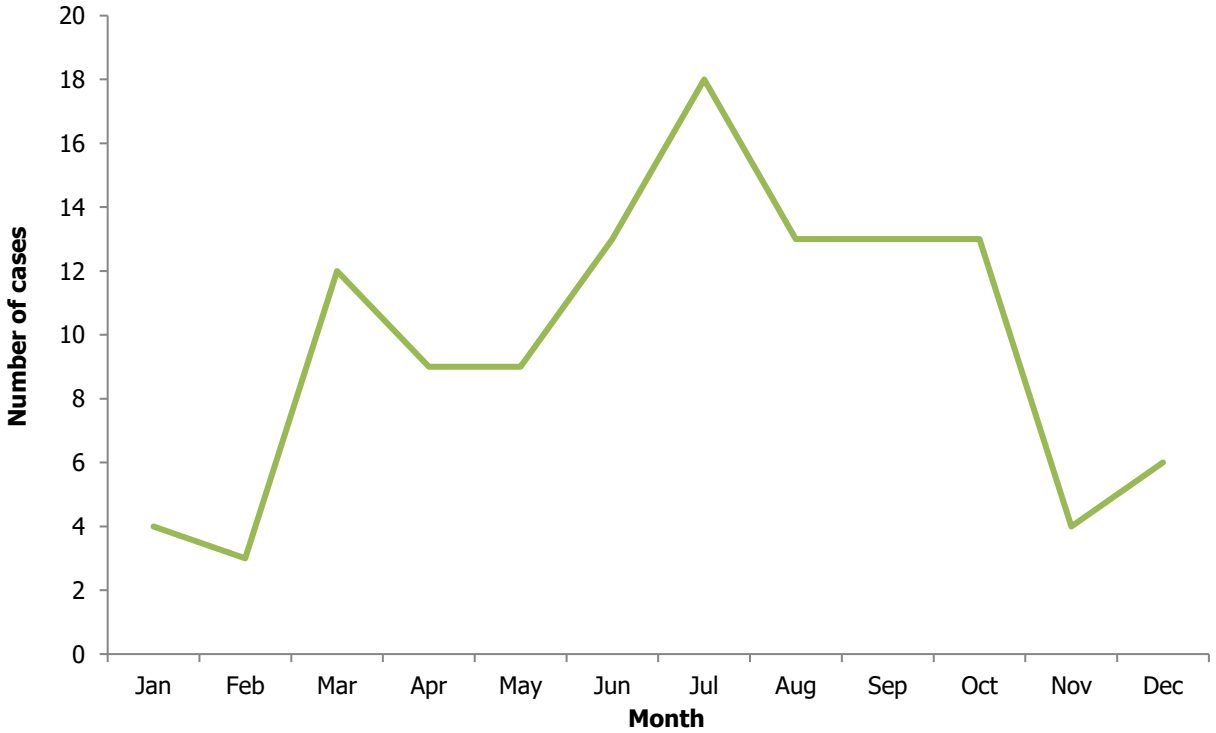



*Source: Country reports from Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, France, Greece, Hungary, Italy, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.*

# Seasonality

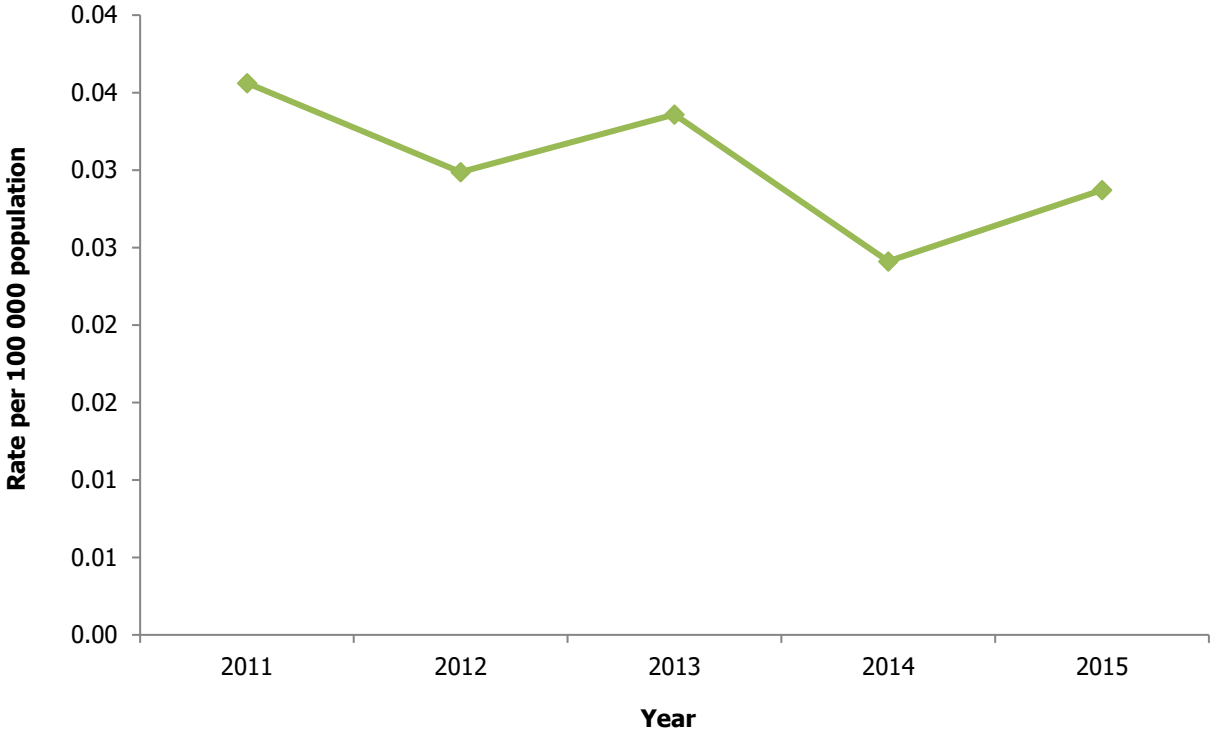
Most cases of tetanus were reported between June to October (Figures 2). However, in March 2015, there was a small peak with 12 cases reported in total, five of which were reported from Italy.

**Figure 2. Seasonal distribution of reported, locally acquired tetanus cases, EU/EEA, 2015**




*Source: Country reports from Belgium, 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, the United Kingdom.*

**Figure 3. Trend of reported tetanus cases, EU/EEA, 2011–2015**




*Source: Country reports from Austria, Belgium, 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, the United Kingdom.*

# Outcome

Of the 67 cases with data available, 17 (n=25%) were fatal. The fatal cases were aged between 5 and 90 years, with the majority being older than 45 years of age.

# Discussion

Tetanus is a sporadic and relatively uncommon infection in EU/EEA countries, caused by the bacterium *Clostridium tetani*. Vaccination and appropriate post-exposure prophylaxis may prevent the disease. Contamination of wounds with tetanus spores in unvaccinated persons can cause an illness characterised by generalised muscular spasms. Case fatality may vary from 10% to 70% depending on treatment, age and general health of the patient. In the youngest and oldest age groups, and in the absence of intensive care, case fatality approaches 100% [5].

The notification rate for tetanus in the EU/EEA countries remains very low, thanks to the widespread use of tetanus vaccination, which is included in the primary vaccination schedule of all EU/EEA countries [6].

Both the number of cases and the reported rate increased slightly compared to the previous year. 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 had fewer opportunities to get vaccinated as compared to men of the same age who in many countries received the vaccine during compulsory military service [7].

The peak in cases observed during the summer months may be related to more outdoor activities during this time of year.

France and Italy, two of the countries reporting the majority of cases, use case definitions that are different from the EU case definition [7,8]. In both countries 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.

There are three different priming vaccination schedules for tetanus used in the 30 EU/EEA countries: three doses at 2, 3 and 4 months of age; three doses at 2, 4 and 6 months of age; and three doses at 3, 5 and 12 months of age. Booster doses are recommended at different ages depending on the country. More than half of the Member

States recommend a booster for adults who have reached or are above 18 years of age. Most countries also recommend booster doses for children and teenagers after completing the priming vaccinations [6]. 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. Indeed, protective immunity persisting for 20–30 years after a sixth dose of tetanus-containing vaccine has been suggested in several studies. On the other hand, it is also reported that high antibody levels after a primary series will decline over time. In the EU/EEA countries, where vaccination programmes are based on combined vaccines, the need for the weaker immunogens (i.e. the diphtheria and pertussis valences) govern the need and timing of the booster doses. This is most likely the reason why two tetanus boosters between two and 18 years of age are given in most European countries [9].

Globally, the aims of tetanus vaccination programmes are to achieve global elimination of maternal tetanus and to ensure lifelong protection against tetanus in all people by attaining and sustaining high coverage of six doses (three primary plus three booster doses) [4].

# Public health implications

Due to its severity, tetanus poses a risk to unvaccinated people. There is a need to maintain high vaccine-induced immunity rates in all age groups and to continue developing and implementing strategies to protect specific groups, and in particular the elderly, in countries with higher rates of disease.

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