

Tetanus

Annual Epidemiological Report for 2017

Key facts

- In 2017, 82 cases of tetanus, including 46 confirmed cases, were reported in the EU/EEA.
- The number of reported cases was similar to the number of cases reported in 2016.
- Adults aged 65 years and above were the most affected age group, with females accounting for the majority of the cases.
- 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/developing strategies to protect specific groups, particularly the elderly, in countries with higher rates of disease.

Methods

This report is based on data for 2017 retrieved from The European Surveillance System (TESSy) on 31 January 2019. 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, 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 2017, 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. 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.

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Epidemiology

For 2017, 26 EU/EEA countries reported 82 tetanus cases, of which 46 (56.1%) were classified as confirmed. Italy and Poland accounted for 54% of all notified cases (Table 1, Figure 1). Ten countries reported no cases. The number of cases reported in 2017 was similar to 2016.

The 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 Malta (0.22 cases per 100 000 population).

Between 2013 and 2017, Italy reported 44.3% (n=231) of all cases (n=522) reported from 26 EU/EEA Member States, an average of 46.2 cases per year with a declining trend since 2013. Of the 231 cases reported by Italy, 78% occurred in the age group 65 years and above.

Table 1. Distribution of tetanus cases and rates per 100 000 population by country and year, EU/EEA, 2013–2017

| Country | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | | |
|----------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|-------------|-----------------|
| | Reported cases | Rate | Reported cases | Rate | Reported cases | Rate | Reported cases | Rate | Reported cases | Rate | ASR | Confirmed cases |
| Austria | . | . | . | . | . | . | . | . | . | . | . | . |
| Belgium | . | . | . | . | . | . | . | . | . | . | . | . |
| Bulgaria | 1 | 0.01 | 0 | 0.00 | 0 | 0.00 | 4 | 0.06 | 0 | 0.00 | 0.00 | 0 |
| Croatia | 0 | 0.00 | 1 | 0.02 | 3 | 0.07 | 0 | 0.00 | 2 | 0.05 | 0.04 | 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 | 1 | 0.01 | 1 | 0.01 | 0 | 0.00 | 0.00 | 0 |
| Denmark | 1 | 0.02 | 0 | 0.00 | 0 | 0.00 | 1 | 0.02 | 2 | 0.03 | 0.03 | 2 |
| Estonia | 1 | 0.08 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 0.08 | 0.07 | 0 |
| Finland | . | . | . | . | . | . | . | . | . | . | . | . |
| France | 10 | 0.02 | 4 | 0.01 | 12 | 0.02 | 4 | 0.01 | 4 | 0.01 | 0.01 | 4 |
| Germany | . | . | . | . | . | . | . | . | . | . | . | . |
| Greece | 5 | 0.05 | 2 | 0.02 | 6 | 0.06 | 3 | 0.03 | 2 | 0.02 | 0.02 | 0 |
| Hungary | 2 | 0.02 | 2 | 0.02 | 3 | 0.03 | 5 | 0.05 | 0 | 0.00 | 0.00 | 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 | 0 | 0.00 | 1 | 0.02 | 0.02 | 0 |
| Italy | 71 | 0.12 | 49 | 0.08 | 48 | 0.08 | 30 | 0.05 | 33 | 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 | 1 | 0.03 | 2 | 0.07 | 2 | 0.07 | 3 | 0.11 | 0.09 | 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 | 1 | 0.22 | 0.19 | 1 |
| Netherlands | 1 | 0.01 | 0 | 0.00 | 1 | 0.01 | 1 | 0.01 | 1 | 0.01 | 0.01 | 1 |
| Norway | 0 | 0.00 | 1 | 0.02 | 2 | 0.04 | 0 | 0.00 | 0 | 0.00 | 0.00 | 0 |
| Poland | 14 | 0.04 | 13 | 0.03 | 12 | 0.03 | 12 | 0.03 | 11 | 0.03 | 0.03 | 0 |
| Portugal | 1 | 0.01 | 2 | 0.02 | 1 | 0.01 | 0 | 0.00 | 0 | 0.00 | 0.00 | 0 |
| Romania | 6 | 0.03 | 3 | 0.02 | 7 | 0.04 | 6 | 0.03 | 7 | 0.04 | 0.04 | 7 |
| Slovakia | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 0.02 | 0.02 | 0 |
| Slovenia | 1 | 0.05 | 6 | 0.29 | 3 | 0.15 | 2 | 0.10 | 0 | 0.00 | 0.00 | 0 |
| Spain | 9 | 0.02 | 4 | 0.01 | 9 | 0.02 | 9 | 0.02 | 6 | 0.01 | 0.01 | 1 |
| Sweden | 3 | 0.03 | 2 | 0.02 | 0 | 0.00 | 3 | 0.03 | 2 | 0.02 | 0.02 | 0 |
| United Kingdom | 7 | 0.01 | 7 | 0.01 | 6 | 0.01 | 6 | 0.01 | 5 | 0.01 | 0.01 | 0 |
| EU/EEA | 136 | 0.03 | 98 | 0.02 | 117 | 0.03 | 89 | 0.02 | 82 | 0.02 | 0.02 | 46 |

Source: country reports.

ASR: age-standardised rate

∴: no data reported.

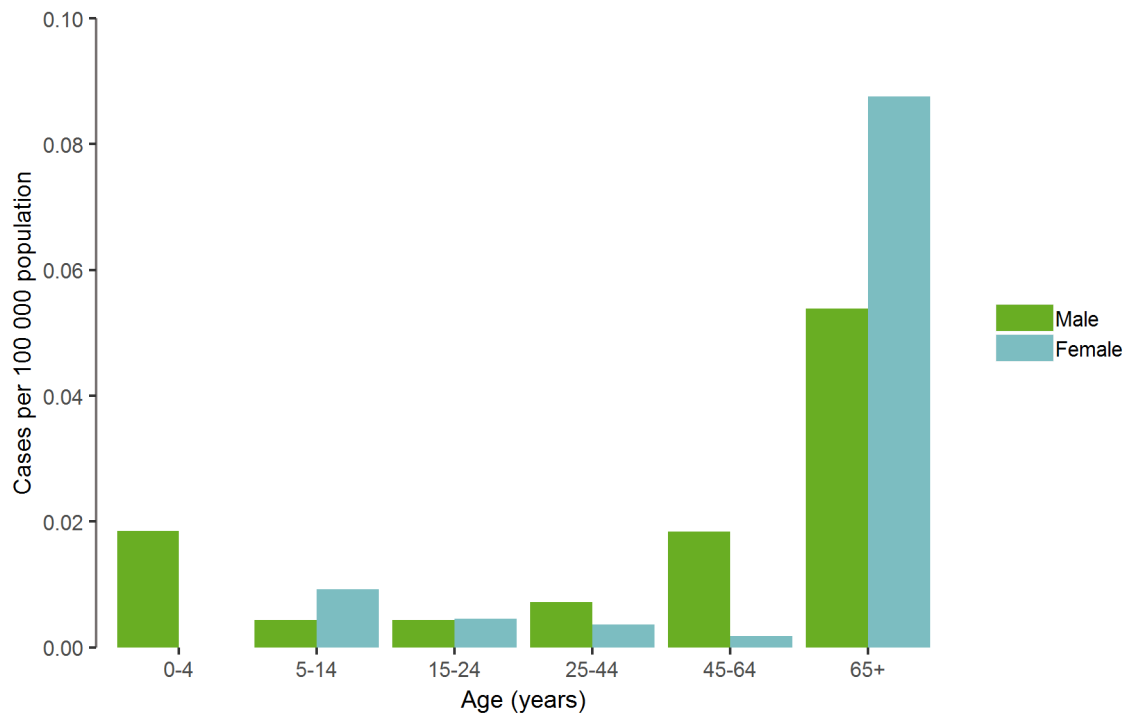
Figure 1. Distribution of tetanus cases by country, EU/EEA, 2017

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 2017, persons aged 65 years or older were most affected (0.10 cases per 100 000 population) and accounted for 70% of all reported cases (Figure 2). More than half of the reported cases were females (56%). However, males were more frequently reported in the younger age groups of 0–4, 25–44 and 45–64 years. Among those aged ≥ 65 years, 39 cases were reported among women and 18 among men. The overall female-to-male ratio was 1:0.8.

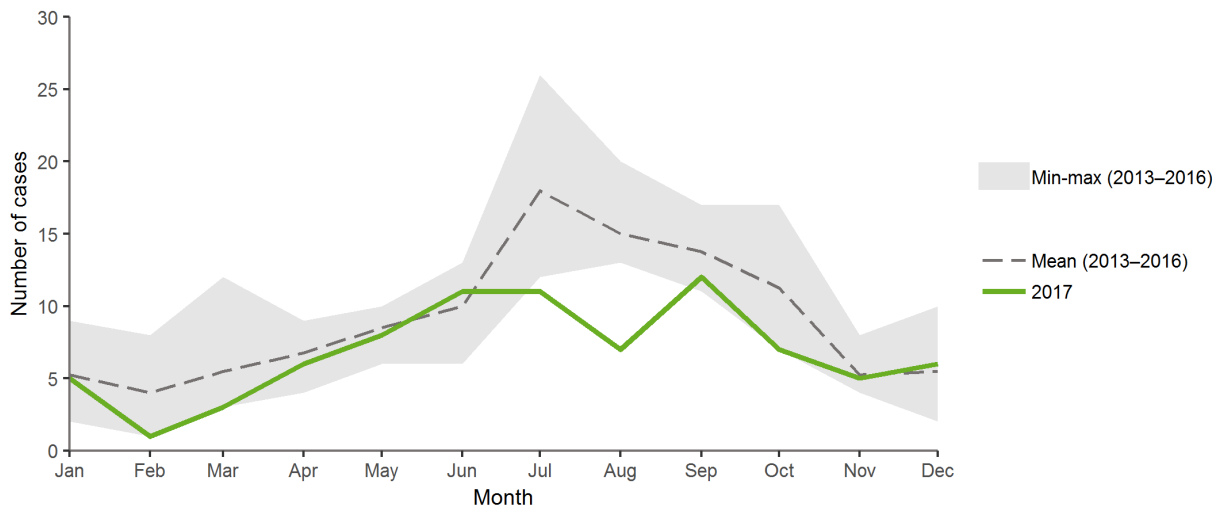
Figure 2. Distribution of tetanus cases per 100 000 population by age and gender, EU/EEA, 2017



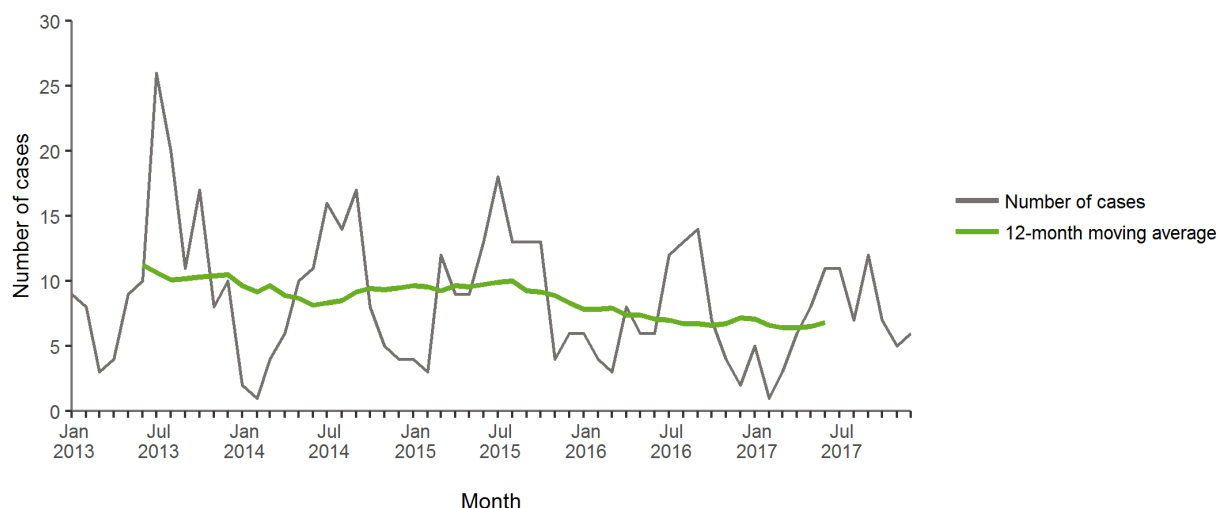
Seasonality

In 2017, 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 2017 compared with the mean number reported from 2013–2016, when most cases occurred during the summer with a peak in July (Figures 3,4).

Figure 3. Distribution of tetanus cases by month, EU/EEA, 2013–2016 and 2017



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, 2013–2017

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 48 cases with reported known outcome, 7 (n=14.6%) were fatal. All cases with a fatal outcome, but one was older than 65 years.

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%–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 approached 100% [5].

In the EU/EEA, there is a small decreasing trend in the number of cases reported from 2013–2017. Most cases were reported in the elderly, probably related to lower vaccination coverage or waning immunity in the 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].

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 almost half of the cases reported from 2013–2017. 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 which are classified as 'confirmed' are required to be laboratory confirmed.

The notification rate for tetanus in the EU/EEA countries remains very low. In the EU/EEA, tetanus vaccination is initiated as part of the infant primary immunisation schedule (3–4 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 18 years of age or above [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. 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].

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. Strategies to protect specific groups, particularly the elderly, 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. In: ECDC. Annual epidemiological report for 2017 [Internet]. Stockholm: ECDC; 2017 [cited 31 January 2019]. Available from: <http://ecdc.europa.eu/annual-epidemiological-reports/methods>.
2. European Centre for Disease Prevention and Control. Surveillance systems overview [Internet, downloadable spreadsheet]. Stockholm: ECDC; 2018 [cited 31 January 2019]. Available from: <http://ecdc.europa.eu/publications-data/surveillance-systems-overview-2017>
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/public/index.aspx?Dataset=27&HealthTopic=51>
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/surveillance-and-disease-data/eu-case-definitions>
5. 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;144(16):3343-3353.
8. European Centre for Disease Prevention and Control. Vaccine Scheduler [Internet]. Stockholm: ECDC; 2019. Available from: <http://vaccine-schedule.ecdc.europa.eu>
9. Borrow R, Balmer P, Roper MH. Immunological Basis for Immunization Series: Module 3 - Tetanus, Update 2006. Geneva: WHO; 2006. Available at http://apps.who.int/iris/bitstream/10665/43687/1/9789241595551_eng.pdf
10. Hammarlund E, Thomas A, Poore EA, Amanna IJ, Rynko AE, Mori M, et al. Durability of Vaccine-Induced Immunity Against Tetanus and Diphtheria Toxins: A Cross-sectional Analysis. Clin Infect Dis. 2016 May 1;62(9):1111-8.