

SURVEILLANCE REPORT

Bi-annual measles and rubella monitoring report

October 2017

This publication reports on measles based on surveillance data from 1 January 2016 to 30 June 2017 and epidemic intelligence up to the first week of September 2017. For rubella, the report covers surveillance data from 1 July 2016 to 30 June 2017.

Summary

- EU/EEA countries reported more than 14 000 measles cases including 34 deaths attributed to measles from 1 January 2016 to end of June 2017 (source: the European Surveillance System - TESSy and the National Institute of Public Health in Romania).
- Continuing measles spread across Europe is related to suboptimal vaccination coverage in many EU/EEA countries. The latest available figures on vaccination coverage collected by the World Health Organization (WHO) for 2016 show that the vaccination coverage for the second dose of measles was below 95% in 20 of 27 EU/EEA countries reporting second dose coverage data. The vaccination coverage for the first dose of measles was below 95% in 18 of 30 EU/EEA countries reporting on the first dose. All countries in the EU/EEA use the combined measles-mumps-rubella (MMR) vaccine.
- During the period 1 July 2016 to 30 June 2017, EU/EEA countries reported 819 cases of rubella. Poland accounted for 77% (n=632) of reported rubella cases in the 12-month period. However, data from Poland should be interpreted with caution since only nine of the reported cases were laboratory confirmed.

Main developments

Measles

- Between 1 July 2016 and 30 June 2017, 10 866 cases of measles were reported by 30 EU/EEA countries to the European Surveillance System (TESSy). Twenty-eight countries reported consistently throughout this 12-month period. Belgium and Lithuania did not report for June 2017.
- In the 12-month period, the highest number of cases were reported by Italy (4 044), Romania (3 906) and Germany (953), accounting for 37%, 36% and 9% of EU/EEA cases, respectively. The highest incidence was reported by Romania (197.7 cases per million population), Italy (66.7 cases per million population) and Belgium (28.8 cases per million population).
- The diagnosis of measles was confirmed by positive laboratory results (serology, virus detection or isolation) in 65% of all EU/EEA cases. Circulating genotypes were A, B3 and D8.
- Over the 12 months period the measles notification rate was below one case per million population in 10 of the 30 reporting countries. Three of these ten countries, Norway, Latvia and Malta, reported no cases.

- The highest age-specific notification rate was observed in infants under one year of age (254.8 cases per million population), followed by children aged 1–4 years (124.8 cases per million population). In the past 12 months in EU/EEA, 40% of the cases were ≥ 20 years old.
- Of all cases with known age, 94% had a known vaccination status and of these, 86% were reported as unvaccinated. In the target group for the first dose of routine childhood MMR vaccination (children 1–4-years), 85% of all cases were unvaccinated. Some countries also administer the second dose in this age group.
- During the 12-month period from 1 July 2016 to 30 June 2017, 22 measles-related deaths were reported to ECDC, 16 in Romania, two in Italy and one in Bulgaria, Germany, Spain and Portugal, respectively. Four of these deaths were in unvaccinated infants < 1 year of age. Seven cases were complicated by acute measles encephalitis.
- For Romania, the number of measles cases reported to ECDC is different from the number regularly published by the Romanian National Institute of Public Health due to the delay in case-based reporting to ECDC.
- The [Communicable Disease Threats Report](#) (CDTR) reports on measles outbreaks inside and outside the EU on a monthly basis.

Rubella

- Twenty-eight EU/EEA countries reported 819 rubella cases during the period 1 July 2016 to 30 June 2017 to TESSy. Twenty-six countries reported consistently for the 12-month period. Lithuania did not report for June 2017 and Portugal did not report for May 2017 and June 2017.
- The rubella notification rate was lower than one case per million population in 26 of the 28 countries. Seventeen of these 26 countries reported zero cases. Of the two countries with a notification rate above one case per million population, the highest rate was reported by Poland (16.65 cases per million population); Austria reported 3.11 cases per million population.
- Poland reported 632 rubella cases, 77% of all reported cases in the 12-month period. This figure should be interpreted with caution as only nine cases were confirmed by laboratory testing. Data were reported in an aggregated format. The highest number of cases were observed in 1–4-year-olds and 5–9-year-olds.
- ECDC monitors European rubella outbreaks on a monthly basis through epidemic intelligence. No new rubella outbreaks were detected in the EU/EEA in the last six months. For more information see the [CDTR](#).

Progress towards elimination goals of the WHO European Region

At the [sixth meeting](#) of the Regional Verification Commission for Measles and Rubella in June 2017, of 53 countries in the WHO European Region, 33 (22 in the EU/EEA) were declared to have achieved the elimination goal for measles and 33 (21 in the EU/EEA) for rubella (based on 2016 data). In addition, nine countries (four EU/EEA) were deemed to have interrupted endemic transmission for less than 36 months for measles and four for rubella (two EU/EEA), meaning that they are on their way to achieving the elimination goal. Four EU/EEA countries were considered to still be experiencing endemic transmission of measles: Belgium, France, Italy and Romania.

High-quality surveillance will be essential to achieve the elimination goal, along with increasing vaccination coverage rates in young children targeted by routine vaccination programmes and closing immunisation gaps in adolescents and adults who have missed opportunities for vaccination in the past.

Frequency of ECDC measles and rubella outputs

ECDC collects measles and rubella data on a monthly basis via TESSy. In addition, ECDC monitors measles and rubella epidemiology and outbreaks via epidemic intelligence.

Monthly:

- [Surveillance Atlas of Infectious Diseases](#) (TESSy data)
- [Surveillance report: monthly measles and rubella monitoring report](#) (a concise report, TESSy data)
- [Communicable Disease Threats Report](#) (CDTR) 'Measles and Rubella, Monitoring European and worldwide outbreaks' section (epidemic intelligence data)

Bi-annual:

- [Bi-annual Surveillance Report](#) (an extensive report, TESSy and epidemic intelligence data presented)

Methods

Measles and rubella routine surveillance data were retrieved from The European Surveillance System (TESSy) on 26 July 2017. As in all 'Bi-annual Measles and Rubella Monitoring Reports', the analysis focuses on the most recent 12-month period since data retrieval, therefore, the present report covers the 12 month period from 1 July 2016 to 30 June 2017.

Exceptionally in the current issue, a more in-depth analysis is presented for measles for the 18-month period from 1 January 2016 to 30 June 2017, with an analysis presented for the three countries reporting the most cases.

Such deviation from standard format of bi-annual measles and rubella reports is to provide a more comprehensive overview of the status of measles epidemiology in Europe during a period when the number of cases is increasing in certain European countries.

In this issue, information from epidemic intelligence (specifically from the National Institute of Public Health in Romania) and TESSy data are combined in some sections when data from Romania are presented. The number of measles cases reported monthly to TESSy is different from the number published by the National Institute of Public Health in Romania due to the delay in case-based reporting to ECDC.

Measles

Overview

From 1 January 2016 to 30 June 2017, more than 14 000 measles cases were reported in EU/EEA countries, with 34 deaths (source: TESSy and Romanian National Institute of Public Health) during this period.

Measles epidemiology in EU/EEA countries, 2016-17.

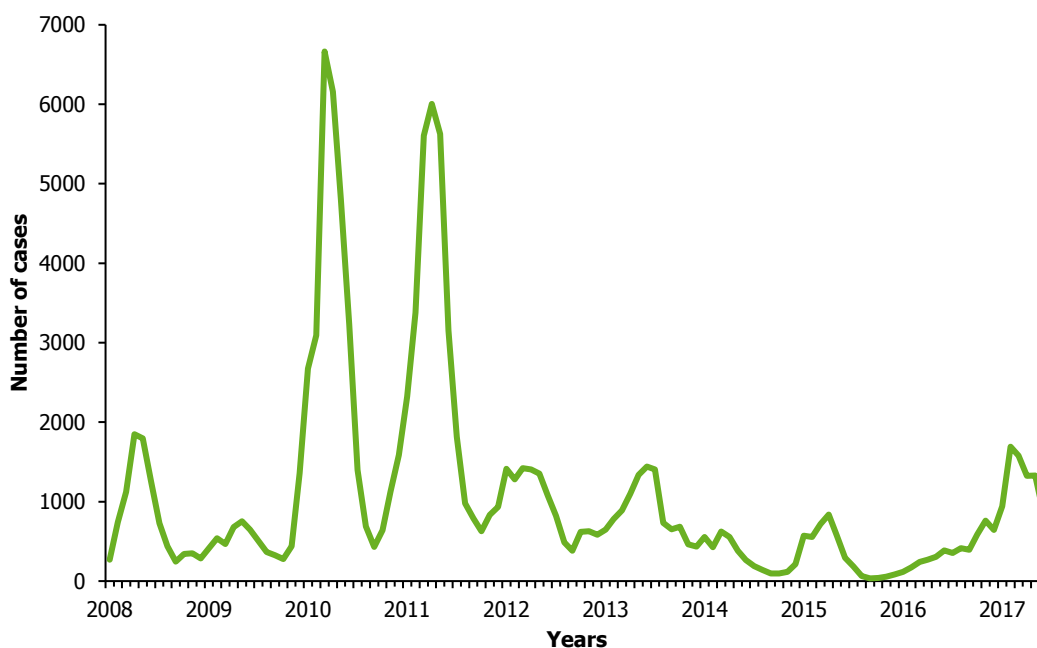
From 1 January 2016 to 30 June 2017, the total number of measles cases reported to TESSy at ECDC were 12 359.

The countries reporting the majority of cases during this period were the following: Italy (n=4 521, 37%), Romania (n=4 276, 35%), Germany (n=1 124, 9%), UK (n=663, 5%) and France (n=429, 3%).

The number of measles cases reported in the first half of 2017 exceeded the number reported in 2016 in eighteen countries (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, France, Greece, Iceland, Italy, Luxembourg, the Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden).

In the first half of 2017, 31.9% of cases were <5 years of age and 47.0% were aged ≥20 years. In 2016, 43.8% of cases were aged <5 years, and 25.5% were aged ≥20 years. (Figure 10).

Figure 1. Distribution of measles cases by month, EU/EEA countries, 1 January 2008–30 June 2017



Note: From 2008–2011, 29 EU/EEA countries reported measles data to ECDC. From 2012 this number increased to 30 after Croatia joined the European Union.

Measles epidemiology in EU/EEA countries, 1 July 2016 to 30 June 2017

Thirty EU/EEA countries conduct measles surveillance and routinely report measles data to ECDC. Twenty-eight countries reported consistently during the period (Table 1). All countries reported case-based data, except Belgium, which has reported aggregated data since May 2016.

During the 12-month period, 10 866 cases of measles were reported to TESSy (Figure 1, Table 1). Italy reported most cases (n=4 044, 37% of all cases), 889 of which were reported in March 2017 (Table 1). Romania (3 906) and Germany (953) also reported a high number of cases. The number of measles cases reported in the 12-month period is shown in Figure 7 and country-specific notification rates for the entire 12-month period are presented below.

The measles notification rate was lower than one case per million population in 10 of the 30 reporting countries. Three countries (Latvia, Malta and Norway) reported zero cases. Twenty reporting countries had a notification rate above one case per million population, with the highest notification rate reported by Romania (198 cases per million population) which was followed by Italy (67 cases per million population) and Belgium (29 cases per million population) (Table 1).

Over the 12-month period, the diagnosis of measles was confirmed in 65% (7 095) of the cases by positive laboratory results (serology, virus detection or isolation). There was a large variation among countries in the proportion of laboratory-confirmed cases, which can be attributed to the significant variation in the number of cases reported by the countries, different laboratory capacities, and the fact that laboratory confirmation may not be considered necessary for all cases during an outbreak due to the higher positive predictive value of a clinical diagnosis in this context.

In addition, a high notification rate and proportion of cases continue to be observed in unvaccinated 1–4-year olds in several countries across the EU/EEA (Figure 9). This highlights the importance of closing immunisation gaps in adolescents and adults who have missed opportunities for vaccination in the past, as well as improving immunisation coverage rates in the age groups already targeted by routine vaccination programmes. The highest age-specific notification rate was observed in infants under one year of age (255 cases per million population), followed by children aged 1–4 years (125 cases per million population) (Figure 9).

Data on vaccination status were available for 94% (10 162/10 864) of the cases with known age. The majority of cases were unvaccinated (n=8 742, 86%); 9% (880) had received one dose of measles vaccine, 3% (353) had received two or more doses, and 2% (187) had received an unknown number of doses. The proportion of unvaccinated cases was high in all age groups and highest among infants under one year (95%) (Figure 11). Infants under one year are often too young to be eligible for vaccination. In the target group for the first dose of routine childhood MMR vaccination (1–4-year-old children), 85% of all cases were unvaccinated. (Figure 11). Some countries also administer the second dose in this age group, while others administer the second dose to older children. For more information on the different measles and rubella vaccine schedules in EU/EEA countries, see the ECDC vaccine scheduler (<http://vaccine-schedule.ecdc.europa.eu/Pages/Scheduler.aspx>). Measles vaccination coverage by country for the second dose of a measles-containing vaccine is presented in Figure 7.

Over the 12-month period, 22 deaths were attributed to measles, 16 in Romania, two in Italy and one in Bulgaria, Germany, Spain and Portugal, respectively. Four of these deaths were in unvaccinated infants <1 year of age. Seven cases were complicated by acute measles encephalitis.

In 2017, the reported circulating genotypes in EU/EEA Member States were A, B3 (most common) and D8 in 2017. In Italy, Germany and Spain, genotype B3 and D8 are circulating. Romania and other countries were mainly affected by genotype B3, while genotype A was mainly circulating in France.

In 2017, 206 of the 7 715 reported cases were defined as imported, of which 183 cases indicated a probable country of infection. Cases are defined as imported if there is virological evidence or epidemiological evidence of exposure outside the country during the 7–18 days prior to rash onset.

Country profiles, 2016–mid 2017

During the 18 months' period, Italy, Romania and Germany reported more cases than other countries in both 2016 and the first half of 2017. The increasing trend started at different points in time in these three most affected countries. Romania started to observe a sharp increase of cases from October 2016 and the trend has continued into 2017. In Italy, an increasing trend has been observed since January 2017. Germany's turning point occurred in February 2017, after Romania and Italy, and the increase was slower than that of Italy and Romania. An in-depth description of the three countries is presented for the 18 months' period from January 2016 to June 2017.

Italy

Italy reported 861 cases in 2016. Since January 2017 (n=287), the monthly case number increased through the late winter and early spring, peaking in March 2017 with 889 cases reported. In the first half of 2017, Italy has reported 3 660 cases. The main circulating reported genotype was B3 and D8.

The main affected population are adults. In 2016, 50% of cases were 20 years old or above. In 2017, by the end of June, 68% of all cases were 20 years old or above.

The incidence reported by Italy in the past 12 months was 67 cases per million population, with higher incidence observed in children below the age of five years and adults between 20 and 29 years.

Figure 2. Distribution of measles notification rate by age group in Italy, 1 July 2016–30 June 2017

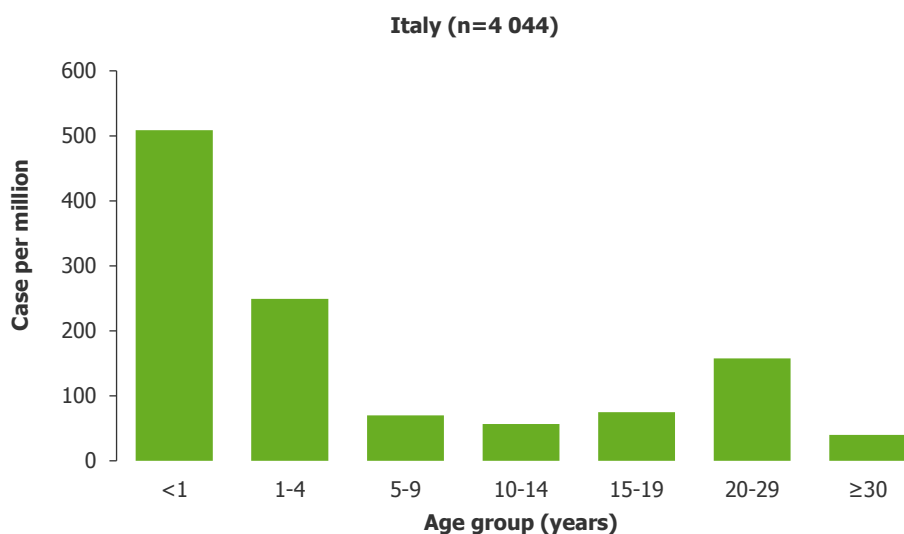
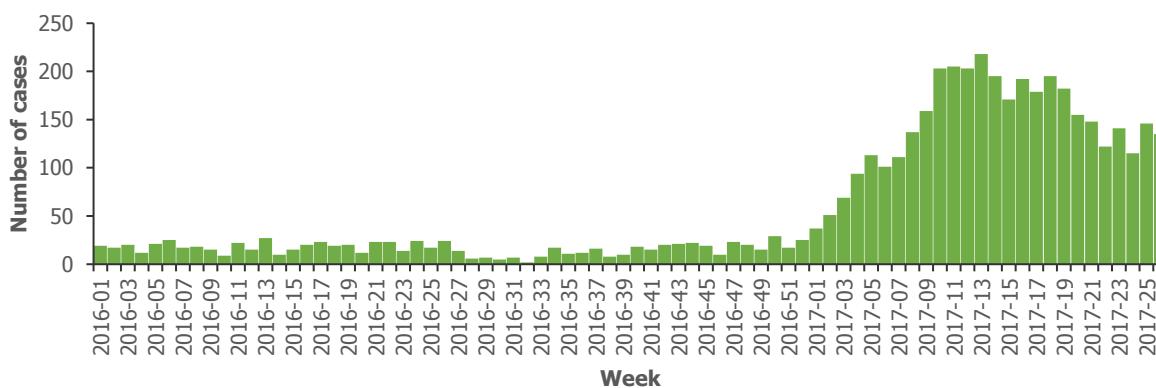


Figure 3. Distribution of measles cases by week, Italy, week 1, 2016 – week 26, 2017*



*week is week used for statistics

Romania

According to the information collected through TESSy and epidemic intelligence for Romania from 1 January 2016 to 30 June 2017, the number of measles cases reported was 7 282 (source 2016: TESSy; source 2017: Romanian National Institute of Public Health).

A steady increase in the number of cases was observed at the beginning of 2016 and continued throughout the year from six cases in January 2016 to 506 cases in December 2016. In the first half of 2017, Romania reported 1 844 cases with a peak in February (n=843). The circulating genotype in Romania is B3 and the main affected age group was young children. In 2016, 59% of cases were in those under five years of age and 56% of these cases were reported in the first six months of 2017. The highest notification rates were observed for children below the age of five years.

ECDC published a risk assessment on the risk of measles spreading and the likelihood of sustained transmission in EU/EEA countries in relation to the ongoing outbreak in Romania and the current epidemiological situation in the EU/EEA [1].

Figure 4. Distribution of measles notification rate by age group in Romania, 1 July 2016–30 June 2017, n=3 906

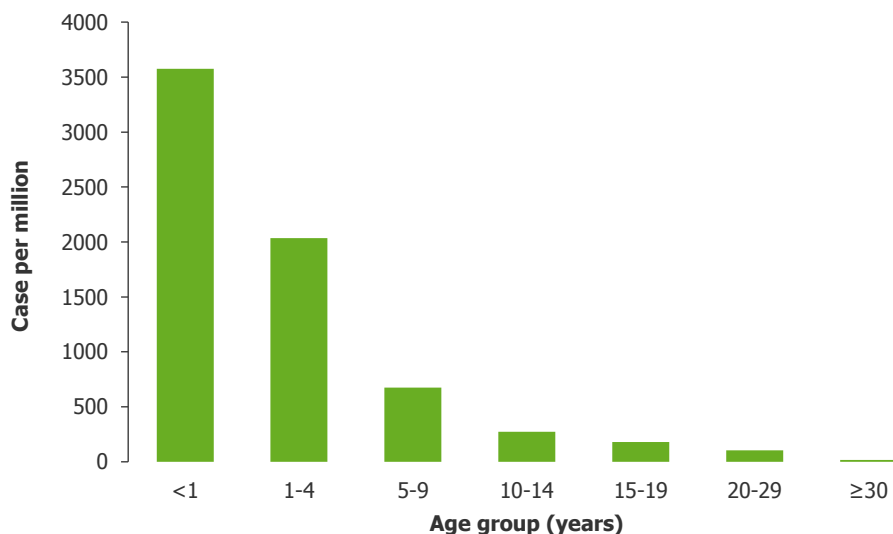
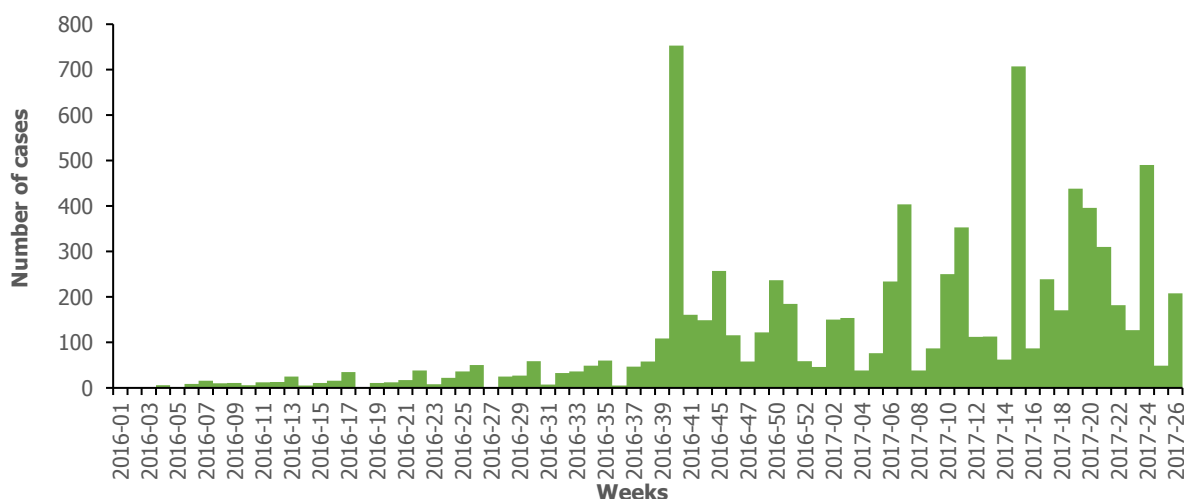


Figure 5. Distribution of measles cases by week, Romania, week 1, 2016 – week 26, 2017*



*From 2008 to 2016-39 data from TESSy, from 2016-40 onwards data from Romanian Ministry of Health
 TESSy data week refers to week used for statistics, Romanian Ministry of Health data week refers to week of reporting

Germany

In 2016, Germany reported 326 cases, with a peak in June of 72 cases. The number rose again in early 2017, peaking in March with 212 cases. Germany reported 798 cases in the first half of 2017. The main reported circulating genotypes were B3 and D8. The incidence of all cases reported by Germany in the past 12 months was 12 cases per million population, with highest incidence reported in children below the age of five years.

Figure 6. Measles notification rate by age group in Germany, 1 July 2016–30 June 2017, n=953

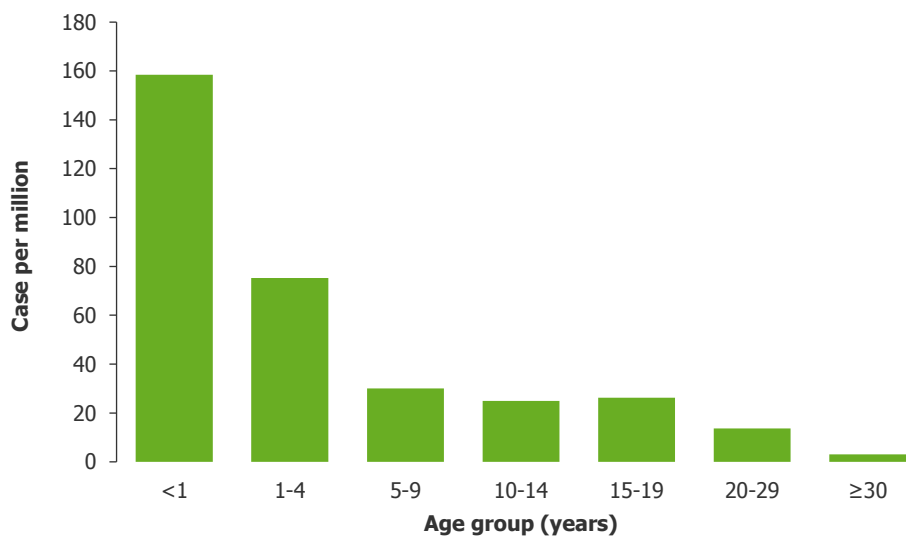
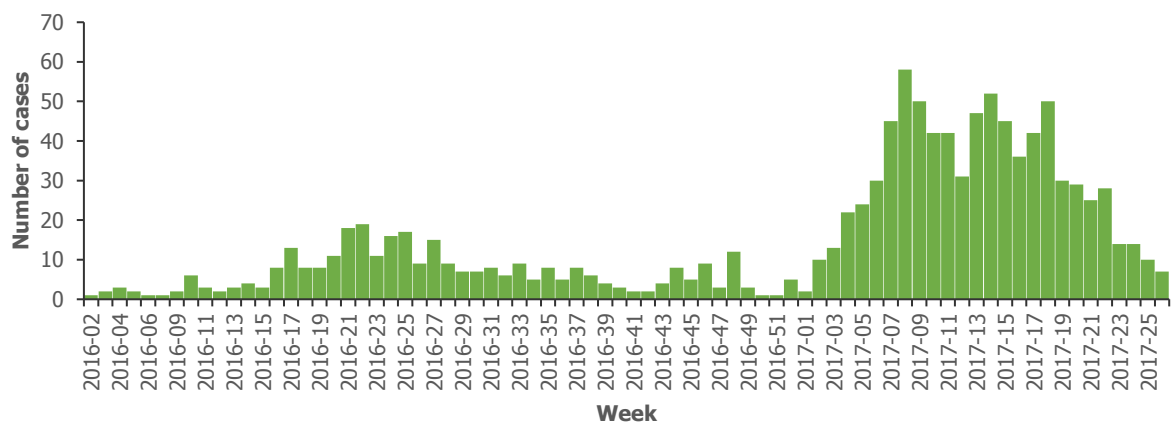


Figure 7. Number of measles cases by week, Germany, week 1 2016–week 26, 2017*



* week used for statistics

Table 1. Number of measles cases by month and notification rate per million population by country, 1 July 2016–30 June 2017, EU/EEA countries

Country	2016	2016	2016	2016	2016	2016	2017	2017	2017	2017	2017	2017	Total	Cases per million	Total lab-positive cases
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
Austria	8	3	4	3	1	4	28	34	8	2	6	1	102	11.7	89
Belgium	1	0	2	2	2	3	27	79	156	35	19	NR	326	28.8	197
Bulgaria	0	0	0	0	0	0	0	0	19	41	57	44	161	22.5	85
Croatia	1	0	1	0	0	0	2	5	0	0	0	0	9	2.2	9
Cyprus	0	0	0	0	0	0	0	0	0	0	1	2	3	3.5	3
Czech Republic	0	0	1	0	1	0	0	0	20	63	42	6	133	12.6	125
Denmark	0	1	0	0	0	1	0	0	1	0	0	0	3	0.5	3
Estonia	0	0	0	0	0	0	0	0	0	0	1	0	1	0.8	1
Finland	0	0	0	0	0	3	0	0	0	0	0	1	4	0.7	4
France	6	4	7	2	2	4	34	52	49	61	112	42	375	5.6	245
Germany	38	28	31	11	25	22	47	157	212	175	134	73	953	11.6	645
Greece	0	0	0	0	0	0	0	0	0	0	3	1	4	0.4	4
Hungary	0	0	0	0	0	0	1	11	3	0	0	0	15	1.5	15
Iceland	0	1	0	0	0	0	0	0	2	0	0	0	3	9.0	3
Ireland	3	5	1	0	0	0	0	1	2	2	1	1	16	3.4	11
Italy	45	34	54	80	83	88	287	458	889	792	711	523	4 044	66.7	3 097
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Lithuania	0	0	0	0	0	0	0	0	0	1	0	NR	1	0.4	1
Luxembourg	0	0	0	0	0	0	0	0	3	0	0	0	3	5.2	3
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
The Netherlands	0	2	0	0	0	4	0	0	0	2	3	1	12	0.7	10
Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Poland	6	39	40	24	13	4	6	6	5	3	2	4	152	4.0	94
Portugal	0	0	0	0	0	0	0	2	10	18	4	0	34	3.3	28
Romania	112	185	219	426	614	506	484	843	161	100	156	100	3 906	197.7	1 826
Slovakia	0	0	0	0	0	0	0	0	0	1	0	0	1	0.2	1
Slovenia	0	0	0	0	0	0	2	4	0	0	0	0	6	2.9	6
Spain	3	2	3	2	6	2	10	29	22	9	40	32	160	3.4	151
Sweden	0	2	0	0	0	0	2	8	7	3	4	0	26	2.6	26
United Kingdom	132	108	29	37	14	1	10	1	8	17	34	22	413	6.3	413
Total	355	414	392	587	761	642	940	1 690	1 577	1 325	1 330	853	10 866	21.1	7 095

Liechtenstein does not report. NR: Not reported

The target towards elimination is an incidence of less than one case per million population per year (including confirmed, probable and possible cases, but excluding imported cases). Achieving this target is consistent with progress towards elimination, but does not constitute elimination or confirm that it has been achieved.

In the table, countries with a notification rate of ≥ 1 per million population are highlighted in green. All cases (endemic, imported, import-related) are included in the calculation of the notification rate. Also included are all confirmed, probable, possible or unknown cases, as defined by the EU 2012 case definition.

Tables with the numbers of measles cases by month in previous years are available from:
<https://ecdc.europa.eu/en/measles/surveillance-and-disease-data/annual-surveillance-data>

Figure 8. Distribution of measles cases by country, 1 July 2016–30 June 2017 (n=10 866), and vaccine coverage (second dose of measles-containing vaccine, 2015–2016, WHO*), EU/EEA countries

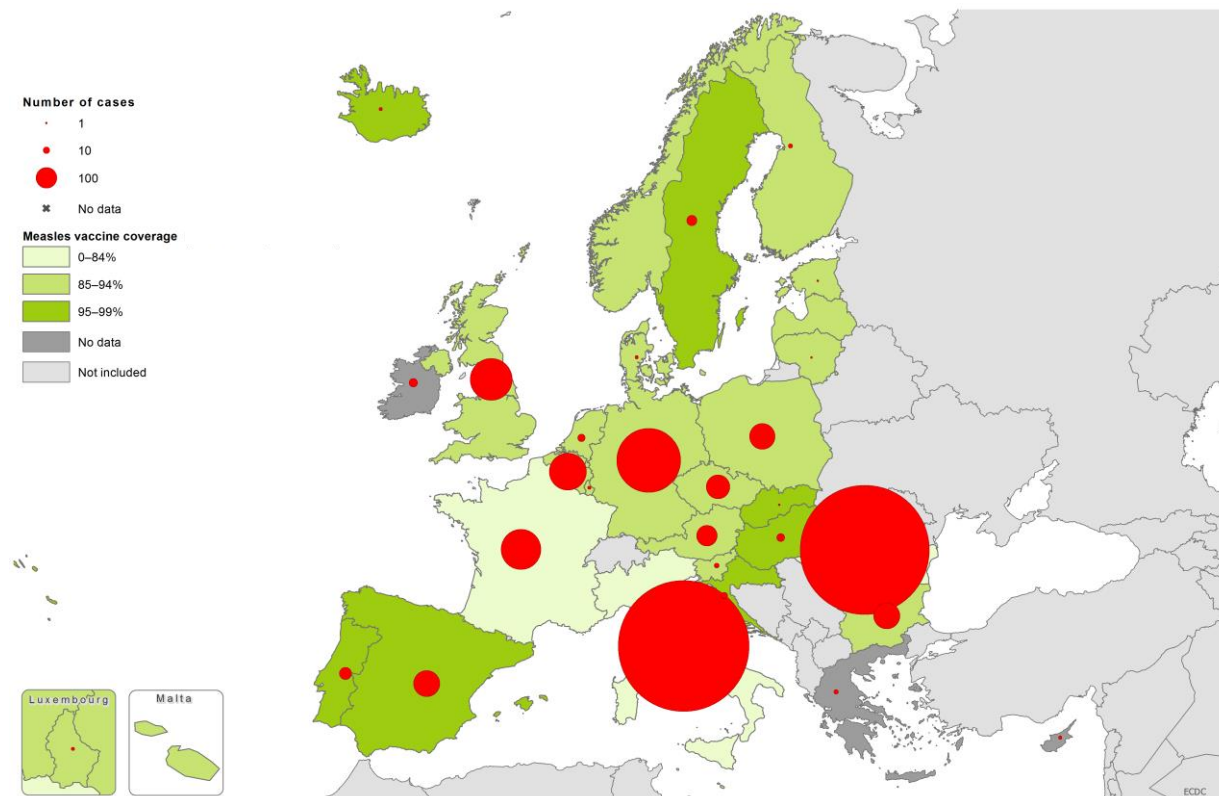


Figure 9. Measles notification rate per million population by country, 1 July 2016–30 June 2017, EU/EEA countries (n=10 866)

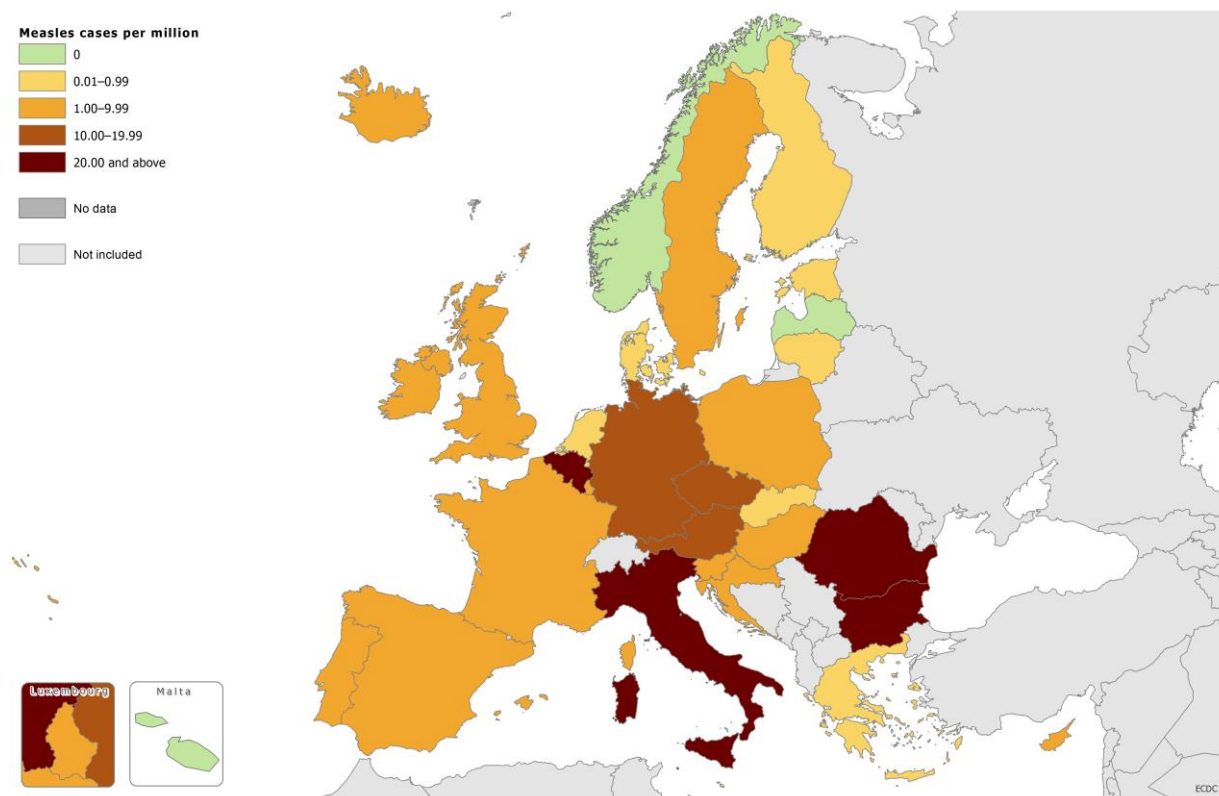
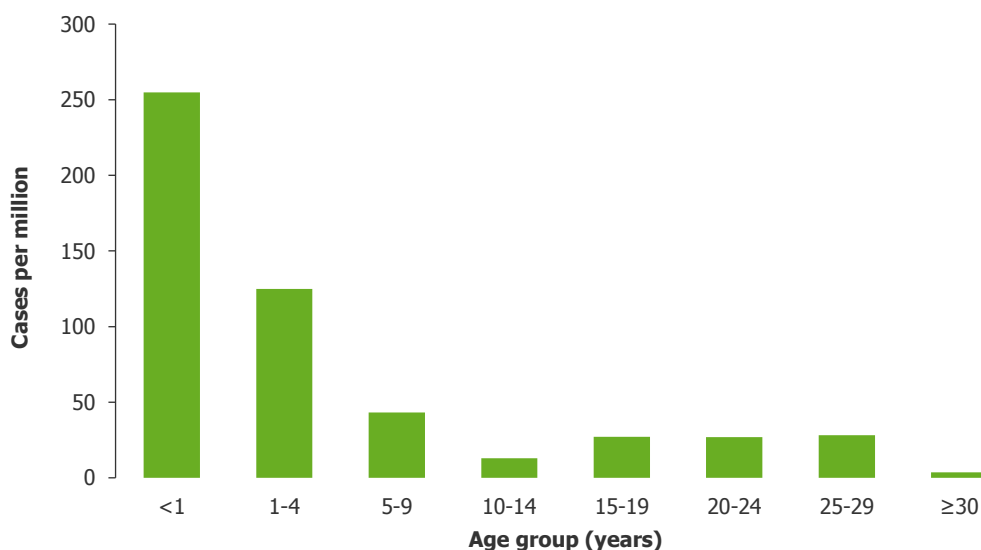
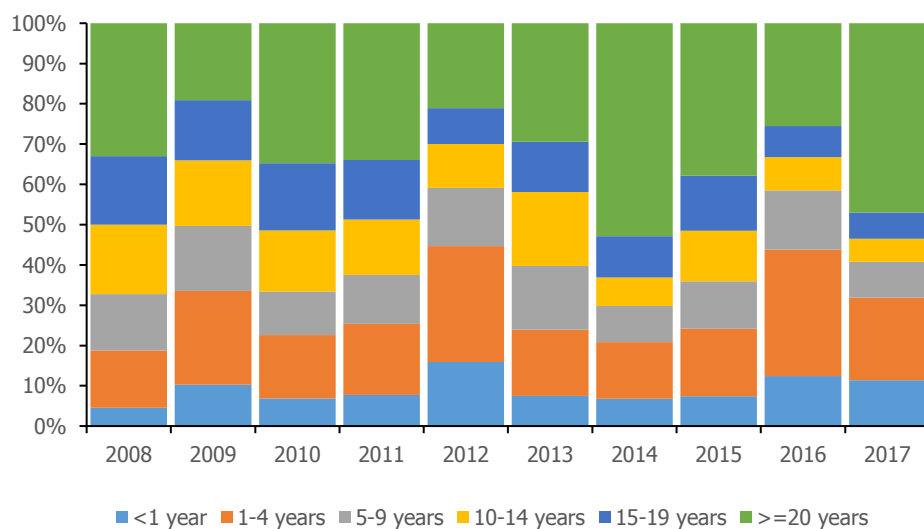


Figure 10. Measles notification rate by age group, 1 July 2016–30 June 2017, EU/EEA countries (n=10 864 cases with known age)



Note: From 2006–2011, 29 EU/EEA countries reported measles data to ECDC. From 2012 this number increased to 30 after Croatia joined the European Union

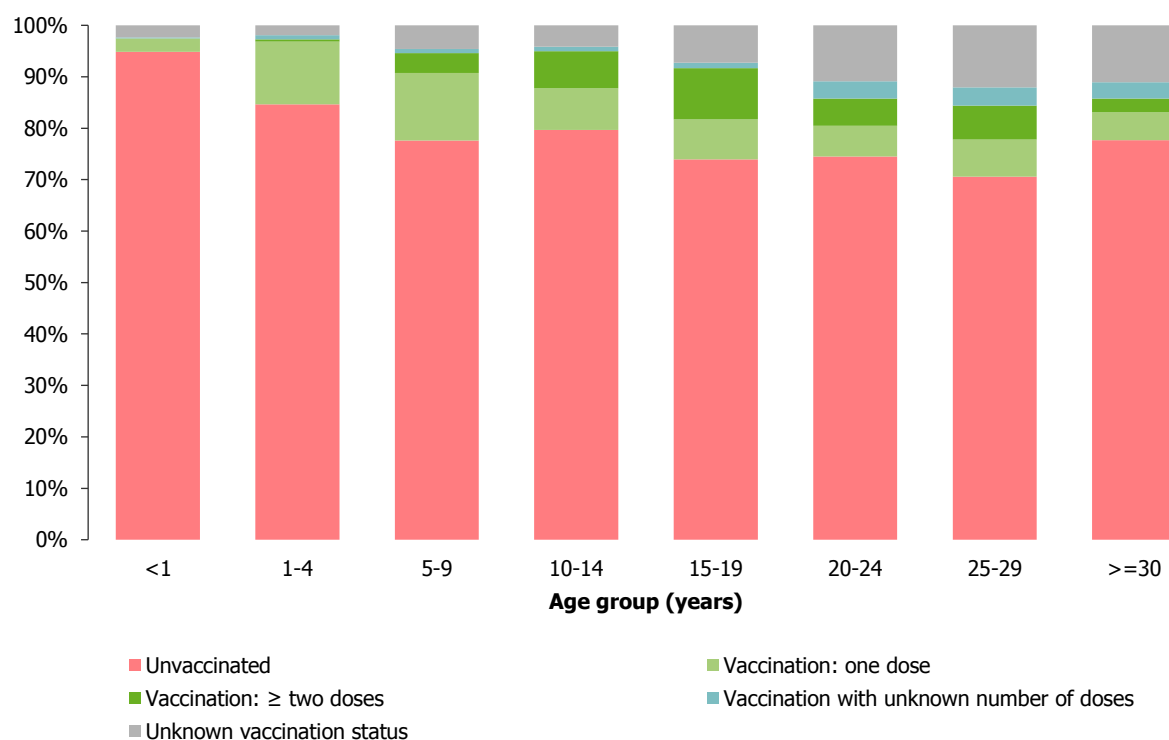
Figure 11. Distribution of measles cases by age group and year, 2008–2017*, EU/EEA countries



Note: From 2006–2011, 29 EU/EEA countries reported measles data to ECDC. From 2012 this number increased to 30 after Croatia joined the European Union

*The year 2017 only includes the first six months.

Figure 12. Distribution of measles cases by vaccine coverage and age group, 1 July 2016–30 June 2017, EU/EEA countries (n=10 864 cases with known age)



Epidemiological summary for countries outside EU/EEA

The sources used to collect information on [epidemic intelligence](#) include the websites of Ministries of Health, National Institutes of Health and the media, as of the first week of September 2017.

WHO European Region

Switzerland: In 2017, as of 4 September, Switzerland has reported 76 cases of measles compared with 42 in the same period in 2016. [Source: [media](#)]

Ukraine: In 2017, as of the end of July, Ukraine has reported 1 386 cases of measles, compared with 10 cases in the same period in 2016. Most cases were reported in the Ivano-Frankivsk (637) and Odessa regions (526). [Source: [media](#)]

Israel: On 14 August 2017, Israel reported nine cases of measles among soldiers, diagnosed between 7 and 14 August. The index case had visited his family in Ukraine where he probably contracted the disease. During the past four months, Israel has reported 26 measles cases. [source: [media](#)]

WHO African Region

Democratic Republic of Congo: In 2017, as of 22 August, DR Congo has reported 30 211 suspected measles cases, including 370 deaths. The incidence has declined since the peak of the current outbreak in early 2017. [Source: [official figures](#)]

Ethiopia: In 2017, as of 6 August, Ethiopia has reported 2 601 cases. Of the reported cases, 17.2% were unvaccinated, and 43.8% had an unknown immunisation status. [Source: [official figures](#)]

Kenya: Measles outbreaks have been ongoing in Dagahaley, Dadaab, and IFO refugee camps in Garissa County since March 2017 and in Mandera county since June 2017. As of 31 July, 49 cases (12 confirmed) were reported, including one death. [Source: [official figures](#)]

Liberia: In 2017, as of 27 August, Liberia has reported 1 048 suspected measles cases. Of the suspected cases, 884 were tested, with 147 positive, 691 negative and 46 equivocal. One hundred and sixty-four of the suspected cases were compatible with measles and had an epidemiological link. Of the 737 equivocal and negative cases, 708 samples have been tested for rubella, 312 of which were positive. [Source: [media](#)]

Nigeria: In 2017, as of 20 August, Nigeria has reported 16 833 suspected measles cases, including 101 deaths. During the same time period in 2016, 21 604 suspected cases and 86 deaths were reported. [Source: [official figures](#)]

South Africa: In 2017, as of 18 August, South Africa has reported 133 cases of measles. Most cases were reported from an ongoing outbreak in Gauteng province (68 cases) and from an outbreak in Western Cape province (31 cases). In KwaZulu-Natal Province, a measles outbreak has been declared with 19 confirmed or probable cases in three districts: Ethekewini (12), Umgungundlovu (5) and Ilembe (2). [Source: [media](#)]

South Sudan: In 2017, as of 31 August, South Sudan has reported 1 025 measles cases and 24 deaths. [Source: [media](#)]

Uganda: Between 24 April and 9 August 2017, 282 cases (including one death, CFR: 0.4%) were reported from Kampala (216 cases and one death) and Wakiso (66 cases). The outbreak is attributed to low immunisation coverage, especially among large peri-urban populations. A preliminary analysis shows that only 3% of the reported cases had previous measles vaccination. [Source: [official figures](#)]

WHO Eastern Mediterranean Region

Oman: In 2017, as of 19 August, Oman reported 89 measles cases, compared with 114 cases in 2016. [source: [media](#)]

Somalia: In 2017, as of 31 August, Somalia has reported almost 16 000 suspected cases. This is almost three times the number of cases reported in 2016 (5 657 cases). [Source: [media](#)]

Syria: In 2017, as of end of June, Syria reported 352 confirmed measles cases. Most of the cases were reported in April (92 cases). Between 30 July and 5 August 2017, Syria reported 45 suspected measles cases, with most cases reported from Dar'a (9), Damascus (8) and Ar-Raqqa (8). [Source: [media](#)]

WHO South-East Asia Region

Thailand: In 2017, as of 2 September, Thailand has reported 2 231 cases from 72 provinces. No deaths were reported. [Source: [official figures](#)]

WHO Western Pacific Region

Australia: In 2017, as of end of August, Australia reported 58 cases. In the same time period in 2016, 63 cases were reported. In August 2017, Australia reported four measles cases in a [school in Perth](#), in Western Australia [Source: [official figures](#)]

WHO Pan-American Region

USA: In 2017, as of 12 August, 118 cases were reported from 14 states (California, Florida, Kansas, Maine, Maryland, Michigan, Minnesota, Nebraska, New Jersey, New York, Pennsylvania, Utah, and Washington). In 2016, 70 measles cases were reported from 16 states. [Source: [official figures](#)]

Rubella

Epidemiology

Rubella surveillance data were retrieved from TESSy on 26 July 2017. The rubella situation in Europe is relatively stable and therefore we report rubella data for the 12 months as usual. The analysis covered the period from 1 July 2016 to 30 June 2017.

Two EU countries – Belgium and France – do not operate rubella surveillance systems with national coverage and do not report to the EU/EEA enhanced rubella surveillance. In Belgium, a network of sentinel laboratories (58% of all laboratories) reports cases positive for IgM on a voluntary basis to the Institute of Public Health. In France, a surveillance system captures rubella infections diagnosed in pregnant women or newborn infants [2].

Of the 28 reporting countries, twenty-six reported data for the entire 12-month period. All countries reported case-based data, except Poland that reported aggregated data.

During the period 1 July 2016 to 30 June 2017, 819 cases of rubella were reported (Table 2). The diagnosis of rubella was confirmed in 11% (92) of the cases by positive laboratory results (serology, virus detection or isolation). The number of cases and the notification rates for the entire 12-month period are shown in Figures 12 and 13.

The rubella notification rate was lower than one case per million population in 26 of the 28 countries. Seventeen of these 26 countries reported no cases. Of the two countries with a notification rate above one case per million the indicator, the highest notification rate was reported by Poland (16.7 cases per million), followed by Austria (3.1 cases per million). In Germany the notification rate was close to one case per million (0.97) (Table 2).

The highest age-specific notification rates were observed in infants under one year of age (25.9 cases per million population) and in cases aged between one and four years (14.2 cases per million population) (Figure 14).

Poland accounted for 77% (n=632) of all reported rubella cases in the 12-month period. The highest number of cases was observed among 1–4-year-olds (n=219) and 5–9-year-olds (n=156).

In Poland, 233 cases (37%) reported over the 12-month period were unvaccinated, 275 (44%) cases were vaccinated with one dose, 52 (8%) cases had received two or more doses, and 72 (11%) cases had an unknown vaccination status. The data from Poland should be interpreted with caution as only nine of the reported cases had a positive laboratory test.

Table 2. Number of rubella cases by month and notification rate (cases per million) by country, 1 July 2016–30 June 2017, EU/EEA countries

Country	2016	2016	2016	2016	2016	2016	2017	2017	2017	2017	2017	2017	Total cases	Cases per million	Total lab-positive cases
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
Austria	0	1	0	0	0	0	0	0	24	1	1	0	27	3.11	23
Bulgaria	1	0	0	0	1	1	0	0	0	0	0	0	3	0.42	0
Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Czech Republic	0	0	0	0	0	0	0	0	0	1	1	0	2	0.19	2
Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Estonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Finland	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Germany	15	3	4	3	7	5	5	4	8	7	9	10	80	0.97	18
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Ireland	0	0	0	0	0	0	0	0	1	0	0	0	1	0.21	0
Italy	1	1	0	3	4	2	3	8	10	11	8	6	57	0.94	27
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Lithuania	0	0	0	0	0	0	0	0	0	0	0	NR	0	0.00	0
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Netherlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Poland	52	47	46	78	57	70	49	39	46	44	59	45	632	16.65	9
Portugal	0	0	0	0	1	0	0	0	1	0	NR	NR	2	0.19	0
Romania	0	3	0	1	2	2	1	1	0	0	2	0	12	0.61	11
Slovakia	0	0	0	0	0	0	0	0	0	1	0	0	1	0.18	0
Slovenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Spain	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Sweden	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
United Kingdom	0	0	0	0	1	0	0	0	0	1	0	0	2	0.03	2
Total	69	55	50	85	73	80	58	52	90	66	80	61	819	1.90	92

Liechtenstein, Belgium and France do not report. NR: Not reported

The target towards elimination is an incidence of less than one case per million population per year (including confirmed, probable and possible cases, but excluding imported cases). Achieving this target is consistent with progress towards elimination, but does not constitute elimination or confirm that it has been achieved.

In the table, countries with a notification rate of ≥ 1 per million population are highlighted in green. However, all cases (endemic, imported, import-related) are included for the calculation of the notification rate. All confirmed, probable, possible or unknown cases are also included, as defined by the EU 2012 case definition.

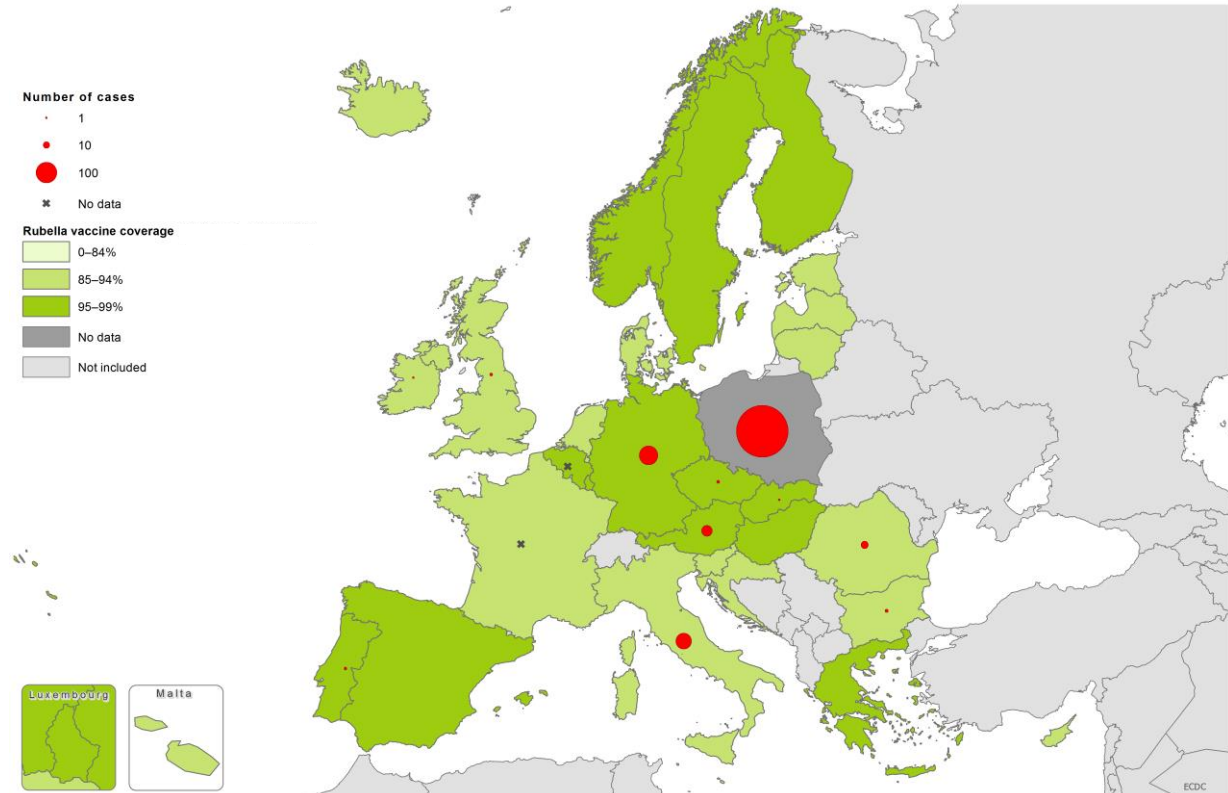
* The national surveillance system for rubella in Denmark currently only captures rubella infections during pregnancy; therefore the true incidence of rubella in the Danish population is underestimated.

** Due to the high proportion of cases reported by Poland, an overall notification rate for Europe is not presented.

Tables with the number of rubella cases in previous years are available from:

http://www.ecdc.europa.eu/en/healthtopics/rubella/epidemiological-data/pages/epidemiological_data.aspx

Figure 13 Number of rubella cases by country, 1 July 2016 – 30 June 2017 (n=819), and rubella vaccine coverage (first dose, rubella-containing vaccine, 2015–2016, WHO*), EU/EEA countries



* First dose, rubella-containing vaccine, 2015–2016, WHO. Coverage figures (%) are official national figures reported via the annual WHO/UNICEF Joint Reporting Form. See notes at the end of this report for further explanations.

Figure 14. Distribution of rubella notification rate per million population by country, 1 July 2016 – 30 June 2017, EU/EEA countries, n=819

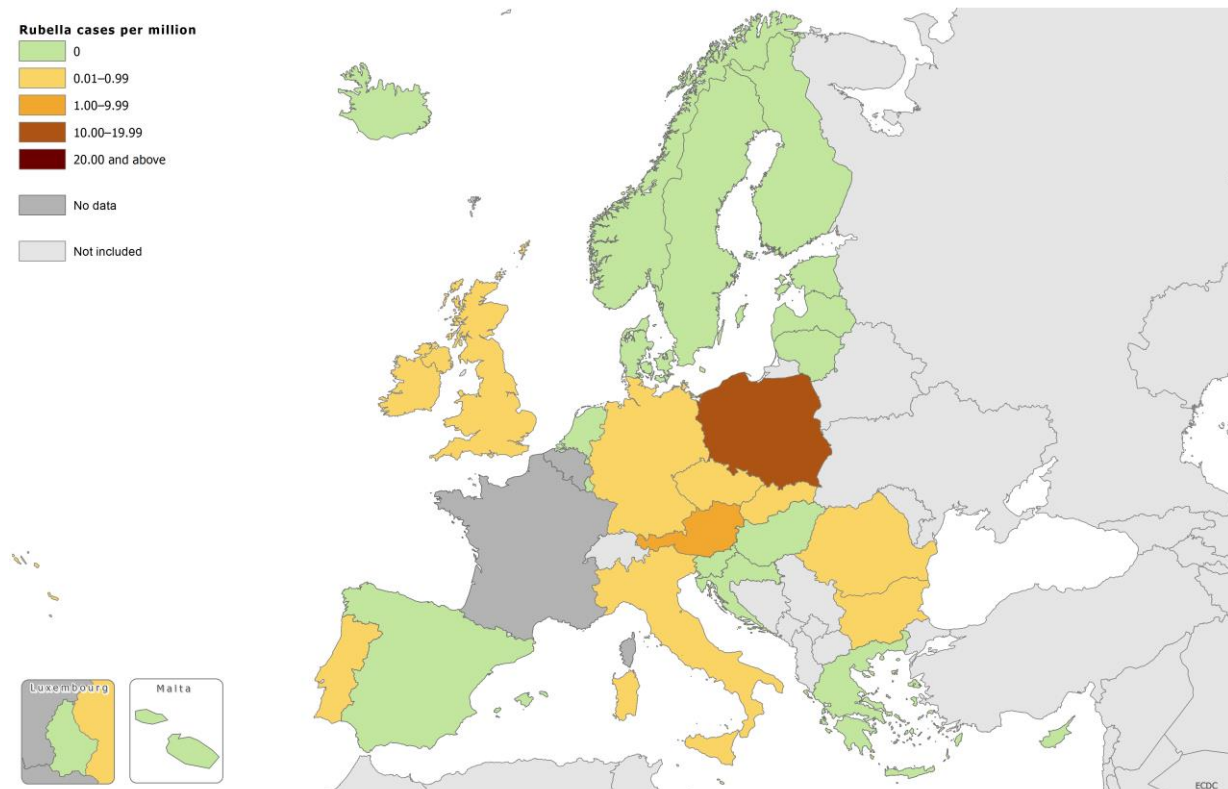
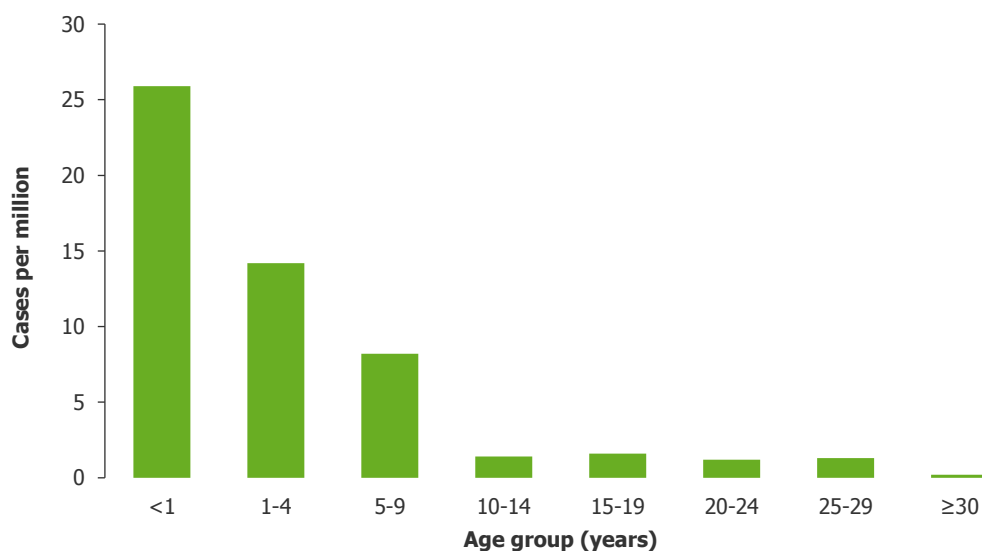


Figure 15. Distribution of rubella notification rate by age group, 1 July 2016–30 June 2017, EU/EEA countries, n=819 cases with known age



Progress towards measles and rubella elimination in EU/EEA Member States

In May 2012, 194 countries at the World Health Assembly adopted the Global Vaccine Action Plan (GVAP), which established their joint commitment to achieving measles and rubella elimination in at least five WHO Regions by the end of 2020.

Elimination is defined as the absence of endemic cases for a period of at least 12 months in a defined geographical area with a well-performing surveillance system. Regional elimination can be declared after at least 36 months' absence of endemic measles or rubella in all Member States [3]. The status of measles and rubella elimination in the WHO European Region is assessed annually by the Regional Verification Commission. The classification of countries with regard to disease elimination, interrupted or ongoing endemic transmission depends on a series of components, including epidemiology of disease, surveillance performance, and evidence of population immunity. If evidence is inconclusive, the country is classified as 'endemic'.

Although progress has been made towards regional elimination, this goal has not yet been achieved. At the sixth meeting of the Regional Verification Commission for Measles and Rubella in June 2017 [4], annual status reports for 2016 data were assessed. Of 53 Member States in the WHO European Region, 33 (22 EU/EEA) were declared to have interrupted endemic measles transmission for ≥ 36 months, and thus achieved the elimination goal. This is nine more countries than the previous year. Furthermore, 33 countries were verified as having eliminated rubella (21 EU/EEA), nine more than the previous year. In addition, nine countries for measles (four EU/EEA) and four for rubella (two EU/EEA) were deemed to have interrupted endemic transmission for less than 36 months, meaning they are on their way to achieving the elimination goal (Table 3).

To interrupt the circulation of the virus, a vaccination coverage (second dose) of at least 95% must be achieved and maintained for both diseases and in all countries. The latest available figures on vaccination coverage collected by WHO (2016) show that the vaccination coverage for the second dose of measles was below 95% in 20 of 27 EU/EEA countries reporting second dose coverage data. The vaccination coverage for the first dose of measles was below 95% in 18 of 30 EU/EEA countries reporting on the first dose.

If the elimination goal is to be achieved, the vaccination coverage rates in young children targeted by routine vaccination programmes will have to be increased to at least 95%, and immunisation gaps closed for adolescents and adults who have missed vaccination opportunities in the past. This is relevant at both the national and subnational level because pockets of susceptible individuals still exist throughout the EU/EEA, even in countries with high overall vaccine coverage.

In order to achieve and accurately document progress towards the elimination goal, high-quality surveillance is essential [5]. Surveillance systems must be highly sensitive and geographically representative to ensure the timely and sufficient investigation and management of suspected cases. Data reporting must be timely and complete, particularly with regard to the origin of infection (i.e. importation status: whether the case was outside the country of residence during the incubation period). Adequate laboratory investigation is essential because data on viral genotype are needed to track transmission chains. Current surveillance and control measures in several EU Member States will need to improve and expand if the elimination target is to be achieved.

Table 3. Elimination status of EU/EEA Member States, based on 2016 data review, taken from Regional Verification Commission meeting report

Elimination status	Measles	Rubella
EU/EEA Member States judged to have eliminated the disease (≥ 36 months without endemic transmission)	Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Iceland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, the United Kingdom, Bulgaria (22)	Croatia, Cyprus, the Czech Republic, Estonia, Finland, Greece, Hungary, Iceland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, the United Kingdom, Ireland (21)
EU/EEA Member States judged to have interrupted endemic transmission for 24 months	Ireland (1)	Austria (1)
EU/EEA Member States judged to have interrupted endemic transmission for 12 months	Germany, Poland, Austria (3)	Bulgaria (1)
EU/EEA Member States judged to have endemic transmission	Belgium, France, Italy, Romania (4)	Belgium, Denmark, France, Germany, Italy, Poland, Romania (7)

Source: Meeting report of the sixth Meeting of the European Regional Verification Commission for Measles and Rubella Elimination [4]

Useful links

More information about measles and rubella is available on the ECDC website:

- Measles and rubella ECDC Surveillance atlas: <http://ecdc.europa.eu/en/data-tools/atlas/Pages/atlas.aspx>
- Measles health topic page, ECDC: <http://ecdc.europa.eu/en/healthtopics/measles/Pages/index.aspx>
- Measles monthly epidemiological updates: <https://ecdc.europa.eu/en/measles/surveillance-and-disease-data/epidemiological-updates>
- Rubella health topic page, ECDC: <https://ecdc.europa.eu/en/rubella>
- Rubella monthly epidemiological updates: <https://ecdc.europa.eu/en/rubella/surveillance-and-disease-data/epidemiological-updates>
- Vaccination schedules in EU/EEA countries, ECDC: <http://vaccine-schedule.ecdc.europa.eu/Pages/Scheduler.aspx>
- Infographics and videos on immunisation: <https://ecdc.europa.eu/en/immunisation-vaccines/facts/infographics-videos>
- Immunisation health topic page, ECDC: <http://ecdc.europa.eu/en/healthtopics/immunisation/pages/index.aspx>

Notes

The European Surveillance System (TESSy) collects a 'date used for statistics', which is a date chosen by the country for reporting purposes. This date may indicate onset of disease, date of diagnosis, date of notification or date of laboratory confirmation, depending on reporting practices in the respective countries.

When reporting data on measles, rubella and other vaccine-preventable diseases to TESSy, countries may update previously reported data. This means that the date of retrieval can influence the data presented in this report, as later retrievals of data relating to the same period may result in slightly different numbers. For this reason, the date of data retrieval is indicated for each issue.

The vaccine coverage figures displayed in the maps of this report were retrieved from the WHO Global Database available from http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tscoveragerubella1.html and http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tscoveragemcv2.html.

Measles: Vaccine coverage for the second dose of measles-containing vaccine is estimated annually. If the 2016 country estimates were unavailable, estimates from 2015 were used. Some countries only report the coverage of the first dose of measles-containing vaccine. For more information, please check the above link to the WHO Global Database.

Rubella: Vaccine coverage for the first dose of rubella-containing vaccine is estimated annually. If the 2016 country estimates were unavailable, estimates from 2015 were used.

Notification rates were calculated using the most recent population estimates available from Eurostat (2016).

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