

SURVEILLANCE REPORT

Measles and rubella monitoring

July 2016

Disease surveillance data: 1 July 2015 – 30 June 2016

Main developments

The ECDC measles and rubella monitoring report is published twice a year. The January issue reports on the previous calendar year, while the summer issue (July) focuses on the most recent measles and rubella season and presents the data collected over the past 12 months.

Visualised measles and rubella data are available online through the [measles](#) [1] and [rubella](#) [2] pages of the ECDC Surveillance Atlas (updated monthly). In addition, ECDC produces monthly high-resolution measles [maps](#) [3].

Measles

- Between 1 July 2015 and 30 June 2016, 1 818 cases of measles were reported by 30 EU/EEA countries. Twenty-six countries reported consistently throughout this 12-month period.
- Italy accounted for 31% of all cases reported during this period.
- Measles is targeted for elimination in Europe. The measles notification rate was below the elimination target (one case per million population) in 19 of the 30 reporting countries. Eight of these 19 countries reported zero cases. Eleven reporting countries had a notification rate above this indicator, with Lithuania reporting the highest rate (16.8 cases per million population).
- The diagnosis of measles was confirmed by positive laboratory results (serology, virus detection or isolation) in 74% of all cases.
- Of all cases with known age, 90% had a known vaccination status, and of these, 85% were reported as unvaccinated. In the target group for routine childhood MMR vaccination (1–4-year-old children), 78% of all cases were unvaccinated.
- During the period 1 July 2015 – 30 June 2016, one measles-related death was reported in an eight-month-old child in Romania. One case was complicated by acute measles encephalitis.

Rubella

- Twenty-eight EU/EEA countries reported 1 708 rubella cases during the period 1 July 2015 and 30 June 2016. Twenty-five countries reported consistently for the 12-month period.
- Rubella is targeted for elimination in Europe. The rubella notification rate was lower than the elimination target (one case per million population) in 24 of the 28 countries. Fourteen of these 25 countries reported zero cases. Of the four countries with a notification rate above this indicator, the highest rate was reported by Poland (40.9 cases per million population).
- Poland reported 1 553 rubella cases, which accounted for 91% of all reported cases in the 12-month period. This figure should be interpreted with caution because only 17 of 1 553 cases were confirmed through laboratory testing. Data were reported in an aggregated format. The highest number of cases was observed in 1–4-year-olds and 5–9-year-olds.

Progress towards WHO elimination goals

In 2015, the vaccination coverage rate for the first dose of measles- and rubella-containing vaccines was at least 95% in 15 EU/EEA countries. Two countries failed to submit first-dose coverage data for 2014 and 2015. In seven countries, the vaccination coverage rate for the second dose of measles-containing vaccine was at least 95%. Second-dose coverage was not reported for seven countries in 2015 or 2014.

Results of the [fourth meeting](#) of the WHO Regional Verification Commission for Measles and Rubella, October 2015 (based on 2014 data) [4]:

Measles

- Elimination goal reached: 15 EU/EEA countries
- Interrupted endemic transmission for between 24 and 36 months: 0 EU/EEA countries
- Interrupted endemic transmission for between 12 and 24 months: 7 EU/EEA countries
- Endemic transmission: 8 EU/EEA countries

Rubella

- Elimination goal reached: 14 EU/EEA countries
- Interrupted endemic transmission for between 24 and 36 months: 2 EU/EEA countries
- Interrupted endemic transmission for between 12 and 24 months: 5 EU/EEA countries
- Endemic transmission: 9 EU/EEA countries

The classification of countries with regard to disease elimination, interrupted or ongoing endemic transmission depends on a series of components which are assessed by the Regional Verification Commission, including epidemiology of disease, surveillance performance, and evidence of population immunity. If inconclusive evidence is provided, the country is classified as 'endemic'.

Measles

Enhanced surveillance data

Measles surveillance data were retrieved from The European Surveillance System (TESSy) on 26 July 2016. The analysis by ECDC covered the period from 1 July 2015 to 30 June 2016. Thirty EU/EEA countries report measles data to TESSy, and twenty-six reported consistently for this 12-month period (Table 1). All countries report case-based data, except Belgium, which has reported aggregated data since May 2016.

During the 12-month period, 1 818 cases of measles were reported (Figure 1, Table 1). The country which reported the most cases was Italy (n=572, 31% of all cases) (Table 1). Most of the Italian cases (432) were reported between January and June 2016. Other countries with a high number of cases were Germany (309), Romania (311) and the United Kingdom (270). More than half (59%) of the cases in the EU/EEA over this 12-month period were reported between March and June 2016. The number of measles cases reported in June 2016 are shown in Figure 2; country-specific notification rates for the entire 12-month period are presented in Figure 3.

The measles notification rate was lower than the elimination target (one case per million population) in 19 of the 30 reporting countries. Eight countries reported zero cases. Eleven reporting countries had a notification rate above the elimination target. The highest notification rate was reported by Lithuania (16.8 cases per million population) (Table 1).

The highest age-specific notification rate was observed in infants under one year of age (33.6 cases per million population), followed by children aged 1–4 years (20.1 cases per million population) (Figure 4).

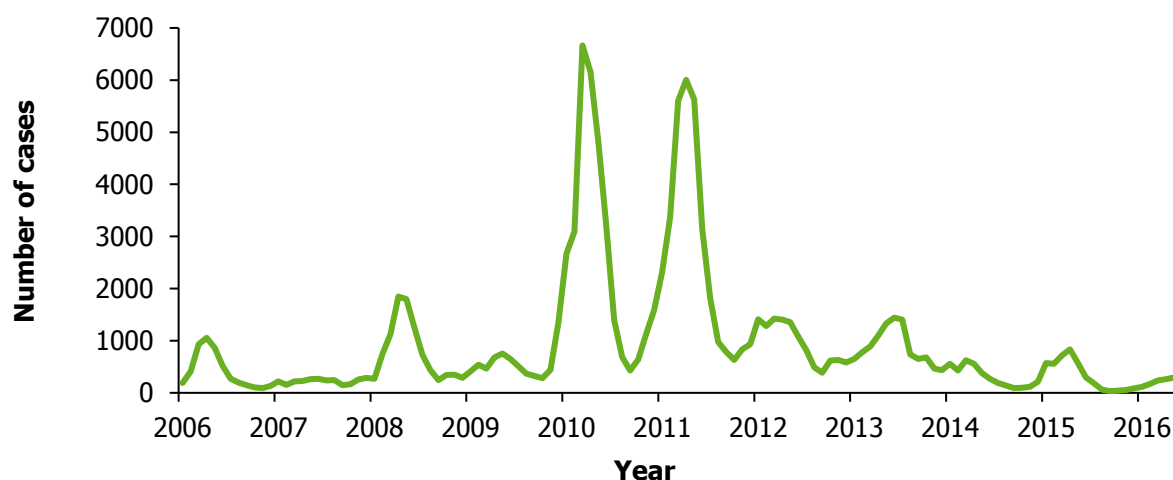
In 74% of all cases, the diagnosis of measles was confirmed by positive laboratory results (serology, virus detection or isolation), although there were large variations between countries in the proportion of laboratory-

confirmed cases. This 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.

Vaccination status was known for 90% (1 630/1 815) of the cases with known age. The overwhelming majority of cases with both known age and known vaccination status (1 380 case, 85%) were unvaccinated; 9% (151) had received one dose of measles vaccine, 5% (80) had received two or more doses, and 1% (19) 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 of age (95%) (Figure 5). Children below the age of one year are often too young to be eligible for vaccination. Among children between one and four years of age – the age group targeted by routine childhood vaccination programmes – 78% of all cases were unvaccinated (Figure 5). Measles vaccination coverage by country for the second dose of a measles-containing vaccine is presented in Figure 2.

Over the 12-month period, one death was attributed to measles in an eight-month-old infant in Romania. One case was complicated by acute measles encephalitis in Poland.

Figure 1. Distribution of measles cases by month, EU/EEA countries, 1 January 2006 – 30 June 2016



Note: Since 1 January 2006, 29 EU/EEA countries have been reporting measles data to TESSy. Croatia is included from 2012 onwards.

Table 1. Number of measles cases by month and notification rate (cases per million) by country, 1 July 2015 – 30 June 2016, EU/EEA countries

Country	2015						2016						Total cases	Cases per million	Total lab-positive cases
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
Austria	9	3	1	0	2	2	0	0	0	2	1	1	21	2.5	18
Belgium	0	0	0	3	2	1	4	8	19	13	17	NR	67	6.0	54
Bulgaria	0	0	0	0	0	0	0	1	0	0	0	0	1	0.1	1
Croatia	0	0	0	0	0	0	0	0	0	2	NR	NR	2	0.5	2
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Czech Republic	0	0	0	0	0	0	0	0	1	0	3	NR	4	0.4	4
Denmark	0	0	0	0	0	0	0	0	0	1	0	0	1	0.2	1
Estonia	0	0	0	0	0	3	1	0	0	1	0	0	5	3.8	5
Finland	0	0	0	0	0	1	1	0	0	0	0	0	2	0.4	2
France	17	10	1	6	4	11	18	15	13	5	1	6	107	1.6	58
Germany	90	19	12	14	5	4	6	4	16	28	45	66	309	3.8	246
Greece	0	0	1	0	0	0	0	0	0	0	0	NR	1	0.1	1
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Ireland	2	0	0	0	0	2	1	1	0	0	19	16	41	8.9	37
Italy	17	16	15	14	32	46	76	76	73	72	77	58	572	9.4	392
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Lithuania	26	1	0	0	0	0	0	0	0	10	10	2	49	16.8	49
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Netherlands	2	0	0	0	0	0	0	0	0	0	0	0	2	0.1	1
Norway	1	4	0	0	0	0	0	0	0	0	0	0	5	1.0	5

Country	2015						2016						Total cases	Cases per million	Total lab-positive cases
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
Poland	2	3	0	0	0	4	0	1	2	0	2	2	16	0.4	9
Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Romania	0	0	0	0	1	0	6	40	63	62	68	71	311	15.7	181
Slovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Slovenia	0	0	0	0	0	0	0	0	0	0	1	0	1	0.5	1
Spain	6	1	0	0	0	0	0	0	9	9	0	2	27	0.6	12
Sweden	3	0	0	0	0	0	0	0	0	1	0	0	4	0.4	3
United Kingdom	7	5	3	2	9	12	3	22	44	55	49	59	270	4.2	270
Total	182	62	33	39	55	86	116	168	240	261	293	283	1818	3.5	1352

Liechtenstein does not report. NR: Not reported

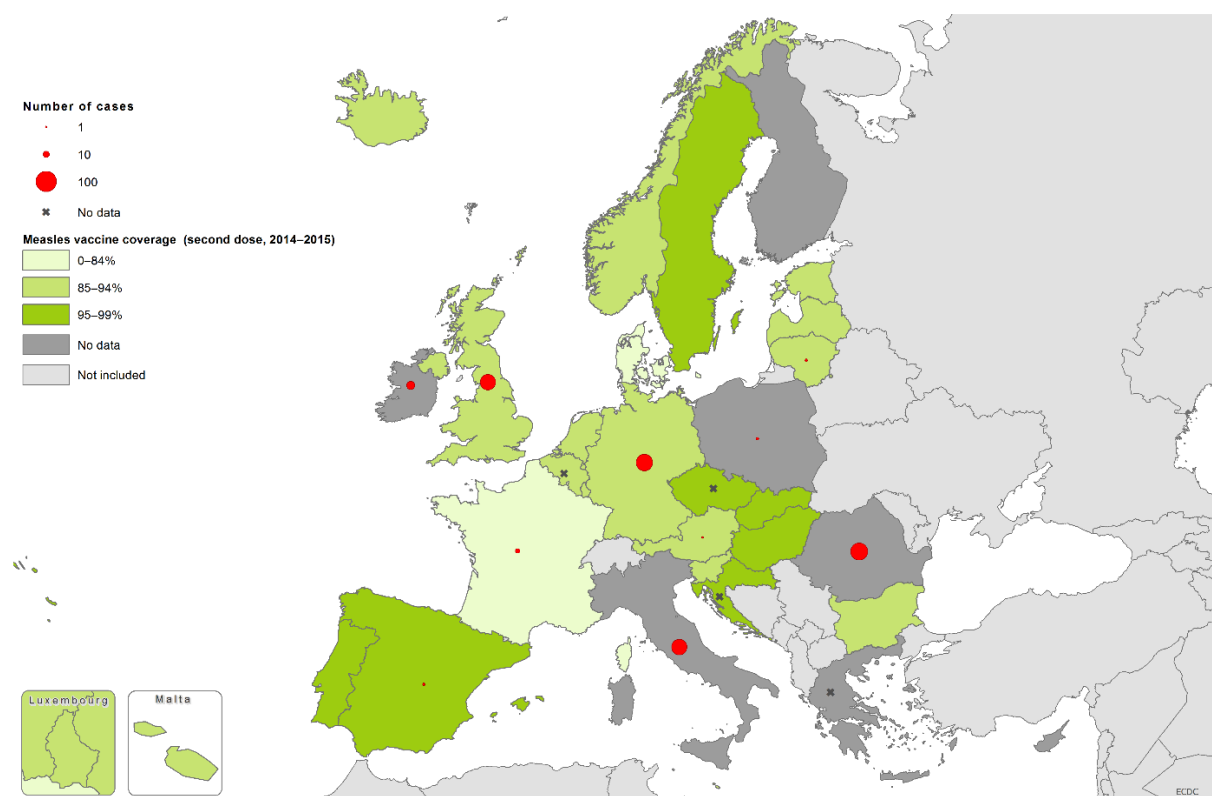
The target towards elimination is an incidence of less than one case per million population per year (including confirmed, probable and possible cases, but excluding imported cases). Achieving this target is consistent with progress towards elimination, but does not constitute elimination or confirm 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 in previous years are available from:

http://www.ecdc.europa.eu/en/healthtopics/measles/epidemiological_data/pages/annual_epidemiological_reports.aspx

Figure 2. Distribution of measles cases by country, June 2016 (n=2 83), and vaccine coverage (second dose, 2014–2015, WHO*), EU/EEA countries



* 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 3. Measles notification rate (cases per million) by country, 1 July 2015 – 30 June 2016, EU/EEA countries (n=1 818)

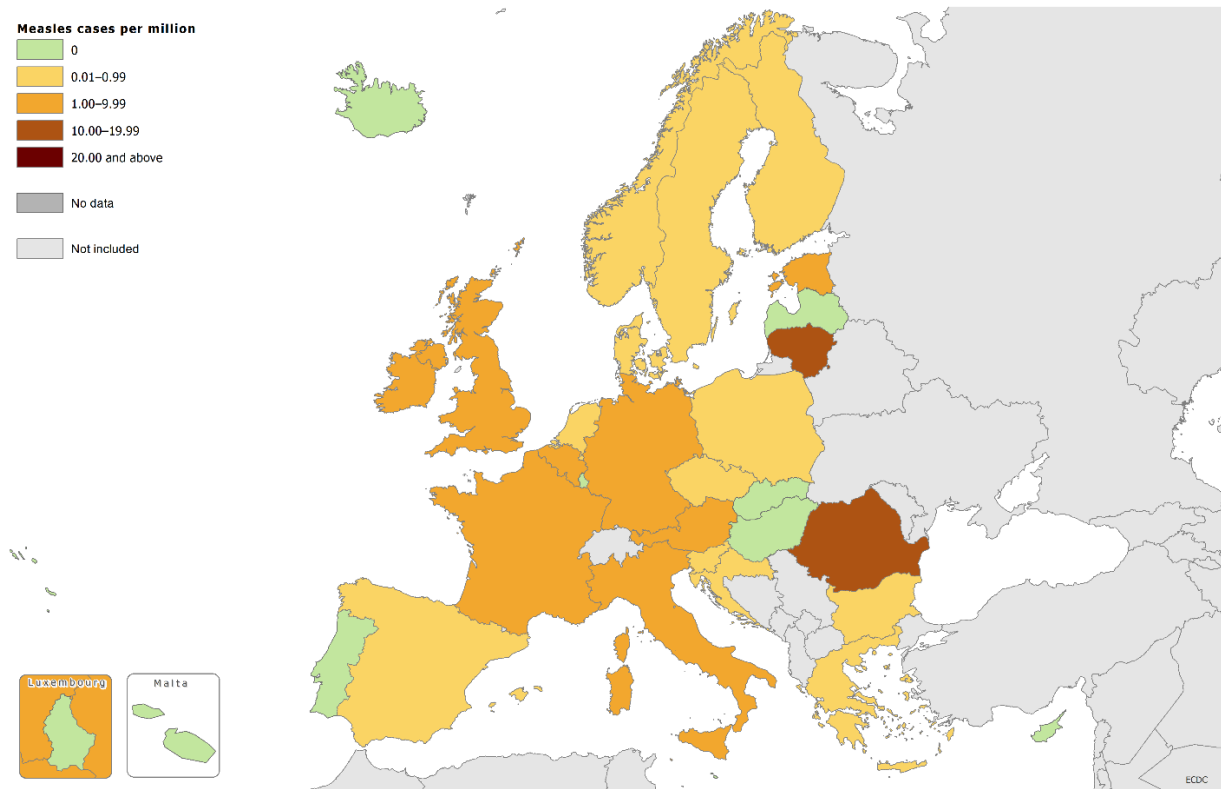


Figure 4. Measles notification rate (cases per million) by age group, 1 July 2015 – 30 June 2016, EU/EEA countries (n=1 815 cases with known age)

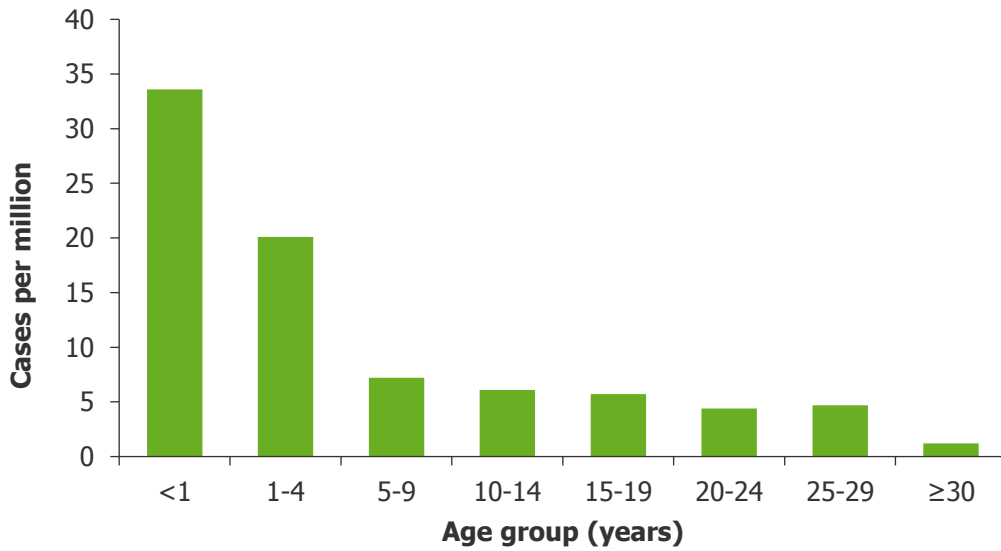
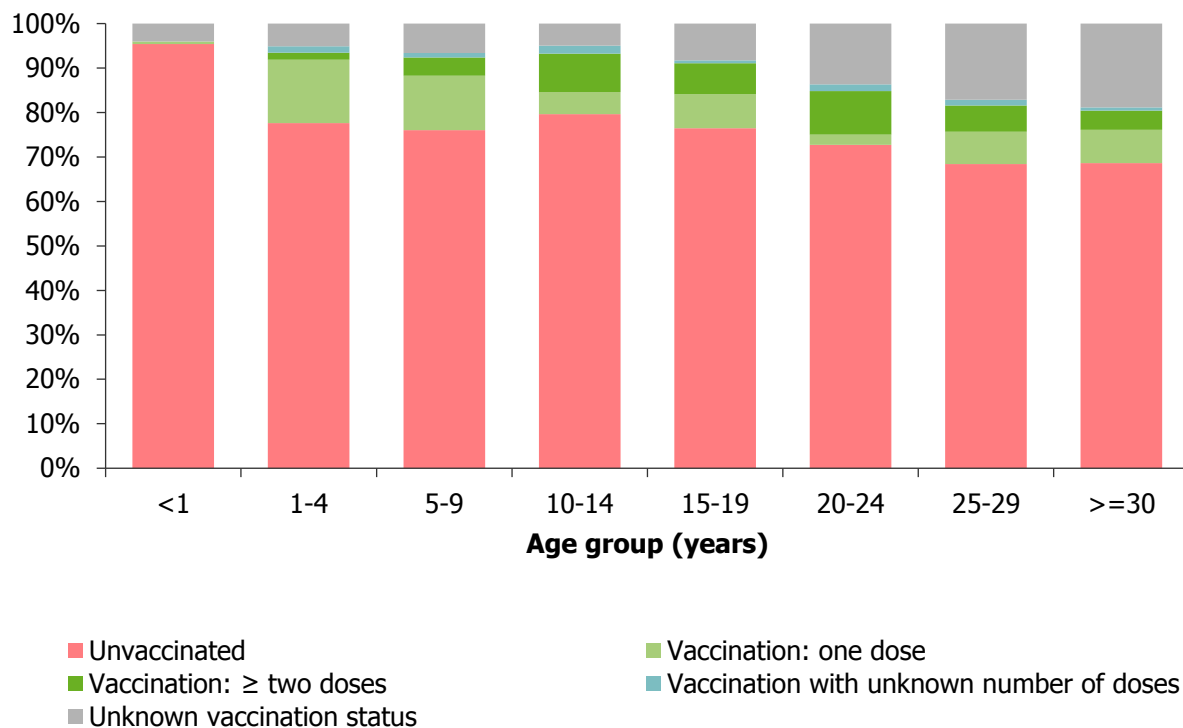


Figure 5. Percentage distribution of vaccination status among measles cases by age group, 1 July 2015 – 30 June 2016, EU/EEA countries (n=1 815 cases with known age)



Rubella

Enhanced surveillance data

Rubella surveillance data were retrieved from The European Surveillance System (TESSy) on 26 July 2016. The analysis covered the 12-month period from 1 July 2015 to 30 June 2016.

Two EU countries – Belgium and France – do not operate rubella surveillance systems with national coverage and therefore do not report to the EU/EEA enhanced rubella surveillance. In Belgium, a network of sentinel laboratories, consisting of 58% of all laboratories, reports on a voluntary basis to the Institute of Public Health cases positive for IgM. In France, a surveillance system captures rubella infections diagnosed in pregnant women or newborn infants [5].

Of the 28 contributing countries, twenty-five reported data for the entire 12-month period. Twenty-seven countries reported case-based data, while one country (Poland) reported aggregated data.

During the period 1 July 2015 to 30 June 2016, 1 708 cases of rubella were reported (Table 2). Laboratory confirmation (by serology, virus detection or isolation) was available for 3% (n=58) of the cases. The number of cases reported in June 2016 and the notification rates for the entire 12-month period are shown in Figures 6 and 7.

The rubella notification rate was lower than the elimination target (one case per million population) in 24 of the 28 countries. Fourteen of these 24 countries reported zero cases. Of the four countries with a notification rate above the indicator, the highest notification rate was reported by Poland (40.9 cases per million) (Table 2).

The highest age-specific notification rates were observed in infants under one year of age (55.7 cases per million population) and in cases aged between one and four years (33.5 cases per million population) (Figure 8).

Poland accounted for 91% (n=1 553) of all reported rubella cases in the 12-month period. These figure should be interpreted with caution because only 17 of the reported cases had a positive laboratory test. The highest number of cases was observed among 1–4-year-olds (n=550) and 5–9-year-olds (n=417).

In Poland, a total of 503 cases (32%) reported over the 12-month period were unvaccinated, 731 (47%) cases were vaccinated with one dose, 105 (7%) cases had received two or more doses, and 214 (14%) cases had an unknown vaccination status.

Table 2. Number of rubella cases by month and notification rate (cases per million) by country, 1 July 2015 – 30 June 2016, EU/EEA countries

Country	2015						2016						Total cases	Cases per million	Total lab-positive cases
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
Austria	0	0	0	0	0	0	0	1	1	0	0	0	2	0.2	1
Bulgaria	0	1	0	0	1	0	0	0	0	0	0	0	2	0.3	0
Croatia	0	0	0	0	0	0	0	0	0	0	2	NR	2	0.5	2
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Czech Republic	0	0	0	0	0	0	0	0	0	0	0	NR	0	0.0	0
Denmark*	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Estonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Finland	0	0	0	1	4	0	0	0	0	0	0	0	5	0.9	5
Germany	13	4	4	3	6	5	3	6	5	16	11	15	91	1.1	16
Greece	0	0	0	0	0	0	0	0	0	0	0	NR	0	0.0	0
Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Ireland	1	4	0	0	0	0	0	0	1	0	0	0	6	1.3	0
Italy	3	3	2	1	0	1	1	3	1	2	0	5	22	0.4	6
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	0	0	0	0	0.0	0
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Netherlands	0	0	0	1	0	0	0	0	0	0	0	0	1	0.1	1
Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Poland	142	114	92	148	139	142	142	138	112	150	111	123	1553	40.9	17
Portugal	1	1	0	0	3	0	1	1	1	0	2	1	11	1.1	0
Romania	1	0	0	1	1	0	0	0	1	1	1	0	6	0.3	3
Slovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Slovenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Spain	0	0	1	0	2	0	0	0	1	1	0	0	5	0.1	5
Sweden	0	0	0	0	0	0	0	0	0	0	1	0	1	0.1	1
United Kingdom	0	0	0	0	0	0	0	0	1	0	0	0	1	0.0	1
Total	161	127	99	155	156	148	147	149	124	170	128	144	1708	**	58

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. Also included are all confirmed, probable, possible or unknown cases, as defined by the EU 2012 case definition.

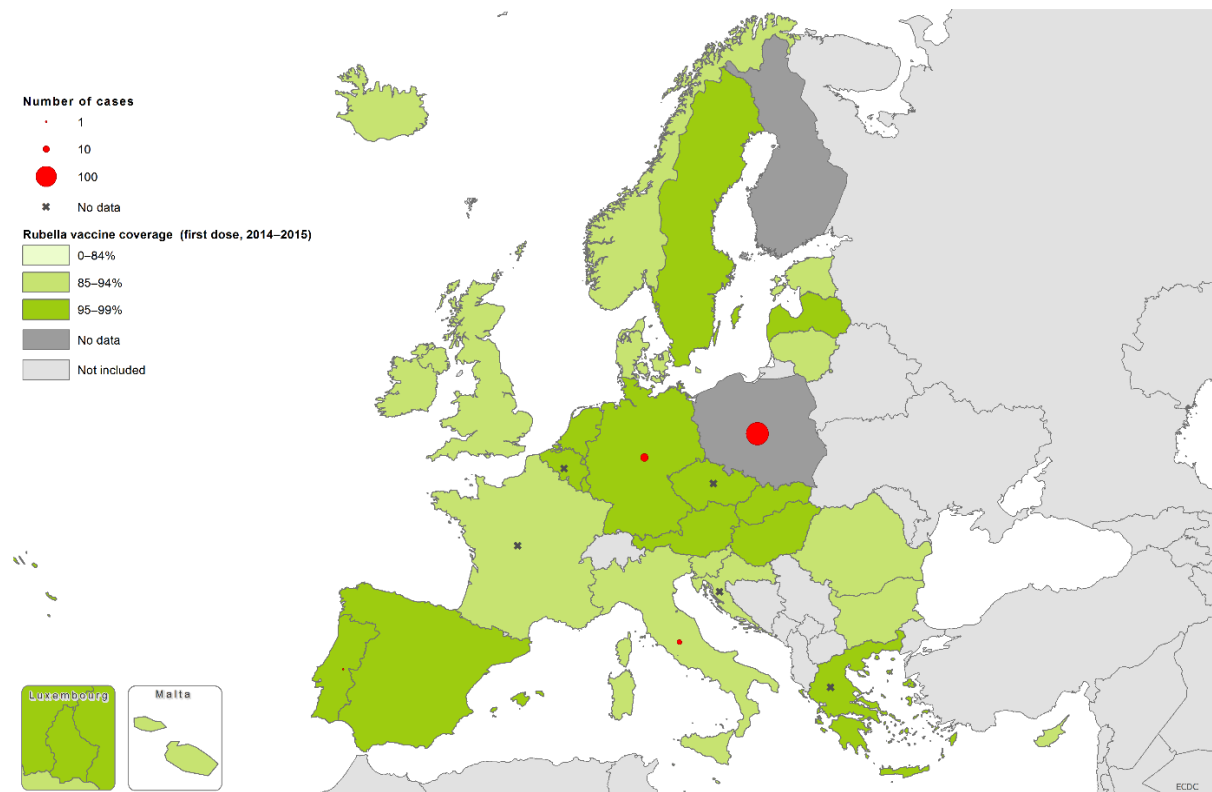
* The national surveillance system for rubella in Denmark currently only captures rubella infections during pregnancy; therefore the true incidence of rubella in the Danish population is underestimated.

** 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 6. Number of rubella cases by country, June 2016 (n=144), and rubella vaccine coverage (first dose, 2014–2015, WHO*), EU/EEA countries



* 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 7. Rubella notification rate (cases per million) by country, 1 July 2015 – 30 June 2016, EU/EEA countries (n=1 708)

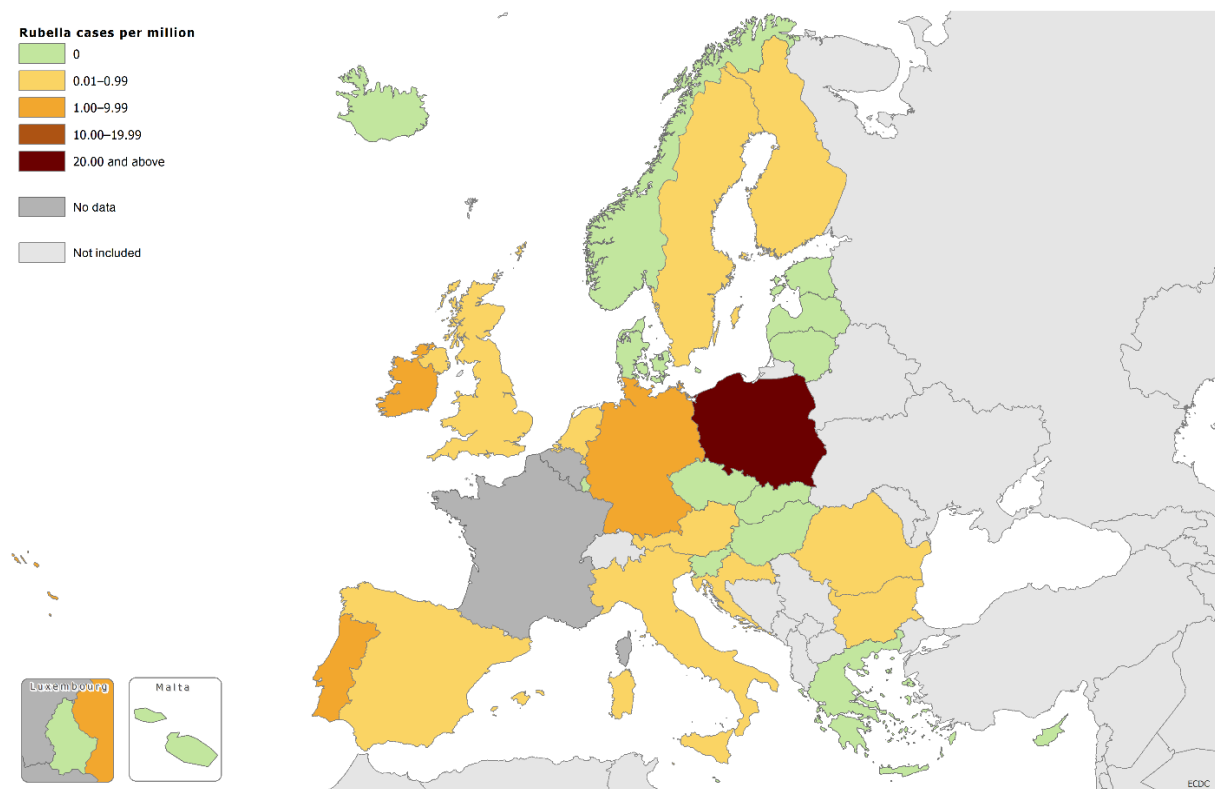
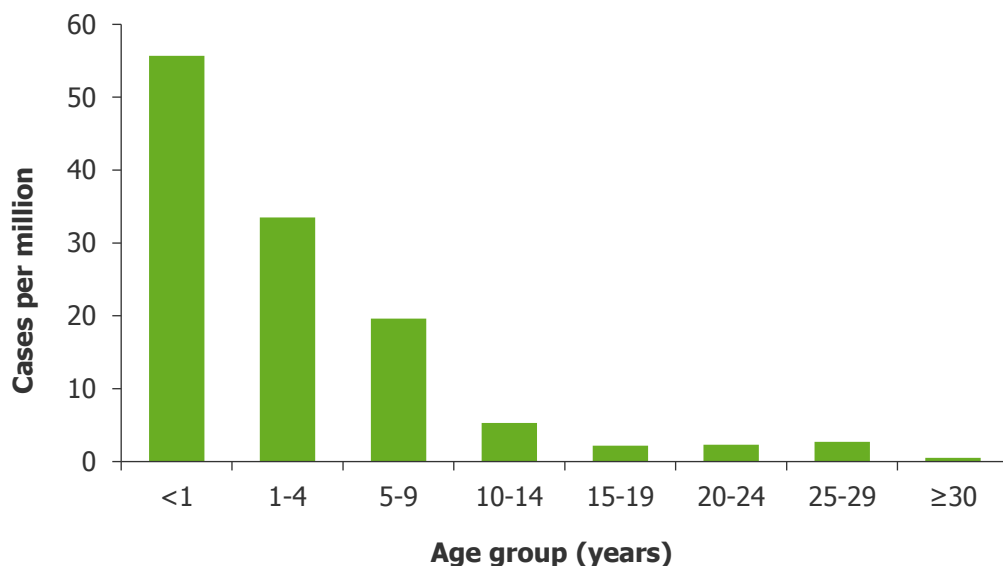


Figure 8. Rubella notification rate (cases per million) by age group, 1 July 2015 – 30 June 2016, EU/EEA countries (n=1 708 cases with known age)



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 establishes their joint commitment to achieve 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 36 or more months' absence of endemic measles or rubella in all Member States [6].

Although progress has been made towards elimination, this goal has not yet been achieved. At the [fourth meeting](#) of the Regional Verification Commission for Measles and Rubella from 26 to 29 October 2015 [4], 15 EU/EEA countries – based on country reports for 2014 – were declared to have interrupted endemic measles transmission for ≥ 36 months, thus reaching the elimination goal. Seven countries were classified as having interrupted endemic transmission for between 12 and 24 months, and eight countries were classified as still having endemic transmission.

For rubella, 14 EU/EEA countries were declared to have reached the elimination goal. Five countries were classified as having interrupted endemic transmission for between 12 and 24 months, two as having interrupted endemic transmission for between 24 and 36 months, and nine countries as still having endemic transmission [6]. The status of measles and rubella elimination in the WHO European Region will be assessed annually.

The elimination target is an incidence of less than 1 endemic measles or rubella case per million population in a 12-month period. In the past 12 months, the overall notification rate for measles in EU/EEA countries was 3.5 cases per million population. Nineteen EU/EEA countries over the past 12 months notified less than 1 case per million population (Table 1). Twenty-four countries over the past 12 months reported less than 1 case of rubella per million population (Table 2). These figures include imported and import-related cases, and therefore the number of countries having reached the target may be underestimated for each disease.

To interrupt the circulation of the virus, a vaccination coverage (second dose) of at least 95% must be reached and maintained for both diseases and in all countries. Data from WHO for 2015 [7] show that the vaccination coverage rate was above this target in 15 EU/EEA countries for the first dose of measles- and rubella-containing vaccines. Two countries failed to submit first-dose coverage data for 2014 and 2015. In seven countries, the vaccination coverage rate for the second dose of measles-containing vaccine was at least 95%. Second-dose coverage was not reported for seven countries in 2015 or 2014. WHO does not collect coverage data for the second dose of rubella-containing vaccines.

If the elimination goal is to be reached, vaccination coverage rates will have to be increased for both measles and rubella; immunisation gaps must be closed in young children – who are targeted by vaccination programmes – and in adolescents and adults who have missed opportunities for vaccination 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 vaccine coverage.

In order to achieve and accurately document progress towards the elimination goal, high-quality disease surveillance is essential. 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 case infection. 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 reached.

WHO's *Surveillance guidelines for measles, rubella and congenital rubella syndrome in the WHO European Region* are available from [8]: http://www.euro.who.int/data/assets/pdf_file/0018/79020/e93035-2013.pdf.

Useful links

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

Measles health topic page, ECDC: <http://ecdc.europa.eu/en/healthtopics/measles/Pages/index.aspx>

Rubella health topic page, ECDC: <http://ecdc.europa.eu/EN/HEALTHTOPICS/RUBELLA/Pages/index.aspx>

Measles and rubella atlases to monitor progress toward elimination, ECDC: <http://ecdc.europa.eu/en/data-tools/atlas/Pages/atlas.aspx>

Vaccination schedules in EU/EEA countries, ECDC: <http://vaccine-schedule.ecdc.europa.eu/Pages/Scheduler.aspx>

Let's talk about protection, ECDC: <http://www.ecdc.europa.eu/en/healthtopics/immunisation/comms-aid/Pages/protection.aspx>

Information about vaccines and immunisation from the website of the World Health Organization's Regional Office for Europe: <http://www.euro.who.int/en/health-topics/communicable-diseases/measles-and-rubella>

WHO CISID database: <http://data.euro.who.int/cisid/>

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 2015 country estimates were unavailable, estimates from 2014 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 2015 country estimates were unavailable, estimates from 2014 were used.

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

References

1. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases – Measles. [Internet.] Stockholm: ECDC; 2015. [Accessed 2016 Aug 25.] Available from: <http://atlas.ecdc.europa.eu/public/index.aspx?Dataset=27&HealthTopic=35&GeoResolution=2&TimeResolution=Month&FixDataset=1&FixHealthTopic=0?Instance=MeaslesMonthlyAtlas>
2. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases – Rubella [Internet.] Stockholm: ECDC; 2015. [Accessed 2016 Aug 25.] Available from: <http://atlas.ecdc.europa.eu/public/index.aspx?Dataset=27&HealthTopic=45&GeoResolution=2&TimeResolution=Month&FixDataset=1&FixHealthTopic=0&Instance=RubellaMonthlyAtlas>
3. European Centre for Disease Prevention and Control. Measles maps. [Internet.] Stockholm: ECDC; 2015. [Accessed 2016 Aug 25.] Available from: http://ecdc.europa.eu/en/healthtopics/measles/epidemiological_data/Pages/measles_maps.aspx
4. WHO Regional Office for Europe. 4th Meeting of the European Regional Verification Commission for Measles and Rubella Elimination. Copenhagen: WHO Europe; 2016. Available from: http://www.euro.who.int/_data/assets/pdf_file/0011/304958/4th-RVC-meeting-report.pdf
5. European Centre for Disease Prevention and Control. Survey on rubella, rubella in pregnancy and congenital rubella surveillance systems in EU/EEA countries. Stockholm: ECDC; 2013. Available from: <http://ecdc.europa.eu/en/publications/Publications/survey-rubella-pregnancy-congenital-surveillance-systems-may-2013.pdf>
6. WHO Regional Office for Europe. Eliminating measles and rubella – Framework for the verification process in the WHO European Region. Copenhagen: WHO Europe; 2014. Available from: http://www.euro.who.int/_data/assets/pdf_file/0009/247356/Eliminating-measles-and-rubella-Framework-for-the-verification-process-in-the-WHO-European-Region.pdf
7. World Health Organization. Measles-containing vaccine 2nd dose. [Internet.] Geneva: WHO; 2016. [Accessed 2016 Aug 25.] Available from: http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tscoveragemcv2.html
8. WHO Regional Office for Europe. Surveillance guidelines for measles, rubella and congenital rubella syndrome in the WHO European Region. Copenhagen: WHO Europe; 2012. Available from: http://www.euro.who.int/_data/assets/pdf_file/0018/79020/e93035-2013.pdf