

SURVEILLANCE REPORT

ECDC measles and rubella monitoring (EMMO)

Issue 12: June 2012

Main developments

Starting with this issue, EMMO will also cover rubella. Therefore, EMMO changes its name to *ECDC measles and rubella monitoring* and will report enhanced surveillance data and epidemic intelligence information for both diseases.

Both measles and rubella are targeted for elimination in Europe in 2015, and vaccinations are routinely delivered as a trivalent measles-mumps-rubella (MMR) vaccine. Infection with rubella virus during the first three months of pregnancy carries a very high risk of foetal malformations, a condition referred to as congenital rubella syndrome (CRS). Prevention of congenital infections is the main reason for targeting rubella for elimination through routine vaccination of children and women of childbearing age.

Measles

- From 1 January to 30 April 2012, 2919 cases of measles were reported by the 29 contributing EU and EEA countries.
- In the 12-month period leading up to 30 April 2012, a total of 17 448 measles cases were reported.
- France, Romania, Italy and Spain accounted for 83% of the measles cases.
- The majority of cases (82%) were unvaccinated, including in the age groups targeted by vaccination programmes.
- The number of new cases and the cumulative number of measles cases continues to be considerably lower in 2012 compared with 2010 and 2011.
- There were no fatal cases in the last 12-month period; nine cases of measles acute encephalitis were reported.
- Epidemic intelligence has not detected any major new outbreaks or unexpected developments since the previous EMMO.
- From this issue onwards, measles data will be presented for the most recent 12-month period for which data is available in TESSy. This change should be considered when comparing with data presented by calendar year in previous EMMOs.

Rubella

- In the first quarter of 2012, 25 EU/EEA countries reported a total of 11 809 rubella cases to ECDC, compared with 8 320 cases for 2011 and 4 767 cases for 2010. Thirteen countries reported zero cases in Q1 2012.
- Romania accounted for 90% of the reported cases while the country is facing its largest rubella outbreak since 2003.
- The highest incidence of rubella was in the 15–19-year-old age group. Of the cases with known vaccination status in this age group, more than 99% had not been vaccinated.
- Cases of rubella infection during pregnancy were reported; one baby infected in utero was reported to have died in the newborn period as a consequence of congenital rubella syndrome (CRS).
- Only 13% of the reported rubella cases were laboratory confirmed.
- The rubella data submitted by EU and EEA Member States to TESSy were complete and comprehensive.

Measles

Surveillance data

The enhanced measles surveillance data was retrieved from TESSy on 28 May 2012. The analysis covers the 12-month period from 1 May 2011 to 30 April 2012.

Twenty-six countries reported case-based data for the entire 12-month period. Lithuania reported case-based data for 11 months and aggregated data for April 2012. Poland reported case-based data for the period May 2011 to March 2012 but did not submit data for April 2012, and the Netherlands did not submit data for March and April 2012 but reported case-based data for the first 10 months of the period.

An overview of the number of cases and notification rates in the latest 12-month period is shown in Table 1. The number of cases reported for the first four months of 2012 is much lower than the number of cases reported for the same period in 2011 (Figure 1).

In the latest 12-month period, the highest notification rate was among infants under one year (33.1 cases per 100 000 population), followed by children aged between one and four years (16.9 cases per 100 000 population) (Figure 2).

Vaccination status was known for 84% (14 630) of the reported cases. Of these, 82% (12 056) were unvaccinated, 13% (1915) had received one dose of measles vaccine, 4% (532) had received two or more doses, and 0.1% (127) cases had received an unknown number of doses. The proportion of unvaccinated cases was high across all age groups, ranging from around 89% in those under the age of one year (too young for routine measles vaccination) to around 50% in the 25–29-year-old age group (Figure 5).

There were no measles-associated deaths reported in the latest 12-month period. Nine cases were complicated by acute measles encephalitis.

Figure 1. Number of measles cases in 2011 and 2012 and number of countries reporting in 2012 by month

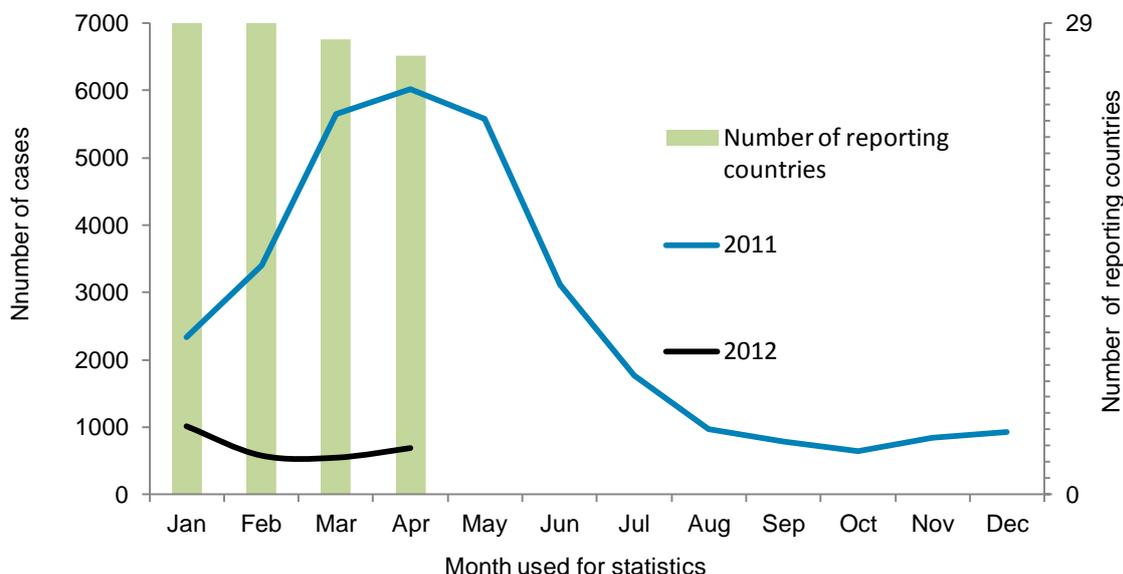


Table 1. Number of measles cases by month and notifications per 100 000 population in the last 12 months (May 2011–April 2012), EU and EEA countries

Country	2011								2012				May 2011–April 2012	
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total cases	Notification rate per 100 000
Austria	18	33	16	4	2	0	0	0	0	0	0	0	73	0.9
Belgium	129	92	43	9	10	3	12	2	7	6	2	8	323	3.0
Bulgaria	18	1	0	0	1	0	1	0	0	0	0	0	21	0.3
Cyprus	0	0	0	0	0	0	0	0	0	1	0	0	1	0.1
Czech Republic	4	0	1	3	0	0	0	1	3	2	0	2	16	0.2
Denmark	19	0	2	0	0	0	0	0	1	0	0	0	22	0.4
Estonia	1	1	0	0	0	0	0	0	0	0	0	2	4	0.3
Finland	12	1	0	5	2	0	0	0	1	0	0	3	24	0.4
France	2,227	907	395	141	80	71	100	126	106	122	139	104	4,518	6.9
Germany	429	237	119	57	22	16	21	7	3	19	7	0	937	1.1
Greece	10	2	0	3	0	0	0	0	0	0	0	0	15	0.1
Hungary	0	0	0	0	0	0	0	5	0	1	0	1	7	0.1
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	12	30	33	65	72	33	20	5	4	7	6	6	293	6.5
Italy	1,303	849	416	176	99	61	56	54	58	117	79	68	3,336	5.5
Latvia	0	0	0	1	0	0	0	0	0	2	1	0	4	0.2
Lithuania	2	4	0	0	0	0	0	0	0	0	0	2	8	0.2
Luxembourg	2	1	0	1	1	0	0	0	0	0	1	0	6	1.2
Malta	0	0	0	1	1	0	0	0	0	0	0	0	2	0.5
Netherlands	11	5	0	1	0	0	0	0	0	0	NR	NR	17	0.1
Norway	3	5	1	1	2	1	0	0	0	0	0	1	14	0.3
Poland	9	5	1	10	5	1	0	0	1	1	1	NR	34	0.1
Portugal	0	0	0	0	0	0	0	1	1	0	0	0	2	0.02
Romania	514	455	377	286	247	214	357	592	729	110	85	317	4283	20.0
Slovakia	0	1	0	0	0	0	0	0	0	0	0	0	1	0.02
Slovenia	1	7	12	0	0	0	0	0	1	0	1	0	22	1.1
Spain	667	345	248	146	185	168	203	108	59	64	68	38	2299	5.0
Sweden	4	1	2	1	0	0	4	0	2	14	4	4	36	0.4
United Kingdom	186	133	105	60	54	73	63	29	39	109	148	131	1130	1.8
Total	5581	3115	1771	971	783	641	837	930	1,015	575	542	687	17448	3.4

Data in red were reported in an aggregated format. NR: data not reported.

Notification rates were calculated using the most recent population estimates available from Eurostat (2011).

Countries with a notification rate ≥ 1.0 per 100 000 population are highlighted in green.

For tables relating to number of measles cases in previous years, see

http://ecdc.europa.eu/en/activities/surveillance/euvac/data/Pages/data_bymonth.aspx

Figure 2. Notification rates (cases per 100 000 population), by age group for the period May 2011–April 2012, EU/EEA countries (n= 17 196 cases with known age)

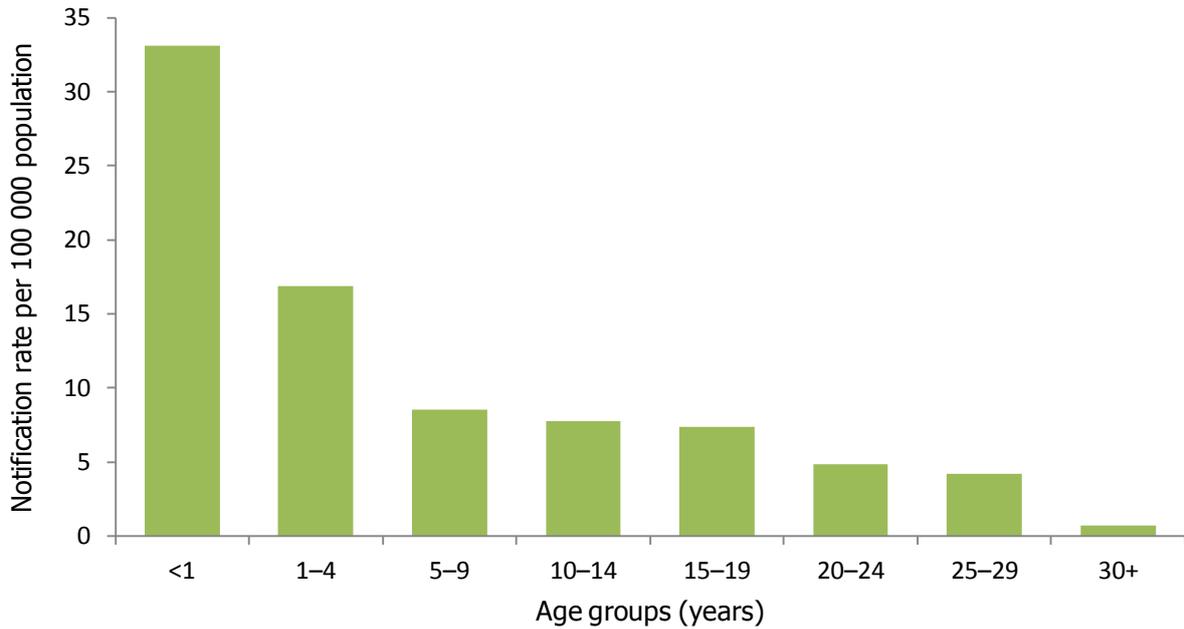


Figure 3. Proportion of vaccination status among measles cases by age group in the last 12 months (May 2012–April 2012), EU/EEA countries (n= 17 194 cases with known vaccination status age)

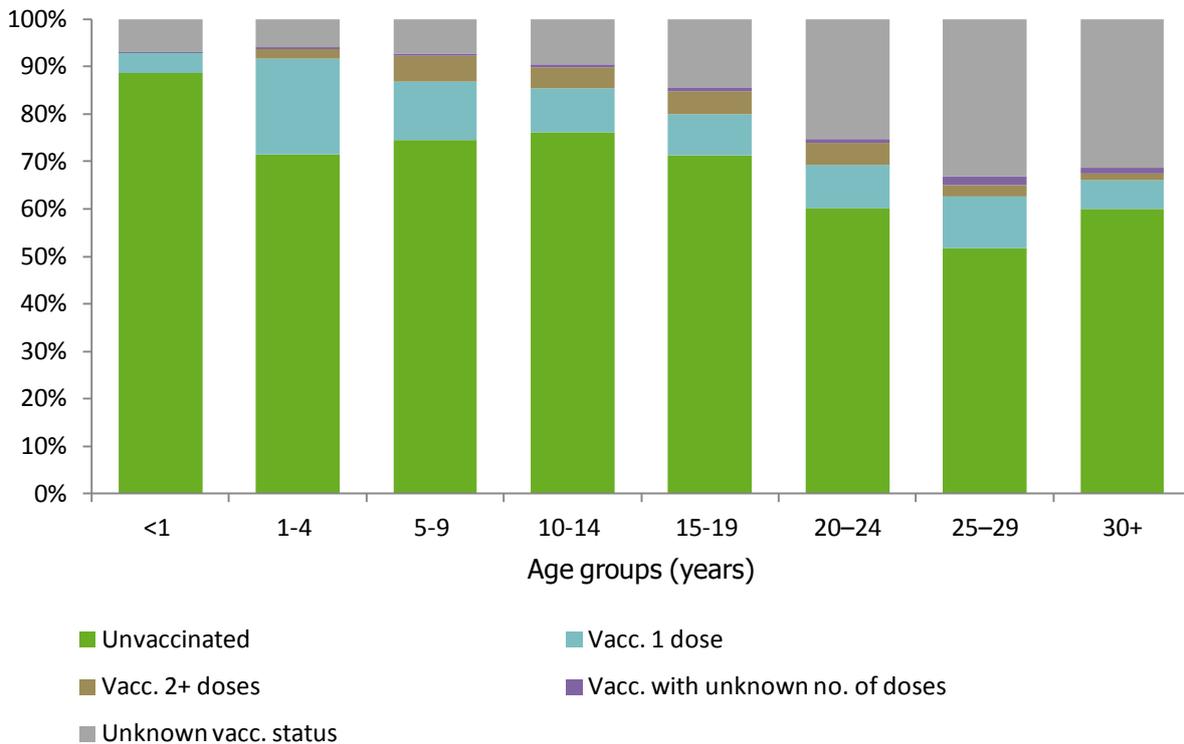
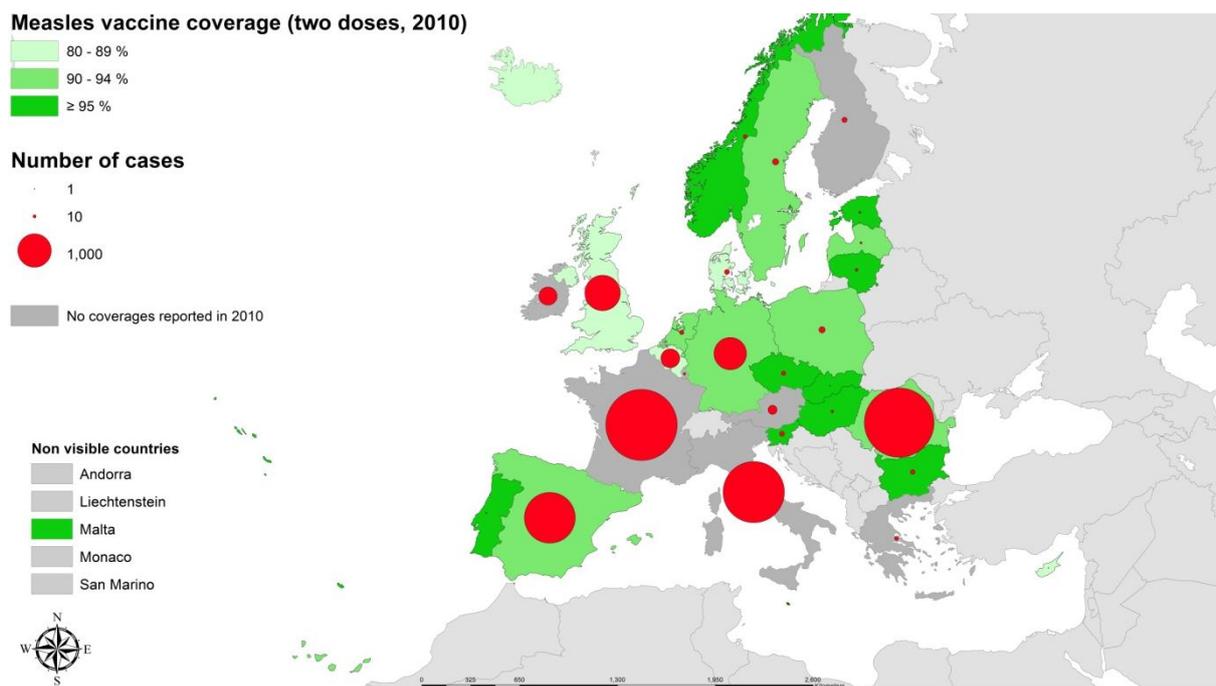
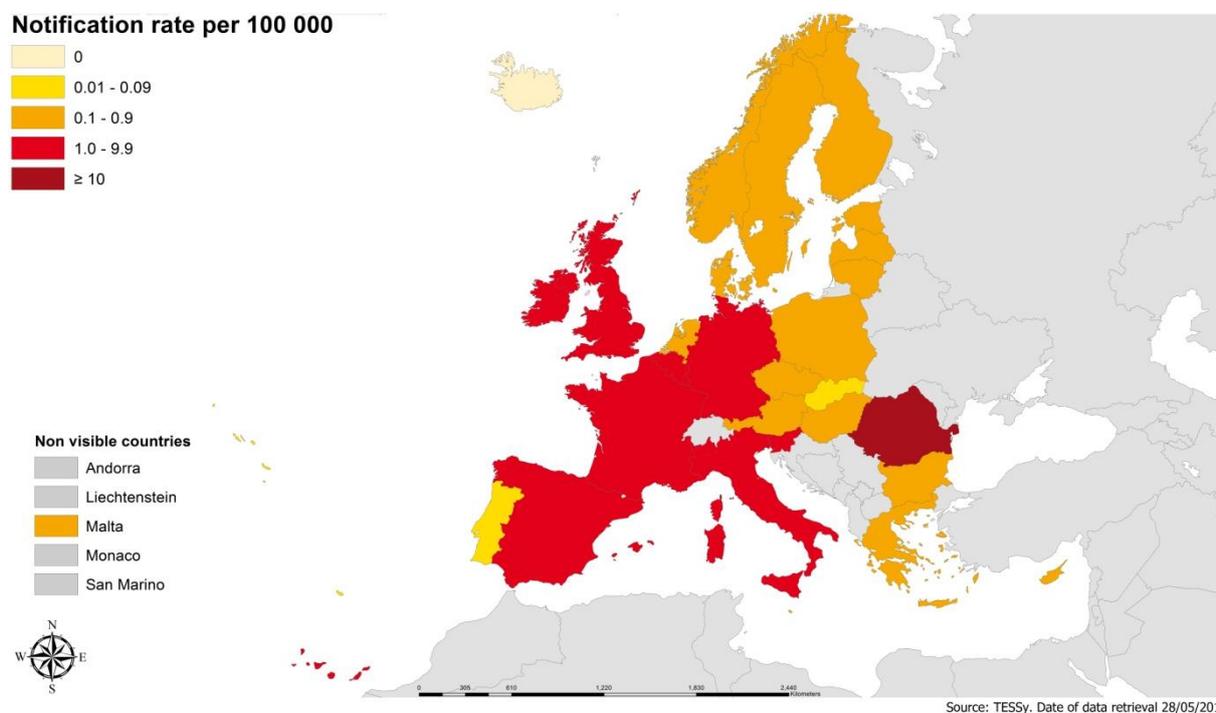


Figure 4. Number of measles cases by country in the last 12 months (May 2011–April 2012; n=17 448) and two-dose measles vaccine coverage* (2010 CISID)



* Coverage figures (%) are official national figures reported via the annual WHO/UNICEF Joint Reporting Form and WHO Regional Office for Europe reports.

Figure 5. Measles notification rates (cases per 100 000 population) by country (May 2011–April 2012; n=17 488)



For maps relating to measles cases and notification rates in 2011, see http://ecdc.europa.eu/en/activities/surveillance/euvac/data/Pages/measles_maps.aspx

Epidemic intelligence: measles

European Union Member States

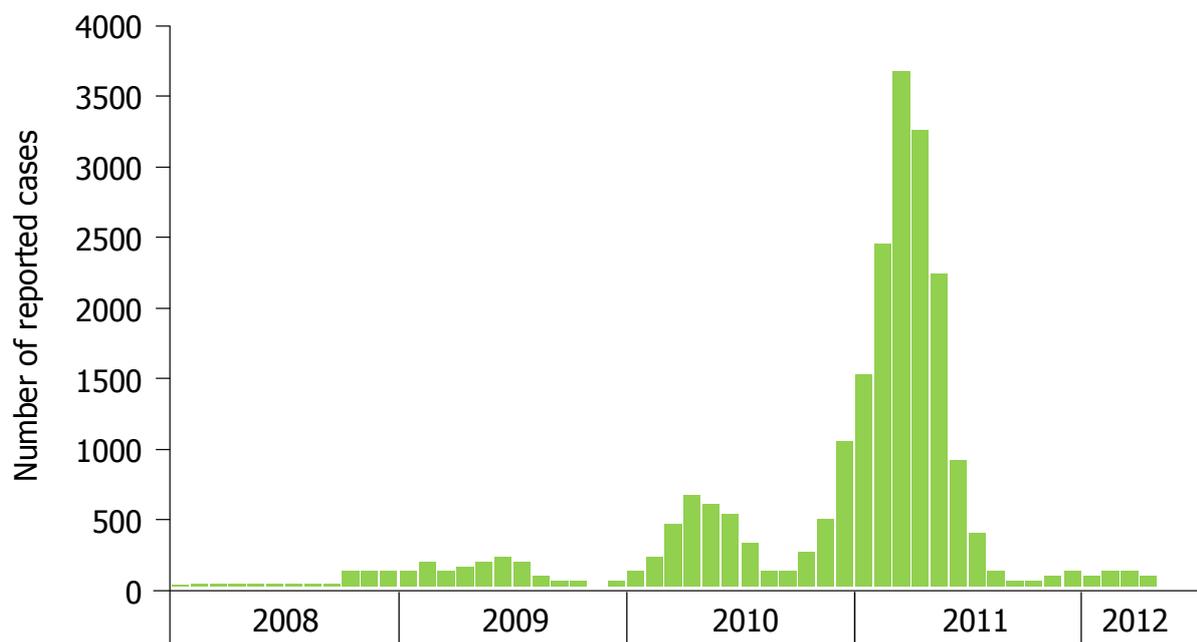
The peak transmission period for measles in Europe will soon come to an end. The number of new cases and the cumulative number of cases have so far been considerably lower in 2012 compared to 2010 and 2011. There were no major new outbreaks or unexpected developments since the previous EMMO.

France

Source: [Institut de Veille Sanitaire](#)

Since 1 January 2012, 473 cases of measles were notified, 19 of which were complicated by severe pneumonia. Unlike the previous two years, the monthly number of cases has remained relatively stable during the peak transmission period.

Figure 6. Number of measles cases per month (mandatory notification), France, January 2008 –April 2012 (provisional data for April 2012)



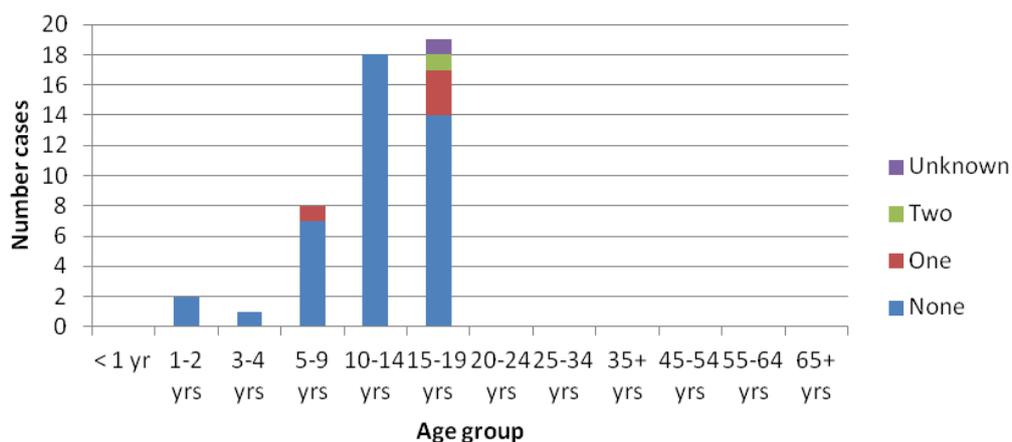
Source: Graph: ECDC, data: [Institut de Veille Sanitaire](#)

Ireland

Source: [Health Protection Surveillance Centre](#) and [Epi Insight](#)

A measles outbreak in Cork in the southwest of Ireland has affected 51 people as of 1 June 2012. All cases have been below 20 years of age, and two patients required hospitalisation. Most of the sick were between 10 and 19 years of age, and 88% had not been vaccinated against measles. The first dose of MMR is recommended at 12 months in Ireland and the second dose at 4–5 years of age. The national vaccination rate at 24 months is 92% but the estimated uptake in West Cork is as low as 86%.

Figure 7. Measles cases reported by Health Services Executive South, Ireland, by age group and vaccination status, 2012 (n=48 cases)



Health authorities have informed general practitioners (GPs) and hospital services in the affected area about the outbreak and asked them to isolate patients suspected of having measles and to notify all suspected cases. Further control measures include isolating infected children at home and excluding unvaccinated siblings from school. Parents living in the outbreak area have been advised to vaccinate infants aged 6–12 months with an extra dose of MMR during the outbreak period. Infants who receive an extra MMR dose to protect them during the outbreak are recommended to have the routine MMR vaccinations at 12 months and 4–5 years of age.

Poland

Source: [Media](#)

An outbreak of measles among ethnic Roma in Wroclaw, first reported in the media, was confirmed by Polish authorities. Eleven cases were reported from a Roma camp of about 100 people. All affected were of Romanian nationality. No cases were notified from outside of the affected community. The community has been offered vaccinations, and the situation is closely monitored by local authorities.

UK

Source: [Health Protection Report](#) and [NOIDs weekly report](#)

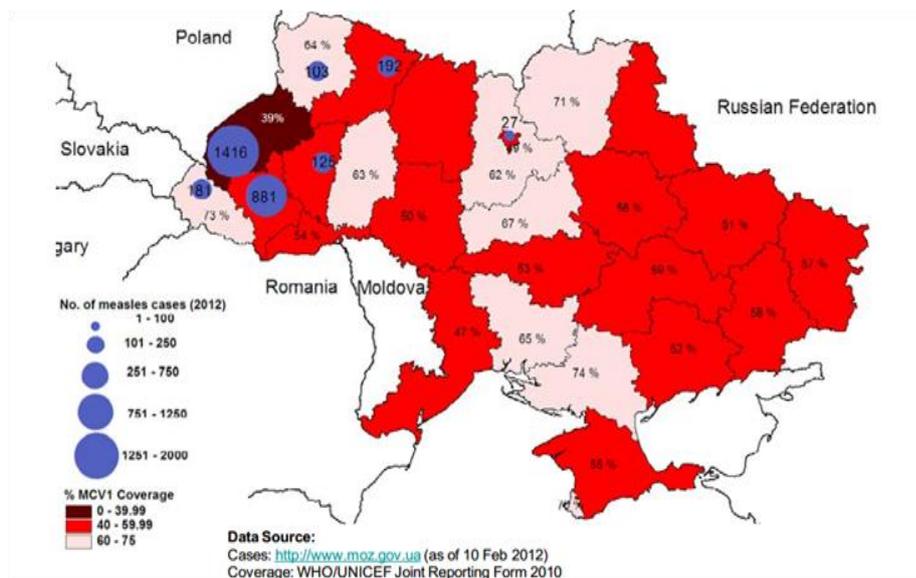
So far this year, 1 677 suspected cases of measles have been notified in England and Wales, of which 447 had been laboratory confirmed by the end of April. Cases were reported from all but two of the regions in England and Wales. The majority (78%) of infections were in children and adolescents. Eight percent of the confirmed measles cases had received one or more doses of a measles-containing vaccine. Half of all cases were connected to the outbreak in the North West region which has accumulated 272 confirmed cases since January 2012. The genotype associated with this outbreak is B3. An outbreak of the D8 strain in North Wales is continuing although spread into the local community is more limited, with only 12 new cases confirmed in April. The South East region, where the predominant strain is D4, was the only region that reported more cases in April than in March; 44 cases were linked to the ongoing outbreak (onset September 2011). Each of the three outbreaks is associated with a different measles genotype but investigations have not identified index cases with history of travel abroad or contact with infected overseas travellers.

EU neighbouring countries

Ukraine

Source: [MOH](#)

As of 31 May, Ukraine has reported 10 108 measles cases since the start of 2012. The majority of the cases are reported from the western regions of the country bordering Poland, Slovakia, Hungary and Romania (Transcarpathian, Lviv Oblast, Ivano-Frankivsk, Ternopili, Volyn and Rivne regions). The officially reported vaccine uptake is low in Ukraine and the country has experienced shortages of MRR vaccine in the last years.

Figure 8. Measles cases in 2012 and MCV1 coverage in 2010 by region, Ukraine

Source: WHO Epidemiological Brief No. 21, February 2012

Rubella

Background

ECDC closely monitors rubella transmission in Europe through the reporting of cases to the European Surveillance System (TESSy) and its epidemic intelligence (EI) activities. Twenty-four EU and two EEA countries contribute to the enhanced rubella surveillance. Data is submitted monthly to TESSy and then checked and analysed by ECDC. After validation by the contributing countries, the data are forwarded once a month to WHO's global database.

For more information on rubella go to <http://ecdc.europa.eu/EN/HEALTHTOPICS/RUBELLA/Pages/index.aspx>.

The purpose of the enhanced rubella monitoring is to provide regular and timely updates on the rubella situation in Europe in support of effective disease control, increased public awareness and for the achievement of the 2015 rubella and congenital rubella elimination target.

Surveillance data

The enhanced rubella surveillance data was retrieved from TESSy on 26 April 2012, and the analysis covers the period from 1 January to 31 March 2012. Data from previous years is presented for comparison when relevant.

Out of the 25 countries reporting data during the first quarter of 2012, twenty-four countries reported case-based data, and one country (Poland) reported aggregated data. Data from Italy was not available at the time of analysis for this report. In Denmark, only rubella in pregnancy and congenital rubella infections are notifiable diseases, hence only those rubella infections are reported to TESSy. France conducts a voluntary laboratory-based surveillance system for rubella among pregnant women and newborns. Belgium operates a dedicated surveillance network for congenital rubella infections. In Germany, surveillance for rubella currently exists only at the sub-national level and not in all federal states but nationwide rubella surveillance will be implemented in 2013.

During the first quarter of 2012, 11 809 rubella cases were reported to ECDC, compared with annual totals of 8 320 in 2011 and 4 767 in 2010 (Table 1, Figure 1).

- Romania, where an outbreak is currently ongoing, accounted for 90% (10 602) of all cases reported to TESSy over this three-month period.
- Poland accounted for 9.7% (1 148) of the cases.
- Thirteen countries reported zero cases for the first quarter of 2012.

Table 2. Number of rubella cases by quarter (2010 and 2011) and by month for 2012, EU and EEA countries

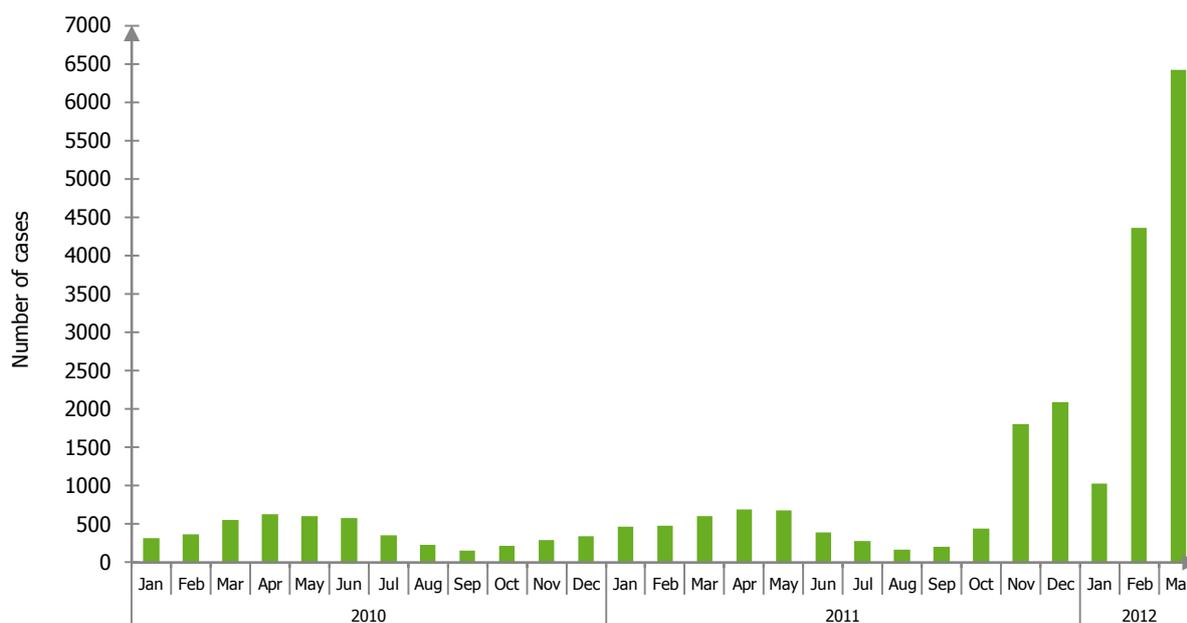
	2010					Total	2011				Total	2012			Total
	Q1	Q2	Q3	Q4	Q1		Q2	Q3	Q4	Jan		Feb	Mar		
Austria	1	1	0	0	2	1	0	1	1	3	0	0	0	0	
Belgium	nr	nr	nr	nr	-	nr	nr	nr	nr	-	nr	nr	nr	-	
Bulgaria	0	0	0	39	39	26	8	5	2	41	1	2	4	7	
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Czech Republic	4	0	0	0	4	5	19	2	2	28	2	0	2	4	
Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Estonia	2	0	0	0	2	0	0	0	0	0	0	0	0	0	
Finland	0	0	0	0	0	1	1	0	1	3	0	0	0	0	
France	nr	nr	nr	nr	-	nr	nr	nr	nr	-	nr	nr	nr	-	
Germany	nr	nr	nr	nr	-	na	na	na	na	-	na	na	na	-	
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hungary	0	0	0	0	0	1	1	0	1	3	0	1	1	2	
Ireland	4	9	8	3	24	3	3	1	2	9	0	0	3	3	
Italy	41	57	7	17	122	nr	nr	nr	nr	0	nr	nr	nr	-	
Latvia	0	0	0	0	0	0	1	0	1	2	0	0	0	0	
Lithuania	2	0	0	0	2	0	0	0	0	0	0	0	0	0	
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Netherlands	0	0	0	0	0	1	0	0	0	1	0	0	nr	0	
Poland	1149	1669	647	732	4197	1456	1706	580	551	4293	174	279	695	1148	
Portugal	0	0	1	0	1	0	0	0	0	0	0	0	0	0	
Romania	76	120	77	77	350	49	24	67	3776	3916	850	4054	5698	10602	
Slovakia	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	
Spain	4	3	2	0	9	3	4	1	0	8	3	2	3	8	
Sweden	0	3	0	0	3	0	2	0	3	5	0	0	0	0	
United Kingdom	2	8	1	1	12	3	0	3	0	6	3	19	11	33	
EU total					4767					8318				11808	
Iceland	0	0	0	0	0	0	0	0	0	0	0	nr	nr	0	
Liechtenstein	nr	nr	nr	nr	-	nr	nr	nr	nr	-	nr	nr	nr	-	
Norway	0	0	0	0	0	2	0	0	0	2	0	1	0	1	
EU/EEA total					4767					8320				11809	

Source: TESSy

na: data for rubella not available during the corresponding period

nr: rubella data not reported

Figure 9. Distribution of rubella cases, January 2010 to March 2012, by month, EU/EEA reporting Member States (n=24 774)



Source: TESSy

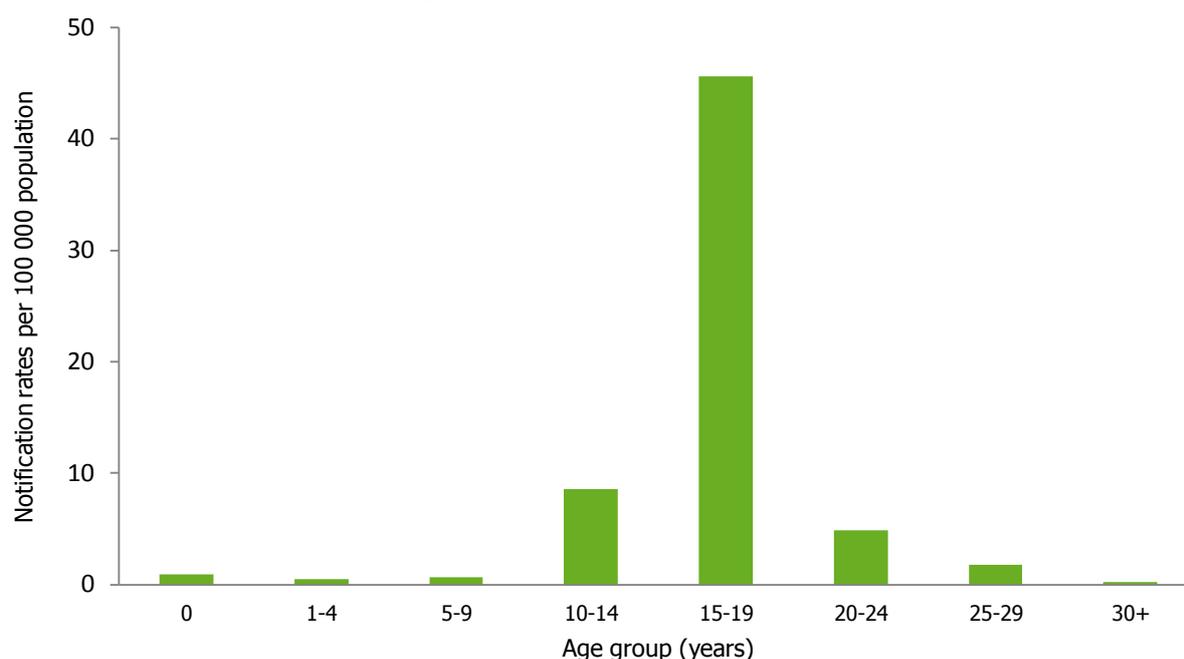
Reporting Member States: Austria, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom. Italy was excluded as data were not available for the entire period covered in Figure 1.

Classification status

The 2008 EU case definition for rubella was used by 19 countries. Classification status was reported for all cases reported in the first quarter of 2012. Thirteen percent (1 536) of the cases were laboratory confirmed, 77% (9 116 cases) were reported as probable (with an epidemiological link), and 10% (1 157 cases) were reported as possible. For Romania, which accounted for 90% of all reported cases, 14% (1 488 cases) were laboratory confirmed, and 86% (9 114 cases) were reported as probable. Strengthening of rubella surveillance systems is essential for rubella and CRS elimination in the EU, for example active outbreak investigations and efforts to increase the proportion of laboratory-confirmed cases.

Age distribution

The highest notification rate was among adolescents aged 15–19 years (45.6 cases per 100 000 population), followed by the age group 10–14 years (4.1 cases per 100 000 population) (Figure 2). To a large extent this reflects notification rates in Romania since cases from that country dominate the overall incidence of rubella. Factors which explain age distribution among cases include the timing of rubella vaccine introduction, the number of recommended doses, and the likelihood of a case presenting to healthcare services. Rubella is in general a mild disease in childhood but tends to produce more prominent symptoms in teenagers and adults. More details on the rubella outbreak in Romania can be found in a recent Eurosurveillance article (<http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20089>).

Figure 10. Distribution of rubella notification rates per 100 000 population by age group, January–March 2012, EU and EEA countries (n=11 809)

Countries included: Austria, Bulgaria, Cyprus, Czech Republic, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

Vaccination status

Data on vaccination status by age group are presented for 10 661 cases reported to TESSy in a case-based format. Vaccination status was known for 99% of the reported cases. Of these, 99% (10 516) were reported as unvaccinated, and 1% had received one dose of rubella vaccine.

Table 3. Number of rubella cases vaccinated by age groups, EU and EEA countries, January–March 2012 (n=10 661)

Vaccination status	Number of doses	Age groups (years)								Total
		<1	1–4	5–9	10–14	15–19	20–24	25–29	≥30	
		No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Vaccinated	1 dose	0 (0)	21 (37)	24 (26)	57 (5)	34 (0)	2 (0)	0 (0)	1 (0)	139 (1)
	Unknown	0 (0)	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)
Not vaccinated	-	28 (100)	35 (61)	67 (74)	1206 (95)	7495 (100)	906 (100)	360 (100)	419 (100)	10516 (99)
Unknown		0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (1)	2 (0)	5 (0)
Total		28 (100)	57 (100)	91 (100)	1263 (100)	7529 (100)	908 (100)	363 (100)	422 (100)	10661 (100)

Complications and outcomes

Information on complications and outcome was reported for all except 39 of the 10 661 cases. There were three cases of neurological complications, 37 cases were complicated by arthritis, 1 642 cases had other complications (not specified) and 8 940 cases were free of complications. Table 3 describes the distribution of reported complications by age group.

One fatal case was reported in 2012. A baby infected in utero and born with multi-organ malformations (CRS) died soon after birth.

Table 4. Distribution of rubella complications by age groups, January–March 2012, EU and EEA countries (n=10 661)

Type of complications	Age groups								total
	0	1–4	5–9	10–14	15–19	20–24	25–29	30+	
Rubella arthritis	0	1	0	2	15	6	5	8	37
Other	0	1	4	186	1246	105	47	53	1642
Neurological complications	0	0	0	0	3	0	0	0	3
No complications	26	50	81	1071	6252	794	309	357	8940
Unknown	2	5	6	4	13	3	2	4	39
total	28	57	91	1263	7529	908	363	422	10661

Regarding **importation status**, 10 663 cases were believed to have been infected in their country of residence. Information on importation status was missing for nine cases. Six cases were infected abroad and recorded as imported cases and 13 cases were import-related (i.e. second generation case from an imported case). The six cases imported cases had acquired the infection in Romania (4), Spain (1) and Vietnam (1).

Pregnancy status was known for 4 476 out of the 4 489 female cases for which case-based data was available. Sixteen women were reported to have been pregnant when infected but information on the progress of the pregnancy at the time of symptoms was available for only two cases, of which one occurred in the first trimester and one in the third trimester.

Epidemic intelligence: rubella

European Union Member States

ECDC continuously monitors rubella transmission and rubella outbreaks in the EU and Europe. Overall, rubella transmission has been slow in the last three months except for the large outbreak ongoing in Romania which was relayed by local media. Some media attention was also raised in Spain after an outbreak in a kindergarten in the region of Aragon (http://www.elperiodicodearagon.com/noticias/aragon/un-brote-de-rubeola-en-una-guarderia-adelanta-vacunacion_748755.html)

Publications

Measles

Nosocomial transmission of measles: An updated review

Botelho-Nevers E, Gautret P, Biellik R, Brouqui P. Nosocomial transmission of measles: An updated review. *Vaccine*. 2012 Jun 8;30(27):3996-4001. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22521843>

Summary: The authors review cases of measles with nosocomial transmission between 1997 and 2011 and show that measles is transmitted from patients to healthcare workers (HCWs) and from HCWs to patients and colleagues. Additionally, they describe how measles outbreaks in healthcare settings differ from community transmission and highlight the need for all HCWs to be immunised against measles.

Disclosure statement: Authors declare to have no conflict of interest.

ECDC comment: Measles outbreaks continue to occur in the EU and other developed countries as a result of suboptimal vaccine coverage. This review highlights the increasing importance of healthcare-associated measles transmission in countries with low incidence of disease. In the last decade, around 22% of measles cases associated with small outbreaks were linked to transmission in healthcare settings. Nosocomial transmission of measles is of particular concern for high-risk patients who are also more likely to use healthcare services, such as pregnant women, newborns, prematurely born babies, and immunocompromised patients. The risk of transmission in healthcare settings can be minimised by routinely checking immunity against measles among healthcare workers, vaccinating susceptible staff, isolating suspected cases, and maintaining vigilance for measles.

Rubella

Ongoing rubella outbreak among adolescents in Salaj, Romania, September 2011–January 2012

Janta D, Stanescu A, Lupulescu E, Molnar G, Pistol A. Ongoing rubella outbreak among adolescents in Salaj, Romania, September 2011–January 2012. *Euro Surveill*. 2012;17(7):pii=20089. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20089> (accessed 3 May 2012)

Letter to the editor: Commitment needed for the prevention of congenital rubella syndrome in Europe

Derrough T, Bacci S, Lopalco PL. Euro Surveill. Letter to the editor: Commitment needed for the prevention of congenital rubella syndrome in Europe. 2012;17(10):pii=20106. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20106> (accessed 3 May 2012)

Impact of birth rate, seasonality and transmission rate on minimum levels of coverage needed for rubella vaccination

Metcalfe CJ, Lessler J, Klepac P, Cutts F, Grenfell BT. Impact of birth rate, seasonality and transmission rate on minimum levels of coverage needed for rubella vaccination. Epidemiol Infect. 2012 Feb 16:1-12. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22335852>

Research priorities for global measles and rubella control and eradication

Goodson JL, Chu SY, Rota PA, Moss WJ, Featherstone DA, Vijayaraghavan M, Thompson KM, Martin R, Reef S, Strebel PM. Research priorities for global measles and rubella control and eradication. Vaccine. 2012 Apr 28. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22549089>

Conferences

A scientific conference entitled 'Progress toward rubella elimination and CRS prevention in Europe' took place in Rome, Italy, from 8 to 10 February 2012. A short description of the conference and a link to the presentations can be found here: <http://www.sabin.org/events/progress-toward-rubella-elimination-and-crs-prevention-europe>

EMMO-related links

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

<http://ecdc.europa.eu/en/healthtopics/measles>

http://ecdc.europa.eu/en/healthtopics/measles/epidemiological_data/Pages/data_bymonth.aspx

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

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

Information on the surveillance of vaccine-preventable diseases in the European Union is available from the [EUVAC-Net](#) website.

Notes

- The European Surveillance System (TESSy) reports 'date used for statistics', which is a date chosen by the country for reporting purposes. Such date may indicate onset of disease, date of diagnosis, date of notification, or date of laboratory confirmation.
- Countries report on measles, rubella and other vaccine-preventable diseases to TESSy at their own convenience. This means that the date of retrieval can influence the data resented in EMMO. For this reason, the date of data retrieval is indicated for all EMMO issues. For EMMO issue 12, measles data was retrieved on 28 May and rubella data on 26 May. Later retrievals of data may result in slightly different numbers as countries have the possibility to update data in TESSy retrospectively.