

Congenital rubella and rubella in pregnancy *News*



Congenital rubella and rubella in pregnancy surveillance report

The National Measles and Rubella Elimination Plan (PNEMoRc) 2010-2015 includes among its objectives the reduction of the incidence of congenital rubella to less than one case per 100,000 live births by 2015, according to the recommendations of the European Region of the World Health Organization (WHO-EURO).

In Italy a national surveillance system of congenital rubella and rubella infections in pregnancy is active since 2005 in order to monitor progress toward elimination.

This report shows national and regional surveillance data for the period **2005 - 2015**. Reclassification of some cases due to updated information may be responsible for minor variation of data respect to the previous bulletins. Moreover a retrospective search of congenital rubella cases by reviewing hospital records and a crosscheck with surveillance notifications was conducted in 2015.

Highlights

- In 2005-2015, **84 congenital rubella infections** (probable and confirmed cases) were reported, with two peaks in 2008 and 2012.
- Moreover **167 rubella infections in pregnancy** (possible, probable and confirmed cases) were notified. Among them, **32 voluntary terminations, 1 stillbirth** and **1 spontaneous abortion** were reported.
- In 2015 and the first months of 2016 no congenital rubella case was reported. Congenital rubella incidence is **below 1 case per 100,000 live births since 2013**. It is, however, necessary to keep high the attention, taking into consideration that rubella infection has a cyclic-epidemic trend.
- It is necessary to reinforce the follow **up of the outcome of pregnancies** and of the **status of infection of the newborns** with suspected congenital rubella over time.
- Clinicians' awareness on the **importance of reporting** all cases to the surveillance system should be improved.
- In this bulletin, the results of a study comparing congenital rubella **notifications** and **hospitalizations**, performed in 2015, are reported.

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Congenital rubella: national data

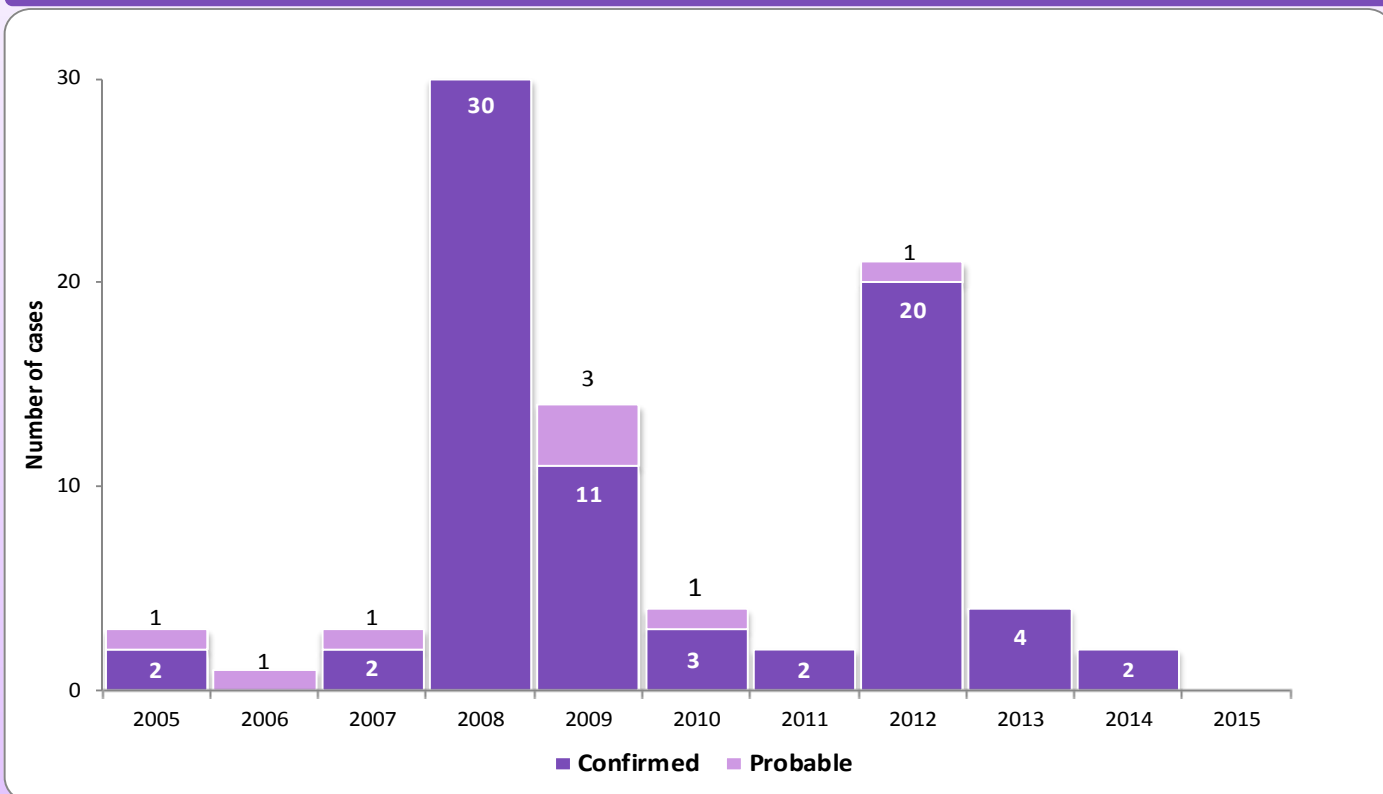
In the period **2005–2015**, **84** cases of congenital rubella were reported: **76 confirmed** and **8 probable** cases according to European Commission case definition.

Furthermore, we received **64** notifications that we could not classify because of lack of information or because these cases were not monitored over time.

In the first months of 2016, no congenital rubella infection was reported.

Figure 1 shows the number of congenital infections (confirmed and probable cases) by year and classification. We can observe a peak of notifications in 2008 (30 cases, with an incidence of 5.2 per 100,000 live births) and one in 2012 (21 cases, with an incidence of 3.9 per 100,000 live births).

Figure 1. Congenital rubella infections by year and classification. Italy, 2005-2015



Clinical information

Information on clinical manifestations are available for **78** of the 84 probable/confirmed reported cases. At least one clinical manifestation was reported for **62** cases. The most frequently reported symptoms were:

- Congenital heart disease (43 children)
- Loss of hearing (29 children)
- Cataract (13 children)
- Meningoencephalitis (11 children)
- Microcephaly (11 children)

Twenty-one cases had multiple defects involving the heart, hearing or vision.

Sixteen infants were asymptomatic: they are cases with laboratory confirmation and epidemiological link.

Rubella in pregnancy: national data

In the period **2005–2015**, **167** cases of rubella in pregnancy (**154 confirmed, 9 probable and 4 possible cases**) were reported.

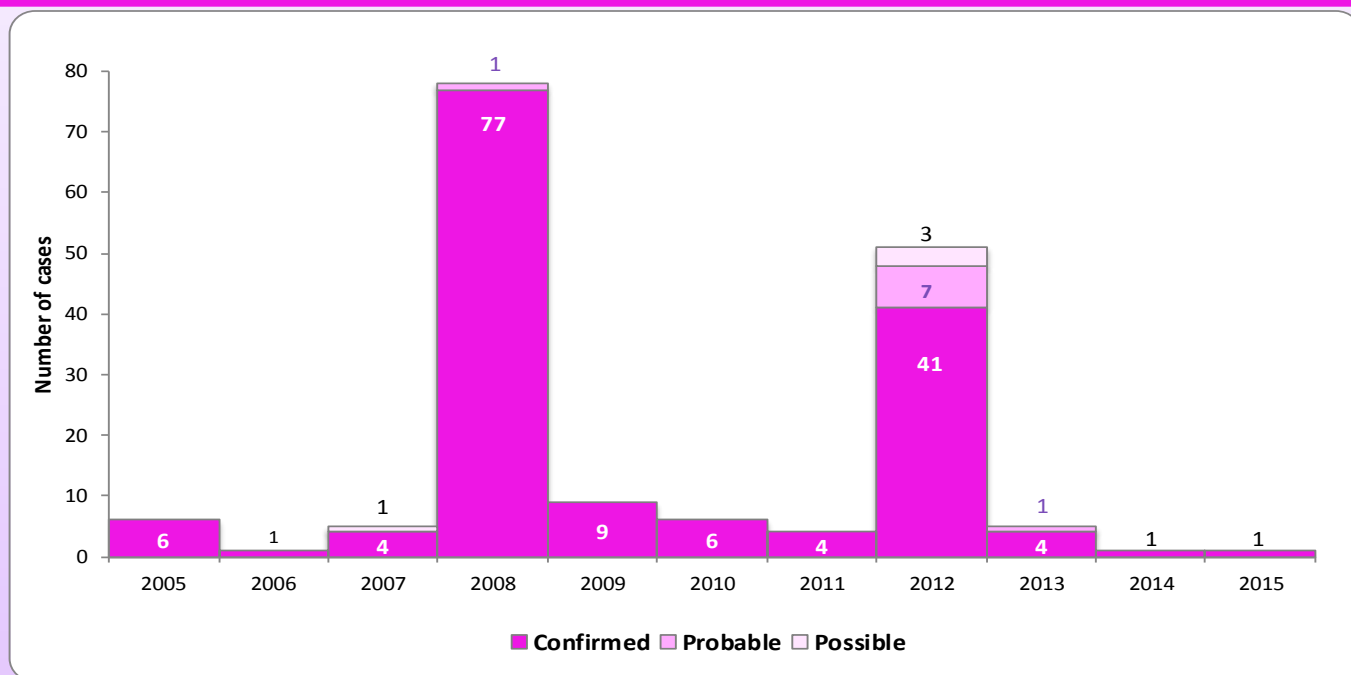
In addition, we received **106** notifications that we were unable to classify with the available information.

In the same period, among the infected women, **one stillbirth, one spontaneous abortion and 32 voluntary terminations** were reported.

In the first months of 2016, no rubella infection during pregnancy was reported.

The Figure 2 reports the number of rubella infections in pregnancy (confirmed, probable and possible cases) by year and case classification. We can observe a peak of notifications in 2008 (78 cases) and one in 2012 (51 cases). This temporal trend is consistent with what reported for congenital rubella in the Figure 1.

Figure 2. Rubella in pregnancy by year and classification. Italy, 2005-2015



Characteristics of women with rubella infection in pregnancy

(confirmed, probable and possible cases)

- The median age is 27 years
- 14% (23/161) is not Italian
- 42% (46/110) acquired the infection in the first trimester of pregnancy
- 29% (38/129) performed the rubella antibody screening before pregnancy
- 45% (70/155) had previous pregnancies (Figure 3)
- Three women reported to be vaccinated (but the vaccination history is not documented)
- For 38 women (23%) it is unknown if the infection was transmitted to the newborn, because the outcome of the pregnancy is unknown or because information regarding the status of infection of the newborn was not available.

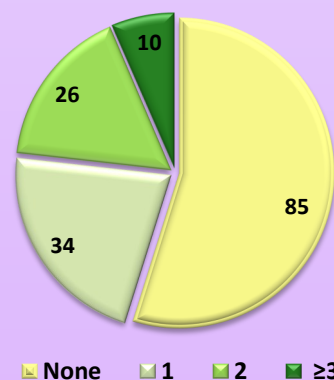


Figure 3. Previous pregnancies

Congenital rubella and rubella in pregnancy: regional data

Table 1. Congenital rubella cases (confirmed and probable cases) by Region/A.P., 2005–2015

Region	Cases (N)
Piemonte	6
Lombardia	5
Veneto	2
Emilia-Romagna	3
Toscana	2
Lazio	8
Campania	37
Puglia	3
Calabria	6
Sicilia	8
Sardegna	4
Total	84

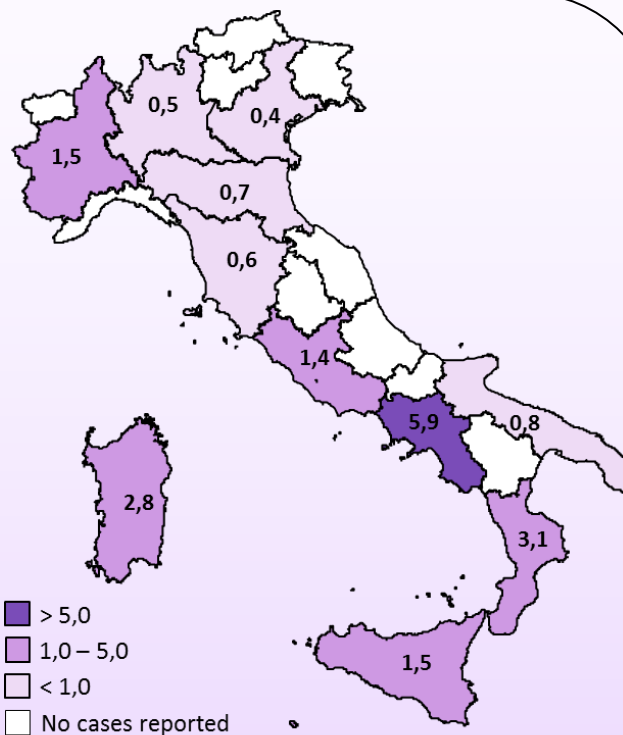


Figure 4. Annual mean incidence of congenital rubella per 100,000 live births by Region/A.P., 2005–2015

- Table 1 shows the number of cases (probable and confirmed) of congenital rubella infection by Region/A.P.
- In six regions the annual average incidence was greater than 1 in 100,000 live births (Figure 4).
- Figure 5 shows the number of rubella infection in pregnancy (confirmed, probable and possible) by Region/A.P.



Figure 5. Rubella in pregnancy cases (confirmed, probable and possible cases) by Region/A.P., 2005–2015

Congenital rubella: surveillance data and hospital discharge records compared, 2010-2014

In order to evaluate the sensitivity of the national congenital rubella surveillance system, in 2015 the National Public Health Institute (Istituto Superiore di Sanità, ISS), in collaboration with the Regional Health Authorities (RHAs), carried out a retrospective search of congenital rubella cases by reviewing hospital discharge records (HDRs) and a crosscheck with surveillance notifications for the years 2010-2014.

Methods

The regional computerized discharge data of infants born between 2010 and 2014 who were discharged with the **ICD9-CM code of congenital rubella (771.0)**, as main or secondary diagnosis, were reviewed. The individual hospital records (IHRs) were retrieved in order to verify the suspect or diagnosis of congenital rubella.

A crosscheck between the list of identified hospital records and the list of suspected congenital rubella cases reported to the national surveillance system in the same period was performed.

Results

Nineteen out of 21 RHAs participated in this study.

In 2010-2014, 78 HDRs with 771.0 code were identified and 75 IHRs were retrieved and consulted. In the study period 1 probable case and 10 confirmed cases (5 infections—CRI and 5 syndromes—CRS) were detected from HDRs.

In the same period, 8 confirmed cases (3 CRS and 5 CRI) had been reported to the surveillance system.

Five of the 11 probable/confirmed case detected through the HDRs were previously reported to the surveillance system, while **6 cases (2 CRS, 3 CRI and 1 probable case)** were not reported (Figure 6).

Merging the two data sources (surveillance and HDRs), 14 congenital rubella cases were detected in the period 2010-2014. Capture-recapture method highlighted that congenital rubella surveillance system is affected by an **underreporting rate equal to 52.9%** (CI95% 30.8-64.4).

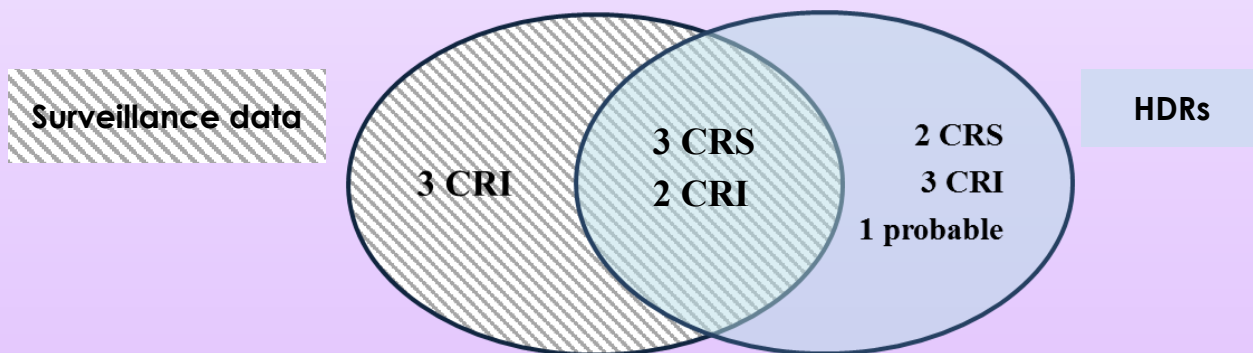


Figura 6. Surveillance data and hospital discharge records compared. Italy, 2010-2014.

Conclusions

This study allowed us to detect six probable/confirmed congenital rubella cases that were not previously reported to the surveillance system in the years 2010-2014. As expected for passive reporting systems, the national congenital rubella surveillance system resulted to be affected of a certain degree of underreporting, estimated as 52.9% in the study period.

Hospital discharge registries resulted to be a good integrative source for detecting congenital rubella infections. Therefore, while approaching rubella elimination, an annual or biannual crosscheck between congenital rubella reported cases and hospital records should be performed.

Even after merging surveillance data and cases detected from hospital records, in the period 2010-2014 the annual incidence of congenital rubella remained below 1 case per 100,000 live births, except for the 2012 peak. It is, however, necessary to keep high the attention, taking into consideration that rubella infection has a cyclic-epidemic trend.



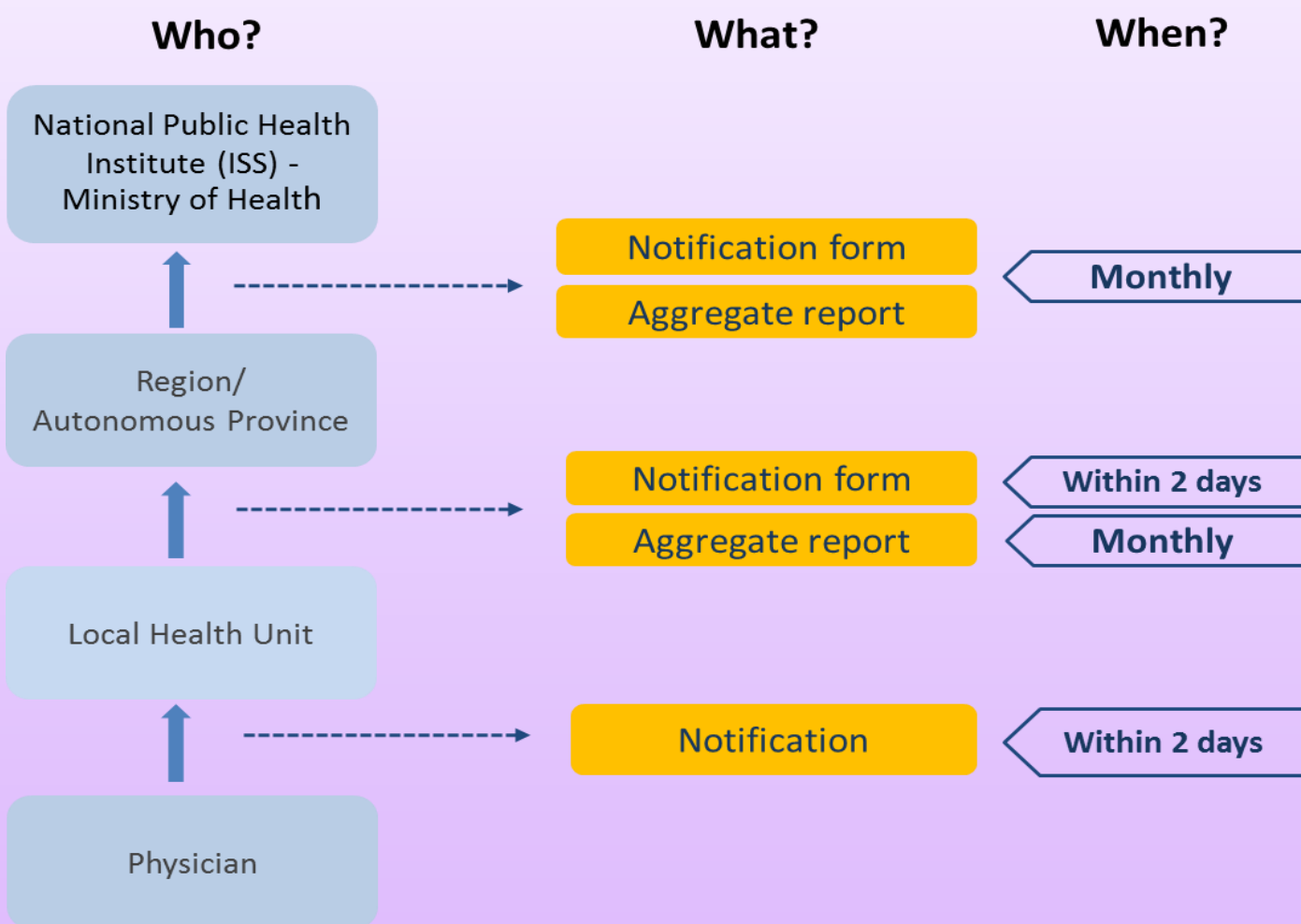
The surveillance system for congenital rubella and rubella in pregnancy

In Italy the notification of congenital rubella syndrome, congenital rubella infections and rubella infections in pregnancy is mandatory since the 1st of January 2005.

The national surveillance system for congenital rubella and rubella in pregnancy is mandatory, passive, case-based and based on clinicians.

Two separate notification forms are used for congenital rubella and rubella infections in pregnancy; the notification form for congenital rubella also includes a section regarding the mother's history.

Data flow is described below.





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To improve the surveillance...

- Improving the sensitivity and specificity of the surveillance system is important to monitor progresses towards elimination.
- An annual/biannual crosscheck between notifications and hospital records with 771.0 discharge code should allow to detect congenital rubella cases not reported to the surveillance system.
- Clinicians' awareness on the importance of reporting all cases to the surveillance system should be arisen.
- Strengthening the surveillance of pregnant women with suspected rubella infection is fundamental because it is an entry point for congenital rubella cases. Early diagnosis of congenital rubella cases also allows quick interventions for any associated defect and prevention of rubella spread from infected infants.
- Monitoring of infected pregnant women is also important to record all the outcomes of the pregnancy, including stillbirth, spontaneous and voluntary terminations, that contribute to assess the burden of congenital rubella.
- It is important that all the babies born from mothers with possible, probable and confirmed infection in pregnancy are followed up over time with laboratory, clinical and diagnostic investigations, in order to confirm or exclude the congenital infection and correctly classify the cases as infection or syndrome. It is necessary to improve the timeliness of the collection of clinical information and laboratory results and their completeness, in order to reduce the amount of cases that cannot be classified.
- A monthly report of congenital infections and infections in pregnancy, including zero-reporting, is needed to improve the sensitivity and the timeliness of the surveillance system.

Useful links...

- 2012 European Commission case definitions for rubella and congenital rubella: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:262:0001:0057:EN:PDF>
- Italian Ministry of Health. National Plan for the elimination of measles and congenital rubella 2010-2015. http://www.salute.gov.it/imgs/C_17_pubblicazioni_1519_allegato.pdf (in Italian)
- Italian Ministry of Health. "Surveillance of congenital rubella and rubella infection in pregnancy according to the new National Plan for measles and congenital rubella elimination 2010-2015" del 17 Luglio 2013: <http://www.trovanorme.salute.gov.it/norme/renderNormsanPdf?anno=0&codLeg=46583&parte=1%20&serie=> (in Italian)
- Morbillo & Rosolia News: the monthly bulletin of the integrated measles and rubella surveillance: <http://www.epicentro.iss.it/problemi/morbillo/bollettino.asp> (in Italian)
- Scientific publication: "Congenital rubella still a public health problem in Italy: analysis of national surveillance data from 2005 to 2013" Euro Surveill. 2015;20(16):pii=21103: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=21103>
- Scientific publication: "Surveillance of congenital rubella and rubella infections in pregnancy in EU/EEA countries, 2012: Current status and future perspective to monitor elimination." Vaccine 2015; 33(38): 4929–4937

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