

# Ongoing measles outbreak in Romania, 2011

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Since January 2011 Romania has been experiencing a measles outbreak with 2,072 cases notified in 29 of the 42 Romanian districts. Most cases occurred in the north-western part of the country among unvaccinated children with the highest number of cases (893 cases) registered in children aged one to four years. This report underlines once more the need for additional measures targeting susceptible populations to achieve high vaccination coverage with two doses of measles-mumps-rubella vaccine.

Between January and June 2011, 2,072 measles cases were notified in 29 of the 42 Romanian districts with most cases registered in the north-western part of the country mainly among unvaccinated children. No measles-related deaths have so far been notified in 2011.

An outbreak of measles was first noticed in late August 2010 in the north-eastern part of Romania [1] and by the end of the year, 193 cases were registered in the whole country.

Measles is a statutorily notifiable disease since 1978 in Romania, and medical practitioners have to immediately report all suspected measles cases to the local public health authorities. At national level, the National Centre for Communicable Diseases Surveillance and Control in Bucharest collects and analyses all notifications of measles cases. National case-based notification was initiated in 1999 and the European Union (EU) case definition and case classification have been adopted since 2005 [2].

The monovalent measles-containing vaccine was introduced in 1979 in the Romanian immunisation schedule for children aged 9-11 months. In 1994, the second measles vaccine dose was introduced for children aged between six and seven years (first school grade). The combined measles-mumps-rubella (MMR) vaccine replaced the monovalent measles vaccine in 2004 and was recommended as a first dose for children aged 12-15 months. The second MMR vaccine has been recommended for children aged between six and seven years since October 2005.

Between 2000 and 2008 the national measles vaccination coverage for children aged between 18 and 24 months with the first dose of measles-containing vaccine was estimated at 97%-98% and for children aged seven years, the vaccination coverage with the second dose of measles-containing vaccine was estimated at 96%-98% [3]. In the last two years a constant decrease could be noticed in the measles vaccination coverage for children aged 12 months. According to the vaccination coverage reports, in 2009, the coverage for the first MMR vaccine dose was 85.1% (95% CI: 82.4-87.8) at the age of 12 months and reached the target of 95% (95% CI: 93.4-95.8) coverage for children aged 18 months. A high number of children remain unvaccinated not only in the hard-to-reach communities but also in the general population, due to parental refusal and scepticism regarding the benefits of the vaccination. Vaccination coverage for the second dose of MMR vaccine is reported every year by the school medical staff to the local health authorities after the school vaccination campaign. In 2010, the reported coverage for the second dose of measles-containing vaccine, calculated using the number of doses administered divided by the total number of eligible children aged seven years was 93.4% (95% CI: 90.7-95.0).

Here we report an ongoing measles outbreak in Romania by analysing measles data available from 1 January to 30 June 2011. Descriptive analysis was performed using the national surveillance standardised form sent by the public health authorities of each district to the National Centre for Communicable Diseases Surveillance and Control.

## Outbreak description

From the beginning of 2011 until 30 June, a total number of 2,072 measles cases were notified by the local public health authorities. The highest number of cases was registered among children aged between one and four years (893 cases), followed by the five-nine year-olds (445 cases) and the infants under one year of age (303 cases). Among the 10-14 year-olds there were 189 cases identified, 150 cases in those aged 20 years and above and 92 cases were registered among adolescents aged

between 15 and 19 years. Among the total number of cases, approximately half occurred in hard-to-reach communities. The monthly incidence increased from 131 cases registered in January to a peak of 515 cases in May, and decreased in June when the number of notified cases was 437 (Figure 1).

The laboratory confirmation was performed by detecting measles IgM antibodies in serum samples. Due to many local outbreaks, the laboratory confirmation was performed only in some of the first cases identified in a particular area until D4 genotype was confirmed. For those cases with clear epidemiological link with the outbreak, the epidemiological confirmation criteria were used.

Of the 2,072 notified measles cases, 898 were laboratory-confirmed, 1,161 were probable cases with

documented epidemiological link and 13 were clinical measles cases for whom sera could not be obtained due to parental refusal.

RT-PCR techniques to detect measles virus nucleic acid were also used to confirm the first cases from some affected districts. Twelve viruses were genotyped by a nested RT-PCR reaction which targeted a 450 nt region at the C-terminus of the N protein (Nc region). All of them belonged to D4 genotype currently circulating in Europe [4].

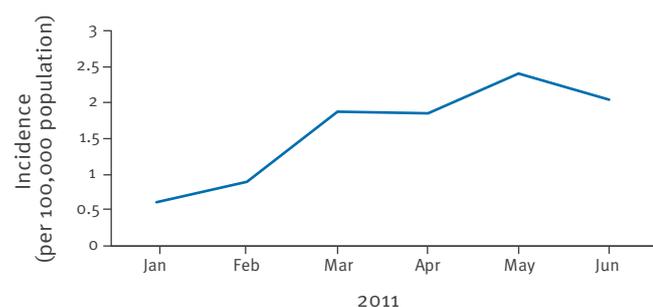
Measles spread in 29 districts (including Bucharest) of a total of 42 and the geographical distribution shows a concentration of measles cases in the north-western part of the country (Figure 2).

Of the total number of 2,072 measles cases, 800 (38.6%) presented complications: 582 (72.8%) cases developed pneumonia, 203 (25.4%) diarrhoea, eight (1%) malnutrition, five (0.62%) convulsions and two (0.25%) encephalitis.

The median age was three years (range: three weeks – 43 years). The highest incidence (138.4 per 100,000 population) was in infants not eligible for vaccination (under one year of age), followed by the one to four year-olds (103.4 per 100,000 population) and the five to nine year-olds (42.3 per 100,000 population) (Figure 3). For the older age groups the incidence ranged between 17.1 per 100,000 population and 1.8 per 100,000 population.

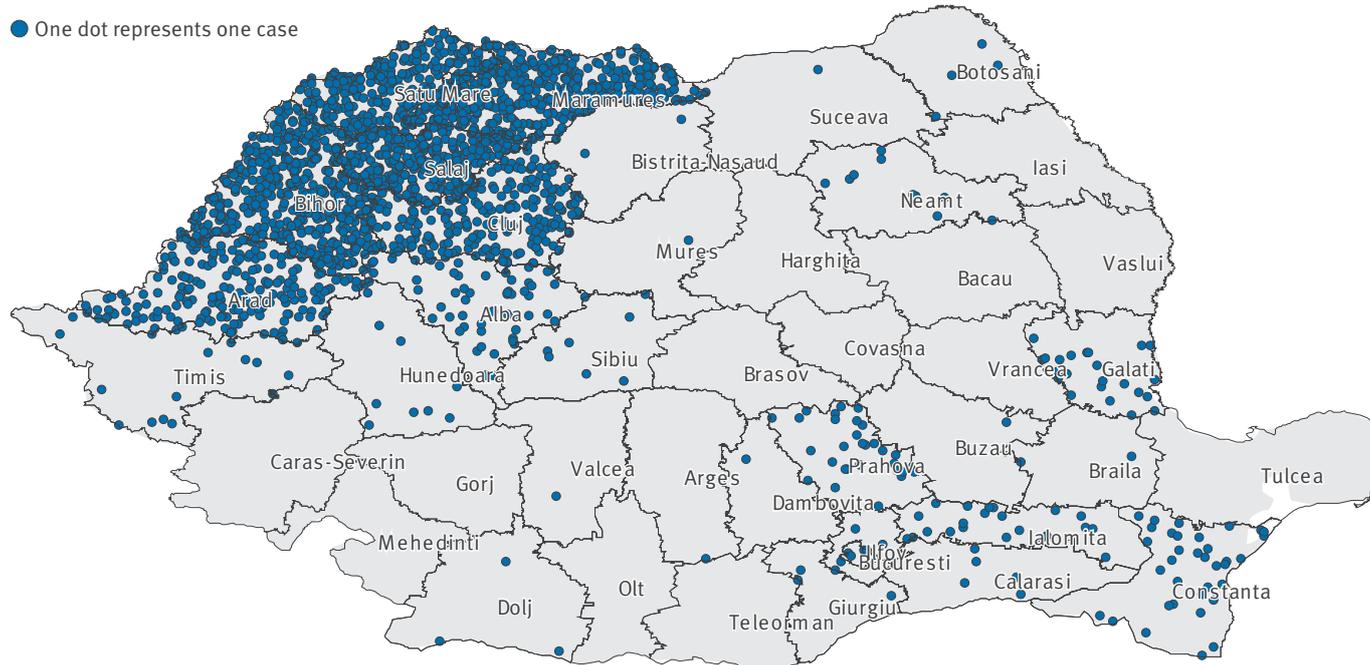
**FIGURE 1**

Monthly incidence of notified measles cases, Romania, 1 January–30 June 2011 (n=2,072 cases)



**FIGURE 2**

Distribution of notified measles cases, Romania, 1 January–30 June 2011 (n=2,072 cases)



Most cases occurred among unvaccinated children representing 72.8% from the total number of cases registered during period mentioned above. Of these, only 19.8% were not eligible for MMR vaccination due to their age (under 12 months) (Figure 4).

## Control measures

Several control measures have been implemented by the local health authorities in their efforts to stop this outbreak. An additional MMR vaccination campaign started in the affected areas targeting all children aged between seven months and seven years, irrespective of their measles vaccination status. Nevertheless, no change has yet been foreseen in the national immunisation schedule regarding the administration of the first dose of MMR vaccine. The MMR vaccine is supplied by the Ministry of Health and is offered free of charge through the routine immunisation services (family doctors) and special outreach teams. As of 30 June 2011, 4,500 children have been vaccinated with

measles-containing vaccine, following this additional vaccination campaign. Active case finding was initiated by general practitioners in the areas most affected by the outbreak, as well as contact-tracing in hospitals and in the community. Other activities such as meetings with local public health representatives were undertaken by the national public health authorities in order to increase awareness on the ongoing outbreak not only among physicians but also in the general population.

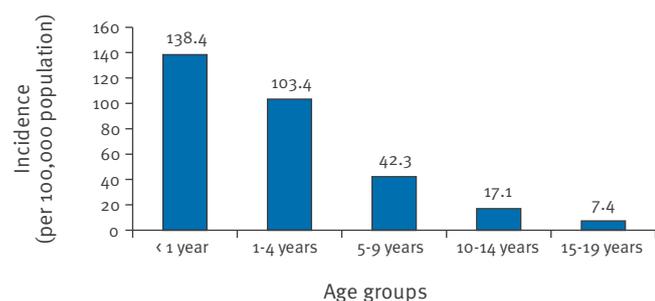
## Discussion and conclusions

In Romania, the measles incidence dropped from 16.3 and 1.6 per 100,000 population in 2006–2007 respectively, to less than 0.1 per 100,000 population in 2008–2009 [5-7].

Despite the high national immunisation coverage with MMR vaccine reported during the last 10 years, this outbreak highlights the presence of pockets of individuals vulnerable to measles and particularly those members of hard-to-reach communities but not only. We observed that more parents, even among highly educated persons, lost their confidence in vaccination benefits for their children and this became an important problem that needs to be addressed. The current measles outbreak in Romania and in other European countries reveal the need for increased awareness on the declining confidence that people have in vaccination benefits for their children and for public health intervention focused in hard-to-reach communities. In addition, after the pandemic influenza A(H1N1)2009, a constant scepticism and refusal regarding vaccination in general could be noticed, not only in hard-to-reach communities, but also in the general population. In areas and communities where vaccine coverage remains sub-optimum, large cohorts of susceptible people accumulate and represent a potential for large outbreaks. The large proportion of cases observed in infants suggests an intensely circulating measles virus [7].

**FIGURE 3**

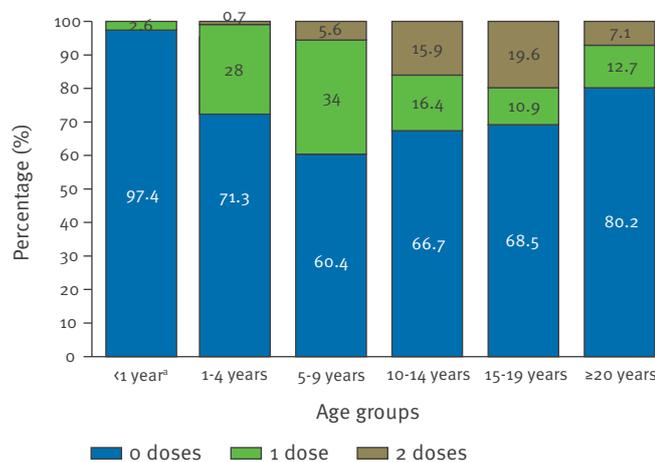
Measles incidence by age groups, Romania, 1 January–30 June 2011 (n=1,922 cases<sup>a</sup>)



<sup>a</sup> Cases aged 20 years and above (n=150) are not included in the figure.

**FIGURE 4**

Percentage of measles cases by age group and vaccination status, 1 January–30 June 2011 (n=2,072 cases)



<sup>a</sup> 2.6% were vaccinated during the incubation period in the course of the additional vaccination campaign targeted at children aged seven months–seven years.

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