



## Introduction

The following measles surveillance report covers the year 2005 and aims to describe basic epidemiological features of measles in 32 EUVAC.NET participating countries. Up to 2004, annual measles surveillance reports were based on data submitted by 19 EUVAC.NET participating countries. In May 2005, Croatia joined the network on a voluntary basis. In October 2005 a new grant agreement between EUVAC.NET and the EU Commission was signed and an additional 12 countries officially became part of the EUVAC.NET network: nine of the newer EU Member States together with Bulgaria, Romania and Turkey. In this report incidence rates are based on reported measles cases per 10<sup>5</sup> inhabitants per year.

## Methods

Data was available for the whole year from all countries with the exception of France that started reporting case-based data from June 2005 onwards. Twenty-nine countries provided case-based data that were obtained through national mandatory notification systems. Belgium provided data collected through a non-mandatory notification system. Romania and Turkey provided aggregated data (Table 1). For the purpose of this report, all clinical, laboratory-confirmed or epidemiologically linked cases meeting the requirements for national surveillance were included in the analysis.

**Table 1.** *Measles surveillance data source by country, 2005*

<b>Countries reporting case-based data</b>			
Austria	Finland	Latvia	Slovakia
Belgium	France <sup>1</sup>	Lithuania	Slovenia
Bulgaria	Germany	Luxembourg	Spain
Croatia	Greece	Malta	Sweden
Cyprus	Hungary	The Netherlands	Switzerland
Czech Republic	Iceland	Norway	United Kingdom
Denmark	Ireland	Poland	
Estonia	Italy	Portugal	
<b>Countries reporting aggregated data</b>			
Romania			
Turkey			

<sup>1</sup> France introduced case-based reporting based on mandatory notification in June 2005

Data analysis was based on cases with disease onset in 2005. In 45 case-based reports (3%) the disease onset dates were not available. However, these cases were also included in the analyses on the basis of their date of notification or date of collection of laboratory sample being in 2005. In some countries minor discrepancies with nationally reported data may arise if these include cases notified in 2005 but with disease onset in 2004.

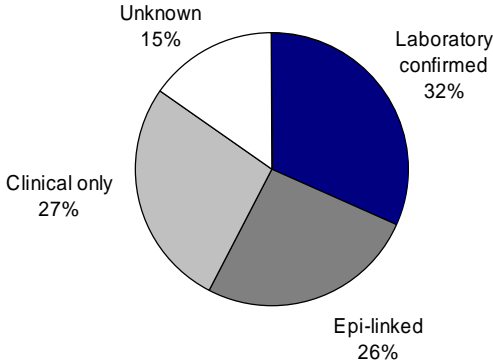
Incidence rates were based on population statistics for 2005 obtained from the Population Information page on the WHO website for the Computerized Information System for Infectious Diseases (CISID), <http://data.euro.who.int/cisid/> . Variables that had no data in the case-based reports were converted to an unknown status.

In addition to case-based data collected through national mandatory notification systems, France, Italy and Switzerland also provided sentinel surveillance data.

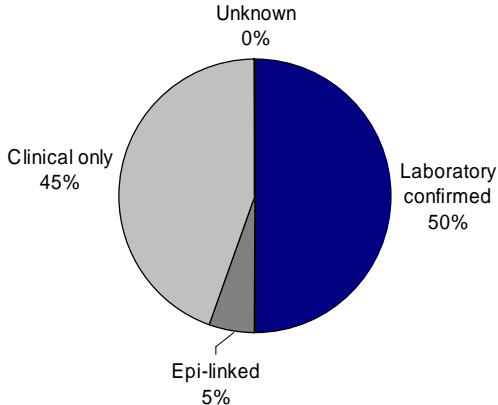
**Incidence – notifications and laboratory data**

A total of 13,322 measles cases were reported from EUVAC.NET countries giving a crude incidence of 2.33 per 100,000 inhabitants. Data on 1,469 (11%) of these were case-based and classified as seen in Figures 1a. Data on the rest of the cases (89%) were aggregated data from Romania and Turkey (Figure 1b).

**Figure 1a.** *Diagnosis classification of measles cases from case-based reports (n=1,469)*



**Figure 1b.** *Diagnosis classification of measles cases from aggregate reports (n=11,853)*



The distribution of notified measles cases varied considerably among the participating countries (Table 2). The highest incidence of measles notifications was reported from Romania followed by Turkey with a crude incidence of 25.49 and 8.48 per 100,000 inhabitants respectively.

**Table 2. Reported measles cases and laboratory confirmed cases by country, 2005 (n=13,322)**

	<i>No. of reported cases</i>	<i>Crude incidence per 100,000 inhabitants</i>	<i>Confirmed cases* as a % of no. reported</i>	<i>Laboratory confirmed as a % of total confirmed cases</i>
<b>Austria</b>	9	0.11	33%	100%
<b>Belgium</b>	25	0.24	44%	91%
<b>Bulgaria</b>	3	0.04	100%	100%
<b>Croatia</b>	2	0.04	0%	-
<b>Cyprus</b>	1	0.12	100%	100%
<b>Czech Republic</b>	0	0.00	-	-
<b>Denmark</b>	2	0.04	100%	100%
<b>Estonia</b>	2	0.15	100%	100%
<b>Finland</b>	1	0.02	100%	100%
<b>France <sup>1</sup></b>	22	0.04	41%	100%
<b>Germany</b>	778	0.95	77%	41%
<b>Greece</b>	116	1.09	22%	100%
<b>Hungary</b>	2	0.02	100%	100%
<b>Iceland</b>	0	0.00	-	-
<b>Ireland</b>	92	2.31	12%	100%
<b>Italy</b>	215	0.38	0%	-
<b>Latvia</b>	2	0.08	100%	100%
<b>Lithuania</b>	1	0.03	0%	-
<b>Luxembourg</b>	0	0.00	-	-
<b>Malta</b>	4	1.01	75%	33%
<b>The Netherlands</b>	3	0.02	100%	100%
<b>Norway</b>	0	0	-	-
<b>Poland</b>	14	0.04	7%	100%
<b>Portugal</b>	7	0.07	86%	100%
<b>Romania</b>	5647	25.49	96%	88%
<b>Slovakia</b>	0	0.00	-	-
<b>Slovenia</b>	0	0.00	-	-
<b>Spain</b>	17	0.04	88%	67%
<b>Sweden</b>	12	0.14	83%	90%
<b>Switzerland</b>	61	0.85	92%	73%
<b>Turkey</b>	6206	8.48	18%	100%
<b>United Kingdom</b>	78	0.13	100%	97%
<b>Total</b>	<b>13 322</b>	<b>2.33</b>	<b>56%</b>	<b>86%</b>

\* Confirmed cases include both laboratory-confirmed cases and epidemiologically-linked cases.

<sup>1</sup> France introduced case-based reporting based on mandatory notification in June 2005.

In table 3, countries have been grouped into low, moderate and high incidences based on notified indigenous (non-imported) measles cases. No indigenous cases were reported from 11 countries: Bulgaria, Cyprus, Czech Republic, Hungary, Iceland, Latvia, Luxembourg, the Netherlands, Norway, Slovakia and Slovenia.

**Table 3.** *Reported incidence of indigenous measles cases per 100,000 inhabitants by country, 2005*

<b>High incidence (&gt;1.0)</b>		
Ireland (2.31)	<i>Romania (25.49)*</i>	
Malta (1.01)	<i>Turkey (8.48)*</i>	
Greece (1.09)		
<b>Moderate incidence (0.1-1.0)</b>		
Belgium (0.22)	Sweden (0.10)	
Germany (0.93)	Switzerland (0.84)	
Italy (0.38)	United Kingdom (0.12)	
<b>Low incidence (&lt; 0.1)</b>		
Austria (0.09)	Finland (0.02)	Norway (0)
Bulgaria (0)	France (0.03)	The Netherlands (0)
Croatia (0.04)	Hungary (0)	Portugal (0.06)
Cyprus (0)	Iceland (0)	Poland (0.04)
Czech Republic (0)	Latvia (0)	Slovakia (0)
Denmark (0.04)	Lithuania (0.03)	Slovenia (0)
Estonia (0.08)	Luxembourg (0)	Spain (0.04)

\* For Romania and Turkey the crude incidence is quoted in this table as data on importation status of cases from are not included in the aggregated dataset provided.

### **Outbreak-related and imported cases**

Information on outbreak status was provided in 73% of case-based reports. Of these, there were 572 outbreak-related cases (Table 4) making up to 53% of those with a known outbreak status. Most outbreak cases were reported from Germany (84%). Although there were no case-based reports on outbreak cases from Romania and Turkey both countries reported very high measles activity. Reports on measles outbreaks occurring in 2005 came from Germany,<sup>1,2</sup> Greece,<sup>3,4</sup> Romania<sup>5</sup> and Sweden.<sup>6</sup>

Importation status was known in 72% of case-based reports (Table 4). Of these, there were 52 imported cases amounting to 5% of case-based reports with known importation status. Eighteen cases (35%) were imported from another European country. There were 34 imported cases (65%) from other continents including, 19 from Asia, five from the Middle East, four from Africa, six from North America.

**Table 4.** *Reported measles cases: hospitalised, outbreak related and imported, by country, 2005*

	Hospitalised cases (n=13,322)			Outbreak-related cases (n=1,469)			Imported cases (n=1,469)		
	No. (% of known hospitalisation status)	% unknown /no data		No. (% of known outbreak status)	% unknown /no data		No. (% of known importation status)	% unknown /no data	
Austria	5	56%	0%	0	0%	0%	2	22%	0%
Belgium	2	11%	28%	3	19%	36%	2	12%	32%
Bulgaria	2	67%	0%	3	100%	0%	3	100%	0%
Croatia	0	0%	0%	0	0%	0%	0	0%	50%
Cyprus	1	100%	0%	0	0%	0%	1	100%	0%
Czech Republic	0	-	-	0	-	-	0	-	-
Denmark	1	50%	0%	2	100%	0%	0	0%	50%
Estonia	1	50%	0%	0	0%	0%	1	50%	0%
Finland	0	0%	0%	0	0%	0%	0	-	100%
France <sup>1</sup>	4	18%	0%	1	6%	18%	2	100%	91%
Germany	98	13%	1%	481	62%	0%	18	2%	1%
Greece	66	88%	35%	12	10%	0%	0	0%	1%
Hungary	2	100%	0%	0	0%	0%	2	100%	0%
Iceland	0	-	-	0	-	-	0	-	-
Ireland	5	13%	59%	0	0%	84%	1	8%	87%
Italy	34	21%	26%	0	-	100%	0	-	100%
Latvia	2	100%	0%	0	0%	0%	2	100%	0%
Lithuania	0	0%	0%	0	0%	0%	0	0%	0%
Luxembourg	0	-	-	0	-	-	0	-	-
Malta	0	0%	0%	3	75%	0%	0	0%	0%
The Netherlands	2	67%	0%	2	100%	33%	3	100%	0%
Norway	0	-	-	0	-	-	0	-	-
Poland	0	0%	0%	0	0%	0%	0	0%	0%
Portugal	4	57%	0%	6	86%	0%	1	14%	0%
Romania <sup>2</sup>	4601	81%	0%	n.r.	-	-	n.r.	-	-
Slovakia	0	-	-	0	-	-	0	-	-
Slovenia	0	-	-	0	-	-	0	-	-
Spain	3	18%	0%	12	71%	0%	1	6%	0%
Sweden	0	-	100%	0	-	100%	3	25%	0%
Switzerland	7	12%	7%	47	81%	5%	1	2%	21%
Turkey <sup>2</sup>	0	-	100%	n.r.	-	-	n.r.	-	-
United Kingdom	20	45%	44%	0	-	100%	9	100%	88%
<b>Total</b>	<b>4860</b>	<b>70%</b>	<b>48%</b>	<b>572</b>	<b>53%</b>	<b>27%</b>	<b>52</b>	<b>5%</b>	<b>28%</b>

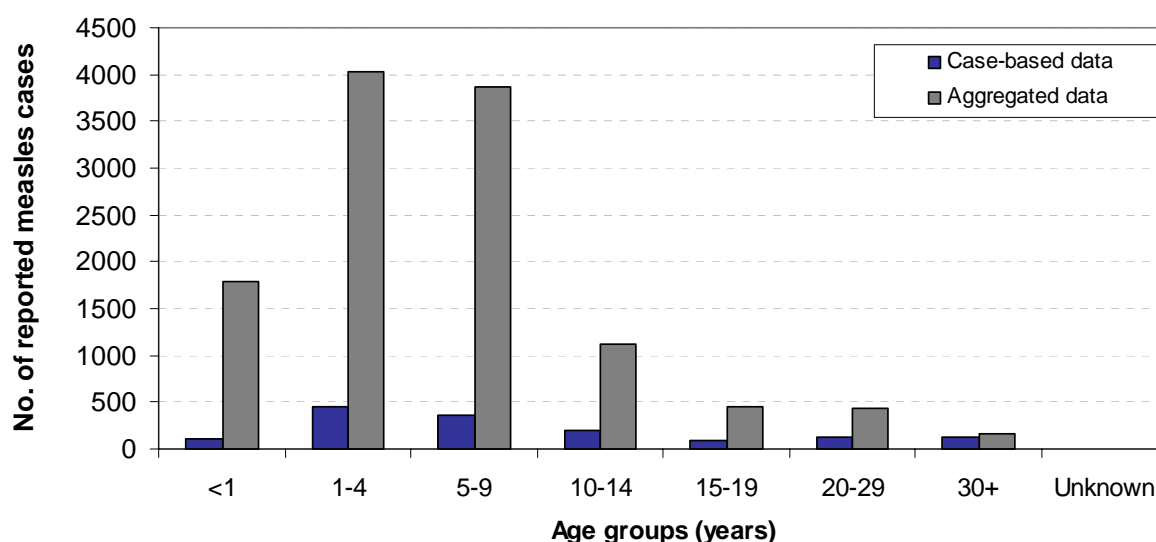
<sup>1</sup> France introduced case-based reporting based on mandatory notification in June 2005.

<sup>2</sup> Aggregated data does not include information on outbreaks and importation status. n.r. = not reported

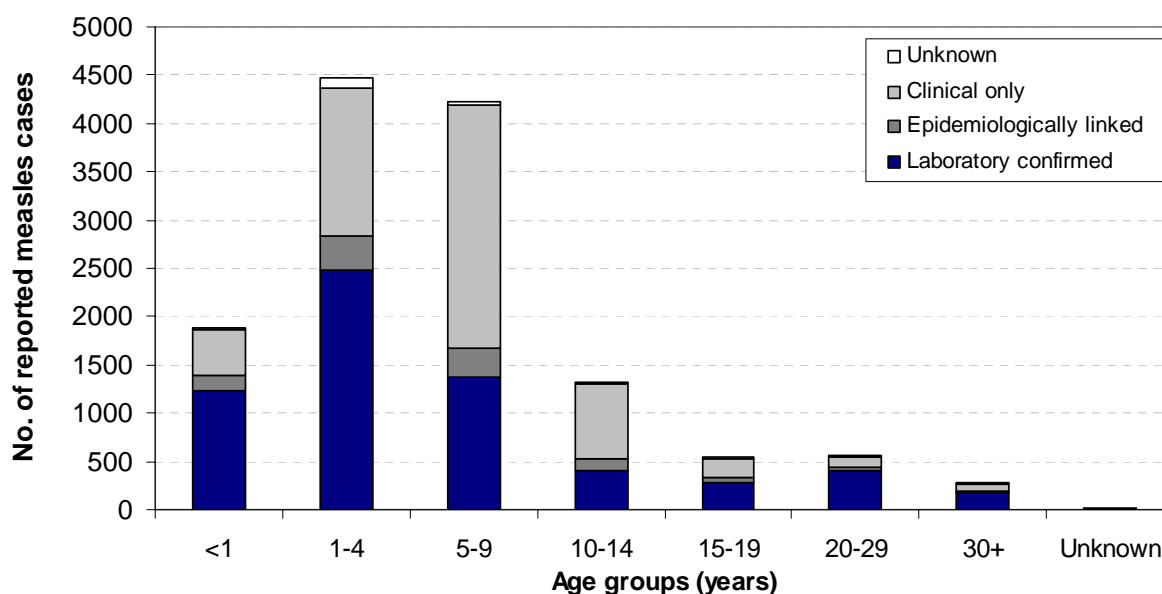
### Age distribution and seasonality

Measles was reported in both children and adults. In countries reporting case-based data 76% of cases were less than 15 years old. While in countries reporting aggregated data 91% of cases belonged to this age group (Figure 2). Overall, the highest proportion of laboratory confirmed cases was in those >20 years (69%), followed by children <1 year of age (65%) (Figure 3). Most case-based reports (71%) occurred in the first half of the year. Figure 4 shows the occurrence of measles by month of onset derived from case-based reports. Aggregated data did not include such information.

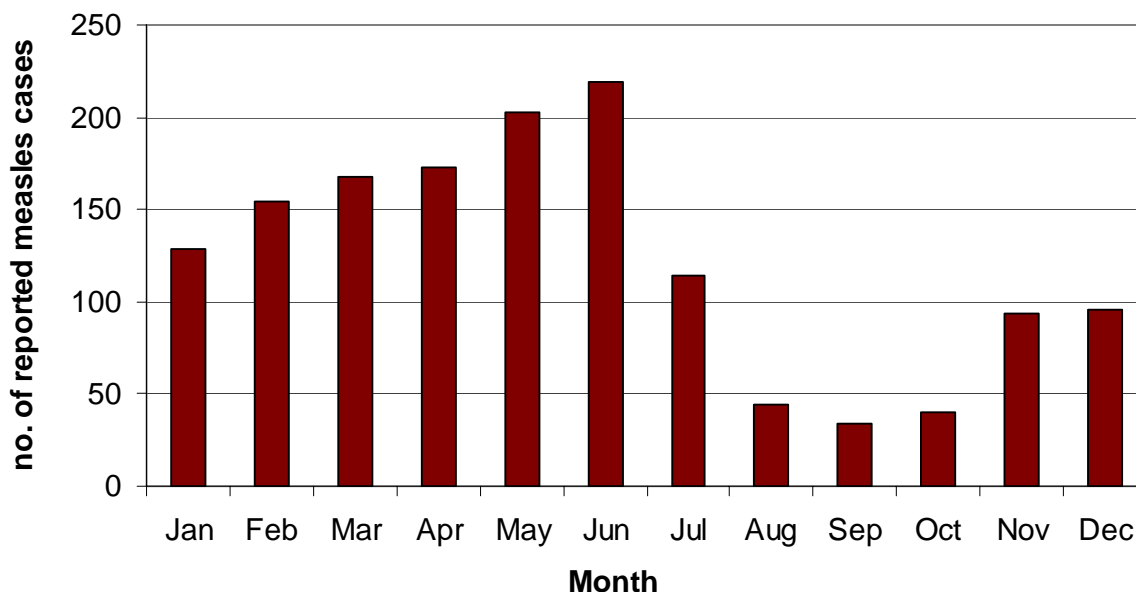
**Figure 2.** Notified measles cases by age group in all reporting countries, 2005 (n=13,322)



**Figure 3.** Notified measles cases by age group and confirmation status in all reporting countries, 2005 (n=13,322)



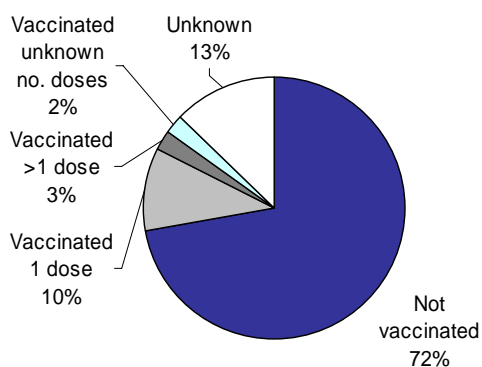
**Figure 4.** Number of reported measles cases by month of disease onset from case-based reporting countries, 2005 (n=1,469)



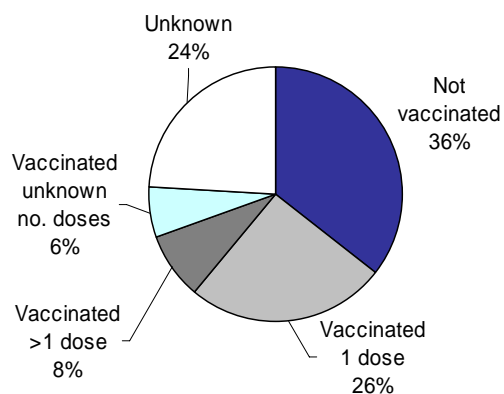
### Vaccination status

Information on vaccination status was provided in 77% of all reported measles cases. Overall, 51% of those with a known vaccination status were unvaccinated: 83% of measles cases from case-based reports (Figure 5a) and 47% of cases from aggregated data (Figure 5b).

**Figure 5a.** Vaccination status of measles cases from case-based reports (n=1,469)



**Figure 5b.** Vaccination status of measles cases from aggregate reports (n=11,853)



**Table 5.** Vaccination status of reported measles cases by country, 2005 (n=13,322)

	<i>No. of unvaccinated cases (% of un vaccinated of known vaccination status)</i>		<i>No. of vaccinated cases (% vaccinated of known vaccination status)</i>		<i>No. with unknown vaccination status/no data (% unknown status/no data of total)</i>	
Austria	4	57%	3	43%	2	22%
Belgium	13	65%	7	35%	5	20%
Bulgaria	3	100%	0	0%	0	0%
Croatia	0	0%	1	100%	1	50%
Cyprus	0	-	0	-	1	100%
Czech Republic	0	-	0	-	0	-
Denmark	2	100%	0	0%	0	0%
Estonia	1	50%	1	50%	0	0%
Finland	1	100%	0	0%	0	0%
France <sup>1</sup>	14	70%	6	30%	2	9%
Germany	662	89%	80	11%	36	5%
Greece	53	88%	7	12%	56	48%
Hungary	1	100%	0	0%	1	50%
Iceland	0	-	0	-	0	-
Ireland	36	61%	23	39%	33	36%
Italy	135	70%	59	30%	21	10%
Latvia	0	0%	1	100%	1	50%
Lithuania	1	100%	0	0%	0	0%
Luxembourg	0	-	0	-	0	-
Malta	0	0%	4	100%	0	0%
The Netherlands	2	67%	1	33%	0	0%
Norway	0	-	0	-	0	-
Poland	3	21%	11	79%	0	0%
Portugal	5	83%	1	17%	1	14%
Romania	3215	74%	1145	26%	1287	23%
Slovakia	0	-	0	-	0	-
Slovenia	0	-	0	-	0	-
Spain	15	88%	2	12%	0	0%
Sweden	1	100%	0	0%	11	92%
Switzerland	40	85%	7	15%	14	23%
Turkey	1001	22%	3614	78%	1591	26%
United Kingdom	70	95%	4	5%	4	5%
<b>Total</b>	<b>5278</b>	<b>51%</b>	<b>4969</b>	<b>49%</b>	<b>3067</b>	<b>23%</b>

<sup>1</sup> France introduced case-based reporting based on mandatory notification in June 2005.

### Morbidity and mortality

Data on known hospitalisation status was available in 52% of cases. There were 4,860 reported hospitalised cases in connection with measles (Table 4) amounting to 71% of all cases with known hospitalisation status. Of these, 95% were reported from Romania. Encephalitis was reported in four cases, three from Romania and one from Germany, giving an overall incidence of 30 per 100,000 measles cases. The cases from Romania were aged <14 years. The case from Germany occurred in a 35 year-old male who was not vaccinated against measles.



There were 13 deaths attributed to measles: 11 from Romania, one from Germany and one from Turkey. This corresponds to an overall incidence of 98 per 100,000 measles cases. Of the cases from Romania seven cases were aged <1 year. The case from Germany was a 14 year old female who was not vaccinated against measles.

### **Data from Sentinel Surveillance Systems**

In France the sentinel surveillance system continued to report measles cases. In 2005 it involved 265 general practitioners who reported eight clinical cases giving an extrapolated 4100 cases nationwide and an incidence of 7 per 100,000 inhabitants.

Besides case-based reporting Switzerland also provided sentinel surveillance data. The Swiss sentinel system involved the participation of about 3% of all primary care physicians who reported six cases giving an extrapolated 130 cases and a crude incidence rate of 2 per 100,000 inhabitants.

In Italy a paediatric sentinel surveillance system for childhood vaccine-preventable diseases (Sorveglianza Padiatri Sentinella - SPES) involved 324 paediatricians caring for 2.5% of the paediatric population up to 14 years of age. The Italian paediatric sentinel surveillance system reported a record low of only nine cases giving a crude incidence rate of 4 per 100,000 children aged up to 14 years. Five (56%) of the cases were in the 1-4 year age group.

### **Comments**

Comparisons with the previous year are not made in this report as data for 2004 was not requested from the 12 new participating countries. The highest incidence of measles in 2005 occurred in Romania and Turkey. Germany also reported an increase in incidence compared with the previous year from 0.15 to 0.95 per 100,000 inhabitants. In contrast 11 countries reported indigenous measles incidence rates of zero possibly indicating an elimination or near-elimination situation. More information on outbreaks in Germany, Greece, Romania and Sweden, are found in the references below.

### **References**

<sup>1</sup> Siedler A . Measles in Germany, 2005, EUVAC.NET website, 07.06.2005. Available from: <http://www.ssi.dk/euvac/outbreak/germany.html>

<sup>2</sup> Siedler A, Tischer A, Mankertz A, Santibanez S. Two outbreaks of measles in Germany 2005, Euro Surveill 2006;11(4):131-4. Available from: <http://www.eurosurveillance.org/em/v11n04/1104-225.asp>

<sup>3</sup> Georgakopoulou T, Grylli C, Kalamara E, Katerelos P, Spala G, Panagiotopoulos T. Current measles outbreak in Greece. Euro Surveill 2006;11(2):E060223.2. Available from: <http://www.eurosurveillance.org/ew/2006/060223.asp#2>

<sup>4</sup> Georgakopoulou T, Panagiotopoulos T, Muscat M. Measles outbreak in Greece. EUVAC.NET website, 17.02.2006. Available from: <http://www.ssi.dk/euvac/outbreak/greece.html>

<sup>5</sup> Pistol A. Measles outbreak in Romania, 2004-2005, EUVAC.NET website, 23.09.2005. Available from: <http://www.ssi.dk/euvac/outbreak/Romania.html>

<sup>6</sup> Normann B, Dannetun E. Measles in Linköping, Sweden. EUVAC.NET website, 22.06.2005. Available from: <http://www.ssi.dk/euvac/outbreak/sweden.html>

## Reporters

Mark Muscat and Henrik Bang

## Acknowledgements

We would like to thank all reporters who have contributed data to this surveillance network for this 2005 report: Reinhild Strauss and Gabriela El Belazi, Federal Ministry for Health and Women, Austria; Tinne Lernout, Scientific Institute of Public Health, Belgium; Mira Kojouharova, National Centre of Infectious and Parasitic Diseases, Bulgaria; Bernard Kaic, National Institute of Public Health, Croatia; Chrystalla Hadjianastassiou, Medical and Public Health Services, Cyprus; Bohumir Kriz and Jitka Castkova, National Institute of Public Health, Czech Republic; Annette Hartvig Chistiansen, Statens Serum Institut, Denmark; Natalia Kerbo, Health Protection Inspectorate, Estonia; Irja Davidkin, National Public Health Institute, Finland; Isabelle Parent, Institut de la Veille Sanitaire, France; Anette Siedler, Robert Koch-Institut, Germany; Theano Georgakopoulou, Hellenic Centre for Infectious Diseases Control, Greece, Marta Melles and Molnár Zsuzsanna, National Centre for Epidemiology, Hungary, Thorolfur Gudnason, Directorate of Health, Iceland, Sarah Gee and Suzanne Cotter, National Disease Surveillance Centre, Ireland; Stefania Iannazzo, Communicable Disease Unit, Ministry of Health, Italy and Marta Ciofi, Istituto Superiore di Sanità, Italy; Jurijs Perevoscikovs, Public Health Agency, Latvia; Nerija Kupreviciene, Centre for Communicable Diseases Prevention and Control, Lithuania; Pierrette Huberty-Krau, Direction de la Santé, Luxembourg; Andrew Amato Gauci and Jackie Maistre Melillo, Health Division, Malta; Hester de Melker and Susan Hahne, National Institute of Public Health and the Environment, The Netherlands; Øistein Løvoll, National Institute of Public Health, Norway; Andrzej Zielinski and Pawel Stefanoff, National Institute of Hygiene, Poland; Maria Da Graça Gregório de Freitas and Teresa Fernandes, National Institute of Health, Portugal, Adriana Pistol and Aurora Stanescu, Institute of Public Health, Romania; Eva Maderova and Katarina Palova-Krajcirova, Public Health Authority, Slovakia; Alenka Kraigher, Institute of Public Health, Slovenia; M<sup>a</sup> Victoria Martínez de Aragón, Instituto de Salud Carlos III, Spain; Malin Arneborn, Swedish Institute for Infectious Disease Control, Sweden; Jean-Luc Richard, Swiss Federal Office of Public Health, Switzerland; Mehmet Torunoglu, Primary Health Care General Directorate, Turkey; Joanne White and Emma Savage, Health Protection Agency, Communicable Disease Surveillance Centre, UK.

© Copyright 2006 EUVAC.NET

All rights reserved. No part of this report may be reproduced by any means, or transmitted, or translated into machine language without written permission of EUVAC.NET

---