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## MEASLES IN POLAND IN 2011

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### ABSTRACT

**INTRODUCTION.** Since 2001, Poland has been participating in Measles Elimination Program coordinated by the World Health Organization (WHO). Commitment in the implementation of this program is to maintain 95% of the population vaccinated, recording all suspected cases of measles and confirmation of diagnosis in the Reference Laboratory.

**THE PURPOSE OF THE STUDY.** To evaluate the epidemiology of measles in Poland in 2011, and the degree of implementation of the Measles Elimination Program.

**MATERIAL AND METHODS.** The epidemiological situation of measles in 2011 was assessed on the basis of the individual reported cases / suspected cases of measles, sent to the NIPH-NIH by regional sanitary-epidemiological stations collected and presented in the newsletter “ Infectious Diseases and Poisonings in Poland in 2011” and “Vaccinations in Poland in 2011” (MP Czarkowski et al, Warsaw 2012, NIZP-PZH, GIS).

**RESULTS.** In 2011, 38 reported cases of measles (incidence 0.10/ 100,000), of which 29 (76.3%) were laboratory-confirmed. There have been four outbreaks of measles, total of 12 people. The highest incidence was observed in patients 25-29 years old (0.28 /100,000), then in 30-34 (0.26 / 100,000). 23 people were hospitalized (60.5%). No death from measles was reported. Vaccination status of children and youth aged 2 to 11 years ranged from 84.4% to 99.7% (primary vaccination in children born in 2010 - 2005) and from 53.7% to 60.3% (booster, in born 2004 - 2000).

**SUMMARY AND CONCLUSIONS.** The epidemiological situation of measles in 2011, worsen in relation to the previous year. A persistent low number of suspected cases of measles indicates low sensitivity of the surveillance system.

**Keywords:** *measles, epidemiology, Poland, 2011*

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### INTRODUCTION

Since 2001, Poland has been actively participating in the Measles Elimination Program, implemented under the auspices of the UN World Health Organization (WHO). Under the Program, subject to the reporting and recording are all suspected measles cases. They have to be laboratory-confirmed by determining the level of specific IgM antibodies or virus isolation from biological material. Measles elimination strategy requires that confirmatory testing was conducted in the laboratory with special accreditation. In Poland, a reference center for the diagnosis of measles is the Laboratory of Virology in NIZP-PZH.

### PURPOSE OF THE STUDY

The purpose of the study was to assess epidemiological situation of measles in Poland in 2011 and the status of vaccination against measles in the Polish population and also to assess the implementation of the Measles Elimination Program on the basis of the sensitivity indicators developed by WHO.

### MATERIALS AND METHODS

The assessment of epidemiological situation of measles in 2011 was based on the results of the individual reports on cases / suspected cases of measles, sent to the NIPH-NIH by regional sanitary-epidemiological

Table I. Measles in Poland during 2005-2011. Number of suspected and confirmed cases and incidence per 100 000 population by province

Province	Median 2005 - 2009				2010				2011			
	suspected cases		confirmed cases		suspected cases		confirmed cases		suspected cases		confirmed cases	
	number	incidence per 100 000	number	incidence per 100 000	number	incidence per 100 000	number	incidence per 100 000	number	incidence per 100 000	number	incidence per 100 000
POLAND	147	0.39	100	0.26	38	0.09	13	0.03	63	0.17	38	0.10
1. Dolnoslaskie	11	0.38	4	0.14	2	0.07	.	.	.	.	.	.
2. Kujawsko-pomorskie	4	0.19	1	0.05	.	.	.	.	6	0.28	3	0.14
3. Lubelskie	7	0.32	6.5	0.30	8	0.37	7	0.32	2	0.09	.	.
4. Lubuskie	0	0.00	0	0.00	2	0.20	1	0.10	1	0.10	.	.
5. Łódzkie	7	0.27	1	0.04	1	0.04	.	.	5	0.20	4	0.16
6. Malopolskie	17	0.52	3	0.09	3	0.09	1	0.03	12	0.36	12	0.36
7. Mazowieckie	28	0.54	23	0.44	5	0.10	2	0.04	18	0.34	10	0.19
8. Opolskie	8	0.77	2	0.20	1	0.10	.	.	2	0.20	1	0.10
9. Podkarpackie	15	0.71	14	0.67	2	0.10	.	.	5	0.23	3	0.14
10. Podlaskie	2	0.17	0	0.00	.	.	.	.	.	.	.	.
11. Pomorskie	5	0.23	1	0.05	1	0.04	1	0.04	1	0.45	.	.
12. Slaskie	12	0.26	8	0.17	5	0.10	1	0.02	5	0.10	2	0.04
13. Swietokrzyskie	1	0.08	0	0.00	.	.	.	.	1	0.08	1	0.08
14. Warmińsko-mazurskie	0.5	0.00	0	0.00	1	0.07	.	.	1	0.07	1	0.07
15. Wielkopolskie	17	0.50	10	0.30	7	0.20	.	.	3	0.09	.	.
16. Zachodniopomorskie	2	0.12	2	0.12	.	.	.	.	1	0.06	1	0.06

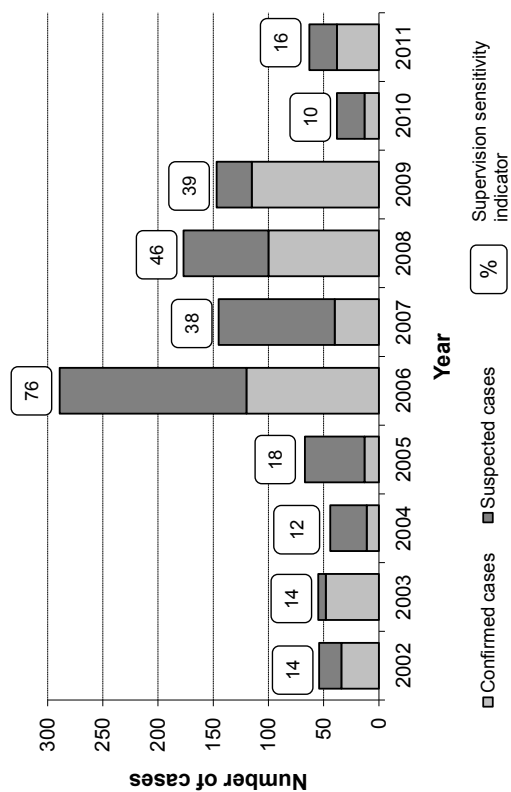


Fig 1. Measles surveillance performance in Poland 2002-2011

stations, as well as data from the annual newsletter “Infectious Diseases and Poisonings in Poland in 2011”, and “Vaccination in Poland in 2011” (Czarkowski MP et al. Warsaw 2011, NIZP-PZH and GIS).

Classification of measles cases as possible, probable and confirmed was made on the basis of the definitions developed by European Center for Disease Control and Prevention (ECDC) for the epidemiological surveillance.

## RESULTS

**The epidemiological situation of measles in 2011.** In 2011, a total of 38 reported cases of measles (incidence 0.10/100000), i.e. almost three times more than in 2010 (Tab. I). Twenty-nine (76.3%) cases were laboratory-confirmed. In 2 cases the diagnosis was based on clinical symptoms and contact with another, confirmed, case of measles (probable cases). In 7 cases diagnosis was made on the basis of clinical signs (possible cases).

Measles cases were reported in 10 provinces (Tab. I). Most cases (12) occurred in the Malopolskie province (incidence 0.36 / 100,000) and Mazowieckie 10 cases (incidence 0.19 / 100,000). In these provinces, as well as in the Pomorskie, Kujawsko-Pomorskie, Lodzkie and Podkarpackie incidence exceeded the WHO threshold of measles elimination (1 case at 1 000 000). In Opolskie province incidence was equal to the threshold of elimination.

The incidence of measles in the age groups differed from the previous years, when it was the highest

in children aged 0-4 and 5-9 years. In 2011 the highest incidence occurred in 25-29 years old (0.28 / 100,000) and 30-34 years (0.26/100,000).

Out of 38 patients, 19 people (50%) were unvaccinated, 5 (13%) had been vaccinated in accordance with current vaccination schedule, and in 14 (37%) vaccination status was unknown. Vaccine recipients who developed disease received only one dose of measles vaccine. 23 (60.5%) patients were hospitalized. Average length of hospital stay was 8 days (3 -14). Complications occurred in 11 (28.9%) patients. It was: pneumonia (5 patients), acute hepatitis (5 patients), bronchitis (2 patients), and inflammation of the cornea (1 patient).

In 2011 four outbreaks of measles occurred in Poland. Two of them were in the province of Malopolska. Cases and were linked epidemiologically (2 persons living in the same street and the other 3 people living at the same address). A third was in Kujawsko-Pomorskie. It involved four people who were in contact. The fourth outbreak took place in Lodzkie province and involved three persons belonging to the Roma community.

**Measles vaccination coverage in 2011.** The existing scheme of vaccination against measles remained unchanged since 2005. It consists the basic dose given at 13-14 months of age and a booster dose at 10 years of age, in a combined vaccine against measles, mumps and rubella (MMR) vaccine. In 2011 Poland maintained a high level of vaccination coverage of children and adolescents aged 2 to 11 years. It ranged from 84.4% to 99.7% (primary vaccination, year 2010 to 2005) and from 53.7% to 60.3% (booster, for born 2000 - 2004) (Tab. II). Vaccine coverage in the different provinces

Table II. Number and percentage of children vaccinated against measles in Poland 2008-2011 according to birth year (primary and booster vaccinations)\*

Birth year	State of 31th December 2008		State of 31th December 2009		state of 31th December 2010		State of 31th December 2011	
	number	% of children vaccinated	number	% of children vaccinated	number	% of children vaccinated	number	% of children vaccinated
Primary dose								
2005	352 320	99,1	352 626	99,4	349 694	99,5	350 304	99,7
2006	360 022	98,4	362 139	99	363 288	99,4	361 648	99,5
2007	323 239	84,9	375 221	98,3	377 659	99,0	379 510	99,4
2008	x	x	342 111	84,3	398 429	98,2	402 018	99,0
2009	x	x	x	x	346 706	84,9	400 927	98,1
2010	x	x	x	x	x	x	340 509	84,4
Booster dose								
2000	19 214	5,3	266 688	73,6	339 301	93,8	347 918	96,4
2001	7 701	2,2	7 368	2,1	278 437	79,2	333 289	94,9
2002	3 187	0,9	4 294	1,3	6192	1,8	274 437	81,2
2003	x	x	x	x	1 904	0,6	x	x
2004	x	x	x	x	x	x	x	x

\* vaccination against measles, rubella, mumps (on the basis of “Vaccination in Poland in 2011”, NIPH-NIH, Warsaw 2012)

varies from 78.7% in the Mazowieckie province to 97.7% in the province of Warmińsko-Mazurskie.

**Implementation of the program of elimination of measles in Poland in 2011.** Developed by the European Regional Office of the World Health Organization measles elimination strategy assumes that the annual incidence of suspected cases of measles, which have been reported at the national level should be maintained at 1/100,000. Therefore there is a need for the diagnostic laboratory to test 385 cases per year. Over time, the decrease of the number of confirmed cases should be accompanied by increase in the number of reported suspicions which should be tested in reference laboratory. In the final phase of the program confirmed cases should represent less than 10% of the total number of reports. In 2011 the number of suspected measles cases in Poland was higher than in 2010 but it still does not meet the requirements. In the whole country 63 reports (measles or suspicion), which represents 16% of the expected reports and shows a low sensitivity of the surveillance system (Fig. 1).

It should be emphasized that the purpose of the elimination strategy is not only reliable evidence of the elimination of indigenous measles, but also the efficient detection of disease imported from other countries. Therefore, monitoring of all suspected cases of measles, including secondary cases in outbreaks and performing genetic studies of measles virus strains are key activities that should be carried out with utmost care. Surveillance of measles in the country in 2011 was uneven. Number of entries per 100,000 population in any of the provinces did not exceed the minimum level set by the WHO at 1 per 100 000. Most entries were recorded in the Mazowieckie voivodship (18 reports, 0.34 / 100,000) and Malopolskie (12 reports (0.36 / 100,000) (Table I). In two provinces: Dolnośląskie and Podlaskie there were no suspected cases of measles, suggesting a lack of active participation in the WHO measles elimination program.

Number of serological tests performed in the cases with suspected measles in 2011 remained at a low level. For 63 cases and suspected cases recorded in 2011 serological tests for IgM were performed in 50 cases (79%). 41 (82%) were done in the reference laboratory of the Department of Virology NIPH - NIH, 5 (10%) in the WSEZ and 4 (8%) in the hospital laboratory.

Measles according to the Law on the Suppression of infections and infectious diseases in humans (Act of 5 December 2008 on the prevention and combating of infections and infectious diseases in humans, Dz.U.08.234.1570 as amended.) is a subject to the statutory obligation to notify within 24 hours from the time of diagnosis or suspicion of infection by a physician. As in the previous two years, in 2011 the median of days between the first visit to the doctor if you suspect a disease notification to the local sanitary-epidemiological station exceeded the applicable time and was 5 days.

To maintain high sensitivity of the serological diagnosis of measles, the time from onset of rash to collecting blood sample should remain in the range of 7 - 45 days. The highest titer is observed about the day 8. The median number of days that have elapsed since the onset of rash was in 2011, eight days. From the 13 patients blood samples were collected less than 7 days from the onset of rash. Maximum time after which the material was drawn was 23 days. For two patients, it was not possible to determine the period in question, due to incompleteness of data.

## CONCLUSIONS

The epidemiological situation of measles in 2011, worsen in relation to the previous year.

The incidence of measles, compared to 2010 increased by almost three times. Low sensitivity of the surveillance system allows to call into question the adequacy of the reports. There is a need to strengthen surveillance of suspected measles in all Polish regions. Outbreaks of disease among the Roma community, show the need to maintain active surveillance intensified vaccination campaigns and facilitation of access to vaccinations in the areas inhabited by ethnic groups.

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