Justyna Rogalska

MEASLES IN POLAND IN 2013*

Department of Epidemiology, National Institute of Public Health
– National Institute of Hygiene in Warsaw

ABSTRACT

BACKGROUND. Since 1998, Poland has been actively participating in the Measles Elimination Program, coordinated by the World Health Organization (WHO). It requires achieving and maintaining very high vaccine coverage (>95%), recording all cases and suspected cases of measles, and laboratory testing of all suspected measles cases in the WHO Reference Laboratory. In Poland it is a Laboratory of Department of Virology, NIPH-NIH. In order to confirm or exclude the case of measles specific measles IgM antibodies should be measured using Elisa test, or molecular testing (PCR) should be performed to detect the presence measles virus RNA in biological material.
AIM. To assess epidemiological situation of measles in Poland in 2013, including vaccination coverage in Polish population, and Measles Elimination Program implementation status.
METHODS. The descriptive analysis was based on data retrieved from routine mandatory surveillance system and published in the annual bulletins "Infectious diseases and poisonings in Poland in 2013" and "Vaccinations in Poland in 2013", and measles case-based reports from 2013 sent to the Department of Epidemiology NIPH-NIH by Sanitary-Epidemiological Stations.
RESULTS. In total, there were 84 measles cases registered in Poland in 2013 (incidence 0.22 per 100,000). The highest incidence rate was observed among infants (2.18 per 100,000) and children aged 1 year (1.27 per 100,000). In 2013, 56 cases (66.7%) were hospitalized due to measles. No deaths from measles were reported. Vaccination coverage of children and youth aged 2-11 years ranged from 82.8% do 99.5% (primary vaccination in children born in 2012-2007) and from 73.6% to 93.2% (booster dose in children born in 2004-2001). In 2013, 127 measles-compatible cases were reported (67% of expected reports). Two hundred seven cases (80%) were confirmed by IgM ELISA test.
SUMMARY AND CONCLUSIONS. In 2013, the epidemiological situation of measles deteriorated in comparison to proceding year. The sensitivity of measles surveillance improved but is still insufficient. It is necessary to further promote Measles Elimination Program in Poland, to improve measles surveillance system and tomaintain the high immunisation coverage.

Keywords: *measles, infectious diseases, epidemiology, Poland, 2013*

INTRODUCTION

In 1998 Poland, along with all other Member States in the WHO European Region, implemented Measles Elimination Program coordinated by WHO. In May 2012, the World Health Assembly adopted a declaration on elimination of the disease by end of 2020 in at least five out of six WHO regions. The program requires recording and investigating all cases and suspected cases of measles, and laboratory testing (either serology or virus isolation) of all suspected measles cases in the WHO Reference Laboratory (Laboratory of Department of Virology, NIPH-NIH). Laboratory testing of all suspected cases of measles demonstrates high sensitivity of surveillance, and genetic characterization of wild–type strains of measles virus allows identification of the source of infection and differentiation between native and imported cases.

The aim of the study was to assess epidemiological situation of measles in Poland in 2013, including vac-

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cination coverage in Polish population, and Measles Elimination Program implementation status based on WHO surveillance sensitivity indicators.

MATERIAL AND METHODS

The descriptive analysis of epidemiological situation of measles was based on data retrieved from routine mandatory surveillance system and published in the annual bulletin "Infectious diseases and poisonings in Poland in 2013", and measles case-based reports from 2012 sent to the Department of Epidemiology NIPH-NIH by Sanitary-Epidemiological Stations. Vaccination coverage was assessed based on data published in the annual bulletin "Vaccinations in Poland in 2013".

Measles cases were classified according to the criteria of surveillance case definition implemented in the European Union (Commission Decision of 28 April 2008 amending Decision 2002/253/EC). Measles cases were categorized into confirmed, probable and possible cases.

RESULTS

Epidemiological situation of measles in 2013. In 2013, a total of 84 measles cases (incidence 0.22 per 100,000) were registered in Poland. Fifty six cases (66.7%) were laboratory confirmed, whereas in 23 cases 27.4%) the diagnosis was based only on clinical symptoms. Five cases that met the clinical criteria for measles and were epidemiologically linked to cases with laboratory-confirmed measles have been classified as probable cases.

Measles cases were registered in 7 out of 16 voivodeships (Tab. I). The highest number of cases occured in slaskie voivodeship (30 cases, incidence 0.65 per 100,00) and malopolskie voivodeship (24 cases, incidence 0.71 per 100,000). In the voivodeships, where measles cases were registered, the incidence did not exceed the threshold of measles elimination specified by the WHO as one case per 1,000,000 inhabitants.

In 2013, seven measles outbreaks were reported in five voivodeships (3 outbreaks in malopolskie and slaskie voivodeship, 1 outbreak in mazowieckie, pomorskie and zachodniopomorskie voivodeship), involving in total 29 individuals. One outbreak registered in zachodniopomorskie voivodeship occurred among people of Romanian origin. One measles case registered in 2013 was imported from Germany and infected a student working in the hospital where the case was hospitalized.

The highest incidence rate was observed among children under 5 years of age (0.84 per 100,000), especially infants (2.18 per 100,000) and children aged 1 year (1.27 per 100,000). Based on data from individual reports of cases, of 84 measles cases registered in 2013, 77 patients (92%) were unvaccinated (including 5 children in first year of life, not subjected to mandatory vaccination), 7 patients (8%) vaccinated with 1 dose of measles vaccine. For 26 cases (31%) vaccination status was unknown. In 2013, 56 of all registered measles cases (67%) were hospitalized. Complications occurred in 15 patients (18%), including 12 measles cases diagnosed with pneumonia. No deaths from measles were reported in 2013.

Vaccinations against measles in 2013. The existing scheme of vaccination against measles remained unchanged since 2005 and consists of primary dose for children at 13-14 months and booster dose at 10 years of age. Live attenuated combined vaccine against measles, mumps and rubella (MMR) is used. In 2013, Poland mantained a high vaccination coverage of children. As of 31st December 2013, vaccination coverage of children and youth aged 2-11 years ranged from 82.8% do 99.5% (primary vaccination in children born in 2007-2012) and from 73.6% to 93.2% (booster dose in children born in 2004-2001) (Tab. II). As in previous years, differences between voivodeships in performance of primary vaccination in children at 13-15 months of age were observed. Percentage of children born in 2012 vaccinated with trivalent vaccine against measles, mumps and rubella (82.8% in Poland) ranged from 75.7% in mazowieckie voivodeship to 97.5% in warminsko-mazurskie voivodeship.

Measles Elimination Program implementation status in 2013. WHO European Region measles elimination strategy requires maintaining a sensitive and timely surveillance of measles and measles-compatible cases, with serologic testing of at least one suspect case per 100,000 population. Considering the number of people living in Poland, there is a need to perform laboratory diagnostics for at least 385 cases per year. Over time, a decrease in number of confirmed measles cases should be accompanied by an increase in the number of notified and laboratory tested suspected cases of measles. In Poland in 2013, the number of reported suspected measles cases was higher than in 2012, but, as in previous years, still insufficient. In 2013, a total of 258 cases and suspected cases of measles were reported in Poland which constitutes 67% of the expected reports and shows a low sensitivity of surveillance system (Fig. 1).

Along with a reliable evidence of the elimination of indigenous measles, efficient detection of the disease imported from other countries is also important in measles elimination strategy. Therefore, the key activities should be investigating all suspected cases of measles, including secondary cases in outbreaks, and performing genotyping of measles virus. In 2013, surveillance of measles suspected cases in the country was uneven. No voivodeship registered sufficient number of suspected

measles cases to meet or exceed the minimal threshold of measles elimination specified by the WHO as one case per 1,000,000 inhabitants. The highest number of suspected cases was registered in slaskie voivodeship (86 reports, incidence 1.87/100,000), mazowieckie voivodeship (47 reports, 0.89/100,000) and malopolskie voivodeship (46 reports, 1.37/100,000) (Tab. I). In podlaskie voivodeships none suspected measles cases were registered in 2013 which suggests not active participation in the WHO measles elimination program.

Number of serological tests performed in suspected measles cases in 2013 was higher than in the previous year. Of 258 recorded cases and suspected cases of measles, 207 (80.2%) were diagnosed with IgM ELISA test. In 177 of these cases (85.5%) the serological test was performed in the WHO reference laboratory in the Department of Virology NIPH – NIH, in 22 cases (10.6%) in laboratory of Voivodeship Sanitary Station and in 8 cases in a private laboratory.

According to the law on control of infections and infectious diseases in humans (Act of 5 December 2008 on prevention and control of infections and infectious diseases in humans, Dz.U.08.234.1570 with further amendments) measles is subjected to statutory notification by a doctor within 24 hours from the time of diagnosis or suspicion of infection. The median number of days between the first visit to the doctor and notification of case or suspected measles cases to the local sanitary-epidemiological stations was 6 days and therefore exceeded the applicable time.

To maintain high sensitivity of the serological diagnosis of measles, the specimen should be collected between 7 and 45 day after rash onset date. The highest titer is observed on 8 day.

The median number of days between rash onset date and specimen collection date was 9 days in 2013.

SUMMARY AND CONCLUSIONS

The epidemiological situation of measles in 2013 was similar compared to the previous year. Too low sensitivity of measles surveillance allows to doubt in the completeness of the reports.

Performance of serological tests in suspected measles cases is still too poor. The WHO measles elimination strategy requires confirmatory tests to be performed in laboratories with the necessary accreditations. At the moment, the only reference center in Poland is a laboratory of the Department of Virology NIPH-NIH. It has accreditations for testing under the program provided by the WHO and the Polish Centre for Accreditation. Referral of laboratory testing in accredited laboratory is free of charge.

In the current situation the most important element of the strategy of measles elimination in Poland, in addition to maintaining high vaccine coverage, is intensification of activities in regions with poor surveillance of cases and suspected cases of measles. In addition, it is necessary to intensify surveillance in areas inhabited by ethnic groups with a lower vaccination coverage, which may be a reservoir of the measles virus and a cause of virus circulation after it's importation from abroad. Reaching out to minorities and carrying out vaccination campaigns among these groups is an essential part of the measles elimination program. An efficient epidemiological surveillance will allow tracking imported cases as a source of infection for under-vaccinated communities.

It is necessary to further promote measles elimination program among physicians, taking into account the dissemination of detailed information about the plan and implementation of the program, the current epidemiological situation of the disease and, above all, the need to document and laboratory confirm all cases and suspected cases of measles. An important elements of the strategy are also increasing awareness of the role of a reference laboratory in the implementation of the program and performance of free of charge laboratory testing.

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Address for correspondence:
Justyna Rogalska
Department of Epidemiology
National Institute of Public Health – National Institute of Hygiene
24 Chocimska Street, 00-791 Warsaw, Poland
e-mail: jrogalska@pzh.gov.pl

Voivodeship		Median 2007 - 2011				2012				2013			
		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	40	0.1	127	0.33	70	0.18	258	0.67	84	0.22
1.	Dolnośląskie	10.5	0.37	9	0.31	24	0.82	18	0.62	3	0.1	1	0.03
2.	Kujawsko-pomorskie	5	0.24	2	0.1	6	0.29	1	0.05	9	0.43	-	-
3.	Lubelskie	7	0.32	7	0.32	3	0.14	-	-	3	0.14	-	-
4.	Lubuskie	1.5	0.15	1	0.1	1	0.1	-	-	1	0.1	-	-
5.	Łódzkie	7	0.27	4	0.16	1	0.04	1	0.04	3	0.12	-	-
6.	Małopolskie	12	0.36	2.5	0.08	7	0.21	3	0.09	46	1.37	24	0.71
7.	Mazowieckie	22	0.42	10	0.19	30	0.57	21	0.4	47	0.89	14	0.26
8.	Opolskie	7	0.68	3	0.29	1	0.1	-	-	14	1.39	-	-
9.	Podkarpackie	5.5	0.26	12.5	0.6	3	0.14	1	0.05	2	0.09	-	-
10.	Podlaskie	3	0.25	-	-	1	0.08	-	-	-	-	-	-
11.	Pomorskie	1	0.04	1	0.04	7	0.31	1	0.04	4	0.17	1	0.04
12.	Śląskie	10	0.22	5	0.11	30	0.65	22	0.48	86	1.87	30	0.65
13.	Świętokrzyskie	1	0.08	1	0.08	0	0	-	-	2	0.16	-	-
14.	Warmińsko-mazurskie	1	0.07	1	0.07	0	0	-	-	1	0.07	-	-
15.	Wielkopolskie	8	0.24	10	0.3	11	0.32	1	0.03	22	0.64	1	0.03
16.	Zachodniopomorskie	2.5	0.15	1	0.06	2	0.12	1	0.06	15	0.87	13	0.76

Table I. Measles in Poland during 2007-2013. Number of suspected and confirmed cases and incidence per 100 000 population by voivodeship.

Year of birth	As of 31th December 2010		As of 31th December 2011		As of 31th December 2012		As of 31th December 2013	
	number	% of children vaccinated	number	% of children vaccinated	number	% of children vaccinated	number	% of children vaccinated
Primary dose								
2007	402 018	99	379 510	99.4	377 818	99.5	377 446	99.5
2008	400 927	98.1	402 018	99	403 615	99.3	401 608	99.4
2009	340 509	84.4	400 927	98.1	404 820	98.9	405 744	99.1
2010	x	x	340 509	84.4	395 336	97.9	398 282	98.7
2011	x	x	x	x	318 126	83.6	370 876	97.5
2012	x	x	x	x	x	x	314 402	82.8
Booster dose								
2001	156 428	44.5	210 997	60.1	235 086	67.1	257 018	73.6
2002	3 437	1	181 325	53.7	239 103	70.8	260 467	77.3
2003	1 259	0.4	x	x	255 409	76.6	309 837	93.2
2004	x	x	x	x	x	x	267 231	79
2005	x	x	x	x	x	x	x	x

Table II. Number and percentage of children vaccinated against measles in Poland 2010-2013 according to birth year (primary and booster vaccinations)*

* vaccination against measles. rubella and mumps - MMR (based on "Vaccinations in Poland in 2013", NIPH-NIH, Warsaw 2014)

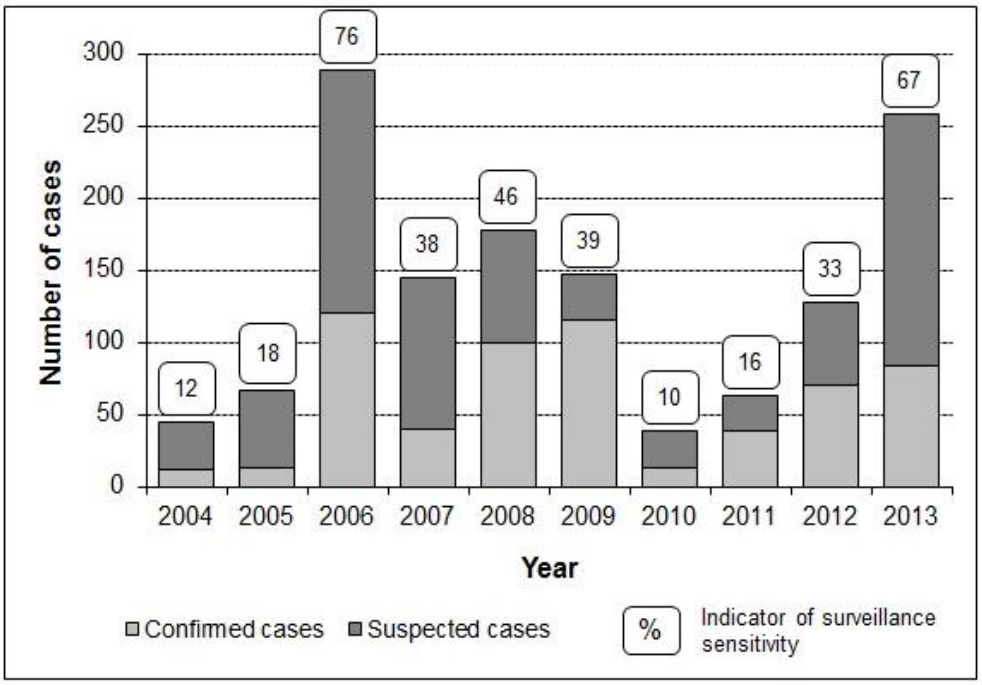

Fig 1. Measles surveillance performance in Poland 2004-2013