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IS MEASLES ELIMINATION POSSIBLE IN WHO EUROPEAN REGION UP TO 2015?

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ABSTRACT

STUDY OBJECTIVE The assessment of epidemiological situation of measles in WHO European Region during last decade in terms of progress in disease elimination.
MATERIAL AND METHODS. The surveillance data regarding measles control and vaccination coverage in entire region were compared to the targets that should be achieved at the last stage of measles elimination program.
RESULTS. There were not sufficient vaccination coverage to protect population against measles outbreaks in many areas of WHO European Region during last decade. The incidence of measles was significantly higher than is required on that stage of measles elimination i.e. 1/1 000 000 excluding imported cases. Furthermore, there were notified 42 fatal cases related to measles during considered period.
CONCLUSIONS The insufficient vaccination coverage in many countries of the region causes the sustainable virus transmission in population. That situation lies behind the high probability of measles outbreaks in nearly future, that could delay the disease elimination in the set limit of time.

Key words: *measles, epidemiological situation, WHO European Region*

INTRODUCTION

Measles is an infectious disease, characterized by the criteria that enable its eradication. An intermediate stage to eradicate measles is its elimination, that was initially planned by 2007 year in WHO European Region. The disease elimination at a given area means the lack of endemic measles cases and virus transmission in case of its introduction to population. The set limit of time was insufficient to meet the program's objective. The time period to finally complete the program in the region was prolonged up to 2015. The strategy focuses on the implementation of four components:

- to achieve and maintain high vaccination coverage among children and youth with two doses of measles vaccines (over 95%) according to routine vaccination schedules,
- to secure the possibility of second dose against measles through additional vaccination initiatives in populations vulnerable to infection,
- to intensify the system of measles surveillance using effective methods of epidemiological investigation with routine laboratory confirmation,
- to improve the access to confirmed information concerning advantages and disadvantages of vaccinations against measles for health professionals and whole society.

Some detailed assumptions of Measles Elimination Program in WHO European Region, as well as its later verification accomplished in 2012 were included in previous papers (1,2).

The aim of the study was the assessment of epidemiological situation of measles in WHO European Region during last decade in terms of progress in disease elimination up to 2015.

MATERIAL AND METHODS

We have analyzed the data of measles epidemiological surveillance in WHO European Region and Poland, registered by WHO and National Institute of Hygiene in Warsaw in 2002 – 2012 (3,4). The data regarding measles control and vaccination coverage in entire region were compared to the targets that should be achieved at the last stage of measles elimination program.

RESULTS

Epidemiological situation of measles in WHO European Region has been various for 10 years. In the initial period there were measles outbreaks in the eastern countries of the region, such as: Turkey, Ukraine, Kazakhstan, Azerbaijan. There was a significant increase of measles incidence in France and Italy at that time. In the last few years the outbreaks occurred in Bulgaria (the highest measles incidence during the last decade was notified in 2010 – 292/100 000), Romania, a as well as in France and Ukraine again. The highest number of measles cases in the region – over 30 000, was registered in 2011, more than half of them occurred in France. In Poland measles incidence decreased in 2006 – 2009 (the highest incidence in 2009 – 0,3/ 100 000). There were observed the cyclic trends of measles outbreaks in many countries. At average 4 – 5 years after previous outbreak, there was the next one in Ukraine, Romania, France and Italy (tab. I). The number of measles cases in the region relatively decreased in 2012 compared with the previous year, in 9 of the European Union countries there were no reported cases. Nevertheless, some measles outbreaks occurred in the other countries. During the last decade measles epidemiological situation in the WHO European Region significantly differed from incidence that was assumed to achieve in the last stage of the measles elimination program (<1/1000 000, excluding imported cases). Moreover, there were still measles-related deaths: 24 - in Bulgaria, 16 - in Romania and 10 in France, cumulatively 42 fatal cases in entire region.

Measles was notified mainly among the youngest children, youth and young adults. It was observed that the higher measles incidence, the higher rate of cases in adults. The distribution of measles cases by age was in many countries similar to Poland (tab. II). The most of measles cases (90%) concerned unvaccinated individuals or those with unknown immunization status, approximately 7% were vaccinated against measles with a single dose and 2% by two dose schedule. Measles immunization coverage is too low in many countries (less, than required 95%), and the lack of immunity particularly concerns young adults. Maintenance of vaccination coverage on current level will preserve a present measles epidemiological situation in the region (fig.1)

Table II. The number of measles cases in Poland according to age group in 2004 -2011

Age group	2004	2005	2006	2007	2003	2009	2010	2011
0-4	2	7	24	8	23	39	6	1
5- 9	3	4	9	5	12	15	3	2
10- 14	3	1	9	-	13	13	1	1
15- 19	-	-	5	4	21	11	1	4
20-24	1	-	22	6	12	8	-	2
25-29	-	-	34	15	12	13	1	9
30- 34	-	-	9	2	4	3	1	3
35 - 39	-	-	6	-	1	6	-	6
40-44	-	-	1	-	2	1	-	2
45 -49	1	-	-	-	-	1	-	1
50-54	-	-	1	-	-	-	-	1
55-59	-	1	-	-	-	-	-	1
60 +	-	-	-	-	-	-	-	-
Total	11	13	120	40	100	115	13	38

Table I. The number of suspected and confirmed measles cases in selected countries of WHO European Region in 2002-2012[1]

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Albania	-	4	8	6	93	33	1	10	11	28	1
Armenia	-	4	1783	528	127	20	3	1	100	19	21
Austria	18	99	16	9	27	23	428	47	48	219	19
Azerbaijan	1261	1978	827	1200	393	2	5	16	12	90	102
Bulgaria	-	-	-	6	8	2	3	2545	21664	155	1
France	-	-	4448	-	44	55	618	1592	5139	15214	856
Georgia	199	216	7033	1351	334	44	55	23	22	64	44
Spain	-	256	27	17	349	260	305	43	285	3508	424
Kazakhstan	-	24	2204	15745	110	7	24	-	-	30	54
Moldova	9334	86	4	6	34	10	-	-	-	-	11
Germany	-	779	125	778	2279	570	937	582	813	1600	163
Poland	34	48	11	13	120	40	100	115	13	38	60
Romania	11	1	179	5373	2695	417	531	220	359	4420	3565
Russian Federation	540	2275	2470	453	1147	172	27	101	169	837	1950
Turkey	7815	5844	8927	6200	34	3	3	8	15	105	57
Ukraine	7587	411	146	2392	44534	986	41	24	42	1313	12508
Great Britain	-	471	202	79	773	1024	1547	1380	397	1083	1684
Italy	-	10998	678	215	581	410	1619	173	864	5187	660

[1] – The data include suspected and confirmed cases but the laboratory confirmation rate has been various in analyzed countries with average value about 50%.

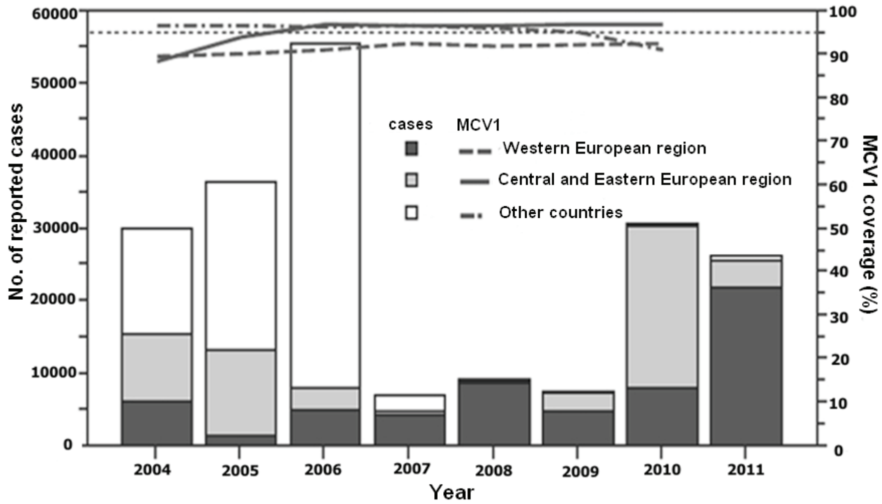

Fig.1. The number of measles cases in WHO European Region on the background of vaccination coverage (1st vaccine dose - MVC[1])

DISCUSSION

The current measles epidemiological situation in WHO European Region does not give an optimistic view at the diseases elimination in the immediate years. The occurrence of measles outbreaks provides an evidence of insufficient immunization coverage against measles among children, youth and young adults. That situation enables virus transmission in population. High contagious measles virus leads to outbreaks every few years. They give the possibility to develop natural immunity against measles but with the risk of disease complications, that may occur especially in youngest infants and adults, because a disease is recognized as untypical for these groups of population (5). The current epidemiological situation of measles in WHO European Region seems to be distant from the stage of its eradication, however the fact should not be interpreted as a failure of vaccinations. For example, measles incidence in Poland had been on the average level – 450/ 100 000 before 1975, when the vaccination was included to immunization schedule. The highest rate of incidence during the last decade was only 0,3/100 000. Unfortunately, the advantageous of epidemiological situation affected decreased public acceptance of measles vaccinations, because it seemed not to be a serious problem for community. The high vaccination coverage against measles, while human body is the only reservoir for the agent, can develop herd immunity (6).

In that case, not only vaccinated people are protected but also those who avoided vaccination. The fact can be recognized as an confirmation of vaccinations' useless for some individuals. The situation may lead to decreased acceptance of vaccinations, as well as, lower vaccinations coverage (7). As a result, the number of adverse effects following immunization also decreases, what is comfortable for anti- vaccination movement activists. Subsequently, the population of unvaccinated and unimmunized people has significantly increased. Consequently, the measles outbreaks may occur, again. The increased measles incidence develop the real risk to be infected for unimmunized people. Awareness of potential threat mobilize community to be interested in vaccinations (8).

The variable acceptance of vaccinations was observed when triple vaccination against measles, mumps and rubella (MMR) was introduced in order to achieve measles and rubella eradication (with the WHO recommendation). This effect is particularly unfavorable in the last stage of the program of measles elimination. Nevertheless, it is recognized more often recently.

The efficient realization of MMR vaccinations that allows to achieve required immunization coverage is regarded as crucial condition to eliminate measles. Performing the program of measles surveillance is the more essential, the closer to the state of measles elimination, although most countries of WHO European Region have not reached the goal yet. Currently, the achievement of measles elimination by 2015 requires an increase of vaccination coverage in children and youth, using triple MMR vaccines, as well as maintaining the high level of immunization according to routine vaccination schedules. When it is needed, some additional vaccination campaigns should be implemented in order to reduce some measles cases among adults susceptible to the virus infection. The observed declining trend of measles vaccinations must be reversed. Furthermore, it is important to rebuild society's reliance to the vaccinations system and hold it on the suitable level (10). Regrettably, most of WHO European Region countries do not efficiently required vaccinations as United States do. It becomes duty for health professionals to reassure parents to make a good decision concerning vaccinations (11). That is the reason to raise their qualifications regularly in the field of making conversations with parents, especially those who doubt the effectiveness and safety of vaccinations. For more efficient monitoring of progress in measles elimination, there is the improved surveillance needed that should be restricted to lower measles incidence. It should be also emphasized to introduce the indispensable routine laboratory confirmation of measles cases (2).

SUMMARY

In conclusion, according to our analysis there are many actions to be undertaken in order to achieve measles elimination in WHO European Region by 2015 year. The purpose is possible to achieve suggesting an American Region, where transmission of indigenous measles virus was interrupted in 2002 year. However, too low immunization coverage in many countries of the region creates some conditions to remain virus transmission in population. It threats the measles outbreaks in the immediate future, what may prohibit the achievement of measles elimination on time.

REFERENCES

1. Makówka A, Gut W, Litwińska B. Podstawy Programu Eliminacji Odry na Świecie i w Polsce. Przegl Epidemiol 2007; 61:135-142.
2. Eliminating measles and rubella. Framework for the verification process in the WHO European Region 2012. www.euro.who.int/_data/assets/pdf/0005/156776/e96153-Eng.pdf

   Biuletyny PZH. Choroby zakaźne i zatrucia w Polsce w latach 2002-2011. www.pzh.gov.pl
4. European Health for All Database (HFA-DB). www.euro.who.int/en/what-we-do/data-and-evidence/databases
5. Szenborn L. Wpływ szczepień na obraz kliniczny chorób zakaźnych. W: Wakcynologia. Red. Magdzik W, Naruszewicz-Lesiuk D, Zieliński A. Wyd.1.Bielsko-Biała: α-medica press; 2005: 156-61.
6. Zieliński A. Odporność zbiorowiskowa. W: Wakcynologia. Red. Magdzik W, Naruszewicz-Lesiuk D, Zieliński A. Wyd.1.Bielsko-Biała: α-medica press; 2005: 46-53.
7. Alfredsson R, Svensson E, Trollfors B, Borres MP. Why do parents hesitate to vaccinate their children against measles, mumps and rubella? Acta Paediatr 2004; 93(9):1232-7.
8. Ratzan SC. Health in the 21st century - immunizations and progress. J Health Commun 2008; 13(7):617-8.
9. Vandermeulen C, Roelants M, Theeten H, Van Damme P, Hoppenbrouwers K. Vaccination coverage and sociodemographic determinants of measles-mumpsrubella vaccination in three different age groups. Eur J Pediatr 2008; 167(10):1161-8.
10. Mrożek-Budzyn D. Znaczenie badań epidemiologicznych dla realizacji program eliminacji odry. Przegl Epidemiol 2010; 64:361-366.
11. McGreevy D. Risks and benefits of the single versus the triple MMR vaccine: how can health professionals reassure parents? J R Soc Promot Health 2005; 125(2):84-6.

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