

Ewa Staszewska, Barbara Kondej, Mirosław P Czarkowski

SCARLET FEVER IN POLAND IN 2012

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

ABSTRACT

OBJECTIVE. Assessment of the epidemiological situation of scarlet fever in Poland in 2012

MATERIALS AND METHODS. The evaluation was performed by analysing surveillance data published in the bulletin, “Infectious diseases and poisonings in Poland in 2012” (Warsaw 2013, NIPH-NIH, CSI) and also in bulletins from previous years, and unpublished data collected under Statistical survey program of official statistics.

RESULTS. In the last 15-20 years in Poland has been observed more than 2-fold lengthening of scarlet fever epidemic cycle, slowdown in the decline and slower growth rate in epidemic curve and decrease in average annual incidence. In 2012, in the country a total of 25 421 cases were registered and incidence was 66.0 per 100,000 population (in voivodeships: from 25.8 in łódzkie to 114.2 in pomorskie). The highest incidence was notified in 5-year-old (1094.7) and 6-year-old children (877.3), however, the incidence among children and young people up to 15 years accounted for 95.6% of all cases. The incidence of men (74.8) was higher by almost 30% than the incidence of women (57.6). The incidence was higher in urban areas than in rural areas and was 72.7 (in rural area 55.7). 0.9% of patients were hospitalized. No deaths related to the disease were reported.

SUMMARY. Distinct changes in the epidemiological situation of scarlet fever in recent decades are related to, i.a., aging of the Polish population and decline in the number of children, group particularly vulnerable to infection. In order to improve accuracy of surveillance data, it is recommended significantly increase percentage of cases in which clinical diagnosis will be confirmed by the result of bacteriological examination.

Key words: *scarlet fever, infectious diseases, epidemiology, Poland, 2012*

OBJECTIVE

The aim of this study was to assess the epidemiological situation of scarlet fever in Poland in 2012, in comparison with the previous years.

MATERIALS AND METHODS

Assessment of epidemiological situation of scarlet fever in Poland in 2012 was performed by analysing surveillance data registered in the sanitary inspection and sent to Department of Epidemiology NIPH-NIH by Voivodeship Sanitary-Epidemiological Stations under Statistical survey program of official statistics, including data published in the bulletin, “Infectious diseases and poisonings in Poland in 2012” (Warsaw 2013, NIPH-NIH, CSI) and also in bulletins from previous years.

The above data refer to scarlet fever cases obligatory reported by physicians since 1963, based on “Communicable disease act” (Dz. U. Nr 50, poz. 279 z późn. zm.) and later legislation on disease surveillance system in Poland (Dz. U. 2001 nr 126 poz. 1384 z późn. zm.; Dz. U. 2008 nr 234 poz. 1570 z późn. zm.).

During the entire obligatory reporting period of scarlet fever cases, i.e. since 1963, all illnesses reported by physicians as a scarlet fever (regardless of laboratory confirmation) were registered and published in the reports, what allows to maintain comparability of data over time. Introduction in 2005 in epidemiological surveillance in Poland, scarlet fever case definition, not disrupted comparability of these data, because this definition also accounts for (except of confirmed cases and probable cases) possible cases – defined as “an illness recognized by physicians as a scarlet fever”, for all cases of scarlet fever reported by physicians based on clinical symptoms.

RESULTS AND DISCUSSION

The epidemic cycle of scarlet fever in Poland has prolonged at least 2-fold in the last 15-20 years. In the beginning, after 1995 for eight years a noticeable decline in the incidence has been observed, then, after 2003, for the next nine years there has been a more or less marked increase in incidence rate. (Fig. 1) In 2012, the incidence of scarlet fever in Poland increased by almost 40% in comparison to the previous year and nearly 2-fold in comparison to the median for years 2005-2010, however, the seasonal incidence curve for 2012 does not prognosticate the collapse of the upward trend for the next year. (Fig. 2)

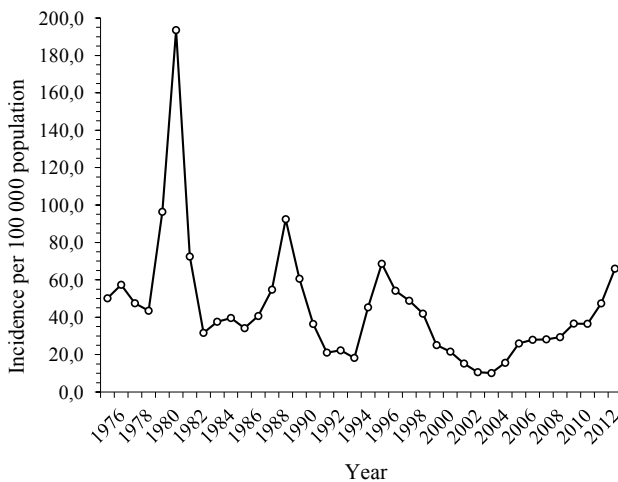


Fig. 1. Scarlet fever in Poland 1975-2012. Incidence per 100,000 population

In 2012, in the country a total of 25 421 cases were registered corresponding to incidence rate of 66.0 per

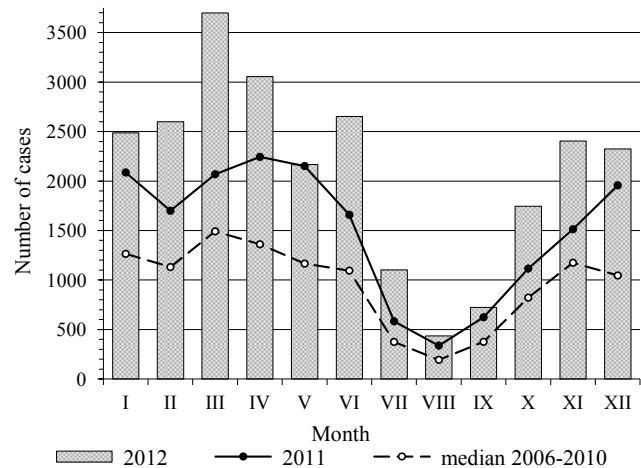


Fig. 2. Scarlet fever in Poland 2006-2012. Number of reported cases by month

100,000 population. The most cases were registered in March (3 697, i.e. 14.6% of the total number of cases registered in the entire year) and in April (3 056, 12.0%), and the least cases - as usual - in August (435, 1.7 %) (Fig. 2) Hence, there were no significant differences between observed distribution of cases and distribution typical for the period of relatively mild changes (slight increase, slight decrease) in the epidemic curve.

In two voivodships the incidence of scarlet fever in 2012, compared to 2011, remained at a similar level (differences within $\pm 5\%$) and in other fourteen increased within 10% to 120%. The most noticeable increase (in percentage) was reported in Pomorskie – from 51.8 to 114.2 per 100,000 population, i.e. by 120% and in Warmińsko-mazurskie - from 34.8 to 68.3, i.e. by 96%. (Tab.I)

Intervoideship differences in the incidence of scarlet fever in 2012 - measured by the ratio of the

Table I. Scarlet fever in Poland 2006-2012. Number of cases and incidence per 100,000 population by voivodship

Voivodship	Median 2006-2010		2011		2012	
	Number of cases	Incidence	Number of cases	Incidence	Number of cases	Incidence
POLAND	11 179	29.3	18 267	47.4	25 421	66.0
1. Dolnośląskie	830	28.9	1 350	46.3	1 745	59.9
2. Kujawsko-pomorskie	726	35.1	1 156	55.1	1 608	76.7
3. Lubelskie	379	17.5	573	26.3	972	44.8
4. Lubuskie	428	42.4	587	57.4	584	57.1
5. Łódzkie	460	18.1	594	23.4	652	25.8
6. Małopolskie	836	25.5	1 563	46.8	2 123	63.4
7. Mazowieckie	1 784	34.5	3 153	59.8	4 385	82.8
8. Opolskie	417	40.5	526	51.8	743	73.4
9. Podkarpackie	309	14.7	581	27.3	685	32.2
10. Podlaskie	244	20.5	414	34.4	521	43.4
11. Pomorskie	896	40.4	1 181	51.8	2 611	114.2
12. Śląskie	2 063	44.2	3 148	68.0	4 328	93.7
13. Świętokrzyskie	331	26.0	371	29.0	452	35.4
14. Warmińsko-mazurskie	432	30.3	505	34.8	991	68.3
15. Wielkopolskie	1 153	34.2	1 864	54.0	1 886	54.5
16. Zachodniopomorskie	294	17.4	701	40.7	1 135	65.9

Source: Infectious diseases and poisonings in Poland. NIPH-NIH, CSI, Warsaw. Annals 2006-2012

Table II. Scarlet fever in Poland 2006-2012. Number of cases and incidence per 100.000 population by location (urban/rural)

Location	Median 2006-2010		2011		2012	
	Number of cases	Incidence	Number of cases	Incidence	Number of cases	Incidence
Urban areas	7 569	32.5	12 481	53.3	16 975	72.7
Towns < 20 thous.	1 614	32.7	2 181	43.6	2 980	60.0
Towns 20-49 thous.	1 305	31.4	2 119	49.9	2 933	68.8
Towns 50-99 thous.	1 136	34.7	1 714	52.7	2 294	70.7
Towns ≥ 100 thous.	4 042	36.8	6 467	59.3	8 768	80.6
Rural areas	3 610	24.4	5 786	38.3	8 446	55.7
Total	11 179	29.3	18 267	47.4	25 421	66.0

Source: Infectious diseases and poisonings in Poland. NIPH-NIH. CSI. Warsaw. Annals 2006-2012

highest incidence in a scale of voivodeship to the ratio of the lowest incidence - was as the ratio of 4.4:1, which corresponded to the average diversity between voivodeships observed in Poland after administrative division introduced in 1999. The highest incidence rate was recorded in: the voivodeship Pomorskie - 114.2 (exceed the nationwide incidence by 73%) and in Śląskie - 93.7 (exceed the nationwide incidence by 42%). The lowest incidence, for the third year in a row, was registered in the voivodeship Łódzkie (25.8, 61% lower than the incidence in the country). However, this lowest incidence in 2012 in country was simultaneously the highest incidence that has ever been recorded in this voivodeship after 1998, i.e. after the administrative reform of the country. (Tab. I) In 2012, significantly lower incidence than nationwide was also found in the voivodeship Podkarpackie (32.2, -51%) and Świętokrzyskie (35.4, -46%).

A scarlet fever incidence in urban areas in total (72.7 na 100,000) was in 2012 by 31% higher than in

rural areas (55.7), moreover, higher incidence in cities was notified regardless of size of the cities. (Tab.II) In particular voivodeships, a scarlet fever incidence rates in urban areas ranged from 121.3 in Pomorskie to 23.4 in łódzkie, while in rural areas from 102.5 in śląskie to 23.2 in Podkarpackie. A significantly higher incidence in urban areas (in total) than in rural areas (12% to 93%) was recorded in the thirteen voivodeships. In three voivodeships (Łódzkie, Kujawsko-pomorskie, and śląskie) scarlet fever incidence rate on the rural areas was in 2012 higher than in urban areas (respectively 28%, 15% and 13%). As year before, higher incidence of scarlet fever in urban areas than in the rural areas was notified in almost all analyzed age groups, however, the biggest difference, almost 2-fold, was observed among three-year-old children (incidence in urban areas 981.9 per 100,000 children in this age; in the rural areas 539.1) and among four-year-old children (respectively: 1302.1;681.4). (Tab.III)

Table III. Scarlet fever in Poland 2012. Number of cases. incidence per 100.000 population. and percentage of cases by age. gender. and location (urban/rural)

Age. years	Gender						Location						Total		
	Male			Female			Urban			Rural			Number of cases	Incidence	%
	Number of cases	Incidence	%	Number of cases	Incidence	%	Number of cases	Incidence	%	Number of cases	Incidence	%			
0 - 4	5 826	549.7	41.7	4 580	455.7	40.0	7 390	618.5	43.5	3 016	346.6	35.7	10 406	503.9	40.9
0	89	45.0	0.6	78	41.8	0.7	113	50.8	0.7	54	33.3	0.6	167	43.5	0.7
1	483	231.9	3.5	348	176.8	3.0	552	234.3	3.3	279	164.5	3.3	831	205.1	3.3
2	944	433.8	6.8	679	328.8	5.9	1 138	462.1	6.7	485	272.7	5.7	1 623	382.7	6.4
3	1 939	874.5	13.9	1 504	711.7	13.1	2 458	981.9	14.5	985	539.1	11.7	3 443	795.1	13.5
4	2 371	1106.1	17.0	1 971	966.4	17.2	3 129	1302.1	18.4	1 213	681.4	14.4	4 342	1038.0	17.1
5 - 9	6 435	680.5	46.1	5 685	633.3	49.6	7 867	762.9	46.3	4 253	523.7	50.4	12 120	657.5	47.7
5	2 316	1145.0	16.6	2 000	1041.7	17.4	2 945	1308.1	17.3	1 371	810.7	16.2	4 316	1094.7	17.0
6	1 792	927.2	12.8	1 515	824.9	13.2	2 154	1008.4	12.7	1 153	705.9	13.7	3 307	877.3	13.0
7	1 187	635.7	8.5	1 030	581.4	9.0	1 362	667.9	8.0	855	534.5	10.1	2 217	609.3	8.7
8	683	375.0	4.9	697	403.5	6.1	848	432.3	5.0	532	335.2	6.3	1 380	388.9	5.4
9	457	252.1	3.3	443	257.3	3.9	558	290.1	3.3	342	212.4	4.0	900	254.7	3.5
10 - 14	944	96.9	6.8	823	88.9	7.2	1 047	103.4	6.2	720	81.1	8.5	1 767	93.0	7.0
15 - 19	509	43.9	3.6	141	12.7	1.2	363	29.9	2.1	287	27.2	3.4	650	28.7	2.6
20 - 29	180	6.0	1.3	88	3.0	0.8	160	4.5	0.9	108	4.5	1.3	268	4.5	1.1
30 - 39	45	1.5	0.3	99	3.3	0.9	106	2.8	0.6	38	1.7	0.4	144	2.4	0.6
40 +	20	0.2	0.1	46	0.5	0.4	42	0.4	0.2	24	0.3	0.3	66	0.4	0.3
Total	13 959	74.8	100.0	11 462	57.6	100.0	16 975	72.7	100.0	8 446	55.7	100.0	25 421	66.0	100.0

Source: Infectious diseases and poisonings in Poland. NIPH-NIH. CSI. Warsaw. 2012

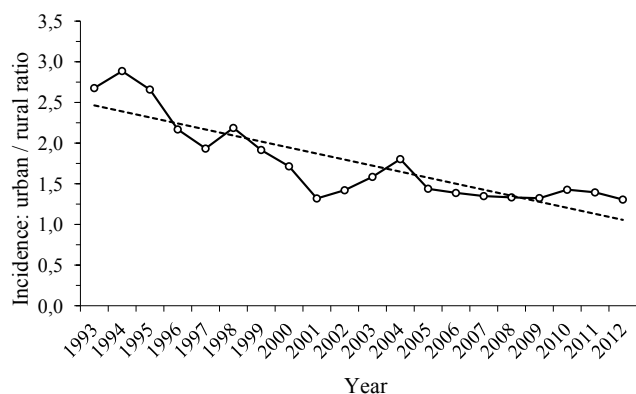


Fig. 3. Scarlet fever in Poland 1993-2012. Incidence per 100,000 population: urban/rural ratio

During analysis of association between incidence and place of residence it should be noted that in long term in Poland significant decrease of difference between scarlet fever incidence in urban and in rural areas is observed, however, this process is quite slow. (Fig.3)

Over the years, ratio of men to women incidence rates has changed. A significantly higher incidence among men is noted consistently in Poland since 1981, however, this difference between incidence rates after 1998 has tendency to expand. (Fig.4)

In 2012, incidence of men (74.8 per 100,000) was by 30% higher than incidence of women (57.6), however, higher incidence rates of men was reported primarily among children and adolescents.

The biggest difference between the incidence of men and women (3.5-fold) occurred in the age group 15-19 years (respectively: 43.9 and 12.7).

Distribution of cases of scarlet fever by age in 2012 (Tab. III) did not differ from the distribution observed in Poland a year earlier. The highest incidence, as in 2011, was recorded among children: five-year-old (1094.7 per 100,000 children in this age group) and four-year-old (1038.0), the incidence of children and adolescents under the age of 15 accounted for 95.6% of all cases. The highest incidence rates of five-year-old children was reported in the eleven voivodeships and children four-year-old in four voivodeships.



Fig. 4. Scarlet fever in Poland 1993-2012. Incidence per 100,000 population: male/female ratio

In particular voivodeship incidence of children: five-year-old fluctuated in the range of 476.3 in the voivodeship Łódzkie to 1658.1 in śląskie; and children four-year-old - from 357.2 in łódzkie to 1686.8 in Pomorskie.

In 2012 in Poland due to scarlet fever were hospitalized 229 persons - 0.9% of all persons who become ill. No deaths related to scarlet fever - according to data from the Demographic Surveys and Labour Market Department-CSO - were registered.

According to the data of the Sanitary-Epidemiological Stations, which report scarlet fever cases based on surveillance case definition, only 0.28% of all registered cases (72 cases) were classified as cases laboratory "confirmed"; majority of cases - 99.71% - were reported as „possible” cases, i.e. cases recognized by physicians based solely on clinical symptoms. The remaining 0.01 % of cases (2 cases) were classified as „probable”, i.e. epidemiologically linked to a laboratory confirmed cases. Thus, compared to 2011, although there was more than 2-fold increase in the percentage of laboratory-confirmed cases, but such low level does not improve the quality of scarlet fever surveillance in Poland and does not increase its specificity.

SUMMARY AND RESULTS

In the last 15-20 years is observed in Poland over 2-fold extend of scarlet fever epidemic cycle, slowdown of decline and growth of the epidemic curve and decrease in the average annual incidence. These changes in dynamics of scarlet fever epidemiological situation, are caused by, i.a. demographic changes – population aging and decline in the number of children, group which is particularly vulnerable to infection.

In order to raise the specificity of epidemiological surveillance of scarlet fever, it is recommended to substantially increase the percentage of cases in which clinical diagnosis will be confirmed by the result of bacteriological examination. This postulate is of crucial importance if we notice that laboratory confirmation of scarlet fever may be useful not only to distinguish a tonsillitis (pharyngitis) and allergic reactions but also to distinguish between measles or rubella, i.e. the diseases that are covered by the elimination programs.

Received: 28.04.2014

Accepted for publication: 5.05.2014

Address for correspondence:

Ewa Staszewska

Department of Epidemiology, National Institute of Public Health - NIH

ul. Chocimska 24, 00-791 Warszawa

e-mail: estaszewska@pzh.gov.pl