

Morbidity and mortality due to cervical cancer in Poland after introduction of the Act – National Programme for Control of Cancerous Diseases

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Abstract

In 2005 in Poland, referring to the recommendations by the National Health Programme and recommendations by the European Union, the National Programme for Control of Cancerous Diseases was implemented by virtue of the Act, one of its basic assumptions being an improvement of oncologic awareness among the Polish population. It is expected that the result of actions in this respect will be an increase in reporting rates for prophylactic examinations and a decrease in the number of deaths due to cancerous diseases.

The objective of the study was presentation of the analysis of morbidity and mortality due to cervical cancer in Poland and in individual regions, after the implementation of the National Programme for Control of Cancerous Diseases. The data was obtained from the Oncology Centre and from the computer Information System for Prophylaxis Monitoring (SIMP). In the analysis of obtained results, qualitative variables distribution was defined by means of the following values: number of instances (n) and frequency (%) with which they occur in a given category. The frequencies with which these categories of variables occur were compared by means of the chi-squared test with Yates' correction. The permissible error probability of the first type (p-value) is assumed to equal 0.05. The statistical assessment of results was performed by means of STATISTICA PL statistical software, version 9.0. In Poland in 2010, as many as 3,078 female patients suffered from with cervical cancer, compared with 3,263 in 2005, i.e. prior to implementation of The National Cancer Prevention Programme Act. Therefore, it can be concluded that there was a decline in cervical cancer incidence of 5.7%. As regards the mortality rate, there was a decline of 3.4%. A comparison of the cervical cancer morbidity and mortality rate for Poland and its provinces between 2005-2010 showed statistically significant differences only for morbidity rate – a decline in frequency in the entire Polish territory and in the following provinces: Lublin, Łódź, Lesser Poland, and Greater Poland, as well as an increase in the morbidity rate in Kuyavian-Pomeranian province.

Key words

cervical cancer, reporting rates, mortality, prophylaxis

INTRODUCTION

On 1 July 2005, referring to the recommendations by the National Health Programme and recommendations by the European Union, by virtue of the Act, Poland introduced the National Programme for Control of Cancerous Diseases [1]. Among the basic assumptions of the Programme is an improvement of oncologic awareness among the Polish nation. It is anticipated that these actions will result in an increase in reporting rates for prophylactic examinations. In the Act, where the resources come from the State budget, the effectiveness of all the prophylactic actions proposed is scientifically confirmed.

The objective of the programme is (Official Journal of 2003, No. 15, Clause 148, Art. 2):

- 1) inhibition of growth in morbidity due to cancer;
- 2) achievement of the mean European indicators in the area for early cancer detection;
- 3) achievement of the mean European indicators in the effectiveness of treatment;
- 4) creation of conditions for the use in oncologic practice for the advancement of knowledge concerning the causes and mechanisms of the development of malicious cancer;
- 5) creation of the system of a constant monitoring of the effectiveness of cancer control on a national scale, and in individual regions of Poland.

Within the Programme, among other things, actions are undertaken concerning: development of primary prevention of malicious cancer, with the consideration of inadequate nutrition and tobacco smoking; implementation of the population programmes of early cancer detection: cervical, breast and colon cancer, and selected types of cancer in children; improvement of the availability of the methods for early diagnosis, and the provision of the quality of cancer

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diagnostics and therapy; improvement of the functioning of the system of collection of data pertaining to the degree of cancer advancement; popularization in society of knowledge concerning prophylaxis, early diagnosis and treatment of cancer [1].

Among the priorities of the programme is the carrying out of prophylactic actions. Within the Act, the following tasks are performed in the area of prophylaxis and health promotion: primary prevention of cancer, population programme of prophylaxis and early cervical cancer detection, population programme of early breast cancer detection, screening tests programme for early colon cancer detection, programme of care of families at high risk, hereditary cancer risk [1].

The Programme is financed from the State budget and out-of-budget resources. The planned outlay for the performance of tasks related with early cancer detection is 3 milliard PLN, and in the subsequent years, the following percentage of the annual outlay should be allocated for the Programme: 2006 and 2007 – 20%; 2008 and 2009 – 25%; 2010 and 2011 – 30%, and 2012, 2013, 2014 and 2015 – 35% [1].

After many years of reasonable and consistent functioning, the National Programme for Control of Cancerous Diseases may create for Polish patients the conditions of prophylaxis and treatment consistent with the recommendations and standards by the World Health Organization (WHO) and the European Union (EU). This may bring Polish results in this area closer to the level of the countries of Western and Northern Europe, which would mean that the level of cured cases among males should be approximately 40%, and among females – approximately 50% [1, 2]. These actions should also improve statistics concerning morbidity and mortality due to cervical cancer, which is a primary malignant carcinoma of the cervix. Invasive cancer of this organ is preceded by cervical intraepithelial neoplasia (CIN), also known as cervical dysplasia or pre-invasive cancer. CIN may progress to invasive cancer, therefore, an early detection of changes before the pre-invasive period is important [3]. Knowledge of this problem and knowledge of prevention of other cancerous diseases may reduce the risk due to this disease in Poland and worldwide.

OBJECTIVE

The objective of the study is presentation of the analysis of morbidity and mortality due to cervical cancer in the whole of Poland, and in individual regions during the period 2005-2010. Particular attention was paid to the effects of the National Programme for Control of Cancerous Diseases with relation to morbidity and mortality due to cervical cancer.

MATERIALS AND METHOD

Statistical data were analysed concerning the performance in individual regions of basic actions resulting from the introduction in Poland of the National Programme for Control of Cancerous Diseases. The source of data for the presented study was information obtained from the Oncology Centre and the Computer Information System for Prophylaxis Monitoring (SIMP). The data obtained from the system were used to assess the cervical cancer morbidity and mortality rates among Polish women in years 2005 – 2010.

In the analysis of obtained results, qualitative variables distribution is defined by means of the following values: number of instances (n) and frequency (%) with which they occur in a given category. The frequencies with which these categories of variables occur were compared by means of the chi-squared test with Yates' correction. The permissible error probability of the first type (p-value) is assumed to equal 0.05. The statistical assessment of results was performed by means of STATISTICA PL statistical software, version 9.0. The results are presented in Tables.

RESULTS

The National Cancer Prevention Program Act was signed by the Polish President in July 2005 and implemented in 2006. In the initial stages of implementation of the Act there was a noticeable increase in cervical cancer morbidity and mortality, while starting in 2009 (morbidity) and in year 2008 (mortality) a decline of both rates was reported. Cervical cancer morbidity and mortality in individual Polish provinces in years 2005-2010 are presented in Table 1.

In Poland in 2000, as many as 3,777 women suffered from cervical cancer. In 2010, cervical cancer morbidity declined by 699 cases, i.e. to 3,078. Prior to implementation of The National Cancer Prevention Programme Act, in 2005 as many as 3,263 women fell ill with the disease, which means that in 2010 there was a decline in morbidity by 185 [4].

Table 2 presents the number of women, morbidity and mortality due to cervical cancer in Polish provinces in years 2005 and 2010, along with evaluation of statistical significance of frequency differences.

A comparison of morbidity and mortality due to cervical cancer for Poland and provinces in 2005-2010 did not show any significant difference of mortality rates. However, it showed statistically significant differences of morbidity in the entire Polish territory (decline, $p = 0.008$) and in the following provinces: Kuyavian-Pomeranian (increase, $p = 0.02$), Lublin (decline, $p = 0.03$), Łódź (decline, $p = 0.03$), Lesser Poland (decline, $p = 0.003$), and Greater Poland (decline, $p = 0.0003$). Table 3 presents a standardized rate (per 100 thousand women) cervical cancer morbidity and mortality in individual provinces between 2000-2010.

In Poland, the cervical cancer morbidity and mortality rates in 2010 declined, compared with 2005, by 1.2 and 0.6, respectively. This result might have been influenced, among other things, by The National Cancer Prevention Programme, which secured funds not only for the improvement of women's access to examinations, which would increase the number of cytological screenings, but also ensured a better organization and quality of diagnostic procedures.

In the West Pomeranian Voivodeship morbidity and mortality rate in 2010 declined, compared with 2005, by 2.0 and 2.5, respectively.

In the Lower Silesian Voivodeship in 2010, the standardized morbidity rate equalled 11.0, with mortality equalling 5.1, while in 2005 they were higher by 0.9 and 0.4, respectively.

In 2010 in the Kuyavian-Pomeranian Voivodeship, the morbidity rate was higher by 2.1 and the mortality rate lower by 0.3 than in 2005.

In Lublin Voivodeship, the cervical cancer morbidity and mortality rates in 2010 were lower by 3.2 and 0.6, respectively, than in 2005.

Table 1. Number of morbidity and mortality on cervical cancer in voivodeships in Poland during the period 2005-2010

| Voivodeship | Absolute numbers incidence | | | | | | Absolute numbers deaths | | | | | |
|-----------------------|----------------------------|--------------|--------------|--------------|--------------|--------------|-------------------------|--------------|--------------|--------------|--------------|--------------|
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| Lower Silesian | 266 | 281 | 282 | 275 | 244 | 255 | 136 | 137 | 152 | 154 | 123 | 126 |
| Kuyavian – Pomeranian | 172 | 178 | 195 | 182 | 172 | 223 | 93 | 118 | 125 | 84 | 96 | 100 |
| Lublin | 176 | 164 | 182 | 206 | 182 | 136 | 80 | 76 | 73 | 96 | 78 | 77 |
| Lubusz | 95 | 88 | 92 | 101 | 87 | 93 | 68 | 51 | 67 | 60 | 53 | 61 |
| Łódź | 252 | 238 | 251 | 244 | 240 | 200 | 136 | 144 | 135 | 102 | 131 | 126 |
| Lesser Poland | 180 | 256 | 305 | 241 | 244 | 247 | 131 | 137 | 136 | 142 | 120 | 123 |
| Masovian | 425 | 393 | 424 | 424 | 440 | 408 | 244 | 257 | 261 | 229 | 258 | 244 |
| Opole | 72 | 94 | 101 | 93 | 87 | 70 | 42 | 37 | 50 | 60 | 43 | 53 |
| Subcarpathian | 138 | 153 | 156 | 128 | 133 | 126 | 60 | 71 | 62 | 94 | 86 | 70 |
| Podlachian | 111 | 108 | 117 | 107 | 121 | 105 | 50 | 48 | 60 | 54 | 46 | 62 |
| Pomeranian | 195 | 228 | 205 | 209 | 218 | 226 | 112 | 137 | 127 | 113 | 115 | 99 |
| Silesian | 403 | 417 | 432 | 361 | 388 | 368 | 251 | 235 | 275 | 222 | 219 | 254 |
| Świętokrzyskie | 106 | 131 | 122 | 100 | 79 | 102 | 57 | 60 | 67 | 51 | 48 | 45 |
| Warmin – Masurian | 132 | 104 | 139 | 133 | 128 | 155 | 72 | 62 | 77 | 72 | 82 | 79 |
| Greater Poland | 301 | 255 | 271 | 290 | 222 | 223 | 157 | 159 | 152 | 126 | 178 | 127 |
| West Pomeranian | 157 | 139 | 157 | 176 | 117 | 141 | 107 | 95 | 88 | 86 | 72 | 89 |
| Total | 3,263 | 3,226 | 3,431 | 3,270 | 3,102 | 3,078 | 1,796 | 1,824 | 1,907 | 1,745 | 1,748 | 1,735 |

Source: prepared based on data from Oncology Centre in Warsaw [4].

Table 2. Number of women, morbidity and mortality due to cervical cancer in Polish provinces 2005 – 2010, together with evaluation of statistical significance of frequency differences

| Voivodeship | Number of woman | | Absolute number incidence | | p-value | Absolute number deaths | | p-value |
|-----------------------|-------------------|-------------------|---------------------------|--------------|--------------|------------------------|--------------|-------------|
| | 2005 | 2010 | 2005 | 2010 | | 2005 | 2010 | |
| Lower Silesian | 1501645 | 1513426 | 266 | 255 | 0.60 | 136 | 126 | 0.54 |
| Kuyavian – Pomeranian | 1069412 | 1081307 | 172 | 223 | 0.02 | 93 | 100 | 0.72 |
| Lublin | 1126353 | 1123838 | 176 | 136 | 0.03 | 80 | 77 | 0.88 |
| Lubusz | 519980 | 524781 | 95 | 93 | 0.89 | 68 | 61 | 0.56 |
| Łódź | 1353180 | 1332151 | 252 | 200 | 0.03 | 136 | 126 | 0.67 |
| Lesser Poland | 1672239 | 1714326 | 180 | 247 | 0.003 | 131 | 123 | 0.52 |
| Masovian | 2675261 | 2739864 | 425 | 408 | 0.37 | 244 | 244 | 0.83 |
| Opole | 540663 | 526259 | 72 | 70 | 0.94 | 42 | 53 | 0.25 |
| Subcarpathian | 1076720 | 1086025 | 138 | 126 | 0.46 | 60 | 70 | 0.46 |
| Podlachian | 616623 | 616527 | 111 | 105 | 0.73 | 50 | 62 | 0.30 |
| Pomeranian | 1125651 | 1163255 | 195 | 226 | 0.26 | 112 | 99 | 0.29 |
| Silesian | 2424674 | 2397268 | 403 | 368 | 0.29 | 251 | 254 | 0.83 |
| Świętokrzyskie | 663890 | 657296 | 106 | 102 | 0.89 | 57 | 45 | 0.30 |
| Warmin – Masurian | 733290 | 741644 | 132 | 155 | 0.23 | 72 | 79 | 0.68 |
| Greater Poland | 1731680 | 1767363 | 301 | 223 | 0.0003 | 157 | 127 | 0.06 |
| West Pomeranian | 869322 | 883755 | 157 | 141 | 0.31 | 107 | 89 | 0.18 |
| Total | 19,700,583 | 19,869,085 | 3,263 | 3,078 | 0.008 | 1,796 | 1,735 | 0.21 |

Source: prepared based on data from the Oncology Centre in Warsaw [4].

The morbidity rate in Lubusz Voivodeship in 2010 was lower by 1.2, and the mortality rate lower by 0.6 than in 2005.

In 2010 in Łódź Voivodeship, morbidity and mortality rates were lower by 2.9 and 0.8, respectively, as against 2005.

In the Lesser Poland Voivodeship in 2010, the cervical cancer morbidity and mortality rates were lower by 1.6 and 0.6, respectively, as against year 2005.

The standardized morbidity and mortality rate in 2010

in the Masovian Voivodeship was lower by 0.6 and by 0.2, respectively, than in 2005.

In 2010 in Opole Voivodeship, the standardized morbidity rate was lower by 1.0, while the mortality rate was higher by 1.1 than the mortality rate for 2005.

In the Podlachian Voivodeship in 2010, the standardized morbidity rate was lower by 1.8 than in 2005, while the mortality rate was higher by 0.5.

Table 3. Standardized rate for cervical cancer morbidity and mortality in Polish provinces 2000-2010

| Voivodeship | Incidence Mortality | Standardized rate | | | | | | | | | | |
|-----------------------|------------------------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | Years | | | | | | | | | | |
| | | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| West Pomeranian | incidence | 18.5 | 19.6 | 21.2 | 16.6 | 16.1 | 12.4 | 11.3 | 11.7 | 13.7 | 9.0 | 10.4 |
| | mortality | 7.8 | 7.9 | 7.0 | 6.7 | 8.6 | 8.0 | 6.8 | 5.6 | 5.7 | 5.1 | 5.5 |
| Lower Silesian | incidence | 13.7 | 14.1 | 12.0 | 12.0 | 12.7 | 11.9 | 12.3 | 12.1 | 11.6 | 10.2 | 11.0 |
| | mortality | 6.4 | 5.5 | 5.8 | 5.9 | 5.9 | 5.5 | 5.4 | 6.2 | 5.7 | 4.8 | 5.1 |
| Kuyavian – Pomeranian | incidence | 13.6 | 13.8 | 11.5 | 13.3 | 11.1 | 11.3 | 11.3 | 12.7 | 11.9 | 10.8 | 13.4 |
| | mortality | 7.7 | 7.1 | 6.2 | 6.7 | 6.3 | 5.6 | 7.3 | 7.5 | 4.9 | 5.4 | 5.3 |
| Lublin | incidence | 13.1 | 15.3 | 12.9 | 10.9 | 9.5 | 11.3 | 10.6 | 11.6 | 13.1 | 11.2 | 8.1 |
| | mortality | 5.2 | 6.5 | 6.1 | 5.2 | 5.0 | 4.6 | 4.3 | 4.1 | 5.1 | 4.1 | 4.0 |
| Lubusz | incidence | 11.4 | 10.0 | 11.8 | 13.6 | 11.9 | 13.4 | 12.0 | 11.8 | 13.7 | 11.3 | 12.2 |
| | mortality | 10.4 | 6.8 | 10.2 | 7.1 | 8.3 | 8.1 | 6.3 | 8.0 | 7.4 | 5.8 | 7.5 |
| Łódź | incidence | 10.6 | 10.7 | 12.8 | 9.9 | 12.1 | 12.2 | 11.4 | 11.9 | 11.2 | 11.0 | 9.3 |
| | mortality | 7.3 | 6.4 | 6.1 | 6.8 | 6.0 | 5.7 | 6.3 | 5.8 | 4.3 | 5.4 | 4.9 |
| Lesser Poland | incidence | 14.3 | 12.2 | 14.5 | 13.0 | 12.1 | 11.4 | 11.0 | 13.0 | 10.1 | 10.3 | 9.8 |
| | mortality | 6.6 | 5.9 | 5.7 | 5.9 | 5.7 | 4.9 | 5.1 | 4.8 | 5.3 | 4.6 | 4.3 |
| Masovian | incidence | 12.1 | 12.1 | 12.2 | 10.8 | 11.1 | 10.7 | 9.9 | 10.5 | 10.3 | 10.8 | 10.1 |
| | mortality | 6.7 | 6.6 | 6.3 | 5.8 | 5.4 | 5.6 | 5.6 | 4.8 | 5.4 | 5.4 | 5.4 |
| Opole | incidence | 13.8 | 12.7 | 14.8 | 13.7 | 10.3 | 9.5 | 12.3 | 12.8 | 11.8 | 10.6 | 8.5 |
| | mortality | 7.1 | 5.1 | 4.7 | 5.0 | 5.8 | 4.6 | 4.3 | 5.3 | 7.0 | 4.7 | 5.7 |
| Subcarpathian | incidence | 12.6 | 10.9 | 11.4 | 11.7 | 12.0 | 10.0 | 10.1 | 10.3 | 8.4 | 8.2 | 8.0 |
| | mortality | 5.2 | 4.2 | 3.6 | 4.3 | 4.7 | 3.9 | 4.5 | 3.6 | 5.5 | 5.2 | 3.6 |
| Podlachian | incidence | 14.3 | 12.3 | 16.8 | 13.8 | 13.8 | 13.0 | 12.3 | 13.2 | 12.2 | 13.1 | 11.2 |
| | mortality | 6.0 | 4.2 | 6.1 | 7.4 | 6.7 | 5.2 | 5.0 | 6.0 | 5.3 | 4.4 | 5.7 |
| Pomeranian | incidence | 18.8 | 17.9 | 14.3 | 16.5 | 13.8 | 11.9 | 13.6 | 12.5 | 12.7 | 12.8 | 13.3 |
| | mortality | 8.0 | 7.0 | 8.3 | 7.8 | 7.9 | 6.3 | 7.3 | 7.1 | 6.2 | 6.2 | 5.3 |
| Silesian | incidence | 14.7 | 10.9 | 11.6 | 12.7 | 11.9 | 11.1 | 11.4 | 11.8 | 9.9 | 10.6 | 9.6 |
| | mortality | 7.0 | 5.2 | 6.0 | 6.0 | 5.1 | 6.5 | 5.5 | 6.6 | 5.5 | 5.2 | 6.0 |
| Świętokrzyskie | incidence | 15.7 | 12.3 | 14.7 | 11.9 | 11.5 | 11.1 | 13.9 | 12.1 | 9.9 | 8.1 | 10.1 |
| | mortality | 6.8 | 5.3 | 4.4 | 5.4 | 4.7 | 5.1 | 4.9 | 6.0 | 4.5 | 4.0 | 3.9 |
| Warmin –Masurian | incidence | 14.4 | 14.3 | 14.0 | 13.0 | 12.6 | 13.2 | 10.7 | 14.0 | 13.3 | 12.2 | 14.5 |
| | mortality | 7.0 | 5.8 | 8.3 | 6.3 | 7.0 | 6.3 | 5.6 | 6.8 | 6.1 | 7.1 | 6.5 |
| Greater Poland | incidence | 13.7 | 14.7 | 12.7 | 10.6 | 10.2 | 12.6 | 10.6 | 11.0 | 11.9 | 8.9 | 8.9 |
| | mortality | 7.8 | 7.9 | 7.0 | 6.7 | 8.6 | 8.0 | 6.8 | 5.6 | 5.7 | 6.4 | 4.6 |
| Total | incidence | 13.8 | 13.2 | 13.2 | 12.3 | 11.9 | 11.5 | 11.3 | 11.8 | 11.9 | 10.5 | 10.3 |
| | mortality | 6.8 | 6.0 | 6.2 | 6.0 | 5.9 | 5.7 | 5.6 | 5.9 | 5.3 | 5.3 | 5.1 |

Source: prepared on the basis of the National Cancer Registers COI 2000-2010.

In 2010 in the Pomeranian Voivodeship, the morbidity rate was higher by 1.4, while the mortality rate was lower by 1.0, as against year 2005.

In the Subcarpathian Voivodeship, a decline in the morbidity rate by 2.0 was reported, while the mortality rate was lower by 0.3 in 2010, as against 2005.

There was a decline of the standardized morbidity and mortality rates in 2010, as against 2005, in the Silesian Voivodeship, of 1.5 and 0.5, respectively.

A comparison of the standardized cervical cancer morbidity and mortality rates in Świętokrzyskie Voivodeship

shows that following implementation of The National Cancer Prevention Programme there was a decline by 1.0 and 1.2, respectively, in 2010, as against 2005.

In the Warmin-Masurian Voivodeship, the standardized morbidity rate in 2010 was higher by 1.3, while the mortality rate was higher by 0.2, as against year 2005.

In the Greater Poland Voivodeship, the morbidity rate was lower by 3.7, while the mortality rate was lower by 3.4 in 2010, as against year 2005.

In year 2005, the standardized morbidity rate was lower than in Poland (11.5) in the following provinces: Opole

(9.5), Subcarpathia (10.0), Masovia (10.7), Silesia (11.1), Świętokrzyska (11.1), Kuyavia-Pomerania (11.3), Lublin (11.3), and Lesser Poland (11.4).

A higher standardized morbidity rate than in Poland in 2005 was reported for the following provinces: Lower Silesia (11.9), Pomerania (11.9), Łódź (12.2), West Pomerania (12.4), Greater Poland (12.6), Podlachia (13.0), Warmia-Masuria (13.2), and Lubusz (13.4).

In 2010, a lower standardized morbidity rate than in Poland (10.3) was reported in the following provinces: Subcarpathia (8.0), Lublin (8.1), Opole (8.5), Greater Poland (8.9), Łódź (9.3), Silesia (9.6), Lesser Poland (9.8), Masovia (10.1), and Świętokrzyska (10.1).

A higher standardized morbidity rate in 2010 than in Poland (10.3) was reported in the following provinces: West Pomerania (10.4), Lesser Poland (11.0), Podlachia (11.2), Lubusz (12.2), Pomerania (13.3), Kuyavia-Pomerania (13.4), and Warmia-Masuria (14.5).

In 2005, a lower standardized mortality rate than in Poland (5.7) was reported in the following provinces: Subcarpathia (3.9), Opole (4.6), Lublin (4.6), Lesser Poland (4.9), Świętokrzyska (5.1), Podlachia (5.2), Lower Silesia (5.5), Kuyavia-Pomerania (5.6), and Masovia (5.6).

An equal standardized mortality rate was reported in 2005 in Łódź Voivodeship (5.7), while a higher rate was reported in the following provinces: Pomerania (6.3), Warmia-Masuria (6.3), Silesia (6.5), Greater Poland (8.0), West Pomerania (8.0), Lubusz (8.1).

In 2010, a lower standardized mortality rate than in Poland (5.1) was reported in the following provinces: Subcarpathia (3.6), Świętokrzyska (3.9), Lublin (4.0), Lesser Poland (4.3), Greater Poland (4.6), and Łódź (4.9).

An equal standardized mortality rate was reported in the Lower Silesian Voivodeship (5.1), while a higher rate was reported in the following provinces: Kuyavian-Pomeranian Voivodeship (5.3), Pomeranian Voivodeship (5.3), Masovian Voivodeship (5.4), West Pomeranian Voivodeship (5.5), Opole Voivodeship (5.7), Podlachian Voivodeship (5.7), Silesian Voivodeship (6.0), Varmian-Masurian Voivodeship (6.5), Lubusz Voivodeship (7.5).

A decline in the value of the standardized morbidity rate in year 2010 as against year 2005 was reported for the following provinces: Masovian Voivodeship (0.6), Lower Silesian Voivodeship (0.9), Opole Voivodeship (1.0), Świętokrzyskie Voivodeship (1.0), Lubusz Voivodeship (1.2), Silesian Voivodeship (1.5), Lesser Poland Voivodeship (1.6), Podlachian Voivodeship (1.8), Subcarpathian Voivodeship (2.0), West Pomeranian Voivodeship (2.0), Łódź Voivodeship (2.9), Lublin Voivodeship (3.2), Greater Poland Voivodeship (3.7).

An increase in the value of the standardized morbidity rate in year 2010 as against year 2005 was reported for the following provinces: Varmian-Masurian Voivodeship (1.3), Pomeranian Voivodeship (1.4), Kuyavian-Pomeranian Voivodeship (2.1).

A decline in the value of the standardized mortality rate in year 2010 as against year 2005 was reported for the following provinces: Masovian Voivodeship (0.2), Subcarpathian Voivodeship (0.3), Kuyavian-Pomeranian Voivodeship (0.3), Lower Silesian Voivodeship (0.4), Silesian Voivodeship (0.5), Lublin Voivodeship (0.6), Lubusz Voivodeship (0.6), Lesser Poland Voivodeship (0.6), Łódź Voivodeship (0.8), Pomeranian Voivodeship (1.0), Świętokrzyskie Voivodeship

(1.2), West Pomeranian Voivodeship (2.5), Greater Poland Voivodeship (3.4).

An increase in the value of the standardized mortality rate in year 2010 as against year 2005 was reported for the following provinces: Varmian-Masurian Voivodeship (0.2), Podlachian Voivodeship (0.5), Opole Voivodeship (1.1).

As a standardized morbidity and mortality rates analysis shows, both rates increased only in Varmian-Masurian Voivodeship. The morbidity rate increased in the following provinces: Kuyavian-Pomeranian Voivodeship and Pomeranian Voivodeship, while the standardized mortality rate increased in Opole Voivodeship and Podlachian Voivodeship. In eleven provinces there was a decline in both the morbidity rate and the mortality rate.

DISCUSSION

In 2002, cancer was diagnosed in 5,060,657 women worldwide, cervical cancer constituting approximately 10% of these cases (493,243 new cases), and occupies the second position according to the frequency of occurrence [5]. Over 80% of cases of cervical cancer are registered in the developing countries, which constitutes an important global health problem.

The value of standardized morbidity rates due to cervical cancer differs in individual regions of the world by nearly 20 scores. In the majority of the countries of Sub-Saharan Africa, in central and South America, and in southern and south-eastern Asia, the standardized morbidity rate is approximately 25/100,000. A rate lower than 7/100,000 women is observed in the countries of western Asia and in urbanized China, while in the majority of the developed countries it remains below 10/100,000 women [5].

Considering mortality, cervical cancer is the third cause of death among women worldwide – 273,505 cases. Morbidity in the developed countries is 3-8/100,000 women, whereas in the developed countries – 10-25/100,000 women.

In Europe, morbidity due to cervical cancer varies and is the lowest in Finland (4/100,000 women), and the highest in Serbia (27/100,000 women) [6]. In Poland, morbidity due to cervical cancer is on the medium level (10.3/100,000 women) [4].

Differences between European countries are also noted with respect to mortality due to this cancer. The lowest mortality rates are observed in Malta (2/100,000 women), and the highest in Romania (13/100,000 women). Poland is placed in the upper limit adopted for low mortality (5.1/100,000) [4].

For the first time, the cervical screening programme was implemented on a population scale in 1942 in the State of British Columbia in Canada. Within 20 years, in the province of Vancouver, where the screening was initiated, morbidity rates due to cervical cancer decreased from 24.9/100,000 down to 6.9/100,000 [7].

During the period 1950-1970 in the United States, after the implementation of cervical screening, the number of deaths due to cervical cancer decreased by 70% [8].

Screening allows the distinguishing of those from a large group of patients who are at an increased risk of contracting the disease, with a probability of health improvement as a result of prophylactic and treatment actions [9].

Observation of 8 screening programmes, with the participation of approximately 2 million women, provided

an answer concerning optimum time intervals between the subsequent cytological examinations of the cervix. Screening examinations performed every: 5, 3 and 2 years and annually, decreased the incidence of invasive cancer in women aged 35 – 64 by 84%, 91%, 93% and 94%. This comparison shows that there is no clear difference between the time intervals of 3 years, 2 years, and annually [10].

The National Programme for Control of Cancerous Diseases, and the Polish Gynaecological Association, recommend the performance of cervical screening every 3 years in the case of normal results of cytological smears and lack of cervical cancer risk [11, 12].

Until 2008, the National Health Fund sent personal invitations. In order to improve reporting rates, since 2009 the invitations are sent by individual Regional Coordination Centres. The Computer System of Prophylaxis Monitoring introduced in 2006 facilitated the observation of the results and coordination of studies on-line [13].

Considering both the high cost of invitations associated with the inspiration of a single woman to participate in the screening, and unsatisfactory patients' response to the invitations, in the future, the organizers of the screening response will search for more attractive forms of arousing the interest of women in the examinations. It was considered that personal invitations are a poorly effective tool for the improvement of reporting rates for prophylactic oncologic examinations [14, 15].

In Poland in year 2010 – 3078 patients came down with cervical cancer, while prior to implementation of The National Cancer Prevention Program Act in year 2005, 3263 women became sick. Therefore it can be concluded that there was a decline in cervical cancer incidence of 5.7%. As regards the mortality rate, there was a decline of 3.4%. A comparison of cervical cancer morbidity and mortality in Poland and in Polish provinces in years 2005-2010 showed statistically significant differences only in the morbidity rate, i.e. a decline in frequency in the entire Polish territory and in the following provinces: Lublin Voivodeship, Łódź Voivodeship, Lesser Poland Voivodeship, Greater Poland Voivodeship, as well as an increase in the morbidity rate in Kuyavian-Pomeranian Voivodeship.

As an standardized morbidity and mortality rates analysis suggests, both rates increased only in Varmian-Masurian Voivodeship. The morbidity rate increased in the following provinces: Kuyavian-Pomeranian Voivodeship and Pomeranian Voivodeship, while the standardized mortality rate increased in Opole Voivodeship and Podlachian Voivodeship. In eleven provinces there was a decline in both the morbidity rate and the mortality rate.

According to the prognosis for year 2025, if morbidity and mortality rates continue to decrease in Poland, these statistics are expected to decrease even further. The highest decline in the morbidity rate is expected to occur in women over 65 years old, while the decrease may be the lowest for 45-65 years old women, of whom as many as 60% may come down with the disease. It is expected that in year 2025 the mortality rate will decrease nearly twice in 25-44 years old women, while the mortality rate will decrease to 800 in 45-64 years old women and to approximately 600 in women over the age of 65 [16].

CONCLUSIONS

1. The analysis of the morbidity rate and the mortality rate in Poland in year 2005 and 2010 shows that implementation of The National Cancer Prevention Program Act resulted in a decline of cervical cancer incidence of 5.7%, as well as 3.4% a decline mortality rate.
2. As a result of implementation of The National Cancer Prevention Program Act, eleven provinces reported a decline in the standardized morbidity and mortality rates, in two provinces the cervical cancer morbidity rate increased and the mortality rate declined, while in another two provinces the morbidity rate declined and the mortality rate increased. Only one province reported an increase in both of the rates.
3. The longer The Population Program for Prophylaxis and Early Detection of Cervical Cancer is being enforced, the higher the decline in the morbidity rate and the mortality rate.

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