DOI: http://dx.doi.org/10.12775/MBS.2016.035

Medical and Biological Sciences, 2016, 30/4, 59-64

Tomasz Mierzwa

THE EPIDEMIOLOGY OF BREAST CANCER IN KUJAWSKO-POMORSKIE VOIVODSHIP IN 2006-2010

EPIDEMIOLOGIA RAKA PIERSI W WOJEWÓDZTWIE KUJAWSKO-POMORSKIM W LATACH 2006-2010

Zakład Profilaktyki i Promocji Zdrowia Centrum Onkologii im. prof. F.Łukaszczyka w Bydgoszczy

S u m m a r y

The analysis of the epidemiology of breast cancer in Kujawsko-Pomorskie voivodship in 2006 – 2010 in terms of the number of cases and deaths, and selected epidemiological indicators. Kujawsko-Pomorskie is the region with a great epidemiology risk in Poland. The number of cancers detected in this period was 4402, majority among the people between the ages of 50 and 69. 20% of cases were detected in cancer screening. The number of breast cancers detected in the pre-invasive stage is growing. The 5 year cure rate in the cases of breast cancer has risen.

S t r e s z c z e n i e

Dokonano analizy epidemiologicznej raka piersi w województwie kujawsko-pomorskim w latach 2006-2010 pod kątem liczby zachorowań i zgonów, oraz wybranych wskaźników epidemiologicznych. Województwo kujawsko-pomorskie jest regionem o dużym zagrożeniu epidemiologicznym w Polsce. Liczba raków wykrytych w tym okresie wyniosła 4402, najwięcej u osób w wieku 50-69 lat. 20% przypadków rozpoznanych zostało w badaniach skriningowych. Rośnie liczba nowotworów piersi wykrytych w stadium przedinwazyjnym. Wzrostowi uległ również odsetek 5-letnich wyleczeń z powodu raka piersi.

Key words: the epidemiology , breast cancer
Słowa kluczowe: epidemiologia, rak piersi

INTRODUCTION

In 2012, 1 676 633 cases of breast cancer were reported worldwide, which accounts for 21.91% of all malignant neoplasm cases. In Europe there were 464 202 cases, accounting for 28.8% of the total cases [1]. In Poland it is still the most common malignant neoplasm among women. In 2013, there were 17 142 cases in the country, representing 21.91% of cases in this sex [2]. Compared to other European countries, Poland belongs to the countries with an average ratio of breast cancer and an average growth rate of mortality. It is estimated that the phenomenon of the prevalence of breast cancer (people who have been affected by the disease) affects about 60 000 women. Epidemiological projections, taking into account demographic factors suggest that in 2025 about 21 000 new cases of breast cancer will occur [3, 4]. Kujawsko-Pomorskie belongs to the voivodships with high standardized incidence ratio, which in 2013 was 281.0 for men and 244.7 for women, placing this region among the regions with the highest values of that ratio.

In Kujawsko-Pomorskie in 2013, 1 040 women were diagnosed with breast cancer, representing 22.18% of all malignant neoplasm cases in this sex [5]. In order to fully observe the dynamics of the changes in epidemiological indicators of cancer, periodic epidemiological evaluation is needed. The previous evaluation was made for the period of 2001-2005 year [6].

THE AIM OF THE THESIS

The aim of this study was the epidemiological evaluation of the incidence and mortality from breast cancer in Kujawsko-Pomorskie in years 2006-2010.

MATERIALS AND METHODS

Data analysis was made of the Kujawsko-Pomorskie Malignant Cancer Registry, which collects tumour declarations on the Mz / N-1a form, issued in all cases: the diagnosis, treatment or the pronouncement of death due to malignant neoplasm. Those forms, after being sent by the health care facilities (under the Law on Official Statistics) are subjected to statistical calculations [7]. The following epidemiological indicators were calculated: absolute number of cases and deaths in years 2006, 2007, 2008, 2009 2010 and crude incidence rates (number of cases /100 000 of the studied population), standardized ratio (number of cases /100 000 of the studied population, in relation to the so-called standard world population). The time trends of morbidity and mortality were presented and compared with the data of the whole country. Geographic distribution of the cases in the region was presented graphically by illustrating it on maps. The number of detected breast cancers during prophylactic examinations in particular years was estimated as well as the data concerning detected tumours in situ. The 5-year survival rate for breast cancer was calculated in the selected period. Data concerning breast cancer among men was also presented.

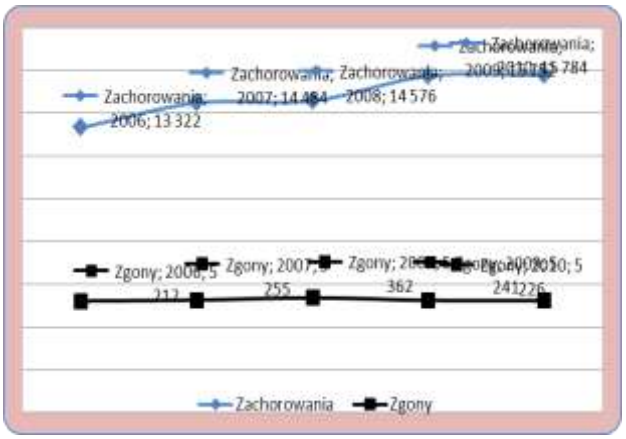
RESULTS

In Poland, in particular years the following number of cases was consecutively registered: 13 322; 14 484; 14 576; 15 752; 15 784; which gives a total of 73 918 cases of malignant breast cancer.

Year to year, the following number of deaths was consecutively registered: 5 212; 5 255; 5 362; 5 241; 5 226; which gives a total of 26 296 deaths caused by malignant breast cancer. Data is presented in tab. I, Fig. 1.

Tab. I. *Registered disease and deaths of breast cancer in women in years 2006–2010 in Poland*

year	disease absolute numbers	deaths absolute numbers
2006	13 322	5 212
2007	14 484	5 255
2008	14 576	5 362
2009	15 752	5 241
2010	15 784	5 226
altogether	**73 918**	**26 296**

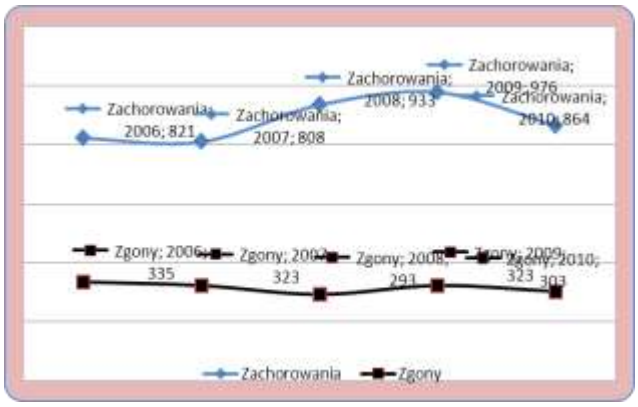


Ryc. 1. *Time trend disease and deaths of breast cancer in women in years 2006–2010 in Poland*

When analysing the incidence of breast cancer in Kujawsko-Pomorskie during the period covering this study, it was established that breast cancer was diagnosed for the following number of people: 821, 808, 933, 976, 864, which gives a total of 4 402 cases. In the same period in Kujawsko-Pomorskie the following number of deaths due to the breast cancer was consecutively registered: 335, 323, 293, 323, 303, which gives a total of 1 577 deaths. Data is presented in tab. II, Fig. 2.

Tab. II. *Registrated disease and deaths of breast cancer in women in years 2006-2010 in woj. kuj-pom.*

year	disease absolute numbers	deaths absolute numbers
2006	821	335
2007	808	323
2008	933	293
2009	976	323
2010	864	303
altogether	**4 402**	**1 577**



Ryc. 2. *Time trend disease and deaths of breast cancer in women in years 2006-2010 in woj. kuj.-pom.*

The next table III presents the number of breast cancer cases depending on age.

Tab. III. *Registrated disease and deaths of breast cancer in women ages in years 2006-2010 in woj. kuj.-pom.*

ages	2006	2007	2008	2009	2010	altogether
<5	0	0	0	0	0	0
5–9	0	0	0	0	0	0
10–14	0	0	0	0	0	0
15–19	0	0	0	0	0	0
20–24	0	1	0	1	0	2
25–29	8	7	6	4	5	30
30–34	9	10	10	20	18	67
35–39	20	18	34	25	24	121
40–44	64	34	45	45	54	242
45–49	96	74	85	94	89	438
50–54	144	119	141	173	131	708
55–59	140	165	161	159	127	752
60–64	100	128	133	159	153	673
65–69	85	93	113	99	77	467
70–74	69	73	82	74	65	363
75–79	48	47	65	65	55	280
80–84	29	23	39	40	42	173
85+	9	16	19	18	24	86
sum:	**821**	**808**	**933**	**976**	**864**	**4402**

On the other hand, table IV shows detailed analysis taking into account particular epidemiological indicators of detected breast cancer in particular years.

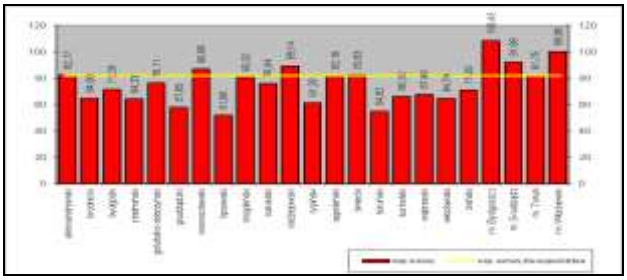
Tab. IV. *Absolute number, raw factor, standardized rate disease of breast cancer in women in years 2006-2010 in woj. kuj.-pom.*

year	absolute number	raw factor	standardized rate	standardized rate
2006	821	76.83	52.45	24,27%
2007	808	75.62	50.19	22,84%
2008	933	87.27	56.67	24,33%
2009	976	91.18	58.76	24,17%
2010	864	79.90	51.25	20,72%

Epidemiological indicators concerning the incidence in different regions of Kujawsko-Pomorskie were analysed. Table V and Fig. 3 and 4 illustrate the geography of incidence in Kujawsko-Pomorskie voivodship.

Tab. V. *Registrated disease and deaths of breast cancer in women in years 2006-2010 in woj. kuj.-pom.*

County	2006		2007		2008		2009		2010		altogether	
	nr	raw factor	n	raw factor	nr	raw factor	n	raw factor	nr	raw factor	nr	raw factor
aleksandrowski	**18**	62.90	**26**	90.68	**19**	66.28	**21**	73.36	**34**	117,18	**118**	**82.17**
brodnicki	**25**	65.55	**20**	52.40	**32**	83.39	**30**	78.08	**17**	43,42	**124**	**64.50**
bydgoski	**33**	67.05	**37**	73.41	**42**	81.54	**37**	70.88	**34**	63,69	**183**	**71.29**
chełmiński	**14**	53.16	**17**	64.49	**17**	64.46	**23**	87.24	**14**	52,03	**85**	**64.23**
golubsko–dobrzyński	**18**	79.02	**15**	65.75	**21**	91.74	**22**	95.97	**11**	48,03	**87**	**76.11**
grudziądzki	**11**	57.16	**11**	57.05	**14**	72.39	**10**	51.79	**10**	50,08	**56**	**57.65**
inowrocławski	**79**	92.93	**65**	76.55	**70**	82.55	**77**	90.84	**77**	90,42	**368**	**86.66**
lipnowski	**14**	41.70	**12**	35.79	**26**	77.42	**21**	62.60	**14**	41,05	**87**	**51.68**
mogileński	**18**	75.46	**13**	54.45	**15**	62.77	**30**	125.54	**20**	83,31	**96**	**80.32**
nakielski	**20**	46.38	**27**	62.39	**35**	80.73	**46**	106.02	**37**	84,39	**165**	**76.04**
radziejowski	**16**	74.84	**24**	112.83	**20**	94.07	**23**	108.49	**12**	55,92	**95**	**89.14**
rypiński	**8**	35.45	**19**	84.59	**17**	75.75	**12**	53.66	**13**	57,13	**69**	**61.28**
sępoleński	**10**	48.47	**23**	111.49	**18**	87.19	**17**	82.46	**17**	81,21	**85**	**82.16**
świecki	**26**	52.47	**37**	74.60	**42**	84.57	**47**	94.32	**54**	106,60	**206**	**82.63**
toruński	**26**	56.59	**27**	57.72	**22**	46.24	**24**	49.61	**31**	62,82	**130**	**54.62**
tucholski	**18**	75.84	**12**	50.52	**12**	50.18	**18**	75.17	**19**	78,61	**79**	**66.10**
wąbrzeski	**10**	56.14	**12**	67.55	**12**	67.81	**15**	84.66	**11**	61,36	**60**	**67.48**
włocławski	**23**	53.54	**22**	51.11	**39**	90.30	**23**	53.31	**33**	75,16	**140**	**64.74**
żniński	**21**	59.52	**17**	48.15	**31**	87.38	**36**	101.44	**21**	58,62	**126**	**71.03**
m. Bydgoszcz	**214**	110.85	**196**	102.09	**209**	109.52	**220**	115.55	**201**	104,20	**1 040**	**108.43**
m. Grudziądz	**50**	96.00	**52**	99.98	**48**	92.26	**56**	107.75	**33**	63,82	**239**	**91.99**
m. Toruń	**87**	78.30	**75**	67.62	**106**	95.78	**94**	85.09	**90**	82,03	**452**	**81.75**
m. Włocławek	**62**	98.28	**49**	78.18	**66**	105.65	**74**	119.05	**61**	98,81	**312**	**99.96**
sum:	**821**	**76.79**	**808**	**75.55**	**933**	**87.14**	**976**	**91.12**	**864**	**79,89**	**4 402**	**82.10**



Ryc. 3. *Raw factor of breast cancer in women in years 2006-2010 in woj. kuj.-pom.*

The regions with the highest epidemiological threat are the big cities in this voivodship and districts radziejowski , inowrocławski and świecki.

A role of mammographic screening in the diagnosis of breast cancer was analysed next. Since 2006 in Kujawsko-Pomorskie, the mammogram has been performed within the Population Program for Early Detection of Breast Cancer in 12 stationary labs and mammobuses.

Cases of cancer detected in prophylactic examinations are reported to the registry with a mandatory note that the patient took part in the Program.

In Kujawsko-Pomorskie in particular years the following numbers were consecutively registered: 69, 142, 211, 273, 207, which gives a total of 902 detected malignant breast cancer in prophylactic examinations for women – tab. VI.

Współczynnik surowy dla województwa -82.1

Ryc. 4. *Geographical distribution of registrated disease of breast cancer in women in years 2006-2010 in woj. kuj.-pom.*

Tab. VI. *Breast cancer in women in years 2006-2010 in woj. kuj.-pom. detected in preventive testing*

year	ages				
	50–54	55–59	60-64	65–69	sum
2006	26	15	19	9	**69**
2007	33	45	37	27	**142**
2008	65	57	44	45	**211**
2009	73	78	83	39	**273**
2010	62	44	70	31	**207**
sum	**259**	**239**	**253**	**151**	**902**

Data concerning diagnosis of breast cancer was also analysed in the investigated period of time, in pre-invasive stage. Data is presented in table VII.

Tab VII. *Number and standardized rate disease of breast cancer in women in years 2006-2010 in woj. kuj.-pom.*

year	disease in situ	
	number	standardized rate
2006	6	0.29
2007	11	0.70
2008	7	0.43
2009	65	4.07
2010	32	2.09
sum	**121**	-

In Poland, in particular years the following number of cases was consecutively registered: 97, 87, 119, 112, 107 which gives a total 522 cases of malignant breast cancer among men, and deaths consecutively: 43, 45, 37, 69, 59, which gives a total 253 deaths. (tab.VIII).

Tab. VIII. *egistrated disease and deaths of breast cancer in men in years 2006-2010 in Poland*

year	disease absolute numbers	deaths absolute numbers
2006	97	43
2007	87	45
2008	119	37
2009	112	69
2010	107	59
altogether	**522**	**253**

In Kujawsko-Pomorskie in particular years the following number of cases was consecutively registered: 6, 7, 3, 10, 6, which gives a total 32 cases of malignant breast cancer among men, and deaths consecutively: 1, 7, 3, 1, 3, which gives a total 15 deaths. (tab. IX).

Tab. IX. *Registrated disease and deaths of breast cancer in men in years 2006-2010 in woj. kuj.-pom.*

year	disease absolute numbers	deaths absolute numbers
2006	6	1
2007	7	7
2008	3	3
2009	10	1
2010	6	3
altogether	**32**	**15**

It should be added that when analysing cancer incidence age for men, it was shown that half of these cases (16/32) was in the age range between 60 and 74.

Next table X presents the value of standardized ratio of cancer incidence in particular regions of the country [wg 2].

Kujawsko-Pomorskie ranks on a high second place in Poland, quite significantly exceeding the average level of standardized ratio for Poland.

In table XI data concerning the 5-year survival rate of patients diagnosed with breast cancer was presented in particular years.

Tab. X S*tandardized rate of registrated disease of breast cancer in women in years 2006-2010 in woj. kuj-pom.*

voivodeship	standardized rate in years **2006-2010**
WIELKOPOLSKIE	54.6
KUJAWSKO-POMORSKIE	**53.9**
DOLNOŚLĄSKIE	52.9
ŁÓDZKIE	51.8
LUBUSKIE	50.1
ZACHODNIOPOMORSKIE	49.7
WARMIŃSKO-MAZURSKIE	47.9
MAZOWIECKIE	47.7
MAŁOPOLSKIE	46.1
ŚLĄSKIE	45.4
OPOLSKIE	44.8
LUBELSKIE	43.1
PODLASKIE	42.6
POMORSKIE	42.2
ŚWIĘTOKRZYSKIE	41.4
PODKARPACKIE	38.4
Polska	**47.8**

Tab. XI. *Percentage five-year survival of breast cancer in years 2006-2010 in woj. kuj.-pom.*

Year disease	Percentage five-year survival
2006	64,2%
2007	68,8%
2008	69,8%
2009	69,7%
2010	data in the development

DISCUSSION

Amongst 14.2 million cases per year worldwide, breast cancer is the most common malignant neoplasm for women with the number of 1 676 633 cases. It remains the most common cause of deaths caused by cancer in this sex with the number of deaths reaching 525 900 in 2012 [8]. In Poland the number of breast cancer incidence has been growing, reaching up to 17 001 cases in 2013 [2]. A similar trend applies to Kujawsko-Pomorskie, which ranks on a high 2nd place in Poland in terms of the level of standardized incidence ratio. In our voivodship in years 2006-2010 breast cancer was diagnosed in 4 402 cases, which in comparison to the previous 5 years (3 544 cases) indicates an increase of 858 (i.e. by 24.2%) cases [6]. Crude incidence rates in the period of concern was 82.10 and in comparison to the years 2001-2005 (66.13) also showed a significant increase.

The age group characterized by the greatest number of cancer diagnosis is the age group between 50 and 69 years old (total of 2600 i.e. 59.1%) and this data is consistent with the data for the entire country. In that age range, 60% of all cases of breast cancer are diagnosed [9]. That tendency appeared at the beginning of 2000 and has been consolidated over the years. It is the basic epidemiological criterion of including people of that age in cancer screening. In Poland Breast Cancer Prevention Program began in 2006 and has been continuing. In Kujawsko-Pomorskie during the considered period breast cancer was diagnosed in 902 participants of cancer screening. It means that thanks to the prophylactic examinations breast cancer was detected in every fifth female patient. In the following years this number has risen – 2013 concerned 416 patients / 1 040 total diagnoses (i.e. 40%) [5]. Another measure of the effectiveness of cancer screening is the percentage of detected cases of breast cancer in pre-invasive stage. In the sample material, the number of detected cases of in situ was 121, demonstrating over five years increasing tendency, reaching standardized ratio of 4.07/100 000 population in 2009. It is reflected in the data for the whole country, where the role of that form of tumour compared to all staging of cancer was about 7% [10]. Areas with the highest incidence ratio in Kujawsko-Pomorskie are the big cities – Bydgoszcz, Włocławek, Grudziądz and districts: świecki, sępoleński, inowrocławski, aleksandrowski and radziejowski. This phenomenon is consistent with the worldwide trend where urbanization and westernization of life, along with little physical activity, obesity, late procreation is listed among the most common risk factors for breast cancer [11]. The 5-year survival rate for breast cancer in 2006-2010 in Kujawsko-Pomorskie has risen from 64.2% to 69.7%, i.e. by 5.5 percentage points. These figures are consistent with the data for the country and are mainly caused by an increasing proportion of patients with lower stages of cancer. With the continuing increase of cancer incidences, maintaining the level of deaths on a similar level should be regarded as a considerable success. This is the characteristic "opening" of the curves of morbidity and mortality (Fig. 2). It is a significant sign of progress in treating breast cancer in Kujawsko-Pomorskie and in Poland [10]. An increasing number of patients for whom surgical treatment can be applied using breast conserving techniques, the progress of complementary methods of treatment (radiotherapy, chemotherapy and immunotherapy) along with the prophylactic programs, determine the progress in the treatment of breast cancer, which was expected for so long. Further health education, the continuation of screening programs, the development of the oncology centres, increased vigilance of physicians and gynaecologists –

decreasing delays of diagnostic-therapeutic process – may become the guarantor of the relevant trends of lasting changes in the epidemiology of breast cancer [12-15].

CONCLUSIONS

1. The number of breast cancer cases is constantly rising.
2. The number of breast cancer detected in screening examinations and in the pre-invasive stage is increasing.
3. The 5-year survival rate for breast cancer is improving.

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Address for correspondence:
Zakład Profilaktyki i Promocji Zdrowia
Centrum Onkologii im. prof. F. Łukaszczyka
w Bydgoszczy
ul. dr I. Romanowskiej 2
85-796 Bydgoszcz

Received: 20.09.2016
Accepted for publication: 16.12.2016