

Cancer incidence and mortality in Greater Poland Province in 2006 – Report

Agnieszka DYZMANN-SROKA, Agata HARSKA, Wiesława MYŚLIŃSKA,
Wiesława OLENDERCZYK, Małgorzata RYMARCZYK-WCIORKO,
Beata SZCZĘCH, Maciej TROJANOWSKI, Teresa WOSICKA

SUMMARY

Greater Poland is a region of high cancer risk in Poland. Standardized rates for cancer incidence among man and woman are the highest in Poland. Standardized rates for cancer deaths are also very high (4th place for men and 2nd for woman).

When analysing the absolute numbers of cases and deaths among men in Greater Poland for last eight years, we observe increase of cases number by 16,14% and deaths by 10,85%.

Most common cancer incidence sites in Greater Poland for man are: lung, colorectum and prostate. Among woman breast, colorectum and lung.

Most common cancer deaths sites in men are: lung, colorectum and stomach. Among woman breast, lung and colorectum.

When analysing standardized rates for malignant tumors morbidity and mortality among men and women, we see clearly that increase of number of new cancer cases and deaths is determined first of all by ageing in Greater Poland population.

Lung cancer in Greater Poland is situated in first three most common cancer sites by incidence and mortality. Region has a medium lung cancer incidence and mortality compare to other voivodships. In analyzed period (1999-2006) lung cancer incidence and mortality among men has decreased. Unfortunately the same trend is not observed among women.

High breast cancer incidence is very typical for Greater Poland. Analysis of standardized rates shows that Greater Poland is on 3rd place by breast cancer incidence and on the 4th place by breast cancer mortality. The most important and at the same time the cheapest method to eliminate tumors is prophylactics and screening.

KEY WORDS: cancer register, Greater Poland province,

Received: 14.01.2008
Accepted: 22.12.2009
Subject: review article

The Greater Poland Cancer Centre,
Department of Epidemiology
and Cancer Prevention, Greater
Poland Cancer Registry

Address for correspondence:
Agnieszka Dyzmann-Sroka
Greater Poland Cancer Centre
15th Garbary Str.
61-866 Poznań
e-mail:
agnieszka.dyzmann-sroka@wco.pl

Introduction

This report includes basic data about the occurrence of tumours in Greater Poland Province, their diversity with respect to counties, sex, age and site. Data concern the most common cancer incidences and mortality for Greater Poland Province.

Description of the region

Greater Poland Province is one of the biggest in Poland. In terms of surface area (29 825 km²) it is second in the country and third with respect to number of inhabitants (3 370 179), which constitutes 8.8% of the population of the country. The population density is 113 people per sq. km. Nearly 57% of the province population lives in towns.

Greater Poland Province consists of 31 district counties and 4 town counties; the counties contain 226 districts, including 118 rural districts, 89 rural town districts and 19 town districts.

The Greater Poland Cancer Registry

The Greater Poland Cancer Registry has existed for more than 30 years. It operates within the Greater Poland Cancer Centre and is supported exclusively from the Centre's own funds.

Since 1999 it has included 31 counties and four towns with county rights (Kalisz, Konin, Leszno, Poznań). The electronic database of the Cancer Registry concerning Poznań

city contains data from 1980, and concerning other previous provinces (now counties) from 1985.

Table 1. Population in Greater Poland, by sex and county, 2006

County	Absolute number	Male	Female
Chodzież	47 037	23 009	24 028
Czarnków-Trzcianka	86 562	42 662	43 900
Gnieźno	140 806	68 771	72 035
Gostyń	76 332	37 572	38 760
Grodzisk	49 594	24 607	24 987
Jarociń	70 980	34 613	36 367
Kalisz	80 722	39 661	41 061
Kępno	55 641	27 410	28 231
Koło	89 545	43 656	45 889
Konin	124 312	61 450	62 862
Kościań	77 798	38 000	39 798
Krotoszyn	77 442	37 854	39 588
Leszno	50 137	24 889	25 248
Międzychód	36 468	17 925	18 543
Nowy Tomyśl	71 894	34 960	36 934
Oborniki	56 083	27 657	28 426
Ostrów Wielkopolski	159 284	77 671	81 613
Ostrzeszów	54 560	26 866	29 694
Piła	137 708	67 211	70 497
Pleszew	62 131	30 649	31 482
Poznań	289 832	141 474	148 358
Rawicz	59 546	29 219	30 327
Słupca	59 185	29 385	29 800
Szamotuły	85 568	41 727	43 841
Środa Greater Poland	54 652	26 826	27 826
Śrem	58 751	28 779	29 972
Turek	84 050	40 983	43 067
Wągrowiec	68 114	33 647	34 467
Wolsztyn	54 773	27 066	27 707
Września	74 073	36 175	37 898
Złotów	69 268	34 215	35 053
Kalisz town	108 143	50 562	57 581
Konin town	80 907	38 735	42 172
Leszno town	63 656	30 430	33 226
Poznań city	554 625	258 699	295 926
Greater Poland	3 370 179	1 635 015	1 735 164

The task for the Greater Poland Cancer Registry is gathering data about malignant tumour incidence, updating the data in the registry database, introducing new incidence, calculating the incidence and death rate and analysing the data gathered.

The Greater Poland Cancer Registry gathers data concerning the incidence in a particular area, about population precisely determined according to its structure and size. Data from the Registry allow a departmental strategy to be worked out in the scope of health protection for Greater Poland Province and the future needs to be determined in the scope of the number of oncological beds, personnel number and the purchase of necessary equipment. The most important task for the Greater Poland Cancer Registry is gathering information that can be used for scientific research, studies, publications, monitoring of patients' fate, as well as programmes for eliminating malignant tumours (screening).

Statistical methods

In the report "Cancer incidence and mortality in Greater Poland Province in 2006", some basic statistical parameters were used, such as absolute numbers, raw rates and age-standardized rates.

Absolute number of new cases and cancer deaths in a given population within a defined time interval – depends on population size and its age structure.

Raw incidence (mortality) rates – number of new cases or cancer deaths per 100 000 individuals of the studied population – the age structure is not taken into account. In the bulletin also partial rates are used, in order to define the prevalence of a given disease in selected age groups (also as number of cases per 100 000 individuals of the studied population within a selected age group).

Incidence and mortality data must be compared in time between various populations. To achieve this goal in our report methods that take into account age and population structure were used. Polish society is undergoing significant changes in regard to age, some of them resulting from the consequences of World War II. In order to enable us to compare data for different populations in Bulletin 2006 we chose to use standardized incidence

(mortality) rates. They predict how many new cases or deaths would occur in the studied population if its sex and age structure were equal to those of a standard population.

The direct standardization method was used in the present bulletin. "Standard world population" was taken as the standard population (Parkin, Whelan, Ferlay et al. 1997).

Standardized incidence (mortality) rate can be calculated using the following equation:

$$SR = \frac{\sum_{i=1}^N \frac{k_i}{p_i} w_i}{\sum_{i=1}^N w_i}$$

Where:

- k_i refers to the number of new cases (deaths) in the i -age group,
- p_i refers to the population size of i -population,
- i refers to the number of the age group ($i=1, \dots, N$), – N refers to the number of age groups (for age groups of 5 years $N=18$),
- w_i refers to the weight attributed to the i -age group resulting from distribution within the standard world population.

Also a structure index was used in this bulletin. The mortality structure index (registered cases) for cancer refers to the quotient of absolute number of deaths (registered cases) from particular cancer and total number of deaths (registered cases) expressed as percent.

Cancer case report card

Cancer Case Report Card MZ/N-1a is used to report cancer and in situ cancer cases by public and non-public healthcare facilities in Poland.

The card should be filled in:

- in case of a newly diagnosed or suspected cancer case,
- after control visits during which changes in treatment or disease progression are detected,

- based on the death certificate, if cancer was the cause of death.

All neoplasms in codes C00-C97 and D00-D09 of the International Statistical Classification of Diseases and Related Health Problems Tenth Revision (ICD-X) should be reported.

Completeness and registration quality of malignant tumours in Greater Poland

According to data from the Polish National Cancer Registry, Greater Poland Cancer Registry was indexed in the third position among cancer registries in Poland by completeness.

The condition to judge correctly the state of threat of malignant tumours for the researched population is the high completeness of cancer registration in the province.

The simplest measurement of the registration completeness is incidence/death rates, i.e. the quotient of the total new registered malignant tumours to the mortality caused by malignant tumours in the same period.

The incidence/death rate for Greater Poland in 2006 was 1.45 (for men 1.35, for women 1.59). For a few years this rate for Greater

Table 3. Ten most common cancer incidence sites

among men	among women
C33 – C34 lung (21.7%)	C50 breast (21.6%)
C18 – C21 colorectal (12.0%)	C18 – C21 colorectal (9.9%)
C61 prostate (12.0%)	C33 – C34 lung (7.5%)
C67 urinary bladder (6.9%)	C54 corpus uteri (6.6%)
C16 stomach (5.3%)	C56 ovary (5.1%)
C64 kidney (3.4%)	C53 cervix (4.4%)
C32 larynx (2.6%)	C16 stomach (2.9%)
C25 pancreas (2.3%)	C73 thyroid (2.4%)
C71 brain (2.2%)	C25 pancreas (2.3%)
C62 testis (1.6%)	C71 brain (2.3%)

Table 2. Completeness of cancer registration in Greater Poland Province according to sex in 2006

Sex	Incidence/death rate	Standard I/D rate	Completeness
Male	1.35	1.40	96%
Female	1.59	1.70	94%
Total	1.45	1.50	97%

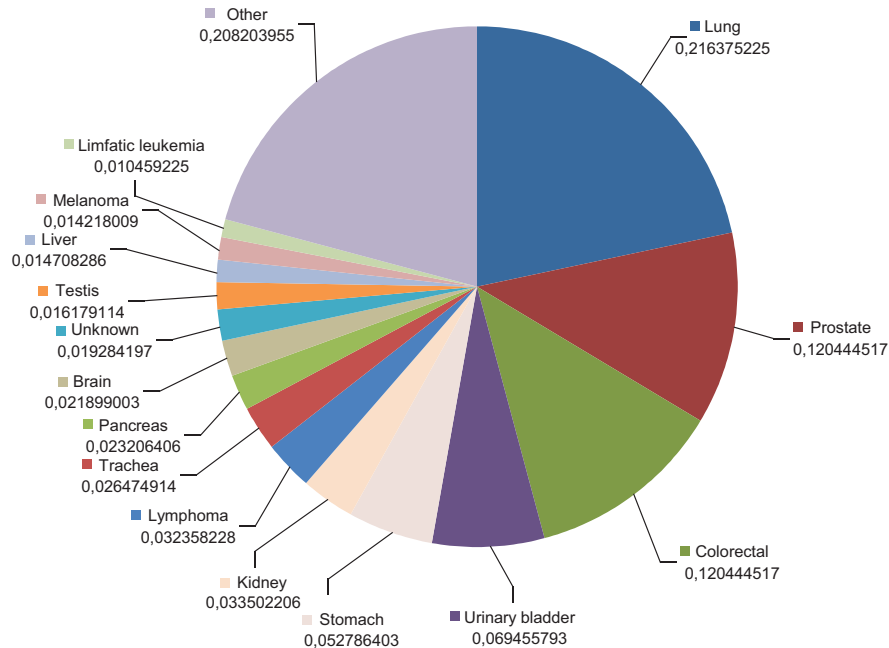


Fig. 1. Cancer incidence in Greater Poland by site, 2006, male

Table 4. Cancer incidence in Greater Poland, 1999–2006, male

Year	Absolute number	Crude rate	Stand. rate
1999	5 118	314.2	272.8
2000	5 210	319.4	271.7
2001	5 298	324.4	274.4
2002	5 399	332.3	275.4
2003	5 625	345.8	281.1
2004	5 728	351.6	282.2
2005	5 874	359.9	282.5
2006	6 119	374.3	298.2

Table 5. Cancer incidence in Greater Poland, 1999–2006, female

Year	Absolute number	Crude rate	Stand. rate
1999	5 198	302.3	209.7
2000	5 341	310.2	214.0
2001	5 503	319.0	215.3
2002	5 475	317.8	211.5
2003	5 570	322.9	211.5
2004	5 656	327.3	213.2
2005	5 912	341.4	220.0
2006	5 862	337.8	225.8

Poland has been at the same level; in 2005 it was 1.49 (for men 1.35, for women 1.67).

A significant difference in the incidence/death rate value between the sexes has remained for a few years in the Greater Poland Cancer Registry, as well as in all registries in Poland; its value is higher in the female population, which can be explained by the fact that in the male population malignant lung tumour with bad prognosis dominates (it constitutes 1/3 of the incidence and mortality).

An approximate percentage of the regis-

tered malignant tumours, called the registry completeness, is a quotient of the incidence/death rate to the incidence/death rate recognised as a standard (1.50) multiplied by 100%. The registry completeness for Greater Poland in 2006 was 97%, whereas in 2005 it was 99%.

Completeness and incidence/death ratio are presented in Table 6.

The Greater Poland Cancer Registry has remained for years in the leading position in respect of registry completeness and the percentage of the cases histologically confirmed.

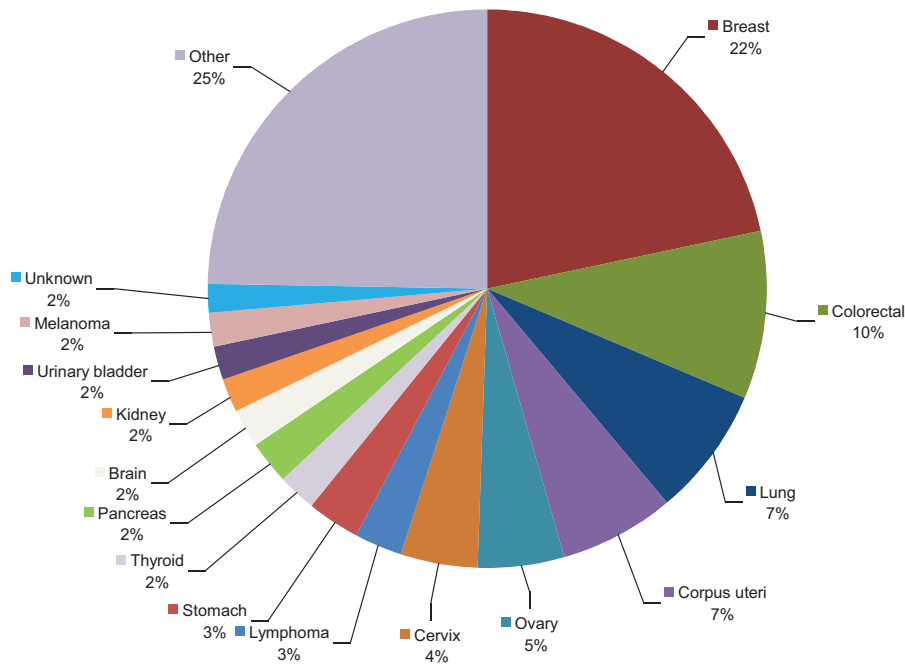


Fig. 2. Cancer incidence in Greater Poland by site, 2006, female

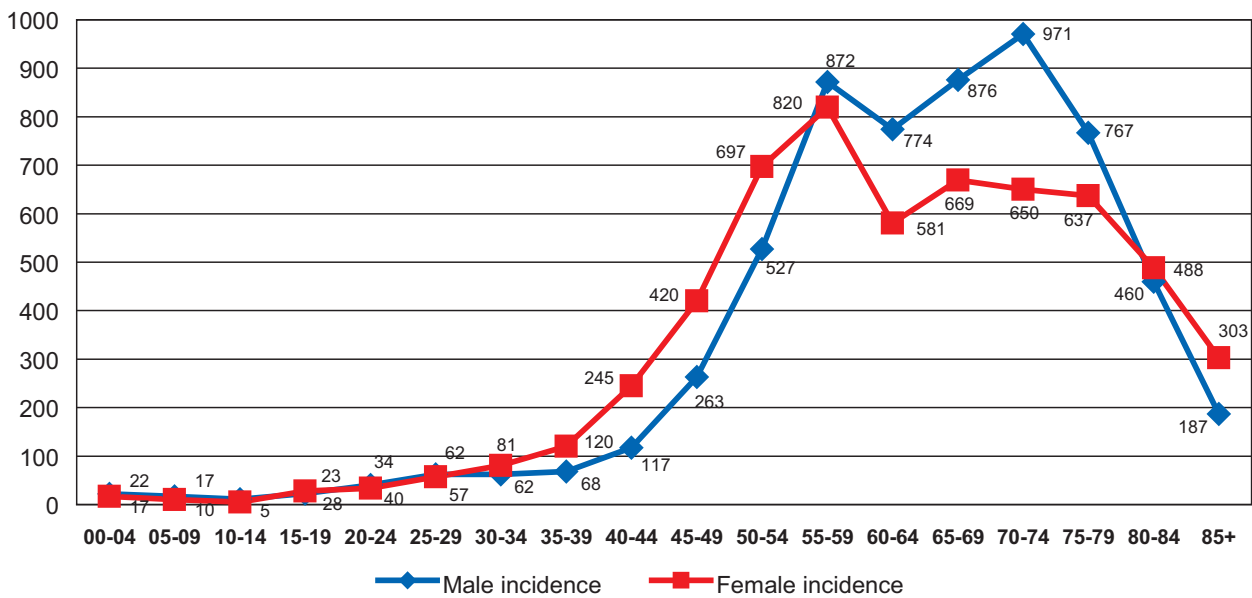


Fig. 3. Malignant tumour incidence among men and women in Greater Poland in 5-year age groups, 2006

Source of the data

The data concerning the incidence of malignant tumours presented in the Bulletin come from the Greater Poland Cancer Registry,

the data concerning the population structure in Greater Poland Province according to sex and 5-year age groups from the Statistical Office in Poznań. The data concerning the level

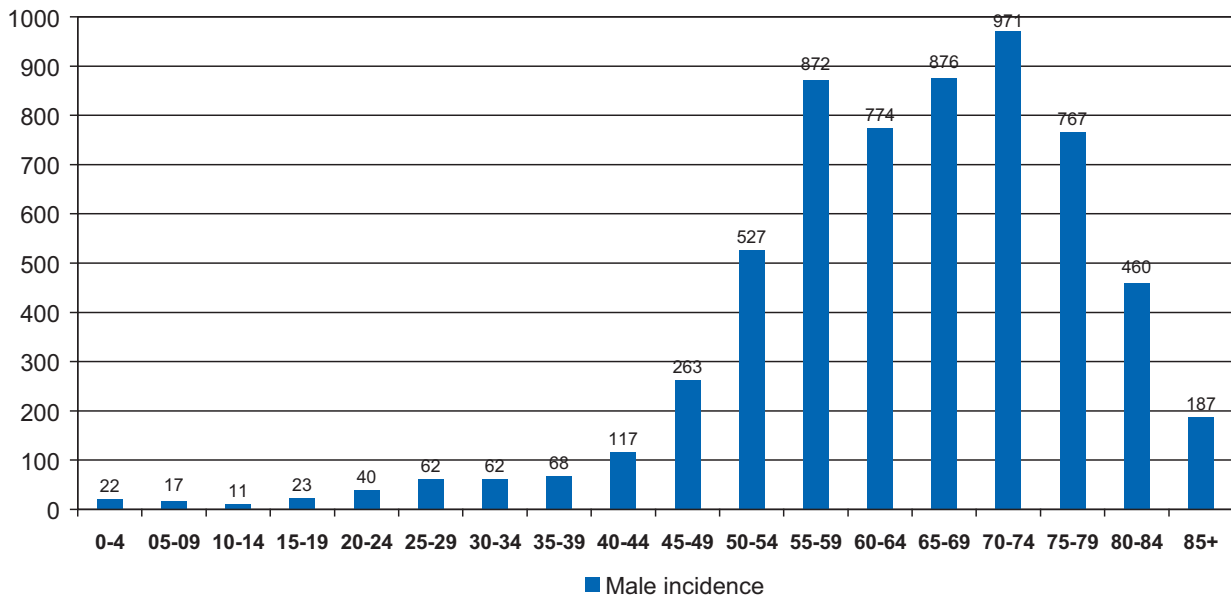


Fig. 4. Malignant tumour incidence among men in Greater Poland in 5-year age groups, 2006

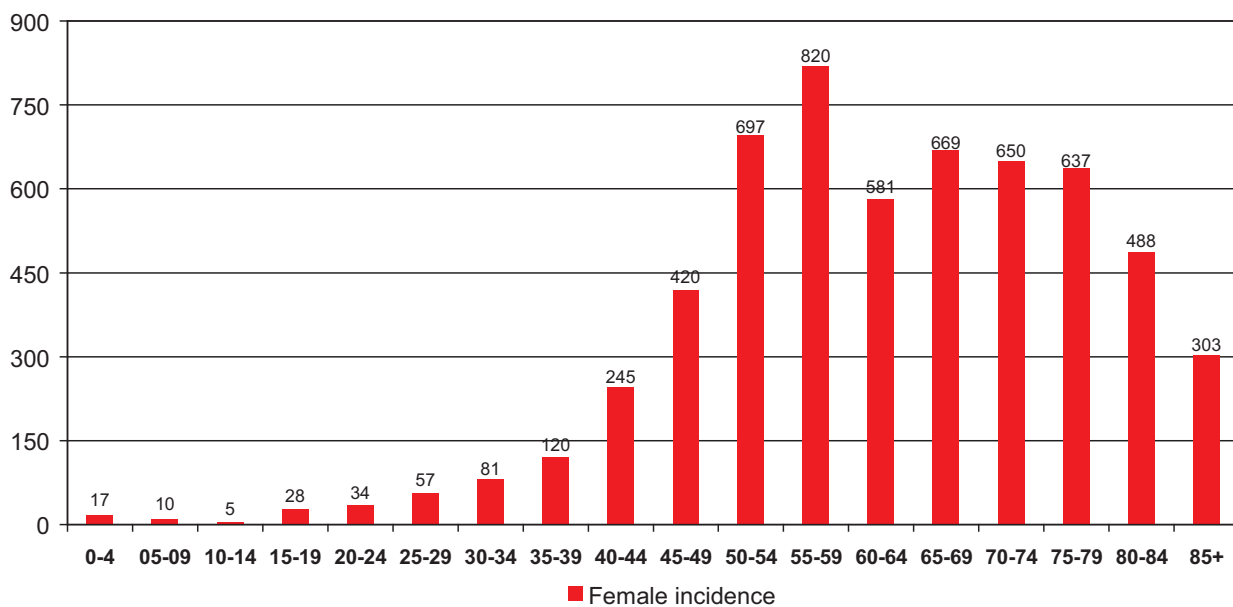


Fig. 5. Malignant tumour incidence among women in Greater Poland in 5-year age groups, 2006

of mortality come from the National Cancer Registry.

Incidence in Greater Poland

The Greater Poland Cancer Registry gathers and processes the data for approximately 12

thousand new reports of cancers in Greater Poland a year on the basis of the cancer case report card. 11 981 new cases of malignant tumours were reported in 2006 in Greater Poland. In comparison with 2005 (11 786 new cases) an increase of incidence by 1.65% was noted.

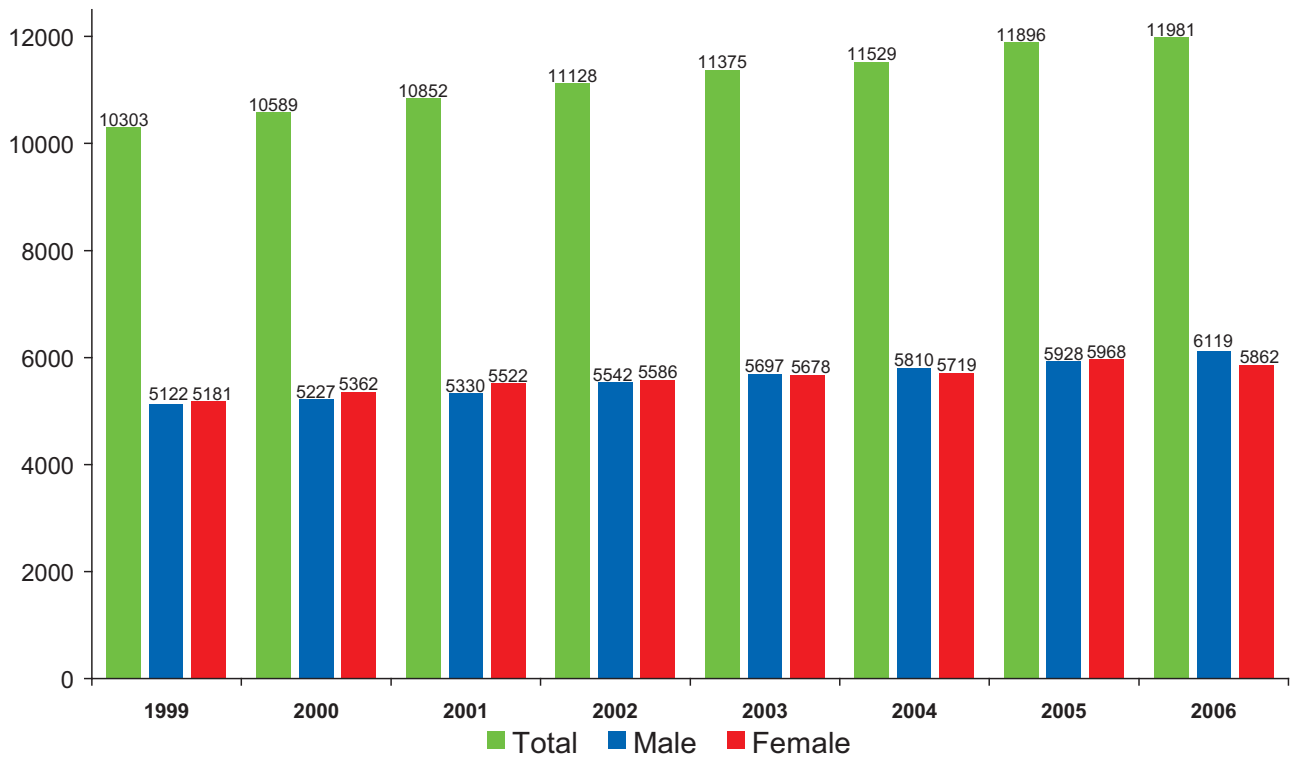


Fig. 6. Malignant tumour morbidity in Greater Poland Province in 1999–2006

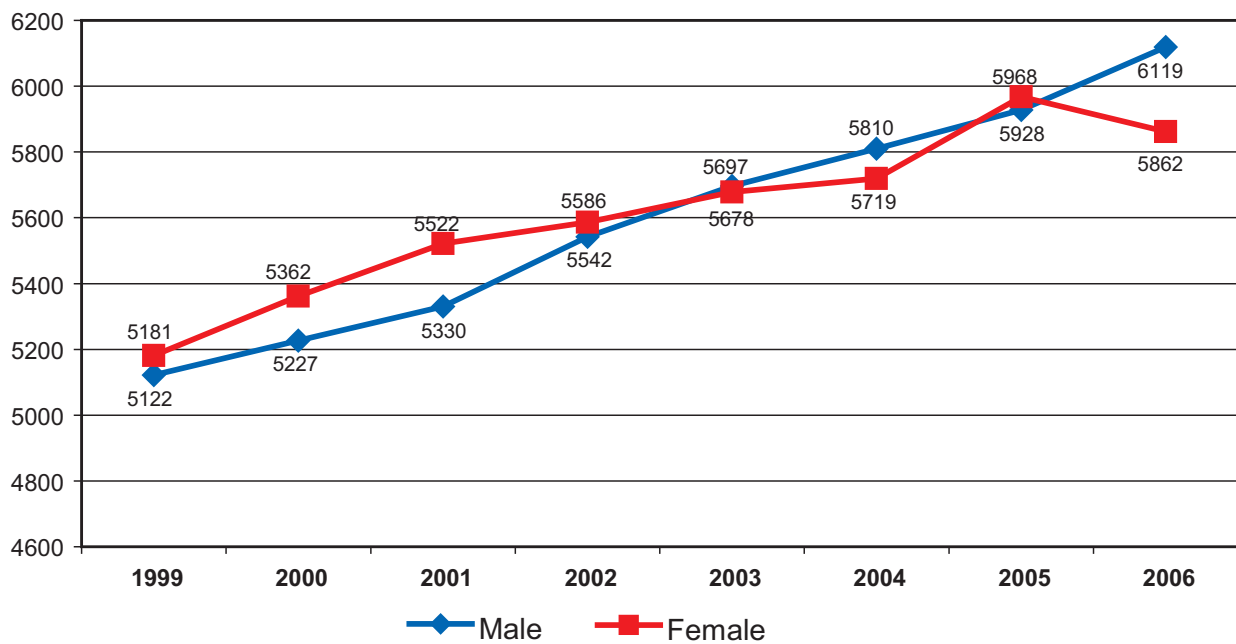


Fig. 7. Malignant tumour morbidity in Greater Poland Province in 1999–2006

Incidence for the most common malignant tumours in Greater Poland Province in 2006 (per 100 thousand)

	Site of neoplasm	Absolute number	Crude incidence rate	Standardized incidence rate
Ordinal number	Men	6 119	374.3	298.2
1.	C33 – C34 lung (21.7%)	1326	81.1	64.4
2.	C18 – C21 colorectal (12.0%)	737	45.1	35.3
3.	C61 prostate (12.0 %)	737	45.1	34.6
4.	C67 urinary bladder (6.9%)	424	25.9	20.2
5.	C16 stomach (5.3%)	323	19.8	15.2
6.	C64 kidney (3.4%)	205	12.5	10.1
7.	C32 larynx (2.6%)	167	9.9	8.0
8.	C25 pancreas (2.3%)	142	8.7	6.9
9.	C71 brain (2.2%)	134	8.2	7.2
10.	C62 testis (1.6%)	99	6.0	5.7
Ordinal number	Women	5 862	337.8	225.8
1.	C50 breast (21.6%)	1268	73.1	52.1
2.	C18 – C21 colorectal (9.9%)	581	33.1	20.0
3.	C33 – C34 lung (7.5%)	438	25.2	16.6
4.	C54 corpus uteri (6.6%)	387	22.3	15.8
5.	C56 ovary (5.1%)	298	17.2	12.4
6.	C53 cervix (4.4%)	255	14.7	11.1
7.	C16 stomach (2.9%)	168	9.7	5.5
8.	C73 thyroid (2.4%)	139	8.0	6.7
9.	C25 pancreas (2.3%)	134	7.7	4.7
10.	C71 brain (2.3%)	133	7.7	5.6

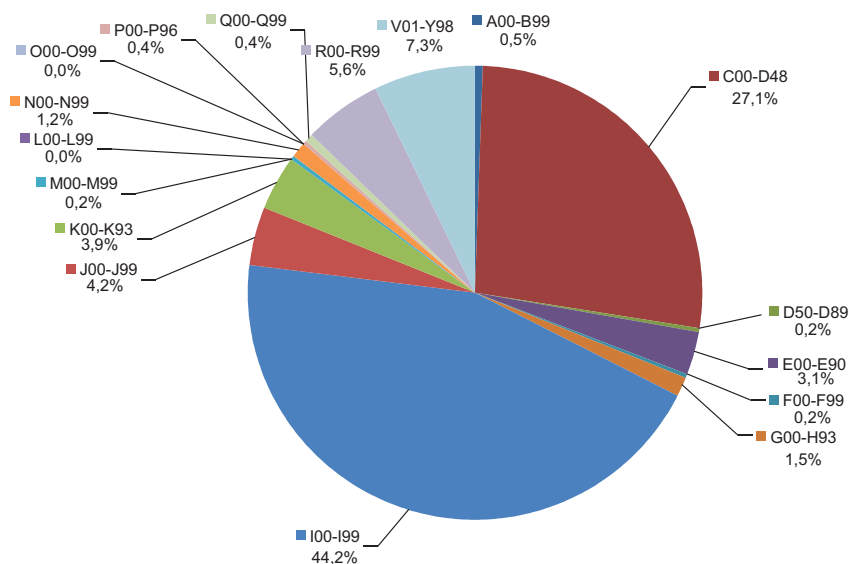


Fig. 8. Number of deaths by causes (ICD-X) in Greater Poland in 2006

The most common tumour sites causing death were:

among men	among women
C33 – C34 lung (21.7%)	C50 breast (21.6%)
C18 – C21 colorectal (12.0%)	C18 – C21 colorectal (9.9%)
C61 prostate (12.0%)	C33 – C34 lung (7.5%)
C67 urinary bladder (6.9%)	C54 pancreas (6.6%)
C16 stomach (5.3%)	C56 ovary (5.1%)
C64 kidney (3.4%)	C53 cervix (4.4%)
C32 larynx (2.6%)	C16 stomach (2.9%)
C25 pancreas (2.3%)	C73 thyroid (2.4%)
C71 brain (2.2%)	C25 pancreas (2.3%)
C62 testis (1.6%)	C71 brain (2.3%)

Table 6. Cancer deaths in Greater Poland, male 1999–2006

Year	Absolute number	Crude rate	Stand. rate
1999	4 149	254.7	219.5
2000	4 108	251.9	212.5
2001	4 178	255.8	211.6
2002	4 193	258.0	210.5
2003	4 266	262.3	209.6
2004	4 550	279.3	220.8
2005	4 345	266.2	206.4
2006	4 572	279.6	217.1

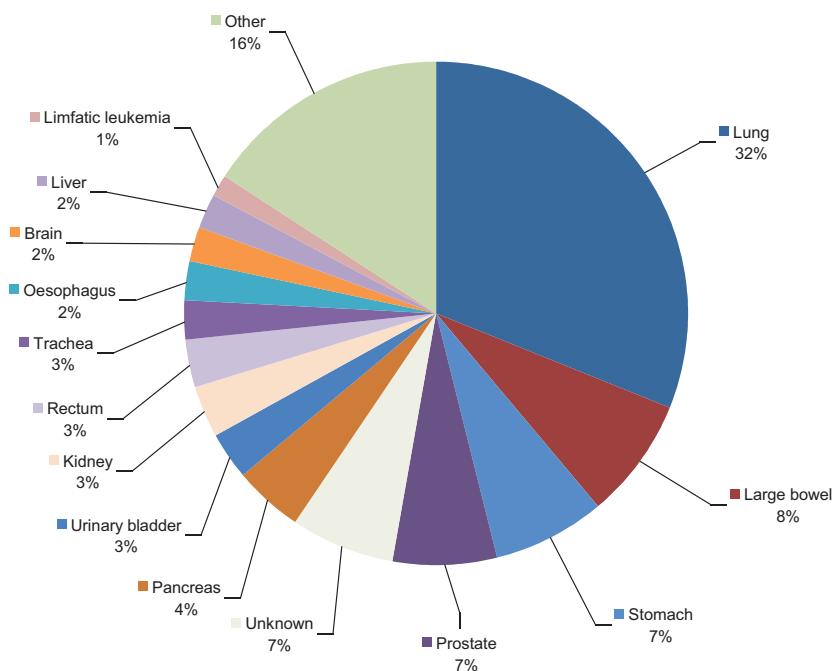


Fig. 9. Structure of cancer deaths in Greater Poland, male 2006

In this bulletin is presented the malignant tumour incidence among men and women in Greater Poland in 2006, as well as graphs showing incidence breakdown by particular age groups.

High incidence occurs among men of 55–59 years and at the age of 65–79 with an incidence peak for the age group of 70–74 years (Figs. 3 and 4). This is caused by the increase of the length of life among people who are more susceptible.

The highest incidence occurs among women in the age group of 50–59 years and in the group of 65–79 years (Figs. 3 and 5).

As seen in Figure 6, the number of registered cases in Greater Poland is increasing, while in Figure 7 a slower rise in incidence among women in Greater Poland can be noticed from 2002 to 2004. In 2004 and 2006 the number of new registered cases among women was lower than among men.

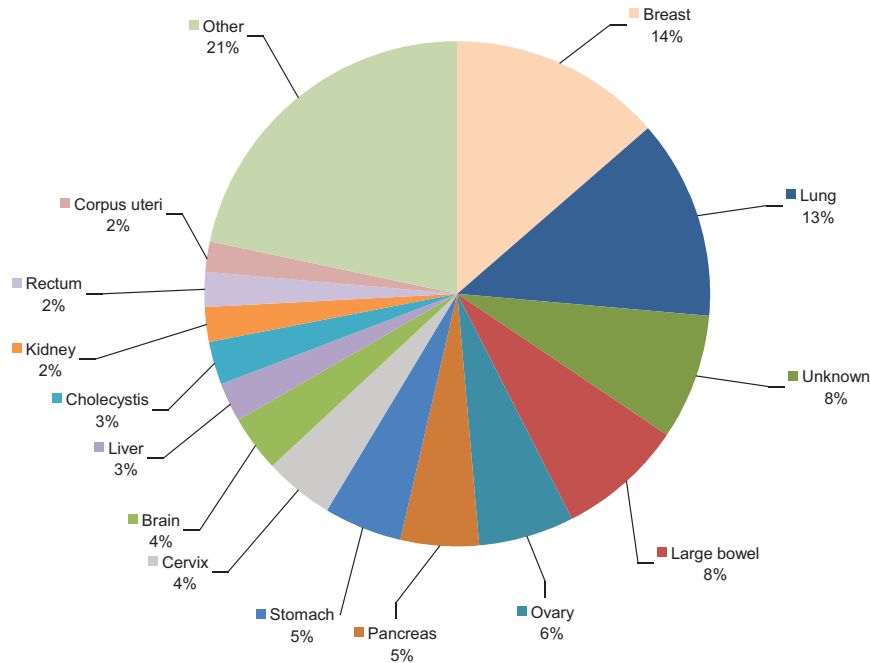


Fig. 10. Cancer deaths in Greater Poland, female 2006

Table 7. Cancer deaths in Greater Poland, female 1999–2006

Year	Absolute number	Crude rate	Stand. rate
1999	3 234	188.1	117.6
2000	3 321	192.9	117.8
2001	3 408	197.6	119.0
2002	3 391	196.8	116.9
2003	3 329	193.0	111.7
2004	3 407	197.2	112.8
2005	3 540	204.4	114.5
2006	3 679	212.0	123.7

In the next part of the Report, incidence for the ten most common malignant tumours in Greater Poland in 2006 is presented.

Mortality in Greater Poland

In 2006 mortality due to tumours (C00-D49 mortality 8 355) was the second cause (27.1%) of death after diseases of the circulatory system (mortality 13 659, 44.2%). This is shown in Figure 8. Of the total number of deaths (30 872) for Greater Poland, as many as 26.7% are due to malignant tumours (C00-D09 mortality 8 251).

Despite the fact that the incidence among men and women remains nearly at an equal level (difference of 207 cases), the mortality is considerably higher among men (difference of 893 deaths). This is caused by the fact that men visit the doctor less than women, which is reflected in late cancer detection at a more advanced stage, which gives a lower chance of survival. The second reason for this situation is that the most common cancer among women – breast cancer – gives better chances of full recovery than lung cancer, which is the most common cancer among men.

The mortality rates in the age groups for men and women in 2006 are presented in Figure 12. The highest death rate was noted among men in the age groups presented from 65 to 79 years, among women in the age groups from 70 to 84 years.

Mortality rates for men and women are similar until 44 years of life, but from age 45 they grow apart. In fact, the difference in number of deaths between men and women begins to increase, which is a result of two factors: – most preventive programmes are aimed at women,

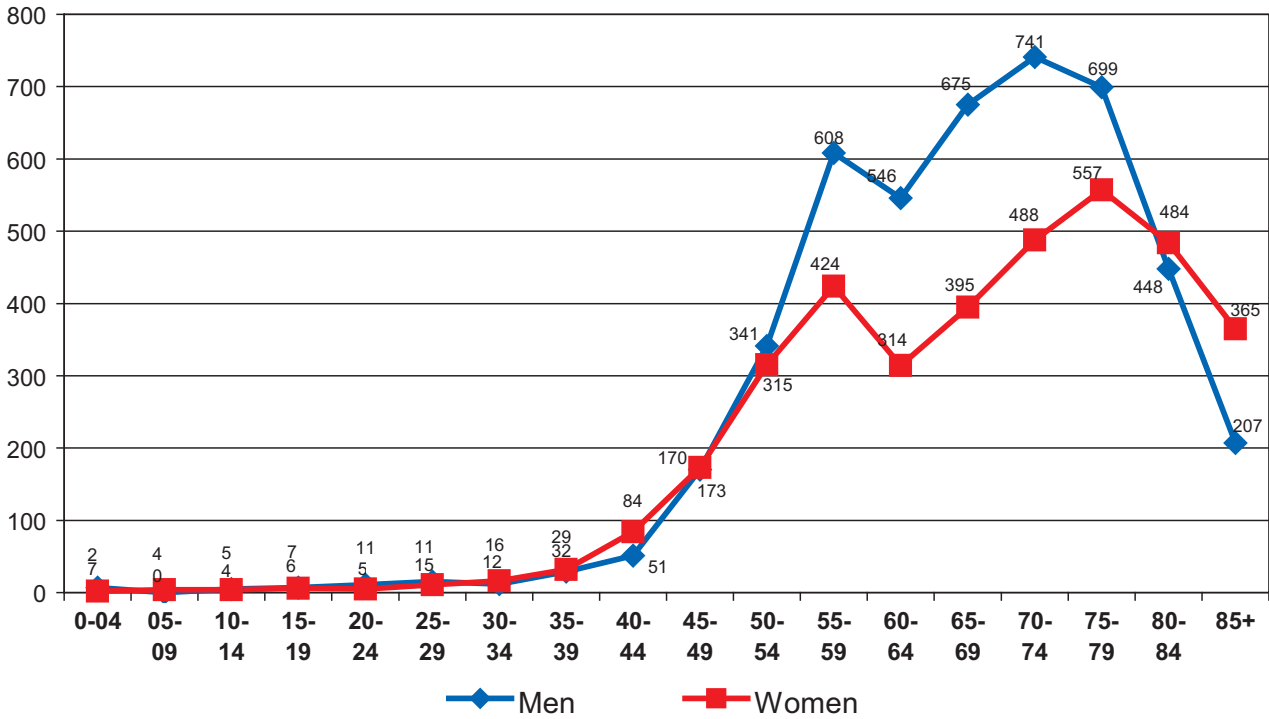


Fig. 11. Mortality due to malignant tumours among men and women in Greater Poland Province in 5-year age groups, 2006

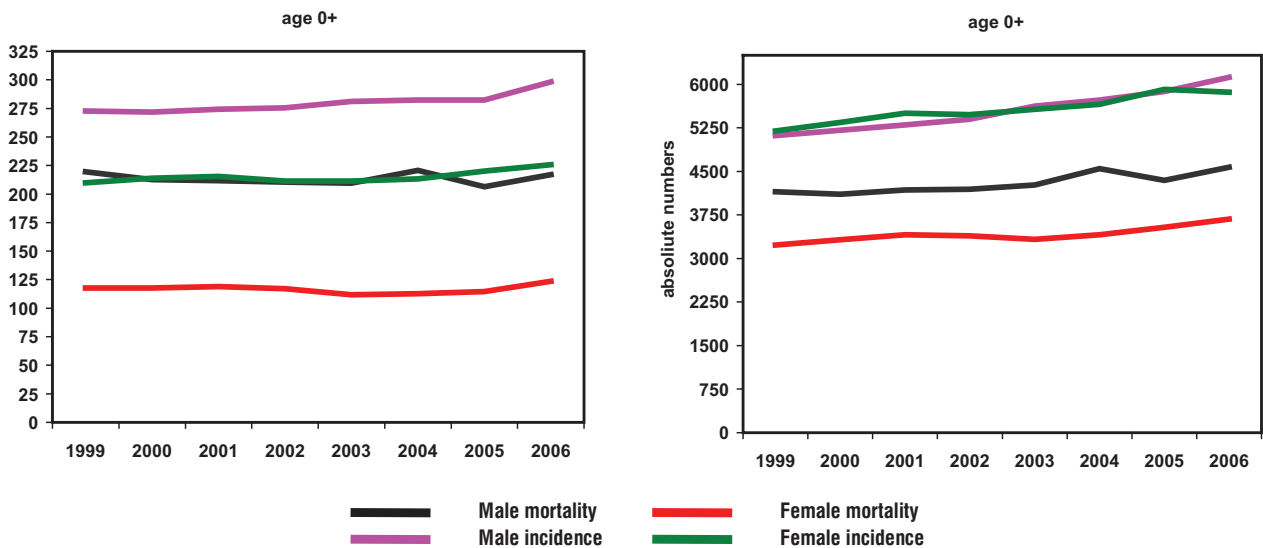


Fig. 12. Number of cases and deaths registered in Greater Poland (standardized rates and absolute numbers) (1999–2006)

– women are more interested in their health status.

In age group 55–79 the number of cancer deaths among men is much higher than

among women. Mortality rates due to the ten most common malignant tumours in Greater Poland in 2006 are presented in the table below.

Mortality due to the most common malignant tumours in Greater Poland Province in 2006 (per 100 thousand)

	Site of neoplasm	Absolute number	Crude incidence rate	Standardized incidence rate
Ordinal number	Men	4572	279.6	217.1
1.	C33 – C34 lung (31.2%)	1426	87.2	68.8
2.	C18 – C21 colorectal (11.6%)	529	38.3	24.3
3.	C16 stomach (7.3%)	332	20.3	15.6
4.	C61 prostate (6.8%)	310	19.0	13.7
5.	C25 pancreas (4.4%)	201	12.3	9.7
6.	C67 urinary bladder (4.0%)	185	11.3	8.5
7.	C64 kidney (3.5%)	160	9.8	7.3
8.	C32 larynx (2.6%)	119	7.3	5.7
9.	C15 oesophagus (2.5%)	112	6.9	5.7
10.	C71 brain (2.3%)	106	6.5	5.5
Ordinal number	Women	3679	212.0	123.7
1.	C50 breast (13.7%)	503	29.0	17.4
2.	C33 – C34 lung (12.7%)	466	26.9	16.9
3.	C18 – C21 colorectal (11.4%)	418	24.1	12.2
4.	C56 ovary (6.1%)	224	12.9	8.7
5.	C25 pancreas (5.1%)	188	10.8	6.2
6.	C16 stomach (4.9%)	181	10.4	5.6
7.	C53 cervix (4.3%)	159	9.2	6.2
8.	C71 brain (3.8%)	139	8.0	5.1
9.	C64 kidney (2.4%)	88	5.1	2.7
10.	C54 corpus uteri (1.8%)	66	3.8	2.4

Conclusion

Greater Poland is a region of high cancer risk in Poland. Standardized rates for cancer incidence among men and women are the highest in Poland. Standardized rates for cancer deaths are also very high: the 2nd place for women and 4th for men.

When analysing the absolute numbers of cases and deaths among men in Greater Poland for the last eight years, we observe an increase of number of cases by 16.14% and deaths by 10.85% (Figure 12). A positive fact is that the lines of registered incidences and deaths are beginning to diverge.

During analysis an increase of incidence among men by 19.56% and by 12.77% for women was observed. The number of deaths has increased by 10.19% for men and 13.76% for women. The lines of crude rates for incidences

and deaths are beginning to diverge similarly in men and women (Figure 12).

The most common cancer incidence sites in Greater Poland for men are: lung, colorectum and prostate. Among women breast, colorectum and lung are the most common cancer sites.

The most common cancer death sites in Greater Poland for men are: lung, colorectum and stomach. Among women breast, lung and colorectum are the most common cancer sites.

When analysing morbidity and mortality of malignant tumours, for example standardized rates among men and women (Figure 12), we see clearly that increase of number of new cancer cases and deaths is determined first of all by ageing in the Greater Poland population. Standardized rates have stayed at a similar level for eight years, forming almost a straight line. Cancer is a serious health problem in this region.

Lung cancer in Greater Poland is in the first three most common cancer sites by incidence and mortality. The region has a medium lung cancer incidence and mortality compared to other voivodships. Lung cancer is in about 90% of cases caused by tobacco use. That is why incidence and mortality trends for this cancer follow the levels of active and second-hand smoking. In the analyzed period (1999–2006) lung cancer incidence and mortality among men decreased. Unfortunately the same trend is not observed among women. Smoking has become more popular among them during the last 50 years. That is reflected in incidence and mortality trends. In some regions of Poland lung cancer is more common than breast cancer, which is more typical for women.

High breast cancer incidence is very typical for Greater Poland. The eastern lifestyle that contains a lot of breast cancer risk factors is more common here than in western voivodships. Analysis of standardized rates shows that Greater Poland is in the 3rd place by breast cancer incidence and in the 4th place by breast cancer mortality compared to the rest of Poland.

The most important and at the same time the cheapest method to eliminate tumours is prophylactics and screening. The early ability to detect cancer (or pre-cancerous state) aims at decreasing the mortality caused by tumours. This is currently the most essential task, because patients with tumours detected at an early stage have a greater chance to recover, and the costs of their treatment are considerably lower.