The analysis of mortality from cardiovascular diseases in Pomeranian province

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Absract

Purpose: Descriptive epidemiology characterises frequency of appearance of given event (here decease) in dependence of many factors concerning a person, region or time of existence of given salubrious phenomena. The source of information was the official death registry that provides complete records of all deaths that took place in Pomeranian province. This description of sanitary situation of people from particular area enables doing comparison between regions, facilitates researching etiological factors, planning work of medical workers and programming preventive rules. Cardiovascular diseases during last fifty years are the main reason of death of people from developed countries witch is also Poland.

Material and methods: The aim of this work is to find out differences in health condition between citizens of Pomeranian province and other people in Poland and countries of European Union.

Results: In Pomeranian province in 2002 the highest mortality from cardiovascular diseases was observed for Sztum county (587.5/100 000) and was 72.5% of all deaths in this region. Similarly, there was high mortality these reasons in Tczew county (442.1/100 000), Malbork county (406.9/100 000) and also in Tricity (424.8/100 000). The lowest mortality from cardiovascular diseases was observed in Gdańsk county (257.2/100 000) and was only 40% of all deaths in this region. Relatively low mortality was in Czluchow county (288.9/100 000). Frequency of death from cardiovascular diseases in Pomeranian province has become lower from year 2000 (361.0/100 000) to year 2002 (347.9/100 000). It was lower than in other parts of Poland (449.8/100 000 in year 2000) but higher than in countries of European Union (257.8/100 000 in year 2000).

Conclusions: Mortality from cardiovascular diseases has decreased during last few years. Also there are distinctions in this phenomena among regions of Pomeranian province, other parts of Poland and countries of European Union. From these reasons health care should be differentiated to address the differences in spatial patterns of risk observed.

Key words: epidemiology, mortality, cardiovascular diseases.

Introduction

Cardiovascular diseases are the most widespread reason of the decease and one of the most frequent reasons of disability in Poland. In 2001 died 363.2 thousand people and 173.8 thousand of them died because of cardiovascular diseases. That was 46.8% of all deaths. The mortality rate was 431.5, and in 2002 – 412.4 per 100 000 persons [1,2]. The mortality caused by cardiovascular diseases had risen in Poland since seventies to eighties. In the same time in countries of the former European Union the number of deaths because of cardiovascular diseases had decreased. In Poland from the beginning of nineties this tendency firstly had stopped and than, in 1992 had inverted [1]. It is thought that this occurrence was caused by no-medical conditions of state of health connected with changes in the diet quality. Complying with this diet was possible because of economical transformations in Poland [3,4]. However, in Poland mortality rate connected with cardiovascular diseases is one of the highest in all Europe and big differences in comparison with European Union countries had not decreased. Cardiovascular diseases are in Poland the main reason of the precocious mortality (which means less than 64 years old) and determine 37% of

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Table 1. **Mortality in years 1999-2002 in Pomeranian province, Poland, Europe per 100 000 persons**

	Circulatory system disease					Ischaemic heart disease				
	1999	2000	2001	2002	Change 1999/2000 [%]	1999	2000	2001	2002	Change 1999/2000 [%]
Pomeranian province	381.5	361.0	371.1	347.9	- 8.8	b.d.	141.8	146.6	151.3	+ 6.6
Poland	469.0	444.0	431.5	412.4	- 12.1	147.9	141.0	133.5	125.5	- 15.1
Europe	266.7	257.8	244.7	238.5	- 10.6	103.2	97.4	94.2	b.d.	- 0.9

Table 2. **The general mortality rate connected with circulatory system diseases in counties of Pomeranian province**

Lp.	County	Number of deaths				Relation (2) to (1) in %
		(1) General mortality		(2) Circ. syst. diseases		
		total number	for 100 000 people	total number	for 100 000 people	
1	Bytów	563	749.9	227	302.2	40.3
2	Chojnice	677	750.7	334	370.1	49.3
3	Człuchów	423	740.8	165	288.9	39.0
4	Gdańsk	523	649.5	207	257.2	39.6
5	Kartuzy	687	660.2	314	301.7	45.7
6	Kościerzyna	493	750.7	252	383.6	51.1
7	Kwidzyn	623	779.8	281	351.7	45.1
8	Lębork	476	749.4	208	327.5	43.7
9	Malbork	562	890.4	257	406.9	45.7
10	Nowy Dwór Gdański	321	900.2	138	387.1	43.0
11	Puck	509	710.1	237	330.9	46.6
12	Słupsk	744	810.4	299	325.8	40.2
13	Starogard Gdański	991	820.7	446	369.3	45.0
14	Sztum	339	807.0	247	587.5	72.8
15	Tczew	996	889.5	495	442.1	49.7
16	Wejherowo	1377	789.8	511	293.0	37.1
	Pomeranian province	10780	812.0	4926	371.1	45.7
	Poland	364592	941.1	128426	331.5	45.9

all deaths for men and 17% for women [1]. The main reasons of decease in that group just like for all Polish people are cardiovascular diseases. World Health Organisation Regional Office shows that the level of precocious mortality caused by cardiovascular diseases was two and the half times higher in Poland than in EU countries.

Moreover, these big differences relating to the precocious mortality are observed only in reference to external reasons of men's mortality. It is anticipated that if in Poland present rate of reduction of the precocious mortality caused by cardiovascular diseases is going to be kept, it will achieve EU country's rate in 2018 (from 2001 in 17 years) [5].

Material and methods

The matter of this analysis was data concerning deaths from Pomeranian province. Data concerning deaths in particular counties, which had previously belonged to the Gdańsk province included five years period (since 1998 to 2002). Data from other counties of the Pomeranian province were possible to get only for three years period (since year 2000 to 2002). No standardised data, which was next taken to elaborate, had been received from Pomeranian Centre of the Health Protection. To analyse this data there was made in the Academy of Medicine in Gdańsk (in the Department of the Hygiene and Epidemiology) special computer program enabling quick choice of desirable parameters and moreover, the exact workout of chosen epidemiological coefficients and factors. It was necessary to use the publication of GUS (Principal Office of Statistic) relating to number of citizens in particular counties, during following years. In selection of data authors were using current symbols from International Statistical Classification of Diseases and Health Related Problem, Revision 10 – ICD 10.

Analysis was realised for deaths appointed with symbols:

- I 00 to I 99 – all deaths caused by cardiovascular diseases
- I 10 to I 15 – deaths because of ischaemic heart diseases
- I 21 to I 23 – deaths caused by infarct of heart muscle, repeated infarct of heart muscle and complications appearing during infarct of heart muscle.

The data about deceases in European Union and Poland come from the WHO database.

Results

Since 1999 to 2002 the mortality rate connected with cardiovascular diseases in the Pomeranian province had decreased about 8.8% (from 381.5 to 347.9/100 000 persons). However, the frequency of deaths connected with the ischaemic heart disease since 2000 to 2002 had increased about 6.6% (from 141.8 to 151.3/100 000 persons).

In Poland as well as in European Union countries (*Tab. 1*) in that period (since 1999 to 2001) the mortality rate connected with circulatory system diseases had decreased (in Poland about 12.1% and in Europe about 10.6%). Also the mortality rate connected with the ischaemic heart disease had decreased (since 1999 to 2001) in Poland about 15.1% and in Europe about 0.9%.

In *Tab. 2* the general mortality was compared with the mortality rate connected with cardiovascular diseases, in different counties of the Pomeranian province, in 2001. The highest mortality caused by cardiovascular diseases was observed in Sztum county (587.5/100 000 persons) and was 72.8% of all deaths. It

***Table 3*. Tendency in mortality connected with cardiovascular diseases in counties of Pomeranian province**

Lp.	County	Change of mortality rate					
		Circulatory system diseases totality		Ischaemic heart disease			
				Totality		Infarct of heart muscle	
		trend	[%]	trend	[%]	trend	[%]
1	Bytów	-	15.9	+	28.2	-	62.6
2	Chojnice	-	13.1	+	46.8	+	12.2
3	Człuchów	-	13.0	+	7.1	-	5.1
4	Gdańsk	+	7.8	-	1.3	-	6.3
5	Kartuzy	+	5.2	+	23.2	-	5.4
6	Kościerzyna	+	9.9	+	6.1	-	5.1
7	Kwidzyn	-	3.2	+	11.2	+	4.1
8	Lębork	+	1.1	+	61.8		0
9	Malbork	-	34.7	-	21.3	-	26.3
10	Nowy Dwór Gdański	+	28.8	+	49.6	+	25.4
11	Puck	-	10.2	-	11.3	-	1.2
12	Słupsk	-	5.3	+	17.2	+	18.8
13	Starogard Gdański	-	8.9	-	1.3	-	19.1
14	Sztum	+	10.1	+	9.4	+	10.2
15	Tczew	+	6.1	+	15.8	+	16.3
16	Wejherowo	+	4.3	+	14.2	+	14.2
	Pomeranian province	-	3.6	+	6.6	-	14.1
	Poland	-	7.1	-	10.9	-	15.1
	Europe	-	7.5	-	8.7		b.d.

was also high in Tczew county (442.1/100000) and was 49.7% of the general mortality. A significant percentage of deaths caused by diseases of circulatory system in reference to the general mortality was observed in Kościerzyna county (51.1%) as well as in Chojnice county (49.3%). In Pomeranian province the coefficient of deaths caused by diseases of circulatory system was 45.7% of the general mortality when in whole Poland it was 45.9%.

Since 2000 to 2002 in 8 counties (from 16, which is 50.0%) frequency of decease because of cardiovascular diseases had decreased, while in 8 other counties had increased (*Tab. 3*). The highest decrease was observed in Malbork county (34.7%), and the highest increase in Nowy Dwór Gdański county (28.8%). In Pomeranian province the mortality rate connected with mentioned causes had decreased about 3.6 % and in EU countries about 7.5%. In the same period in most counties of the Pomeranian province mortality rate connected with ischaemic heart disease had increased. The highest increase was observed in Lębork county (61.8%), Nowy Dwór Gdański county (49.6%) and Chojnice county (46.8%). Also in whole Poland mortality rate from that reason had increased about 6.6% while in EU countries had decreased about 10.9%. In Malbork county mortality rate connected with ischaemic heart disease had decreased about 21.3%. Significant decrease of mortality rate connected with infarct of heart muscle was observed in Bytów county (62.2%), Malbork county (26.3%) and Starogard Gdański county (19.1%). However the highest increase was observed

***Table 4*. Relation between men's and women's mortality rate connected with cardiovascular diseases**

	Circulatory system diseases		
	Totality	Ischaemic heart disease	
		Totality	Infarct of heart muscle
Pomeranian province	100 / 111	100 / 94	100 / 61
Town	100 / 114	100 / 99	100 / 66
Village	100 / 104	100 / 83	100 / 51
Tricity	100 / 115	100 / 101	100 / 71

in Nowy Dwór Gdański county (25.4%) and Słupsk county (18.8%). In Poland the mortality rate connected with the infarct of heart muscle had decreased since 2000 to 2002 about 14.1% and in EU countries of about 15.1%.

In Pomeranian province in 2002 there was 100 men for 105 women. Among deceased because of cardiovascular diseases proportion between men and women was 100/111, because of ischaemic heart disease – 100/94 and infarct of heart muscle 100/61.

Among deceased inhabitants of cities in Pomeranian province that proportions were 100/114, 100/99, 100/66, in villages – 100/104, 100/83, 100/51, whereas in Tricity: 100/115, 100/101, 100/71 (*Tab. 4*).

Differences in age structure of people died because of cardiovascular diseases were not observed in towns as well as in villages (*Fig. 1*). However, there were some differences between mortality rate of men and women. Among men from younger age groups, proportion of decease is several times higher than for women. Only in groups of 70 and over 70 years old women outnumbered men (*Fig. 2*).

Discussion

Cardiovascular diseases from few dozens years are the most frequent reason of decease in Poland as well as in most countries. In 1970 the standardised mortality rate connected with cardiovascular diseases for men in age from 0 to 64 years old in Poland was similar to that in EU countries, while for women in the same age the mortality rate was lower in Poland than in EU countries. From that period to beginning of nineties the mortality rate had been increasing in Poland while in EU countries it had been decreasing. In Poland this unfavourable tendency in 1992 had inverted.

Results of our research confirm that the mortality rate connected with cardiovascular diseases in Pomeranian province, in Poland and in EU countries had been decreasing since 1999 to 2002. In Poland as well as in EU countries at the beginning of 21th century frequency of death because of ischaemic heart disease had decreased, however, in Pomeranian province since 2000 to 2002 it had increased about 6.6%. It requires further observation as well as urgent inclusion of preventive aids.

In particular counties of Pomeranian province there are differences in mortality rate connected with circulatory system diseases, as well as in the tendency of rate change since 2000 to 2002. Particularly disturbing is positive tendency of the mortal-

Figure 1. **Age structure and number of the people died because of circulatory system diseases in Pomeranian province in 2002 according to place of living**

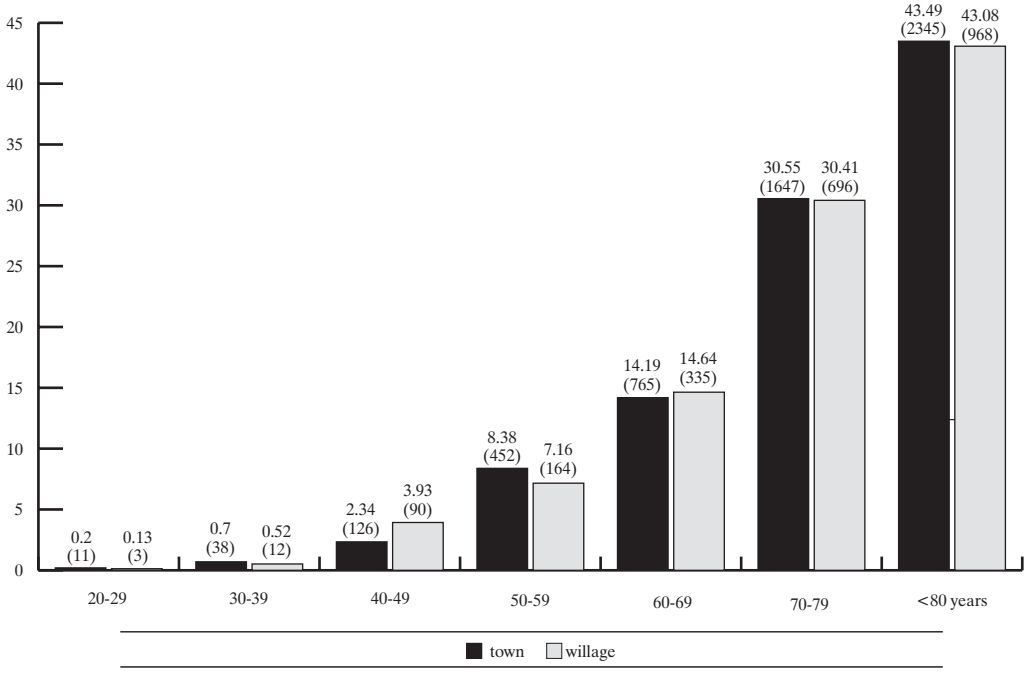
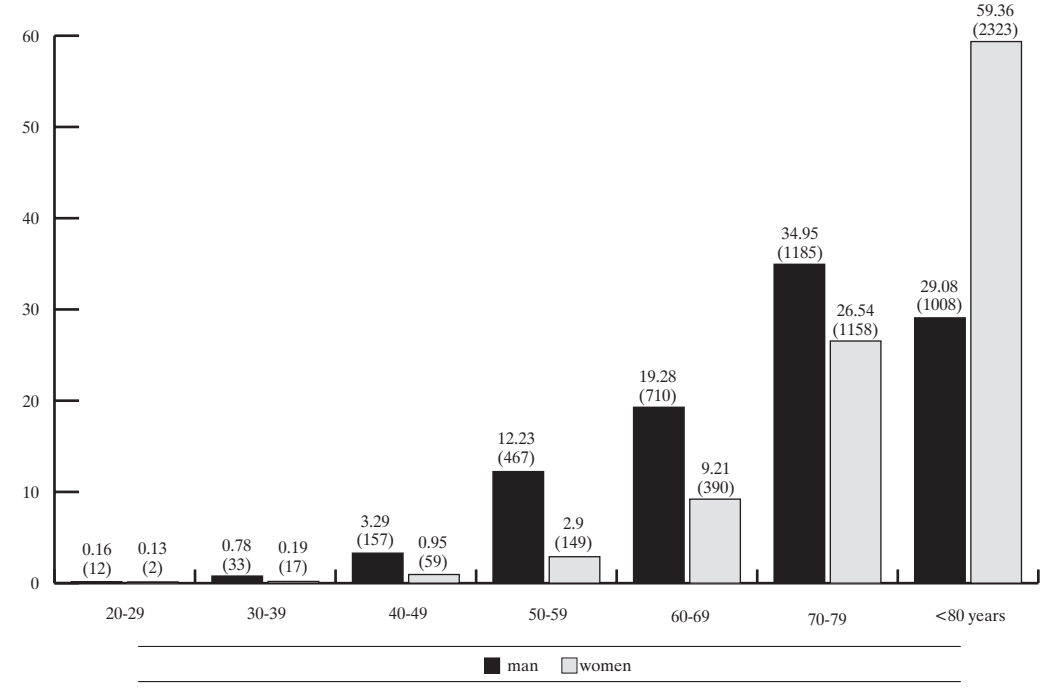


Figure 2. **Age structure and number of the people died because of circulatory system diseases in Pomeranian province in 2002 according to sex**



ity rate connected with cardiovascular diseases (including also mortality relative to ischaemic heart disease and infarct of heart muscle) in Nowy Dwór Gdański county, Sztum county and Wejherowo county.

Aetiology of circulatory system diseases is dependent to a large degree to environmental and social-economical factors as well as to pro-sanitary behaviours, while mortality depends to Health Care's quality.

Geographical variation of mortality from cardiovascular diseases could be attributable to regional differences in public health system policy. The differences in performance of health care services occurred mainly due to liberation in market of

health care services in transition period. The changes in health care services that would affect the cardiovascular mortality could be those related to emergency medicine, diagnostics procedures and prevention.

In Pomeranian province about 6.8% of employees in 2002 had been working in health damaging conditions. Pomeranian province in comparison with others polish provinces has 5th position in emission of dust pollution and 6th in emission of gas pollution. Number of medical advises was 5.5 per person during 2002 [6,7].

Among inhabitants of Pomeranian province in 2002 there were 100 men for 105 women. Comparison of men and women's mortality rate connected with circulatory system diseases (100/111) shows that it is higher for women. However, it is on the contrary for men if there are analysing mortality rate connected with ischaemic heart disease (100/94) and infarct of heart muscle (100/61).

It is necessary to find the reason of very high mortality rate connected with cardiovascular diseases in Sztum county (72.8% of all deaths, when normally it does not reach 50.0%).

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