

Early lung cancer detection program in Szczecin – massive screening for moderate costs

Prof. dr hab. med. Tomasz Grodzki
Thoracic Surgery
Pomeranian Medical University
Szczecin Zdunowo

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Vaasa



Lung cancer – incidence per 100 000*





Lung cancer 5-years survival



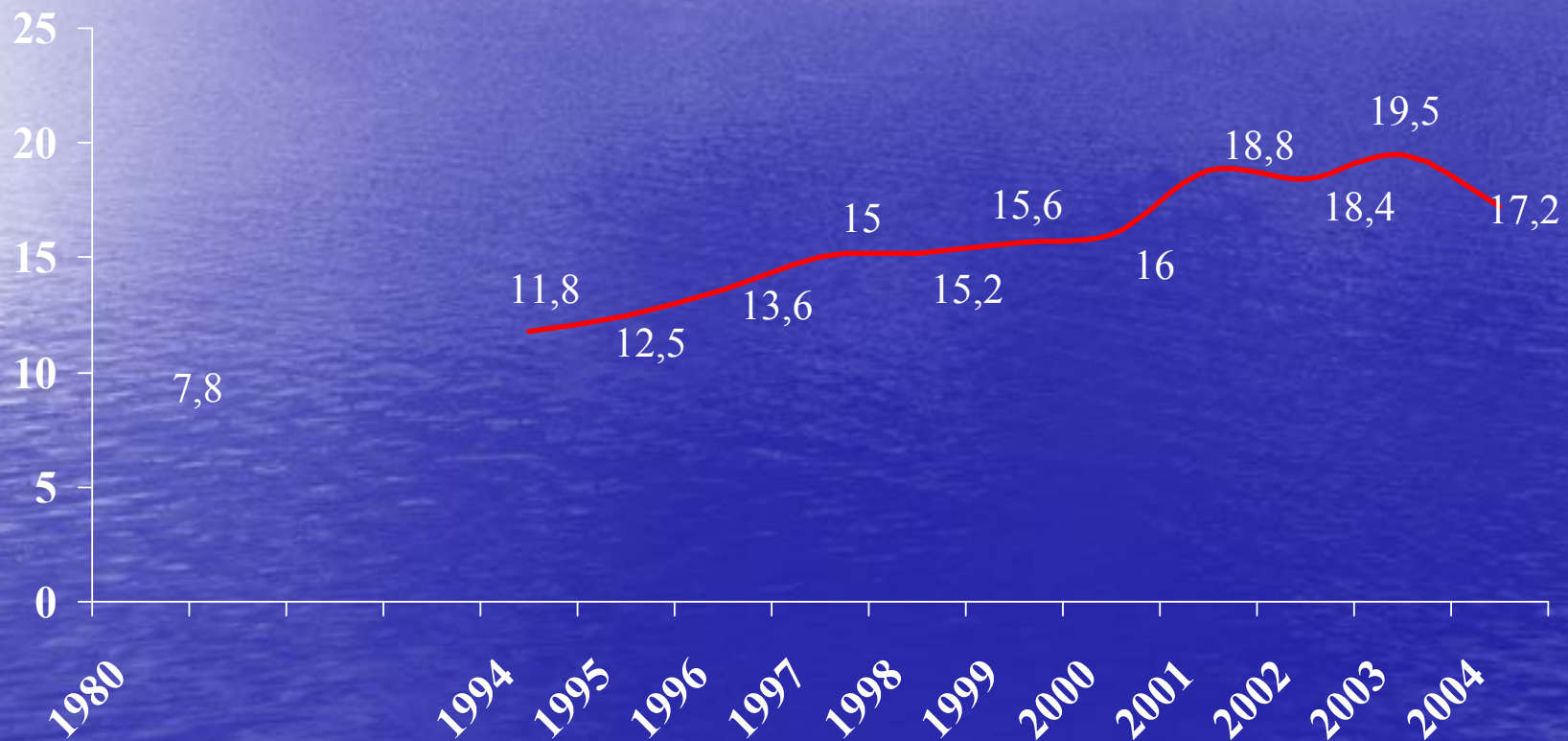
Estimated New Cases*

			Males	Females			
Prostate	218,890	29%			Breast	178,480	26%
Lung & bronchus	114,760	15%			Lung & bronchus	98,620	15%
Colon & rectum	79,130	10%			Colon & rectum	74,630	11%
Urinary bladder	50,040	7%			Uterine corpus	39,080	6%
Non-Hodgkin lymphoma	34,200	4%			Non-Hodgkin lymphoma	28,990	4%
Melanoma of the skin	33,910	4%			Melanoma of the skin	26,030	4%
Kidney & renal pelvis	31,590	4%			Thyroid	25,480	4%
Leukemia	24,800	3%			Ovary	22,430	3%
Oral cavity & pharynx	24,180	3%			Kidney & renal pelvis	19,600	3%
Pancreas	18,830	2%			Leukemia	19,440	3%
All Sites	766,860	100%			All Sites	678,060	100%

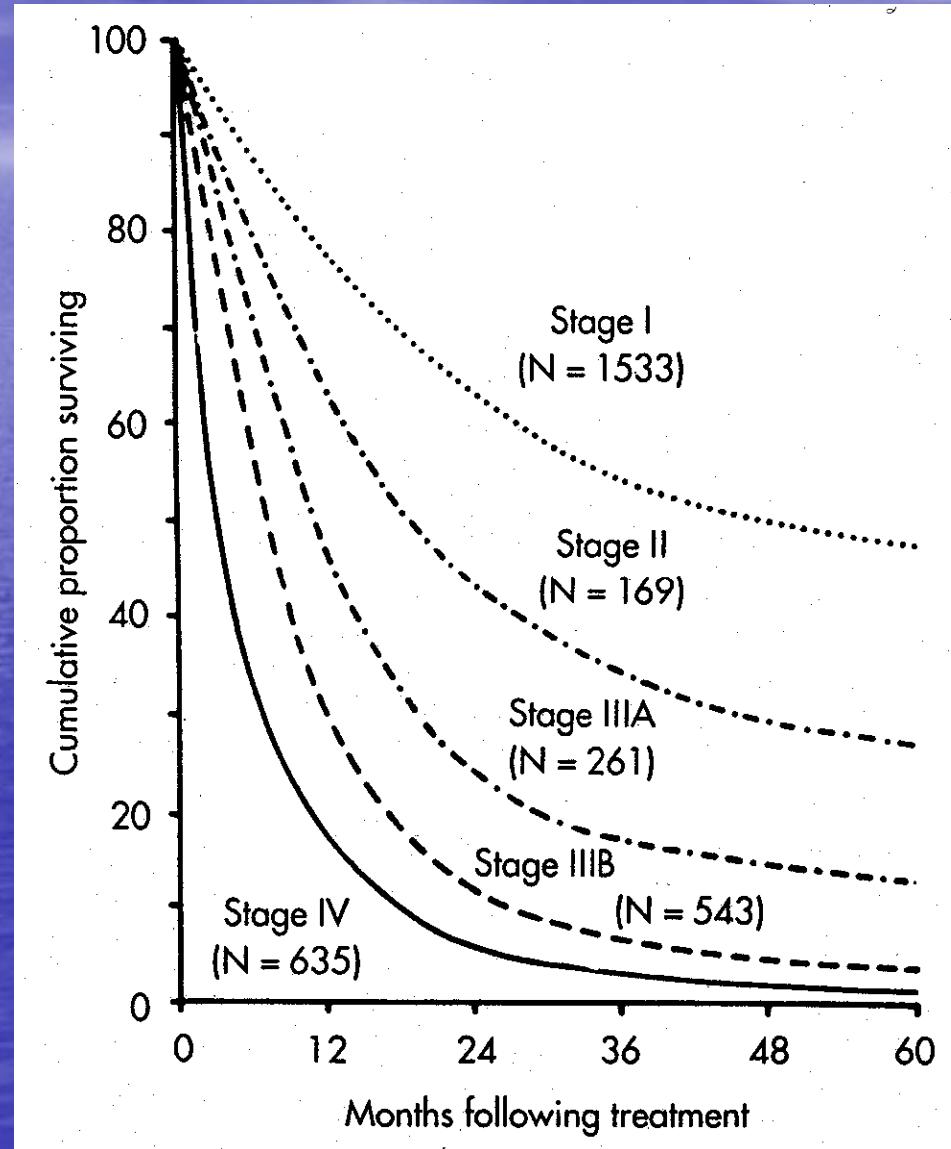
Estimated Deaths

			Males	Females			
Lung & bronchus	89,510	31%			Lung & bronchus	70,880	26%
Prostate	27,050	9%			Breast	40,460	15%
Colon & rectum	26,000	9%			Colon & rectum	26,180	10%
Pancreas	16,840	6%			Pancreas	16,530	6%
Leukemia	12,320	4%			Ovary	15,280	6%
Liver & intrahepatic bile duct	11,280	4%			Leukemia	9,470	4%
Esophagus	10,900	4%			Non-Hodgkin lymphoma	9,060	3%
Urinary bladder	9,630	3%			Uterine corpus	7,400	3%
Non-Hodgkin lymphoma	9,600	3%			Brain & other nervous system	5,590	2%
Kidney & renal pelvis	8,080	3%			Liver & intrahepatic bile duct	5,500	2%
All Sites	289,550	100%			All Sites	270,100	100%

Lung cancer resection rate in Poland



Survival in accordance with TNM stage



West Pomerania



- Zduńsko – one of the largest thoracic surgeries in Poland
- Resection rate >20%
- 250 – 300 primary lung cancers resected annually
- Perioperative mortality after major resections - 1.2%

What does it mean?

- Of **100** lung cancer patients **50** are not diagnosed before death
- Of the remaining **50** just **25** are fit for radical resection
- Of **25** treated surgically **16** will be resected really radically
- Of **16** only **5** will survive for 5 years

So

If we can increase resection rate from 16% to 35% it will double the number of long-term survivors

Who is the key person to improve our results

- Thoracic surgeon - NO
- Pulmonologist - NO

- Hospital specialists - NO
- Family doctor and patient itself
YES

Lung cancer screening trends

- Massive screening based on CT (computed tomography)
- Used in Japan, Denmark, Holland, Italy, Germany and some regions of the USA
- They result in early detection of the lung cancer and reduce mortality from this disease (NEJM 2011;365:395-409)
- Early detection = better prognosis

What did we think in Szczecin about?

- Screening for 15 000 citizens 55-65 years of age, heavy smokers
- City Council has provided ca 350 000 Euro (0.1% of the Szczecin budget) per year
- It worked (since Apr 2008)

Key factor - cooperation

Family doctors

Radiologists

Pulmonologists

Thoracic surgeons

Technicians

City Council and Mayor support

1.04.2008 – 31.03.2011

Detected lesion	N	N of lung cancer detected
< 5 mm asymptomatic	1862	1 (<u>1/1862 CT</u>)
<5 mm asymptomatic multiple	1741	4 (<u>1/435 CT</u>)
5 -15 mm asymptomatic	1576	26 (<u>1/60 CT</u>)
5 -15 mm asymptomatic multiple	750	23 (<u>1/32 CT</u>)
> 15 mm asymptomatic	445	40 (<u>1/11 CT</u>)
> 15 mm symptomatic	78	26 (<u>1/3 CT</u>)
All positive	6452	119 (<u>1/54 CT</u>)
Negative	8568	1
All	15020*	120 (1/125 CT)

*

- 77/120 (64,1%) treated surgically
 - 39 (50,6%) adenoca
 - 9 (11,6%) bronchioalveolare
 - 29 (37,6%) squamous
- 53/77 (69.0%) stage I
- 33 metastatic lesions

Metastatic lesions

Kidney	6
Large bowel	9 (24,1%)
Breast	4
Larynx	4
Goiter	3
Stomach	1
Malignant melanoma	1
Liver	1
Bone sarcoma	1
<u>Mesothelioma</u>	<u>3</u>
All	33

Benign lesions

42 cases

Hamartoma	9
TB	20 (47,6%)
Aspergilloma	1
Fibrosis	5
Intrapulmonary nodule	1
Silicosis	6

Our results vs others

Author	n	Lung cancer per 1000 CT	Avg diameter in mm	% of lesions visible on X-ray	% stage I
Ohmatsu et al	9 452	3,7	15	26	82
Sone et al	5 483	4,8	17	21	84
Yasuda et al	2 201	3,6	20	38	100
Kaneko et al	1 369	4,3	16	27	93
Henschke et al	1 000	2,8	10	25	85
Szczecin	15020	7,9	10	18	69

Potential disadvantages

- Many lesions of potentially minimal clinical importance:
 - Patients anxiety
 - Need for invasive diagnostic procedures with potential risk of complications
 - Increased workload for radiologists, technicians, pulmonologists
- Potential psychosocial impact
- Some surgeries will not confirm malignant lesions
- Potential risk of treatment delay in cases of lesions assessed as probably benign due to algorithms
- Relatively high cost of one NSCLC detection

Advantages

- Large number of early detected NSCLC (majority in stage I)
- Increased number of lobectomies vs pneumonectomies
- Detection of other lesions potentially life threatening (aneurysms, lymphomas, TB)
- Positive impact on postoperative course
- **Positive impact on long term survival** ("Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening" by the National Lung Screening Trial Research Team – NEJM 2011;365:395-409)

Costs

- Per one lung cancer detected 35400 zł
- Avg monthly wage 3200 zł – it means that one year after returning back to work it is compensated. Usually patients are able to work if treated by less invasive resection (maximum lobectomy)
- Costs for the City – 0.1% of the annual budget

- Screening can and does save lives
- Dr Claudia Henschke

Thank you for your attention