

Giedrė Smailytė

Lithuanian Cancer Registry, National Cancer Institute, Vilnius, Lithuania
Lithuanian Social Research Centre, Vilnius, Lithuania

Domantas Jasilionis

Lithuanian Social Research Centre, Vilnius, Lithuania

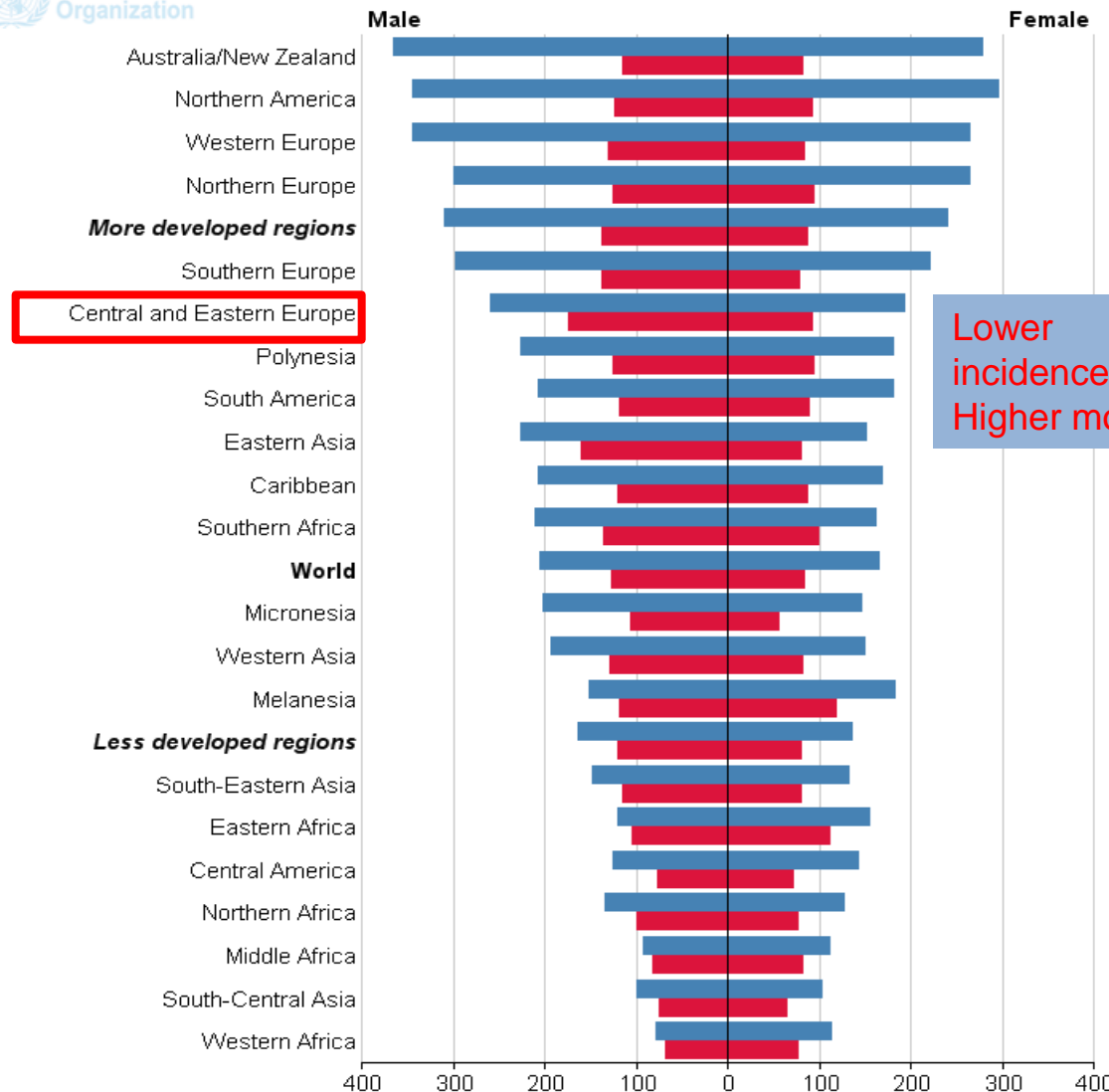
Educational gradients in site-specific cancer incidence and mortality



The research is funded by EU structural assistance (European Social Fund) to Lithuania under the measure VP-1-3.1-ŠMM-07-K “Support to Research Activities of Scientists and Other Researchers (Global Grant)” project Nr. VP-1-3.1-ŠMM-07-K-02-067.

Cancer incidence and mortality in different regions of the World

International Agency for Research on Cancer

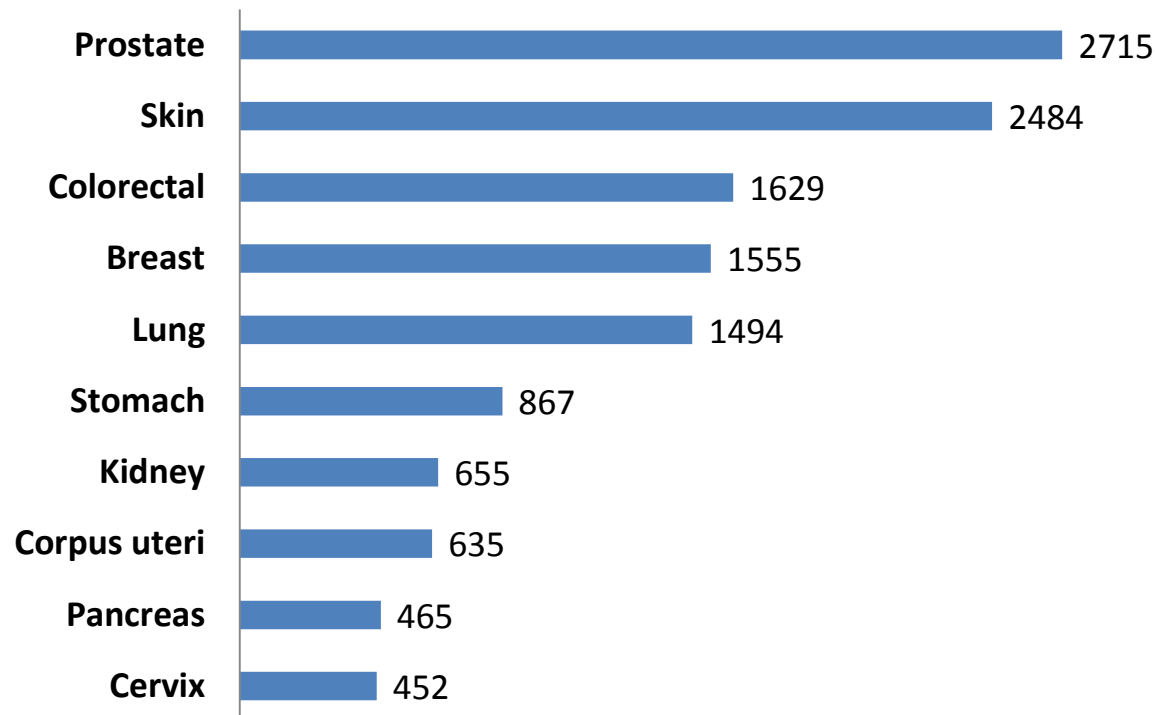


Lower incidence, Higher mortality

- There were 14.1 million new cancer cases, 8.2 million cancer deaths in 2012 worldwide
- 57% of new cancer cases, 65% of the cancer deaths occurred in the less developed regions
- The incidence rate is almost 25% higher in men than in women
- Male incidence rates vary almost five-fold across the different regions of the world in female -almost three-fold

Cancer in Lithuania

- Cancer is the second frequent cause of death in Lithuanian population (in 2011 – 8108 cancer deaths, 19.8% of all deaths)
- More than 17 000 of new cancer cases are diagnosed in recent years (in 2011 – 17 862 cancers)
- Cancer incidence is increasing



Most common cancers in Lithuania, 2011

Cancer incidence

Lithuania

male 311.9
female 224.0

Central and Eastern Europe

male 260.0
female 193.5

Northern Europe

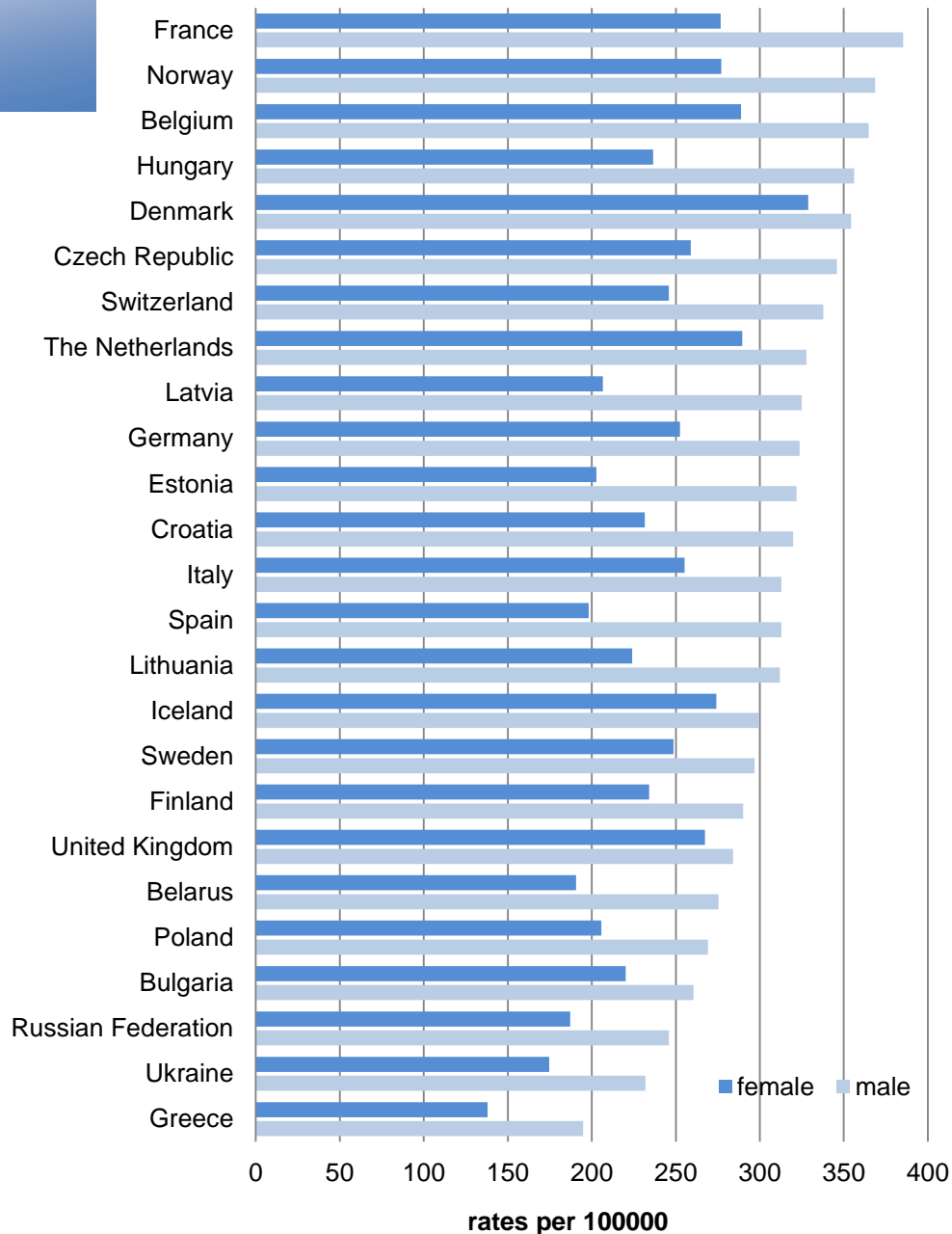
male 298.4
female 263.9

Southern Europe

male 297.6
female 220.4

Western Europe

male 343.7
female 263.7



Cancer mortality

Lithuania

male 194.9
female 88.8

Central and Eastern Europe

male 173.4
female 91.6

Northern Europe

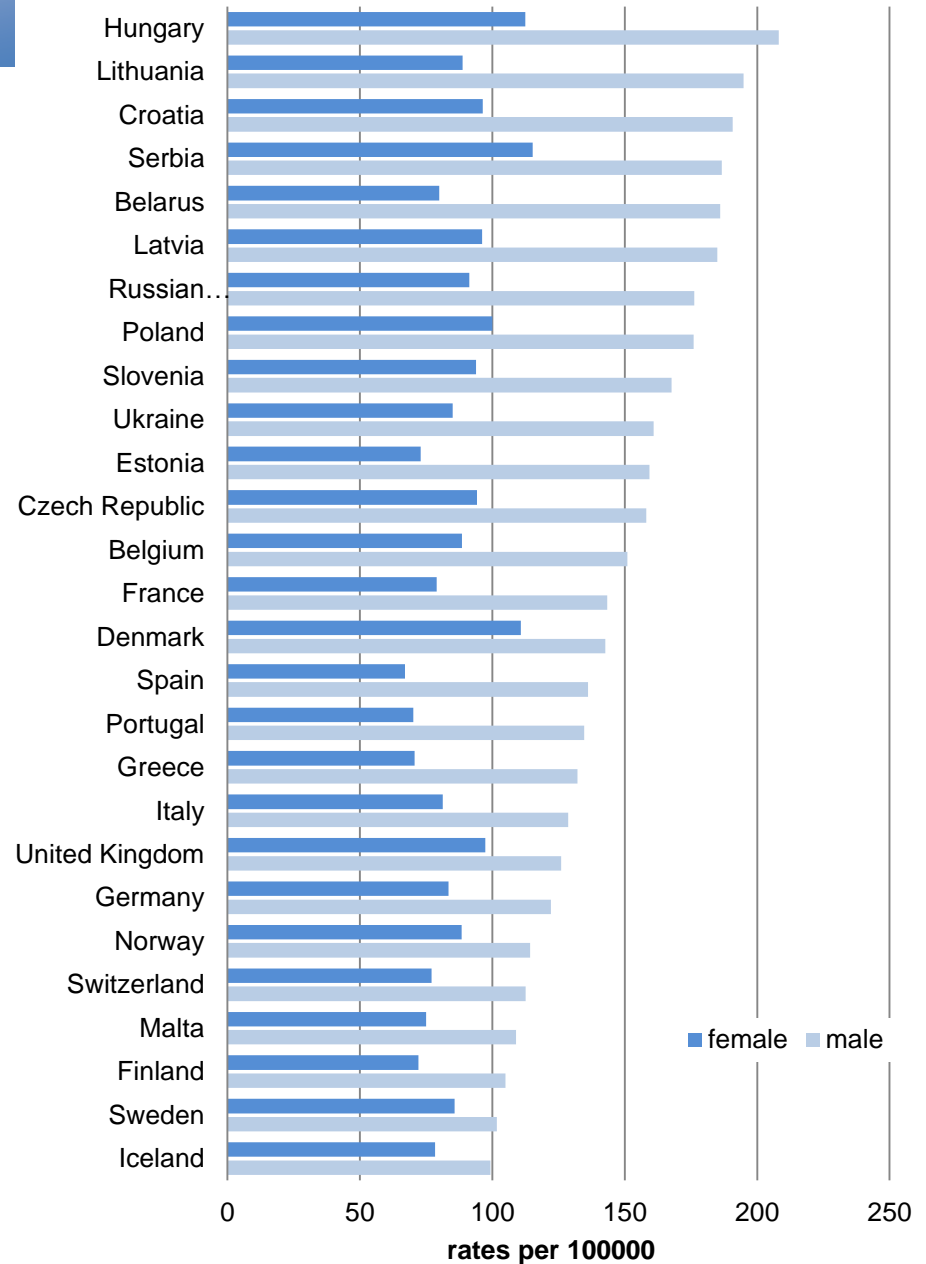
male 125.9
female 94.2

Southern Europe

male 137.9
female 78.9

Western Europe

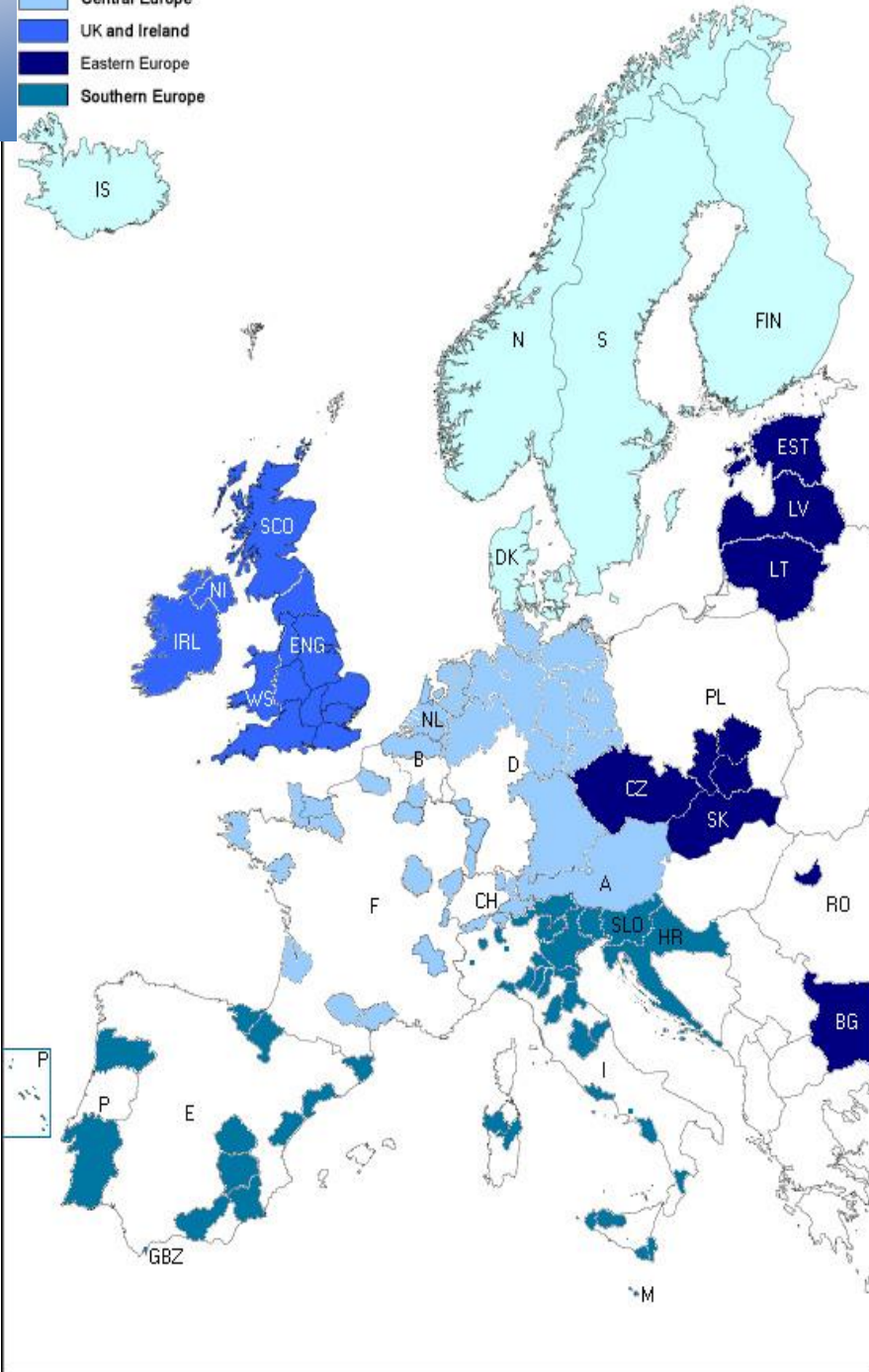
male 131.3
female 83.6



EUROCARE

Legend for the map:

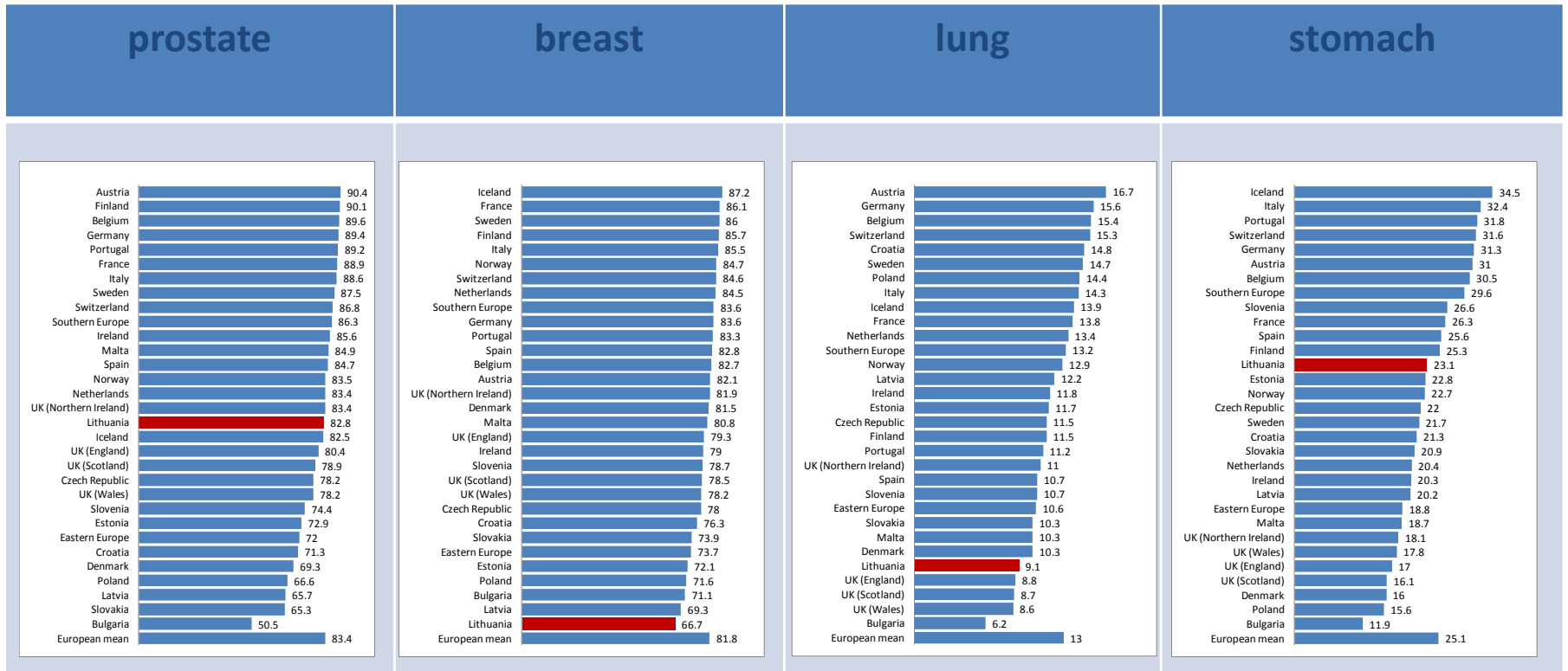
- Nordic countries
- Central Europe
- UK and Ireland
- Eastern Europe
- Southern Europe



- EUROpean CANcer REgistry-based study on survival and CARE of cancer patients
- EUROcare is the widest collaborative research project on cancer survival in Europe.
- The project started in 1989, with the participation of a large number of population-based Cancer Registries throughout Europe.
- Aims of the study are: to provide an updated description of cancer survival time trends and differences across European countries, to measure cancer prevalence, and to study patterns of care of cancer patients.

5-year relative survival of cancer patients in Europe (EUROCARE-5 results)

more than 21 million cancers
diagnosed 2000-2007
provided by 107 Cancer Registries
from 29 European countries



Source: De Angelis R, Sant M, Coleman MP, Francisci S, Baili P, Pierannunzio D, Trama A, Visser O, Brenner H, Ardanaz E, Bielska-Lasota M, Engholm G, Nennecke A, Siesling S, Berrino F, Capocaccia R and the EUROCARE-5 Working Group Increasing cancer survival in Europe in the first decade of the 21st century: results of the EUROCARE-5 study, Lancet Oncol. 2014 Jan;15(1):23-34.

What data is collected by a cancer registry?

The Patient

Personal identification number

Name

Sex

Date of birth (age)

Address

Ethnic group

The Tumor

Incidence date

Most valid basis of diagnosis

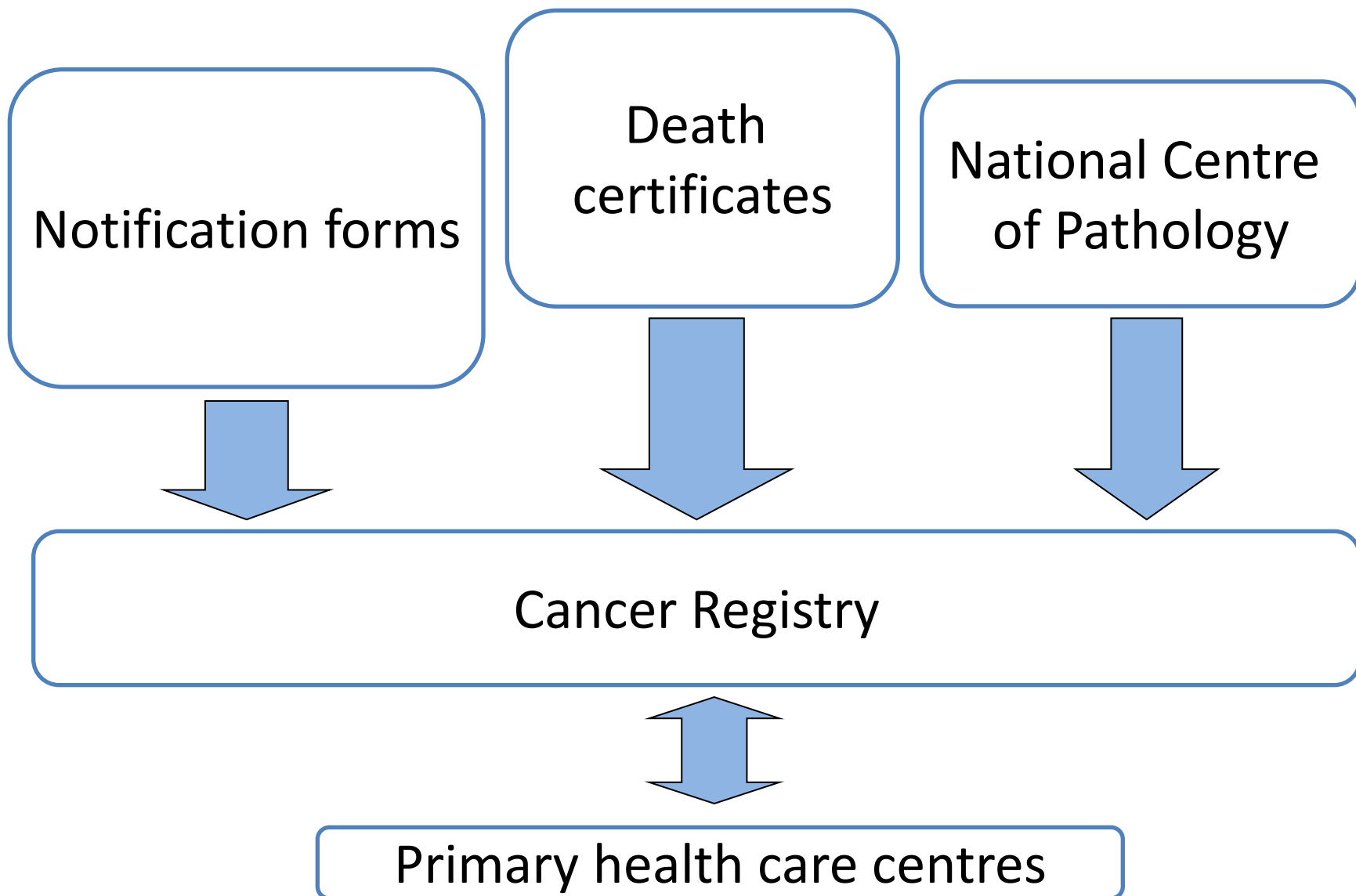
Topography (site)

Morphology (histology)

Behaviour

Source of information

Cancer registration in Lithuania

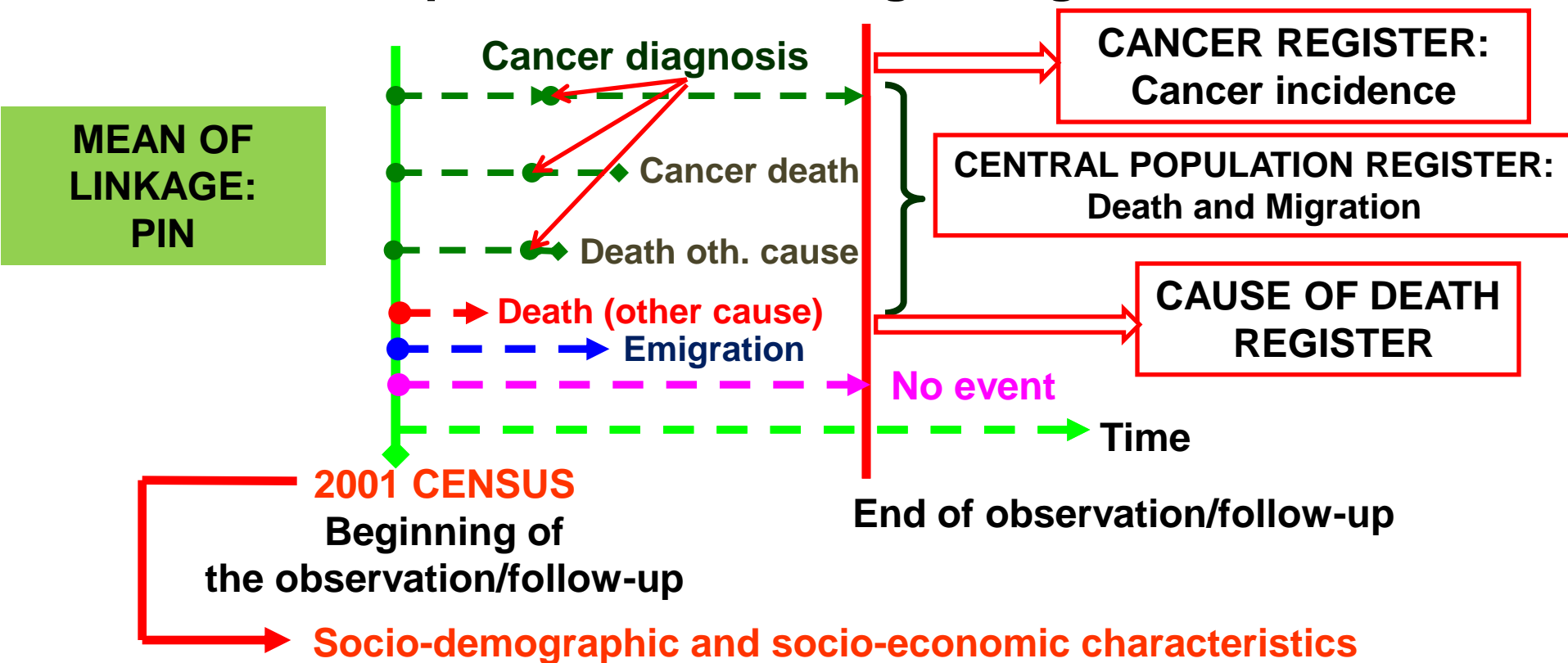


The role of cancer registries in cancer control

Cancer registry data can be used in a wide variety of areas of cancer control

- Etiological research
- Primary prevention
- Secondary prevention
- Health-care planning
- Patient care

Follow-up scheme including linkage to census



- A) Individual data on cancer patients
- B) Frequency dataset (whole population: numbers of events (cancer cases and deaths) and person years by each combination of categories of available variables.

Period or cohort cancer indicators by pop. group
Relative survival, Poisson regression coefficients (rate ratios)

Educational gradients in cancer incidence and mortality

INCIDENCE rate ratios according to level of education, ages 40-79 (2001-2004)

Cancer site	Men			Women		
	Higher	Secondary	Lower than secondary	Higher	Secondary	Lower than secondary
All sites (C00-C97)	1.00	1.01 (0.97-1.06)	0.95 (0.91-0.99)^a	1.00	0.87 (0.84-0.91)	0.72 (0.69-0.75)
Stomach (C16)	1.00	1.39 (1.17-1.66)	1.54 (1.31-1.83)	1.00	1.11 (0.90-1.37)	1.17 (0.95-1.45)
Colon and rectum (C18-C21)	1.00	0.96 (0.84-1.10)	0.78 (0.68-0.88)	1.00	0.96 (0.83-1.11)	0.79 (0.68-0.91)
Trachea and lung (C33, C34)	1.00	1.95 (1.71-2.24)	2.86 (2.51-3.26)	1.00	1.02 (0.77-1.34)	1.29 (0.98-1.70)
Breast (C50)	-	-	-	1.00	0.76 (0.70-0.83)	0.59 (0.54-0.66)
Cervix (C53)	-	-	-	1.00	1.49 (1.25-1.77)	1.56 (1.28-1.91)
Prostate (C61)	1.00	0.70 (0.64-0.76)	0.49 (0.46-0.53)	-	-	-

MORTALITY rate ratios according to level of education , ages 40-79 (2001-2004)

Cancer site	Men			Women		
	Higher	Secondary	Lower than secondary	Higher	Secondary	Lower than secondary
All sites (C00-C97)	1.00	1.50 (1.40-1.60)^a	1.82 (1.71-1.94)	1.00	1.11 (1.04-1.19)	1.05 (0.98-1.13)
Stomach (C16)	1.00	1.59 (1.30-1.96)	1.86 (1.52-2.27)	1.00	1.33 (1.04-1.72)	1.25 (0.97-1.61)
Colon and rectum (C18-C21)	1.00	1.13 (0.94-1.36)	0.99 (0.84-1.18)	1.00	1.08 (0.87-1.34)	0.97 (0.79-1.20)
Trachea and lung (C33, C34)	1.00	1.93 (1.67-2.23)	3.01 (2.62-3.45)	1.00	1.19 (0.88-1.61)	1.21 (0.90-1.65)
Breast (C50)	-	-	-	1.00	1.00 (0.87-1.16)	0.88 (0.75-1.03)
Cervix (C53)	-	-	-	1.00	2.09 (1.56-2.80)	2.74 (1.99-3.75)
Prostate (C61)	1.00	1.18 (0.93-1.48)	1.40 (1.13-1.72)	-	-	-

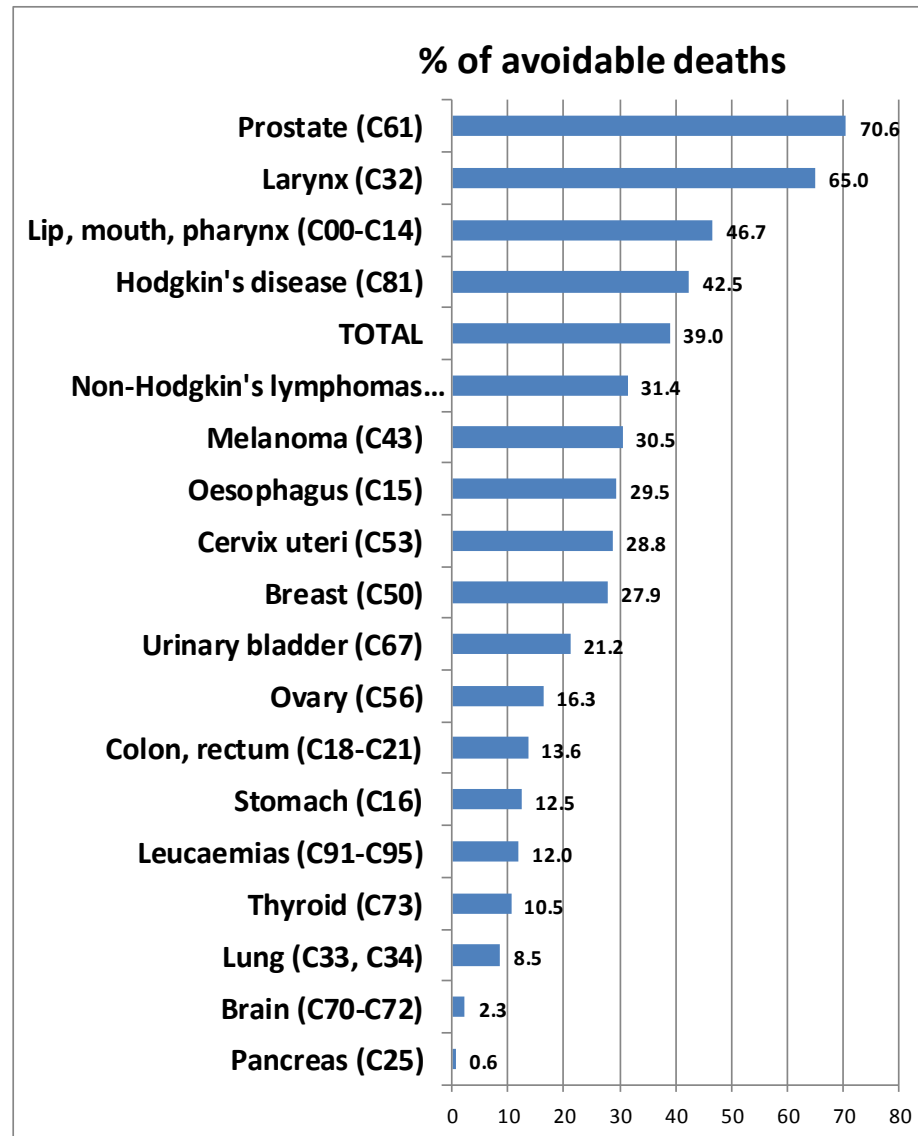
5-year relative survival (RS) of cancer patients by site and education level. Lithuania, MALES, 2001-2009.

Cancer site	ICD-10	Higher	RS difference (vs higher), %	
		RS	Secondary	Lower than secondary
Oral cavity	C00-C14	42.9	-18.26	-15.52
Oesophagus	C15	17.2	-10.51	-12.25
Stomach	C16	29.6	-0.02	-10.35
Colorectal	C18-C21	56.3	-6.1	-10.54
Larynx	C32	68.4	-17.16	-23.25
Lung	C33,C34	11.6	-0.31	-3.87
Skin melanoma	C43	68.1	-12.81	-12.37
Prostate	C61	97.2	-5.51	-11.02
Testis	C62	99.2	-17.76	-45.66
Kidney	C64	76.3	-11.94	-25.93
Bladder	C67	59.5	4.36	-3.75
Brain and nervous system	C70-C72	18.5	0.72	-7.99
Thyroid	C73	95.6	-1.64	-13.76
Hodgkin's lymphoma	C81	86.2	-16.06	-45.07
Non-Hodgkin's lymphoma	C82-C85	62.8	-8.22	-22.77
Multiple myeloma	C90	47.0	-12.72	-20.72
Leukemia	C91-C95	59.1	-8.96	-20.49

5-year relative survival (RS) of cancer patients by site and education level. Lithuania, FEMALES, 2001-2009.

Cancer site	ICD-10	Higher RS	RS difference (vs higher), %	
			Secondary	Lower than secondary
Oral cavity	C00-C14	71.4	-17.79	-16.92
Oesophagus	C15	16.5	-0.57	-4.54
Stomach	C16	32.9	-1.23	-3.31
Colorectal	C18-C21	59.3	-7.24	-11.91
Lung	C33,C34	23.3	-9.19	-12.1
Skin melanoma	C43	84.4	-9.62	-14.91
Breast	C50	80.2	-6.61	-15.32
Cervix uteri	C53	74.5	-9.17	-24.48
Corpus uteri	C54	81.6	2.28	-6.37
Ovary	C56	51.2	-4.61	-21.88
Kidney	C64	77.4	-2.13	-16.26
Bladder	C67	73.9	3.43	-17.4
Brain and nervous system	C70-C72	19.7	4.8	-15.08
Thyroid	C73	97.1	1.47	-4.24
Hodgkin's lymphoma	C81	85.9	-4.13	-26.03
Non-Hodgkin's lymphoma	C82-C85	69.0	-3.14	-20.2
Multiple myeloma	C90	41.7	-8.41	-14.91
Leukemia	C91-C95	58.7	-5.84	-12.12

Avoidable deaths (hypothetical situation where all patients would have the same relative survival as those in the highest education category) of cancer patients due to educational inequalities in cancer survival, 2001-2009



Educational inequalities in cancer incidence and mortality in Lithuania: main findings

- The study confirmed the existence of both the positive and inverse educational gradients in cancer incidence and mortality in Lithuania
- The contradictory findings showing opposite directions of educational gradients in incidence and mortality suggest that highly educated men and women may have a notable advantage in terms of screening, early diagnosis, and survival from these cancers
- The results point to the failures ensuring equal access to medical care and prevention

What are the Causes of Disparities in Health Status, Health Care, and Outcomes?

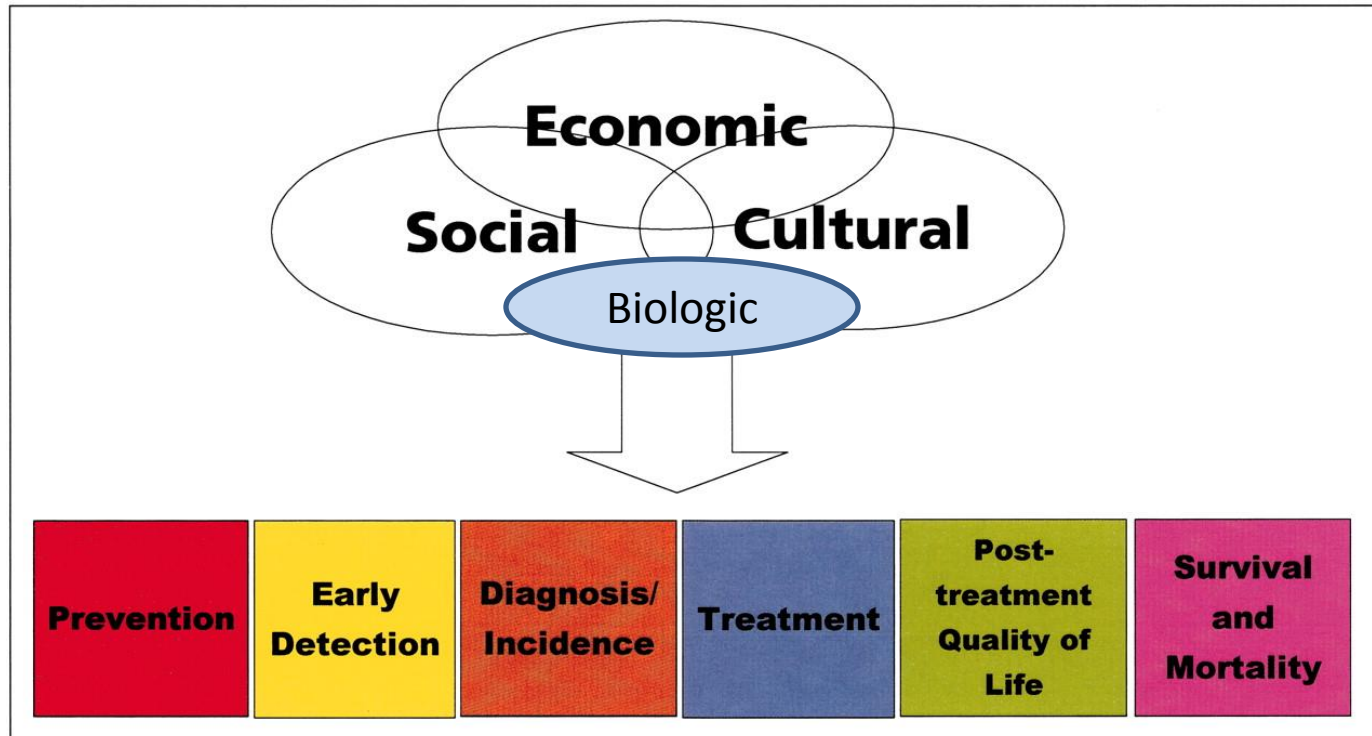


FIGURE 1 Factors That Influence Social Disparities.

Source: Adapted from Freeman, HP³ and Institute of Medicine.⁷

From Ward, E. et al.
CA Cancer J Clin 2004;54:78-93.