Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

Munich Cancer Registry at Munich Cancer Center
Marchioninistr. 15
Munich, 81377
Germany

http://www.tumorregister-muenchen.de/en

Cancer statistics: Baseline statistics

C62: Testicular cancer

Year of diagnosis	1998-2013
Patients	3,036
Diseases	3,098
Creation date	05/19/2015
Export date	12/30/2014
Population (males)	2.28 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C62__E.pdf

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.64 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR. The time-delayed acquisition of data and the occasionally high DCO-rates indicate optimizing reserves, among others, because of current financial and legal conditions that hinder the analyses.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, May 2015

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2014 are incorporated into these analyses.

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate. A high proportion of DCO cases (≥5%) in particular cancer types indicate insufficient participation of specific cancer specializations.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C62.-	Malignant neoplasm of testis
C62.0	Undescended testis
C62.1	Descended testis
C62.9	Testis, unspecified

INCIDENCE

Table 1

Patient cohorts by year of diagnosis including DCO cases and multiple primaries, and with proportion of deaths and active follow-up

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %	
1998	131	2	1.5	10.7	10.7	97.7	
1999	117			11.1	6.8	95.7	
2000	124	1	0.8	9.7	6.5	92.7	
2001	131	1	0.8	6.1	6.1	91.6	
2002	219	1	0.5	13.7	8.2	94.1	#
2003	202	1	0.5	11.4	7.9	97.0	
2004	231	5	2.2	13.4	7.8	93.5	
2005	218	6	2.8	13.3	8.7	94.5	
2006	196	4	2.0	12.8	7.1	87.8	
2007	264	1	0.4	13.6	8.3	66.3	# ##
2008	193	2	1.0	10.4	7.3	38.9	
2009	233	1	0.4	13.3	6.0	42.1	
2010	212	2	0.9	9.0	4.7	42.5	
2011	205			12.2	0.5	39.5	
2012	219	2	0.9	7.3	3.7	37.9	
2013	203	1	0.5	10.3	2.0	100.0	###
1998-2013	3098	30	1.0	11.4	6.3	73.5	

\# The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Since 2007 the percentage of actively followed patients sharply declined compared to the previous years. This is a consequence of ambiguous data protection rules that currently forbid cancer registries in Bavaria to obtain the essential life status informations from competent registration offices.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. Therefore, the presented figures and tables are potentially related to different time periods as pointed out in the respective headlines or legends.

Table 2

Incidence measures by year of diagnosis and gender including DCO cases
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002,
and from 3.96 to 4.64 m as of 2007, respectively)

Year of diagnosis	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	131	11.8	9.7	10.4	10.7
1999	117	10.5	8.4	9.0	9.4
2000	124	10.9	9.5	9.8	10.3
2001	131	11.3	9.5	10.0	10.6
2002	219	11.8	9.6	10.5	11.1
2003	202	10.8	9.2	9.9	10.4
2004	231	12.3	10.4	11.2	11.8
2005	218	11.5	9.7	10.5	11.0
2006	196	10.2	8.7	9.5	10.0
2007	264	11.9	10.6	11.3	11.8
2008	193	8.7	7.5	8.2	8.6
2009	233	10.4	8.9	9.8	10.3
2010	212	9.4	8.4	9.1	9.5
2011	205	9.0	7.9	8.6	9.0
2012	219	9.6	8.6	9.2	9.7
2013	203	8.9	8.1	8.6	9.1
1998-2013	3098	10.4	9.0	9.7	10.2

The computation of the incidence measures includes all primaries, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	131	36.7	10.3	1.3	59.4	24.2	30.6	36.4	43.2	51.7
1999	117	37.0	11.3	18.8	74.7	25.1	30.3	34.9	40.6	55.3
2000	124	35.4	10.7	14.4	85.1	23.0	28.0	34.4	40.8	46.4
2001	131	36.7	11.5	15.1	79.0	23.9	29.6	35.2	41.0	49.9
2002	219	38.4	11.2	19.1	93.5	25.2	31.2	36.9	43.7	49.5
2003	202	37.5	11.7	4.2	75.2	25.0	29.2	35.7	42.6	52.5
2004	231	38.8	12.4	0.5	84.6	25.8	30.5	37.7	44.7	55.2
2005	218	39.1	12.2	2.8	88.6	26.2	31.4	37.9	44.7	54.6
2006	196	38.3	11.8	18.6	86.7	24.1	30.3	37.3	43.8	53.3
2007	264	37.7	12.4	0.1	95.0	24.8	29.6	36.1	43.5	52.9
2008	193	39.1	12.2	15.9	83.8	24.4	29.7	38.4	44.4	55.5
2009	233	39.8	12.6	16.8	82.0	25.0	31.1	38.4	46.5	55.6
2010	212	38.0	11.5	16.4	80.2	24.8	29.7	36.5	44.1	51.8
2011	205	38.7	11.8	18.9	77.0	24.9	29.7	37.0	46.3	52.2
2012	219	38.2	11.9	2.6	78.8	23.9	30.0	37.4	45.4	52.4
2013	203	37.8	11.4	12.6	83.1	23.8	29.3	36.4	45.7	52.7
1998-2013	3098	38.1	11.8	0.1	95.0	24.5	30.1	36.9	44.3	52.9

Table 4

Age distribution by 5-year age group for period 1998-2013
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%
0-4	7	0.2	0.2
5-9	1	0.0	0.3
10-14	4	0.1	0.4
15-19	79	2.6	2.9
20-24	252	8.1	11.1
25-29	419	13.5	24.6
30-34	557	18.0	42.6
35-39	620	20.0	62.6
40-44	448	14.5	77.0
45-49	297	9.6	86.6
50-54	150	4.8	91.5
55-59	98	3.2	94.6
60-64	69	2.2	96.9
65-69	42	1.4	98.2
70-74	23	0.7	99.0
75-79	12	0.4	99.4
80-84	14	0.5	99.8
85+	6	0.2	100.0
All ages	3098	100.0	

Included in the statistics are 10.5% multiple primaries.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2013

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=30 %	Prop. all cancers n=158258 %
0- 4	7	0.5		2.2
5- 9	1	0.1		0.6
10-14	4	0.3		2.4
15-19	79	5.1		22.3
20-24	249	14.1		40.6
25-29	415	20.7		42.9
30-34	549	24.1		36.6
35-39	614	24.6	0.2	27.3
40-44	447	17.1	0.7	14.0
45-49	295	12.5	1.0	5.5
50-54	149	7.4	2.7	1.7
55-59	98	5.3		0.7
60-64	69	3.9	5.8	0.3
65-69	42	2.7	7.1	0.2
70-74	23	1.8	8.7	0.1
75-79	12	1.5	16.7	0.1
80-84	14	2.8	50.0	0.1
85+	6	1.8	16.7	0.1
All ages	3073		1.0	1.9
Incidence				
Raw		10.3		
WS		8.9		
ES		9.6		
BRD-S		10.1		

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

Table 6

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C19-C20	Rectum	4	1.5	2.6	0.7	6.7		2.3	
C22	Liver	4	0.6	6.4	1.7	16.4	#	3.1	
C25	Pancreas	2	0.8	2.5	0.3	9.2		1.1	
C32	Larynx	2	0.4	5.4	0.7	19.6		1.5	50.0
C33-C34	Lung	7	2.8	2.5	1.0	5.1		3.8	
C43	Malign. melanoma	6	2.1	2.8	1.0	6.2	#	3.6	
C61	Prostate	12	5.4	2.2	1.2	3.9	#	6.1	
C62	Testis	52	1.9	27.1	20.2	35.5	#	45.8	
C64	Kidney	6	1.2	5.0	1.9	11.0	#	4.4	
C67	Bladder	2	0.7	2.7	0.3	9.7		1.1	
C70-C72	CNS cancer	3	0.8	3.8	0.8	11.2		2.0	
C73	Thyroid	2	0.6	3.2	0.4	11.4		1.2	
C76-C79	CUP	3	0.4	7.1	1.5	20.9	#	2.4	
C82-C85	NHL	2	1.3	1.5	0.2	5.5		0.6	
C91-C96	Leukaemia	5	0.5	9.2	3.0	21.6	#	4.1	20.0
Other primaries		13	6.0	2.2	1.2	3.7	#	6.4	
Not observed		0	1.3	0.0	0.0	2.9		-1.1	
All mult. primaries		125	28.4	4.4	3.7	5.2	#	88.3	1.6

Patients	2048
Median age at second malignancy (years)	47.1
Person-years	10939
Mean observation time (years)	5.3
Median observation time (years)	4.6

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category "Other primaries".

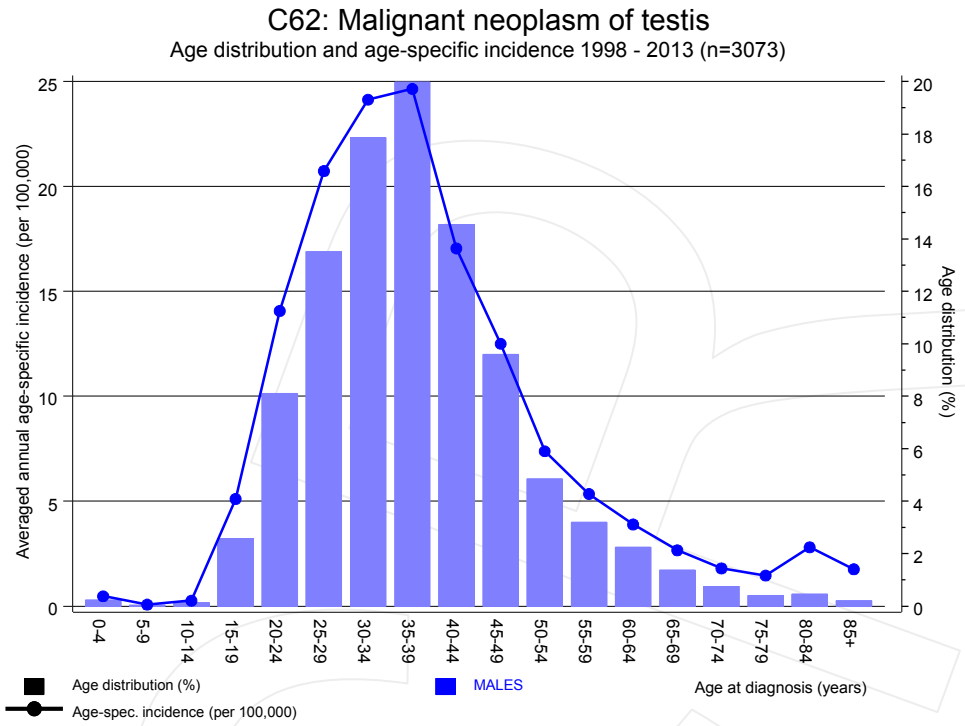

Figure 7. Age distribution and age-specific incidence

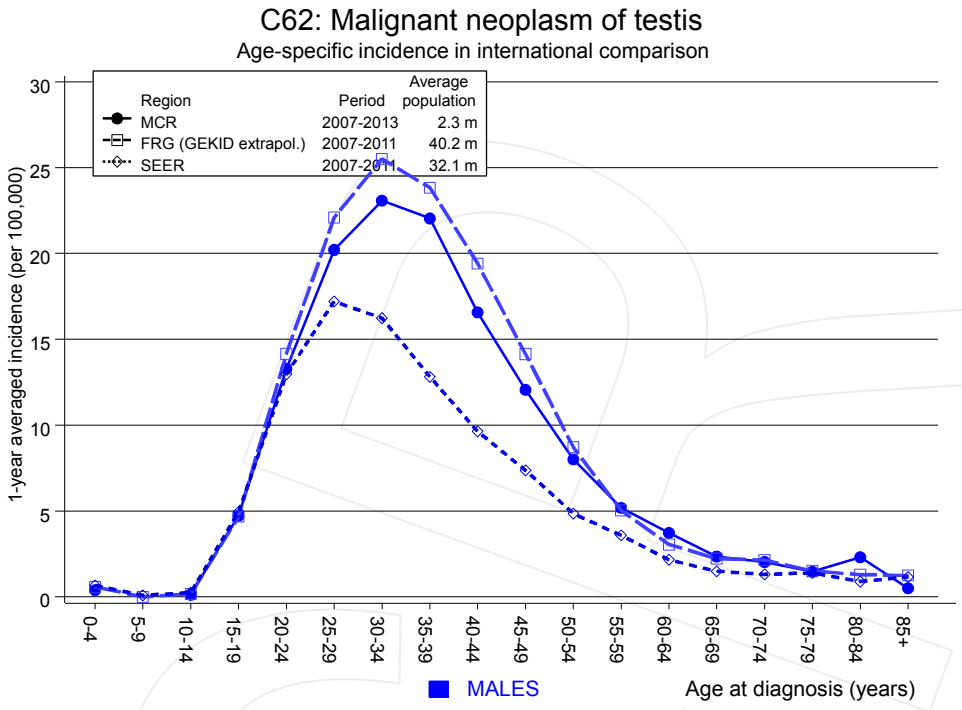

Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. http://www.gekid.de. Last access: 02/11/2015

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. http://www.seer.cancer.gov.

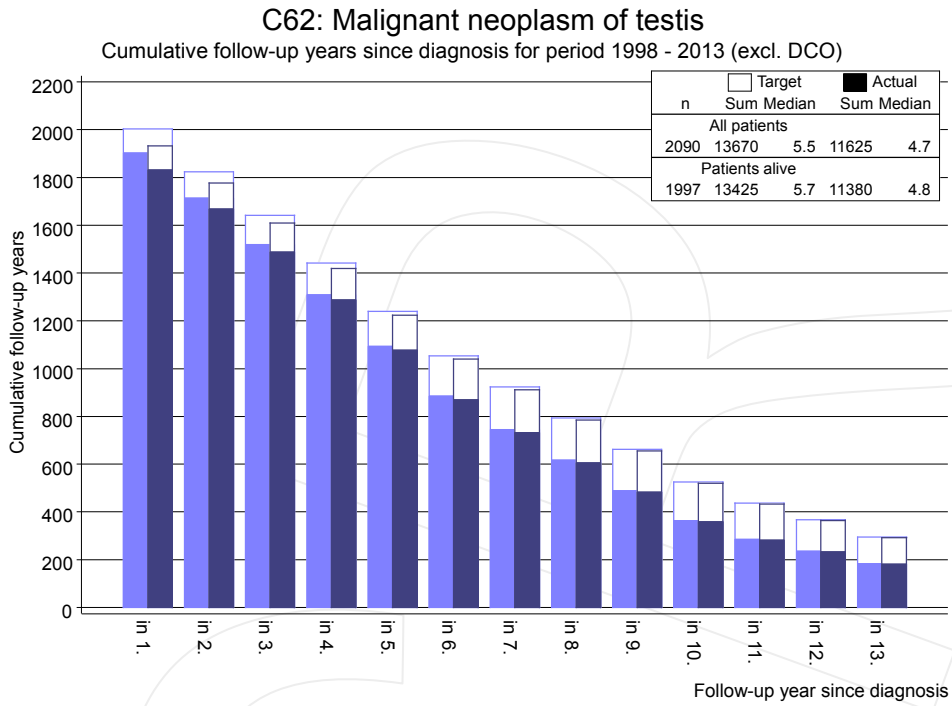

Figure 8. Cumulative follow-up years depending on time since diagnosis

The increase of the lost to follow-up rate can be interpreted as a consequence of a declining number of survivors over time.

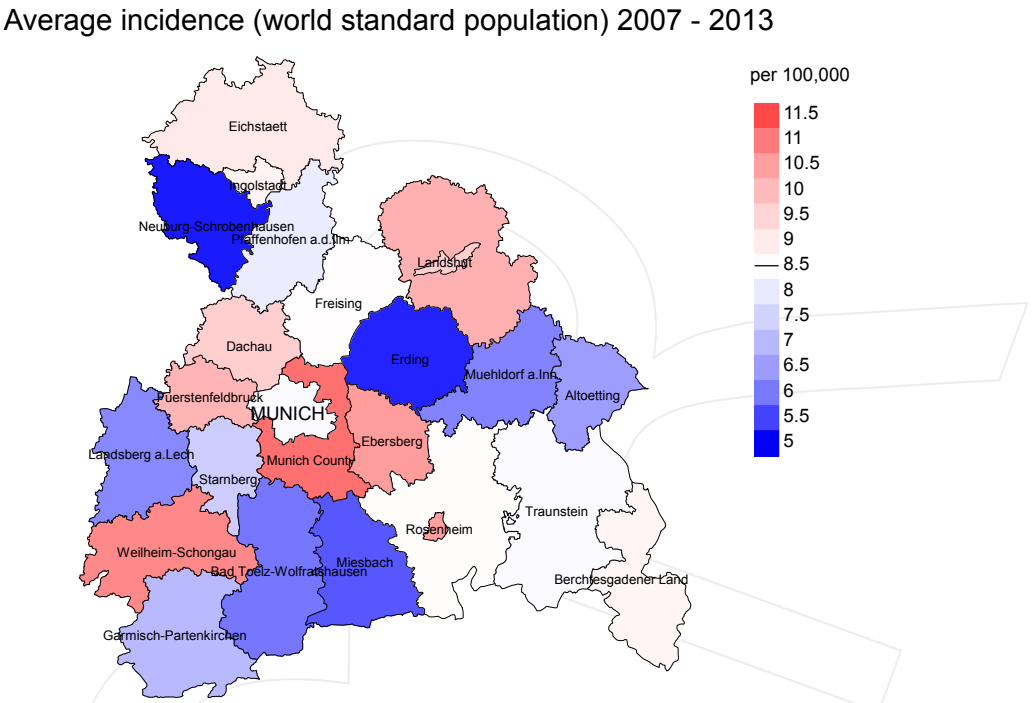

Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (8.5/100,000 WS N=1,514).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,385 male residents (averaged) in the period from 2007 to 2013 a total of 46 men were identified with newly diagnosed testicular cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 10.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 6.7 and 15.8/100,000.

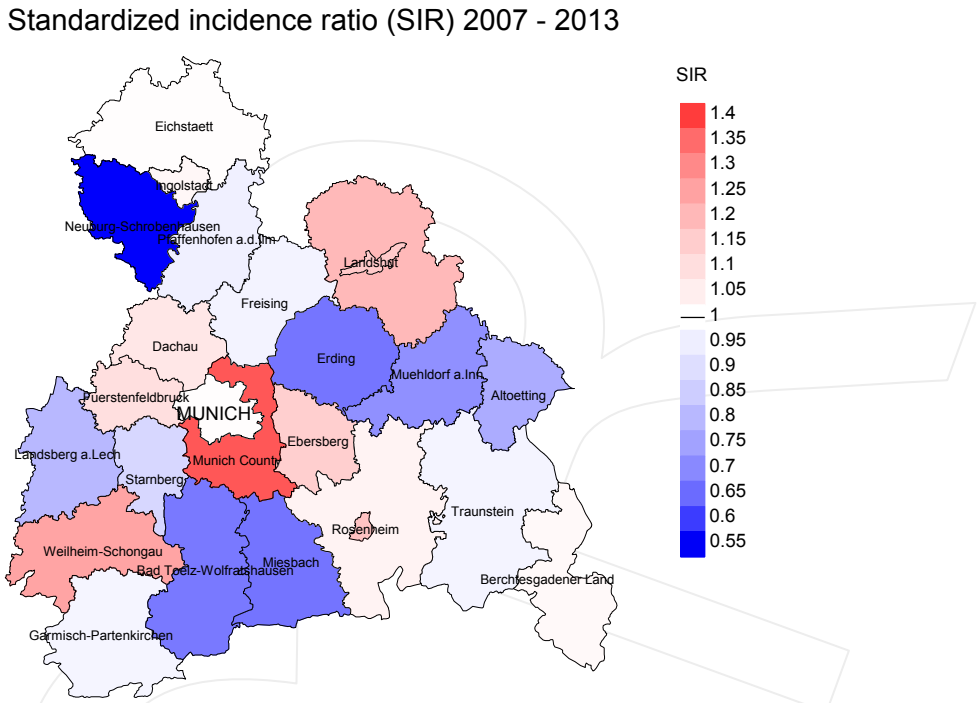

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=1,514).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,006 male residents (averaged) in the period from 2007 to 2013 a total of 46 men were identified with newly diagnosed testicular cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.14. Though, the value of this parameter may vary with an underlying probability of 99% between 0.76 and 1.65, and is therefore not statistically striking.

MORTALITY

Table 10a

Patient cohorts of incident cancers by year of diagnosis, follow-up status, proportion of DCO, deaths among the annual cohorts, and proportion of available death certificates (with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	131	97.7	1.5	14	10.7	100.0
1999	117	95.7		8	6.8	100.0
2000	124	92.7	0.8	8	6.5	100.0
2001	131	91.6	0.8	8	6.1	100.0
2002	219	94.1	0.5	18	8.2	100.0
2003	202	97.0	0.5	16	7.9	100.0
2004	231	93.5	2.2	18	7.8	100.0
2005	218	94.5	2.8	19	8.7	89.5
2006	196	87.8	2.0	14	7.1	100.0
2007	264	66.3	0.4	22	8.3	95.5
2008	193	38.9	1.0	14	7.3	100.0
2009	233	42.1	0.4	14	6.0	92.9
2010	212	42.5	0.9	10	4.7	100.0
2011	205	39.5		1	0.5	100.0
2012	219	37.9	0.9	8	3.7	87.5
2013	203	100.0	0.5	4	2.0	75.0
1998-2013	3098	73.5	1.0	196	6.3	96.9

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis
(incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	131	9	100.0	3	2.3
1999	117	17	82.4	1	0.9
2000	124	6	100.0	1	0.8
2001	131	15	100.0	5	3.8
2002	219	24	100.0	4	1.8
2003	202	22	100.0	6	3.0
2004	231	19	84.2	5	2.2
2005	218	33	93.9	9	4.1
2006	196	25	92.0	4	2.0
2007	264	28	96.4	4	1.5
2008	193	29	100.0	5	2.6
2009	233	35	97.1	3	1.3
2010	212	32	93.8	4	1.9
2011	205	37	100.0		
2012	219	30	100.0	4	1.8
2013	203	44	100.0	3	1.5
1998-2013	3098	405	96.5	61	2.0

Table 10c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	9	66.7	33.3	100.0
1999	17	82.4	17.6	85.7
2000	6	50.0	50.0	66.7
2001	15	80.0	20.0	73.3
2002	24	91.7	8.3	91.7
2003	22	81.8	18.2	86.4
2004	19	78.9	21.1	87.5
2005	33	72.7	27.3	87.1
2006	25	48.0	52.0	60.9
2007	28	57.1	42.9	85.2
2008	29	72.4	27.6	79.3
2009	35	74.3	25.7	73.5
2010	32	62.5	37.5	66.7
2011	37	75.7	24.3	81.1
2012	30	60.0	40.0	60.0
2013	44	63.6	36.4	61.4
1998-2013	405	69.9	30.1	76.2

Table 11

Medians of age at death according to the grouping in Table 10

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	9	50.6	55.5	45.3	50.6
1999	17	40.9	42.9	40.5	42.9
2000	6	60.5	38.4	61.3	49.1
2001	15	58.1	48.9	66.1	58.1
2002	24	67.9	63.7	74.7	63.7
2003	22	63.7	63.7	56.0	63.3
2004	19	63.1	63.1	63.6	63.7
2005	33	58.9	55.7	70.8	56.9
2006	25	62.2	52.0	65.4	52.0
2007	28	60.5	58.6	63.7	59.0
2008	29	61.3	54.2	65.0	60.5
2009	35	59.4	58.2	65.8	59.5
2010	32	62.4	63.8	58.7	61.0
2011	37	61.8	62.8	53.4	62.8
2012	30	60.4	59.3	61.9	58.3
2013	44	57.3	56.4	63.1	55.9
1998-2013	405	60.2	59.4	62.1	59.5

By 2010, life expectancy for a newborn male in Germany is 77.5 years compared with 82.6 years for his female counterpart.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 12

Mortality measures (cancer-related death) and mortality-incidence-index by year of death

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	6	0.5	0.05	0.4	0.04	0.5	0.05	0.5	0.05
1999	14	1.3	0.12	0.9	0.10	1.1	0.12	1.2	0.13
2000	3	0.3	0.02	0.3	0.03	0.3	0.03	0.2	0.02
2001	12	1.0	0.09	0.8	0.09	1.0	0.10	1.2	0.11
2002	22	1.2	0.10	0.7	0.08	1.1	0.10	1.3	0.12
2003	18	1.0	0.09	0.6	0.07	0.8	0.09	1.0	0.09
2004	15	0.8	0.07	0.6	0.05	0.7	0.06	0.8	0.07
2005	24	1.3	0.11	0.9	0.09	1.1	0.10	1.2	0.11
2006	12	0.6	0.06	0.5	0.05	0.6	0.06	0.7	0.07
2007	16	0.7	0.06	0.5	0.04	0.6	0.06	0.7	0.06
2008	21	0.9	0.11	0.6	0.08	0.8	0.10	0.9	0.11
2009	26	1.2	0.11	0.7	0.08	1.0	0.10	1.1	0.11
2010	20	0.9	0.09	0.5	0.06	0.7	0.08	0.8	0.09
2011	28	1.2	0.14	0.8	0.10	1.0	0.12	1.2	0.13
2012	18	0.8	0.08	0.5	0.05	0.6	0.07	0.7	0.08
2013	28	1.2	0.14	0.8	0.11	1.1	0.13	1.2	0.13
1998-2013	283	1.0	0.09	0.6	0.07	0.8	0.08	0.9	0.09

Table 13

Age distribution of age at death (cancer-related) for period 1998-2013
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%
5-9	1	0.3	0.3
10-14	0	0.0	0.3
15-19	1	0.3	0.7
20-24	10	3.5	4.2
25-29	7	2.4	6.6
30-34	9	3.1	9.8
35-39	21	7.3	17.1
40-44	17	5.9	23.0
45-49	25	8.7	31.7
50-54	31	10.8	42.5
55-59	24	8.4	50.9
60-64	39	13.6	64.5
65-69	36	12.5	77.0
70-74	25	8.7	85.7
75-79	19	6.6	92.3
80-84	14	4.9	97.2
85+	8	2.8	100.0
All ages	287	100.0	

Included in the statistics are 10.5% multiple primaries.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**incl. multiple primaries**)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9	1	0.1	1.00	2.6
10-14		0.0		
15-19	1	0.1	0.01	2.2
20-24	10	0.6	0.04	11.1
25-29	7	0.3	0.02	6.5
30-34	9	0.4	0.02	4.8
35-39	21	0.8	0.03	5.3
40-44	17	0.6	0.04	2.0
45-49	25	1.1	0.08	1.4
50-54	31	1.5	0.21	0.9
55-59	24	1.3	0.24	0.4
60-64	39	2.2	0.57	0.4
65-69	36	2.3	0.86	0.3
70-74	25	2.0	1.09	0.2
75-79	19	2.3	1.58	0.1
80-84	14	2.8	1.00	0.1
85+	8	2.3	1.33	0.1
All ages	287			0.4
Mortality				
Raw		1.0	0.09	
WS		0.6	0.07	
ES		0.8	0.08	
BRD-S		0.9	0.09	
PYLL-70				
per 100,000		15.5		
ES		14.2		
AYLL-70		18.8		

The rates underestimate the prognosis if other synchronous cancers are prognostic unfavorable.

Table 15

Multiple primaries in deaths in period 1998-2013

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	4	1.8					4	100.0
C09-C10 Oropharynx	4	1.8	1	25.0			3	75.0
C15 Oesophagus	3	1.4			1	33.3	2	66.7
C16 Stomach	9	4.1	2	22.2			7	77.8
C18 Colon	11	5.0	2	18.2			9	81.8
C19-C20 Rectum	10	4.6					10	100.0
C22 Liver	8	3.7					8	100.0
C23-C24 Bile	5	2.3					5	100.0
C25 Pancreas	14	6.4					14	100.0
C32 Larynx	4	1.8					4	100.0
C33-C34 Lung	38	17.4	2	5.3	1	2.6	35	92.1
C43 Malign. melanoma	5	2.3	2	40.0			3	60.0
C44 Skin others	4	1.8					4	100.0
C46,C49 Soft tissue	6	2.8	2	33.3			4	66.7
C61 Prostate	25	11.5	7	28.0	1	4.0	17	68.0
C62 Testis	4	1.8					4	100.0
C64 Kidney	3	1.4					3	100.0
C67 Bladder	10	4.6					10	100.0
C70-C72 CNS cancer	8	3.7	2	25.0	1	12.5	5	62.5
C76-C79 CUP	8	3.7					8	100.0
C82-C85 NHL	9	4.1	2	22.2	1	11.1	6	66.7
C90 Mult. myeloma	3	1.4			1	33.3	2	66.7
C91-C96 Leukaemia	11	5.0	1	9.1			10	90.9
Other primaries	12	5.5			1	8.3	11	91.7
All mult. primaries	218	100.0	23	10.6	7	3.2	188	86.2

Multiple primaries with number of cases 1 to 2 are pooled in category "Other primaries".

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a multiple malignancy.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**Singular primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19	1	0.1	0.01	2.4
20-24	10	0.6	0.04	11.9
25-29	6	0.3	0.02	6.1
30-34	9	0.4	0.02	5.0
35-39	20	0.8	0.03	5.3
40-44	16	0.6	0.04	2.0
45-49	23	1.0	0.08	1.4
50-54	29	1.4	0.21	1.0
55-59	20	1.1	0.23	0.4
60-64	36	2.0	0.61	0.5
65-69	32	2.0	1.10	0.3
70-74	21	1.6	1.50	0.2
75-79	16	1.9	3.20	0.2
80-84	10	2.0	1.67	0.1
85+	7	2.1	1.40	0.1
All ages	256			0.4
Mortality				
Raw		0.9	0.09	
WS		0.6	0.07	
ES		0.7	0.08	
BRD-S		0.8	0.09	
PYLL-70				
per 100,000		14.3		
ES		13.0		
AYLL-70		19.0		

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**Single primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19	1	0.1	0.01	2.4
20-24	10	0.6	0.04	12.7
25-29	5	0.2	0.01	5.4
30-34	9	0.4	0.02	5.1
35-39	17	0.7	0.03	4.7
40-44	14	0.5	0.03	1.9
45-49	17	0.7	0.07	1.1
50-54	5	0.2	0.04	0.2
55-59	3	0.2	0.04	0.1
60-64	13	0.7	0.26	0.2
65-69	13	0.8	0.48	0.2
70-74	3	0.2	0.30	0.0
75-79	2	0.2	0.40	0.0
80-84	2	0.4	0.40	0.0
85+	3	0.9	0.75	0.1
All ages	117			0.2
Mortality				
Raw		0.4	0.04	
WS		0.3	0.04	
ES		0.3	0.04	
BRD-S		0.4	0.04	
PYLL-70				
per 100,000		9.9		
ES		9.0		
AYLL-70		24.8		

* See corresponding tables with multiple primaries.

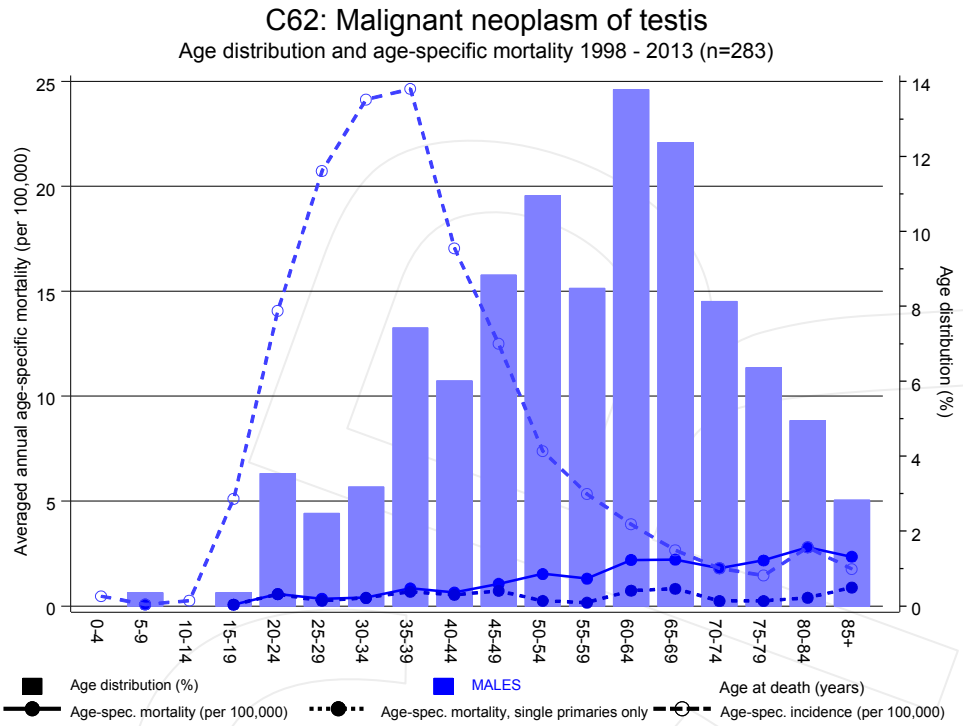

Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at testicular cancer-related death (see Table 10) should be considered.

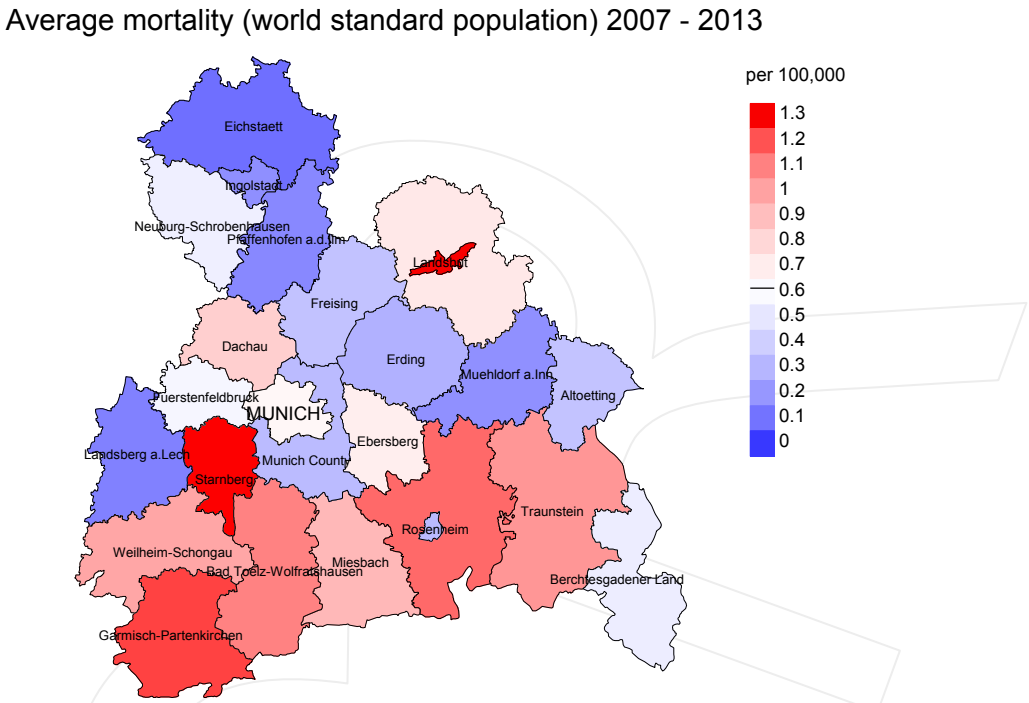

Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (0.6/100,000 WS N=152).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,385 male residents (averaged) in the period from 2007 to 2013 a total of 4 men died from testicular cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 3.0/100,000.

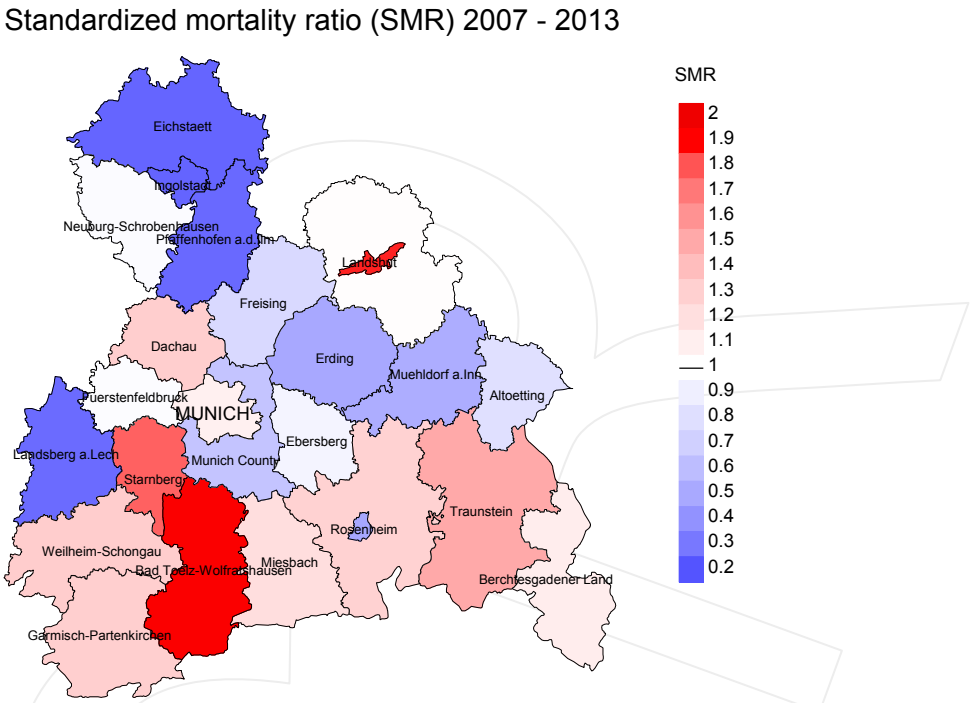

Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=152).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,006 male residents (averaged) in the period from 2007 to 2013 a total of 4 men died from testicular cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.93. Though, the value of this parameter may vary with an underlying probability of 99% between 0.16 and 2.93, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head/neck and lung).

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
MCR	Munich Cancer Registry (Tumorregister München)
SEER	Surveillance, Epidemiology, and End Results (USA)
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
BRD-S	German standard population
DCO	Death certificate only
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
ES	European standard population (old)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

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