

Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
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ICD-10 C62: Testicular cancer

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	4,145
Diseases	4,239
Creation date	01/25/2021
Database export	01/07/2021
Population (males)	2.43 m



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<https://www.tumorregister-muenchen.de/en>

https://www.tumorregister-muenchen.de/en/facts/base/bC62__E-ICD-10-C62-Testicular-cancer-incidence-and-mortality.pdf

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**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 4.69 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.

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, January 2021

[#] 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 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

^{##} 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.

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

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (incl. DCO)

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	134	3	2.2	3.7	6.2	14.9	92.5
1999	121	1	0.8	3.9	6.1	13.2	93.4
2000	124	2	1.6	3.4	5.9	7.3	88.7
2001	131	1	0.8	3.1	5.7	8.4	90.1
2002	219	1	0.5	3.4	5.7	11.4	93.6 #
2003	203	1	0.5	3.9	5.4	10.3	97.5
2004	233	5	2.1	4.3	5.3	11.2	91.8
2005	222	6	2.7	4.7	5.1	10.4	93.2
2006	196	4	2.0	4.8	4.8	9.2	87.8
2007	264	1	0.4	5.1	4.5	9.5	83.3 #
2008	198	2	1.0	5.2	4.4	8.1	96.0
2009	234	1	0.4	5.6	4.4	9.0	98.3
2010	220	2	0.9	5.6	4.2	7.7	95.5
2011	209			5.7	3.8	3.3	96.7
2012	234	2	0.9	5.5	3.1	5.1	97.9
2013	253	1	0.4	5.4	2.8	3.6	96.4
2014	226	3	1.3	5.4	2.5	3.5	95.1
2015	205			5.5	2.4	3.4	83.4
2016	173	4	2.3	5.5	2.0	5.2	98.3
2017	170	4	2.4	5.6	1.4	4.7	99.4
2018	171	1	0.6	5.6	0.8	2.3	100.0
2019	99			5.6	0.0	2.0	56.6 ##
1998-2019	4239	45	1.1	5.6	6.2	7.4	92.9

4,239 cases diagnosed 1998-2019 are related to a total of 4,145 patients. Currently, in 452 (10.9 %) of these 4,145 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 404 / 40 / 8 (9.7 % / 1.0 % / 0.2 %) patients exist having 2 / 3 / 4+ malignancies.

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

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 170 cases has been diagnosed, of which 5.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.4 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	134	12.1	9.9	10.6	11.0
1999	121	10.8	8.8	9.4	9.7
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	203	10.8	9.3	9.9	10.4
2004	233	12.4	10.4	11.2	11.9
2005	222	11.7	9.8	10.7	11.1
2006	196	10.2	8.7	9.5	10.0
2007	264	11.9	10.6	11.3	11.8
2008	198	8.9	7.7	8.4	8.8
2009	234	10.5	9.0	9.8	10.4
2010	220	9.8	8.7	9.4	9.8
2011	209	9.3	8.3	9.0	9.5
2012	234	10.3	9.3	10.0	10.5
2013	253	11.0	9.9	10.7	11.2
2014	226	9.7	8.6	9.4	9.9
2015	205	8.6	7.5	8.3	8.7
2016	173	7.2	6.4	7.0	7.2
2017	170	7.0	6.2	6.8	7.2
2018	171	7.0	6.4	6.9	7.2
2019	99	4.1	3.6	4.0	4.2
1998-2019	4239	9.6	8.4	9.1	9.5

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

Table 3

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

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	134	36.9	10.2	1.3	59.4	24.2	31.2	36.4	43.7	51.7
1999	121	36.6	11.6	5.2	74.7	24.8	30.2	34.8	40.5	55.2
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	203	37.7	11.9	4.2	75.2	25.0	29.2	35.8	42.7	53.6
2004	233	38.7	12.4	0.5	84.6	25.8	30.5	37.7	44.3	55.2
2005	222	39.2	12.3	2.8	88.6	26.3	31.5	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	29.7	36.1	43.5	52.9
2008	198	39.2	12.1	15.9	83.8	24.4	30.0	38.5	45.1	55.5
2009	234	39.6	12.6	16.8	82.0	24.5	31.1	38.2	46.5	55.6
2010	220	38.1	11.5	16.4	80.2	25.1	30.0	36.7	44.4	51.9
2011	209	38.8	11.9	18.9	77.0	24.4	29.7	37.0	46.5	54.0
2012	234	38.0	11.4	2.6	78.8	23.9	30.0	37.4	45.4	51.4
2013	253	38.0	11.5	0.9	83.1	23.8	29.9	36.7	45.8	52.7
2014	226	39.2	12.9	15.5	88.4	24.5	29.4	37.7	48.1	55.2
2015	205	40.0	13.4	17.0	99.3	25.4	30.6	37.6	48.5	56.5
2016	173	39.2	12.2	16.3	88.2	25.9	31.5	37.1	45.3	55.2
2017	170	40.4	15.0	17.5	94.3	24.0	29.6	38.0	48.6	62.1
2018	171	38.6	12.1	17.9	72.3	23.9	29.5	36.8	45.7	54.5
2019	99	39.6	11.4	18.8	77.0	24.5	30.7	39.2	47.2	54.9
1998-2019	4239	38.5	12.1	0.1	99.3	24.5	30.1	37.0	44.9	53.9

Table 4

Age distribution by 5-year age group for period 2007-2019
(incl. DCO)

Age at diagnosis Years	Cases		Cum.%
	n	%	
0-4	4	0.2	0.2
5-9	0	0.0	0.2
10-14	1	0.0	0.2
15-19	65	2.4	2.6
20-24	224	8.4	11.1
25-29	373	14.0	25.1
30-34	443	16.7	41.8
35-39	450	16.9	58.7
40-44	374	14.1	72.8
45-49	284	10.7	83.5
50-54	184	6.9	90.4
55-59	95	3.6	94.0
60-64	62	2.3	96.3
65-69	39	1.5	97.8
70-74	27	1.0	98.8
75-79	12	0.5	99.3
80-84	9	0.3	99.6
85+	10	0.4	100.0
All ages	2656	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers for period 2007–2019

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=21 %	Prop. all cancers n=143063 %
0- 4	4	0.3		1.9
5- 9		0.0		
10-14	1	0.1		0.8
15-19	65	4.1		21.7
20-24	222	11.9		37.8
25-29	369	17.6		42.0
30-34	434	20.4		36.2
35-39	449	21.0		26.3
40-44	373	15.9	0.3	14.4
45-49	282	11.2		5.9
50-54	183	7.8	1.6	2.3
55-59	95	4.9	2.1	0.8
60-64	62	3.8	3.2	0.4
65-69	39	2.6	5.1	0.2
70-74	26	1.9		0.1
75-79	12	1.1	8.3	0.1
80-84	9	1.4	33.3	0.1
85+	10	2.3	70.0	0.1
All ages	2635		0.8	1.8
Incidence				
Raw		8.7		
WS		7.8		
ES		8.4		
BRD-S		8.8		

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).

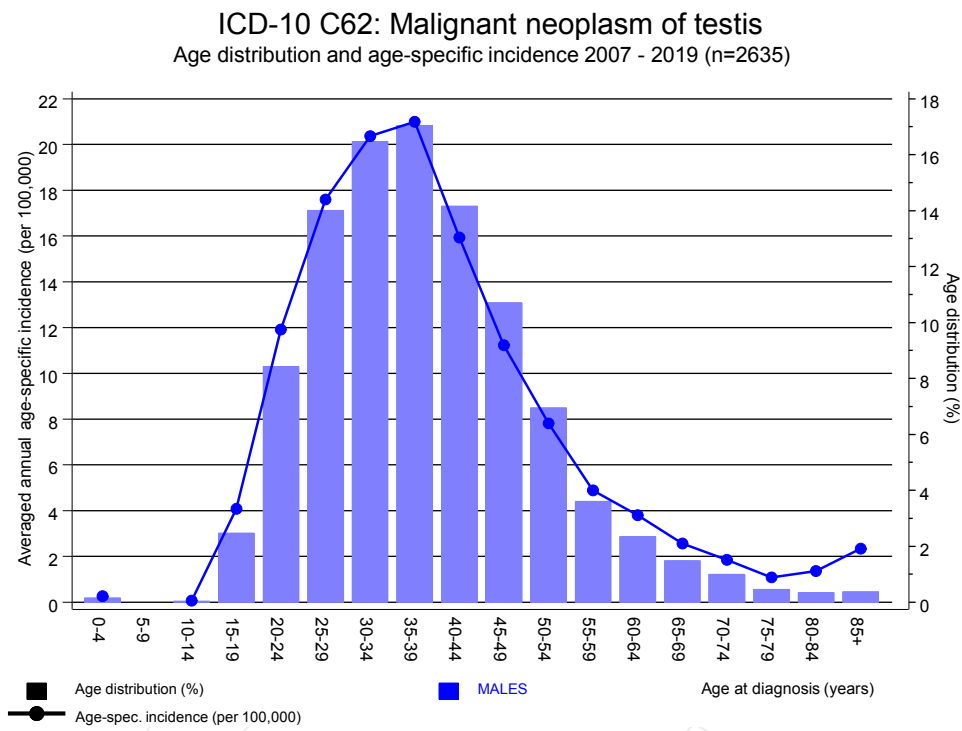


Figure 6. Age distribution (mean=38.9 yrs, median=37.4 yrs) and age-specific incidence.

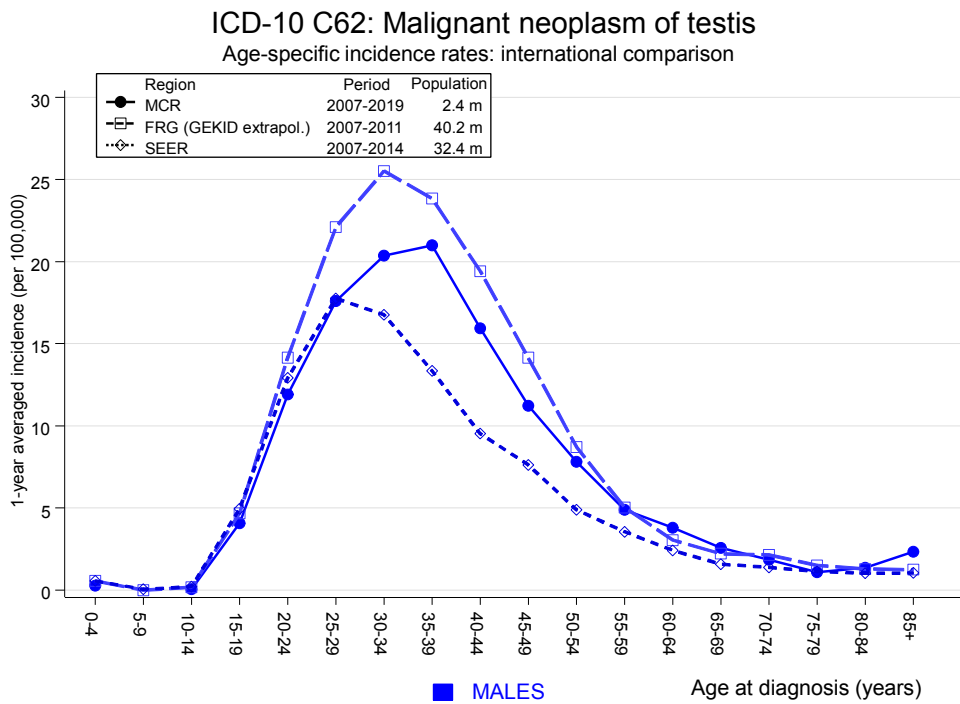


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 2019, based on the November 2018 submission. <http://www.seer.cancer.gov>.

Table 7

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2019

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
	1	0.0	103.5	2.6	576.6 #	0.6	
C03-C06 Oral cavity	2	0.8	2.4	0.3	8.7	0.7	
C07-C08 Salivary gland	1	0.1	8.2	0.2	45.5	0.5	
C09-C10 Oropharynx	2	0.9	2.1	0.3	7.7	0.6	
C12-C13 Hypopharynx	2	0.5	4.2	0.5	15.0	0.9	
C15 Oesophagus	1	1.0	1.0	0.0	5.4	-0.0	
C16 Stomach	4	1.6	2.6	0.7	6.6	1.4	
C17 Small intestine	3	0.3	8.8	1.8	25.6 #	1.5	
C18 Colon	6	3.4	1.8	0.6	3.9	1.5	
C19-C20 Rectum	5	2.5	2.0	0.6	4.6	1.4	
C21 Anus/canal	2	0.2	11.2	1.4	40.3 #	1.0	
C22 Liver	7	1.1	6.3	2.5	13.0 #	3.4	
C23-C24 Bile	1	0.3	2.9	0.1	16.1	0.4	
C25 Pancreas	6	1.4	4.2	1.6	9.2 #	2.6	
C32 Larynx	3	0.6	5.2	1.1	15.1 #	1.4	33.3
C33-C34 Lung	19	4.8	3.9	2.4	6.2 #	8.2	5.3
C37 Thymus	1	0.0	20.0	0.5	111.5	0.5	
C40-C41 Bone	1	0.1	8.3	0.2	46.3	0.5	
C43 Malign. melanoma	10	3.5	2.8	1.4	5.2 #	3.7	
C46,C49 Soft tissue	1	0.5	2.2	0.1	12.3	0.3	
C61 Prostate	35	8.9	3.9	2.7	5.5 #	15.0	2.9
C62 Testis	92	2.9	32.1	25.8	39.3 #	51.4	
C64 Kidney	12	1.9	6.2	3.2	10.8 #	5.8	
C67 Bladder	3	1.3	2.3	0.5	6.7	1.0	
C69 Eye lymphoma	1	0.0	93.3	2.4	519.8 #	0.6	
C70-C72 CNS cancer	6	1.2	5.0	1.8	10.8 #	2.8	16.7
C73 Thyroid	6	1.1	5.5	2.0	12.0 #	2.8	
C74-C80 Cancer others	2	0.1	26.1	3.2	94.2 #	1.1	
C76-C79 CUP	3	0.7	4.4	0.9	12.7	1.3	
C81 Hodgkin lymphoma	2	0.6	3.6	0.4	12.9	0.8	
C82-C85 NHL	6	2.3	2.6	1.0	5.7	2.1	
C90 Mult. myeloma	3	0.5	5.8	1.2	17.0 #	1.4	
C91-C96 Leukaemia	5	0.8	6.1	2.0	14.2 #	2.4	20.0
Not observed	0	1.1	0.0	0.0	3.2	-0.7	
All further malignancies	254	47.2	5.4	4.7	6.1 #	119.2	2.0
Patients			3999				
Median age at next malignancy (years)			48.9				
Person-years			17352				
Mean observation time (years)			4.3				
Median observation time (years)			2.7				

The occurrence of further specified malignancy is statistically significant.

Average incidence (Germany 1987 standard population) 2007 - 2019

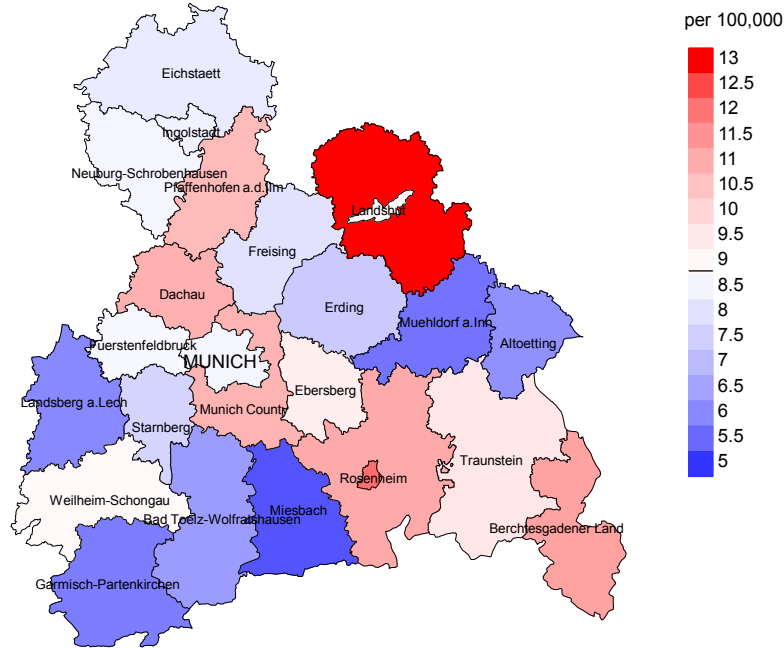


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (8.8/100,000 WS N=2,635).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,374 male residents (averaged) in the period from 2007 to 2019 a total of 73 men were identified with newly diagnosed testicular cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 9.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 6.6 and 12.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2019

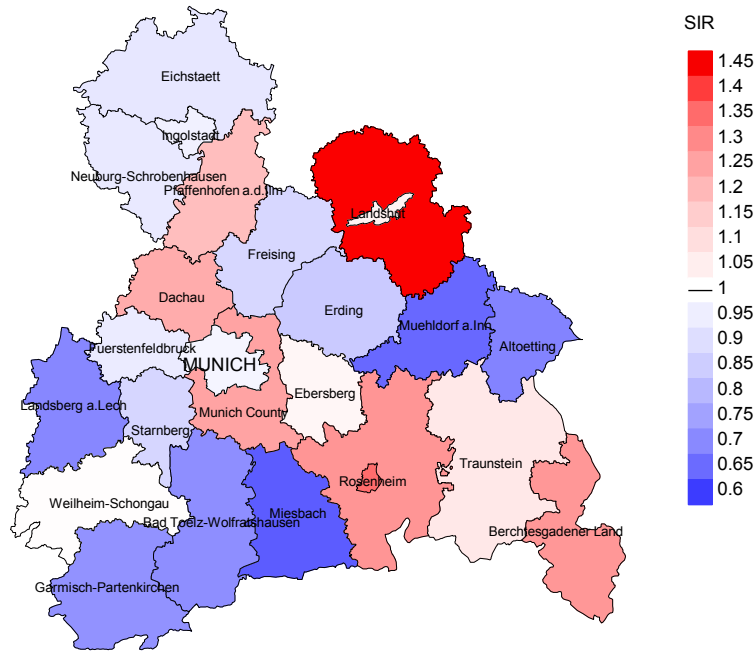


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=2,635).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,991 male residents (averaged) in the period from 2007 to 2019 a total of 73 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 1.03. Though, the value of this parameter may vary with an underlying probability of 99% between 0.74 and 1.38, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 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	134	92.5	2.2	20	14.9	95.0
1999	121	93.4	0.8	16	13.2	93.8
2000	124	88.7	1.6	9	7.3	100.0
2001	131	90.1	0.8	11	8.4	90.9
2002	219	93.6	0.5	25	11.4	92.0
2003	203	97.5	0.5	21	10.3	95.2
2004	233	91.8	2.1	26	11.2	96.2
2005	222	93.2	2.7	23	10.4	91.3
2006	196	87.8	2.0	18	9.2	77.8
2007	264	83.3	0.4	25	9.5	100.0
2008	198	96.0	1.0	16	8.1	93.8
2009	234	98.3	0.4	21	9.0	95.2
2010	220	95.5	0.9	17	7.7	88.2
2011	209	96.7		7	3.3	57.1
2012	234	97.9	0.9	12	5.1	100.0
2013	253	96.4	0.4	9	3.6	100.0
2014	226	95.1	1.3	8	3.5	75.0
2015	205	83.4		7	3.4	71.4
2016	173	98.3	2.3	9	5.2	77.8
2017	170	99.4	2.4	8	4.7	100.0
2018	171	100.0	0.6	4	2.3	75.0
2019	99	56.6		2	2.0	50.0
1998-2019	4239	92.9	1.1	314	7.4	91.1

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 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	134	9	100.0	4	3.0
1999	121	17	82.4	2	1.7
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	203	22	100.0	6	3.0
2004	233	19	84.2	5	2.1
2005	222	33	93.9	9	4.1
2006	196	25	92.0	4	2.0
2007	264	28	96.4	4	1.5
2008	198	29	100.0	5	2.5
2009	234	34	97.1	3	1.3
2010	220	33	93.9	4	1.8
2011	209	37	100.0		
2012	234	28	100.0	3	1.3
2013	253	46	97.8	4	1.6
2014	226	32	100.0	3	1.3
2015	205	34	100.0	1	0.5
2016	173	37	97.3	5	2.9
2017	170	46	95.7	6	3.5
2018	171	35	37.1	2	1.2
2019	99	32	50.0	1	1.0
1998–2019	4239	621	91.0	81	1.9

Table 9c

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 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 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	84.2	15.8	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	34	73.5	26.5	72.7
2010	33	63.6	36.4	67.7
2011	37	75.7	24.3	81.1
2012	28	60.7	39.3	60.7
2013	46	65.2	34.8	62.2
2014	32	59.4	40.6	71.9
2015	34	52.9	47.1	64.7
2016	37	56.8	43.2	72.2
2017	46	56.5	43.5	56.8
2018	35	48.6	51.4	69.2
2019	32	21.9	78.1	56.3
1998–2019	621	63.3	36.7	72.9

Table 10

Medians of age at death according to the grouping in Table 9

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	63.3	62.5	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	34	59.4	59.4	65.8	61.7
2010	33	61.6	63.6	58.7	60.5
2011	37	61.8	62.8	53.4	62.8
2012	28	58.3	57.2	59.3	57.2
2013	46	56.5	56.2	63.1	55.1
2014	32	66.3	66.5	59.6	67.1
2015	34	67.3	67.9	57.4	67.9
2016	37	62.0	63.4	61.8	59.9
2017	46	74.7	75.1	72.7	75.6
2018	35	60.6	56.5	65.7	66.5
2019	32	64.1	62.8	64.6	61.7
1998-2019	621	62.0	61.4	62.7	61.6

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

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 11

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	0.11	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	0.08	1.0	0.09
2004	16	0.9	0.07	0.6	0.06	0.7	0.07	0.9	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	25	1.1	0.11	0.7	0.08	0.9	0.10	1.1	0.10
2010	21	0.9	0.10	0.6	0.07	0.7	0.08	0.9	0.09
2011	28	1.3	0.14	0.8	0.10	1.0	0.12	1.2	0.13
2012	17	0.7	0.07	0.4	0.05	0.6	0.06	0.7	0.07
2013	30	1.3	0.12	0.9	0.09	1.1	0.11	1.2	0.11
2014	19	0.8	0.08	0.5	0.05	0.6	0.07	0.7	0.07
2015	18	0.8	0.09	0.4	0.06	0.6	0.07	0.7	0.08
2016	21	0.9	0.12	0.5	0.08	0.7	0.10	0.8	0.11
2017	26	1.1	0.15	0.5	0.08	0.7	0.11	1.0	0.13
2018	17	0.7	0.10	0.5	0.08	0.6	0.09	0.6	0.09
2019	7	0.3	0.07	0.2	0.04	0.2	0.05	0.3	0.06
1998-2019	393	0.9	0.09	0.6	0.07	0.7	0.08	0.8	0.09

Table 12

Age distribution of age at death (cancer-related) for period 2007-2019
(incl. multiple malignancies)

Age at death Years	Cases		Cum.%
	n	%	
0-4			
5-9			
10-14			
15-19	1	0.4	0.4
20-24	4	1.5	1.9
25-29	3	1.1	3.0
30-34	9	3.4	6.4
35-39	14	5.3	11.7
40-44	13	4.9	16.5
45-49	15	5.6	22.2
50-54	31	11.7	33.8
55-59	27	10.2	44.0
60-64	32	12.0	56.0
65-69	44	16.5	72.6
70-74	26	9.8	82.3
75-79	19	7.1	89.5
80-84	18	6.8	96.2
85+	10	3.8	100.0
All ages	266	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(incl. multiple malignancies)

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	0.02	2.1
20-24	4	0.2	0.02	6.0
25-29	3	0.1	0.01	3.5
30-34	9	0.4	0.02	7.0
35-39	14	0.7	0.03	5.8
40-44	13	0.6	0.03	2.3
45-49	15	0.6	0.05	1.1
50-54	31	1.3	0.17	1.2
55-59	27	1.4	0.28	0.7
60-64	32	2.0	0.52	0.5
65-69	44	2.9	1.13	0.5
70-74	26	1.9	1.00	0.2
75-79	19	1.7	1.58	0.2
80-84	18	2.7	2.00	0.2
85+	10	2.3	1.00	0.1
All ages	266			0.4
Mortality				
Raw		0.9	0.10	
WS		0.5	0.07	
ES		0.7	0.09	
BRD-S		0.8	0.09	
PYLL-70				
per 100,000		11.6		
ES		10.4		
AYLL-70		16.0		

Table 14

Further malignancies in deaths in period 1998-2019

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	4	1.3					4	100.0
C07-C08 Salivary gland	1	0.3					1	100.0
C09-C10 Oropharynx	6	1.9	1	16.7			5	83.3
C12-C13 Hypopharynx	2	0.6					2	100.0
C15 Oesophagus	4	1.3			1	25.0	3	75.0
C16 Stomach	14	4.4	2	14.3	1	7.1	11	78.6
C17 Small intestine	2	0.6					2	100.0
C18 Colon	24	7.5	3	12.5			21	87.5
C19-C20 Rectum	17	5.3	2	11.8			15	88.2
C21 Anus/canal	1	0.3					1	100.0
C22 Liver	10	3.1					10	100.0
C23-C24 Bile	6	1.9					6	100.0
C25 Pancreas	24	7.5					24	100.0
C32 Larynx	5	1.6					5	100.0
C33-C34 Lung	59	18.4	3	5.1	2	3.4	54	91.5
C38,C45 Mesothelioma	2	0.6					2	100.0
C40-C41 Bone	3	0.9			1	33.3	2	66.7
C43 Malign. melanoma	7	2.2	1	14.3	1	14.3	5	71.4
C44 Skin others	9	2.8	1	11.1			8	88.9
C46,C49 Soft tissue	6	1.9	2	33.3			4	66.7
C48 Peritoneal	2	0.6					2	100.0
C61 Prostate	39	12.2	8	20.5	2	5.1	29	74.4
C62 Testis	8	2.5			1	12.5	7	87.5
C64 Kidney	7	2.2					7	100.0
C65 Renal pelvis	1	0.3					1	100.0
C66 Ureter	1	0.3					1	100.0
C67 Bladder	12	3.8					12	100.0
C68 Urinary org.	1	0.3					1	100.0
C70-C72 CNS cancer	10	3.1	1	10.0	2	20.0	7	70.0
C73 Thyroid	3	0.9					3	100.0
C74-C80 Cancer others	1	0.3					1	100.0
C76-C79 CUP	9	2.8					9	100.0
C82-C85 NHL	11	3.4	2	18.2	1	9.1	8	72.7
C90 Mult. myeloma	4	1.3			1	25.0	3	75.0
C91-C96 Leukaemia	5	1.6	1	20.0			4	80.0
All further malignancies	320	100.0	27	8.4	13	4.1	280	87.5

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 further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(**First 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	0.02	2.2
20-24	4	0.2	0.02	6.7
25-29	2	0.1	0.01	2.6
30-34	9	0.4	0.02	7.3
35-39	14	0.7	0.03	6.2
40-44	12	0.5	0.03	2.3
45-49	14	0.6	0.05	1.1
50-54	28	1.2	0.17	1.3
55-59	23	1.2	0.27	0.6
60-64	28	1.7	0.54	0.6
65-69	40	2.6	1.48	0.6
70-74	22	1.6	1.29	0.3
75-79	16	1.4	2.29	0.2
80-84	15	2.3	5.00	0.2
85+	7	1.6	1.75	0.1
All ages	235			0.5
Mortality				
Raw		0.8	0.10	
WS		0.5	0.07	
ES		0.6	0.08	
BRD-S		0.7	0.09	
PYLL-70				
per 100,000		10.7		
ES		9.6		
AYLL-70		16.3		

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(**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	0.02	2.2
20-24	4	0.2	0.02	6.7
25-29	2	0.1	0.01	2.6
30-34	8	0.4	0.02	6.5
35-39	12	0.6	0.03	5.3
40-44	10	0.4	0.03	1.9
45-49	8	0.3	0.03	0.7
50-54	5	0.2	0.03	0.2
55-59	6	0.3	0.08	0.2
60-64	8	0.5	0.18	0.2
65-69	12	0.8	0.50	0.2
70-74	3	0.2	0.27	0.0
75-79	5	0.5	0.83	0.1
80-84	4	0.6	1.33	0.1
85+	2	0.5	0.50	0.0
All ages	90			0.2
Mortality				
Raw		0.3	0.04	
WS		0.2	0.03	
ES		0.3	0.03	
BRD-S		0.3	0.04	
PYLL-70				
per 100,000		6.5		
ES		6.0		
AYLL-70		22.7		

* See corresponding tables with multiple malignancies.

ICD-10 C62: Malignant neoplasm of testis
Age distribution and age-specific mortality 2007 - 2019 (n=266)

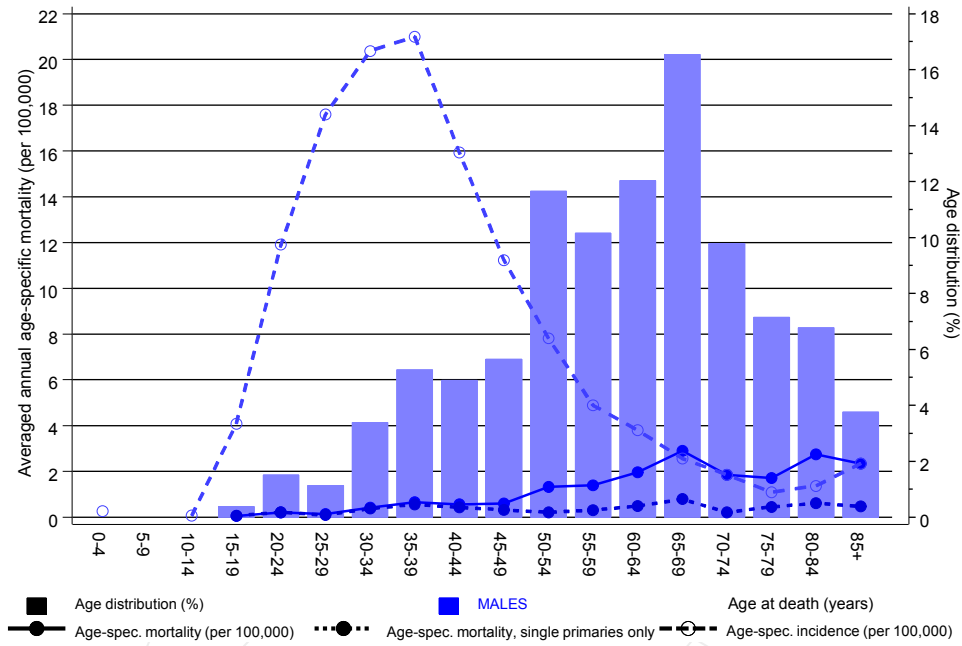


Figure 17. Distribution of age at death (bars; mean=44.4 yrs, median=43.2 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (Germany 1987 standard population) 2007 - 2019

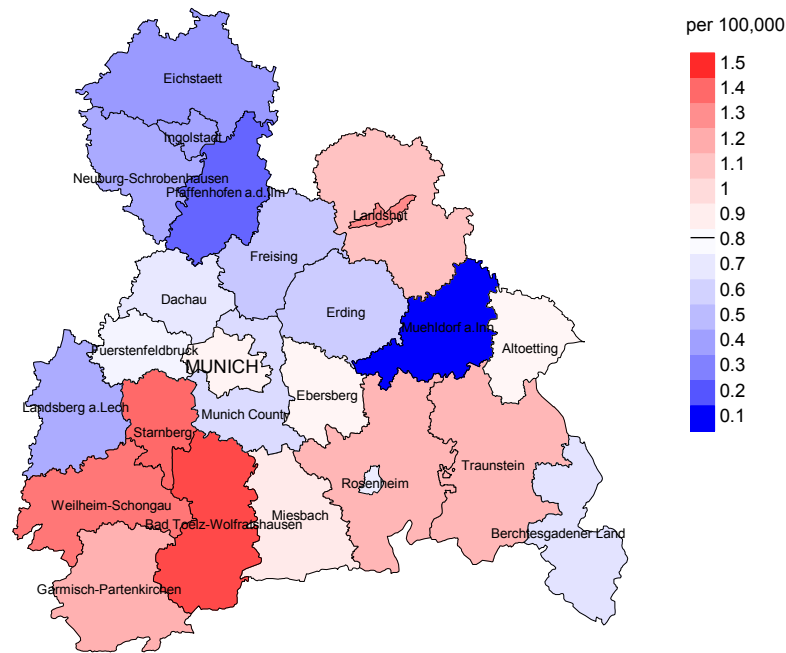


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (0.8/100,000 WS N=266).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,374 male residents (averaged) in the period from 2007 to 2019 a total of 8 men died from testicular cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.9/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.3 and 2.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2019

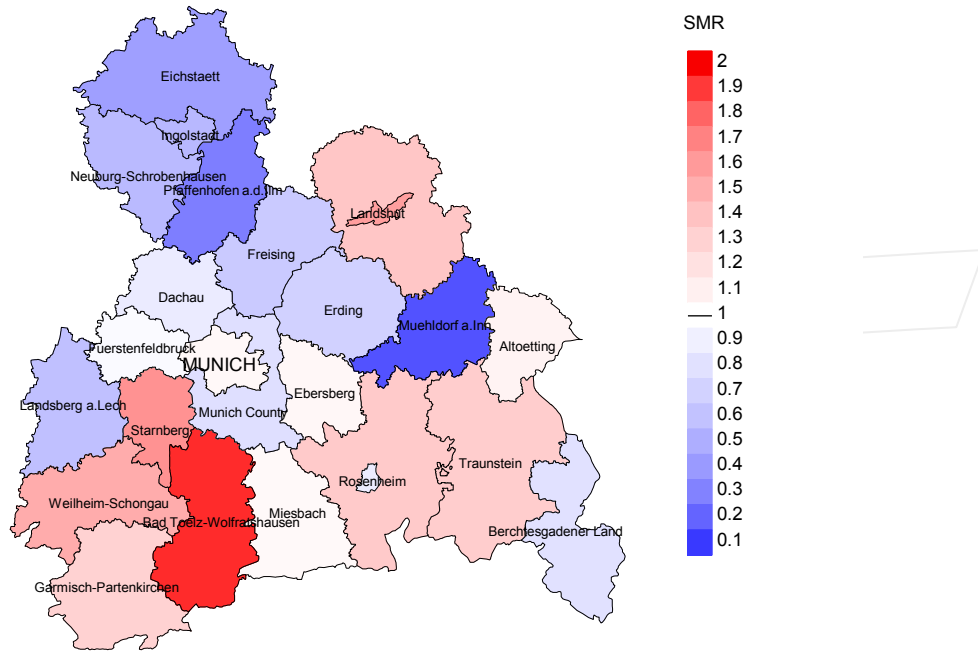


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=266).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,991 male residents (averaged) in the period from 2007 to 2019 a total of 8 men died from testicular cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.06. Though, the value of this parameter may vary with an underlying probability of 99% between 0.34 and 2.45, 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, where applicable. 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 ratio of mortality and incidence (mortality-to-incidence ratio, **MIR, MI-Index**) is a statistical index 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 MIR. 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

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

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