

Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage
- ▶ *Deutsch*

ICD-10 D09.0, D41.4: Bladder tumor

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	9,664
Diseases	9,669
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m




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

<https://www.tumorregister-muenchen.de/en/facts/base/bD0941E-ICD-10-D09.0-D41.4-Bladder-tumor-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, August 2018

[#] 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
D09.0	Carcinoma in situ: Bladder
D41.4	Neoplasm of uncertain or unknown behaviour of urinary organs: Bladder

INCIDENCE

Table 1

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (ALL PATIENTS)

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	284	9.5	22.2	66.2	95.8
1999	285	11.8	22.1	60.4	97.2
2000	284	12.8	21.8	63.4	96.8
2001	264	13.8	21.4	55.3	96.6
2002	445	14.9	21.2	54.8	96.6 #
2003	445	14.9	20.8	50.8	93.5
2004	556	15.4	20.4	49.3	93.0
2005	548	16.5	19.8	46.0	92.5
2006	510	16.9	19.2	41.0	85.9
2007	677	17.4	18.5	41.5	75.5 #
2008	624	18.1	17.5	33.8	61.9
2009	648	18.7	16.8	34.3	63.0
2010	680	19.2	15.7	30.3	58.8
2011	691	19.7	14.6	24.7	58.8
2012	700	20.5	13.7	22.9	60.3
2013	676	21.0	12.8	21.4	57.2
2014	613	21.3	11.9	15.3	62.5
2015	420	21.6	10.3	10.2	97.4
2016	319	21.8	9.7	6.0	76.5 ##
1998-2016	9669	21.8	22.2	35.6	75.9

9,669 cases diagnosed 1998-2016 are related to a total of 9,664 patients. Currently, in 3,930 (40.7 %) of these 9,664 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,803 / 822 / 305 (29.0 % / 8.5 % / 3.2 %) 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 2014, a subgroup of 613 cases has been diagnosed, of which 21.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 11.9 % 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 1a

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (MALES)

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	211	74.3	9.0	23.4	64.9	94.8
1999	202	70.9	10.9	23.2	62.4	97.0
2000	213	75.0	12.1	22.9	61.0	95.8
2001	196	74.2	13.5	22.4	59.2	98.0
2002	327	73.5	14.8	22.1	54.4	96.9 #
2003	334	75.1	15.0	21.6	51.8	93.1
2004	398	71.6	15.7	21.3	49.7	93.0
2005	417	76.1	16.8	20.7	46.0	92.1
2006	397	77.8	17.0	19.9	43.6	84.9
2007	534	78.9	17.3	19.1	42.3	75.8 #
2008	469	75.2	18.3	18.1	34.3	62.0
2009	485	74.8	18.9	17.3	35.9	63.1
2010	520	76.5	19.4	16.1	31.7	59.8
2011	526	76.1	19.9	14.9	26.2	59.7
2012	537	76.7	20.7	13.9	24.2	61.3
2013	537	79.4	21.2	12.8	21.8	55.9
2014	497	81.1	21.5	12.4	15.5	64.0
2015	334	79.5	21.8	10.9	10.5	97.9
2016	250	78.4	21.9	9.9	6.0	74.4 ##
1998-2016	7384	76.4	21.9	23.4	36.0	75.8

7,384 cases diagnosed 1998-2016 are related to a total of 7,380 patients. Currently, in 3,109 (42.1 %) of these 7,380 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,217 / 643 / 249 (30.0 % / 8.7 % / 3.4 %) 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 2014, a subgroup of 497 cases has been diagnosed, of which 21.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 12.4 % 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 1b

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (FEMALES)

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	73	25.7	11.0	18.6	69.9	98.6
1999	83	29.1	14.1	18.5	55.4	97.6
2000	71	25.0	14.5	18.2	70.4	100.0
2001	68	25.8	14.6	18.3	44.1	92.6
2002	118	26.5	15.0	18.1	55.9	95.8 #
2003	111	24.9	14.5	18.2	47.7	94.6
2004	158	28.4	14.4	17.7	48.1	93.0
2005	131	23.9	15.6	16.8	45.8	93.9
2006	113	22.2	16.5	16.7	31.9	89.4
2007	143	21.1	17.9	16.2	38.5	74.1 #
2008	155	24.8	17.6	15.3	32.3	61.3
2009	163	25.2	17.8	15.3	29.4	62.6
2010	160	23.5	18.4	14.2	25.6	55.6
2011	165	23.9	19.2	13.7	20.0	55.8
2012	163	23.3	19.7	13.0	18.4	57.1
2013	139	20.6	20.3	12.7	20.1	62.6
2014	116	18.9	20.7	10.1	14.7	56.0
2015	86	20.5	21.1	7.9	9.3	95.3
2016	69	21.6	21.4	9.0	5.8	84.1 ##
1998-2016	2285	23.6	21.4	18.6	34.2	76.4

2,285 cases diagnosed 1998-2016 are related to a total of 2,284 patients. Currently, in 821 (35.9 %) of these 2,284 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 586 / 179 / 56 (25.7 % / 7.8 % / 2.5 %) 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 2014, a subgroup of 116 cases has been diagnosed, of which 20.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 10.1 % 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
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	211	73	19.0	6.2	11.6	2.8	17.4	4.1	23.1	5.4
1999	202	83	18.0	7.0	10.8	3.0	16.2	4.6	21.9	5.9
2000	213	71	18.7	5.9	10.9	2.5	16.6	3.8	22.1	5.1
2001	196	68	16.9	5.6	9.6	2.8	14.8	4.1	20.4	5.2
2002	327	118	17.6	6.0	9.8	2.7	14.8	4.1	19.5	5.2
2003	334	111	17.8	5.6	10.0	2.7	14.7	3.8	18.8	4.7
2004	398	158	21.2	8.0	11.4	3.5	17.2	5.1	22.6	6.5
2005	417	131	22.0	6.6	11.4	3.0	17.4	4.3	23.5	5.4
2006	397	113	20.7	5.6	10.9	2.2	16.3	3.4	21.1	4.5
2007	534	143	24.1	6.2	12.3	2.8	18.5	4.0	24.4	5.1
2008	469	155	21.1	6.7	10.4	3.0	15.7	4.3	20.7	5.4
2009	485	163	21.7	7.0	10.9	3.0	16.3	4.4	21.2	5.7
2010	520	160	23.1	6.8	11.0	2.9	16.7	4.3	22.3	5.4
2011	526	165	23.5	7.1	10.7	3.1	16.4	4.5	21.9	5.6
2012	537	163	23.7	6.9	10.9	2.9	16.6	4.3	21.9	5.4
2013	537	139	23.3	5.8	10.7	2.3	16.2	3.5	21.6	4.4
2014	497	116	21.3	4.8	9.7	1.9	14.6	2.8	19.2	3.7
2015	334	86	14.0	3.5	6.2	1.5	9.5	2.2	12.7	2.8
2016	250	69	10.4	2.8	4.8	1.1	7.2	1.7	9.4	2.1
1998-2016	7384	2285	20.1	6.0	10.0	2.6	15.1	3.8	19.9	4.8

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

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Std.				Median				
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	284	68.0	13.0	22.9	98.1	50.7	58.8	69.7	77.8	84.0
1999	285	68.8	12.5	18.9	96.7	54.6	60.2	69.9	78.0	84.1
2000	284	69.6	11.2	34.0	94.0	54.0	62.0	71.7	77.5	84.1
2001	264	69.6	10.7	28.4	90.7	55.0	62.3	71.0	77.5	82.5
2002	445	68.9	11.6	28.3	93.8	54.1	61.3	70.6	77.3	82.6
2003	445	67.8	11.8	28.8	92.0	52.0	60.9	68.6	75.8	82.2
2004	556	69.3	11.8	23.3	93.9	53.7	62.3	69.7	77.7	83.6
2005	548	69.8	11.9	18.4	95.3	56.3	62.8	71.1	78.1	84.0
2006	510	70.1	11.0	24.7	97.4	57.0	63.4	70.0	78.0	83.7
2007	677	69.6	11.9	21.7	96.5	54.3	63.4	70.5	78.4	83.6
2008	624	69.9	11.2	23.8	94.9	54.3	63.9	70.4	78.3	83.4
2009	648	69.7	11.9	28.5	95.9	53.7	62.8	71.2	78.2	83.3
2010	680	70.5	11.2	22.4	96.9	55.1	64.2	71.9	78.6	83.7
2011	691	71.4	10.7	28.4	97.8	57.0	65.5	71.9	78.7	84.8
2012	700	71.0	11.5	32.6	97.7	54.8	64.5	72.2	79.3	85.2
2013	676	71.4	11.9	18.3	99.0	55.3	64.6	72.8	80.2	85.2
2014	613	71.9	11.0	20.9	101	57.3	66.0	73.0	79.6	84.9
2015	420	71.5	11.1	33.3	96.6	56.0	65.0	73.2	78.6	84.1
2016	319	71.0	12.3	20.5	95.5	54.6	64.1	72.4	79.3	86.0
1998–2016	9669	70.2	11.6	18.3	101	54.9	63.3	71.4	78.4	84.0

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Std.				Median				
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	211	66.9	12.2	28.9	91.4	51.3	58.0	68.5	76.3	82.1
1999	202	68.0	12.4	18.9	92.9	54.5	60.5	69.1	77.0	83.4
2000	213	68.8	10.9	40.8	94.0	53.3	61.6	70.6	76.4	83.8
2001	196	69.9	10.7	28.4	90.7	55.7	62.3	71.0	77.7	83.5
2002	327	68.5	11.3	28.3	93.0	55.2	61.1	70.2	76.7	81.9
2003	334	67.7	11.3	30.2	92.0	52.6	60.7	68.4	75.5	81.8
2004	398	68.7	11.9	23.3	93.9	52.7	61.5	69.4	77.0	83.4
2005	417	69.8	11.6	18.4	95.3	56.4	62.9	71.5	77.5	82.9
2006	397	69.3	11.1	24.7	94.9	55.4	62.8	69.1	77.6	83.6
2007	534	69.5	11.6	21.7	93.9	53.5	63.0	70.3	77.9	83.0
2008	469	69.7	11.0	29.6	94.2	54.2	64.3	70.2	77.9	83.0
2009	485	69.3	12.0	28.5	95.2	53.7	62.3	70.6	78.1	83.1
2010	520	70.4	10.9	25.6	90.8	55.2	64.2	72.1	78.3	83.3
2011	526	71.7	10.6	28.4	93.7	56.5	66.7	72.5	79.1	84.7
2012	537	71.0	11.4	32.6	97.0	55.4	64.7	72.2	79.1	84.7
2013	537	71.3	11.8	18.3	99.0	55.3	64.8	72.8	80.0	85.1
2014	497	71.6	11.1	20.9	98.5	56.7	66.0	72.7	79.3	84.9
2015	334	71.5	11.1	33.3	96.6	55.8	65.6	73.4	78.6	84.4
2016	250	71.0	12.2	20.5	95.5	54.2	63.9	72.3	79.2	86.0
1998–2016	7384	70.0	11.5	18.3	99.0	54.8	63.3	71.2	78.0	83.6

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Std. dev.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	73	71.1	14.8	22.9	98.1	46.9	65.0	74.4	81.5	86.0
1999	83	70.8	12.4	43.4	96.7	55.9	59.8	71.8	79.7	85.1
2000	71	72.0	11.8	34.0	91.8	55.4	65.2	74.3	79.7	85.6
2001	68	68.7	10.8	45.2	87.5	52.8	61.8	71.5	76.2	81.8
2002	118	70.2	12.4	38.7	93.8	52.5	61.4	72.1	79.4	85.2
2003	111	68.3	13.2	28.8	90.4	49.6	61.8	69.8	78.4	82.9
2004	158	70.6	11.7	36.9	92.6	55.5	63.6	70.3	79.9	85.0
2005	131	69.7	12.9	32.0	94.6	54.4	61.2	69.9	80.4	85.1
2006	113	72.9	9.9	47.0	97.4	59.7	65.4	72.8	80.9	83.9
2007	143	70.1	12.9	22.2	96.5	54.8	64.1	70.7	79.9	84.3
2008	155	70.5	11.7	23.8	94.9	54.4	62.0	71.4	80.2	84.9
2009	163	71.1	11.7	36.0	95.9	54.8	64.5	72.1	78.6	84.9
2010	160	70.9	12.2	22.4	96.9	54.4	64.0	71.6	79.5	85.5
2011	165	70.3	11.1	30.4	97.8	58.0	63.0	70.6	77.6	85.0
2012	163	71.0	12.0	40.2	97.7	53.1	63.9	72.2	79.5	86.2
2013	139	71.9	12.2	40.6	95.2	55.0	63.2	72.7	81.7	86.2
2014	116	73.0	10.8	45.2	101	58.9	66.0	73.7	80.5	85.6
2015	86	71.2	11.2	44.8	95.4	56.1	63.4	72.5	78.4	84.0
2016	69	71.0	12.9	29.7	90.1	55.4	65.2	73.5	79.8	86.1
1998-2016	2285	70.8	12.0	22.2	101	55.0	63.3	71.9	79.6	85.1

Table 4

Age distribution by 5-year age group and sex for period 2007-2016

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19	1	0.0	0.0	1	0.0	0.0			0.0
20-24	8	0.1	0.1	4	0.1	0.1	4	0.3	0.3
25-29	11	0.2	0.3	9	0.2	0.3	2	0.1	0.4
30-34	23	0.4	0.7	20	0.4	0.7	3	0.2	0.7
35-39	31	0.5	1.2	27	0.6	1.3	4	0.3	1.0
40-44	85	1.4	2.6	66	1.4	2.7	19	1.4	2.4
45-49	155	2.6	5.2	124	2.6	5.4	31	2.3	4.6
50-54	279	4.6	9.8	212	4.5	9.9	67	4.9	9.6
55-59	423	7.0	16.8	316	6.7	16.6	107	7.9	17.4
60-64	592	9.8	26.6	448	9.6	26.2	144	10.6	28.0
65-69	934	15.4	42.0	748	16.0	42.1	186	13.7	41.7
70-74	1200	19.8	61.9	934	19.9	62.0	266	19.6	61.3
75-79	1009	16.7	78.6	800	17.1	79.1	209	15.4	76.7
80-84	760	12.6	91.1	590	12.6	91.7	170	12.5	89.2
85+	537	8.9	100.0	390	8.3	100.0	147	10.8	100.0
All ages	6048	100.0		4689	100.0		1359	100.0	

Table 5

Age-specific incidence
for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.
0- 4				
5- 9				
10-14				
15-19	1		0.1	
20-24	4	4	0.3	0.3
25-29	9	2	0.6	0.1
30-34	20	3	1.3	0.2
35-39	27	4	1.7	0.3
40-44	66	19	3.5	1.1
45-49	124	31	6.3	1.6
50-54	212	67	12.3	3.9
55-59	316	107	22.3	7.3
60-64	448	144	36.6	10.8
65-69	748	186	63.1	14.3
70-74	934	266	84.4	21.0
75-79	799	209	100.3	20.9
80-84	590	170	128.3	24.0
85+	390	147	127.4	20.0
All ages	4688	1359		
Incidence				
Raw			20.5	5.7
WS			9.7	2.4
ES			14.6	3.6
BRD-S			19.2	4.5

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).

ICD-10 D09.0, D41.4: Neoplasm of bladder (non-invasive only)
 Age distribution and age-specific incidence 2007 - 2016 (Males: 4688, Females: 1359)

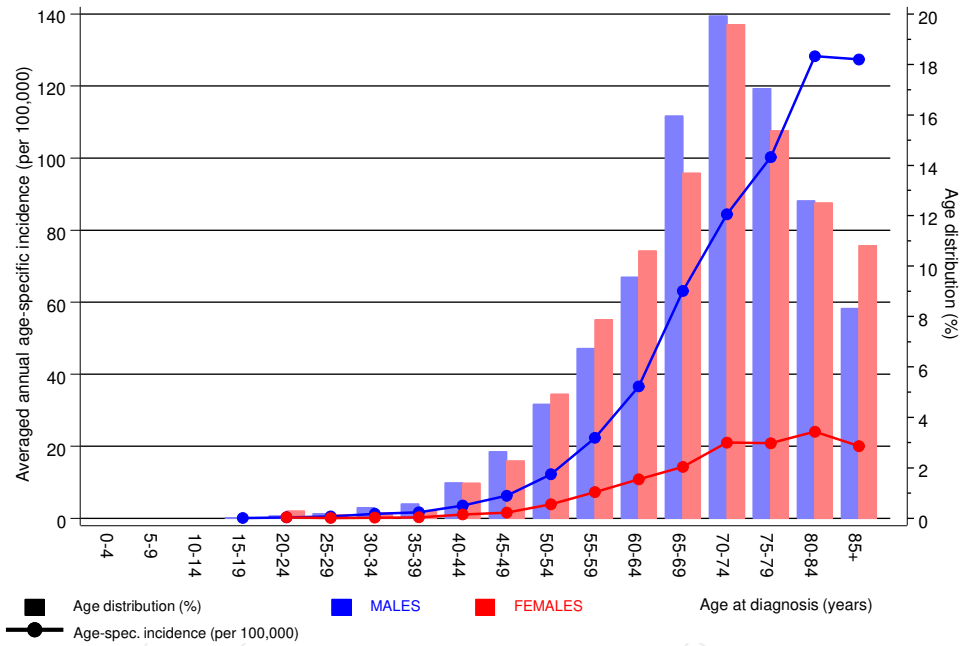


Figure 6. Age distribution (males: mean=70.7 yrs, median=72.0 yrs; females: mean=71.0 yrs, median=71.9 yrs) and age-specific incidence.

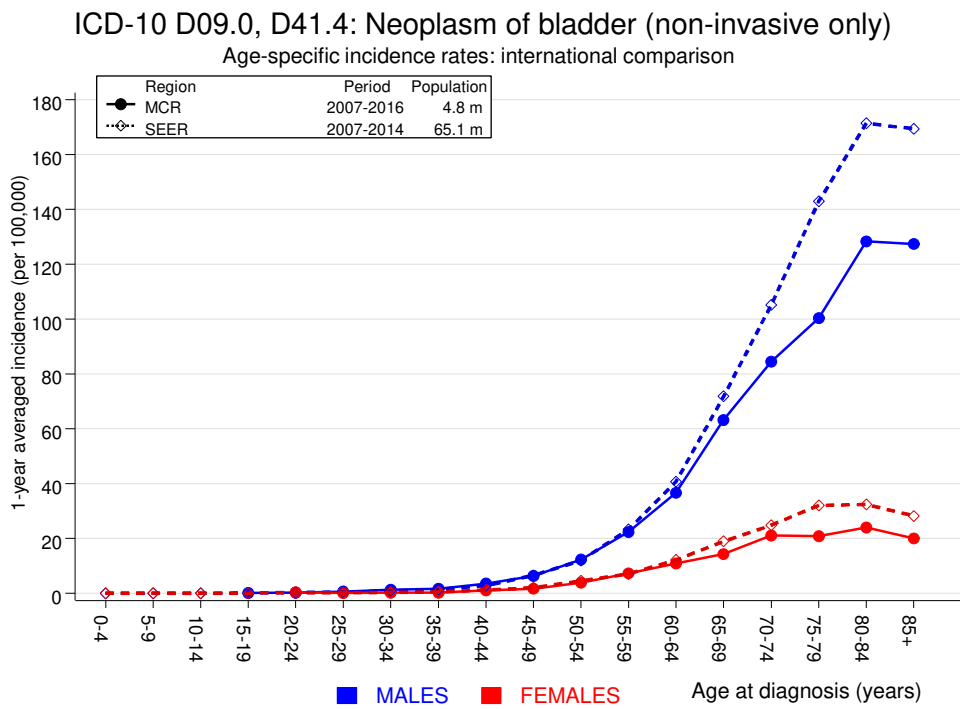


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

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>.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2016

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	12	4.2	2.9	1.5	5.0 #	2.6	8.3
C09-C10 Oropharynx	10	4.9	2.0	1.0	3.7	1.7	10.0
C12-C13 Hypopharynx	6	2.7	2.2	0.8	4.9	1.1	
C15 Oesophagus	21	10.4	2.0	1.2	3.1 #	3.5	4.8
C16 Stomach	36	26.6	1.4	0.9	1.9	3.1	2.8
C17 Small intestine	7	3.2	2.2	0.9	4.4	1.2	
C18 Colon	103	62.4	1.6	1.3	2.0 #	13.3	8.7
C19-C20 Rectum	37	31.4	1.2	0.8	1.6	1.8	
C21 Anus/canal	3	1.3	2.4	0.5	6.9	0.6	
C22 Liver	40	16.9	2.4	1.7	3.2 #	7.6	17.5
C23-C24 Bile	15	6.3	2.4	1.3	3.9 #	2.8	40.0
C25 Pancreas	42	23.9	1.8	1.3	2.4 #	5.9	16.7
C32 Larynx	13	5.5	2.4	1.3	4.0 #	2.5	15.4
C33-C34 Lung	222	70.4	3.2	2.8	3.6 #	49.7	11.3
C38,C45 Mesothelioma	10	4.2	2.4	1.2	4.4 #	1.9	
C43 Malign. melanoma	46	25.1	1.8	1.3	2.4 #	6.9	
C46,C49 Soft tissue	4	3.5	1.1	0.3	2.9	0.2	
C50 Breast	6	1.5	3.9	1.4	8.4 #	1.5	
C60 Penis	5	1.5	3.4	1.1	7.9 #	1.2	40.0
C61 Prostate	604	172.4	3.5	3.2	3.8 #	141.5	6.1
C62 Testis	6	1.0	6.2	2.3	13.4 #	1.6	
C64 Kidney	63	20.1	3.1	2.4	4.0 #	14.0	15.9
C65 Renal pelvis	89	2.8	32.1	25.8	39.5 #	28.3	
C66 Ureter	64	1.6	40.5	31.2	51.7 #	20.5	
C67 Bladder	288	30.7	9.4	8.3	10.5 #	84.3	
C68 Urethra	18	0.5	35.2	20.9	55.6 #	5.7	
C70-C72 CNS cancer	15	7.4	2.0	1.1	3.3 #	2.5	13.3
C73 Thyroid	7	3.2	2.2	0.9	4.5	1.2	
C76-C79 CUP	16	11.0	1.5	0.8	2.4	1.6	
C81 Hodgkin lymphoma	3	1.2	2.4	0.5	7.1	0.6	33.3
C82-C85 NHL	52	25.8	2.0	1.5	2.6 #	8.6	9.6
C90 Mult. myeloma	13	8.3	1.6	0.8	2.7	1.5	30.8
C91-C96 Leukaemia	24	11.0	2.2	1.4	3.3 #	4.3	29.2
Others, specified	14	5.8	2.4	1.3	4.0 #	2.7	14.3
Not observed	0	3.7	0.0	0.0	1.0 #	-1.2	
All further malignancies	1914	612.5	3.1	3.0	3.3 #	426.6	6.8

Patients	7126
Median age at next malignancy (years)	74.8
Person-years	30512
Mean observation time (years)	4.3
Median observation time (years)	3.1

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 to 2 are pooled in category "Others, specified".

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2016

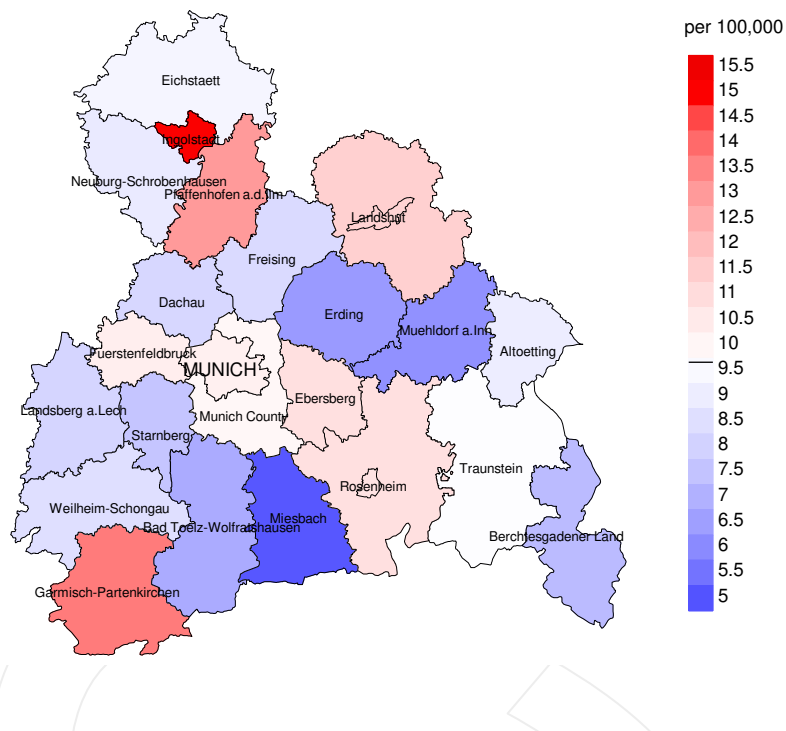
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C15 Oesophagus	3	0.8	3.5	0.7	10.3	2.1	
C16 Stomach	11	5.5	2.0	1.0	3.6 #	5.4	18.2
C17 Small intestine	2	0.7	3.1	0.4	11.1	1.3	
C18 Colon	18	14.9	1.2	0.7	1.9	3.0	5.6
C19–C20 Rectum	10	5.9	1.7	0.8	3.1	4.0	
C22 Liver	5	1.8	2.8	0.9	6.6	3.1	20.0
C23–C24 Bile	4	2.2	1.8	0.5	4.6	1.8	50.0
C25 Pancreas	14	7.0	2.0	1.1	3.4 #	6.9	28.6
C33–C34 Lung	48	9.7	4.9	3.6	6.6 #	37.4	2.1
C43 Malign. melanoma	9	4.7	1.9	0.9	3.7	4.2	
C50 Breast	66	37.5	1.8	1.4	2.2 #	27.9	6.1
C51 Vulva	4	1.5	2.6	0.7	6.7	2.4	
C53 Cervix uteri	5	1.5	3.3	1.1	7.7 #	3.4	60.0
C54 Corpus uteri	12	7.1	1.7	0.9	2.9	4.7	8.3
C56 Ovary	8	5.4	1.5	0.6	2.9	2.5	
C64 Kidney	10	3.4	2.9	1.4	5.4 #	6.5	10.0
C65 Renal pelvis	25	0.5	54.5	35.3	80.5 #	24.0	
C66 Ureter	22	0.2	94.7	59.3	143.4 #	21.3	
C67 Bladder	71	3.0	23.6	18.4	29.8 #	66.5	
C70–C72 CNS cancer	4	1.8	2.2	0.6	5.7	2.2	25.0
C73 Thyroid	2	1.8	1.1	0.1	4.1	0.2	
C76–C79 CUP	5	2.9	1.7	0.6	4.1	2.1	
C82–C85 NHL	10	5.6	1.8	0.9	3.3	4.3	30.0
C90 Mult. myeloma	4	1.8	2.2	0.6	5.7	2.1	
C91–C96 Leukaemia	4	2.4	1.7	0.5	4.3	1.6	25.0
Others, specified	7	2.1	3.3	1.3	6.8 #	4.8	28.6
Not observed	0	4.8	0.0	0.0	0.8 #	-4.7	
All further malignancies	383	136.4	2.8	2.5	3.1 #	241.1	7.0
Patients		2198					
Median age at next malignancy (years)		76.3					
Person-years		10230					
Mean observation time (years)		4.7					
Median observation time (years)		3.4					

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category "Others, specified".

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females

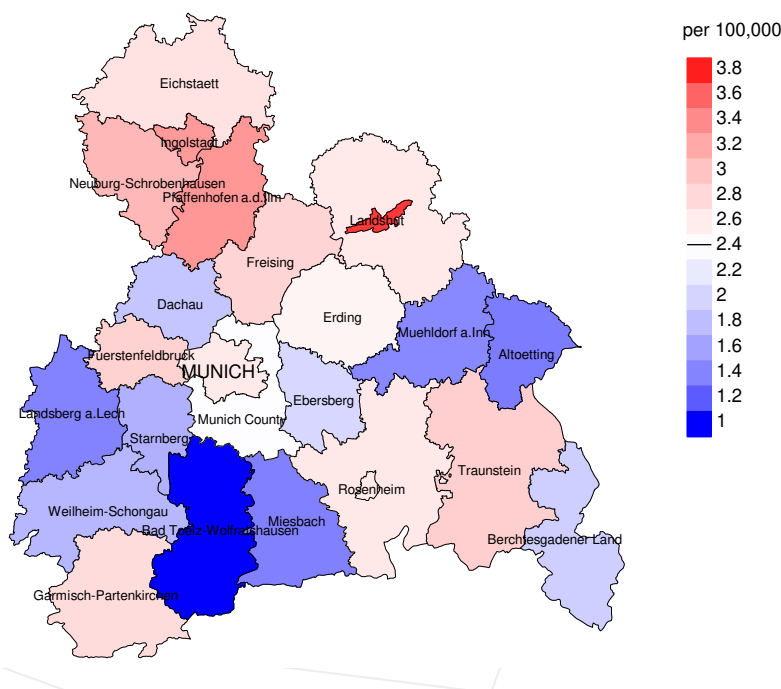
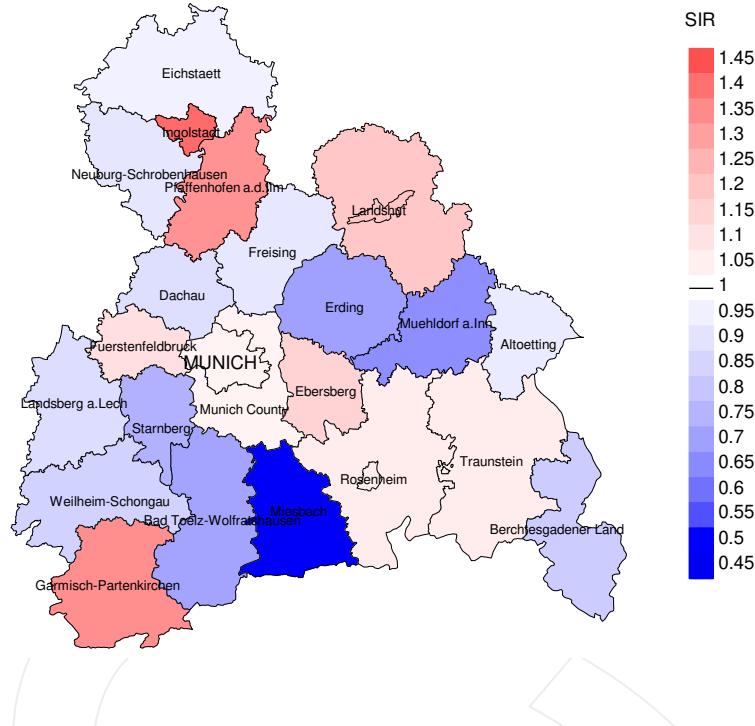


Figure 8a. Map of cancer incidence (world standard population) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 9.7/100,000 WS N=4,688, females 2.4/100,000 WS N=1,359).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 29 women were identified with newly diagnosed bladder tumor. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 3.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

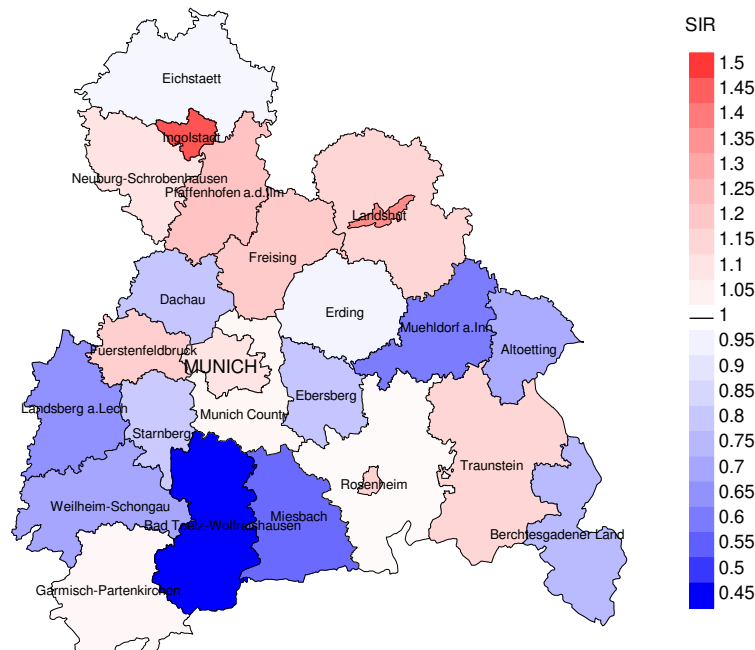


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=4,688, females N=1,359).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 29 women were identified with newly diagnosed bladder tumor. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.79. Though, the value of this parameter may vary with an underlying probability of 99% between 0.46 and 1.25, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status,
and deaths among the annual cohorts

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	284	95.8	188	66.2	93.1
1999	285	97.2	172	60.4	97.7
2000	284	96.8	180	63.4	94.4
2001	264	96.6	146	55.3	98.6
2002	445	96.6	244	54.8	95.5
2003	445	93.5	226	50.8	96.5
2004	556	93.0	274	49.3	97.1
2005	548	92.5	252	46.0	98.8
2006	510	85.9	209	41.0	95.7
2007	677	75.5	281	41.5	98.6
2008	624	61.9	211	33.8	98.1
2009	648	63.0	222	34.3	96.8
2010	680	58.8	206	30.3	97.1
2011	691	58.8	171	24.7	97.7
2012	700	60.3	160	22.9	96.3
2013	676	57.2	145	21.4	95.9
2014	613	62.5	94	15.3	95.7
2015	420	97.4	43	10.2	86.0
2016	319	76.5	19	6.0	78.9
1998-2016	9669	75.9	3443	35.6	96.5

Table 9b

Annual cohorts of incident cancers and deaths,
and cases deceased within the same year of being diagnosed with cancer

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Deaths in same year n	Prop. deaths in same year %
1998	284	96	6	2.1
1999	285	102	8	2.8
2000	284	103	4	1.4
2001	264	124	7	2.7
2002	445	167	7	1.6
2003	445	184	7	1.6
2004	556	211	14	2.5
2005	548	211	17	3.1
2006	510	220	11	2.2
2007	677	264	12	1.8
2008	624	261	13	2.1
2009	648	280	18	2.8
2010	680	320	10	1.5
2011	691	375	27	3.9
2012	700	392	29	4.1
2013	676	389	23	3.4
2014	613	436	24	3.9
2015	420	418	15	3.6
2016	319	372	16	5.0
1998-2016	9669	4925	268	2.8

Table 9c

Annual cohorts of deaths, and proportion of cancer-related and non-cancer-related deaths

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	96	41.7	58.3	59.3
1999	102	30.4	69.6	51.6
2000	103	43.7	56.3	50.5
2001	124	37.9	62.1	53.1
2002	167	46.1	53.9	60.2
2003	184	38.0	62.0	59.3
2004	211	44.5	55.5	60.2
2005	211	50.2	49.8	58.7
2006	220	52.3	47.7	64.2
2007	264	45.8	54.2	61.2
2008	261	46.0	54.0	55.8
2009	280	43.2	56.8	55.3
2010	320	41.6	58.4	54.1
2011	375	44.5	55.5	62.1
2012	392	46.7	53.3	60.4
2013	389	44.0	56.0	57.9
2014	436	42.7	57.3	58.9
2015	418	41.4	58.6	56.0
2016	372	43.3	56.7	57.5
1998-2016	4925	43.9	56.1	58.2

Table 10a

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

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	74	82.5	82.8	82.5	82.6
1999	64	78.1	79.2	76.5	78.1
2000	78	79.6	75.7	81.0	76.5
2001	89	80.4	79.5	81.3	79.6
2002	138	81.3	77.2	82.8	79.1
2003	138	79.4	76.7	81.2	77.8
2004	147	80.4	78.9	83.8	79.8
2005	147	81.4	79.1	83.4	80.6
2006	162	79.1	77.8	80.2	77.0
2007	191	80.7	78.6	81.6	80.0
2008	198	80.8	79.0	82.1	79.9
2009	213	81.1	80.8	81.2	81.4
2010	252	83.8	81.2	84.8	82.4
2011	285	82.1	81.0	82.9	81.4
2012	311	81.9	80.4	83.4	80.5
2013	310	83.3	79.9	85.0	81.1
2014	344	82.5	82.1	82.7	81.4
2015	312	82.8	79.9	84.0	80.6
2016	286	83.3	80.2	84.4	80.6
1998–2016	3739	81.6	79.6	83.1	80.3

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 10b

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

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	22	86.6	83.6	87.0	82.7
1999	38	82.4	77.9	83.2	79.2
2000	25	87.6	86.2	89.3	86.2
2001	35	83.4	82.0	84.5	82.0
2002	29	87.4	82.5	88.8	86.6
2003	46	86.2	80.3	89.1	82.6
2004	64	85.2	81.8	85.9	84.4
2005	64	82.3	79.0	84.1	79.8
2006	58	83.3	80.4	83.9	80.8
2007	73	83.1	81.4	86.6	81.6
2008	63	85.1	82.1	86.7	82.6
2009	67	85.3	79.4	87.0	82.7
2010	68	84.9	80.0	87.4	80.0
2011	90	84.0	80.8	85.7	81.2
2012	81	84.7	78.6	88.9	79.5
2013	79	84.8	80.2	88.0	81.3
2014	92	87.8	83.3	88.3	84.0
2015	106	86.1	79.8	86.8	81.9
2016	86	87.3	83.7	88.4	84.5
1998-2016	1186	85.1	81.2	86.9	82.3

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 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 11a

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

MALES

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	33	3.0	0.16	1.6	0.14	2.8	0.16	4.3	0.19
1999	21	1.9	0.10	1.0	0.09	1.8	0.11	2.6	0.12
2000	37	3.2	0.17	1.8	0.16	2.9	0.18	4.4	0.20
2001	33	2.8	0.17	1.5	0.16	2.6	0.18	3.7	0.18
2002	68	3.6	0.21	1.8	0.19	3.1	0.21	4.5	0.23
2003	56	3.0	0.17	1.5	0.15	2.5	0.17	3.6	0.19
2004	71	3.8	0.18	1.7	0.15	3.0	0.17	4.7	0.21
2005	75	4.0	0.18	1.8	0.15	3.0	0.17	4.6	0.20
2006	89	4.6	0.22	1.9	0.18	3.4	0.21	5.4	0.26
2007	88	4.0	0.16	1.7	0.14	3.0	0.16	4.4	0.18
2008	96	4.3	0.20	1.7	0.17	3.0	0.19	4.8	0.23
2009	92	4.1	0.19	1.6	0.15	2.9	0.18	4.3	0.21
2010	103	4.6	0.20	1.8	0.16	3.1	0.19	4.6	0.21
2011	128	5.7	0.24	2.1	0.20	3.8	0.23	5.6	0.26
2012	155	6.8	0.29	2.5	0.22	4.4	0.26	6.6	0.30
2013	133	5.8	0.25	2.1	0.19	3.6	0.22	5.4	0.25
2014	156	6.7	0.31	2.3	0.24	4.1	0.28	6.0	0.31
2015	136	5.7	0.41	2.0	0.32	3.5	0.37	5.1	0.40
2016	130	5.4	0.52	1.9	0.38	3.2	0.44	4.8	0.51
1998-2016	1700	4.6	0.23	1.9	0.19	3.3	0.22	4.9	0.25

Table 11b

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

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	7	0.6	0.10	0.2	0.06	0.3	0.07	0.4	0.08
1999	10	0.8	0.12	0.3	0.10	0.5	0.11	0.6	0.11
2000	8	0.7	0.11	0.1	0.05	0.3	0.07	0.4	0.08
2001	14	1.2	0.21	0.3	0.12	0.6	0.14	0.8	0.16
2002	9	0.5	0.08	0.1	0.04	0.2	0.05	0.3	0.06
2003	14	0.7	0.13	0.2	0.08	0.4	0.09	0.5	0.10
2004	23	1.2	0.15	0.3	0.10	0.6	0.11	0.8	0.12
2005	31	1.6	0.24	0.5	0.18	0.8	0.20	1.2	0.22
2006	26	1.3	0.23	0.4	0.17	0.6	0.19	0.9	0.20
2007	33	1.4	0.23	0.4	0.14	0.7	0.17	1.0	0.20
2008	24	1.0	0.15	0.2	0.08	0.4	0.10	0.7	0.13
2009	29	1.2	0.18	0.3	0.11	0.6	0.13	0.9	0.15
2010	30	1.3	0.19	0.3	0.12	0.6	0.14	0.9	0.16
2011	39	1.7	0.24	0.5	0.15	0.8	0.17	1.1	0.19
2012	28	1.2	0.17	0.4	0.13	0.6	0.14	0.8	0.16
2013	38	1.6	0.27	0.4	0.19	0.7	0.21	1.0	0.23
2014	30	1.2	0.26	0.3	0.16	0.5	0.18	0.8	0.20
2015	37	1.5	0.43	0.4	0.25	0.6	0.30	1.0	0.36
2016	31	1.3	0.45	0.3	0.28	0.5	0.32	0.8	0.37
1998-2016	461	1.2	0.20	0.3	0.13	0.6	0.15	0.8	0.17

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 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

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 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 between mortality and incidence
FRG	Federal Republic of Germany

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