

Munich Cancer Registry



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

GIST: Gastroint. stromal tumor

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	1,080
Diseases	1,081
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m



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

<https://www.tumorregister-muenchen.de/en/facts/base/bhGISTE-GIST-Gastroint.-stromal-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.

Morphology codes (ICD-O-3 2011) used for specifying cancer site

Code	Description
8936/1	Gastrointestinal stromal tumor, NOS
8936/3	Gastrointestinal stromal sarcoma

INCIDENCE

Table 1

Cases with invasive cancer 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	2	0.0	10.6	100.0	100.0
1999	6	0.0	10.6	83.3	100.0
2000	15	13.0	10.7	80.0	100.0
2001	23	10.9	10.8	69.6	95.7
2002	31	14.3	10.6	80.6	96.8 #
2003	30	15.0	10.8	36.7	90.0
2004	43	14.0	10.7	62.8	93.0
2005	34	14.7	10.3	50.0	94.1
2006	25	14.8	10.2	56.0	96.0
2007	31	15.0	9.8	41.9	71.0 #
2008	49	16.3	9.9	34.7	67.3
2009	53	17.3	9.5	37.7	49.1
2010	84	19.5	9.2	31.0	66.7
2011	98	20.6	8.3	23.5	56.1
2012	133	23.0	7.6	24.8	49.6
2013	104	24.7	7.0	24.0	57.7
2014	116	25.0	7.3	15.5	50.9
2015	109	26.0	6.0	11.9	97.2
2016	95	26.5	3.3	5.3	84.2 ##
1998-2016	1081	26.5	10.6	29.8	70.4

1,081 cases diagnosed 1998-2016 are related to a total of 1,080 patients. Currently, in 382 (35.4 %) of these 1,080 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 281 / 75 / 26 (26.0 % / 6.9 % / 2.4 %) 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 116 cases has been diagnosed, of which 25.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.3 % 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 with invasive cancer 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	1	50.0	0.0	11.1	100.0	100.0
1999	4	66.7	0.0	11.1	75.0	100.0
2000	9	60.0	7.1	11.2	88.9	100.0
2001	12	52.2	7.7	11.4	66.7	91.7
2002	17	54.8	9.3	11.1	94.1	94.1 #
2003	16	53.3	13.6	11.2	50.0	93.8
2004	19	44.2	15.4	11.0	57.9	94.7
2005	16	47.1	17.0	10.6	43.8	93.8
2006	8	32.0	18.6	10.7	62.5	100.0
2007	15	48.4	17.9	10.7	40.0	66.7 #
2008	24	49.0	19.1	11.0	37.5	70.8
2009	29	54.7	19.4	10.9	37.9	51.7
2010	46	54.8	20.8	11.2	34.8	67.4
2011	59	60.2	21.5	10.3	27.1	62.7
2012	70	52.6	24.3	9.3	20.0	50.0
2013	65	62.5	27.3	7.6	21.5	50.8
2014	64	55.2	27.4	8.6	21.9	56.3
2015	54	49.5	28.8	6.1	11.1	98.1
2016	46	48.4	29.3	2.2	4.3	80.4 ##
1998-2016	574	53.1	29.3	11.1	30.5	69.9

574 cases diagnosed 1998-2016 are related to a total of 574 patients. Currently, in 218 (38.0 %) of these 574 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 155 / 46 / 17 (27.0 % / 8.0 % / 3.0 %) 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 64 cases has been diagnosed, of which 27.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 8.6 % 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 with invasive cancer 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	1	50.0	0.0	10.0	100.0	100.0
1999	2	33.3	0.0	10.0	100.0	100.0
2000	6	40.0	22.2	10.0	66.7	100.0
2001	11	47.8	15.0	10.1	72.7	100.0
2002	14	45.2	20.6	10.1	64.3	100.0 #
2003	14	46.7	16.7	10.2	21.4	85.7
2004	24	55.8	12.5	10.3	66.7	91.7
2005	18	52.9	12.2	10.0	55.6	94.4
2006	17	68.0	11.2	9.7	52.9	94.1
2007	16	51.6	12.2	8.8	43.8	75.0 #
2008	25	51.0	13.5	8.6	32.0	64.0
2009	24	45.3	15.1	7.8	37.5	45.8
2010	38	45.2	18.1	6.8	26.3	65.8
2011	39	39.8	19.7	5.9	17.9	46.2
2012	63	47.4	21.5	5.6	30.2	49.2
2013	39	37.5	21.7	6.3	28.2	69.2
2014	52	44.8	22.1	5.9	7.7	44.2
2015	55	50.5	22.7	5.9	12.7	96.4
2016	49	51.6	23.3	4.3	6.1	87.8 ##
1998-2016	507	46.9	23.3	10.0	29.0	71.0

507 cases diagnosed 1998-2016 are related to a total of 506 patients. Currently, in 164 (32.4 %) of these 506 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 126 / 29 / 9 (24.9 % / 5.7 % / 1.8 %) 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 52 cases has been diagnosed, of which 22.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.9 % 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 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	1	1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0
1999	4	2	0.4	0.2	0.3	0.1	0.4	0.1	0.4	0.1
2000	9	6	0.8	0.5	0.4	0.3	0.7	0.4	0.8	0.4
2001	12	11	1.0	0.9	0.6	0.5	0.9	0.7	1.2	0.8
2002	17	14	0.9	0.7	0.5	0.5	0.7	0.6	1.1	0.7
2003	16	14	0.9	0.7	0.6	0.4	0.8	0.5	0.8	0.6
2004	19	24	1.0	1.2	0.6	0.7	0.9	1.0	1.1	1.1
2005	16	18	0.8	0.9	0.5	0.4	0.7	0.6	0.9	0.8
2006	8	17	0.4	0.8	0.2	0.4	0.4	0.6	0.4	0.7
2007	15	16	0.7	0.7	0.4	0.3	0.6	0.4	0.6	0.6
2008	24	25	1.1	1.1	0.6	0.6	0.8	0.8	1.0	0.9
2009	29	24	1.3	1.0	0.7	0.5	1.1	0.7	1.3	0.9
2010	46	38	2.0	1.6	1.1	0.8	1.6	1.2	2.0	1.4
2011	59	39	2.6	1.7	1.3	0.8	1.9	1.1	2.4	1.3
2012	70	63	3.1	2.7	1.6	1.1	2.3	1.7	2.7	2.2
2013	65	39	2.8	1.6	1.4	0.9	2.1	1.1	2.5	1.4
2014	64	52	2.7	2.2	1.4	1.1	2.0	1.5	2.5	1.7
2015	54	55	2.3	2.3	1.1	1.0	1.6	1.4	2.1	1.8
2016	46	49	1.9	2.0	1.0	0.8	1.4	1.2	1.7	1.6
1998-2016	574	507	1.6	1.3	0.8	0.6	1.2	0.9	1.5	1.1

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.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	2	88.8	1.7	87.5	90.0	87.5	87.5	88.8	90.0	90.0
1999	6	63.3	14.4	46.4	88.3	46.4	53.0	62.5	67.1	88.3
2000	15	60.6	14.1	36.6	79.1	37.6	55.1	60.0	72.5	77.9
2001	23	64.1	12.5	31.9	80.5	52.7	57.0	63.9	73.7	79.2
2002	31	66.5	14.6	19.3	89.0	46.8	60.3	68.9	75.8	81.6
2003	30	64.6	13.0	17.9	92.1	52.6	59.4	64.5	72.7	78.4
2004	43	62.7	13.8	16.7	83.2	47.1	55.0	61.9	74.8	79.7
2005	34	67.7	15.2	34.3	89.4	48.8	55.2	70.1	80.8	84.6
2006	25	67.6	11.5	39.5	89.2	54.6	61.9	66.8	73.9	84.8
2007	31	68.4	11.0	46.5	88.3	55.6	59.8	67.1	77.8	83.2
2008	49	66.1	13.4	26.5	97.0	45.9	60.0	67.0	73.1	81.7
2009	53	65.9	13.9	32.6	93.5	49.2	53.8	67.9	77.2	81.0
2010	84	67.0	11.1	30.6	87.5	53.4	60.4	67.6	75.2	82.5
2011	98	66.9	14.0	30.0	88.3	44.6	55.3	71.6	77.1	83.1
2012	133	69.2	11.0	34.9	91.8	54.2	62.1	69.8	77.4	82.5
2013	104	66.5	14.3	16.2	90.6	47.3	59.0	71.1	76.1	79.3
2014	116	66.4	13.8	25.9	93.1	48.0	57.7	68.7	76.5	82.2
2015	109	68.8	12.0	32.6	90.8	51.0	63.9	72.6	76.8	80.5
2016	95	67.4	13.6	32.6	92.4	49.4	55.6	70.4	77.7	83.7
1998-2016	1081	67.0	13.1	16.2	97.0	49.2	58.7	68.7	76.6	82.0

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	1	87.5		87.5	87.5	87.5	87.5	87.5	87.5	87.5
1999	4	63.7	18.5	46.4	88.3	46.4	49.7	60.1	77.7	88.3
2000	9	60.7	15.8	36.6	79.1	36.6	55.1	64.0	72.5	79.1
2001	12	64.1	14.4	31.9	80.5	53.6	55.9	62.9	77.6	80.4
2002	17	71.4	10.9	44.8	89.0	58.1	67.2	71.9	79.2	81.9
2003	16	62.7	15.4	17.9	92.1	52.6	57.6	64.4	68.1	77.9
2004	19	61.2	16.1	16.7	83.2	41.0	54.9	61.4	76.2	80.9
2005	16	63.6	16.3	34.3	89.4	35.6	53.0	65.9	76.0	82.2
2006	8	66.9	12.1	51.7	89.2	51.7	59.9	63.8	73.4	89.2
2007	15	64.1	7.6	47.4	75.2	55.6	58.5	64.0	71.6	73.9
2008	24	66.3	13.7	26.5	88.0	45.4	61.4	69.3	75.1	78.4
2009	29	63.2	13.8	40.8	93.5	44.6	53.3	59.1	74.9	81.0
2010	46	66.9	12.5	30.6	87.5	50.8	59.0	68.4	75.4	82.5
2011	59	68.1	14.0	30.0	88.3	44.7	55.9	72.4	78.9	84.2
2012	70	67.2	10.8	34.9	91.0	51.9	62.0	68.5	73.7	79.8
2013	65	67.1	12.4	34.6	89.4	48.4	59.1	71.7	75.1	78.9
2014	64	66.4	13.1	30.9	83.8	48.0	58.0	69.4	76.9	80.6
2015	54	68.1	12.0	36.8	83.6	49.8	63.8	72.1	77.0	80.2
2016	46	65.8	13.5	32.6	92.4	52.9	55.5	67.0	75.1	81.9
1998-2016	574	66.4	13.0	16.7	93.5	49.2	58.1	68.5	75.7	80.9

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min. Max.		10% 25%		Median		
				Min.	Max.	10%	25%	50%	75%	90%
1998	1	90.0		90.0	90.0	90.0	90.0	90.0	90.0	90.0
1999	2	62.5	1.1	61.7	63.2	61.7	61.7	62.5	63.2	63.2
2000	6	60.5	12.5	41.1	77.9	41.1	55.2	59.8	68.9	77.9
2001	11	64.1	10.7	40.4	79.2	52.7	57.0	66.9	69.9	73.7
2002	14	60.5	16.6	19.3	81.8	42.1	52.1	63.9	72.5	75.8
2003	14	66.8	9.7	46.8	83.9	58.0	59.6	66.3	72.9	79.0
2004	24	63.9	11.9	37.1	81.0	51.8	55.3	63.1	74.3	79.5
2005	18	71.3	13.5	48.8	85.7	49.8	64.3	75.7	82.9	85.4
2006	17	67.9	11.5	39.5	88.2	54.6	63.1	68.4	73.9	84.8
2007	16	72.4	12.4	46.5	88.3	52.0	63.8	77.2	82.4	84.4
2008	25	65.9	13.4	38.1	97.0	48.4	57.1	64.3	73.0	84.8
2009	24	69.3	13.5	32.6	89.4	49.2	62.4	71.7	79.4	83.0
2010	38	67.1	9.3	47.1	85.0	58.2	60.4	67.1	71.2	83.2
2011	39	64.9	13.9	34.3	86.6	44.2	51.9	68.9	74.8	81.9
2012	63	71.3	10.9	47.2	91.8	55.8	62.4	72.5	79.8	86.0
2013	39	65.6	17.2	16.2	90.6	43.1	58.9	69.6	77.5	85.6
2014	52	66.5	14.8	25.9	93.1	49.2	57.4	67.8	75.8	85.9
2015	55	69.6	12.1	32.6	90.8	55.2	64.1	73.2	76.8	83.0
2016	49	69.0	13.7	39.5	91.8	49.2	56.0	73.8	78.1	84.5
1998-2016	507	67.7	13.2	16.2	97.0	49.2	60.0	68.9	77.2	83.2

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	0.1	0.1		0.0		1	0.3	0.3
20-24	1	0.1	0.2		0.0		1	0.3	0.5
25-29	2	0.2	0.5	1	0.2	0.2	1	0.3	0.8
30-34	13	1.5	1.9	8	1.7	1.9	5	1.3	2.0
35-39	12	1.4	3.3	8	1.7	3.6	4	1.0	3.0
40-44	22	2.5	5.8	14	3.0	6.6	8	2.0	5.0
45-49	48	5.5	11.4	21	4.4	11.0	27	6.8	11.8
50-54	51	5.8	17.2	38	8.1	19.1	13	3.3	15.0
55-59	79	9.1	26.3	43	9.1	28.2	36	9.0	24.0
60-64	96	11.0	37.3	44	9.3	37.5	52	13.0	37.0
65-69	128	14.7	51.9	75	15.9	53.4	53	13.3	50.3
70-74	145	16.6	68.6	88	18.6	72.0	57	14.3	64.5
75-79	154	17.7	86.2	77	16.3	88.3	77	19.3	83.8
80-84	72	8.3	94.5	38	8.1	96.4	34	8.5	92.3
85+	48	5.5	100.0	17	3.6	100.0	31	7.8	100.0
All ages	872	100.0		472	100.0		400	100.0	

Table 5

Age-specific incidence and proportion of all cancers for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males Prop.all cancers n=113978 %	Females Prop.all cancers n=112253 %
0- 4						
5- 9						
10-14						
15-19		1		0.1		0.5
20-24		1		0.1		0.3
25-29	1	1	0.1	0.1	0.1	0.1
30-34	8	5	0.5	0.3	0.8	0.3
35-39	8	4	0.5	0.3	0.6	0.2
40-44	14	7	0.8	0.4	0.6	0.2
45-49	21	27	1.1	1.4	0.5	0.4
50-54	38	13	2.2	0.8	0.6	0.1
55-59	43	36	3.0	2.4	0.5	0.4
60-64	44	52	3.6	3.9	0.3	0.5
65-69	75	53	6.3	4.1	0.4	0.4
70-74	88	57	8.0	4.5	0.4	0.4
75-79	77	77	9.7	7.7	0.5	0.6
80-84	38	34	8.3	4.8	0.3	0.3
85+	17	31	5.6	4.2	0.2	0.2
All ages	472	399			0.4	0.4
Incidence						
Raw			2.1	1.7		
WS			1.1	0.8		
ES			1.5	1.1		
BRD-S			1.9	1.4		

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).

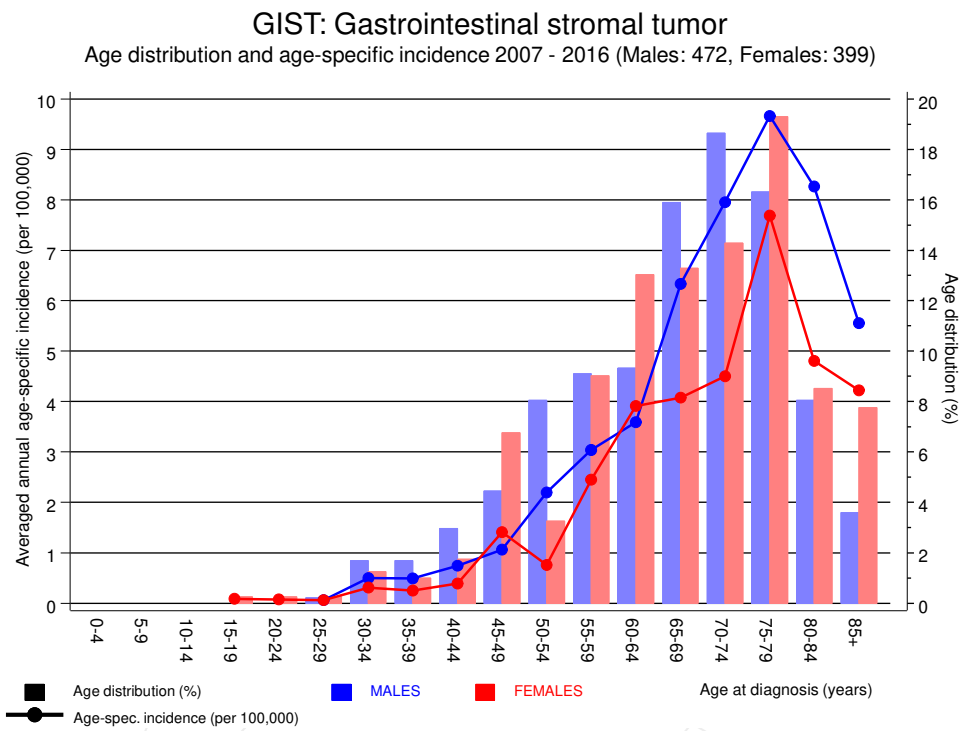


Figure 6. Age distribution (males: mean=66.7 yrs, median=69.2 yrs; females: mean=68.2 yrs, median=70.0 yrs) and age-specific incidence.

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 %
C15 Oesophagus	7	0.4	17.0	6.8	35.0 #	48.6	
C17 Small intestine	8	0.1	63.0	27.2	124.1 #	58.1	
C18 Colon	14	2.0	7.0	3.8	11.7 #	88.6	
C19-C20 Rectum	3	1.1	2.8	0.6	8.0	14.1	
C25 Pancreas	2	0.8	2.4	0.3	8.6	8.6	50.0
C33-C34 Lung	4	2.5	1.6	0.4	4.1	11.1	
C43 Malign. melanoma	4	1.0	4.1	1.1	10.6 #	22.4	
C61 Prostate	8	5.7	1.4	0.6	2.7	16.7	
C64 Kidney	10	0.7	13.7	6.5	25.1 #	68.4	
C76-C79 CUP	2	0.4	5.5	0.7	19.9	12.1	
C82-C85 NHL	3	0.9	3.5	0.7	10.2	15.8	
C90 Mult. myeloma	3	0.3	11.0	2.3	32.1 #	20.1	
C91-C96 Leukaemia	2	0.4	5.5	0.7	19.8	12.1	
Others, specified	9	2.4	3.7	1.7	7.1 #	48.6	11.1
Not observed	0	2.4	0.0	0.0	1.6	-17.5	
All further malignancies	79	21.0	3.8	3.0	4.7 #	427.8	2.5
Patients		535					
Median age at next malignancy (years)		71.7					
Person-years		1355					
Mean observation time (years)		2.5					
Median observation time (years)		1.3					

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 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

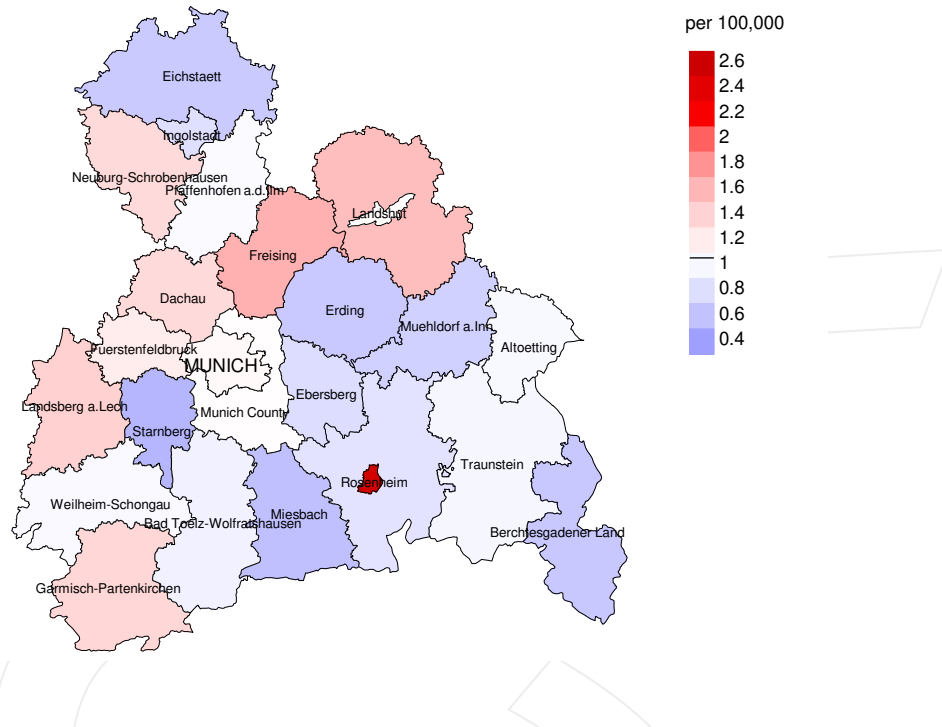
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C16 Stomach	5	0.5	10.7	3.5	24.9 #	37.2	
C17 Small intestine	3	0.1	38.9	8.0	113.7 #	24.0	
C18 Colon	7	1.3	5.2	2.1	10.8 #	46.5	
C19-C20 Rectum	2	0.6	3.6	0.4	12.9	11.8	
C25 Pancreas	4	0.7	5.9	1.6	15.0 #	27.2	
C33-C34 Lung	6	1.1	5.4	2.0	11.7 #	40.1	
C50 Breast	12	4.2	2.8	1.5	4.9 #	63.7	
C51 Vulva	2	0.2	13.2	1.6	47.6 #	15.2	
C54 Corpus uteri	3	0.8	3.8	0.8	11.0	18.1	
C56 Ovary	6	0.6	10.5	3.8	22.8 #	44.6	16.7
C64 Kidney	4	0.4	11.4	3.1	29.2 #	30.0	
C82-C85 NHL	4	0.6	7.3	2.0	18.6 #	28.3	
Others, specified	5	1.2	4.3	1.4	10.0 #	31.5	
Not observed	0	2.1	0.0	0.0	1.7	-17.5	
All further malignancies	63	14.2	4.4	3.4	5.7 #	400.7	1.6
Patients		458					
Median age at next malignancy (years)		74.3					
Person-years		1218					
Mean observation time (years)		2.7					
Median observation time (years)		1.3					

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

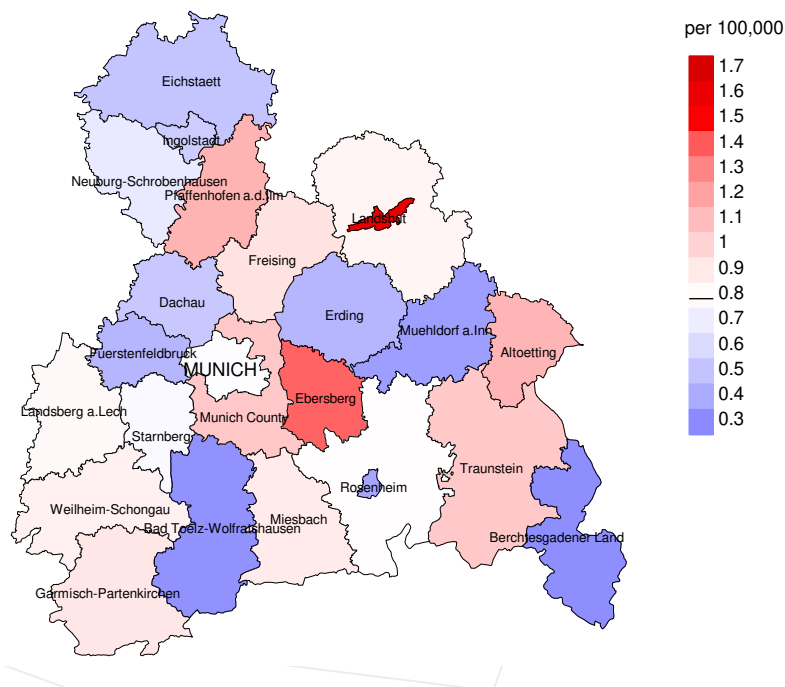
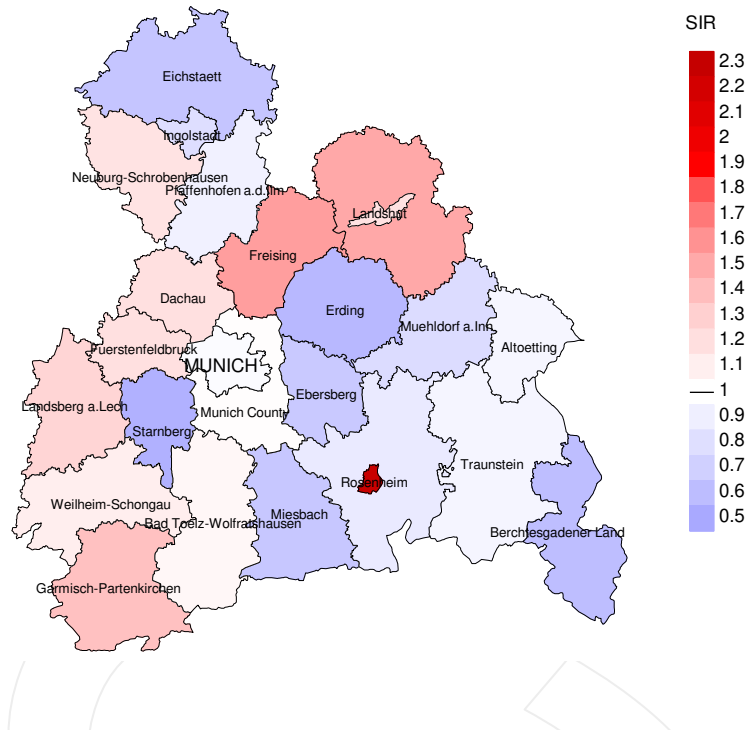


Figure 8a. Map of cancer incidence (world standard population) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.1/100,000 WS N=472, females 0.8/100,000 WS N=399).

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 17 women were identified with newly diagnosed gastroint. stromal tumor. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.6 and 2.8/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

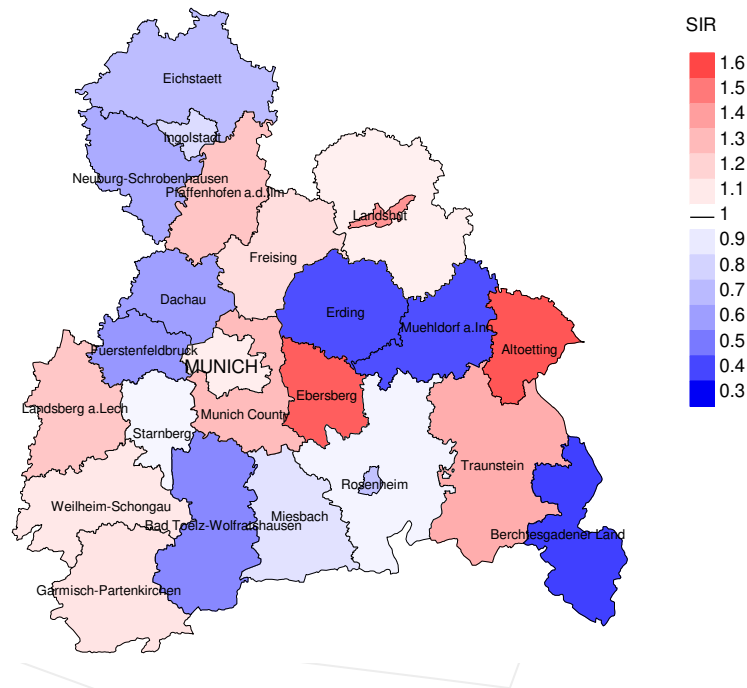


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=472, females N=399).

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 17 women were identified with newly diagnosed gastroint. stromal tumor. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.56. Though, the value of this parameter may vary with an underlying probability of 99% between 0.76 and 2.83, 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	2	100.0	2	100.0	100.0
1999	6	100.0	5	83.3	60.0
2000	15	100.0	12	80.0	91.7
2001	23	95.7	16	69.6	81.3
2002	31	96.8	25	80.6	100.0
2003	30	90.0	11	36.7	100.0
2004	43	93.0	27	62.8	96.3
2005	34	94.1	17	50.0	94.1
2006	25	96.0	14	56.0	100.0
2007	31	71.0	13	41.9	100.0
2008	49	67.3	17	34.7	88.2
2009	53	49.1	20	37.7	100.0
2010	84	66.7	26	31.0	96.2
2011	98	56.1	23	23.5	95.7
2012	133	49.6	33	24.8	93.9
2013	104	57.7	25	24.0	92.0
2014	116	50.9	18	15.5	94.4
2015	109	97.2	13	11.9	92.3
2016	95	84.2	5	5.3	80.0
1998-2016	1081	70.4	322	29.8	94.1

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	2	1	1	50.0
1999	6			
2000	15	3	2	13.3
2001	23	4	1	4.3
2002	31	11	5	16.1
2003	30	12	2	6.7
2004	43	18	7	16.3
2005	34	14	3	8.8
2006	25	12	2	8.0
2007	31	11	1	3.2
2008	49	16	4	8.2
2009	53	12	3	5.7
2010	84	18	5	6.0
2011	98	18	4	4.1
2012	133	26	10	7.5
2013	104	28	6	5.8
2014	116	27	1	0.9
2015	109	48	4	3.7
2016	95	54	5	5.3
1998-2016	1081	333	66	6.1

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	1		100.0	100.0
1999				
2000	3	33.3	66.7	100.0
2001	4	100.0		100.0
2002	11	54.5	45.5	63.6
2003	12	75.0	25.0	90.9
2004	18	72.2	27.8	93.3
2005	14	85.7	14.3	85.7
2006	12	75.0	25.0	81.8
2007	11	90.9	9.1	72.7
2008	16	93.8	6.3	93.8
2009	12	83.3	16.7	83.3
2010	18	66.7	33.3	80.0
2011	18	72.2	27.8	83.3
2012	26	73.1	26.9	80.8
2013	28	67.9	32.1	81.5
2014	27	74.1	25.9	84.0
2015	48	60.4	39.6	74.5
2016	54	63.0	37.0	83.0
1998-2016	333	70.6	29.4	82.1

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	1	87.6		87.6	87.6
1999					
2000	2	84.4	79.2	89.5	79.2
2001	2	71.5	71.5		71.5
2002	5	78.9	80.1	77.6	80.1
2003	8	68.3	70.2	60.0	70.0
2004	10	68.6	67.4	80.5	68.6
2005	5	77.9	77.7	78.4	77.7
2006	7	70.4	70.4	76.2	70.4
2007	7	66.3	66.3		66.3
2008	4	70.4	70.4		70.4
2009	5	68.6	68.6	88.7	68.6
2010	14	71.2	69.1	78.0	71.4
2011	8	73.3	74.3	68.1	72.3
2012	11	77.9	71.6	81.6	71.6
2013	14	74.0	73.0	87.6	71.9
2014	13	74.1	73.8	81.2	74.0
2015	28	78.8	74.5	82.4	75.9
2016	34	73.3	72.5	79.0	72.9
1998-2016	178	73.8	72.1	81.2	72.6

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					
1999					
2000	1	78.5		78.5	78.5
2001	2	60.2	60.2		60.2
2002	6	74.7	71.9	76.3	78.5
2003	4	59.6	59.6		59.6
2004	8	76.5	75.3	79.7	76.5
2005	9	72.8	71.7	74.4	71.7
2006	5	84.2	84.7	74.2	84.7
2007	4	82.7	83.6	81.7	60.9
2008	12	72.8	72.6	82.0	72.6
2009	7	78.5	77.8	97.8	77.8
2010	4	67.7	58.4	75.8	67.7
2011	10	74.7	74.4	75.4	74.7
2012	15	76.0	74.4	87.2	74.4
2013	14	87.5	78.9	88.0	87.5
2014	14	78.3	77.7	78.4	77.7
2015	20	79.6	75.7	84.9	78.3
2016	20	84.3	83.3	85.7	83.5
1998-2016	155	78.4	75.9	82.3	77.7

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
2000	1	0.1	0.11	0.0	0.09	0.1	0.12	0.1	0.18
2001	2	0.2	0.17	0.1	0.19	0.2	0.17	0.2	0.15
2002	2	0.1	0.12	0.0	0.09	0.1	0.11	0.2	0.15
2003	5	0.3	0.31	0.1	0.23	0.2	0.28	0.3	0.37
2004	8	0.4	0.42	0.2	0.34	0.3	0.36	0.4	0.39
2005	4	0.2	0.25	0.1	0.21	0.2	0.25	0.3	0.31
2006	5	0.3	0.63	0.1	0.52	0.2	0.58	0.3	0.66
2007	7	0.3	0.47	0.2	0.46	0.3	0.47	0.3	0.45
2008	4	0.2	0.17	0.1	0.15	0.1	0.15	0.2	0.17
2009	4	0.2	0.14	0.1	0.12	0.1	0.12	0.1	0.12
2010	10	0.4	0.22	0.2	0.21	0.3	0.20	0.4	0.21
2011	5	0.2	0.08	0.1	0.07	0.1	0.07	0.2	0.08
2012	8	0.4	0.11	0.2	0.11	0.3	0.12	0.3	0.13
2013	11	0.5	0.17	0.2	0.14	0.3	0.15	0.4	0.16
2014	11	0.5	0.17	0.2	0.15	0.3	0.16	0.4	0.17
2015	18	0.8	0.33	0.3	0.30	0.5	0.32	0.7	0.32
2016	24	1.0	0.52	0.5	0.47	0.7	0.48	0.9	0.53
2000-2016	129	0.4	0.24	0.2	0.21	0.3	0.23	0.4	0.24

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
2000									
2001	2	0.2	0.18	0.1	0.18	0.1	0.18	0.1	0.17
2002	4	0.2	0.29	0.1	0.19	0.1	0.23	0.2	0.26
2003	4	0.2	0.29	0.1	0.32	0.2	0.29	0.2	0.27
2004	5	0.3	0.21	0.1	0.13	0.1	0.14	0.2	0.19
2005	8	0.4	0.44	0.2	0.48	0.3	0.50	0.4	0.47
2006	4	0.2	0.24	0.0	0.09	0.1	0.13	0.1	0.19
2007	3	0.1	0.19	0.0	0.16	0.1	0.16	0.1	0.15
2008	11	0.5	0.44	0.2	0.34	0.3	0.38	0.4	0.39
2009	6	0.3	0.25	0.1	0.19	0.1	0.21	0.2	0.24
2010	2	0.1	0.05	0.1	0.07	0.1	0.06	0.1	0.05
2011	8	0.3	0.21	0.1	0.18	0.2	0.18	0.2	0.19
2012	11	0.5	0.17	0.2	0.15	0.3	0.15	0.4	0.17
2013	8	0.3	0.21	0.1	0.12	0.2	0.14	0.2	0.15
2014	9	0.4	0.17	0.1	0.09	0.2	0.11	0.3	0.16
2015	11	0.5	0.20	0.1	0.15	0.2	0.16	0.3	0.18
2016	10	0.4	0.20	0.1	0.12	0.2	0.14	0.3	0.16
2000-2016	106	0.3	0.22	0.1	0.17	0.2	0.18	0.2	0.20

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29									
30-34									
35-39	1	0.6	0.6	1	1.0	1.0			0.0
40-44	1	0.6	1.1			1.0	1	1.3	1.3
45-49	7	3.9	5.0	4	3.9	4.9	3	3.8	5.1
50-54	4	2.2	7.2	4	3.9	8.8			5.1
55-59	10	5.5	12.7	7	6.9	15.7	3	3.8	8.9
60-64	14	7.7	20.4	8	7.8	23.5	6	7.6	16.5
65-69	26	14.4	34.8	19	18.6	42.2	7	8.9	25.3
70-74	38	21.0	55.8	23	22.5	64.7	15	19.0	44.3
75-79	24	13.3	69.1	12	11.8	76.5	12	15.2	59.5
80-84	28	15.5	84.5	13	12.7	89.2	15	19.0	78.5
85+	28	15.5	100.0	11	10.8	100.0	17	21.5	100.0
All ages	181	100.0		102	100.0		79	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(incl. multiple malignancies)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	Males MI-index	Females Age- spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39	1		0.1	0.13			0.5	
40-44		1			0.1	0.14		0.1
45-49	4	3	0.2	0.19	0.2	0.11	0.3	0.2
50-54	4		0.2	0.11			0.2	
55-59	7	3	0.5	0.16	0.2	0.08	0.2	0.1
60-64	8	6	0.7	0.18	0.5	0.12	0.2	0.2
65-69	19	7	1.6	0.25	0.5	0.13	0.3	0.1
70-74	23	15	2.1	0.26	1.2	0.26	0.2	0.2
75-79	12	12	1.5	0.16	1.2	0.16	0.1	0.2
80-84	13	15	2.8	0.34	2.1	0.44	0.2	0.2
85+	11	17	3.6	0.65	2.3	0.55	0.2	0.2
All ages	102	79					0.2	0.2
Mortality								
Raw			0.4	0.22	0.3	0.20		
WS			0.2	0.20	0.1	0.14		
ES			0.3	0.21	0.2	0.16		
BRD-S			0.4	0.22	0.2	0.17		
PYLL-70								
per 100,000			1.9		1.0			
ES			1.6		0.8			
AYLL-70			9.0		9.8			

Table 14a

Further malignancies in deaths in period 2000-2016
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C07-C08 Salivary gland	1	1.1					1	100.0
C15 Oesophagus	4	4.5			1	25.0	3	75.0
C16 Stomach	17	19.3			10	58.8	7	41.2
C17 Small intestine	2	2.3					2	100.0
C18 Colon	7	8.0			3	42.9	4	57.1
C19-C20 Rectum	3	3.4					3	100.0
C22 Liver	1	1.1			1	100.0		
C23-C24 Bile	3	3.4	1	33.3	2	66.7		
C25 Pancreas	3	3.4	1	33.3	1	33.3	1	33.3
C26 GI cancer	1	1.1					1	100.0
C32 Larynx	2	2.3	2	100.0				
C33-C34 Lung	1	1.1			1	100.0		
C38,C45 Mesothelioma	1	1.1					1	100.0
C43 Malign. melanoma	4	4.5	2	50.0			2	50.0
C44 Skin others	4	4.5					4	100.0
C50 Breast	1	1.1	1	100.0				
C61 Prostate	15	17.0	9	60.0	1	6.7	5	33.3
C64 Kidney	3	3.4			3	100.0		
C67 Bladder	2	2.3	2	100.0				
C73 Thyroid	2	2.3	2	100.0				
C76-C79 CUP	2	2.3	1	50.0	1	50.0		
C82-C85 NHL	4	4.5	3	75.0			1	25.0
C90 Mult. myeloma	1	1.1					1	100.0
C91-C96 Leukaemia	4	4.5	2	50.0			2	50.0
All further malignancies	88	100.0	26	29.5	24	27.3	38	43.2

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 14b

Further malignancies in deaths in period 2000-2016
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C16 Stomach	6	12.5			3	50.0	3	50.0
C17 Small intestine	1	2.1					1	100.0
C18 Colon	3	6.3			1	33.3	2	66.7
C19-C20 Rectum	2	4.2			1	50.0	1	50.0
C22 Liver	2	4.2			2	100.0		
C25 Pancreas	5	10.4			1	20.0	4	80.0
C26 GI cancer	1	2.1					1	100.0
C33-C34 Lung	5	10.4	2	40.0	2	40.0	1	20.0
C43 Malign. melanoma	1	2.1					1	100.0
C44 Skin others	3	6.3	1	33.3			2	66.7
C46,C49 Soft tissue	1	2.1			1	100.0		
C48 Peritoneal	1	2.1			1	100.0		
C50 Breast	8	16.7	6	75.0			2	25.0
C53 Cervix uteri	2	4.2	2	100.0				
C56 Ovary	4	8.3	2	50.0	1	25.0	1	25.0
C64 Kidney	1	2.1					1	100.0
C74-C80 Cancer others	1	2.1					1	100.0
C90 Mult. myeloma	1	2.1					1	100.0
All further malignancies	48	100.0	13	27.1	13	27.1	22	45.8

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 2007-2016
(**First primaries only ***)

Age at death Years	Males n	Females n	Males Age- spec. mortal. MI-index	Females Age- spec. mortal. MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29						
30-34						
35-39	1		0.1	0.17	0.5	
40-44		1				0.2
45-49	3	2	0.2	0.15	0.3	0.2
50-54	3		0.2	0.09	0.2	
55-59	5	2	0.4	0.14	0.2	0.1
60-64	5	6	0.4	0.17	0.1	0.2
65-69	10	4	0.8	0.20	0.2	0.1
70-74	14	9	1.3	0.28	0.2	0.2
75-79	5	7	0.6	0.13	0.1	0.1
80-84	10	12	2.2	0.42	0.2	0.2
85+	5	12	1.6	0.56	0.1	0.2
All ages	61	55			0.1	0.1
Mortality						
Raw			0.3	0.19		
WS			0.1	0.17		
ES			0.2	0.18		
BRD-S			0.2	0.20		
PYLL-70						
per 100,000			1.4	0.8		
ES			1.2	0.6		
AYLL-70			10.3	10.2		

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age- spec. mortal. MI-index	Females Age- spec. mortal. MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29						
30-34						
35-39	1		0.1	0.17	0.5	
40-44						
45-49	3	1	0.2	0.15	0.3	0.1
50-54	3		0.2	0.10	0.2	
55-59	5	2	0.4	0.16	0.2	0.1
60-64	5	4	0.4	0.19	0.1	0.1
65-69	9	3	0.8	0.20	0.2	0.1
70-74	11	9	1.0	0.26	0.2	0.2
75-79	4	5	0.5	0.12	0.1	0.1
80-84	8	9	1.7	0.38	0.2	0.2
85+	3	10	1.0	0.38	0.1	0.1
All ages	52	43			0.1	0.1
Mortality						
Raw			0.2	0.18	0.2	0.16
WS			0.1	0.17	0.1	0.11
ES			0.2	0.17	0.1	0.12
BRD-S			0.2	0.18	0.1	0.14
PYLL-70						
per 100,000			1.4	0.4		
ES			1.2	0.3		
AYLL-70			10.6	8.5		

* See corresponding tables with multiple malignancies.

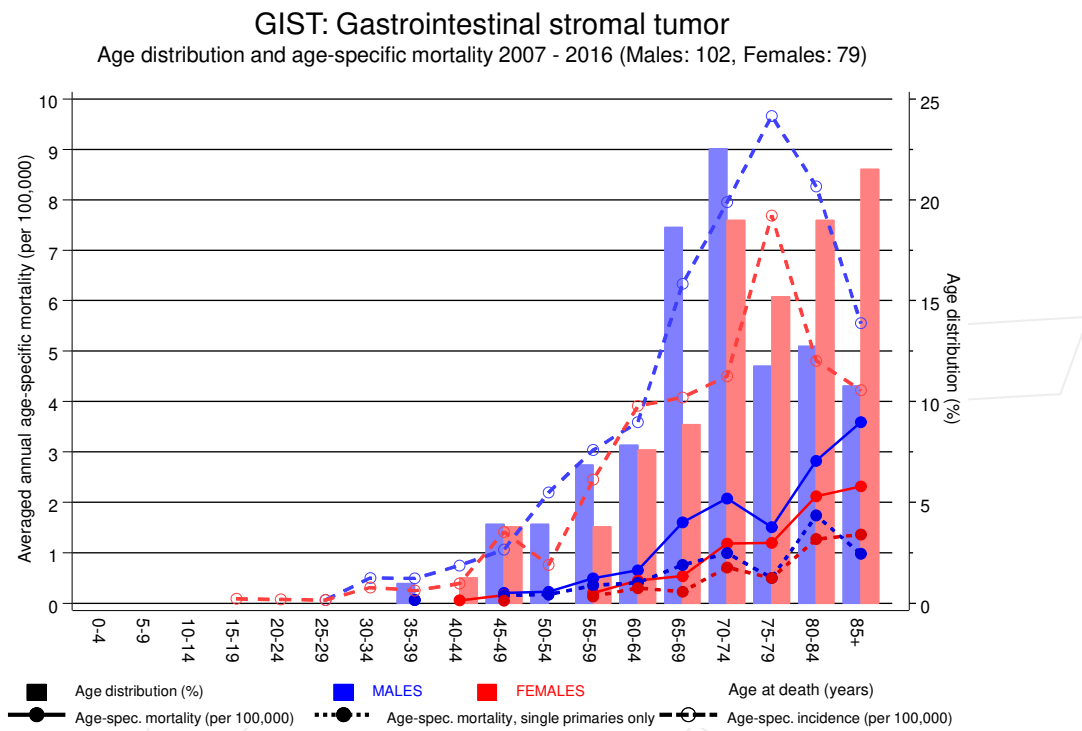
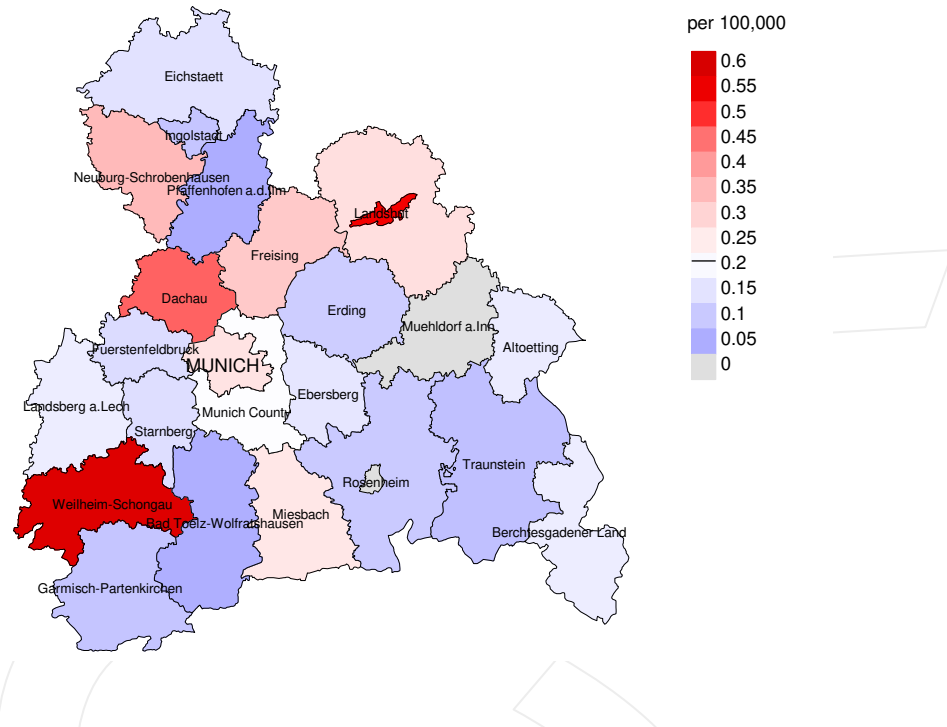


Figure 17. Distribution of age at death (bars; males: mean=67.7 yrs, median=68.1 yrs; females: mean=71.8 yrs, median=73.5 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

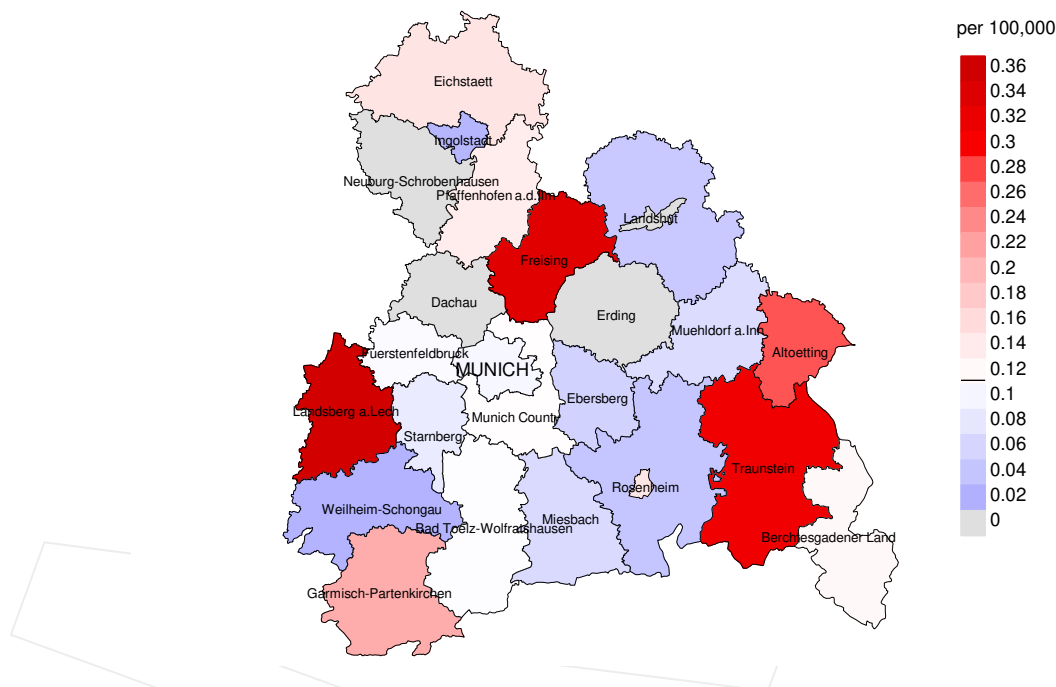
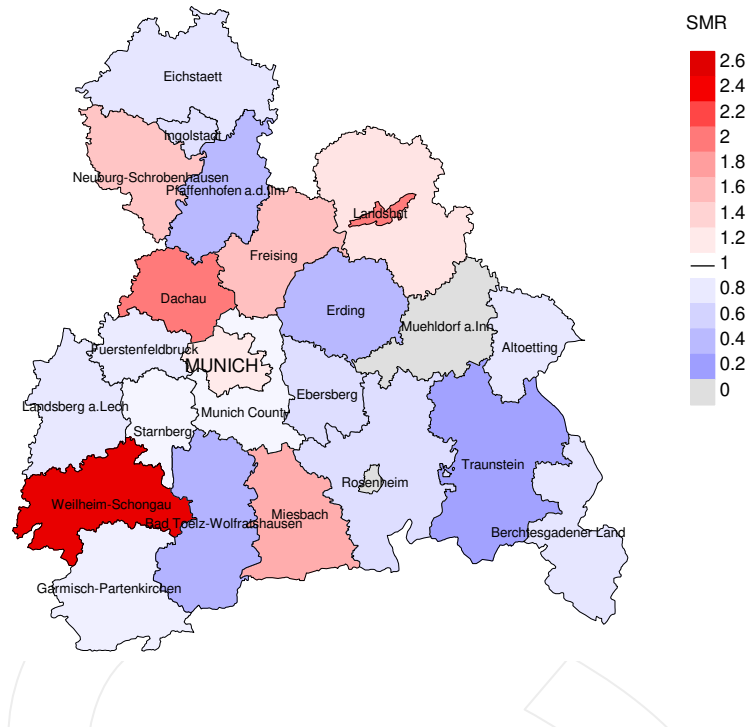


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.2/100,000 WS N=102, females 0.1/100,000 WS N=79).

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 1 women died from gastroint. stromal tumor. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

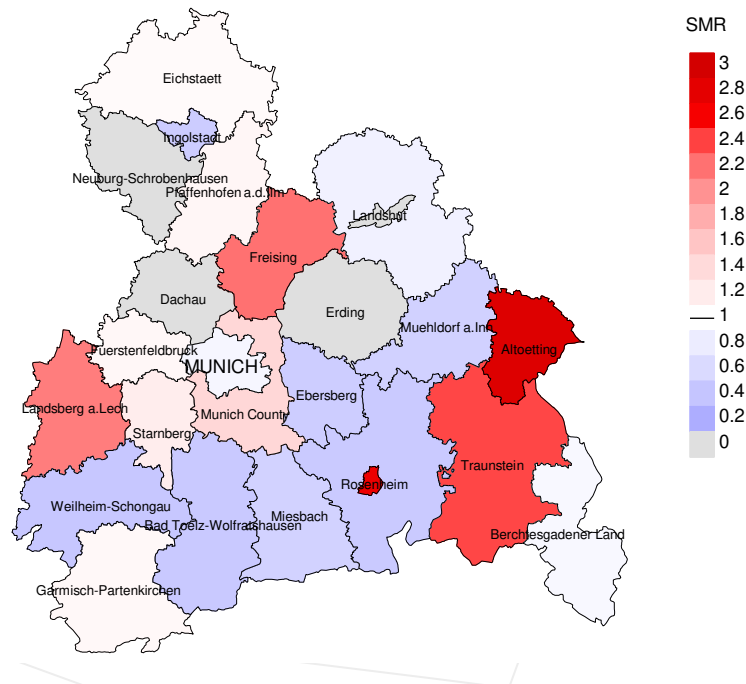


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=102, females N=79).

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 1 women died from gastroint. stromal tumor. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.48. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 3.54, 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 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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