

# Munich Cancer Registry



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## ICD-10 D37-D48: NPL unknown behaviour

### Incidence and Mortality

Year of diagnosis	1998-2019
Patients	11,696
Diseases	11,829
Creation date	01/26/2021
Database export	01/07/2021
Population	4.92 m



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

<https://www.tumorregister-muenchen.de/en/facts/base/bD3748E-ICD-10-D37-D48-NPL-unknown-behaviour-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<sup>#</sup>, with a total of 4.69 million inhabitants, account for the frequency of cancer diseases<sup>##</sup> 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<sup>###</sup> 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](mailto:tumor@ibe.med.uni-muenchen.de).

Munich Cancer Registry, January 2021

- <sup>#</sup> 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).
- <sup>##</sup> 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.
- <sup>###</sup> DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

**ICD-10 codes (ICD-10 2016) used for specifying cancer site**

Code	Description
D37.-	Neoplasm of uncertain or unknown behaviour of oral cavity and digestive organs
D38.-	Neoplasm of uncertain or unknown behaviour of middle ear and respiratory and intrathoracic organs
D39.-	Neoplasm of uncertain or unknown behaviour of female genital organs
D40.-	Neoplasm of uncertain or unknown behaviour of male genital organs
D41.-	Neoplasm of uncertain or unknown behaviour of urinary organs
D42.-	Neoplasm of uncertain or unknown behaviour of meninges
D43.-	Neoplasm of uncertain or unknown behaviour of brain and central nervous system
D44.-	Neoplasm of uncertain or unknown behaviour of endocrine glands
D45	Polycythaemia vera
D46.-	Myelodysplastic syndromes
D47.-	Other neoplasms of uncertain or unknown behaviour of lymphoid, haematopoietic and related tissue
D48.-	Neoplasm of uncertain or unknown behaviour of other and unspecified sites

## 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	166	11.4	15.2	78.9	94.6
1999	179	13.3	15.1	74.9	98.9
2000	227	15.4	15.0	70.0	96.9
2001	243	15.3	15.0	66.3	95.9
2002	408	15.6	14.9	67.4	96.3 #
2003	441	16.3	14.8	66.9	95.0
2004	514	16.5	14.5	60.1	94.9
2005	590	17.2	14.5	63.6	94.9
2006	594	17.7	14.4	61.4	92.8
2007	760	17.5	14.3	57.5	89.5 #
2008	819	17.8	13.8	55.9	97.7
2009	824	18.4	13.5	53.3	96.8
2010	779	19.2	13.0	55.7	97.4
2011	851	19.7	12.7	56.9	97.3
2012	748	20.1	12.1	56.7	96.7
2013	727	20.4	11.5	53.0	97.5
2014	655	20.6	10.4	52.5	95.7
2015	653	21.0	9.5	51.1	91.7
2016	593	21.2	8.6	50.8	97.3
2017	505	21.7	7.1	50.1	97.8
2018	331	22.0	5.8	27.8	97.6
2019	222	22.1	3.2	15.3	66.7 ##
1998-2019	11829	22.1	15.2	56.0	95.2

11,829 cases diagnosed 1998-2019 are related to a total of 11,696 patients. Currently, in 4,279 (36.6 %) of these 11,696 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 3,230 / 797 / 252 (27.6 % / 6.8 % / 2.2 %) 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 505 cases has been diagnosed, of which 21.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.1 % 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 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	59	35.5	20.3	18.3	81.4	93.2
1999	75	41.9	18.7	18.3	80.0	100.0
2000	94	41.4	18.9	18.2	79.8	96.8
2001	98	40.3	19.3	18.2	65.3	93.9
2002	180	44.1	19.2	18.1	72.2	98.9 #
2003	182	41.3	18.3	18.0	73.1	94.5
2004	231	44.9	18.5	17.8	64.5	95.7
2005	258	43.7	19.7	17.6	73.6	97.3
2006	267	44.9	20.5	17.6	71.2	94.4
2007	335	44.1	20.3	17.5	61.2	91.3 #
2008	340	41.5	21.0	16.9	62.4	96.5
2009	361	43.8	21.5	16.4	56.5	96.4
2010	346	44.4	22.7	15.8	63.0	97.7
2011	372	43.7	23.4	15.4	66.1	98.1
2012	345	46.1	23.8	14.4	62.9	96.8
2013	317	43.6	24.2	14.2	63.1	97.2
2014	288	44.0	24.3	13.0	60.8	95.5
2015	277	42.4	24.6	12.2	58.1	94.2
2016	266	44.9	25.0	11.2	60.9	96.2
2017	211	41.8	25.6	8.9	58.8	97.6
2018	139	42.0	26.0	10.4	42.4	97.1
2019	61	27.5	26.2	8.5	21.3	75.4 ##
1998-2019	5102	43.1	26.2	18.3	63.4	95.9

5,102 cases diagnosed 1998-2019 are related to a total of 5,024 patients. Currently, in 2,153 (42.9 %) of these 5,024 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,552 / 433 / 168 (30.9 % / 8.6 % / 3.3 %) 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 211 cases has been diagnosed, of which 25.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 8.9 % 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 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	107	64.5	6.5	12.9	77.6	95.3
1999	104	58.1	10.0	12.8	71.2	98.1
2000	133	58.6	13.1	12.7	63.2	97.0
2001	145	59.7	12.7	12.6	66.9	97.2
2002	228	55.9	13.1	12.4	63.6	94.3 #
2003	259	58.7	14.9	12.4	62.5	95.4
2004	283	55.1	15.1	12.1	56.5	94.3
2005	332	56.3	15.3	12.2	55.7	93.1
2006	327	55.1	15.6	12.0	53.5	91.4
2007	425	55.9	15.3	11.9	54.6	88.0 #
2008	479	58.5	15.4	11.5	51.4	98.5
2009	463	56.2	16.1	11.4	50.8	97.2
2010	433	55.6	16.5	11.0	49.9	97.2
2011	479	56.3	16.8	10.8	49.7	96.7
2012	403	53.9	17.3	10.5	51.4	96.5
2013	410	56.4	17.5	9.6	45.1	97.8
2014	367	56.0	17.8	8.6	46.0	95.9
2015	376	57.6	18.2	7.7	46.0	89.9
2016	327	55.1	18.3	7.0	42.5	98.2
2017	294	58.2	18.7	6.0	43.9	98.0
2018	192	58.0	18.9	3.2	17.2	97.9
2019	161	72.5	19.0	1.3	13.0	63.4 ##
1998-2019	6727	56.9	19.0	12.9	50.4	94.7

6,727 cases diagnosed 1998-2019 are related to a total of 6,672 patients. Currently, in 2,126 (31.9 %) of these 6,672 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,678 / 364 / 84 (25.1 % / 5.5 % / 1.3 %) 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 294 cases has been diagnosed, of which 18.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.0 % 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 4.92 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	59	107	5.3	9.1	3.8	4.5	5.0	6.3	6.0	7.8
1999	75	104	6.7	8.8	4.4	4.5	6.4	6.1	9.1	7.5
2000	94	133	8.3	11.1	5.0	6.2	7.5	8.2	10.2	9.7
2001	98	145	8.5	11.9	5.9	6.3	7.7	8.4	9.6	10.3
2002	180	228	9.7	11.6	6.2	6.3	8.6	8.1	10.8	9.8
2003	182	259	9.7	13.1	6.0	6.8	8.3	9.1	10.6	11.1
2004	231	283	12.3	14.3	7.4	7.5	10.4	10.0	13.2	11.9
2005	258	332	13.6	16.7	7.7	8.5	11.0	11.4	14.7	13.9
2006	267	327	13.9	16.3	8.3	8.5	11.5	11.2	14.6	13.5
2007	335	425	15.1	18.4	8.9	9.8	12.2	12.9	15.6	15.5
2008	340	479	15.3	20.6	8.8	11.2	12.0	14.5	15.3	16.9
2009	361	463	16.2	19.9	9.0	10.3	12.5	13.7	16.1	16.5
2010	346	433	15.4	18.5	8.1	9.1	11.5	12.3	15.1	15.1
2011	372	479	16.6	20.5	8.5	10.5	12.1	13.8	15.9	16.5
2012	345	403	15.2	17.1	8.4	9.0	11.5	11.6	14.4	13.6
2013	317	410	13.8	17.2	6.9	9.2	9.7	11.9	13.0	14.1
2014	288	367	12.4	15.2	6.1	7.1	8.6	9.7	11.4	11.8
2015	277	376	11.6	15.4	5.5	7.3	8.0	9.9	10.6	12.0
2016	266	327	11.1	13.3	4.7	6.6	7.1	8.8	10.0	10.6
2017	211	294	8.7	11.9	3.5	5.7	5.5	7.7	7.7	9.3
2018	139	192	5.7	7.7	2.5	4.5	3.8	5.9	5.0	6.6
2019	61	161	2.5	6.5	1.1	4.0	1.6	5.0	2.2	5.7
1998-2019	5102	6727	11.6	14.7	6.3	7.6	8.8	10.1	11.4	12.0

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	166	66.9	17.1	4.5	95.1	46.3	58.3	68.7	79.0	85.8
1999	179	67.8	17.9	1.7	94.6	45.9	59.2	71.1	81.1	86.1
2000	227	64.9	18.3	10.2	101	36.3	53.3	68.1	78.5	86.1
2001	243	64.2	20.1	0.0	96.0	34.2	55.0	68.3	79.6	86.8
2002	408	65.4	20.3	0.1	97.4	36.5	55.9	70.0	79.7	87.6
2003	441	66.1	18.8	1.1	99.4	38.5	57.0	68.4	79.9	87.0
2004	514	65.4	18.7	1.6	103	39.8	55.9	67.4	80.1	86.2
2005	590	66.8	18.3	0.0	97.1	41.5	58.3	70.3	80.9	85.2
2006	594	65.8	18.9	0.0	101	38.1	56.3	69.3	79.8	85.9
2007	760	65.8	19.1	0.0	100	38.8	56.9	69.1	79.4	86.2
2008	819	65.0	19.5	0.0	99.5	37.7	54.7	69.2	79.1	86.3
2009	824	65.8	18.6	1.9	101	38.0	56.5	69.6	79.5	86.1
2010	779	67.5	18.0	0.2	99.4	42.5	57.3	71.5	80.9	86.5
2011	851	67.0	18.6	0.0	99.2	40.5	56.4	71.7	80.6	86.7
2012	748	66.5	19.6	0.1	99.0	39.5	56.5	70.9	80.9	88.1
2013	727	67.0	18.7	0.0	97.5	43.0	57.2	71.6	80.0	86.4
2014	655	69.0	18.0	1.9	101	44.4	59.0	73.6	82.0	88.5
2015	653	69.0	17.3	5.2	98.2	45.1	57.9	72.9	82.1	88.2
2016	593	69.4	18.4	1.2	104	41.7	58.3	75.7	82.3	88.1
2017	505	70.2	17.1	14.9	98.5	46.1	59.3	75.1	82.9	89.2
2018	331	65.7	16.9	5.0	99.4	41.7	54.0	68.2	78.3	85.6
2019	222	62.8	19.1	18.8	98.7	31.7	50.0	65.6	78.5	84.6
1998-2019	11829	66.7	18.6	0.0	104	40.3	56.8	70.8	80.4	86.8

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	59	62.8	17.6	4.5	90.1	42.6	54.6	65.1	73.3	84.3
1999	75	67.4	19.2	1.7	94.1	44.8	61.2	72.5	80.2	84.8
2000	94	67.2	17.0	10.2	93.8	44.6	60.7	72.0	77.2	84.1
2001	98	60.5	20.4	0.0	91.2	30.9	51.0	64.7	75.6	81.3
2002	180	65.1	19.6	0.1	95.5	38.8	57.4	69.9	78.3	85.9
2003	182	65.8	17.9	1.1	93.9	42.0	60.0	67.5	78.1	84.2
2004	231	65.7	17.8	1.6	93.7	41.5	57.8	68.0	77.8	85.4
2005	258	67.3	17.8	0.0	96.5	44.0	60.5	70.9	79.4	84.3
2006	267	65.7	18.0	0.0	96.5	39.4	59.2	69.4	77.9	84.3
2007	335	65.9	18.6	0.0	100	42.5	58.9	69.8	78.2	84.9
2008	340	65.5	18.4	0.0	94.6	37.5	60.2	69.7	77.8	83.4
2009	361	66.2	18.0	2.6	95.8	40.3	59.4	69.9	79.1	84.4
2010	346	68.8	17.8	0.2	98.9	45.2	62.5	72.1	81.2	86.3
2011	372	68.2	17.4	0.0	92.6	44.1	63.0	72.7	79.5	84.8
2012	345	67.2	19.0	0.3	98.1	41.1	59.7	71.9	79.8	86.5
2013	317	69.2	17.3	1.2	93.0	48.3	63.5	74.2	80.1	84.9
2014	288	69.4	17.7	1.9	101	44.0	61.7	74.5	81.0	85.3
2015	277	71.0	16.0	5.2	97.9	49.9	64.2	73.9	82.1	87.4
2016	266	73.9	15.5	1.2	104	54.7	68.4	78.4	83.7	87.5
2017	211	73.9	13.8	22.1	97.5	56.3	67.6	77.0	83.4	88.2
2018	139	71.6	13.7	23.2	95.6	51.0	65.5	75.1	81.2	86.6
2019	61	72.0	13.6	37.8	93.9	50.9	65.6	76.7	81.5	86.8
1998-2019	5102	67.9	17.8	0.0	104	44.3	60.9	72.0	80.0	85.5

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	107	69.1	16.6	4.9	95.1	46.5	59.6	70.2	81.7	87.9
1999	104	68.0	17.0	15.7	94.6	47.3	56.3	68.8	82.9	88.1
2000	133	63.2	19.1	17.7	101	34.8	51.1	63.6	79.0	87.5
2001	145	66.7	19.6	2.6	96.0	34.5	57.1	70.9	81.5	88.7
2002	228	65.6	20.9	1.6	97.4	35.9	54.3	70.5	80.9	88.9
2003	259	66.2	19.4	2.9	99.4	35.6	55.2	69.2	81.6	88.1
2004	283	65.2	19.4	8.5	103	37.8	52.6	66.7	80.7	86.9
2005	332	66.4	18.7	6.0	97.1	39.5	54.1	69.1	81.7	85.4
2006	327	65.9	19.6	1.7	101	37.2	55.1	68.9	81.3	87.3
2007	425	65.7	19.4	4.1	98.1	37.4	56.2	68.4	80.8	86.9
2008	479	64.6	20.2	0.0	99.5	37.7	50.4	68.7	80.8	87.7
2009	463	65.4	19.1	1.9	101	37.0	54.6	69.1	80.1	87.0
2010	433	66.4	18.1	12.3	99.4	41.0	53.0	70.5	80.7	86.5
2011	479	66.1	19.5	5.6	99.2	39.1	53.4	70.9	81.7	88.1
2012	403	65.9	20.2	0.1	99.0	38.7	54.3	70.4	81.8	88.8
2013	410	65.2	19.5	0.0	97.5	39.5	51.8	69.1	80.0	87.3
2014	367	68.6	18.2	5.0	100	45.7	56.7	72.4	83.0	89.6
2015	376	67.6	18.1	12.6	98.2	43.5	53.8	71.7	82.1	88.8
2016	327	65.8	19.8	1.3	102	36.8	52.9	70.5	81.4	88.7
2017	294	67.6	18.7	14.9	98.5	41.4	53.0	70.5	82.5	90.3
2018	192	61.3	17.7	5.0	99.4	37.8	49.0	61.4	75.7	84.6
2019	161	59.3	19.8	18.8	98.7	29.8	44.5	60.7	75.9	83.5
1998-2019	6727	65.8	19.2	0.0	103	38.2	53.6	69.3	80.9	87.6

Table 4

Age distribution by 5-year age group and sex for period 2007-2019

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	44	0.5	0.5	25	0.7	0.7	19	0.4	0.4
5-9	30	0.4	0.9	17	0.5	1.1	13	0.3	0.7
10-14	54	0.6	1.5	25	0.7	1.8	29	0.6	1.3
15-19	73	0.9	2.4	32	0.9	2.7	41	0.9	2.1
20-24	101	1.2	3.6	32	0.9	3.6	69	1.4	3.6
25-29	131	1.5	5.1	37	1.0	4.6	94	2.0	5.5
30-34	156	1.8	7.0	46	1.3	5.9	110	2.3	7.8
35-39	213	2.5	9.5	62	1.7	7.5	151	3.1	10.9
40-44	285	3.4	12.8	75	2.1	9.6	210	4.4	15.3
45-49	418	4.9	17.8	134	3.7	13.3	284	5.9	21.2
50-54	435	5.1	22.9	143	3.9	17.2	292	6.1	27.3
55-59	515	6.1	29.0	181	4.9	22.1	334	6.9	34.2
60-64	603	7.1	36.1	256	7.0	29.1	347	7.2	41.4
65-69	895	10.6	46.7	441	12.1	41.2	454	9.4	50.9
70-74	1068	12.6	59.3	556	15.2	56.4	512	10.6	61.5
75-79	1209	14.3	73.6	629	17.2	73.6	580	12.1	73.6
80-84	1031	12.2	85.8	530	14.5	88.1	501	10.4	84.0
85+	1206	14.2	100.0	437	11.9	100.0	769	16.0	100.0
All ages	8467	100.0		3658	100.0		4809	100.0	

Table 5

Age-specific incidence  
for period 2007–2019

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.
0– 4	25	18	1.7	1.3
5– 9	17	13	1.2	0.9
10–14	25	29	1.7	2.1
15–19	32	41	2.0	2.8
20–24	32	69	1.7	3.9
25–29	36	94	1.7	4.5
30–34	46	110	2.2	5.2
35–39	62	151	2.9	7.2
40–44	75	210	3.2	9.3
45–49	134	284	5.3	11.7
50–54	142	292	6.1	12.6
55–59	180	332	9.3	16.6
60–64	256	347	15.7	19.8
65–69	437	453	28.7	26.9
70–74	549	509	39.2	31.7
75–79	626	576	56.5	41.8
80–84	521	499	79.4	51.3
85+	434	767	101.8	79.5
All ages	3629	4794		
Incidence				
Raw			12.0	15.4
WS			6.2	8.0
ES			8.7	10.5
BRD-S			11.3	12.4

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).

ICD-10 D37-D48: Neoplasms of uncertain or unknown behaviour

Age distribution and age-specific incidence 2007 - 2019 (Males: 3629, Females: 4794)

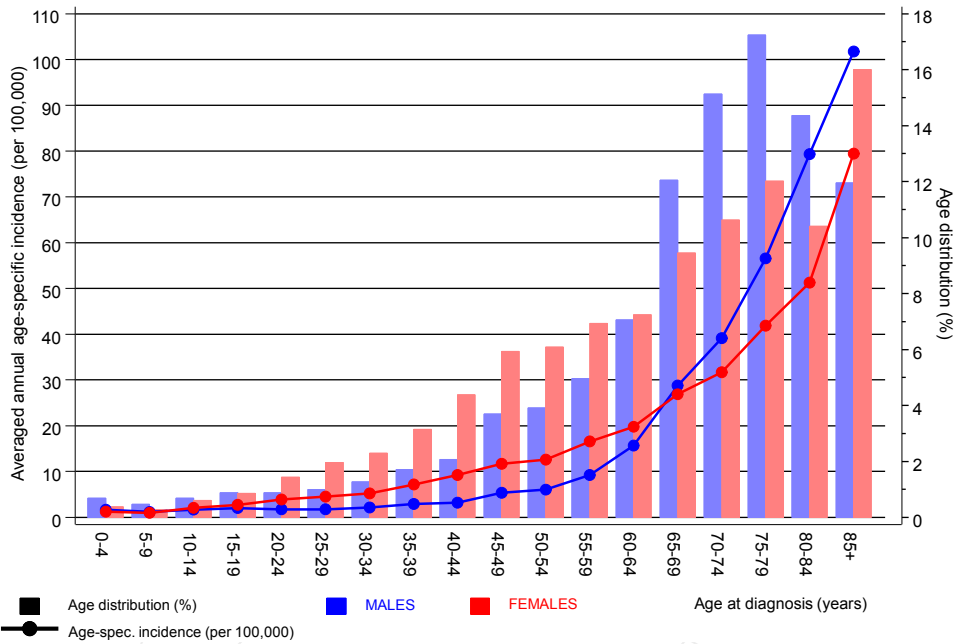


Figure 6. Age distribution (males: mean=68.8 yrs, median=72.9 yrs; females: mean=65.7 yrs, median=69.5 yrs) and age-specific incidence.

Table 7a

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

## MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	13	1.7	7.8	4.1	13.3 #	8.0	
C07-C08 Salivary gland	3	0.5	6.0	1.2	17.6 #	1.8	
C09-C10 Oropharynx	4	2.0	2.0	0.5	5.0	1.4	
C12-C13 Hypopharynx	4	1.1	3.6	1.0	9.2	2.0	25.0
C15 Oesophagus	12	4.1	2.9	1.5	5.1 #	5.6	8.3
C16 Stomach	26	8.5	3.1	2.0	4.5 #	12.4	7.7
C17 Small intestine	8	1.3	6.2	2.7	12.3 #	4.7	
C18 Colon	51	20.7	2.5	1.8	3.2 #	21.4	5.9
C19-C20 Rectum	25	11.1	2.3	1.5	3.3 #	9.8	
C21 Anus/canal	5	0.5	10.0	3.2	23.3 #	3.2	
C22 Liver	18	6.2	2.9	1.7	4.6 #	8.3	11.1
C23-C24 Bile	6	2.3	2.6	1.0	5.8	2.6	
C25 Pancreas	18	8.4	2.1	1.3	3.4 #	6.8	16.7
C32 Larynx	6	2.0	2.9	1.1	6.4 #	2.8	
C33-C34 Lung	113	25.0	4.5	3.7	5.4 #	62.2	8.8
C37 Thymus	3	0.1	25.1	5.2	73.2 #	2.0	
C38,C45 Mesothelioma	5	1.5	3.3	1.1	7.7 #	2.5	20.0
C43 Malign. melanoma	31	9.7	3.2	2.2	4.6 #	15.1	
C46,C49 Soft tissue	5	1.2	4.1	1.3	9.6 #	2.7	
C50 Breast	3	0.6	5.1	1.1	15.0 #	1.7	
C61 Prostate	119	59.3	2.0	1.7	2.4 #	42.2	4.2
C64 Kidney	22	7.3	3.0	1.9	4.6 #	10.4	
C65 Renal pelvis	4	1.0	4.1	1.1	10.4 #	2.1	
C66 Ureter	4	0.6	7.0	1.9	17.9 #	2.4	
C67 Bladder	28	10.2	2.8	1.8	4.0 #	12.6	10.7
C68 Urinary org.	2	0.1	13.6	1.7	49.3 #	1.3	50.0
C69 Eye carcinoma	2	0.1	23.8	2.9	86.1 #	1.4	
C70-C72 CNS cancer	14	2.7	5.1	2.8	8.6 #	8.0	7.1
C73 Thyroid	2	1.4	1.5	0.2	5.3	0.4	
C76-C79 CUP	16	3.6	4.4	2.5	7.2 #	8.7	6.3
C81 Hodgkin lymphoma	6	0.5	11.1	4.1	24.2 #	3.9	
C82-C85 NHL	122	9.2	13.3	11.0	15.8 #	79.7	1.6
C90 Mult. myeloma	76	2.9	26.4	20.8	33.1 #	51.6	2.6
C91-C96 Leukaemia	165	3.4	48.7	41.5	56.7 #	114.1	18.2
Others, specified	7	2.3	3.1	1.2	6.3 #	3.3	
Not observed	0	1.6	0.0	0.0	2.3	-1.1	
All further malignancies	948	214.5	4.4	4.1	4.7 #	518.0	7.2

Patients	3970
Median age at next malignancy (years)	73.9
Person-years	14162
Mean observation time (years)	3.6
Median observation time (years)	2.1

# The occurrence of further specified malignancy is statistically significant.

Further observed 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 1998–2019

## FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	2	1.1	1.8	0.2	6.6	0.5	
C15 Oesophagus	8	1.2	6.5	2.8	12.9 #	3.5	
C16 Stomach	28	6.1	4.6	3.0	6.6 #	11.3	7.1
C17 Small intestine	5	1.0	4.9	1.6	11.5 #	2.1	
C18 Colon	58	17.5	3.3	2.5	4.3 #	20.8	3.4
C19–C20 Rectum	22	7.2	3.0	1.9	4.6 #	7.6	
C21 Anus/canal	4	1.0	3.9	1.1	9.9 #	1.5	
C22 Liver	7	2.3	3.0	1.2	6.3 #	2.4	
C23–C24 Bile	5	2.6	2.0	0.6	4.6	1.3	20.0
C25 Pancreas	32	8.6	3.7	2.5	5.2 #	12.0	25.0
C26 GI cancer	3	0.3	9.9	2.0	28.8 #	1.4	
C32 Larynx	3	0.3	8.8	1.8	25.7 #	1.4	33.3
C33–C34 Lung	54	14.2	3.8	2.9	5.0 #	20.5	1.9
C38,C45 Mesothelioma	3	0.3	8.6	1.8	25.2 #	1.4	
C43 Malign. melanoma	15	7.5	2.0	1.1	3.3 #	3.9	6.7
C46,C49 Soft tissue	13	1.1	12.1	6.4	20.7 #	6.1	
C48 Peritoneal	11	0.8	14.3	7.1	25.5 #	5.3	
C50 Breast	157	58.3	2.7	2.3	3.1 #	50.8	3.2
C51 Vulva	5	2.0	2.5	0.8	5.9	1.6	
C53 Cervix uteri	14	2.7	5.3	2.9	8.8 #	5.8	
C54 Corpus uteri	30	10.3	2.9	2.0	4.2 #	10.1	6.7
C55,C57 Fem. genitals un	2	0.4	5.4	0.6	19.3	0.8	
C56 Ovary	35	7.5	4.7	3.3	6.5 #	14.2	5.7
C64 Kidney	13	4.3	3.0	1.6	5.1 #	4.5	7.7
C66 Ureter	2	0.3	6.5	0.8	23.3	0.9	
C67 Bladder	11	3.6	3.1	1.5	5.5 #	3.8	9.1
C70–C72 CNS cancer	11	2.5	4.5	2.2	8.0 #	4.4	
C73 Thyroid	8	3.4	2.3	1.0	4.6 #	2.4	
C76–C79 CUP	15	3.4	4.5	2.5	7.3 #	6.0	13.3
C81 Hodgkin lymphoma	5	0.4	12.6	4.1	29.5 #	2.4	
C82–C85 NHL	84	7.3	11.5	9.2	14.3 #	39.5	2.4
C90 Mult. myeloma	53	2.3	23.2	17.4	30.3 #	26.1	
C91–C96 Leukaemia	135	2.8	48.8	40.9	57.7 #	68.1	13.3
Others, specified	5	1.4	3.6	1.2	8.3 #	1.9	
Not observed	0	2.8	0.0	0.0	1.3	-1.4	
All further malignancies	858	188.6	4.5	4.2	4.9 #	344.6	5.7

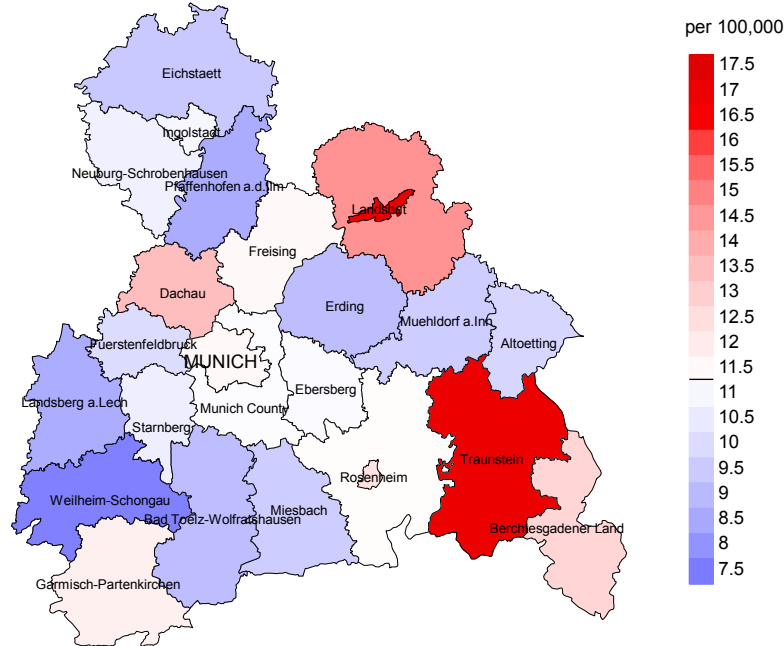
Patients	5204
Median age at next malignancy (years)	71.8
Person-years	19427
Mean observation time (years)	3.7
Median observation time (years)	2.0

# The occurrence of further specified malignancy is statistically significant.

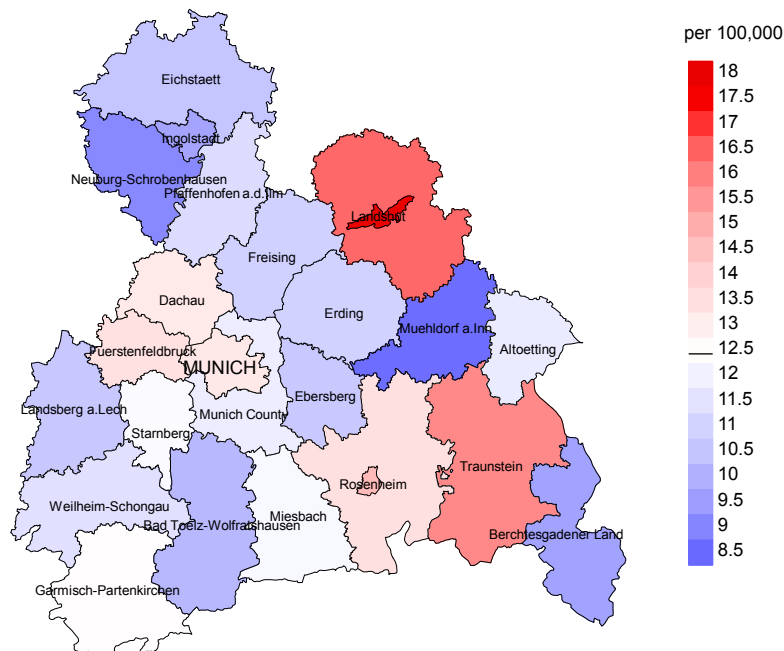
Further observed malignancies with count 1 are pooled in category "Others, specified".



Average incidence (Germany 1987 standard population) 2007 - 2019: Males



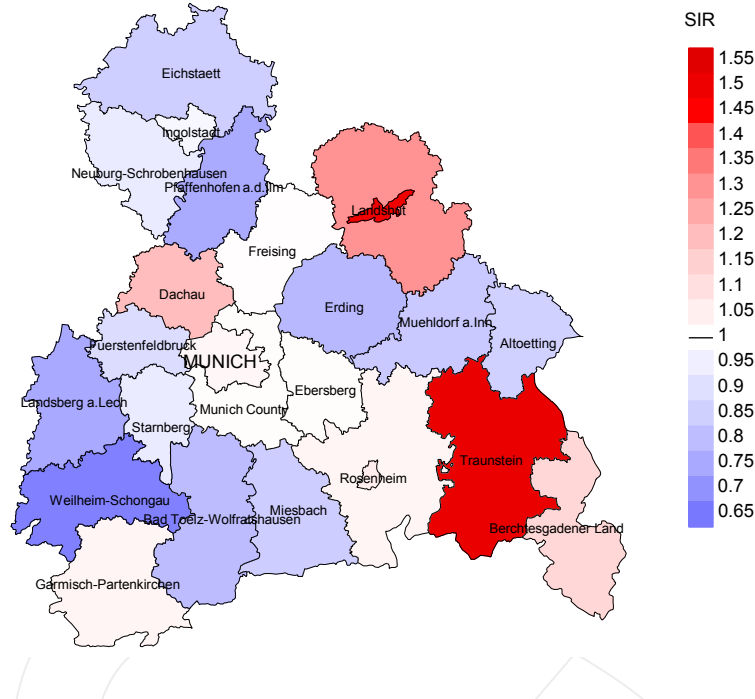
Average incidence (Germany 1987 standard population) 2007 - 2019: Females



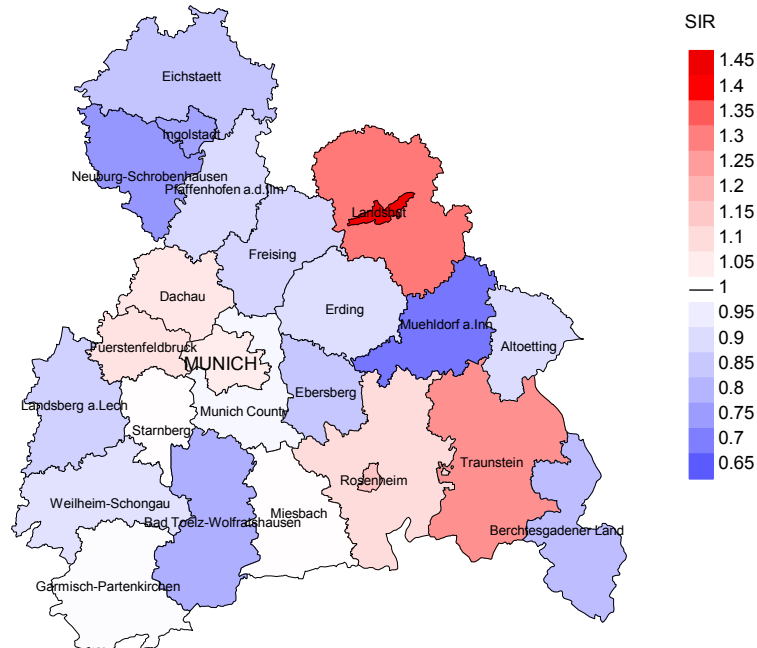
**Figure 8a.** Map of cancer incidence (german standard population) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 11.3/100,000 WS N=3,629, females 12.4/100,000 WS N=4,794).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 111 women were identified with newly diagnosed NPL unknown behaviour. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 10.7/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 8.2 and 13.7/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females



**Figure 8b.** Map of standardized incidence ratio (SIR) 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 (males N=3,629, females N=4,794).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 111 women were identified with newly diagnosed NPL unknown behaviour. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.85. Though, the value of this parameter may vary with an underlying probability of 99% between 0.66 and 1.08, 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 4.92 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	166	94.6	131	78.9	93.9
1999	179	98.9	134	74.9	94.8
2000	227	96.9	159	70.0	95.0
2001	243	95.9	161	66.3	96.3
2002	408	96.3	275	67.4	95.6
2003	441	95.0	295	66.9	95.3
2004	514	94.9	309	60.1	97.4
2005	590	94.9	375	63.6	96.3
2006	594	92.8	365	61.4	95.6
2007	760	89.5	437	57.5	95.7
2008	819	97.7	458	55.9	95.0
2009	824	96.8	439	53.3	94.1
2010	779	97.4	434	55.7	94.9
2011	851	97.3	484	56.9	95.7
2012	748	96.7	424	56.7	95.0
2013	727	97.5	385	53.0	94.5
2014	655	95.7	344	52.5	93.6
2015	653	91.7	334	51.1	94.0
2016	593	97.3	301	50.8	91.7
2017	505	97.8	253	50.1	90.5
2018	331	97.6	92	27.8	72.8
2019	222	66.7	34	15.3	85.3
1998-2019	11829	95.2	6623	56.0	94.5

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 4.92 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	166	72	46	27.7
1999	179	94	52	29.1
2000	227	106	67	29.5
2001	243	101	65	26.7
2002	408	154	125	30.6
2003	441	183	142	32.2
2004	514	187	153	29.8
2005	590	229	183	31.0
2006	594	251	183	30.8
2007	760	251	184	24.2
2008	819	271	185	22.6
2009	824	315	186	22.6
2010	779	324	191	24.5
2011	851	372	218	25.6
2012	748	366	202	27.0
2013	727	380	185	25.4
2014	655	401	200	30.5
2015	653	444	206	31.5
2016	593	402	220	37.1
2017	505	391	187	37.0
2018	331	290	55	16.6
2019	222	196	21	9.5
1998-2019	11829	5780	3256	27.5

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 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	72	55.6	44.4	97.0
1999	94	48.9	51.1	87.6
2000	106	52.8	47.2	91.3
2001	101	39.6	60.4	92.9
2002	154	59.7	40.3	92.8
2003	183	60.1	39.9	88.9
2004	187	58.3	41.7	92.9
2005	229	59.8	40.2	87.8
2006	251	59.8	40.2	90.9
2007	251	63.7	36.3	88.5
2008	271	63.5	36.5	86.2
2009	315	63.8	36.2	84.7
2010	324	63.3	36.7	83.6
2011	372	64.2	35.8	86.5
2012	366	64.5	35.5	82.2
2013	380	65.3	34.7	81.8
2014	401	60.8	39.2	78.9
2015	444	61.3	38.7	78.6
2016	402	63.4	36.6	82.9
2017	391	55.2	44.8	72.5
2018	290	34.5	65.5	71.3
2019	196	29.1	70.9	63.9
1998–2019	5780	58.6	41.4	83.5

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	25	72.3	69.4	73.1	72.3
1999	41	80.0	74.3	82.4	80.4
2000	54	75.8	75.9	75.7	75.9
2001	39	73.8	73.0	80.0	74.9
2002	69	77.6	76.8	79.7	77.6
2003	78	76.3	75.9	78.8	75.9
2004	76	78.4	77.6	78.6	78.5
2005	116	76.5	76.5	77.7	76.8
2006	132	75.6	73.9	81.4	75.7
2007	119	78.4	78.4	78.7	79.2
2008	133	77.0	74.2	81.1	76.0
2009	147	77.2	75.8	79.5	76.9
2010	174	79.1	76.9	81.6	78.9
2011	185	78.1	76.1	81.9	76.9
2012	190	78.0	76.8	80.4	77.0
2013	194	77.7	76.6	79.4	77.2
2014	198	78.9	78.1	79.2	79.1
2015	202	79.2	76.9	82.3	79.2
2016	207	79.3	77.6	81.6	79.0
2017	206	79.1	78.0	80.4	78.7
2018	141	79.6	78.4	80.2	79.6
2019	96	79.2	76.1	81.4	78.2
1998-2019	2822	78.1	76.7	80.4	77.7

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	47	82.0	81.7	83.8	83.2
1999	53	82.6	83.2	80.7	82.9
2000	52	80.7	75.7	82.2	80.6
2001	62	81.8	78.5	84.0	82.8
2002	85	80.5	78.1	85.9	80.0
2003	105	81.2	78.8	83.8	81.0
2004	111	82.8	80.8	84.5	83.4
2005	113	82.6	80.0	85.3	83.0
2006	119	81.4	81.9	81.2	81.6
2007	132	82.0	79.9	84.0	81.7
2008	138	80.7	78.0	82.7	80.5
2009	168	80.7	79.5	83.6	80.6
2010	150	81.5	79.8	85.3	81.0
2011	187	81.3	77.7	83.4	80.8
2012	176	80.6	76.0	84.8	79.4
2013	186	79.2	77.7	84.2	78.9
2014	203	81.2	78.9	84.3	80.5
2015	242	80.2	78.1	85.6	80.2
2016	195	80.7	79.4	83.2	79.8
2017	185	81.0	78.4	83.6	79.1
2018	149	79.9	79.8	80.0	81.2
2019	100	80.2	77.0	81.6	79.7
1998-2019	2958	81.0	78.8	83.6	80.8

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 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	15	1.4	0.26	0.8	0.22	1.2	0.25	1.5	0.25
1999	19	1.7	0.25	1.1	0.25	1.7	0.26	2.3	0.25
2000	29	2.5	0.31	1.3	0.26	2.3	0.30	3.5	0.34
2001	16	1.4	0.16	0.8	0.13	1.2	0.16	1.7	0.18
2002	40	2.1	0.22	1.1	0.18	1.9	0.22	2.6	0.24
2003	54	2.9	0.30	1.4	0.24	2.3	0.28	3.5	0.33
2004	49	2.6	0.21	1.2	0.17	2.1	0.20	3.1	0.24
2005	77	4.1	0.30	1.9	0.25	3.1	0.29	4.6	0.32
2006	83	4.3	0.31	2.0	0.25	3.3	0.29	4.6	0.32
2007	79	3.6	0.24	1.6	0.18	2.7	0.22	3.8	0.25
2008	91	4.1	0.27	1.8	0.21	2.9	0.25	4.1	0.27
2009	98	4.4	0.27	1.9	0.21	3.1	0.25	4.5	0.28
2010	115	5.1	0.33	2.2	0.28	3.5	0.31	5.0	0.33
2011	122	5.5	0.33	2.4	0.28	3.7	0.31	5.3	0.34
2012	121	5.3	0.35	2.3	0.28	3.7	0.32	5.0	0.35
2013	131	5.7	0.41	2.3	0.33	3.7	0.38	5.3	0.41
2014	126	5.4	0.44	2.1	0.35	3.4	0.39	5.0	0.44
2015	128	5.4	0.47	2.0	0.37	3.3	0.41	4.9	0.47
2016	140	5.8	0.53	2.2	0.49	3.6	0.52	5.2	0.53
2017	118	4.9	0.56	1.8	0.51	2.9	0.54	4.2	0.56
2018	47	1.9	0.34	0.7	0.29	1.2	0.31	1.6	0.33
2019	28	1.2	0.46	0.5	0.48	0.7	0.46	1.0	0.48
1998-2019	1726	3.9	0.34	1.7	0.27	2.7	0.31	3.9	0.35



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	25	2.1	0.23	0.8	0.19	1.3	0.20	1.7	0.22
1999	27	2.3	0.26	0.7	0.16	1.2	0.19	1.7	0.23
2000	27	2.2	0.20	0.9	0.15	1.3	0.16	1.7	0.17
2001	24	2.0	0.17	0.7	0.11	1.1	0.13	1.6	0.16
2002	52	2.7	0.23	0.9	0.15	1.5	0.19	2.1	0.21
2003	56	2.8	0.22	1.2	0.17	1.7	0.18	2.1	0.19
2004	60	3.0	0.21	1.1	0.14	1.6	0.16	2.3	0.19
2005	60	3.0	0.18	0.9	0.11	1.5	0.14	2.3	0.16
2006	67	3.3	0.21	1.1	0.13	1.7	0.15	2.4	0.18
2007	81	3.5	0.19	1.1	0.11	1.8	0.14	2.6	0.17
2008	81	3.5	0.17	1.3	0.11	1.9	0.13	2.6	0.15
2009	103	4.4	0.22	1.4	0.13	2.2	0.16	3.1	0.19
2010	90	3.8	0.21	1.2	0.13	2.0	0.16	2.9	0.19
2011	117	5.0	0.24	1.6	0.15	2.5	0.18	3.5	0.21
2012	115	4.9	0.29	1.7	0.18	2.6	0.23	3.5	0.26
2013	117	4.9	0.29	1.7	0.19	2.6	0.22	3.5	0.25
2014	118	4.9	0.32	1.4	0.20	2.3	0.24	3.4	0.29
2015	144	5.9	0.39	2.0	0.28	3.0	0.31	4.2	0.35
2016	115	4.7	0.35	1.5	0.22	2.3	0.26	3.1	0.30
2017	98	4.0	0.34	1.3	0.22	2.0	0.26	2.7	0.30
2018	53	2.1	0.28	0.7	0.15	1.0	0.18	1.5	0.22
2019	30	1.2	0.19	0.4	0.10	0.6	0.13	0.9	0.16
1998-2019	1660	3.6	0.25	1.2	0.16	1.9	0.19	2.6	0.22

Table 12

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	1	0.0	0.0	1	0.1	0.1			0.0
5-9	2	0.1	0.1	2	0.1	0.2			0.0
10-14	1	0.0	0.2			0.2	1	0.1	0.1
15-19	4	0.2	0.3	2	0.1	0.4	2	0.2	0.2
20-24	1	0.0	0.3	1	0.1	0.4			0.2
25-29	6	0.2	0.6	2	0.1	0.6	4	0.3	0.6
30-34	9	0.3	0.9	6	0.4	1.0	3	0.2	0.8
35-39	7	0.3	1.2	3	0.2	1.3	4	0.3	1.1
40-44	19	0.7	1.9	5	0.4	1.6	14	1.1	2.2
45-49	38	1.5	3.4	15	1.1	2.8	23	1.8	4.0
50-54	54	2.1	5.4	24	1.8	4.5	30	2.4	6.4
55-59	69	2.6	8.1	36	2.7	7.2	33	2.6	9.0
60-64	163	6.3	14.4	94	7.0	14.2	69	5.5	14.5
65-69	238	9.1	23.5	129	9.6	23.8	109	8.6	23.1
70-74	434	16.7	40.1	252	18.8	42.6	182	14.4	37.6
75-79	502	19.3	59.4	268	19.9	62.5	234	18.5	56.1
80-84	508	19.5	78.9	265	19.7	82.2	243	19.3	75.4
85+	550	21.1	100.0	239	17.8	100.0	311	24.6	100.0
All ages	2606	100.0		1344	100.0		1262	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	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index
0- 4	1		0.1	0.04		
5- 9	2		0.1	0.12		
10-14		1			0.1	0.03
15-19	2	2	0.1	0.06	0.1	0.05
20-24	1		0.1	0.03		
25-29	2	4	0.1	0.06	0.2	0.04
30-34	6	3	0.3	0.13	0.1	0.03
35-39	3	4	0.1	0.05	0.2	0.03
40-44	5	14	0.2	0.07	0.6	0.07
45-49	15	23	0.6	0.11	0.9	0.08
50-54	24	30	1.0	0.17	1.3	0.10
55-59	36	33	1.9	0.20	1.7	0.10
60-64	94	69	5.8	0.37	3.9	0.20
65-69	129	109	8.5	0.30	6.5	0.24
70-74	252	182	18.0	0.46	11.3	0.36
75-79	268	234	24.2	0.43	17.0	0.41
80-84	265	243	40.4	0.51	25.0	0.49
85+	239	311	56.0	0.55	32.2	0.41
All ages	1344	1262				
Mortality						
Raw			4.5	0.37	4.1	0.26
WS			1.8	0.29	1.3	0.16
ES			2.9	0.34	2.1	0.20
BRD-S			4.2	0.37	2.9	0.23
PYLL-70						
per 100,000			11.8		12.2	
ES			10.7		10.5	
AYLL-70			9.8		11.0	

Table 14a

Further malignancies in deaths in period 1998-2019

MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C00 Lip	2	0.2	1	50.0			1	50.0
C03-C06 Oral cavity	12	1.0	7	58.3	1	8.3	4	33.3
C07-C08 Salivary gland	2	0.2	2	100.0				
C09-C10 Oropharynx	7	0.6	4	57.1	2	28.6	1	14.3
C12-C13 Hypopharynx	3	0.2					3	100.0
C15 Oesophagus	16	1.3	4	25.0	5	31.3	7	43.8
C16 Stomach	28	2.3	14	50.0	1	3.6	13	46.4
C17 Small intestine	3	0.2					3	100.0
C18 Colon	75	6.2	37	49.3	14	18.7	24	32.0
C19-C20 Rectum	36	3.0	21	58.3	4	11.1	11	30.6
C21 Anus/canal	3	0.2	2	66.7			1	33.3
C22 Liver	22	1.8	6	27.3	4	18.2	12	54.5
C23-C24 Bile	4	0.3	3	75.0			1	25.0
C25 Pancreas	20	1.7	5	25.0	7	35.0	8	40.0
C32 Larynx	14	1.2	9	64.3	1	7.1	4	28.6
C33-C34 Lung	114	9.4	22	19.3	31	27.2	61	53.5
C38,C45 Mesothelioma	5	0.4					5	100.0
C43 Malign. melanoma	35	2.9	26	74.3	1	2.9	8	22.9
C44 Skin others	113	9.3	40	35.4	7	6.2	66	58.4
C46,C49 Soft tissue	7	0.6	1	14.3	2	28.6	4	57.1
C50 Breast	2	0.2	2	100.0				
C60 Penis	2	0.2	2	100.0				
C61 Prostate	189	15.6	145	76.7	13	6.9	31	16.4
C62 Testis	5	0.4	5	100.0				
C64 Kidney	37	3.1	23	62.2	5	13.5	9	24.3
C65 Renal pelvis	6	0.5	4	66.7			2	33.3
C66 Ureter	6	0.5	2	33.3	1	16.7	3	50.0
C67 Bladder	43	3.6	26	60.5			17	39.5
C69 Eye carcinoma	2	0.2					2	100.0
C69 Eye melanoma	5	0.4	4	80.0			1	20.0
C70-C72 CNS cancer	18	1.5	5	27.8	2	11.1	11	61.1
C73 Thyroid	6	0.5	5	83.3			1	16.7
C74-C80 Cancer others	3	0.2	1	33.3	1	33.3	1	33.3
C76-C79 CUP	16	1.3	1	6.3	4	25.0	11	68.8
C81 Hodgkin lymphoma	5	0.4	1	20.0	1	20.0	3	60.0
C82-C85 NHL	92	7.6	34	37.0	31	33.7	27	29.3
C90 Mult. myeloma	55	4.5	9	16.4	5	9.1	41	74.5
C91-C96 Leukaemia	191	15.8			62	32.5	129	67.5
Others, specified	5	0.4	3	60.0			2	40.0

Table 14a

Further malignancies in deaths in period 1998-2019  
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
All further malignancies	1209	100.0	476	39.4	205	17.0	528	43.7

Further malignancies with number of cases 1 are pooled in category "Others, specified".

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 1998-2019  
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	3	0.3	2	66.7			1	33.3
C15 Oesophagus	4	0.4	1	25.0	2	50.0	1	25.0
C16 Stomach	22	2.2	6	27.3	2	9.1	14	63.6
C17 Small intestine	5	0.5	3	60.0	1	20.0	1	20.0
C18 Colon	53	5.3	28	52.8	6	11.3	19	35.8
C19-C20 Rectum	15	1.5	5	33.3	2	13.3	8	53.3
C21 Anus/canal	8	0.8	5	62.5			3	37.5
C22 Liver	6	0.6			1	16.7	5	83.3
C23-C24 Bile	10	1.0	5	50.0	2	20.0	3	30.0
C25 Pancreas	42	4.2	10	23.8	8	19.0	24	57.1
C26 GI cancer	3	0.3			1	33.3	2	66.7
C30-C31 Sinuses	3	0.3	3	100.0				
C32 Larynx	2	0.2	1	50.0			1	50.0
C33-C34 Lung	62	6.2	19	30.6	13	21.0	30	48.4
C38,C45 Mesothelioma	2	0.2			1	50.0	1	50.0
C40-C41 Bone	2	0.2	2	100.0				
C43 Malign. melanoma	27	2.7	18	66.7	2	7.4	7	25.9
C44 Skin others	54	5.4	23	42.6	2	3.7	29	53.7
C46,C49 Soft tissue	9	0.9	1	11.1			8	88.9
C48 Peritoneal	8	0.8	2	25.0	1	12.5	5	62.5
C50 Breast	186	18.6	123	66.1	16	8.6	47	25.3
C51 Vulva	8	0.8	3	37.5	1	12.5	4	50.0
C53 Cervix uteri	17	1.7	9	52.9	2	11.8	6	35.3
C54 Corpus uteri	42	4.2	24	57.1	10	23.8	8	19.0
C55,C57 Fem. genitals un	3	0.3	1	33.3			2	66.7
C56 Ovary	41	4.1	12	29.3	6	14.6	23	56.1
C64 Kidney	27	2.7	18	66.7	6	22.2	3	11.1
C66 Ureter	3	0.3	2	66.7			1	33.3
C67 Bladder	11	1.1	4	36.4	1	9.1	6	54.5
C69 Eye melanoma	2	0.2	2	100.0				
C70-C72 CNS cancer	10	1.0			1	10.0	9	90.0
C73 Thyroid	15	1.5	11	73.3			4	26.7
C76-C79 CUP	14	1.4	2	14.3	5	35.7	7	50.0
C82-C85 NHL	57	5.7	25	43.9	15	26.3	17	29.8
C90 Mult. myeloma	48	4.8	3	6.3	4	8.3	41	85.4
C91-C96 Leukaemia	168	16.8	3	1.8	48	28.6	117	69.6
Others, specified	8	0.8	4	50.0	3	37.5	1	12.5
All further malignancies	1000	100.0	380	38.0	162	16.2	458	45.8

Further malignancies with number of cases 1 are pooled in category "Others, specified".

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	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index
0- 4	1		0.1	0.04		
5- 9	2		0.1	0.12		
10-14		1			0.1	0.03
15-19	2	1	0.1	0.06	0.1	0.03
20-24						
25-29	2	3	0.1	0.07	0.1	0.03
30-34	6	3	0.3	0.15	0.1	0.03
35-39	3	2	0.1	0.05	0.1	0.01
40-44	4	10	0.2	0.06	0.4	0.05
45-49	13	14	0.5	0.10	0.6	0.06
50-54	18	19	0.8	0.16	0.8	0.08
55-59	26	19	1.3	0.18	1.0	0.07
60-64	68	48	4.2	0.36	2.7	0.18
65-69	85	64	5.6	0.28	3.8	0.20
70-74	169	115	12.1	0.48	7.2	0.34
75-79	165	167	14.9	0.44	12.1	0.41
80-84	140	169	21.3	0.48	17.4	0.49
85+	138	225	32.4	0.56	23.3	0.40
All ages	842	860				
Mortality						
Raw			2.8	0.34	2.8	0.23
WS			1.2	0.26	0.9	0.13
ES			1.9	0.30	1.4	0.16
BRD-S			2.6	0.34	1.9	0.20
PYLL-70						
per 100,000			9.3		8.0	
ES			8.6		6.9	
AYLL-70			10.7		11.4	

\* 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 \*)

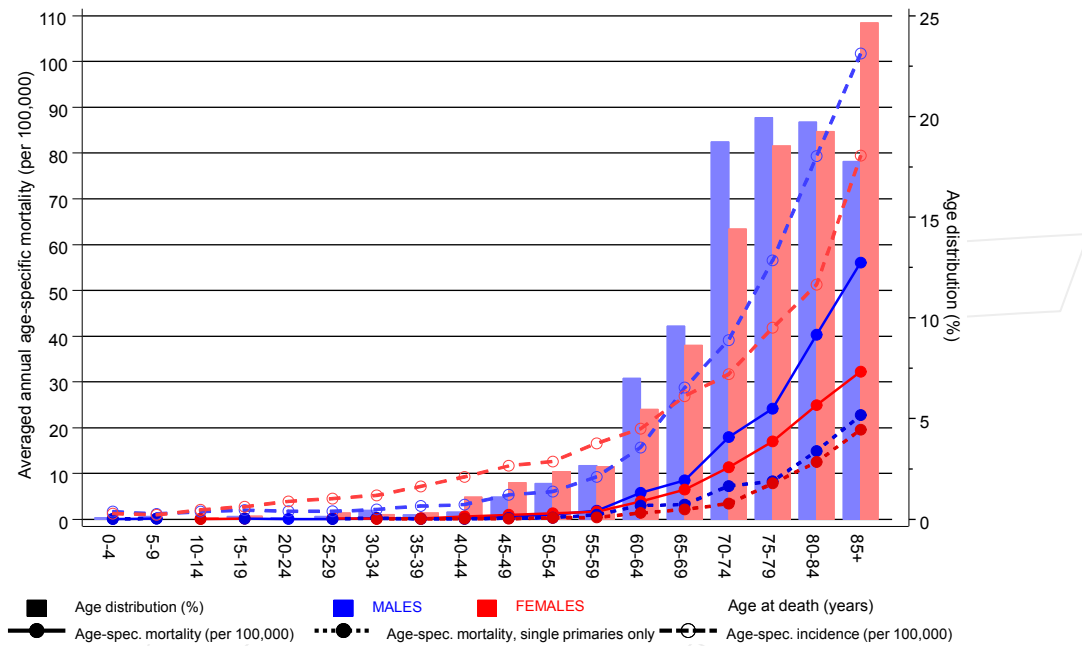
Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index
0- 4	1		0.1	0.04		
5- 9	2		0.1	0.12		
10-14		1			0.1	0.04
15-19	2		0.1	0.06		
20-24						
25-29	1		0.0	0.03		
30-34	6	1	0.3	0.16	0.0	0.01
35-39	1	1	0.0	0.02	0.0	0.01
40-44	2	3	0.1	0.03	0.1	0.02
45-49	7	3	0.3	0.06	0.1	0.01
50-54	8	8	0.3	0.08	0.3	0.04
55-59	19	8	1.0	0.16	0.4	0.04
60-64	49	24	3.0	0.35	1.4	0.11
65-69	49	36	3.2	0.24	2.1	0.14
70-74	102	55	7.3	0.39	3.4	0.21
75-79	92	108	8.3	0.31	7.8	0.32
80-84	98	122	14.9	0.41	12.5	0.40
85+	97	189	22.7	0.43	19.6	0.34
All ages	536	559				
Mortality						
Raw			1.8	0.27	1.8	0.17
WS			0.8	0.20	0.5	0.08
ES			1.2	0.24	0.8	0.11
BRD-S			1.7	0.26	1.2	0.14
PYLL-70						
per 100,000			6.3		3.0	
ES			6.0		2.6	
AYLL-70			11.4		9.3	

\* See corresponding tables with multiple malignancies.



ICD-10 D37-D48: Neoplasms of uncertain or unknown behaviour

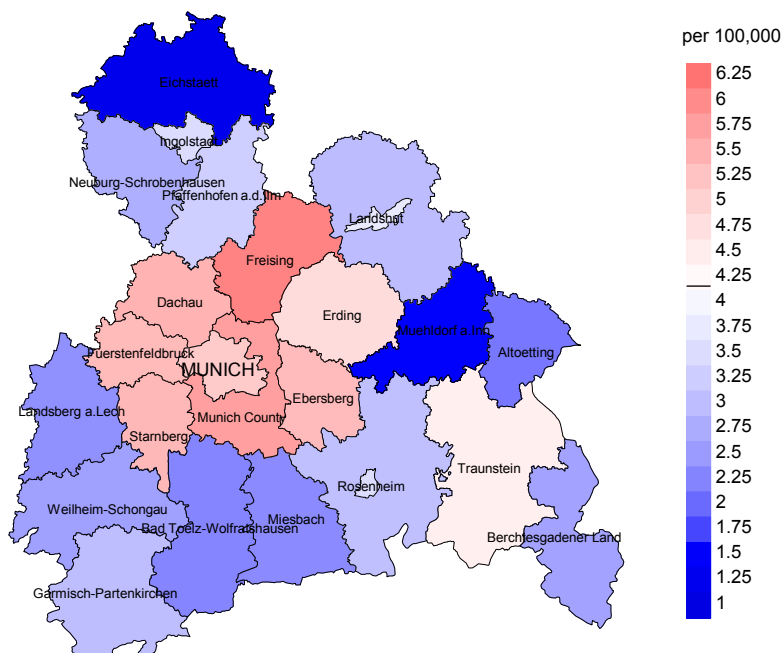
Age distribution and age-specific mortality 2007 - 2019 (Males: 1344, Females: 1262)



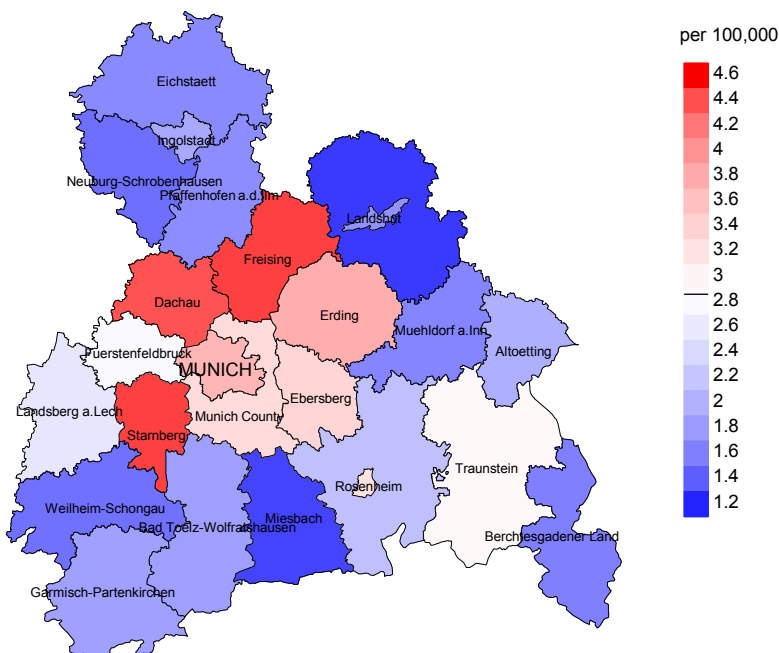
**Figure 17.** Distribution of age at death (bars; males: mean=71.8 yrs, median=73.4 yrs; females: mean=72.1 yrs, median=74.8 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (Germany 1987 standard population) 2007 - 2019: Males



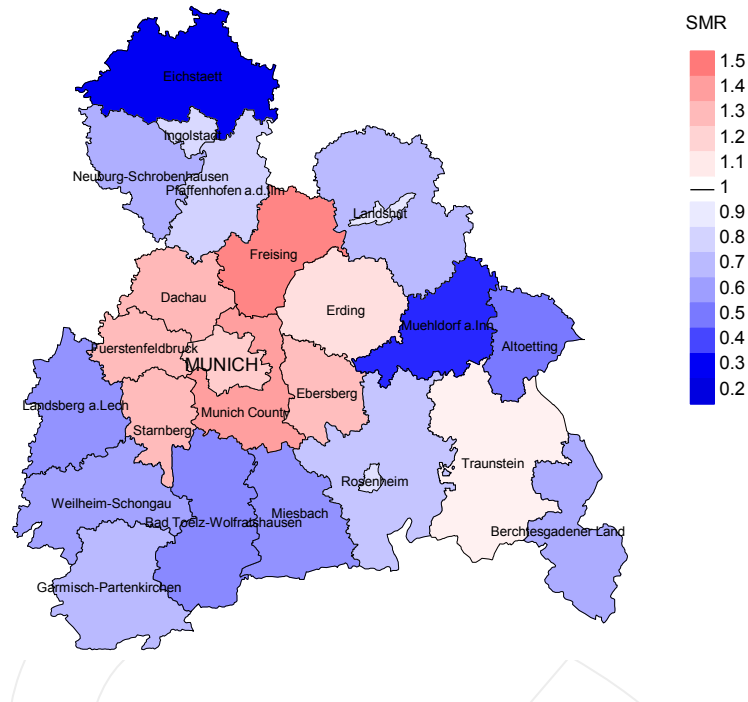
Average mortality (Germany 1987 standard population) 2007 - 2019: Females



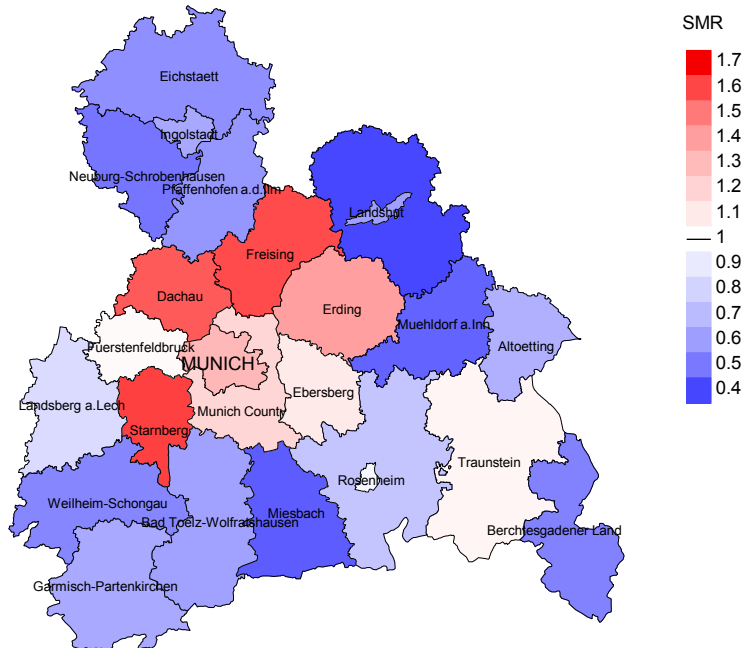
**Figure 18a.** Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 4.2/100,000 WS N=1,344, females 2.9/100,000 WS N=1,262).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 37 women died from NPL unknown behaviour. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 3.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.1 and 5.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females



**Figure 18b.** Map of standardized mortality ratio (SMR) 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 (males N=1,344, females N=1,262).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 37 women died from NPL unknown behaviour. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.10. Though, the value of this parameter may vary with an underlying probability of 99% between 0.69 and 1.66, 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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