Munich Cancer Registry

- Survival
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- *Deutsch*

ICD-10 C69: Eye melanoma

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	512
Diseases	512
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
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Marchioninistr. 15
Munich, 81377
Germany

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

https://www.tumorregister-muenchen.de/en/facts/base/bC69M_E-ICD-10-C69-Eye-melanoma-incidence-and-mortality.pdf

Index of figures and tables

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, December 2021

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

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

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

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

Code	Description
C69.-	Malignant neoplasm of eye and adnexa

... in case of coexisting one of the following ...

Morphology codes (ICD-O-3 2014) used for specifying cancer site

Code	Description
8720/3	Malignant melanoma, NOS
8721/3	Nodular melanoma
8730/3	Amelanotic melanoma
8742/3	Lentigo maligna melanoma
8743/3	Superficial spreading melanoma
8770/3	Mixed epithelioid and spindle cell melanoma
8771/3	Epithelioid cell melanoma
8772/3	Spindle cell melanoma, NOS
8773/3	Spindle cell melanoma, type A
8774/3	Spindle cell melanoma, type B

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	9	0.0	14.9	77.8	88.9
1999	6	6.7	14.7	66.7	100.0
2000	11	19.2	14.5	81.8	90.9
2001	8	23.5	14.0	62.5	100.0
2002	22	19.6	13.8	81.8	100.0 #
2003	29	16.5	14.0	62.1	89.7
2004	36	17.4	13.8	80.6	94.4
2005	34	14.8	13.2	73.5	94.1
2006	32	14.4	12.8	56.3	90.6
2007	32	14.6	11.9	71.9	96.9 #
2008	30	15.3	11.8	73.3	96.7
2009	38	15.0	12.1	47.4	97.4
2010	39	14.4	11.4	61.5	97.4
2011	23	14.9	11.5	60.9	100.0
2012	23	15.3	11.9	60.9	100.0
2013	27	15.0	12.4	66.7	100.0
2014	25	15.1	10.9	40.0	100.0
2015	17	15.9	8.2	52.9	94.1
2016	26	16.3	10.3	69.2	96.2
2017	20	16.4	9.1	35.0	100.0
2018	9	16.7	4.2	66.7	100.0
2019	4	16.6	6.3	25.0	100.0
2020	12	16.8	0.0	8.3	83.3 ##
1998-2020	512	16.8	14.9	62.1	96.1

512 cases diagnosed 1998-2020 are related to a total of 512 patients. Currently, in 154 (30.1 %) of these 512 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 118 / 24 / 12 (23.0 % / 4.7 % / 2.3 %) 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 9 cases has been diagnosed, of which 16.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.2 % 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	2	22.2	0.0	14.0	100.0	100.0	
1999	2	33.3	0.0	14.2	50.0	100.0	
2000	5	45.5	11.1	14.3	100.0	100.0	
2001	2	25.0	18.2	13.3	100.0	100.0	
2002	14	63.6	12.0	13.4	92.9	100.0	#
2003	10	34.5	11.4	14.3	70.0	90.0	
2004	17	47.2	13.5	14.5	82.4	94.1	
2005	14	41.2	13.6	13.2	78.6	100.0	
2006	15	46.9	14.8	13.1	60.0	93.3	
2007	14	43.8	14.7	11.2	50.0	92.9	#
2008	13	43.3	14.8	11.6	76.9	100.0	
2009	15	39.5	14.6	11.2	60.0	100.0	
2010	21	53.8	15.3	10.8	66.7	100.0	
2011	12	52.2	17.3	10.1	66.7	100.0	
2012	13	56.5	17.2	11.5	61.5	100.0	
2013	10	37.0	16.8	13.5	60.0	100.0	
2014	12	48.0	16.2	12.5	58.3	100.0	
2015	13	76.5	18.1	7.7	61.5	92.3	
2016	14	53.8	17.4	10.3	71.4	100.0	
2017	12	60.0	17.8	8.0	41.7	100.0	
2018	5	55.6	18.3	7.7	60.0	100.0	
2019	2	50.0	18.1	12.5	50.0	100.0	
2020	6	50.0	18.5	0.0		83.3	##
1998–2020	243	47.5	18.5	14.0	65.8	97.5	

243 cases diagnosed 1998-2020 are related to a total of 243 patients. Currently, in 76 (31.3 %) of these 243 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 61 / 10 / 5 (25.1 % / 4.1 % / 2.1 %) 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 5 cases has been diagnosed, of which 18.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.7 % 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	7	77.8	0.0	15.6	71.4	85.7
1999	4	66.7	9.1	15.2	75.0	100.0
2000	6	54.5	23.5	14.7	66.7	83.3
2001	6	75.0	26.1	14.6	50.0	100.0
2002	8	36.4	25.8	14.2	62.5	100.0 #
2003	19	65.5	20.0	13.8	57.9	89.5
2004	19	52.8	20.3	13.1	78.9	94.7
2005	20	58.8	15.7	13.3	70.0	90.0
2006	17	53.1	14.2	12.6	52.9	88.2
2007	18	56.3	14.5	12.7	88.9	100.0 #
2008	17	56.7	15.6	12.1	70.6	94.1
2009	23	60.5	15.2	13.0	39.1	95.7
2010	18	46.2	13.7	12.0	55.6	94.4
2011	11	47.8	13.0	13.3	54.5	100.0
2012	10	43.5	13.8	12.3	60.0	100.0
2013	17	63.0	13.6	11.1	70.6	100.0
2014	13	52.0	14.2	8.7	23.1	100.0
2015	4	23.5	13.9	9.1	25.0	100.0
2016	12	46.2	15.3	10.3	66.7	91.7
2017	8	40.0	15.2	10.5	25.0	100.0
2018	4	44.4	15.3	0.0	75.0	100.0
2019	2	50.0	15.2	0.0		100.0
2020	6	50.0	15.2	0.0	16.7	83.3 ##
1998-2020	269	52.5	15.2	15.6	58.7	94.8

269 cases diagnosed 1998-2020 are related to a total of 269 patients. Currently, in 78 (29.0 %) of these 269 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 57 / 14 / 7 (21.2 % / 5.2 % / 2.6 %) 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 4 cases has been diagnosed, of which 15.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.0 % 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 4.94 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	2	7	0.2	0.6	0.1	0.4	0.2	0.5	0.2	0.5
1999	2	4	0.2	0.3	0.1	0.2	0.2	0.3	0.2	0.3
2000	5	6	0.4	0.5	0.3	0.2	0.4	0.3	0.5	0.4
2001	2	6	0.2	0.5	0.1	0.3	0.2	0.4	0.2	0.4
2002	14	8	0.8	0.4	0.5	0.2	0.7	0.3	0.8	0.3
2003	10	19	0.5	1.0	0.3	0.6	0.5	0.7	0.5	0.8
2004	17	19	0.9	1.0	0.4	0.6	0.7	0.8	0.9	0.9
2005	14	20	0.7	1.0	0.4	0.4	0.6	0.6	0.8	0.8
2006	15	17	0.8	0.8	0.5	0.5	0.7	0.6	0.7	0.6
2007	14	18	0.6	0.8	0.3	0.4	0.5	0.5	0.6	0.7
2008	13	17	0.6	0.7	0.3	0.3	0.5	0.5	0.6	0.6
2009	15	23	0.7	1.0	0.4	0.6	0.5	0.8	0.6	0.9
2010	21	18	0.9	0.8	0.5	0.4	0.7	0.6	0.8	0.7
2011	12	11	0.5	0.5	0.2	0.3	0.4	0.4	0.5	0.4
2012	13	10	0.6	0.4	0.3	0.2	0.4	0.3	0.5	0.4
2013	10	17	0.4	0.7	0.3	0.4	0.4	0.5	0.4	0.6
2014	12	13	0.5	0.5	0.3	0.3	0.4	0.4	0.5	0.5
2015	13	4	0.5	0.2	0.2	0.1	0.3	0.1	0.5	0.2
2016	14	12	0.6	0.5	0.3	0.2	0.4	0.4	0.5	0.4
2017	12	8	0.5	0.3	0.2	0.1	0.3	0.2	0.4	0.3
2018	5	4	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1
2019	2	2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
2020	6	6	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2
1998–2020	243	269	0.5	0.6	0.3	0.3	0.4	0.4	0.5	0.5

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

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	9	53.0	13.9	31.1	70.5	31.1	41.2	60.2	63.3	70.5
1999	6	56.5	5.5	50.4	65.9	50.4	52.1	55.7	58.8	65.9
2000	11	66.9	15.6	40.9	86.8	49.0	55.4	71.4	80.7	84.2
2001	8	67.2	8.5	57.3	83.3	57.3	60.4	67.3	70.9	83.3
2002	22	61.4	17.8	16.7	90.9	37.2	52.7	65.0	72.6	80.1
2003	29	59.1	14.3	31.0	81.2	34.8	47.9	61.8	69.1	78.0
2004	36	67.1	9.3	45.4	81.5	53.7	61.2	66.7	75.2	79.4
2005	34	67.7	15.7	30.7	91.9	40.2	59.8	72.1	79.9	82.3
2006	32	65.3	17.3	7.3	94.2	49.6	56.9	64.4	73.8	90.3
2007	32	66.2	15.0	40.4	96.8	44.6	53.0	69.0	78.4	83.7
2008	30	69.2	13.5	35.7	89.6	50.2	63.7	69.4	80.0	84.4
2009	38	62.1	13.9	36.8	86.4	42.8	51.8	63.0	72.3	82.8
2010	39	63.1	15.8	28.4	85.8	37.8	53.9	68.5	73.8	82.9
2011	23	64.1	12.5	27.9	84.0	54.9	56.2	64.9	73.9	79.2
2012	23	64.7	11.6	45.1	82.9	47.2	58.0	64.8	73.8	81.2
2013	27	62.1	15.8	24.6	89.7	32.3	54.9	68.0	71.4	76.7
2014	25	61.2	13.8	30.4	87.3	44.6	51.1	59.4	71.9	76.7
2015	17	71.2	15.8	28.3	93.4	54.3	61.8	76.0	80.2	89.0
2016	26	66.9	11.7	44.2	88.2	56.0	57.0	66.4	77.4	81.4
2017	20	72.9	10.8	49.0	87.2	56.1	63.6	77.4	80.5	82.1
2018	9	64.7	12.2	42.1	80.9	42.1	59.2	66.1	70.4	80.9
2019	4	64.0	13.6	45.1	74.1	45.1	53.9	68.3	74.0	74.1
2020	12	65.5	16.4	34.7	89.8	47.3	54.0	67.2	79.4	82.9
1998–2020	512	64.8	14.3	7.3	96.8	44.9	56.0	66.1	75.2	82.0

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	2	66.9	5.1	63.3	70.5	63.3	63.3	66.9	70.5	70.5
1999	2	58.2	11.0	50.4	65.9	50.4	50.4	58.2	65.9	65.9
2000	5	64.0	15.8	40.9	80.4	40.9	55.4	71.4	71.8	80.4
2001	2	69.9	0.0	69.8	69.9	69.8	69.8	69.9	69.9	69.9
2002	14	60.0	17.7	16.7	81.6	37.2	52.7	62.4	72.6	80.1
2003	10	60.0	10.6	44.1	76.6	46.0	53.0	59.5	70.2	74.0
2004	17	70.7	7.7	60.1	81.4	60.3	62.7	69.7	78.0	80.6
2005	14	64.4	13.1	34.3	81.6	49.4	56.5	68.1	74.3	77.6
2006	15	62.0	8.4	49.6	79.2	51.7	55.1	62.6	66.3	74.3
2007	14	65.5	13.9	42.7	83.3	44.6	48.7	69.8	77.4	78.5
2008	13	68.3	16.9	35.7	89.6	48.7	54.1	69.9	81.2	87.8
2009	15	65.2	13.4	38.6	85.4	42.8	58.3	65.6	75.5	80.3
2010	21	66.4	14.9	28.4	84.2	44.9	62.7	70.1	72.8	82.9
2011	12	70.5	9.5	54.9	84.0	55.1	64.4	72.2	77.2	81.2
2012	13	63.6	12.6	45.1	82.9	47.2	52.8	62.6	71.5	82.6
2013	10	60.0	15.8	24.6	78.9	34.2	54.4	63.9	70.5	75.1
2014	12	61.4	15.2	30.4	84.3	44.6	52.0	64.1	72.7	74.6
2015	13	75.3	11.1	54.3	93.4	60.0	73.1	76.2	80.2	89.0
2016	14	67.2	11.6	52.1	88.2	56.3	56.5	66.4	77.4	81.4
2017	12	72.8	12.3	49.0	87.2	56.0	64.2	77.4	80.5	83.2
2018	5	72.5	7.1	65.2	80.9	65.2	66.8	70.4	79.1	80.9
2019	2	74.0	0.1	73.9	74.1	73.9	73.9	74.0	74.1	74.1
2020	6	66.1	16.0	47.3	89.8	47.3	56.6	61.3	80.5	89.8
1998–2020	243	66.1	13.2	16.7	93.4	48.7	56.9	68.5	75.7	81.2

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	7	49.0	13.1	31.1	64.0	31.1	36.3	49.7	60.5	64.0
1999	4	55.6	2.9	52.1	58.8	52.1	53.4	55.7	57.8	58.8
2000	6	69.3	16.5	49.0	86.8	49.0	55.8	70.0	84.2	86.8
2001	6	66.3	9.9	57.3	83.3	57.3	57.5	64.1	71.9	83.3
2002	8	63.9	18.9	31.0	90.9	31.0	52.0	68.8	73.7	90.9
2003	19	58.7	16.1	31.0	81.2	33.7	43.5	62.6	69.1	79.8
2004	19	63.8	9.5	45.4	81.5	51.9	54.2	64.6	72.6	77.2
2005	20	70.0	17.1	30.7	91.9	38.4	65.2	74.7	82.1	83.9
2006	17	68.2	22.3	7.3	94.2	39.7	62.6	67.9	85.2	91.6
2007	18	66.8	16.2	40.4	96.8	43.1	53.2	66.0	79.5	84.5
2008	17	69.8	10.6	41.9	84.2	54.8	65.3	68.8	75.4	83.0
2009	23	60.0	14.0	36.8	86.4	45.0	47.0	60.6	69.5	82.8
2010	18	59.3	16.3	31.6	85.8	32.2	43.8	58.9	74.7	76.3
2011	11	57.0	11.8	27.9	68.5	44.4	55.3	60.0	64.9	67.8
2012	10	66.3	10.5	46.2	81.2	52.1	58.8	65.7	75.2	78.8
2013	17	63.3	16.2	32.0	89.7	32.3	58.1	69.5	72.7	76.7
2014	13	60.9	13.0	43.6	87.3	48.0	51.1	57.0	71.4	76.7
2015	4	58.0	23.1	28.3	83.8	28.3	41.8	59.9	74.2	83.8
2016	12	66.6	12.2	44.2	84.2	56.0	57.5	66.4	76.8	80.6
2017	8	73.1	8.8	60.6	81.0	60.6	63.6	77.7	80.2	81.0
2018	4	55.1	10.2	42.1	66.1	42.1	47.5	56.1	62.7	66.1
2019	2	53.9	12.6	45.1	62.8	45.1	45.1	53.9	62.8	62.8
2020	6	64.9	18.3	34.7	82.9	34.7	51.4	70.9	78.3	82.9
1998–2020	269	63.6	15.2	7.3	96.8	43.1	54.6	64.5	75.0	82.9

Table 4

Age distribution by 5-year age group and sex for period 2007-2020

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24	1	0.3	0.3	1	0.6	0.6			0.0
25-29	3	0.9	1.2	1	0.6	1.2	2	1.2	1.2
30-34	6	1.8	3.1	1	0.6	1.9	5	3.1	4.3
35-39	5	1.5	4.6	3	1.9	3.7	2	1.2	5.5
40-44	17	5.2	9.8	6	3.7	7.4	11	6.7	12.3
45-49	19	5.8	15.7	9	5.6	13.0	10	6.1	18.4
50-54	22	6.8	22.5	9	5.6	18.5	13	8.0	26.4
55-59	38	11.7	34.2	16	9.9	28.4	22	13.5	39.9
60-64	38	11.7	45.8	15	9.3	37.7	23	14.1	54.0
65-69	37	11.4	57.2	19	11.7	49.4	18	11.0	65.0
70-74	50	15.4	72.6	33	20.4	69.8	17	10.4	75.5
75-79	38	11.7	84.3	18	11.1	80.9	20	12.3	87.7
80-84	37	11.4	95.7	23	14.2	95.1	14	8.6	96.3
85+	14	4.3	100.0	8	4.9	100.0	6	3.7	100.0
All ages	325	100.0		162	100.0		163	100.0	

Table 5

Age-specific incidence and proportion of all cancers
for period 2007-2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4						
5- 9						
10-14						
15-19						
20-24	1		0.0		0.2	
25-29	1	2	0.0	0.1	0.1	0.2
30-34	1	5	0.0	0.2	0.1	0.2
35-39	3	2	0.1	0.1	0.2	0.1
40-44	6	11	0.2	0.5	0.2	0.2
45-49	9	10	0.3	0.4	0.2	0.1
50-54	9	13	0.4	0.5	0.1	0.1
55-59	16	22	0.8	1.0	0.1	0.2
60-64	15	23	0.8	1.2	0.1	0.1
65-69	19	18	1.2	1.0	0.1	0.1
70-74	33	17	2.2	1.0	0.1	0.1
75-79	18	20	1.5	1.3	0.1	0.1
80-84	23	14	3.2	1.3	0.1	0.1
85+	8	6	1.7	0.6	0.1	0.0
All ages	162	163			0.1	0.1
Incidence						
Raw			0.5	0.5		
WS			0.3	0.3		
ES			0.4	0.4		
BRD-S			0.5	0.4		

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).

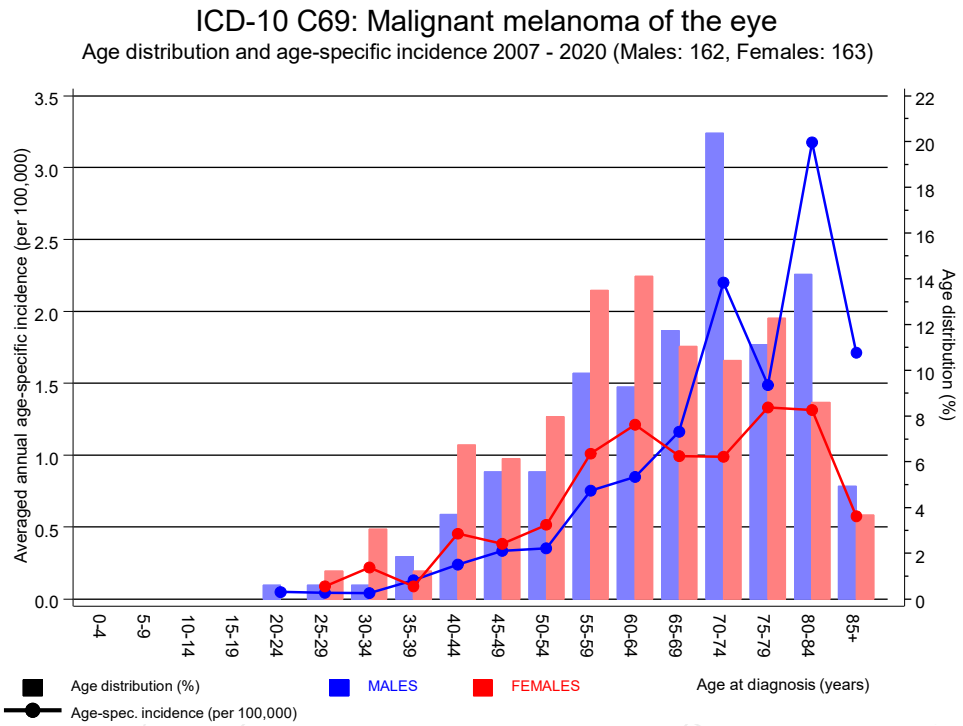


Figure 6. Age distribution (males: mean=67.2 yrs, median=70.2 yrs; females: mean=63.4 yrs, median=63.7 yrs) and age-specific incidence.

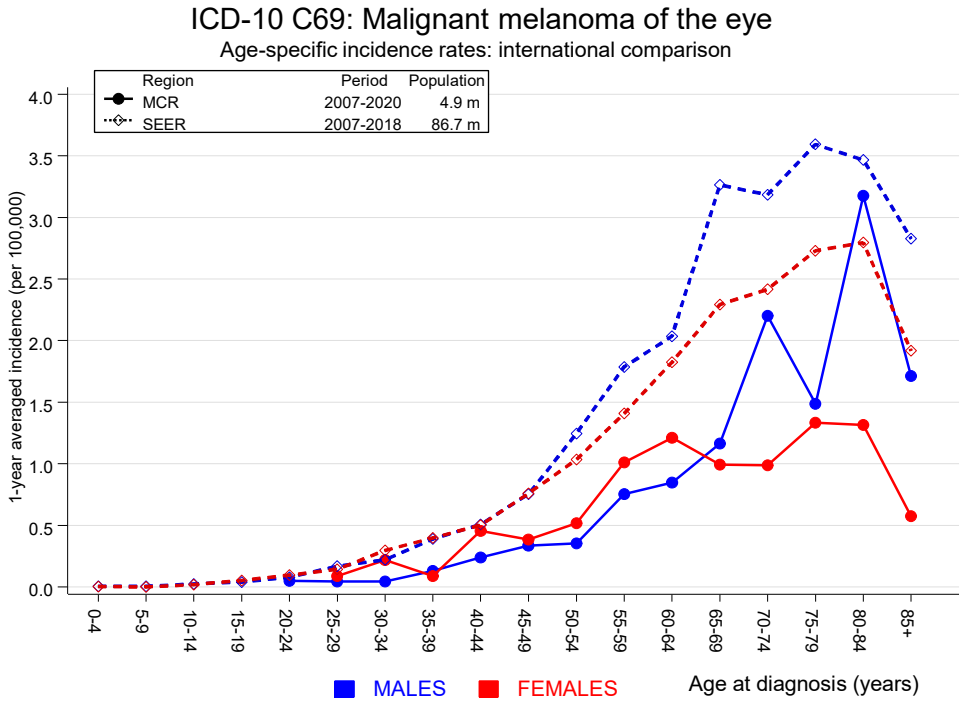


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 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 1998–2020

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C15	Oesophagus	1	0.4	2.8	0.1	15.4		5.5	
C18	Colon	5	1.8	2.8	0.9	6.5		27.7	
C19–C20	Rectum	1	0.9	1.1	0.0	5.9		0.4	
C25	Pancreas	1	0.7	1.4	0.0	7.5		2.3	
C33–C34	Lung	9	2.1	4.2	1.9	8.0	#	59.5	22.2
C43	Malign. melanoma	4	0.8	4.7	1.3	12.1	#	27.3	
C61	Prostate	7	5.0	1.4	0.6	2.9		17.0	
C64	Kidney	2	0.6	3.2	0.4	11.6		11.9	
C67	Bladder	2	0.9	2.2	0.3	8.1		9.6	
C76–C79	CUP	1	0.3	3.2	0.1	17.7		5.9	
C90	Mult. myeloma	1	0.2	4.1	0.1	22.9		6.6	
Not observed		0	4.5	0.0	0.0	0.8	#	-38.9	
All further malignancies		34	18.4	1.8	1.3	2.6	#	134.9	5.9

Patients	235
Median age at next malignancy (years)	73.9
Person-years	1154
Mean observation time (years)	4.9
Median observation time (years)	3.9

The occurrence of further specified malignancy is statistically significant.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C16	Stomach	1	0.5	2.2	0.1	12.0		3.6	100.0
C17	Small intestine	1	0.1	11.9	0.3	66.3		6.1	
C18	Colon	1	1.3	0.7	0.0	4.1		-2.3	
C19–C20	Rectum	1	0.6	1.8	0.0	9.9		2.9	
C21	Anus/canal	1	0.1	11.6	0.3	64.4		6.0	
C22	Liver	2	0.2	11.2	1.4	40.5	#	12.0	
C25	Pancreas	1	0.7	1.5	0.0	8.5		2.3	
C33–C34	Lung	2	1.2	1.7	0.2	6.2		5.6	50.0
C43	Malign. melanoma	2	0.6	3.3	0.4	11.9		9.2	50.0
C50	Breast	16	4.8	3.4	1.9	5.4	#	74.3	
C54	Corpus uteri	2	0.8	2.4	0.3	8.7		7.7	
C56	Ovary	3	0.6	5.1	1.0	14.8	#	15.9	
C69	Eye carcinoma	1	0.0	319.3	8.1	1779	#	6.6	
C70–C72	CNS cancer	1	0.2	5.2	0.1	29.1		5.3	
C73	Thyroid	1	0.3	3.7	0.1	20.3		4.8	
C76–C79	CUP	4	0.2	16.1	4.4	41.2	#	24.8	
C82–C85	NHL	1	0.6	1.8	0.0	9.9		2.9	
Not observed		0	2.4	0.0	0.0	1.6		-15.6	
All further malignancies		41	15.0	2.7	2.0	3.7	#	172.0	7.3

Patients	259
Median age at next malignancy (years)	66.9
Person-years	1513
Mean observation time (years)	5.8
Median observation time (years)	5.1

The occurrence of further specified malignancy is statistically significant.

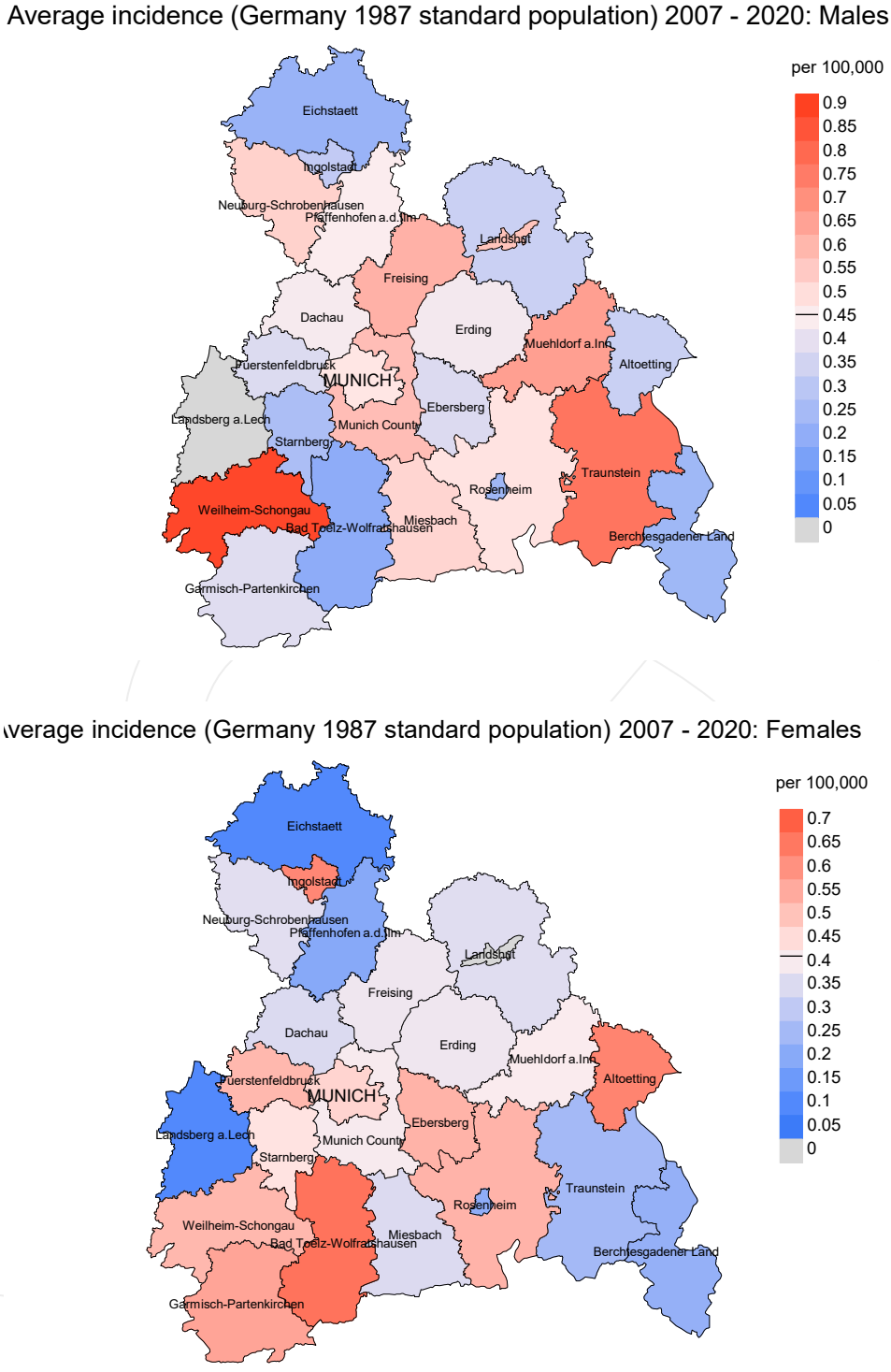
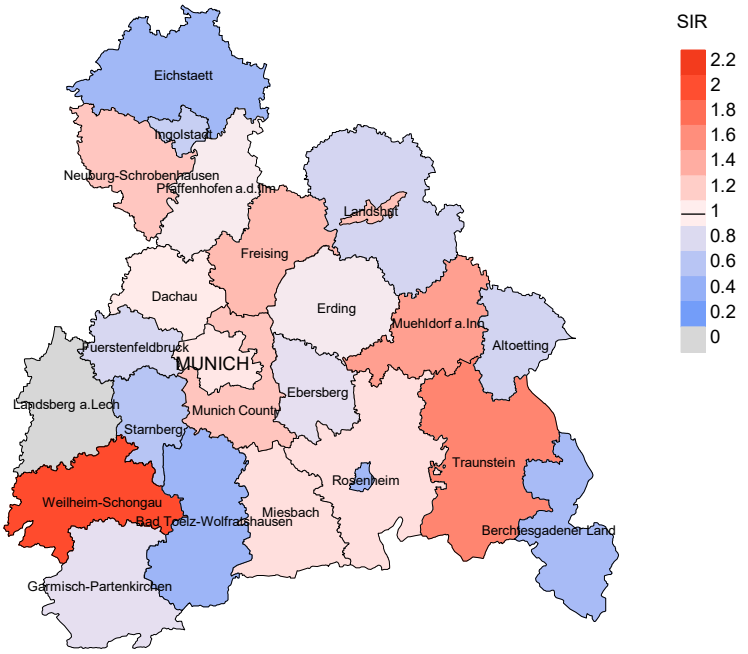


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.5/100,000 WS N=162, females 0.4/100,000 WS N=163).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 6 women were identified with newly diagnosed eye melanoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.4/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

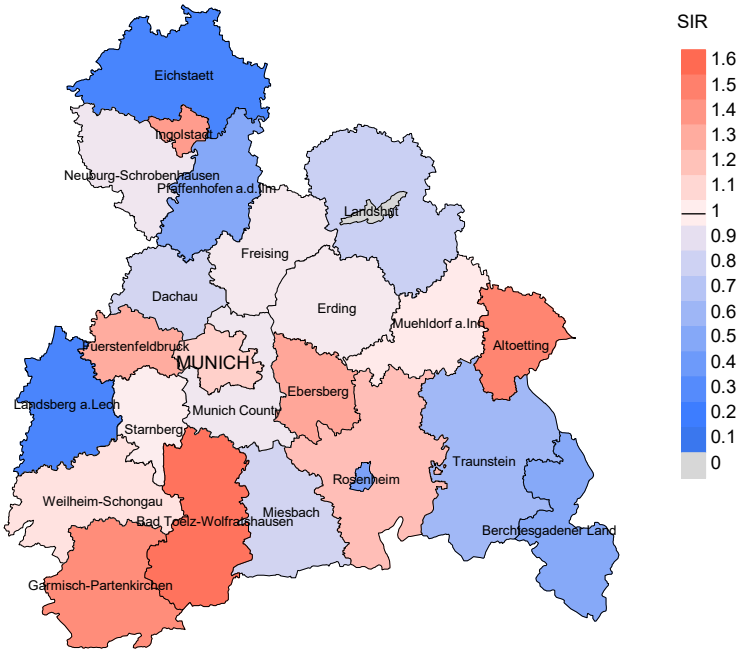


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=162, females N=163).

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 2020 a total of 6 women were identified with newly diagnosed eye melanoma. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.33. Though, the value of this parameter may vary with an underlying probability of 99% between 0.34 and 3.46, 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 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	9	88.9	7	77.8	100.0
1999	6	100.0	4	66.7	100.0
2000	11	90.9	9	81.8	88.9
2001	8	100.0	5	62.5	100.0
2002	22	100.0	18	81.8	83.3
2003	29	89.7	18	62.1	83.3
2004	36	94.4	29	80.6	89.7
2005	34	94.1	25	73.5	92.0
2006	32	90.6	18	56.3	94.4
2007	32	96.9	23	71.9	100.0
2008	30	96.7	22	73.3	100.0
2009	38	97.4	18	47.4	94.4
2010	39	97.4	24	61.5	91.7
2011	23	100.0	14	60.9	85.7
2012	23	100.0	14	60.9	78.6
2013	27	100.0	18	66.7	100.0
2014	25	100.0	10	40.0	100.0
2015	17	94.1	9	52.9	88.9
2016	26	96.2	18	69.2	83.3
2017	20	100.0	7	35.0	71.4
2018	9	100.0	6	66.7	50.0
2019	4	100.0	1	25.0	100.0
2020	12	83.3	1	8.3	
1998–2020	512	96.1	318	62.1	90.3

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 4.94 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	9	11		
1999	6	5		
2000	11	12		
2001	8	3		
2002	22	12		
2003	29	17	2	6.9
2004	36	13	2	5.6
2005	34	19	4	11.8
2006	32	16		
2007	32	22	3	9.4
2008	30	21		
2009	38	26	2	5.3
2010	39	24	1	2.6
2011	23	32	2	8.7
2012	23	18	1	4.3
2013	27	28	1	3.7
2014	25	29	1	4.0
2015	17	31	1	5.9
2016	26	33	2	7.7
2017	20	24	2	10.0
2018	9	20	1	11.1
2019	4	18		
2020	12	25		
1998–2020	512	459	25	4.9

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 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	11	63.6	36.4	60.0
1999	5	40.0	60.0	75.0
2000	12	83.3	16.7	83.3
2001	3	33.3	66.7	100.0
2002	12	50.0	50.0	50.0
2003	17	76.5	23.5	86.7
2004	13	69.2	30.8	84.6
2005	19	84.2	15.8	88.2
2006	16	62.5	37.5	73.3
2007	22	86.4	13.6	90.9
2008	21	76.2	23.8	85.7
2009	26	84.6	15.4	84.6
2010	24	62.5	37.5	78.3
2011	32	81.3	18.8	80.6
2012	18	72.2	27.8	72.2
2013	28	85.7	14.3	89.3
2014	29	69.0	31.0	65.5
2015	31	74.2	25.8	70.0
2016	33	78.8	21.2	84.4
2017	24	62.5	37.5	68.2
2018	20	75.0	25.0	81.3
2019	18	66.7	33.3	75.0
2020	25	56.0	44.0	77.3
1998-2020	459	72.8	27.2	78.7

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	3	85.3	90.3	71.0	71.0
1999	3	76.2		76.2	76.2
2000	2	83.5	83.5		83.5
2001	1	87.2		87.2	
2002	4	67.8	69.2	66.5	67.6
2003	10	65.9	65.9	72.9	69.0
2004	6	71.4	71.0	79.1	71.0
2005	10	74.8	68.7	85.9	68.7
2006	8	75.7	73.8	86.2	73.8
2007	9	73.3	65.5	81.3	67.4
2008	11	69.9	69.1	85.1	69.1
2009	12	71.6	67.7	84.1	67.7
2010	8	79.7	75.1	83.4	79.7
2011	18	73.5	73.5	72.9	73.5
2012	9	68.7	65.7	86.1	65.7
2013	12	80.8	80.8		80.8
2014	17	77.9	75.3	85.4	75.3
2015	18	76.9	75.6	88.1	75.5
2016	16	74.3	73.7	89.1	73.7
2017	11	84.1	78.2	84.9	74.2
2018	7	71.6	63.4	81.9	65.7
2019	12	81.9	80.6	84.2	83.0
2020	15	80.8	80.9	80.6	80.8
1998–2020	222	75.5	73.5	83.9	73.5

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	8	90.0	84.5	91.3	84.7
1999	2	71.8	71.8		71.8
2000	10	73.2	66.8	75.1	66.8
2001	2	78.5	59.8	97.3	78.5
2002	8	83.3	72.7	85.9	72.7
2003	7	63.8	57.1	89.4	57.7
2004	7	73.4	66.1	83.6	71.7
2005	9	78.0	75.6	83.3	73.2
2006	8	81.8	68.2	83.7	68.4
2007	13	69.1	69.1		69.1
2008	10	82.3	72.8	92.7	79.8
2009	14	72.0	68.2	89.0	68.2
2010	16	80.4	66.9	91.3	67.2
2011	14	77.6	74.7	81.8	74.0
2012	9	73.4	61.5	86.0	61.5
2013	16	71.9	70.4	82.3	70.9
2014	12	77.8	70.4	94.3	62.8
2015	13	75.6	73.8	85.0	73.8
2016	17	72.8	66.8	85.5	65.3
2017	13	80.5	79.0	80.9	80.2
2018	13	75.2	76.0	75.2	74.5
2019	6	77.6	73.0	85.6	71.5
2020	10	73.1	64.2	89.9	65.0
1998–2020	237	75.6	70.0	86.1	70.9

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	1	0.1	0.50	0.0	0.38	0.1	0.55	0.1	0.59
1999									
2000	2	0.2	0.40	0.1	0.32	0.2	0.43	0.3	0.49
2001									
2002	3	0.2	0.21	0.1	0.18	0.1	0.19	0.1	0.18
2003	8	0.4	0.80	0.3	0.74	0.4	0.74	0.4	0.79
2004	5	0.3	0.29	0.1	0.33	0.2	0.32	0.3	0.29
2005	8	0.4	0.57	0.2	0.55	0.4	0.60	0.5	0.61
2006	6	0.3	0.40	0.2	0.30	0.2	0.36	0.3	0.45
2007	6	0.3	0.43	0.2	0.47	0.2	0.49	0.3	0.46
2008	10	0.4	0.77	0.2	0.79	0.3	0.75	0.4	0.69
2009	9	0.4	0.60	0.2	0.61	0.3	0.62	0.4	0.62
2010	6	0.3	0.29	0.1	0.24	0.2	0.29	0.3	0.31
2011	15	0.7	1.25	0.3	1.12	0.4	1.18	0.6	1.23
2012	8	0.4	0.62	0.2	0.66	0.3	0.69	0.3	0.65
2013	12	0.5	1.20	0.2	0.75	0.4	1.00	0.5	1.20
2014	13	0.6	1.08	0.2	0.77	0.4	0.89	0.5	1.09
2015	15	0.6	1.15	0.2	1.03	0.4	1.06	0.6	1.14
2016	15	0.6	1.07	0.3	0.90	0.4	0.95	0.5	1.07
2017	5	0.2	0.42	0.1	0.43	0.1	0.45	0.2	0.39
2018	5	0.2	1.00	0.1	1.27	0.2	1.17	0.2	1.04
2019	8	0.3	4.00	0.1	3.00	0.2	3.17	0.3	3.58
2020	8	0.3	1.33	0.1	0.58	0.1	0.80	0.3	1.23
1998-2020	168	0.4	0.69	0.2	0.59	0.3	0.65	0.4	0.70

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	6	0.5	0.86	0.1	0.34	0.3	0.49	0.3	0.64
1999	2	0.2	0.50	0.1	0.32	0.1	0.33	0.2	0.51
2000	8	0.7	1.33	0.3	1.43	0.5	1.38	0.5	1.19
2001	1	0.1	0.17	0.1	0.20	0.1	0.21	0.1	0.18
2002	3	0.2	0.38	0.1	0.30	0.1	0.31	0.1	0.32
2003	5	0.3	0.26	0.2	0.30	0.2	0.31	0.2	0.28
2004	4	0.2	0.21	0.1	0.20	0.2	0.21	0.2	0.22
2005	8	0.4	0.40	0.2	0.36	0.2	0.38	0.3	0.38
2006	4	0.2	0.24	0.1	0.18	0.1	0.22	0.1	0.23
2007	13	0.6	0.72	0.2	0.63	0.3	0.62	0.4	0.63
2008	6	0.3	0.35	0.1	0.30	0.2	0.32	0.2	0.33
2009	13	0.6	0.57	0.3	0.41	0.4	0.48	0.4	0.49
2010	9	0.4	0.50	0.2	0.53	0.3	0.49	0.3	0.51
2011	11	0.5	1.00	0.2	0.54	0.3	0.64	0.3	0.75
2012	5	0.2	0.50	0.1	0.62	0.2	0.59	0.2	0.50
2013	12	0.5	0.71	0.2	0.64	0.4	0.67	0.4	0.69
2014	7	0.3	0.54	0.2	0.61	0.2	0.50	0.2	0.50
2015	8	0.3	2.00	0.1	1.11	0.2	1.46	0.3	1.64
2016	11	0.4	0.92	0.2	0.92	0.3	0.89	0.4	0.90
2017	10	0.4	1.25	0.1	1.28	0.2	1.26	0.3	1.19
2018	10	0.4	2.50	0.2	1.51	0.2	1.63	0.3	2.30
2019	4	0.2	2.00	0.1	1.06	0.1	1.33	0.1	1.38
2020	6	0.2	1.00	0.1	1.23	0.2	1.17	0.2	1.07
1998-2020	166	0.3	0.62	0.2	0.53	0.2	0.55	0.3	0.58

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14	1	0.4	0.4			0.0	1	0.8	0.8
15-19	0	0.0	0.4			0.0			0.8
20-24	1	0.4	0.8			0.0	1	0.8	1.6
25-29	0	0.0	0.8			0.0			1.6
30-34	1	0.4	1.2	1	0.7	0.7			1.6
35-39	2	0.8	1.9			0.7	2	1.6	3.2
40-44	6	2.3	4.2	3	2.2	3.0	3	2.4	5.6
45-49	4	1.5	5.8	1	0.7	3.7	3	2.4	8.0
50-54	10	3.8	9.6	5	3.7	7.4	5	4.0	12.0
55-59	26	10.0	19.6	12	8.9	16.3	14	11.2	23.2
60-64	22	8.5	28.1	10	7.4	23.7	12	9.6	32.8
65-69	36	13.8	41.9	13	9.6	33.3	23	18.4	51.2
70-74	44	16.9	58.8	26	19.3	52.6	18	14.4	65.6
75-79	43	16.5	75.4	27	20.0	72.6	16	12.8	78.4
80-84	34	13.1	88.5	21	15.6	88.1	13	10.4	88.8
85+	30	11.5	100.0	16	11.9	100.0	14	11.2	100.0
All ages	260	100.0		135	100.0		125	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**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		1			0.1	1.00		4.3
15-19								
20-24		1			0.1	1.00		2.3
25-29								
30-34	1		0.0	1.00			0.7	
35-39		2			0.1	1.00		0.5
40-44	3	3	0.1	0.50	0.1	0.27	0.5	0.4
45-49	1	3	0.0	0.11	0.1	0.30	0.1	0.2
50-54	5	5	0.2	0.56	0.2	0.38	0.2	0.2
55-59	12	14	0.6	0.75	0.6	0.64	0.3	0.4
60-64	10	12	0.6	0.67	0.6	0.52	0.2	0.2
65-69	13	23	0.8	0.68	1.3	1.28	0.1	0.3
70-74	26	18	1.7	0.79	1.0	1.06	0.2	0.2
75-79	27	16	2.2	1.50	1.1	0.80	0.2	0.2
80-84	21	13	2.9	0.91	1.2	0.93	0.2	0.1
85+	16	14	3.4	2.00	1.3	2.33	0.2	0.1
All ages	135	125					0.2	0.2
Mortality								
Raw			0.4	0.83	0.4	0.77		
WS			0.2	0.71	0.2	0.66		
ES			0.3	0.78	0.2	0.68		
BRD-S			0.4	0.83	0.3	0.71		
PYLL-70								
per 100,000			1.7		2.6			
ES			1.5		2.3			
AYLL-70			10.8		11.4			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C09–C10	Oropharynx	1	1.4					1	100.0
C18	Colon	7	10.1					7	100.0
C19–C20	Rectum	2	2.9	1	50.0			1	50.0
C22	Liver	3	4.3					3	100.0
C23–C24	Bile	1	1.4					1	100.0
C25	Pancreas	2	2.9	1	50.0			1	50.0
C33–C34	Lung	10	14.5	1	10.0			9	90.0
C43	Malign. melanoma	10	14.5	6	60.0	3	30.0	1	10.0
C44	Skin others	4	5.8	4	100.0				
C61	Prostate	16	23.2	8	50.0	1	6.3	7	43.8
C64	Kidney	1	1.4					1	100.0
C66	Ureter	1	1.4					1	100.0
C67	Bladder	3	4.3	1	33.3			2	66.7
C70–C72	CNS cancer	1	1.4	1	100.0				
C73	Thyroid	1	1.4					1	100.0
C76–C79	CUP	2	2.9					2	100.0
C82–C85	NHL	3	4.3	1	33.3			2	66.7
C90	Mult. myeloma	1	1.4	1	100.0				
All further malignancies		69	100.0	25	36.2	4	5.8	40	58.0

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 1998–2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	3	4.3	1	33.3			2	66.7
C17	Small intestine	1	1.4	1	100.0				
C18	Colon	3	4.3	1	33.3			2	66.7
C19–C20	Rectum	1	1.4					1	100.0
C22	Liver	3	4.3					3	100.0
C25	Pancreas	1	1.4					1	100.0
C33–C34	Lung	6	8.6	2	33.3	1	16.7	3	50.0
C43	Malign. melanoma	8	11.4	2	25.0			6	75.0
C50	Breast	24	34.3	16	66.7	2	8.3	6	25.0
C53	Cervix uteri	2	2.9					2	100.0
C54	Corpus uteri	5	7.1	3	60.0			2	40.0
C56	Ovary	2	2.9					2	100.0
C64	Kidney	1	1.4					1	100.0
C69	Eye carcinoma	1	1.4					1	100.0
C70–C72	CNS cancer	2	2.9					2	100.0
C73	Thyroid	2	2.9	1	50.0			1	50.0
C76–C79	CUP	3	4.3			1	33.3	2	66.7
C82–C85	NHL	2	2.9	1	50.0			1	50.0
All further malignancies		70	100.0	28	40.0	4	5.7	38	54.3

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 2007-2020
(**First primaries only** *)

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		1			0.1	1.00		5.3
15-19								
20-24		1			0.1	1.00		2.4
25-29								
30-34	1		0.0	1.00			0.7	
35-39		2			0.1	1.00		0.5
40-44	3	2	0.1	0.50	0.1	0.25	0.5	0.3
45-49	1	2	0.0	0.11	0.1	0.22	0.1	0.1
50-54	5	5	0.2	0.63	0.2	0.42	0.2	0.2
55-59	12	14	0.6	0.86	0.6	0.74	0.3	0.4
60-64	8	10	0.5	0.67	0.5	0.53	0.1	0.2
65-69	10	20	0.6	0.63	1.1	1.82	0.1	0.4
70-74	24	11	1.6	0.89	0.6	0.79	0.3	0.2
75-79	23	15	1.9	2.09	1.0	0.94	0.3	0.2
80-84	15	10	2.1	1.00	0.9	0.91	0.2	0.1
85+	11	12	2.4	2.20	1.2	2.00	0.2	0.1
All ages	113	105					0.2	0.2
Mortality								
Raw			0.3	0.88	0.3	0.78		
WS			0.2	0.73	0.1	0.68		
ES			0.2	0.80	0.2	0.70		
BRD-S			0.3	0.88	0.2	0.73		
PYLL-70								
per 100,000			1.6		2.3			
ES			1.4		2.1			
AYLL-70			11.6		11.5			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

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		1			0.1	1.00		5.3
15-19								
20-24		1			0.1	1.00		2.5
25-29								
30-34	1		0.0	1.00			0.7	
35-39		2			0.1	1.00		0.5
40-44	3	2	0.1	0.50	0.1	0.29	0.5	0.3
45-49	1	2	0.0	0.11	0.1	0.22	0.1	0.1
50-54	5	4	0.2	0.71	0.2	0.44	0.2	0.2
55-59	10	13	0.5	0.83	0.6	0.72	0.3	0.4
60-64	6	9	0.3	0.60	0.5	0.60	0.1	0.2
65-69	9	16	0.6	0.64	0.9	1.45	0.1	0.3
70-74	15	10	1.0	0.75	0.6	0.83	0.2	0.2
75-79	16	11	1.3	1.45	0.7	0.79	0.2	0.2
80-84	9	7	1.2	0.69	0.7	0.70	0.1	0.1
85+	8	9	1.7	1.60	0.9	1.50	0.1	0.1
All ages	83	87					0.2	0.2
Mortality								
Raw			0.3	0.73	0.3	0.73		
WS			0.1	0.63	0.1	0.67		
ES			0.2	0.69	0.2	0.68		
BRD-S			0.2	0.73	0.2	0.69		
PYLL-70								
per 100,000			1.5		2.2			
ES			1.3		2.0			
AYLL-70			12.1		12.2			

* See corresponding tables with multiple malignancies.

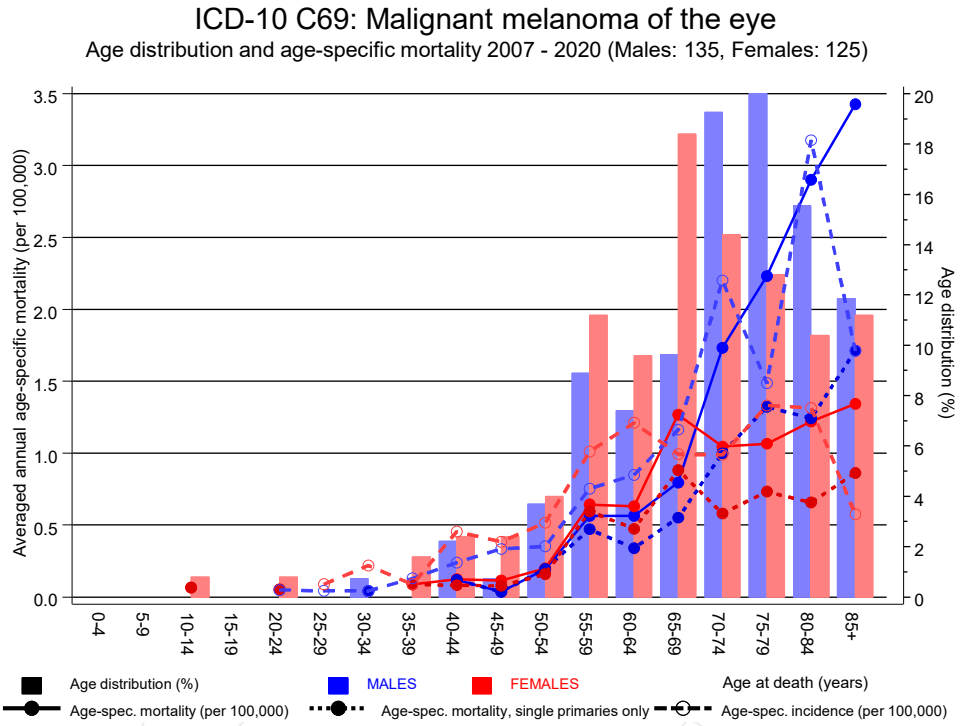


Figure 17. Distribution of age at death (bars; males: mean=64.7 yrs, median=65.7 yrs; females: mean=61.9 yrs, median=63.7 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

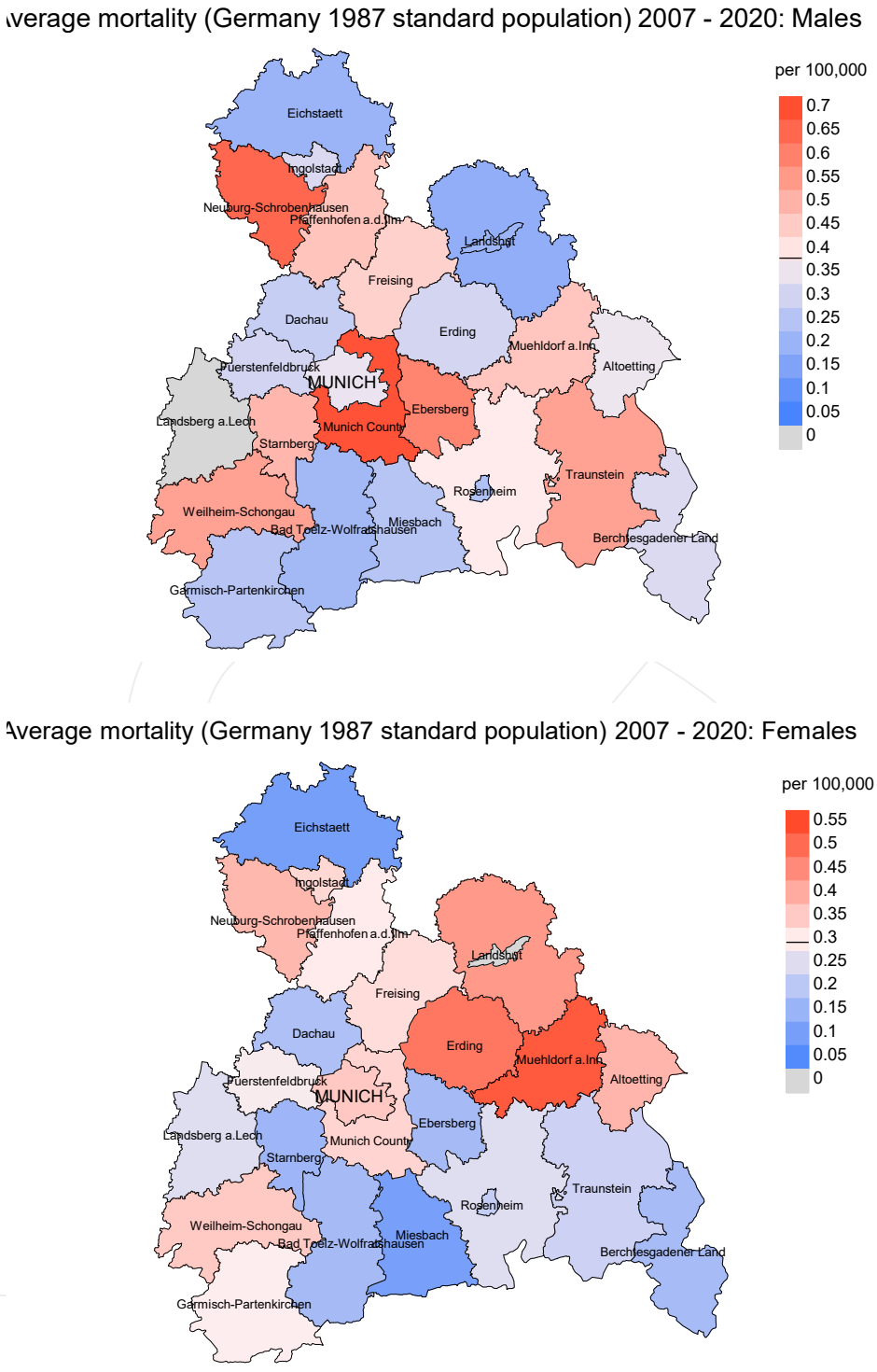
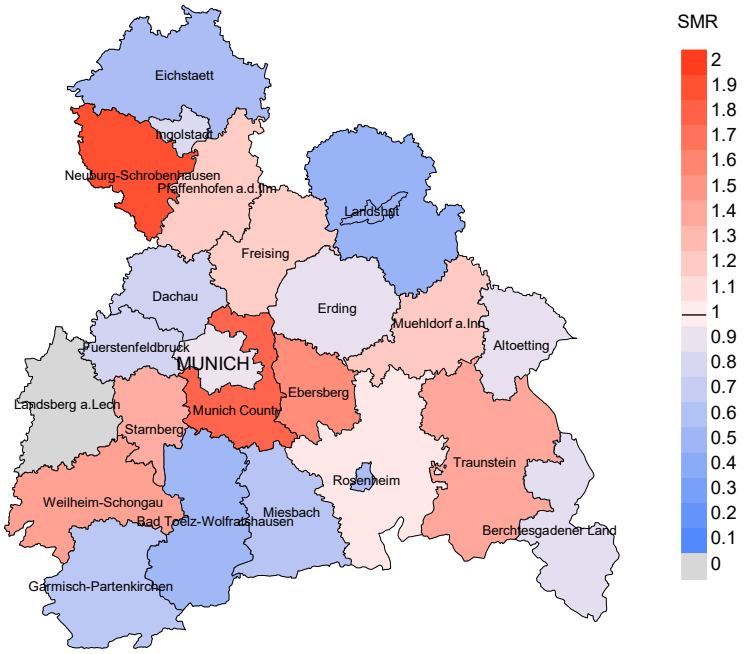


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.4/100,000 WS N=135, females 0.3/100,000 WS N=125).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 2 women died from eye melanoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.2/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.9/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

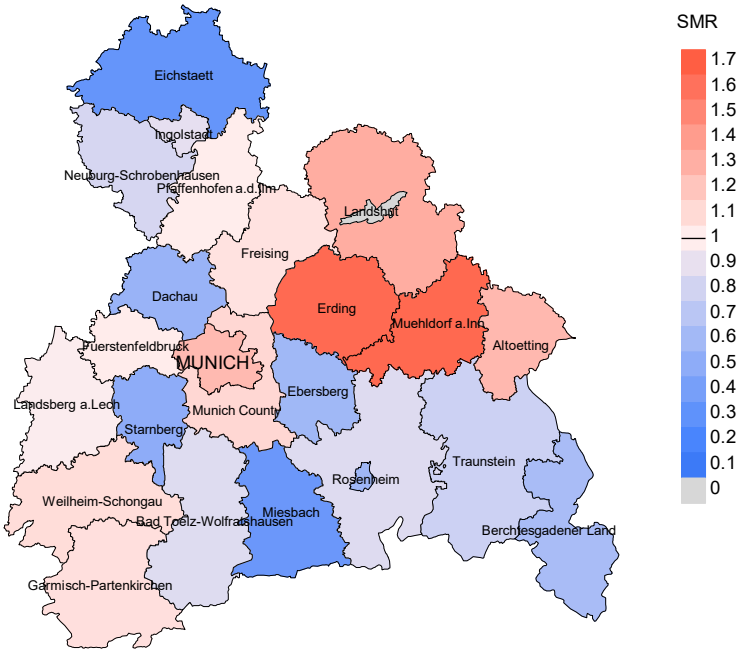


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=135, females N=125).

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 2020 a total of 2 women died from eye melanoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.59. Though, the value of this parameter may vary with an underlying probability of 99% between 0.03 and 2.72, 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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