

Munich Cancer Registry



- ▶ Survival
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- ▶ *Deutsch*

ICD-10 C43: Malignant melanoma

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	17,691
Diseases	18,558
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m



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

https://www.tumorregister-muenchen.de/en/facts/base/bC43__E-ICD-10-C43-Malignant-melanoma-incidence-and-mortality.pdf

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**Global Statements about the statistics on the Internet –
Baseline Statistics** (grey button ) , **Survival** (red button )

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases^{##} and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases^{###} are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, August 2018

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

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

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

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

Code	Description
C43.-	Malignant melanoma of skin
C43.0	Malignant melanoma of lip
C43.1	Malignant melanoma of eyelid, including canthus
C43.2	Malignant melanoma of ear and external auricular canal
C43.3	Malignant melanoma of other and unspecified parts of face
C43.4	Malignant melanoma of scalp and neck
C43.5	Malignant melanoma of trunk
C43.6	Malignant melanoma of upper limb, including shoulder
C43.7	Malignant melanoma of lower limb, including hip
C43.8	Overlapping malignant melanoma of skin
C43.9	Malignant melanoma of skin, unspecified

INCIDENCE

Table 1

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

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	480	13	2.7	12.1	15.8	42.5	95.0
1999	463	10	2.2	13.3	15.6	38.4	95.7
2000	521	13	2.5	13.0	15.3	39.3	93.9
2001	521	8	1.5	13.4	15.1	39.3	95.8
2002	884	15	1.7	13.4	14.7	35.4	95.2 #
2003	807	17	2.1	13.3	14.3	34.2	92.7
2004	907	23	2.5	13.4	14.1	37.2	93.6
2005	904	12	1.3	13.9	13.7	32.3	91.9
2006	930	15	1.6	14.3	13.3	32.9	85.4
2007	1063	17	1.6	14.8	12.8	29.1	61.0 #
2008	1210	21	1.7	15.3	12.3	28.8	56.0
2009	1194	22	1.8	16.0	11.7	27.1	54.1
2010	1392	20	1.4	16.7	11.1	24.4	50.8
2011	1551	20	1.3	17.3	10.4	19.9	47.0
2012	1416	23	1.6	17.7	9.5	18.1	47.5
2013	1460	19	1.3	18.4	8.0	14.8	45.3
2014	1164	18	1.5	18.5	7.0	14.1	46.8
2015	986	24	2.4	18.8	6.2	11.6	95.9
2016	705	16	2.3	19.0	4.7	6.2	89.4 ##
1998-2016	18558	326	1.8	19.0	15.8	25.5	69.0

18,558 cases diagnosed 1998-2016 are related to a total of 17,691 patients. Currently, in 5,467 (30.9 %) of these 17,691 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 3,804 / 1,064 / 599 (21.5 % / 6.0 % / 3.4 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 1,164 cases has been diagnosed, of which 18.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.0 % 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 1a

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

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	242	50.4	7	2.9	11.6	17.6	45.9	95.0
1999	215	46.4	2	0.9	13.6	17.4	40.9	95.8
2000	281	53.9	4	1.4	13.4	17.2	45.6	94.3
2001	267	51.2	4	1.5	14.7	16.8	44.6	97.4
2002	469	53.1	4	0.9	14.6	16.4	42.4	96.4 #
2003	399	49.4	8	2.0	14.6	15.8	39.3	95.0
2004	456	50.3	13	2.9	14.9	15.6	43.4	94.7
2005	476	52.7	6	1.3	16.0	15.2	36.1	94.1
2006	476	51.2	5	1.1	16.3	14.8	37.4	86.1
2007	542	51.0	10	1.8	17.1	14.1	34.7	64.6 #
2008	645	53.3	9	1.4	17.6	13.6	31.8	56.9
2009	652	54.6	7	1.1	18.6	12.8	29.4	55.5
2010	732	52.6	8	1.1	19.4	11.8	26.9	52.7
2011	799	51.5	8	1.0	20.1	11.0	22.4	50.1
2012	750	53.0	13	1.7	20.7	9.5	21.7	50.8
2013	824	56.4	13	1.6	21.5	8.0	16.7	47.8
2014	637	54.7	8	1.3	21.6	6.9	14.9	49.0
2015	544	55.2	13	2.4	21.9	5.7	13.8	97.1
2016	386	54.8	7	1.8	22.1	5.2	6.0	89.4 ##
1998-2016	9792	52.8	149	1.5	22.1	17.6	28.6	70.5

9,792 cases diagnosed 1998-2016 are related to a total of 9,193 patients. Currently, in 3,186 (34.7 %) of these 9,193 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,123 / 635 / 428 (23.1 % / 6.9 % / 4.7 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 637 cases has been diagnosed, of which 21.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.9 % 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 with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (FEMALES) (incl. DCO)

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	238	49.6	6	2.5	12.6	13.8	39.1	95.0
1999	248	53.6	8	3.2	13.0	13.6	36.3	95.6
2000	240	46.1	9	3.8	12.5	13.4	32.1	93.3
2001	254	48.8	4	1.6	12.0	13.2	33.9	94.1
2002	415	46.9	11	2.7	12.2	12.9	27.5	94.0 #
2003	408	50.6	9	2.2	12.0	12.6	29.2	90.4
2004	451	49.7	10	2.2	11.7	12.4	30.8	92.5
2005	428	47.3	6	1.4	11.8	12.0	28.0	89.5
2006	454	48.8	10	2.2	12.2	11.7	28.2	84.6
2007	521	49.0	7	1.3	12.4	11.3	23.2	57.2 #
2008	565	46.7	12	2.1	12.9	10.9	25.3	54.9
2009	542	45.4	15	2.8	13.3	10.6	24.2	52.4
2010	660	47.4	12	1.8	13.9	10.2	21.5	48.6
2011	752	48.5	12	1.6	14.3	9.7	17.2	43.8
2012	666	47.0	10	1.5	14.5	9.4	14.1	43.8
2013	636	43.6	6	0.9	14.9	8.1	12.3	42.0
2014	527	45.3	10	1.9	15.1	7.0	13.1	44.2
2015	442	44.8	11	2.5	15.4	6.8	8.8	94.6
2016	319	45.2	9	2.8	15.5	4.0	6.6	89.3 ##
1998-2016	8766	47.2	177	2.0	15.5	13.8	22.1	67.4

8,766 cases diagnosed 1998-2016 are related to a total of 8,498 patients. Currently, in 2,281 (26.8 %) of these 8,498 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,681 / 429 / 171 (19.8 % / 5.0 % / 2.0 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 527 cases has been diagnosed, of which 15.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.0 % 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 including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	242	238	21.8	20.2	14.9	12.2	19.6	16.0	22.8	18.2
1999	215	248	19.2	20.9	13.1	13.5	17.1	17.0	19.8	19.3
2000	281	240	24.7	20.0	16.1	13.2	21.6	16.4	25.1	18.6
2001	267	254	23.0	20.9	14.7	13.3	19.9	17.0	23.4	19.0
2002	469	415	25.2	21.2	16.0	13.6	21.7	17.1	24.9	19.1
2003	399	408	21.3	20.7	13.3	13.2	17.9	16.7	21.2	18.4
2004	456	451	24.2	22.8	14.9	14.2	20.1	18.1	24.5	20.4
2005	476	428	25.1	21.5	15.4	13.3	21.0	17.2	24.6	19.3
2006	476	454	24.9	22.6	14.8	13.4	20.3	17.4	24.4	19.8
2007	542	521	24.5	22.6	14.4	13.7	19.9	17.7	24.0	19.9
2008	645	565	29.0	24.3	17.1	14.2	23.2	18.6	27.2	21.0
2009	652	542	29.2	23.3	16.2	13.6	22.6	17.7	27.3	20.2
2010	732	660	32.5	28.2	18.5	17.0	25.4	21.8	30.6	24.6
2011	799	752	35.7	32.2	20.4	19.7	27.9	24.9	33.4	28.0
2012	750	666	33.0	28.2	17.9	16.7	25.0	21.6	30.3	24.6
2013	824	636	35.8	26.7	19.5	15.8	27.1	20.4	32.9	23.1
2014	637	527	27.3	21.9	14.5	12.7	20.4	16.3	24.8	18.6
2015	544	442	22.9	18.2	11.9	10.3	16.8	13.7	20.9	15.5
2016	386	319	16.1	13.0	8.3	7.2	11.7	9.6	14.6	11.0
1998-2016	9792	8766	26.6	22.9	15.5	13.8	21.4	17.8	25.6	20.1

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

Table 3

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	480	57.7	16.8	17.2	96.2	33.6	47.1	58.9	70.2	79.0
1999	463	56.5	17.4	9.1	93.5	32.2	42.4	57.9	70.1	79.1
2000	521	57.0	17.2	15.6	98.4	33.7	43.4	58.6	70.0	78.9
2001	521	57.7	16.8	21.1	94.3	33.6	44.4	59.5	69.7	79.5
2002	884	58.4	17.3	7.6	99.0	34.1	44.7	60.6	71.4	80.5
2003	807	58.5	16.6	8.1	97.6	36.1	45.3	60.8	70.5	80.3
2004	907	59.4	16.5	15.6	95.6	36.5	46.3	61.6	72.3	80.4
2005	904	59.8	16.1	11.4	96.6	37.3	48.7	62.0	71.0	79.9
2006	930	61.4	16.5	3.1	102	38.3	48.9	64.1	73.4	82.1
2007	1063	60.9	16.7	14.6	99.9	37.8	48.4	63.3	73.1	81.7
2008	1210	61.4	15.9	14.1	99.3	39.4	49.7	64.7	72.7	80.5
2009	1194	62.4	15.7	13.9	101	40.6	50.3	65.5	73.8	81.4
2010	1392	61.5	16.5	4.9	98.5	38.3	49.4	64.8	73.7	81.8
2011	1551	60.9	16.7	4.9	98.3	38.0	48.1	63.0	73.6	81.5
2012	1416	62.4	16.0	0.2	98.2	40.7	50.2	64.8	74.5	81.7
2013	1460	62.4	16.0	17.5	103	41.1	50.4	64.4	74.6	81.9
2014	1164	63.2	16.7	22.8	105	39.7	50.5	66.4	75.9	83.5
2015	986	63.9	15.5	19.3	97.8	42.4	52.9	66.3	75.5	81.7
2016	705	64.4	15.3	19.2	101	43.8	52.0	67.0	76.5	82.4
1998–2016	18558	61.0	16.5	0.2	105	37.7	48.9	63.1	73.5	81.3

Table 3a

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	242	56.9	16.1	17.2	93.0	32.7	47.4	58.9	68.5	76.2
1999	215	56.9	16.3	9.1	89.6	33.4	44.5	58.6	68.5	78.4
2000	281	58.4	15.2	15.6	92.3	34.8	51.3	60.0	69.1	76.8
2001	267	58.7	15.6	23.6	92.1	34.6	46.9	60.8	68.7	79.2
2002	469	60.1	15.3	7.6	98.4	37.0	50.6	63.2	70.8	77.3
2003	399	59.9	15.2	11.9	91.5	37.2	49.5	62.8	71.1	78.5
2004	456	60.8	15.7	15.6	94.1	38.1	49.9	63.3	73.1	80.5
2005	476	61.0	15.0	17.4	96.6	38.7	52.1	63.2	71.1	78.6
2006	476	62.4	15.3	3.1	95.4	39.6	52.1	65.0	73.2	79.6
2007	542	62.2	15.4	14.6	98.8	40.2	50.6	64.4	73.6	81.3
2008	645	62.2	14.5	14.1	93.5	41.9	52.8	65.5	72.0	78.4
2009	652	63.8	14.3	17.8	96.0	42.7	53.8	67.0	74.2	80.4
2010	732	63.7	15.2	4.9	98.5	42.1	54.4	66.6	74.4	81.4
2011	799	63.0	15.0	15.4	96.9	40.6	53.4	66.4	73.9	80.5
2012	750	64.3	14.3	19.7	93.8	44.6	54.0	67.7	74.7	81.3
2013	824	64.2	15.1	17.5	103	43.9	53.3	66.9	75.5	82.3
2014	637	65.1	15.1	23.5	97.7	44.3	53.7	68.0	76.1	82.4
2015	544	65.8	15.0	19.3	95.7	44.0	55.8	69.4	76.9	81.9
2016	386	66.3	14.8	24.0	101	45.8	54.2	69.8	77.4	83.8
1998–2016	9792	62.6	15.2	3.1	103	40.7	52.4	65.1	73.8	80.6

Table 3b

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

Year of diagnosis	Cases n	Std. dev.		Min. Max.		Median				
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	238	58.6	17.5	18.0	96.2	33.7	46.8	59.0	72.4	81.7
1999	248	56.2	18.4	19.9	93.5	31.4	40.6	56.4	71.3	79.9
2000	240	55.2	19.1	18.3	98.4	30.9	38.8	53.7	71.7	82.3
2001	254	56.8	18.0	21.1	94.3	33.0	41.8	57.5	71.1	80.9
2002	415	56.6	19.2	17.4	99.0	31.7	39.3	56.4	72.3	83.9
2003	408	57.1	17.8	8.1	97.6	35.1	41.7	58.4	69.8	81.7
2004	451	58.0	17.2	18.8	95.6	36.2	43.8	59.4	71.8	80.1
2005	428	58.5	17.2	11.4	96.1	34.9	45.0	58.8	70.8	81.6
2006	454	60.3	17.6	14.1	102	36.1	47.0	62.1	73.8	83.7
2007	521	59.6	17.8	14.9	99.9	35.0	45.6	61.6	72.2	82.9
2008	565	60.6	17.4	14.5	99.3	37.7	45.9	63.4	73.3	83.3
2009	542	60.8	17.0	13.9	101	38.4	47.2	63.1	73.5	82.7
2010	660	59.1	17.6	15.1	94.1	35.7	44.9	60.4	72.5	82.4
2011	752	58.7	18.1	4.9	98.3	33.9	44.9	58.8	73.1	82.3
2012	666	60.1	17.5	0.2	98.2	37.7	47.4	60.8	74.1	83.4
2013	636	59.9	16.8	18.4	94.2	36.2	47.5	61.4	72.9	81.0
2014	527	60.8	18.2	22.8	105	34.9	46.8	62.2	75.1	84.9
2015	442	61.4	15.9	20.7	97.8	39.3	49.9	62.0	74.0	80.6
2016	319	62.3	15.6	19.2	94.2	42.4	50.2	63.2	74.8	81.1
1998-2016	8766	59.3	17.6	0.2	105	35.2	45.7	60.2	73.0	82.3

Table 4

Age distribution by 5-year age group and sex for period 2007-2016
(incl. DCO)

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	3	0.0	0.0	1	0.0	0.0	2	0.0	0.0
5-9	3	0.0	0.0	1	0.0	0.0	2	0.0	0.1
10-14	5	0.0	0.1	2	0.0	0.1	3	0.1	0.1
15-19	39	0.3	0.4	20	0.3	0.4	19	0.3	0.5
20-24	104	0.9	1.3	33	0.5	0.9	71	1.3	1.7
25-29	241	2.0	3.3	65	1.0	1.9	176	3.1	4.8
30-34	346	2.8	6.1	133	2.0	3.9	213	3.8	8.6
35-39	506	4.2	10.3	226	3.5	7.4	280	5.0	13.6
40-44	768	6.3	16.6	325	5.0	12.4	443	7.9	21.5
45-49	1010	8.3	24.9	480	7.4	19.8	530	9.4	30.9
50-54	980	8.1	33.0	480	7.4	27.1	500	8.9	39.8
55-59	988	8.1	41.1	552	8.5	35.6	436	7.7	47.5
60-64	1119	9.2	50.3	621	9.5	45.1	498	8.8	56.4
65-69	1545	12.7	63.1	942	14.5	59.6	603	10.7	67.1
70-74	1662	13.7	76.8	1026	15.8	75.4	636	11.3	78.4
75-79	1266	10.4	87.2	784	12.0	87.4	482	8.6	86.9
80-84	847	7.0	94.2	510	7.8	95.2	337	6.0	92.9
85+	709	5.8	100.0	310	4.8	100.0	399	7.1	100.0
All ages	12141	100.0		6511	100.0		5630	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=94 %	Females DCO rate n=104 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4	1	2	0.1	0.2			0.5	1.3
5- 9	1	2	0.1	0.2			1.0	2.4
10-14	2	3	0.2	0.3			1.7	3.0
15-19	20	19	1.6	1.7			7.9	9.2
20-24	33	70	2.3	5.2			7.2	18.6
25-29	64	174	4.1	11.1	1.6		9.4	20.8
30-34	131	209	8.2	13.1			13.7	14.2
35-39	224	278	13.8	17.4	0.9		16.2	11.1
40-44	319	440	17.1	24.6		0.2	14.7	9.7
45-49	472	520	23.9	27.2	0.2		12.0	7.6
50-54	467	492	27.0	28.8	0.4	0.2	7.6	5.7
55-59	540	432	38.1	29.4	0.2	1.2	5.9	4.6
60-64	611	491	49.9	36.9	0.5	0.6	4.6	4.4
65-69	908	593	76.6	45.7	0.7	0.7	4.9	4.2
70-74	995	628	89.9	49.6	1.7	1.3	4.7	4.2
75-79	741	478	93.0	47.7	1.5	2.7	4.5	3.6
80-84	489	334	106.3	47.2	5.3	4.5	4.4	3.1
85+	297	393	97.0	53.5	8.1	13.7	3.8	3.1
All ages	6315	5558			1.5	1.9	5.5	5.0
Incidence								
Raw			27.6	23.5				
WS			15.4	13.9				
ES			21.3	18.0				
BRD-S			25.7	20.3				

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).

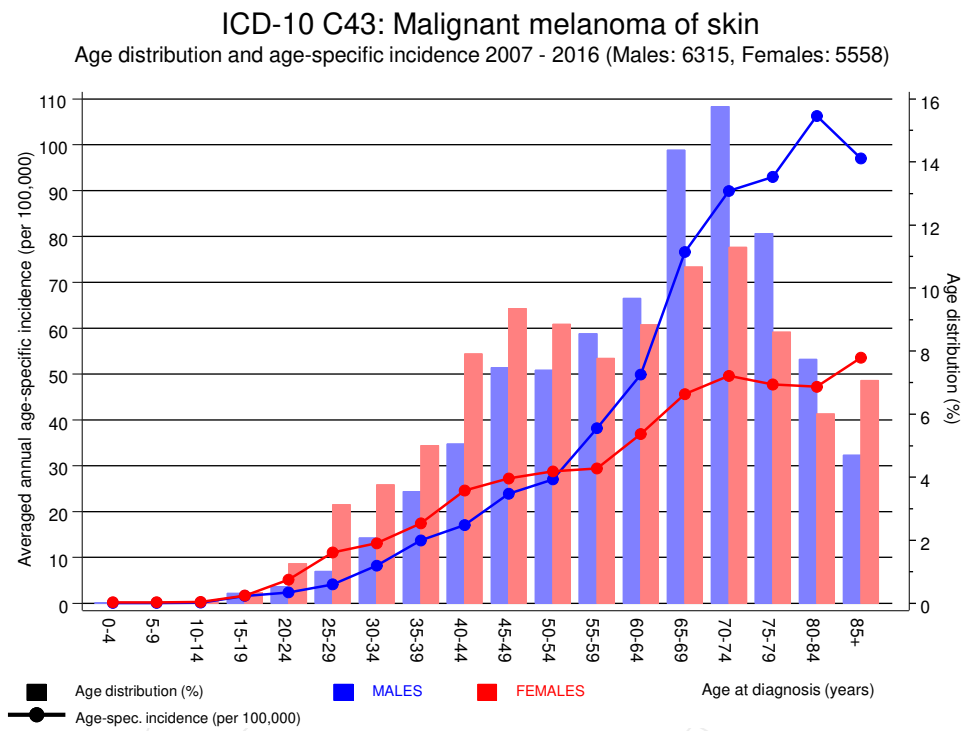


Figure 6. Age distribution (males: mean=63.8 yrs, median=66.8 yrs; females: mean=60.1 yrs, median=61.3 yrs) and age-specific incidence.

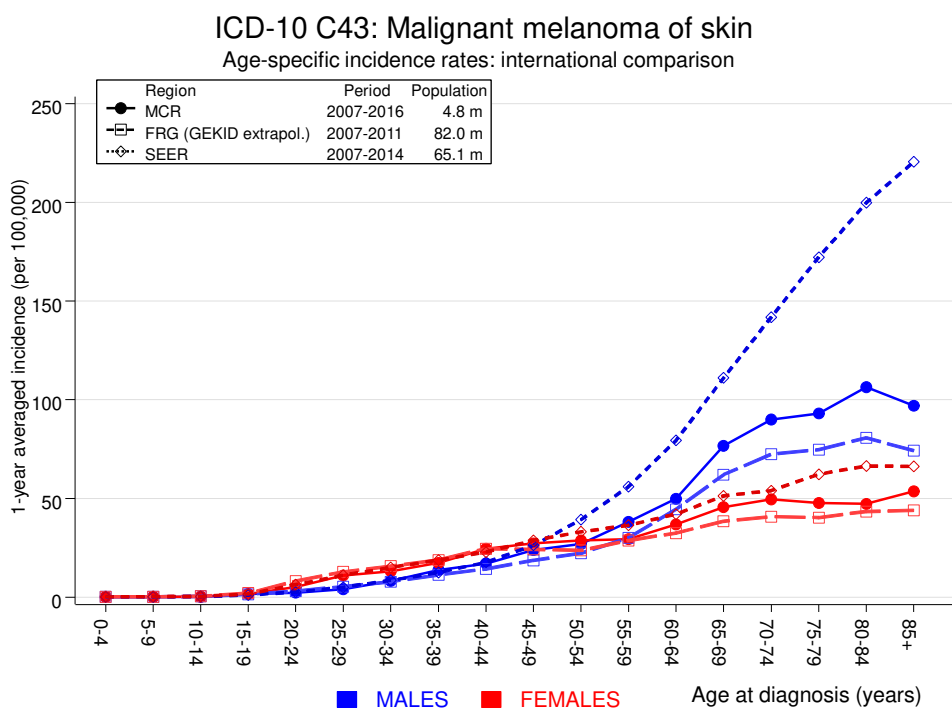


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. <http://www.gekid.de>. Last access: 02/11/2015
 Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. <http://www.seer.cancer.gov>.

Table 7a

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

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	3	0.5	5.7	1.2	16.6 #	0.8	
C03–C06 Oral cavity	8	4.0	2.0	0.9	4.0	1.2	12.5
C07–C08 Salivary gland	2	1.1	1.8	0.2	6.6	0.3	
C09–C10 Oropharynx	4	4.9	0.8	0.2	2.1	-0.3	
C12–C13 Hypopharynx	3	2.7	1.1	0.2	3.3	0.1	33.3
C15 Oesophagus	15	8.7	1.7	1.0	2.8	1.9	
C16 Stomach	28	18.8	1.5	1.0	2.2	2.9	7.1
C17 Small intestine	8	2.6	3.1	1.3	6.1 #	1.7	
C18 Colon	86	44.9	1.9	1.5	2.4 #	12.8	3.5
C19–C20 Rectum	41	25.0	1.6	1.2	2.2 #	5.0	
C21 Anus/canal	2	1.0	1.9	0.2	6.9	0.3	
C22 Liver	26	13.2	2.0	1.3	2.9 #	4.0	19.2
C23–C24 Bile	4	4.6	0.9	0.2	2.2	-0.2	
C25 Pancreas	54	17.6	3.1	2.3	4.0 #	11.3	14.8
C32 Larynx	3	4.8	0.6	0.1	1.8	-0.6	
C33–C34 Lung	93	54.7	1.7	1.4	2.1 #	11.9	12.9
C37 Thymus	3	0.3	11.9	2.5	34.8 #	0.9	
C38,C45 Mesothelioma	10	3.2	3.2	1.5	5.8 #	2.1	
C43 Malign. melanoma	596	20.8	28.7	26.4	31.1 #	179.1	0.3
C46,C49 Soft tissue	17	2.7	6.3	3.7	10.1 #	4.5	
C50 Breast	4	1.2	3.4	0.9	8.6	0.9	
C61 Prostate	281	133.0	2.1	1.9	2.4 #	46.1	5.3
C62 Testis	3	2.0	1.5	0.3	4.4	0.3	
C64 Kidney	47	16.3	2.9	2.1	3.8 #	9.6	
C65 Renal pelvis	4	2.0	2.0	0.5	5.1	0.6	
C66 Ureter	3	1.1	2.7	0.6	7.9	0.6	
C67 Bladder	34	21.2	1.6	1.1	2.2 #	4.0	2.9
C69 Eye carcinoma	2	0.2	12.1	1.5	43.7 #	0.6	
C69 Eye melanoma	5	0.4	11.7	3.8	27.2 #	1.4	
C70–C72 CNS cancer	15	6.2	2.4	1.4	4.0 #	2.7	20.0
C73 Thyroid	19	3.2	5.9	3.5	9.2 #	4.9	
C76–C79 CUP	18	7.9	2.3	1.3	3.6 #	3.1	
C81 Hodgkin lymphoma	2	1.2	1.7	0.2	6.1	0.3	
C82–C85 NHL	67	19.3	3.5	2.7	4.4 #	14.9	11.9
C90 Mult. myeloma	14	6.1	2.3	1.3	3.8 #	2.5	28.6
C91–C96 Leukaemia	18	7.8	2.3	1.4	3.6 #	3.2	44.4
Others, specified	7	4.4	1.6	0.6	3.2	0.8	14.3
Not observed	0	1.6	0.0	0.0	2.4	-0.5	
All further malignancies	1549	471.1	3.3	3.1	3.5 #	335.6	4.8

Patients 8666
 Median age at next malignancy (years) 71.6
 Person-years 32121
 Mean observation time (years) 3.7
 Median observation time (years) 2.2

The occurrence of further malignancy listed is statistically significant.

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

Table 7b

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

FEMALES

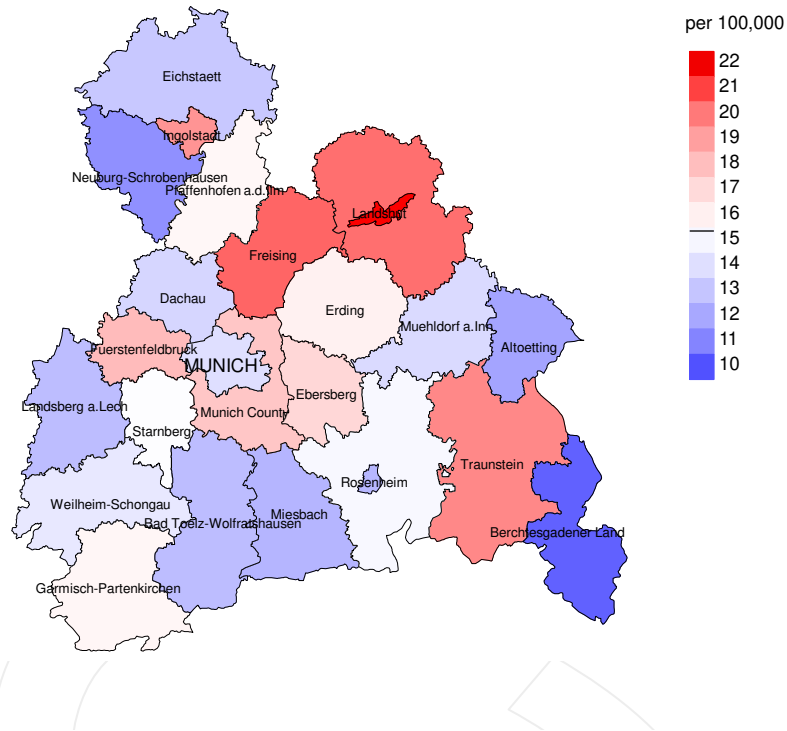
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	3	1.7	1.8	0.4	5.2	0.4	
C09–C10 Oropharynx	3	1.2	2.5	0.5	7.3	0.6	
C15 Oesophagus	4	1.7	2.3	0.6	5.9	0.7	
C16 Stomach	17	9.6	1.8	1.0	2.8 #	2.4	17.6
C17 Small intestine	5	1.4	3.6	1.2	8.3 #	1.2	
C18 Colon	63	26.7	2.4	1.8	3.0 #	11.8	4.8
C19–C20 Rectum	18	11.3	1.6	0.9	2.5	2.2	5.6
C21 Anus/canal	5	1.5	3.3	1.1	7.6 #	1.1	20.0
C22 Liver	6	3.3	1.8	0.7	4.0	0.9	16.7
C23–C24 Bile	6	3.8	1.6	0.6	3.4	0.7	16.7
C25 Pancreas	33	12.4	2.7	1.8	3.7 #	6.7	24.2
C30–C31 Sinuses	4	0.4	10.3	2.8	26.3 #	1.2	
C33–C34 Lung	49	20.4	2.4	1.8	3.2 #	9.3	16.3
C38,C45 Mesothelioma	3	0.5	6.0	1.2	17.5 #	0.8	33.3
C43 Malign. melanoma	265	11.5	23.0	20.3	25.9 #	82.2	0.4
C46,C49 Soft tissue	9	1.7	5.4	2.5	10.3 #	2.4	11.1
C50 Breast	253	88.5	2.9	2.5	3.2 #	53.3	3.2
C51 Vulva	5	2.8	1.8	0.6	4.1	0.7	
C53 Cervix uteri	10	4.6	2.2	1.1	4.0 #	1.8	20.0
C54 Corpus uteri	27	15.1	1.8	1.2	2.6 #	3.9	7.4
C55,C57 Fem. genitals un	3	0.7	4.5	0.9	13.2	0.8	
C56 Ovary	20	11.3	1.8	1.1	2.7 #	2.8	
C64 Kidney	19	6.6	2.9	1.7	4.5 #	4.0	15.8
C66 Ureter	2	0.4	4.9	0.6	17.6	0.5	
C67 Bladder	10	5.2	1.9	0.9	3.5	1.5	
C69 Eye melanoma	3	0.3	10.0	2.1	29.1 #	0.9	
C70–C72 CNS cancer	16	3.9	4.1	2.4	6.7 #	3.9	25.0
C73 Thyroid	28	5.8	4.8	3.2	7.0 #	7.2	3.6
C74–C80 Cancer others	2	1.1	1.9	0.2	6.8	0.3	50.0
C76–C79 CUP	14	5.1	2.8	1.5	4.6 #	2.9	
C81 Hodgkin lymphoma	2	0.6	3.1	0.4	11.3	0.4	
C82–C85 NHL	28	10.8	2.6	1.7	3.8 #	5.6	10.7
C90 Mult. myeloma	7	3.3	2.1	0.8	4.3	1.2	28.6
C91–C96 Leukaemia	13	4.5	2.9	1.5	4.9 #	2.7	30.8
Others, specified	3	1.3	2.3	0.5	6.9	0.6	33.3
Not observed	0	4.2	0.0	0.0	0.9 #	-1.4	
All further malignancies	958	285.3	3.4	3.1	3.6 #	218.2	6.3

Patients	7974
Median age at next malignancy (years)	69.6
Person-years	30833
Mean observation time (years)	3.9
Median observation time (years)	2.3

The occurrence of further malignancy listed is statistically significant.

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

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



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

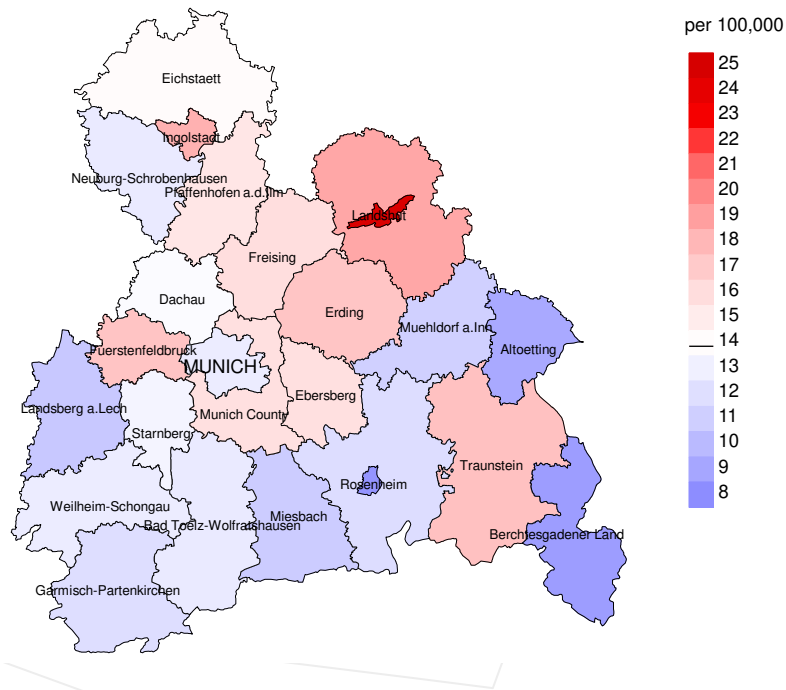
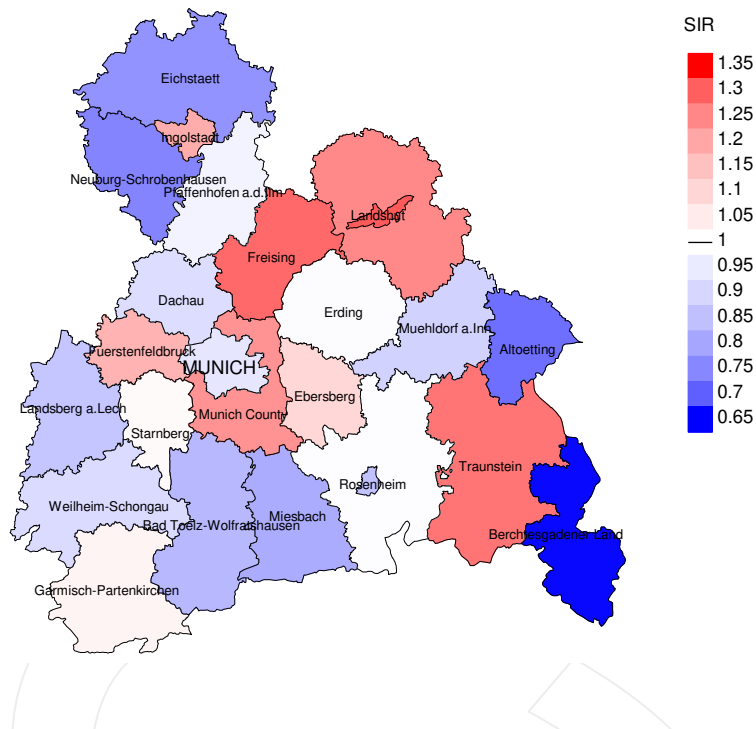


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 15.4/100,000 WS N=6,315, females 13.9/100,000 WS N=5,558).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 174 women were identified with newly diagnosed malignant melanoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 15.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 12.5 and 19.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

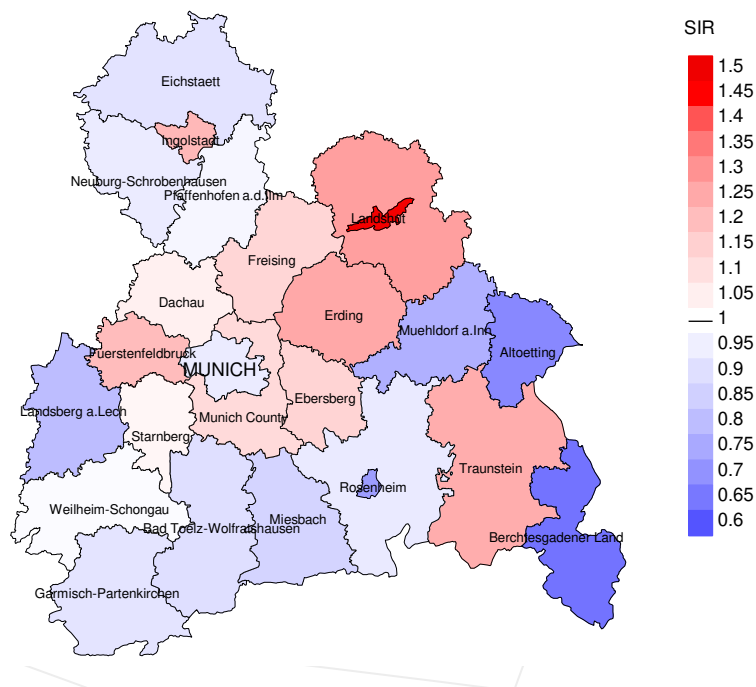


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=6,315, females N=5,558).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 174 women were identified with newly diagnosed malignant melanoma. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.13. Though, the value of this parameter may vary with an underlying probability of 99% between 0.92 and 1.37, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	480	95.0	2.7	204	42.5	91.2
1999	463	95.7	2.2	178	38.4	94.9
2000	521	93.9	2.5	205	39.3	91.2
2001	521	95.8	1.5	205	39.3	97.6
2002	884	95.2	1.7	313	35.4	95.2
2003	807	92.7	2.1	276	34.2	97.5
2004	907	93.6	2.5	337	37.2	96.7
2005	904	91.9	1.3	292	32.3	96.6
2006	930	85.4	1.6	306	32.9	96.7
2007	1063	61.0	1.6	309	29.1	97.1
2008	1210	56.0	1.7	348	28.8	97.1
2009	1194	54.1	1.8	323	27.1	98.5
2010	1392	50.8	1.4	339	24.4	96.8
2011	1551	47.0	1.3	308	19.9	93.8
2012	1416	47.5	1.6	257	18.1	96.5
2013	1460	45.3	1.3	216	14.8	94.4
2014	1164	46.8	1.5	164	14.1	96.3
2015	986	95.9	2.4	114	11.6	92.1
2016	705	89.4	2.3	44	6.2	72.7
1998-2016	18558	69.0	1.8	4738	25.5	95.7

Table 9b

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

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

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	480	127	89.8	13	2.7
1999	463	118	90.7	14	3.0
2000	521	183	90.2	23	4.4
2001	521	168	91.1	18	3.5
2002	884	239	95.4	29	3.3
2003	807	259	90.7	31	3.8
2004	907	281	96.8	52	5.7
2005	904	318	95.6	31	3.4
2006	930	298	95.3	34	3.7
2007	1063	373	98.1	36	3.4
2008	1210	402	98.3	52	4.3
2009	1194	411	97.6	47	3.9
2010	1392	376	97.9	50	3.6
2011	1551	439	98.4	62	4.0
2012	1416	473	96.0	59	4.2
2013	1460	519	97.9	52	3.6
2014	1164	518	97.9	51	4.4
2015	986	537	98.0	57	5.8
2016	705	489	97.5	34	4.8
1998-2016	18558	6528	96.4	745	4.0

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates
(incl. DCO)

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

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	127	59.1	40.9	67.5
1999	118	63.6	36.4	77.6
2000	183	66.7	33.3	75.2
2001	168	61.9	38.1	69.3
2002	239	63.6	36.4	68.9
2003	259	61.4	38.6	72.3
2004	281	67.3	32.7	70.2
2005	318	62.9	37.1	67.8
2006	298	59.7	40.3	65.8
2007	373	63.8	36.2	68.3
2008	402	57.7	42.3	64.1
2009	411	65.2	34.8	68.8
2010	376	65.7	34.3	71.5
2011	439	57.4	42.6	63.7
2012	473	60.7	39.3	64.3
2013	519	60.3	39.7	66.5
2014	518	63.9	36.1	67.5
2015	537	53.1	46.9	60.3
2016	489	47.0	53.0	53.0
1998-2016	6528	60.3	39.7	66.1

Table 10a

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	75	73.9	69.1	79.5	70.2
1999	67	74.9	69.8	85.2	71.1
2000	94	74.2	68.1	82.0	70.2
2001	85	73.1	65.1	79.4	66.2
2002	131	72.8	68.6	81.3	68.6
2003	134	73.3	70.1	79.3	71.7
2004	148	74.3	71.5	80.9	72.6
2005	176	74.8	70.9	82.1	71.0
2006	157	74.4	71.2	81.5	71.6
2007	207	75.4	70.3	81.1	70.5
2008	209	78.0	74.4	82.7	74.3
2009	236	74.6	71.0	82.7	71.2
2010	201	76.2	72.7	81.6	73.7
2011	239	78.6	74.5	84.3	75.8
2012	280	75.9	73.3	82.0	73.8
2013	284	76.9	74.4	81.3	74.4
2014	301	78.2	74.7	84.2	74.8
2015	305	79.6	76.5	82.7	77.4
2016	273	80.6	76.5	83.2	77.8
1998–2016	3602	76.7	73.0	82.3	73.9

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	52	79.5	72.9	86.4	74.7
1999	51	78.3	75.6	79.2	78.0
2000	89	78.1	75.0	84.6	75.6
2001	83	83.4	78.2	87.7	79.6
2002	108	82.0	68.4	85.4	70.9
2003	125	80.7	70.2	88.0	73.4
2004	133	81.6	74.3	84.8	74.3
2005	142	82.2	77.5	87.2	77.0
2006	141	81.8	76.5	88.0	76.5
2007	166	77.9	71.3	86.9	71.5
2008	193	82.6	74.0	86.9	77.9
2009	175	82.2	75.9	87.7	77.4
2010	175	81.1	74.7	86.1	74.9
2011	200	82.2	73.4	86.8	75.8
2012	193	83.3	73.2	88.5	74.2
2013	235	83.7	78.3	87.6	78.4
2014	217	83.5	76.5	87.5	76.1
2015	232	83.3	76.4	89.3	77.0
2016	216	83.1	77.6	86.2	79.3
1998-2016	2926	81.9	75.1	87.1	76.4

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 11a

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

MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	48	4.3	0.20	2.7	0.18	4.0	0.21	5.3	0.24
1999	43	3.8	0.20	2.3	0.18	3.5	0.21	4.5	0.23
2000	63	5.5	0.23	3.3	0.21	5.0	0.24	6.4	0.26
2001	60	5.2	0.23	3.1	0.21	4.5	0.23	5.9	0.26
2002	96	5.2	0.21	2.9	0.19	4.4	0.21	5.8	0.24
2003	91	4.9	0.23	2.8	0.21	4.2	0.24	5.2	0.25
2004	110	5.8	0.25	3.1	0.21	4.7	0.24	6.3	0.27
2005	125	6.6	0.27	3.4	0.23	5.2	0.25	6.9	0.29
2006	99	5.2	0.21	2.6	0.18	4.0	0.20	5.3	0.23
2007	132	6.0	0.25	3.1	0.22	4.7	0.24	6.2	0.27
2008	133	6.0	0.21	2.8	0.17	4.4	0.20	6.3	0.24
2009	164	7.3	0.26	3.8	0.24	5.5	0.26	7.1	0.27
2010	138	6.1	0.19	2.9	0.16	4.4	0.18	6.0	0.20
2011	149	6.7	0.19	3.0	0.15	4.6	0.17	6.4	0.20
2012	177	7.8	0.24	3.5	0.20	5.4	0.22	7.2	0.24
2013	186	8.1	0.23	3.5	0.18	5.4	0.20	7.4	0.23
2014	193	8.3	0.31	3.6	0.25	5.5	0.28	7.5	0.31
2015	162	6.8	0.30	2.8	0.24	4.5	0.27	6.1	0.30
2016	130	5.4	0.35	2.2	0.27	3.5	0.31	4.8	0.34
1998-2016	2299	6.2	0.24	3.1	0.20	4.7	0.22	6.3	0.25

Table 11b

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

FEMALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	27	2.3	0.12	1.0	0.09	1.5	0.10	1.8	0.10
1999	32	2.7	0.13	1.1	0.08	1.7	0.10	2.3	0.12
2000	59	4.9	0.25	2.2	0.17	3.2	0.20	4.2	0.23
2001	45	3.7	0.18	1.5	0.11	2.2	0.13	2.9	0.15
2002	56	2.9	0.14	1.4	0.10	1.9	0.11	2.3	0.12
2003	68	3.5	0.17	1.6	0.12	2.3	0.14	2.8	0.15
2004	79	4.0	0.18	1.7	0.12	2.5	0.14	3.1	0.15
2005	76	3.8	0.18	1.4	0.11	2.2	0.13	3.0	0.15
2006	80	4.0	0.18	1.5	0.11	2.3	0.13	3.1	0.16
2007	106	4.6	0.20	2.0	0.15	2.9	0.17	3.8	0.19
2008	99	4.3	0.18	1.7	0.12	2.6	0.14	3.3	0.16
2009	107	4.6	0.20	1.8	0.13	2.6	0.15	3.5	0.17
2010	109	4.7	0.17	1.8	0.10	2.6	0.12	3.4	0.14
2011	104	4.4	0.14	1.8	0.09	2.7	0.11	3.4	0.12
2012	111	4.7	0.17	1.9	0.12	2.8	0.13	3.4	0.14
2013	127	5.3	0.20	1.9	0.12	2.9	0.14	3.8	0.17
2014	138	5.7	0.27	2.1	0.17	3.1	0.19	4.0	0.22
2015	124	5.1	0.28	1.9	0.18	2.8	0.21	3.6	0.23
2016	101	4.1	0.32	1.5	0.21	2.2	0.23	2.9	0.26
1998-2016	1648	4.3	0.19	1.7	0.12	2.5	0.14	3.3	0.16

Table 12

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19	2	0.1	0.1	2	0.1	0.1			0.0
20-24	5	0.2	0.3	2	0.1	0.3	3	0.3	0.3
25-29	6	0.2	0.5	5	0.3	0.6	1	0.1	0.4
30-34	14	0.5	1.0	8	0.5	1.1	6	0.5	0.9
35-39	25	0.9	1.9	16	1.0	2.1	9	0.8	1.7
40-44	51	1.9	3.8	25	1.6	3.7	26	2.3	4.0
45-49	91	3.4	7.2	50	3.2	6.9	41	3.6	7.6
50-54	110	4.1	11.3	58	3.7	10.6	52	4.6	12.3
55-59	139	5.2	16.5	82	5.2	15.9	57	5.1	17.3
60-64	209	7.8	24.2	120	7.7	23.5	89	7.9	25.2
65-69	314	11.7	35.9	188	12.0	35.5	126	11.2	36.4
70-74	434	16.1	52.0	294	18.8	54.3	140	12.4	48.8
75-79	412	15.3	67.4	259	16.6	70.9	153	13.6	62.4
80-84	403	15.0	82.3	251	16.0	87.0	152	13.5	75.9
85+	475	17.7	100.0	204	13.0	100.0	271	24.1	100.0
All ages	2690	100.0		1564	100.0		1126	100.0	

Table 13

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

Age at death Years	Males n	Females n	Males Age- spec. mortal.	Males MI-index	Females Age- spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	2		0.2	0.10			4.5	
20-24	2	3	0.1	0.06	0.2	0.04	3.5	9.1
25-29	5	1	0.3	0.08	0.1	0.01	6.8	1.4
30-34	8	6	0.5	0.06	0.4	0.03	7.7	5.0
35-39	16	9	1.0	0.07	0.6	0.03	8.0	3.2
40-44	25	26	1.3	0.08	1.5	0.06	5.1	3.9
45-49	50	41	2.5	0.11	2.1	0.08	4.4	3.1
50-54	58	52	3.4	0.12	3.0	0.11	2.8	2.6
55-59	82	57	5.8	0.15	3.9	0.13	2.4	2.0
60-64	120	89	9.8	0.20	6.7	0.18	2.4	2.4
65-69	188	126	15.9	0.21	9.7	0.21	2.6	2.4
70-74	294	140	26.6	0.30	11.1	0.22	3.2	2.1
75-79	259	153	32.5	0.35	15.3	0.32	2.9	2.2
80-84	251	152	54.6	0.51	21.5	0.46	3.3	2.2
85+	204	271	66.6	0.69	36.9	0.69	3.1	2.9
All ages	1564	1126					3.0	2.4
Mortality								
Raw			6.8	0.25	4.8	0.20		
WS			3.1	0.20	1.8	0.13		
ES			4.8	0.22	2.7	0.15		
BRD-S			6.5	0.25	3.5	0.17		
PYLL-70								
per 100,000			32.0		24.8			
ES			27.8		21.0			
AYLL-70			11.6		12.1			

Table 14a

Further malignancies in deaths in period 1998–2016
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	11	0.7	4	36.4	1	9.1	6	54.5
C15 Oesophagus	12	0.7					12	100.0
C16 Stomach	38	2.4	9	23.7	1	2.6	28	73.7
C18 Colon	102	6.3	40	39.2	2	2.0	60	58.8
C19–C20 Rectum	67	4.1	22	32.8			45	67.2
C22 Liver	30	1.9	3	10.0	2	6.7	25	83.3
C25 Pancreas	64	4.0	2	3.1	3	4.7	59	92.2
C33–C34 Lung	140	8.7	10	7.1	10	7.1	120	85.7
C38,C45 Mesothelioma	15	0.9	2	13.3			13	86.7
C43 Malign. melanoma	183	11.3			46	25.1	137	74.9
C44 Skin others	278	17.2	66	23.7	72	25.9	140	50.4
C46,C49 Soft tissue	20	1.2	6	30.0	1	5.0	13	65.0
C61 Prostate	295	18.3	134	45.4	9	3.1	152	51.5
C64 Kidney	48	3.0	19	39.6	4	8.3	25	52.1
C67 Bladder	58	3.6	18	31.0	2	3.4	38	65.5
C70–C72 CNS cancer	27	1.7	4	14.8	1	3.7	22	81.5
C76–C79 CUP	24	1.5	2	8.3	1	4.2	21	87.5
C82–C85 NHL	76	4.7	32	42.1	4	5.3	40	52.6
C90 Mult. myeloma	20	1.2	5	25.0	1	5.0	14	70.0
C91–C96 Leukaemia	21	1.3	3	14.3	1	4.8	17	81.0
Others, specified	86	5.3	32	37.2	5	5.8	49	57.0
All further malignancies	1615	100.0	413	25.6	166	10.3	1036	64.1

Further malignancies with number of cases 1 to 10 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 1998–2016
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C16 Stomach	28	2.8	5	17.9			23	82.1
C18 Colon	56	5.6	14	25.0	3	5.4	39	69.6
C19–C20 Rectum	23	2.3	10	43.5	1	4.3	12	52.2
C23–C24 Bile	15	1.5	2	13.3			13	86.7
C25 Pancreas	56	5.6	1	1.8	2	3.6	53	94.6
C33–C34 Lung	71	7.1	5	7.0			66	93.0
C43 Malign. melanoma	105	10.4			14	13.3	91	86.7
C44 Skin others	93	9.2	24	25.8	21	22.6	48	51.6
C46,C49 Soft tissue	12	1.2	3	25.0	2	16.7	7	58.3
C50 Breast	237	23.6	110	46.4	11	4.6	116	48.9
C53 Cervix uteri	22	2.2	12	54.5	1	4.5	9	40.9
C54 Corpus uteri	32	3.2	14	43.8			18	56.3
C56 Ovary	40	4.0	12	30.0	1	2.5	27	67.5
C64 Kidney	22	2.2	7	31.8	4	18.2	11	50.0
C67 Bladder	11	1.1	1	9.1			10	90.9
C70–C72 CNS cancer	20	2.0	3	15.0			17	85.0
C73 Thyroid	14	1.4	5	35.7			9	64.3
C76–C79 CUP	17	1.7	2	11.8	2	11.8	13	76.5
C82–C85 NHL	42	4.2	19	45.2	1	2.4	22	52.4
C90 Mult. myeloma	13	1.3	5	38.5			8	61.5
C91–C96 Leukaemia	14	1.4					14	100.0
Others, specified	63	6.3	21	33.3	4	6.3	38	60.3
All further malignancies	1006	100.0	275	27.3	67	6.7	664	66.0

Further malignancies with number of cases 1 to 10 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 2007-2016
(First primaries only *)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1		0.1	0.05			2.4	
20-24	2	3	0.1	0.06	0.2	0.04	3.9	9.7
25-29	4	1	0.3	0.06	0.1	0.01	6.0	1.5
30-34	8	6	0.5	0.06	0.4	0.03	7.8	5.7
35-39	16	8	1.0	0.08	0.5	0.03	8.5	3.1
40-44	24	23	1.3	0.08	1.3	0.06	5.3	3.9
45-49	46	32	2.3	0.11	1.7	0.07	4.4	2.8
50-54	52	39	3.0	0.13	2.3	0.09	2.9	2.3
55-59	74	50	5.2	0.16	3.4	0.13	2.5	2.1
60-64	93	73	7.6	0.20	5.5	0.19	2.2	2.4
65-69	140	90	11.8	0.22	6.9	0.21	2.4	2.1
70-74	200	105	18.1	0.33	8.3	0.24	2.8	2.0
75-79	157	105	19.7	0.41	10.5	0.33	2.4	1.9
80-84	163	110	35.4	0.60	15.5	0.47	3.0	2.1
85+	116	198	37.9	0.85	27.0	0.72	2.4	2.7
All ages	1096	843					2.7	2.3
Mortality								
Raw			4.8	0.24	3.6	0.19		
WS			2.3	0.19	1.4	0.12		
ES			3.4	0.22	2.1	0.14		
BRD-S			4.5	0.25	2.6	0.16		
PYLL-70								
per 100,000			28.3		20.5			
ES			24.6		17.5			
AYLL-70			12.4		12.6			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1		0.1	0.05			2.4	
20-24	2	3	0.1	0.06	0.2	0.05	3.9	9.7
25-29	4	1	0.3	0.07	0.1	0.01	6.0	1.5
30-34	8	5	0.5	0.07	0.3	0.03	7.8	4.8
35-39	16	8	1.0	0.08	0.5	0.03	8.5	3.2
40-44	21	19	1.1	0.07	1.1	0.05	4.6	3.2
45-49	42	27	2.1	0.11	1.4	0.06	4.1	2.4
50-54	45	35	2.6	0.12	2.0	0.09	2.5	2.1
55-59	59	37	4.2	0.15	2.5	0.11	2.0	1.6
60-64	63	52	5.1	0.15	3.9	0.15	1.5	1.7
65-69	95	56	8.0	0.18	4.3	0.15	1.7	1.4
70-74	128	58	11.6	0.26	4.6	0.16	1.8	1.1
75-79	86	67	10.8	0.27	6.7	0.24	1.4	1.3
80-84	84	63	18.3	0.37	8.9	0.32	1.6	1.2
85+	62	118	20.2	0.52	16.1	0.49	1.4	1.7
All ages	716	549					1.8	1.5
Mortality								
Raw			3.1	0.18	2.3	0.14		
WS			1.6	0.15	1.0	0.09		
ES			2.3	0.17	1.4	0.11		
BRD-S			2.9	0.18	1.8	0.12		
PYLL-70								
per 100,000			24.3		16.9			
ES			21.1		14.5			
AYLL-70			13.8		13.9			

* See corresponding tables with multiple malignancies.

ICD-10 C43: Malignant melanoma of skin

Age distribution and age-specific mortality 2007 - 2016 (Males: 1564, Females: 1126)

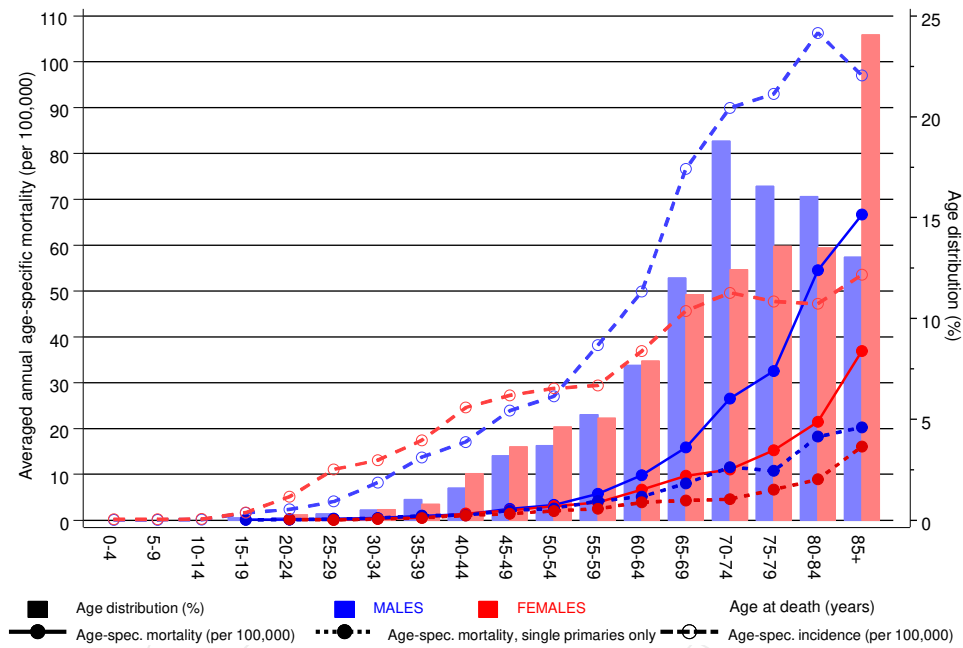
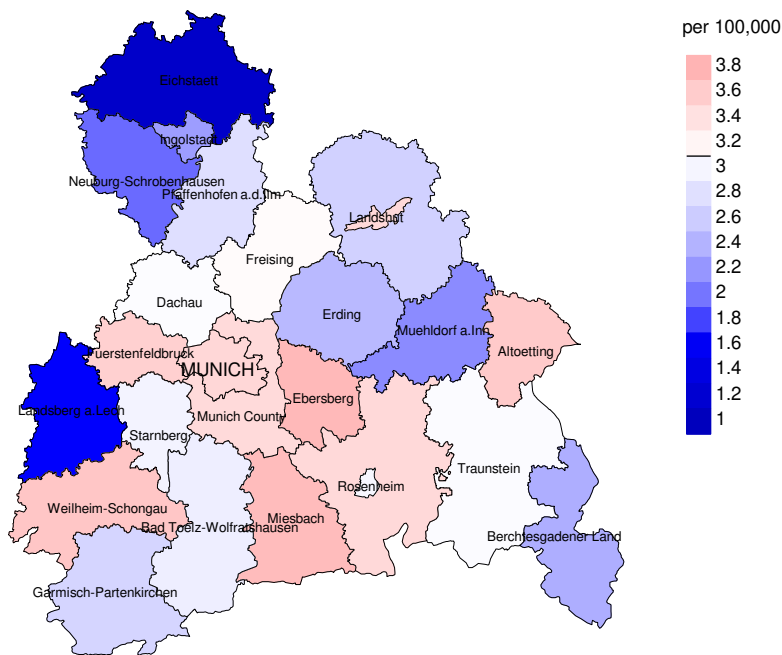


Figure 17. Distribution of age at death (bars; males: mean=66.4 yrs, median=68.5 yrs; females: mean=65.9 yrs, median=67.6 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

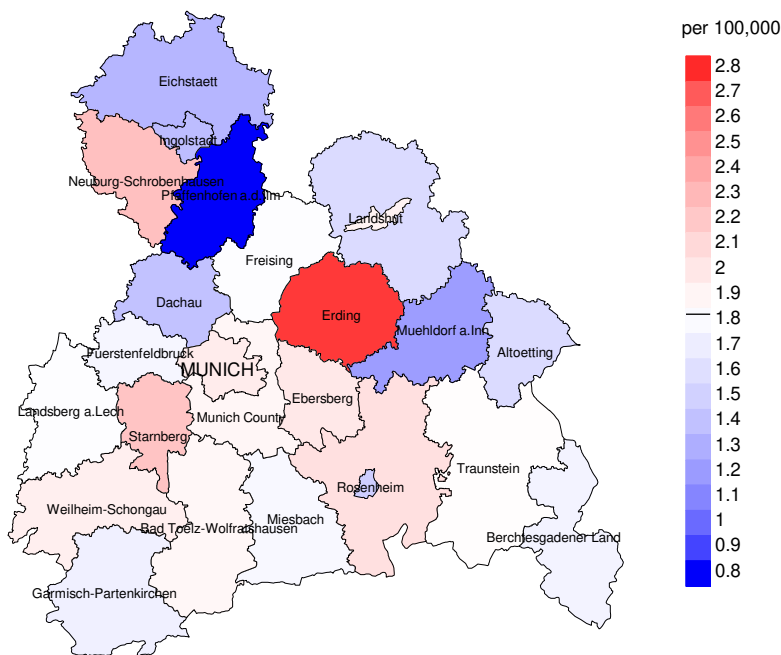
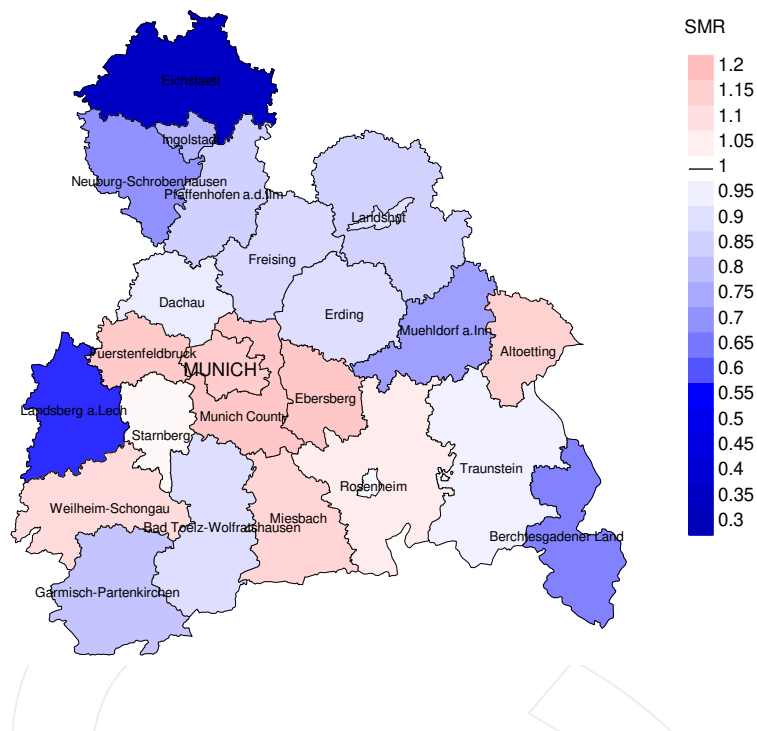


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.1/100,000 WS N=1,564, females 1.8/100,000 WS N=1,126).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 31 women died from malignant melanoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 3.5/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

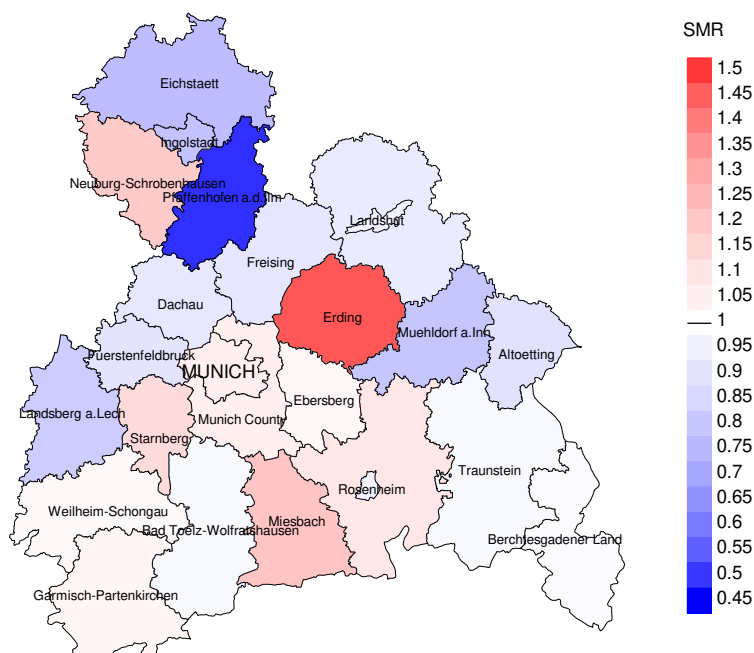


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,564, females N=1,126).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 31 women died from malignant melanoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.03. Though, the value of this parameter may vary with an underlying probability of 99% between 0.62 and 1.61, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. All multiple primaries included

The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. First singular primary (no information about other prior or synchronous malignancy)

The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. Single primary (no information about other prior, syn- or metachronous malignancy)

The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head/neck and lung).

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

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

Recommended Citation

Munich Cancer Registry. ICD-10 C43: Malignant melanoma - Incidence and Mortality [Internet]. 2018 [updated 2018 Aug 21; cited 2018 Oct 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/base/bC43__E-ICD-10-C43-Malignant-melanoma-incidence-and-mortality.pdf

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