

Munich Cancer Registry



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- ▶ *Deutsch*

ICD-10 C43: Malignant melanoma

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	20,388
Diseases	21,410
Creation date	01/25/2021
Database export	01/07/2021
Population	4.92 m





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

https://www.tumorregister-muenchen.de/en/facts/base/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, January 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
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	483	13	2.7	12.0	17.1	45.5	95.2
1999	466	10	2.1	13.2	16.9	41.2	95.7
2000	521	13	2.5	12.9	16.7	43.2	95.2
2001	520	10	1.9	13.4	16.5	43.3	96.3
2002	885	16	1.8	13.4	16.2	41.9	96.5 #
2003	815	18	2.2	13.3	15.8	39.8	94.4
2004	907	27	3.0	13.4	15.5	42.2	95.5
2005	908	12	1.3	14.0	15.2	38.3	93.5
2006	932	16	1.7	14.3	14.8	38.6	89.2
2007	1070	21	2.0	14.8	14.4	33.5	82.6 #
2008	1219	25	2.1	15.4	13.9	33.4	97.0
2009	1198	23	1.9	16.1	13.2	31.2	97.0
2010	1404	21	1.5	16.7	12.7	30.1	97.6
2011	1565	20	1.3	17.3	12.0	26.9	96.7
2012	1445	26	1.8	17.8	11.1	24.6	96.8
2013	1487	19	1.3	18.4	10.0	21.5	96.8
2014	1220	20	1.6	18.6	9.1	23.7	96.2
2015	1247	24	1.9	18.8	8.0	20.8	90.4
2016	937	23	2.5	19.0	7.0	19.5	98.1
2017	883	17	1.9	19.1	5.9	12.2	97.4
2018	670	4	0.6	19.3	6.0	8.7	98.7
2019	628	2	0.3	19.5	3.3	7.5	50.8 ##
1998-2019	21410	380	1.8	19.5	17.1	29.2	93.8

21,410 cases diagnosed 1998-2019 are related to a total of 20,388 patients. Currently, in 6,598 (32.4 %) of these 20,388 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 4,511 / 1,301 / 786 (22.1 % / 6.4 % / 3.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 883 cases has been diagnosed, of which 19.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	245	50.7	7	2.9	11.4	19.0	48.6	94.7
1999	218	46.8	2	0.9	13.4	18.8	42.7	95.9
2000	280	53.7	4	1.4	13.3	18.5	50.4	96.1
2001	266	51.2	6	2.3	14.7	18.2	49.2	97.4
2002	469	53.0	4	0.9	14.5	17.9	49.9	98.3 #
2003	401	49.2	8	2.0	14.6	17.3	46.1	96.0
2004	455	50.2	17	3.7	14.9	17.1	49.9	95.8
2005	476	52.4	6	1.3	16.0	16.7	43.7	95.4
2006	476	51.1	5	1.1	16.3	16.3	43.3	91.4
2007	543	50.7	12	2.2	17.1	15.6	40.1	85.6 #
2008	652	53.5	12	1.8	17.6	15.1	36.3	97.9
2009	654	54.6	8	1.2	18.6	14.1	33.5	96.8
2010	733	52.2	8	1.1	19.4	13.4	33.4	97.4
2011	803	51.3	8	1.0	20.1	12.7	30.9	97.4
2012	758	52.5	15	2.0	20.8	11.5	28.8	97.2
2013	837	56.3	13	1.6	21.5	10.5	24.7	96.8
2014	669	54.8	10	1.5	21.7	9.3	26.2	96.3
2015	686	55.0	13	1.9	21.9	8.0	24.6	91.1
2016	515	55.0	11	2.1	22.1	7.5	22.7	98.8
2017	485	54.9	6	1.2	22.2	6.0	13.4	98.1
2018	337	50.3	1	0.3	22.3	6.3	8.6	99.1
2019	352	56.1	1	0.3	22.4	4.1	9.1	50.9 ##
1998-2019	11310	52.8	177	1.6	22.4	19.0	32.9	94.5

11,310 cases diagnosed 1998-2019 are related to a total of 10,626 patients. Currently, in 3,819 (35.9 %) of these 10,626 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,495 / 777 / 547 (23.5 % / 7.3 % / 5.1 %) 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 retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 485 cases has been diagnosed, of which 22.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.0 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	49.3	6	2.5	12.6	15.2	42.4	95.8
1999	248	53.2	8	3.2	13.0	14.9	39.9	95.6
2000	241	46.3	9	3.7	12.5	14.7	34.9	94.2
2001	254	48.8	4	1.6	12.0	14.6	37.0	95.3
2002	416	47.0	12	2.9	12.2	14.3	32.9	94.5 #
2003	414	50.8	10	2.4	12.0	14.1	33.6	92.8
2004	452	49.8	10	2.2	11.8	13.8	34.5	95.1
2005	432	47.6	6	1.4	11.9	13.5	32.4	91.4
2006	456	48.9	11	2.4	12.3	13.2	33.8	86.8
2007	527	49.3	9	1.7	12.5	12.9	26.6	79.5 #
2008	567	46.5	13	2.3	13.0	12.5	30.0	95.9
2009	544	45.4	15	2.8	13.4	12.2	28.5	97.2
2010	671	47.8	13	1.9	13.9	11.9	26.4	97.9
2011	762	48.7	12	1.6	14.4	11.3	22.7	95.9
2012	687	47.5	11	1.6	14.6	10.6	19.9	96.4
2013	650	43.7	6	0.9	15.0	9.5	17.2	96.8
2014	551	45.2	10	1.8	15.2	8.9	20.7	96.2
2015	561	45.0	11	2.0	15.5	7.9	16.0	89.5
2016	422	45.0	12	2.8	15.7	6.5	15.6	97.2
2017	398	45.1	11	2.8	15.7	5.7	10.8	96.5
2018	333	49.7	3	0.9	16.0	5.8	8.7	98.2
2019	276	43.9	1	0.4	16.3	2.3	5.4	50.7 ##
1998-2019	10100	47.2	203	2.0	16.3	15.2	25.0	93.0

10,100 cases diagnosed 1998-2019 are related to a total of 9,762 patients. Currently, in 2,779 (28.5 %) of these 9,762 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,016 / 524 / 239 (20.7 % / 5.4 % / 2.4 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 398 cases has been diagnosed, of which 15.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.7 % 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 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 4.92 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	245	238	22.1	20.2	15.2	12.2	19.9	16.0	23.1	18.2
1999	218	248	19.5	20.9	13.3	13.5	17.3	17.0	20.1	19.3
2000	280	241	24.6	20.1	16.0	13.2	21.5	16.5	25.0	18.7
2001	266	254	23.0	20.9	14.7	13.3	19.9	17.0	23.2	19.0
2002	469	416	25.2	21.2	15.9	13.7	21.6	17.1	24.9	19.1
2003	401	414	21.4	21.0	13.4	13.5	18.0	17.0	21.3	18.6
2004	455	452	24.2	22.9	14.9	14.2	20.1	18.1	24.4	20.5
2005	476	432	25.1	21.7	15.4	13.5	21.0	17.4	24.6	19.5
2006	476	456	24.9	22.7	14.8	13.5	20.3	17.5	24.4	19.9
2007	543	527	24.5	22.8	14.4	13.9	20.0	17.9	24.1	20.1
2008	652	567	29.3	24.4	17.2	14.3	23.5	18.6	27.4	21.0
2009	654	544	29.3	23.4	16.3	13.7	22.7	17.8	27.5	20.3
2010	733	671	32.5	28.7	18.5	17.3	25.4	22.2	30.7	25.0
2011	803	762	35.9	32.6	20.4	20.0	28.0	25.2	33.5	28.4
2012	758	687	33.4	29.1	18.1	17.2	25.3	22.2	30.6	25.3
2013	837	650	36.4	27.3	19.8	16.1	27.6	20.8	33.4	23.5
2014	669	551	28.7	22.9	15.2	13.2	21.4	17.0	26.0	19.4
2015	686	561	28.8	23.1	15.1	13.0	21.3	17.3	26.4	19.6
2016	515	422	21.4	17.2	11.1	9.6	15.7	12.7	19.5	14.5
2017	485	398	20.1	16.1	10.2	8.8	14.6	11.7	18.0	13.6
2018	337	333	13.8	13.4	6.7	6.8	9.7	9.3	12.3	10.9
2019	352	276	14.5	11.1	6.8	6.0	10.0	8.0	12.8	9.2
1998-2019	11310	10100	25.7	22.1	14.7	13.2	20.3	17.0	24.5	19.3

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	483	57.7	16.8	17.2	96.2	33.5	47.0	58.8	70.1	79.0
1999	466	56.5	17.4	9.1	93.5	32.2	42.4	57.8	70.0	79.1
2000	521	56.9	17.2	15.6	98.4	33.7	43.4	58.6	69.9	78.9
2001	520	57.7	16.8	21.1	94.3	33.9	44.4	59.5	69.5	79.6
2002	885	58.4	17.4	7.6	99.0	34.0	44.7	60.6	71.3	80.5
2003	815	58.4	16.7	8.1	97.6	36.1	44.9	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	908	59.8	16.1	11.4	96.6	37.2	48.6	62.0	71.0	79.9
2006	932	61.3	16.5	3.1	102	38.2	48.8	64.0	73.3	82.1
2007	1070	60.8	16.7	14.6	99.9	37.8	48.3	63.2	73.1	81.7
2008	1219	61.4	15.9	14.1	99.3	39.4	49.7	64.6	72.7	80.5
2009	1198	62.4	15.7	13.9	101	40.5	50.1	65.5	73.8	81.4
2010	1404	61.4	16.6	4.9	98.5	38.3	49.3	64.7	73.7	81.8
2011	1565	60.9	16.7	4.9	98.3	38.0	48.1	63.1	73.6	81.5
2012	1445	62.4	16.0	0.2	98.2	40.7	50.2	64.8	74.5	82.0
2013	1487	62.4	15.9	17.5	103	41.3	50.5	64.2	74.6	82.0
2014	1220	63.3	16.7	22.3	105	39.8	50.6	66.7	75.9	83.6
2015	1247	63.9	15.8	0.5	97.8	42.4	53.0	66.4	75.7	82.5
2016	937	64.4	15.6	19.2	101	43.5	52.0	66.8	76.6	82.8
2017	883	64.9	15.3	18.9	98.0	44.7	53.4	67.5	77.4	82.2
2018	670	66.4	15.4	24.0	99.4	44.9	55.1	69.2	78.8	84.2
2019	628	66.8	15.4	23.8	104	44.7	55.3	69.9	79.0	84.7
1998-2019	21410	61.6	16.5	0.2	105	38.2	49.6	63.7	74.1	81.7

Table 3a

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

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	245	56.8	16.1	17.2	93.0	32.6	47.4	58.8	68.3	76.2
1999	218	56.9	16.2	9.1	89.6	33.4	44.5	58.6	68.3	78.4
2000	280	58.4	15.2	15.6	92.3	34.7	51.1	59.9	68.9	77.0
2001	266	58.7	15.5	23.6	92.1	34.6	47.2	60.8	68.6	79.2
2002	469	60.1	15.3	7.6	98.4	37.0	50.7	63.2	70.8	77.3
2003	401	59.9	15.3	11.9	91.5	37.2	49.5	62.8	71.1	78.1
2004	455	60.7	15.7	15.6	94.1	38.1	49.9	63.3	73.4	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	543	62.1	15.4	14.6	98.8	40.2	50.6	64.3	73.6	81.3
2008	652	62.2	14.4	14.1	93.5	42.1	53.0	65.5	71.9	78.1
2009	654	63.8	14.4	15.5	96.0	42.5	53.7	67.0	74.3	80.4
2010	733	63.7	15.2	4.9	98.5	42.1	54.4	66.6	74.4	81.4
2011	803	63.1	15.0	15.4	96.9	41.1	53.5	66.4	73.9	80.5
2012	758	64.3	14.3	19.7	93.8	44.6	54.0	67.8	74.7	81.2
2013	837	64.2	15.0	17.5	103	44.1	53.3	66.9	75.4	82.3
2014	669	65.2	15.1	22.3	97.7	44.5	53.9	68.3	76.1	82.4
2015	686	65.7	15.2	0.5	95.7	44.7	55.6	69.1	76.9	82.5
2016	515	66.1	15.0	22.5	101	45.1	53.6	69.3	77.4	83.5
2017	485	66.5	14.3	18.9	96.5	46.9	55.6	69.6	77.8	82.0
2018	337	68.3	14.1	24.0	99.4	47.7	59.0	72.4	78.8	83.8
2019	352	69.7	13.2	29.4	97.0	50.4	59.9	72.1	79.2	84.8
1998-2019	11310	63.2	15.2	0.5	103	41.5	53.2	65.7	74.5	81.2

Table 3b

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

Year of diagnosis	Cases n	Std.		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	241	55.2	19.1	18.3	98.4	30.9	38.9	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	416	56.5	19.3	13.9	99.0	31.6	39.1	56.1	72.2	83.9
2003	414	57.0	17.9	8.1	97.6	35.1	41.7	58.4	69.6	81.7
2004	452	58.0	17.2	18.8	95.6	36.2	43.8	59.3	71.8	80.1
2005	432	58.4	17.2	11.4	96.1	35.3	44.8	58.6	70.7	81.5
2006	456	60.2	17.6	14.1	102	35.7	46.7	62.0	73.7	83.7
2007	527	59.5	17.9	14.9	99.9	34.9	45.6	61.4	72.2	82.9
2008	567	60.6	17.4	14.5	99.3	37.7	45.8	63.4	73.3	83.3
2009	544	60.8	17.0	13.9	101	38.3	47.0	63.1	73.5	82.7
2010	671	59.0	17.6	15.1	94.1	35.3	44.9	60.4	72.5	82.3
2011	762	58.7	18.1	4.9	98.3	33.9	45.0	58.9	73.0	82.2
2012	687	60.3	17.5	0.2	98.2	37.9	47.3	60.8	74.3	83.6
2013	650	60.0	16.8	18.4	94.2	36.4	47.6	61.3	72.9	81.1
2014	551	61.0	18.2	22.8	105	35.0	46.8	62.4	75.2	84.9
2015	561	61.6	16.3	20.7	97.8	38.5	49.8	62.4	74.2	82.1
2016	422	62.3	16.1	19.2	94.2	41.0	50.3	63.6	75.2	81.6
2017	398	62.8	16.3	21.9	98.0	40.3	50.3	64.5	76.4	82.7
2018	333	64.5	16.4	27.9	98.5	43.3	52.1	66.8	78.5	84.8
2019	276	63.2	17.2	23.8	104	40.5	50.1	63.6	77.3	84.4
1998-2019	10100	59.7	17.6	0.2	105	35.6	46.3	60.7	73.6	82.6

Table 4

Age distribution by 5-year age group and sex for period 2007–2019
(incl. DCO)

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0–4	4	0.0	0.0	2	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	0.0	0.1
15–19	42	0.3	0.4	22	0.3	0.3	20	0.3	0.4
20–24	120	0.8	1.2	40	0.5	0.8	80	1.2	1.5
25–29	278	1.9	3.0	72	0.9	1.7	206	3.0	4.5
30–34	408	2.7	5.7	147	1.8	3.6	261	3.8	8.3
35–39	580	3.9	9.6	257	3.2	6.8	323	4.6	12.9
40–44	891	6.0	15.6	372	4.6	11.4	519	7.5	20.4
45–49	1206	8.1	23.6	569	7.1	18.5	637	9.2	29.5
50–54	1231	8.2	31.8	592	7.4	25.9	639	9.2	38.7
55–59	1240	8.3	40.1	700	8.7	34.6	540	7.8	46.5
60–64	1355	9.0	49.2	749	9.3	43.9	606	8.7	55.2
65–69	1833	12.2	61.4	1096	13.7	57.6	737	10.6	65.8
70–74	2022	13.5	74.9	1258	15.7	73.3	764	11.0	76.8
75–79	1673	11.2	86.1	1029	12.8	86.1	644	9.3	86.1
80–84	1138	7.6	93.7	693	8.6	94.7	445	6.4	92.5
85+	944	6.3	100.0	423	5.3	100.0	521	7.5	100.0
All ages	14973	100.0		8024	100.0		6949	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers for period 2007-2019

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=116 %	Females DCO rate n=127 %	Males	Females
							Prop.all cancers n=143063 %	Prop.all cancers n=144724 %
0- 4	2	2	0.1	0.1			0.9	1.2
5- 9	1	2	0.1	0.1			0.9	2.2
10-14	2	3	0.1	0.2			1.5	2.6
15-19	22	20	1.4	1.3			7.4	8.1
20-24	40	79	2.1	4.5			6.8	16.7
25-29	71	204	3.4	9.8	1.4		8.1	18.4
30-34	145	256	6.8	12.1			12.1	12.9
35-39	255	319	11.9	15.2	0.8		14.9	9.7
40-44	364	516	15.6	22.8		0.4	14.0	9.0
45-49	561	626	22.3	25.7	0.2	0.2	11.7	7.1
50-54	578	629	24.7	27.2	0.3	0.2	7.4	5.4
55-59	685	536	35.2	26.8	0.4	1.3	5.8	4.3
60-64	737	597	45.2	34.0	0.5	0.7	4.5	4.1
65-69	1061	724	69.8	43.0	0.7	0.8	4.7	4.1
70-74	1223	756	87.3	47.1	1.7	1.2	4.7	4.1
75-79	982	639	88.7	46.4	1.2	2.2	4.4	3.5
80-84	671	442	102.2	45.4	4.8	4.1	4.7	3.1
85+	409	513	95.9	53.1	7.6	12.7	4.2	3.3
All ages	7809	6863			1.5	1.9	5.5	4.7
Incidence								
Raw			25.9	22.1				
WS			14.2	12.8				
ES			19.7	16.7				
BRD-S			23.9	19.0				

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).

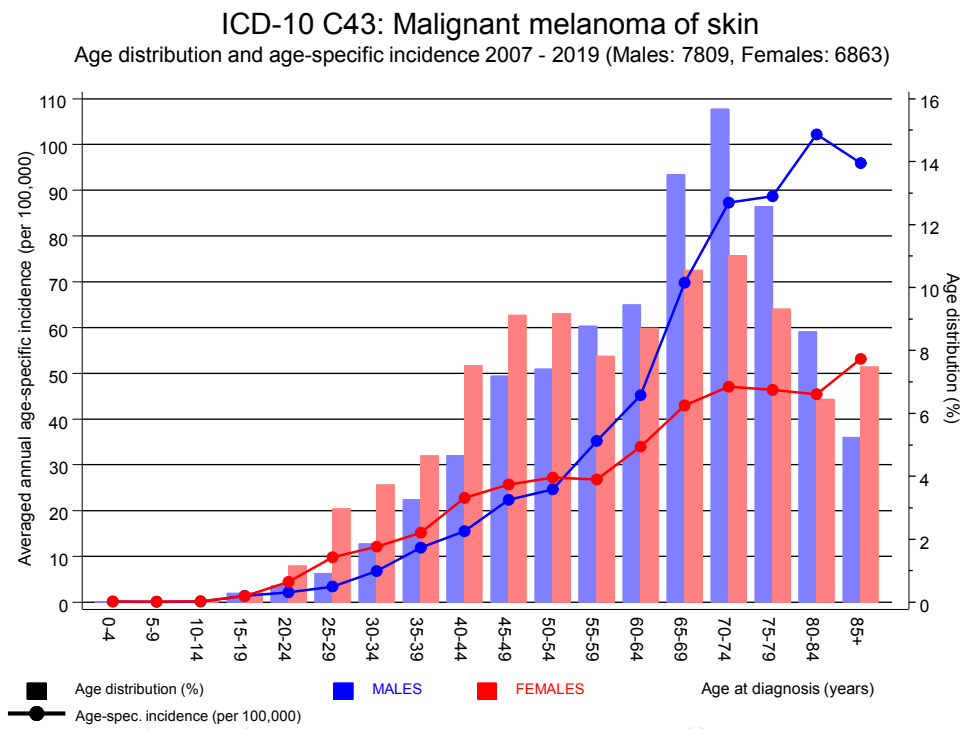


Figure 6. Age distribution (males: mean=64.5 yrs, median=67.3 yrs; females: mean=60.7 yrs, median=61.9 yrs) and age-specific incidence.

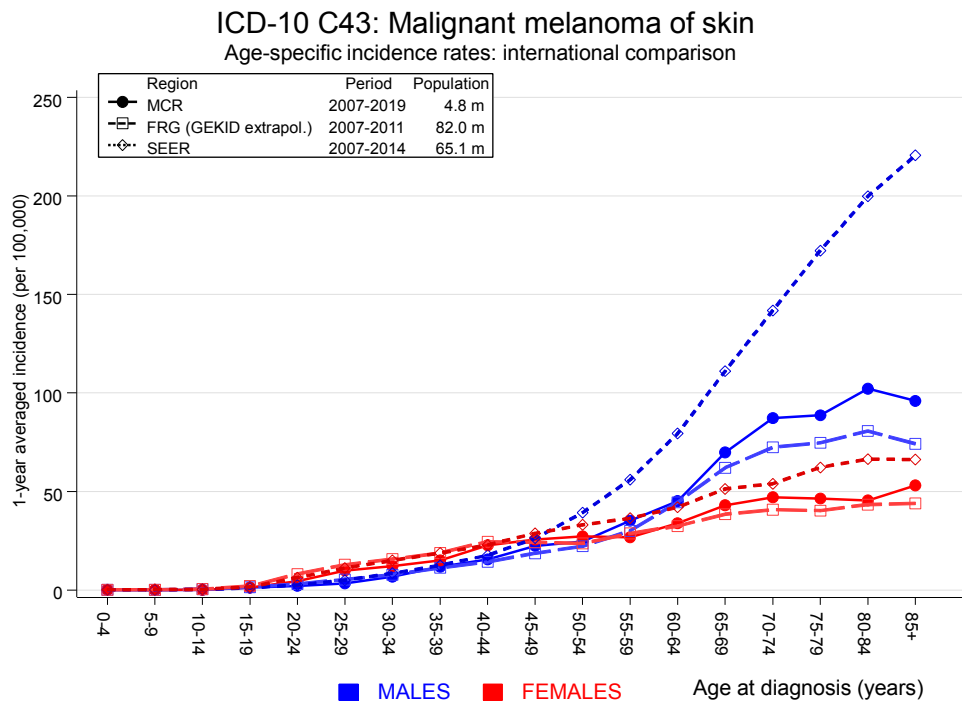


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 2019, based on the November 2018 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 1998–2019

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	4	0.7	6.1	1.7	15.7 #	0.8	
C03–C06 Oral cavity	8	5.0	1.6	0.7	3.2	0.7	12.5
C09–C10 Oropharynx	8	6.1	1.3	0.6	2.6	0.5	
C12–C13 Hypopharynx	5	3.3	1.5	0.5	3.5	0.4	20.0
C15 Oesophagus	24	11.4	2.1	1.3	3.1 #	3.1	
C16 Stomach	42	23.6	1.8	1.3	2.4 #	4.5	4.8
C17 Small intestine	13	3.5	3.7	2.0	6.3 #	2.3	
C18 Colon	119	57.4	2.1	1.7	2.5 #	15.1	3.4
C19–C20 Rectum	49	31.3	1.6	1.2	2.1 #	4.3	
C22 Liver	36	17.0	2.1	1.5	2.9 #	4.6	13.9
C23–C24 Bile	8	6.2	1.3	0.6	2.5	0.4	
C25 Pancreas	65	23.3	2.8	2.2	3.6 #	10.2	15.4
C32 Larynx	3	5.9	0.5	0.1	1.5	-0.7	
C33–C34 Lung	111	69.4	1.6	1.3	1.9 #	10.2	11.7
C37 Thymus	3	0.3	8.8	1.8	25.8 #	0.7	
C38,C45 Mesothelioma	12	4.2	2.9	1.5	5.0 #	1.9	
C43 Malign. melanoma	685	27.0	25.3	23.5	27.3 #	160.9	0.3
C46,C49 Soft tissue	18	3.5	5.2	3.1	8.2 #	3.6	
C50 Breast	5	1.6	3.1	1.0	7.2 #	0.8	
C61 Prostate	383	166.2	2.3	2.1	2.5 #	53.0	4.4
C62 Testis	3	2.4	1.2	0.3	3.6	0.1	
C64 Kidney	69	20.5	3.4	2.6	4.3 #	11.9	2.9
C65 Renal pelvis	8	2.6	3.0	1.3	6.0 #	1.3	
C66 Ureter	3	1.5	2.0	0.4	5.7	0.4	
C67 Bladder	51	28.1	1.8	1.4	2.4 #	5.6	2.0
C69 Eye carcinoma	3	0.2	13.1	2.7	38.3 #	0.7	
C69 Eye melanoma	5	0.7	7.6	2.5	17.6 #	1.1	
C70–C72 CNS cancer	20	7.7	2.6	1.6	4.0 #	3.0	15.0
C73 Thyroid	22	4.0	5.5	3.4	8.3 #	4.4	
C76–C79 CUP	25	10.1	2.5	1.6	3.6 #	3.6	
C82–C85 NHL	92	25.6	3.6	2.9	4.4 #	16.2	10.9
C90 Mult. myeloma	19	7.9	2.4	1.4	3.7 #	2.7	21.1
C91–C96 Leukaemia	25	9.3	2.7	1.7	4.0 #	3.8	36.0
Others, specified	16	10.1	1.6	0.9	2.6	1.4	6.3
Not observed	0	2.1	0.0	0.0	1.7	-0.5	
All further malignancies	1962	600.0	3.3	3.1	3.4 #	333.0	4.3

Patients 10137
 Median age at next malignancy (years) 72.4
 Person-years 40900
 Mean observation time (years) 4.0
 Median observation time (years) 2.3

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 2 are pooled in category "Others, specified".

Table 7b

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

FEMALES

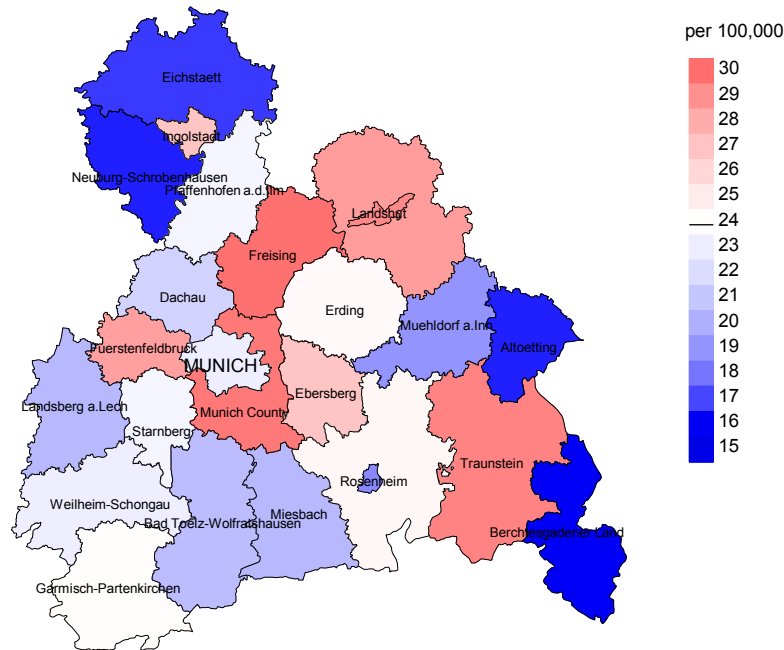
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	8	2.1	3.9	1.7	7.6 #	1.5	
C09-C10 Oropharynx	6	1.5	4.0	1.5	8.7 #	1.2	
C15 Oesophagus	5	2.2	2.2	0.7	5.2	0.7	
C16 Stomach	22	11.8	1.9	1.2	2.8 #	2.7	18.2
C17 Small intestine	11	1.9	5.9	3.0	10.6 #	2.4	
C18 Colon	80	33.2	2.4	1.9	3.0 #	12.1	3.8
C19-C20 Rectum	26	13.8	1.9	1.2	2.8 #	3.2	3.8
C21 Anus/canal	6	2.0	3.0	1.1	6.6 #	1.0	16.7
C22 Liver	9	4.2	2.1	1.0	4.1	1.2	11.1
C23-C24 Bile	7	4.8	1.5	0.6	3.0	0.6	14.3
C25 Pancreas	45	15.9	2.8	2.1	3.8 #	7.6	24.4
C30-C31 Sinuses	4	0.5	8.0	2.2	20.4 #	0.9	
C33-C34 Lung	62	25.9	2.4	1.8	3.1 #	9.4	16.1
C38,C45 Mesothelioma	3	0.6	4.7	1.0	13.8	0.6	33.3
C43 Malign. melanoma	335	14.5	23.2	20.8	25.8 #	83.1	0.3
C46,C49 Soft tissue	9	2.0	4.4	2.0	8.3 #	1.8	11.1
C48 Peritoneal	5	1.4	3.6	1.2	8.5 #	0.9	20.0
C50 Breast	364	111.7	3.3	2.9	3.6 #	65.4	2.7
C51 Vulva	6	3.7	1.6	0.6	3.5	0.6	
C53 Cervix uteri	13	5.6	2.3	1.2	4.0 #	1.9	15.4
C54 Corpus uteri	37	19.0	1.9	1.4	2.7 #	4.7	5.4
C55,C57 Fem. genitals un	3	0.8	3.8	0.8	11.1	0.6	
C56 Ovary	32	14.0	2.3	1.6	3.2 #	4.7	
C64 Kidney	21	8.0	2.6	1.6	4.0 #	3.4	14.3
C66 Ureter	2	0.5	3.7	0.4	13.2	0.4	
C67 Bladder	14	6.7	2.1	1.1	3.5 #	1.9	
C69 Eye melanoma	3	0.4	6.8	1.4	19.8 #	0.7	
C70-C72 CNS cancer	22	4.7	4.7	3.0	7.1 #	4.5	22.7
C73 Thyroid	33	7.0	4.7	3.2	6.6 #	6.7	3.0
C74-C80 Cancer others	2	1.3	1.6	0.2	5.7	0.2	50.0
C76-C79 CUP	17	6.4	2.6	1.5	4.2 #	2.7	
C81 Hodgkin lymphoma	4	0.8	5.1	1.4	13.1 #	0.8	
C82-C85 NHL	35	13.6	2.6	1.8	3.6 #	5.5	8.6
C90 Mult. myeloma	11	4.2	2.6	1.3	4.7 #	1.8	18.2
C91-C96 Leukaemia	16	5.2	3.1	1.8	5.0 #	2.8	25.0
Others, specified	6	2.6	2.3	0.9	5.1	0.9	
Not observed	0	3.0	0.0	0.0	1.2	-0.8	
All further malignancies	1284	357.4	3.6	3.4	3.8 #	240.3	5.4

Patients 9259
 Median age at next malignancy (years) 70.2
 Person-years 38557
 Mean observation time (years) 4.2
 Median observation time (years) 2.5

The occurrence of further specified malignancy is statistically significant.

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

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



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

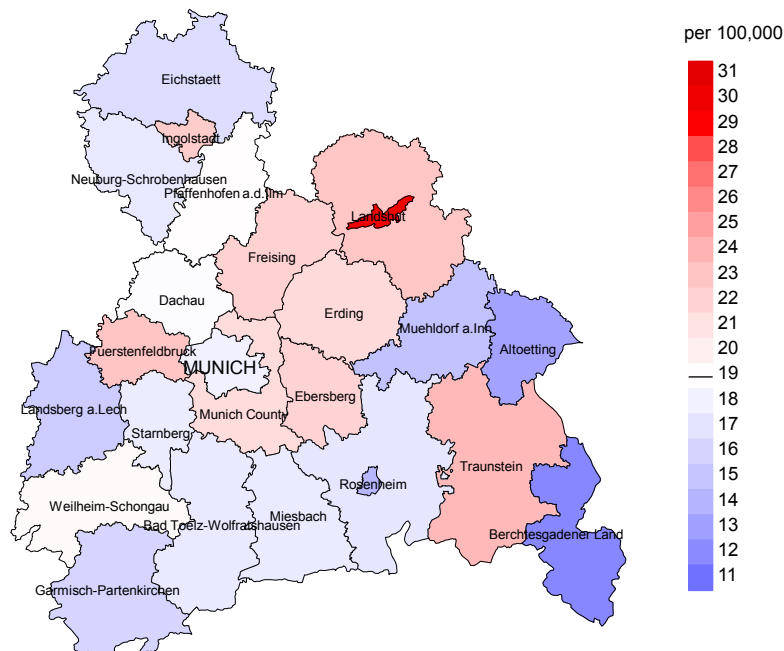
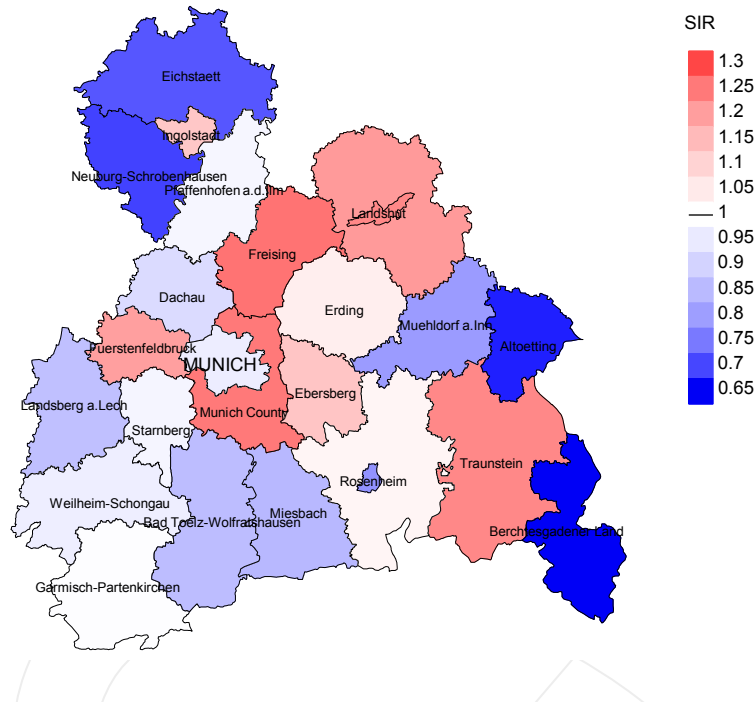


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 23.9/100,000 WS N=7,809, females 19.0/100,000 WS N=6,863).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 223 women were identified with newly diagnosed malignant melanoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 22.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 18.3 and 26.3/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

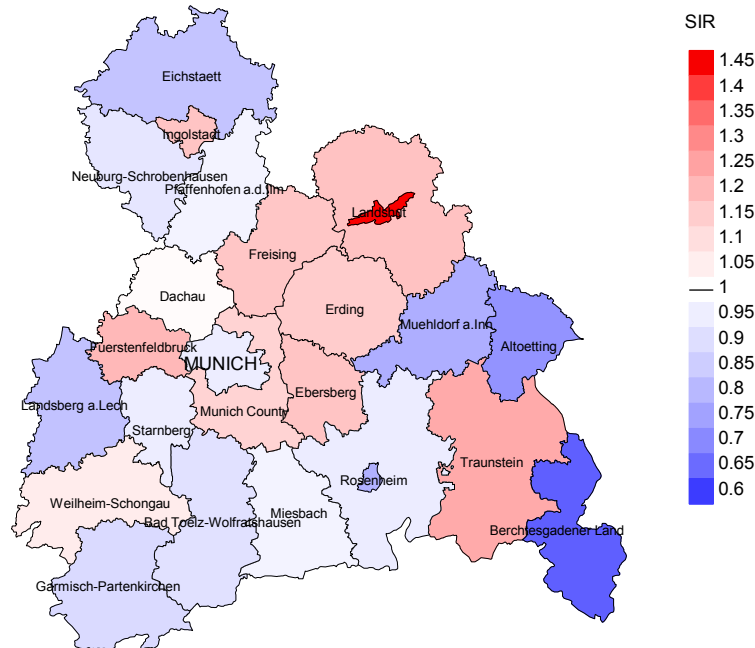


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=7,809, females N=6,863).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 223 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 1.17. Though, the value of this parameter may vary with an underlying probability of 99% between 0.98 and 1.39, 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 4.92 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	483	95.2	2.7	220	45.5	90.0
1999	466	95.7	2.1	192	41.2	94.3
2000	521	95.2	2.5	225	43.2	89.3
2001	520	96.3	1.9	225	43.3	93.8
2002	885	96.5	1.8	371	41.9	92.5
2003	815	94.4	2.2	324	39.8	94.4
2004	907	95.5	3.0	383	42.2	93.0
2005	908	93.5	1.3	348	38.3	93.1
2006	932	89.2	1.7	360	38.6	92.8
2007	1070	82.6	2.0	358	33.5	93.6
2008	1219	97.0	2.1	407	33.4	96.1
2009	1198	97.0	1.9	374	31.2	91.4
2010	1404	97.6	1.5	422	30.1	93.6
2011	1565	96.7	1.3	421	26.9	90.7
2012	1445	96.8	1.8	355	24.6	89.6
2013	1487	96.8	1.3	319	21.5	87.5
2014	1220	96.2	1.6	289	23.7	85.5
2015	1247	90.4	1.9	259	20.8	82.2
2016	937	98.1	2.5	183	19.5	77.0
2017	883	97.4	1.9	108	12.2	66.7
2018	670	98.7	0.6	58	8.7	58.6
2019	628	50.8	0.3	47	7.5	78.7
1998-2019	21410	93.8	1.8	6248	29.2	90.3

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 4.92 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	483	126	89.7	13	2.7
1999	466	118	90.7	14	3.0
2000	521	183	90.2	23	4.4
2001	520	167	91.0	18	3.5
2002	885	239	95.4	29	3.3
2003	815	259	90.7	31	3.8
2004	907	280	96.8	52	5.7
2005	908	318	95.6	31	3.4
2006	932	298	95.3	34	3.6
2007	1070	373	98.1	36	3.4
2008	1219	402	98.3	52	4.3
2009	1198	413	97.3	47	3.9
2010	1404	376	97.9	50	3.6
2011	1565	438	98.4	62	4.0
2012	1445	473	96.0	59	4.1
2013	1487	520	97.9	51	3.4
2014	1220	519	97.7	52	4.3
2015	1247	543	98.2	59	4.7
2016	937	573	98.1	53	5.7
2017	883	547	96.0	37	4.2
2018	670	419	37.7	17	2.5
2019	628	393	52.7	23	3.7
1998–2019	21410	7977	91.2	843	3.9

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 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	126	58.7	41.3	67.3
1999	118	63.6	36.4	77.6
2000	183	66.7	33.3	75.2
2001	167	62.3	37.7	69.7
2002	239	63.6	36.4	68.9
2003	259	61.4	38.6	72.3
2004	280	67.5	32.5	70.5
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	413	65.1	34.9	68.9
2010	376	65.7	34.3	71.5
2011	438	57.3	42.7	63.6
2012	473	60.7	39.3	64.3
2013	520	60.4	39.6	66.6
2014	519	64.0	36.0	67.5
2015	543	52.9	47.1	60.2
2016	573	50.6	49.4	55.0
2017	547	47.9	52.1	56.2
2018	419	33.9	66.1	48.1
2019	393	33.3	66.7	55.6
1998–2019	7977	56.9	43.1	64.7

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	74	74.5	69.2	79.5	71.4
1999	67	74.9	69.8	85.2	71.1
2000	94	74.2	68.1	82.0	70.2
2001	84	72.8	65.1	79.5	66.2
2002	131	72.8	68.6	81.3	68.6
2003	134	73.3	70.1	79.3	71.7
2004	147	74.3	71.5	81.8	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	238	74.5	71.0	82.6	71.2
2010	201	76.2	72.7	81.6	73.7
2011	238	78.5	74.4	84.3	75.7
2012	280	75.9	73.3	82.0	73.8
2013	284	76.9	74.4	81.3	74.4
2014	302	78.1	74.7	84.2	74.8
2015	307	79.8	76.7	82.7	77.5
2016	325	80.2	76.3	83.1	77.5
2017	304	81.7	77.4	84.4	77.9
2018	246	79.7	75.6	81.9	77.6
2019	248	82.5	80.4	83.6	83.0
1998-2019	4453	77.7	73.5	82.7	74.4

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	72.7	88.5	74.2
2013	236	83.7	78.2	87.6	78.4
2014	217	83.5	76.5	87.5	76.1
2015	236	83.5	76.4	89.4	77.1
2016	248	83.2	77.9	87.6	79.3
2017	243	85.0	78.9	88.6	79.0
2018	173	82.1	71.1	86.6	76.4
2019	145	82.1	77.5	83.7	79.7
1998-2019	3524	82.2	75.7	87.1	76.9

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	47	4.2	0.20	2.6	0.17	3.9	0.20	5.2	0.23
1999	43	3.8	0.20	2.3	0.17	3.5	0.20	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	0.22	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	0.23	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	0.19	6.3	0.24
2009	165	7.4	0.26	3.8	0.24	5.6	0.26	7.2	0.28
2010	138	6.1	0.19	2.9	0.16	4.4	0.18	6.0	0.20
2011	148	6.6	0.19	3.0	0.15	4.6	0.17	6.3	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	194	8.3	0.30	3.6	0.24	5.6	0.27	7.5	0.30
2015	163	6.9	0.24	2.8	0.19	4.5	0.21	6.2	0.24
2016	167	6.9	0.33	2.8	0.26	4.5	0.29	6.2	0.32
2017	150	6.2	0.32	2.4	0.24	3.9	0.27	5.4	0.30
2018	96	3.9	0.29	1.7	0.25	2.6	0.27	3.4	0.28
2019	90	3.7	0.26	1.3	0.20	2.2	0.22	3.2	0.25
1998-2019	2673	6.1	0.24	2.9	0.20	4.4	0.22	6.0	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	0.16	3.2	0.19	4.2	0.22
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	0.10	2.2	0.12	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	0.14	2.9	0.16	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	0.16	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	0.16	1.9	0.11	2.8	0.13	3.4	0.14
2013	128	5.4	0.20	1.9	0.12	2.9	0.14	3.8	0.17
2014	138	5.7	0.25	2.1	0.16	3.1	0.18	4.0	0.21
2015	125	5.1	0.22	1.9	0.14	2.8	0.16	3.6	0.19
2016	124	5.1	0.30	1.7	0.18	2.7	0.21	3.5	0.24
2017	113	4.6	0.29	1.4	0.16	2.2	0.19	3.1	0.23
2018	48	1.9	0.15	0.8	0.13	1.2	0.13	1.5	0.14
2019	42	1.7	0.15	0.6	0.10	0.9	0.12	1.2	0.13
1998-2019	1876	4.1	0.19	1.6	0.12	2.4	0.14	3.1	0.16

Table 12

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19	2	0.1	0.1	2	0.1	0.1			0.0
20-24	6	0.2	0.2	3	0.2	0.3	3	0.2	0.2
25-29	6	0.2	0.4	5	0.3	0.5	1	0.1	0.3
30-34	18	0.5	1.0	12	0.6	1.1	6	0.4	0.7
35-39	28	0.9	1.8	17	0.9	2.0	11	0.8	1.6
40-44	59	1.8	3.6	29	1.5	3.5	30	2.2	3.8
45-49	110	3.3	7.0	59	3.0	6.5	51	3.8	7.5
50-54	135	4.1	11.1	76	3.9	10.5	59	4.4	11.9
55-59	160	4.9	15.9	92	4.7	15.2	68	5.0	16.9
60-64	243	7.4	23.3	138	7.1	22.3	105	7.8	24.7
65-69	359	10.9	34.2	219	11.3	33.6	140	10.3	35.0
70-74	511	15.5	49.7	346	17.8	51.5	165	12.2	47.2
75-79	540	16.4	66.1	340	17.5	69.0	200	14.8	62.0
80-84	500	15.2	81.3	318	16.4	85.4	182	13.4	75.4
85+	616	18.7	100.0	283	14.6	100.0	333	24.6	100.0
All ages	3293	100.0		1939	100.0		1354	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007–2019
(incl. multiple malignancies)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	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		0.1	0.09			4.3	
20-24	3	3	0.2	0.08	0.2	0.04	4.5	7.7
25-29	5	1	0.2	0.07	0.0	0.00	5.9	1.1
30-34	12	6	0.6	0.08	0.3	0.02	9.4	3.8
35-39	17	11	0.8	0.07	0.5	0.03	7.0	3.0
40-44	29	30	1.2	0.08	1.3	0.06	5.1	3.7
45-49	59	51	2.4	0.11	2.1	0.08	4.4	3.2
50-54	76	59	3.2	0.13	2.6	0.09	3.0	2.4
55-59	92	68	4.7	0.13	3.4	0.13	2.2	1.9
60-64	138	105	8.5	0.19	6.0	0.18	2.3	2.3
65-69	219	140	14.4	0.21	8.3	0.19	2.5	2.2
70-74	346	165	24.7	0.28	10.3	0.22	3.1	2.0
75-79	340	200	30.7	0.35	14.5	0.31	3.0	2.2
80-84	318	182	48.4	0.47	18.7	0.41	3.4	2.1
85+	283	333	66.4	0.69	34.5	0.65	3.4	3.0
All ages	1939	1354					3.0	2.4
Mortality								
Raw			6.4	0.25	4.4	0.20		
WS			2.8	0.20	1.6	0.13		
ES			4.4	0.22	2.5	0.15		
BRD-S			6.0	0.25	3.2	0.17		
PYLL-70								
per 100,000			28.8		22.0			
ES			25.0		18.6			
AYLL-70			11.7		12.2			

Table 14a

Further malignancies in deaths in period 1998–2019
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C00 Lip	4	0.2	2	50.0			2	50.0
C03–C06 Oral cavity	14	0.7	5	35.7	2	14.3	7	50.0
C09–C10 Oropharynx	8	0.4	3	37.5			5	62.5
C12–C13 Hypopharynx	5	0.3	1	20.0			4	80.0
C15 Oesophagus	15	0.8	1	6.7			14	93.3
C16 Stomach	46	2.3	9	19.6	2	4.3	35	76.1
C17 Small intestine	7	0.4	3	42.9	1	14.3	3	42.9
C18 Colon	116	5.9	47	40.5	2	1.7	67	57.8
C19–C20 Rectum	75	3.8	27	36.0			48	64.0
C22 Liver	35	1.8	3	8.6	3	8.6	29	82.9
C23–C24 Bile	13	0.7	3	23.1			10	76.9
C25 Pancreas	69	3.5	3	4.3	4	5.8	62	89.9
C26 GI cancer	4	0.2	2	50.0			2	50.0
C32 Larynx	12	0.6	6	50.0	1	8.3	5	41.7
C33–C34 Lung	155	7.8	12	7.7	11	7.1	132	85.2
C38,C45 Mesothelioma	16	0.8	2	12.5			14	87.5
C43 Malign. melanoma	256	12.9			64	25.0	192	75.0
C44 Skin others	368	18.6	96	26.1	86	23.4	186	50.5
C46,C49 Soft tissue	24	1.2	7	29.2	1	4.2	16	66.7
C61 Prostate	347	17.5	158	45.5	11	3.2	178	51.3
C62 Testis	5	0.3	5	100.0				
C64 Kidney	60	3.0	21	35.0	4	6.7	35	58.3
C65 Renal pelvis	6	0.3	1	16.7			5	83.3
C66 Ureter	4	0.2	1	25.0			3	75.0
C67 Bladder	66	3.3	19	28.8	2	3.0	45	68.2
C69 Eye melanoma	11	0.6	3	27.3	2	18.2	6	54.5
C70–C72 CNS cancer	31	1.6	4	12.9	1	3.2	26	83.9
C73 Thyroid	9	0.5	2	22.2			7	77.8
C74–C80 Cancer others	3	0.2	1	33.3			2	66.7
C76–C79 CUP	32	1.6	6	18.8	1	3.1	25	78.1
C81 Hodgkin lymphoma	3	0.2	2	66.7			1	33.3
C82–C85 NHL	95	4.8	44	46.3	4	4.2	47	49.5
C90 Mult. myeloma	23	1.2	5	21.7	1	4.3	17	73.9
C91–C96 Leukaemia	25	1.3	3	12.0	1	4.0	21	84.0
Others, specified	19	1.0	8	42.1	2	10.5	9	47.4
All further malignancies	1981	100.0	515	26.0	206	10.4	1260	63.6

Further malignancies with number of cases 1 to 2 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 14b

Further malignancies in deaths in period 1998–2019
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C00 Lip	2	0.2	2	100.0				
C03–C06 Oral cavity	5	0.4	3	60.0	1	20.0	1	20.0
C15 Oesophagus	6	0.5	1	16.7			5	83.3
C16 Stomach	32	2.7	6	18.8			26	81.3
C17 Small intestine	4	0.3	1	25.0			3	75.0
C18 Colon	66	5.6	17	25.8	4	6.1	45	68.2
C19–C20 Rectum	24	2.0	10	41.7	1	4.2	13	54.2
C21 Anus/canal	6	0.5	3	50.0			3	50.0
C22 Liver	15	1.3	1	6.7	1	6.7	13	86.7
C23–C24 Bile	16	1.3	2	12.5			14	87.5
C25 Pancreas	65	5.5	1	1.5	2	3.1	62	95.4
C30–C31 Sinuses	3	0.3	1	33.3	2	66.7		
C32 Larynx	2	0.2	2	100.0				
C33–C34 Lung	82	6.9	5	6.1	2	2.4	75	91.5
C43 Malign. melanoma	118	9.9			18	15.3	100	84.7
C44 Skin others	124	10.4	32	25.8	27	21.8	65	52.4
C46,C49 Soft tissue	13	1.1	3	23.1	2	15.4	8	61.5
C48 Peritoneal	7	0.6	1	14.3			6	85.7
C50 Breast	274	23.1	124	45.3	13	4.7	137	50.0
C51 Vulva	9	0.8	4	44.4	2	22.2	3	33.3
C53 Cervix uteri	24	2.0	13	54.2	1	4.2	10	41.7
C54 Corpus uteri	37	3.1	17	45.9			20	54.1
C55,C57 Fem. genitals un	4	0.3	2	50.0			2	50.0
C56 Ovary	45	3.8	12	26.7	2	4.4	31	68.9
C64 Kidney	23	1.9	7	30.4	5	21.7	11	47.8
C66 Ureter	2	0.2					2	100.0
C67 Bladder	14	1.2	1	7.1			13	92.9
C69 Eye melanoma	13	1.1	10	76.9			3	23.1
C70–C72 CNS cancer	23	1.9	3	13.0			20	87.0
C73 Thyroid	16	1.3	5	31.3			11	68.8
C74–C80 Cancer others	2	0.2	2	100.0				
C76–C79 CUP	19	1.6	2	10.5	2	10.5	15	78.9
C81 Hodgkin lymphoma	3	0.3	3	100.0				
C82–C85 NHL	50	4.2	26	52.0	1	2.0	23	46.0
C90 Mult. myeloma	20	1.7	9	45.0			11	55.0
C91–C96 Leukaemia	14	1.2					14	100.0
Others, specified	6	0.5	1	16.7			5	83.3
All further malignancies	1188	100.0	332	27.9	86	7.2	770	64.8

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

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(**First primaries only ***)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1		0.1	0.05			2.2	
20-24	3	3	0.2	0.08	0.2	0.04	5.0	8.1
25-29	4	1	0.2	0.06	0.0	0.01	5.2	1.2
30-34	11	6	0.5	0.08	0.3	0.03	8.9	4.3
35-39	16	10	0.7	0.07	0.5	0.03	7.0	3.0
40-44	28	27	1.2	0.08	1.2	0.06	5.3	3.8
45-49	55	38	2.2	0.11	1.6	0.07	4.5	2.8
50-54	67	45	2.9	0.13	1.9	0.08	3.0	2.2
55-59	82	60	4.2	0.14	3.0	0.13	2.3	2.0
60-64	105	86	6.4	0.18	4.9	0.18	2.1	2.3
65-69	166	99	10.9	0.22	5.9	0.19	2.4	1.9
70-74	236	123	16.8	0.32	7.7	0.24	2.8	1.9
75-79	209	135	18.9	0.40	9.8	0.33	2.5	2.0
80-84	200	131	30.5	0.54	13.5	0.43	3.0	2.0
85+	162	244	38.0	0.84	25.3	0.69	2.7	2.8
All ages	1345	1008					2.7	2.2
Mortality								
Raw			4.5	0.24	3.2	0.18		
WS			2.1	0.19	1.3	0.12		
ES			3.1	0.21	1.9	0.14		
BRD-S			4.1	0.24	2.4	0.15		
PYLL-70								
per 100,000			25.3		18.2			
ES			21.8		15.4			
AYLL-70			12.5		12.7			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(**Single primaries only ***)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1		0.1	0.05			2.2	
20-24	3	3	0.2	0.08	0.2	0.04	5.0	8.3
25-29	4	1	0.2	0.06	0.0	0.01	5.2	1.2
30-34	11	5	0.5	0.08	0.2	0.02	8.9	3.6
35-39	16	10	0.7	0.07	0.5	0.04	7.1	3.1
40-44	24	23	1.0	0.07	1.0	0.05	4.6	3.3
45-49	51	31	2.0	0.11	1.3	0.06	4.2	2.3
50-54	58	39	2.5	0.12	1.7	0.08	2.7	1.9
55-59	66	43	3.4	0.13	2.2	0.11	1.9	1.5
60-64	71	64	4.4	0.15	3.6	0.16	1.4	1.7
65-69	115	61	7.6	0.19	3.6	0.14	1.7	1.2
70-74	153	69	10.9	0.26	4.3	0.17	1.9	1.1
75-79	113	84	10.2	0.26	6.1	0.24	1.4	1.3
80-84	105	77	16.0	0.33	7.9	0.30	1.7	1.2
85+	95	147	22.3	0.56	15.2	0.47	1.7	1.8
All ages	886	657					1.9	1.5
Mortality								
Raw			2.9	0.18	2.1	0.14		
WS			1.5	0.15	0.9	0.09		
ES			2.1	0.17	1.3	0.10		
BRD-S			2.7	0.18	1.6	0.12		
PYLL-70								
per 100,000			21.7		14.8			
ES			18.9		12.7			
AYLL-70			13.7		13.9			

* See corresponding tables with multiple malignancies.

ICD-10 C43: Malignant melanoma of skin

Age distribution and age-specific mortality 2007 - 2019 (Males: 1939, Females: 1354)

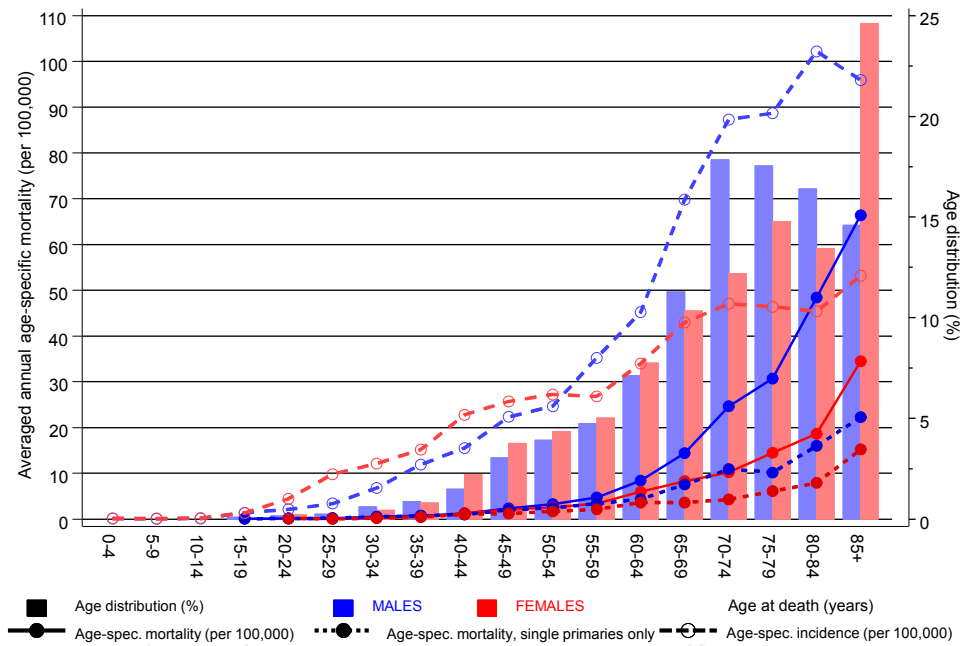
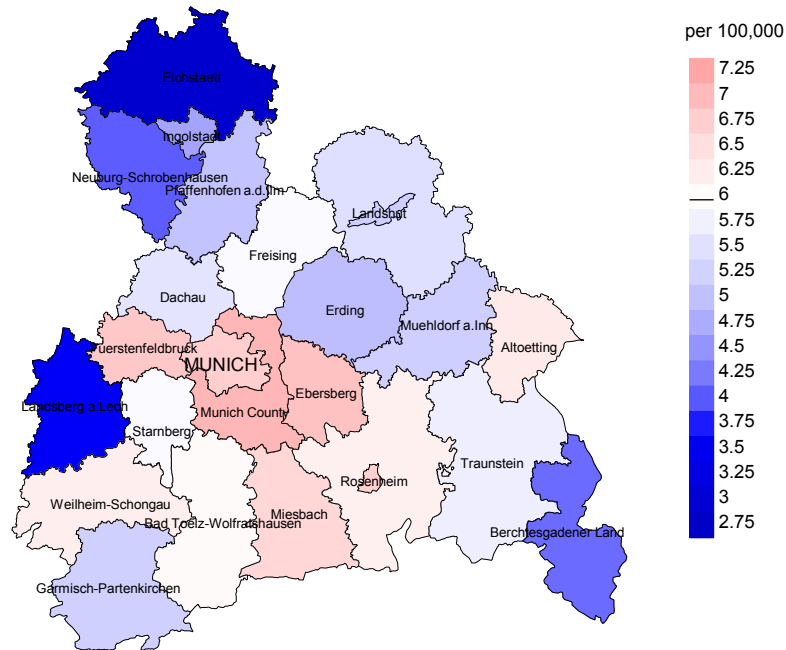


Figure 17. Distribution of age at death (bars; males: mean=66.7 yrs, median=69.0 yrs; females: mean=66.1 yrs, median=68.2 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

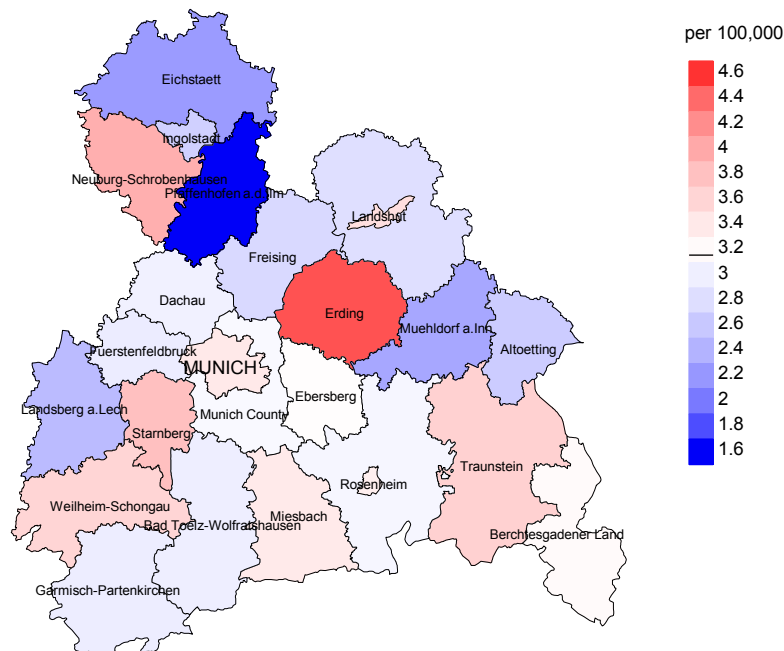
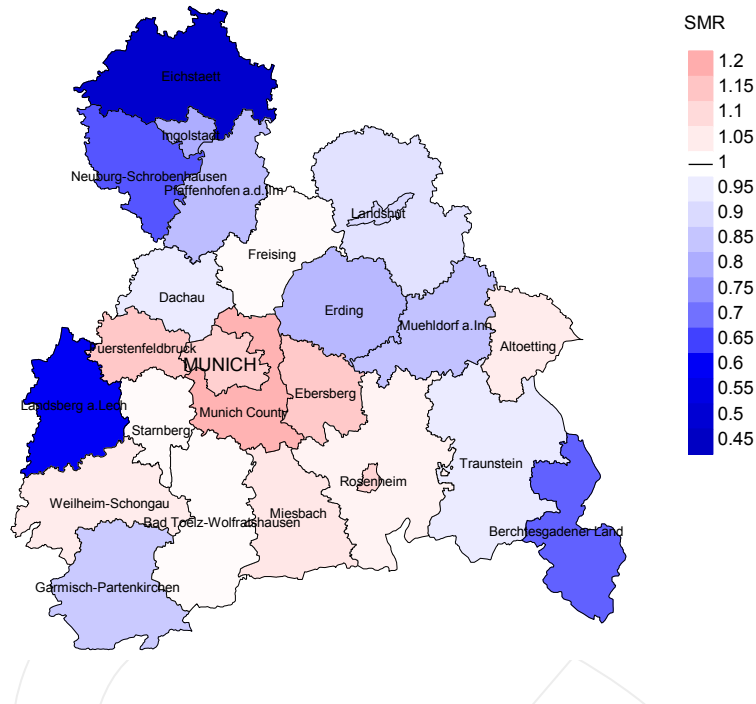


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 6.0/100,000 WS N=1,939, females 3.2/100,000 WS N=1,354).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 38 women died from malignant melanoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 3.2/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.0 and 4.9/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

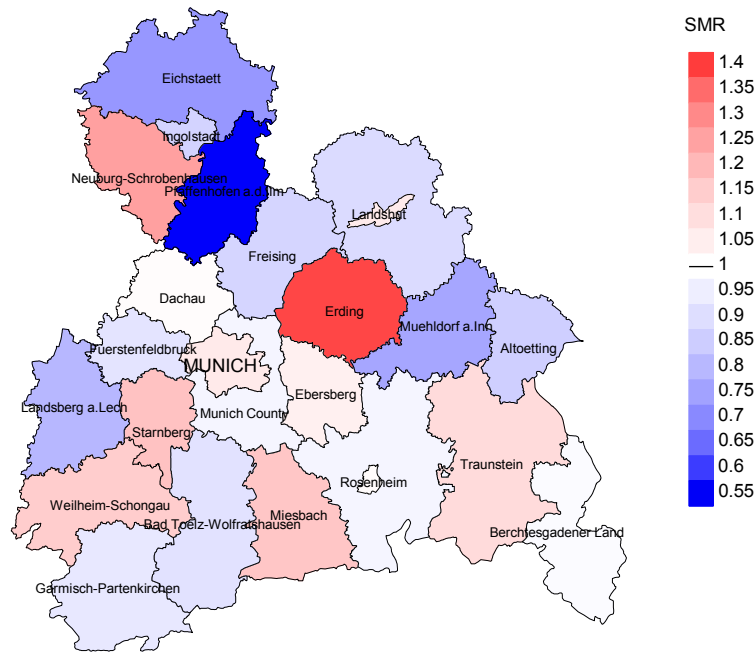


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,939, females N=1,354).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 38 women died from malignant melanoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.04. Though, the value of this parameter may vary with an underlying probability of 99% between 0.66 and 1.56, 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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