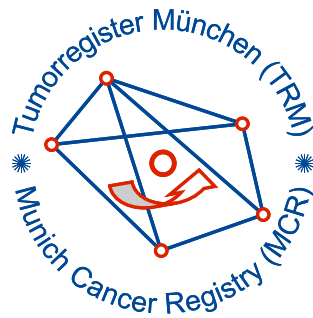


Munich Cancer Registry



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

ICD-10 D03: Melanoma in situ

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	6,684
Diseases	6,973
Creation date	01/26/2021
Database export	01/07/2021
Population	4.92 m





Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninstr. 15
Munich, 81377
Germany

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

https://www.tumorregister-muenchen.de/en/facts/base/bD03__E-ICD-10-D03-Melanoma-in-situ-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
D03.-	Melanoma in situ
D03.0	Lip
D03.1	Eyelid, including canthus
D03.2	Ear and external auricular canal
D03.3	Other and unspecified parts of face
D03.4	Scalp and neck
D03.5	Trunk
D03.6	Upper limb, including shoulder
D03.7	Lower limb, including hip
D03.8	Other sites
D03.9	Melanoma in situ, unspecified

INCIDENCE

Table 1

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (ALL PATIENTS)

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	78	20.5	17.7	33.3	96.2
1999	113	19.9	17.5	29.2	93.8
2000	108	21.4	17.3	25.9	94.4
2001	93	23.0	17.1	20.4	93.5
2002	145	22.0	17.0	30.3	93.8 #
2003	169	21.7	16.6	26.0	95.3
2004	239	21.3	16.3	27.2	93.3
2005	259	21.3	15.6	32.8	93.1
2006	294	21.8	15.0	24.8	89.5
2007	255	22.5	14.6	28.2	83.1 #
2008	388	23.0	13.9	22.2	96.1
2009	379	23.1	12.9	19.3	97.6
2010	485	23.4	12.2	17.5	95.9
2011	565	23.1	11.4	14.3	97.9
2012	618	22.7	10.2	15.9	97.6
2013	544	22.7	9.2	10.5	96.5
2014	410	23.0	7.7	10.0	95.6
2015	385	23.2	6.7	7.8	91.7
2016	354	23.4	6.1	7.3	98.3
2017	296	23.3	4.2	4.4	99.3
2018	335	23.5	2.9	0.9	98.8
2019	461	23.8	1.2	2.6	49.9 ##
1998-2019	6973	23.8	17.7	15.7	92.4

6,973 cases diagnosed 1998-2019 are related to a total of 6,684 patients. Currently, in 2,470 (37.0 %) of these 6,684 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,586 / 512 / 372 (23.7 % / 7.7 % / 5.6 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 296 cases has been diagnosed, of which 23.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.2 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (MALES)

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	35	44.9	28.6	20.1	51.4	94.3
1999	64	56.6	25.3	19.8	35.9	93.8
2000	61	56.5	28.1	19.7	32.8	95.1
2001	43	46.2	28.6	19.5	23.3	93.0
2002	66	45.5	26.4	19.5	39.4	95.5 #
2003	86	50.9	25.4	18.9	33.7	95.3
2004	116	48.5	24.4	18.6	30.2	91.4
2005	119	45.9	25.1	17.8	39.5	92.4
2006	132	44.9	25.3	17.0	30.3	93.9
2007	114	44.7	25.8	16.3	31.6	86.8 #
2008	190	49.0	26.8	15.8	25.3	96.3
2009	204	53.8	27.5	14.5	22.5	97.1
2010	229	47.2	27.8	13.6	21.8	95.6
2011	250	44.2	26.9	12.3	17.6	96.8
2012	301	48.7	26.4	11.2	19.6	97.7
2013	259	47.6	26.3	9.4	12.4	96.9
2014	196	47.8	26.7	7.8	11.7	96.4
2015	197	51.2	27.0	7.0	8.1	92.9
2016	179	50.6	27.3	6.6	8.4	98.3
2017	159	53.7	27.0	4.5	5.7	99.4
2018	180	53.7	27.4	3.1	1.1	100.0
2019	257	55.7	27.6	1.8	3.5	51.4 ##
1998-2019	3437	49.3	27.6	20.1	18.5	92.5

3,437 cases diagnosed 1998-2019 are related to a total of 3,274 patients. Currently, in 1,384 (42.3 %) of these 3,274 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 842 / 291 / 251 (25.7 % / 8.9 % / 7.7 %) 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 2017, a subgroup of 159 cases has been diagnosed, of which 27.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.5 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (FEMALES)

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	43	55.1	14.0	15.4	18.6	97.7
1999	49	43.4	14.1	15.3	20.4	93.9
2000	47	43.5	13.7	15.1	17.0	93.6
2001	50	53.8	16.9	14.9	18.0	94.0
2002	79	54.5	17.5	14.7	22.8	92.4 #
2003	83	49.1	17.9	14.5	18.1	95.2
2004	123	51.5	18.1	14.2	24.4	95.1
2005	140	54.1	17.6	13.6	27.1	93.6
2006	162	55.1	18.6	13.2	20.4	85.8
2007	141	55.3	19.5	12.9	25.5	80.1 #
2008	198	51.0	19.6	12.1	19.2	96.0
2009	175	46.2	18.8	11.4	15.4	98.3
2010	256	52.8	19.1	10.9	13.7	96.1
2011	315	55.8	19.7	10.5	11.7	98.7
2012	317	51.3	19.2	9.2	12.3	97.5
2013	285	52.4	19.4	8.9	8.8	96.1
2014	214	52.2	19.6	7.6	8.4	94.9
2015	188	48.8	19.7	6.4	7.4	90.4
2016	175	49.4	19.8	5.5	6.3	98.3
2017	137	46.3	19.8	3.8	2.9	99.3
2018	155	46.3	19.9	2.7	0.6	97.4
2019	204	44.3	20.2	0.5	1.5	48.0 ##
1998-2019	3536	50.7	20.2	15.4	12.9	92.3

3,536 cases diagnosed 1998-2019 are related to a total of 3,410 patients. Currently, in 1,086 (31.8 %) of these 3,410 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 744 / 221 / 121 (21.8 % / 6.5 % / 3.5 %) 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 137 cases has been diagnosed, of which 19.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	35	43	3.2	3.7	2.0	2.7	2.8	3.2	3.5	3.4
1999	64	49	5.7	4.1	3.7	2.9	4.9	3.6	5.5	3.7
2000	61	47	5.4	3.9	3.3	2.7	4.6	3.3	5.5	3.7
2001	43	50	3.7	4.1	2.4	2.9	3.2	3.5	3.6	3.8
2002	66	79	3.5	4.0	2.2	2.9	3.1	3.4	3.4	3.9
2003	86	83	4.6	4.2	2.9	2.6	3.8	3.4	4.5	3.7
2004	116	123	6.2	6.2	3.8	3.7	5.1	4.8	6.1	5.4
2005	119	140	6.3	7.0	3.7	3.9	5.1	5.3	6.2	6.2
2006	132	162	6.9	8.1	4.1	4.8	5.5	6.2	6.5	7.1
2007	114	141	5.1	6.1	2.9	3.3	4.1	4.4	4.9	5.1
2008	190	198	8.5	8.5	4.8	4.7	6.7	6.2	7.9	7.2
2009	204	175	9.1	7.5	4.8	4.2	6.9	5.5	8.8	6.5
2010	229	256	10.2	10.9	5.5	5.9	7.7	7.9	9.4	9.2
2011	250	315	11.2	13.5	6.0	8.0	8.4	10.3	10.3	11.8
2012	301	317	13.3	13.4	6.9	7.4	9.8	9.8	12.0	11.4
2013	259	285	11.3	12.0	6.4	6.8	8.6	8.9	10.2	10.3
2014	196	214	8.4	8.9	4.4	5.1	6.2	6.7	7.6	7.7
2015	197	188	8.3	7.7	4.1	4.3	6.0	5.7	7.5	6.7
2016	179	175	7.4	7.1	3.5	4.1	5.2	5.4	6.7	6.2
2017	159	137	6.6	5.6	3.4	2.9	4.8	4.0	5.9	4.6
2018	180	155	7.4	6.2	3.6	3.2	5.2	4.4	6.6	5.2
2019	257	204	10.6	8.2	4.9	3.9	7.3	5.4	9.4	6.5
1998-2019	3437	3536	7.8	7.7	4.3	4.4	6.1	5.8	7.4	6.7

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

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	78	55.9	16.6	19.5	92.2	31.4	41.5	59.6	67.3	76.2
1999	113	53.0	16.8	11.8	95.1	31.2	38.8	56.7	63.6	72.6
2000	108	58.3	15.3	22.8	87.1	34.3	46.0	62.1	70.2	75.1
2001	93	54.4	15.1	24.2	86.2	33.5	42.4	55.4	65.7	72.5
2002	145	56.3	16.3	19.9	84.1	32.0	42.2	59.6	67.7	77.5
2003	169	59.2	15.1	18.1	90.3	36.8	50.7	62.1	68.4	78.5
2004	239	60.2	16.2	20.3	94.7	36.4	48.0	63.7	71.5	81.0
2005	259	62.2	16.1	22.9	99.1	38.5	49.2	65.1	74.2	81.5
2006	294	61.6	15.4	16.2	94.5	39.4	51.0	64.5	71.4	81.1
2007	255	63.8	15.2	13.7	91.6	41.3	54.0	67.4	73.9	82.2
2008	388	63.2	14.6	16.0	93.7	42.5	52.5	66.6	72.9	81.4
2009	379	63.9	15.6	15.4	96.5	40.2	53.2	67.7	75.3	81.7
2010	485	64.0	15.2	18.1	97.7	42.2	53.1	67.7	74.5	81.6
2011	565	62.2	15.6	19.6	96.9	40.6	50.4	64.8	73.7	80.8
2012	618	64.1	15.1	12.1	95.7	41.9	53.4	67.8	74.9	80.9
2013	544	61.8	16.6	16.0	96.7	37.0	49.1	65.3	74.1	81.3
2014	410	63.5	15.2	18.4	94.9	42.0	51.6	66.6	74.9	81.1
2015	385	64.4	15.4	23.4	93.9	41.1	53.2	67.5	76.3	81.4
2016	354	64.5	14.6	24.2	91.3	44.5	53.0	67.4	76.5	81.8
2017	296	65.3	14.8	0.4	92.0	45.3	54.1	67.2	77.1	82.2
2018	335	66.6	14.2	24.6	92.8	47.4	57.6	70.3	77.1	81.9
2019	461	68.3	13.7	28.3	101	49.7	58.8	70.9	78.6	82.8
1998-2019	6973	63.0	15.6	0.4	101	40.2	52.3	65.9	74.7	81.2

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	35	62.1	14.5	36.1	92.2	41.5	52.5	61.1	72.9	82.6
1999	64	55.6	16.0	23.7	89.7	32.9	39.5	59.0	65.9	72.9
2000	61	62.6	13.1	33.5	87.1	40.4	57.4	64.9	71.0	78.1
2001	43	56.5	15.3	25.9	86.2	34.8	43.4	59.7	67.5	73.5
2002	66	60.3	11.4	32.0	78.8	40.1	56.4	61.6	67.4	73.4
2003	86	59.0	14.8	18.1	83.4	36.8	49.9	63.0	69.6	76.2
2004	116	60.8	14.7	24.5	89.3	38.4	49.9	64.1	71.1	76.6
2005	119	62.5	16.3	25.2	99.1	37.9	50.9	66.3	73.9	82.6
2006	132	62.0	14.8	18.3	94.5	40.1	52.1	66.1	71.2	77.6
2007	114	64.4	13.8	13.7	89.5	43.4	55.0	67.4	73.9	79.3
2008	190	64.4	12.7	16.0	93.2	44.4	57.8	67.1	72.2	77.5
2009	204	65.2	14.4	22.8	96.5	41.1	57.6	68.8	75.6	80.3
2010	229	64.9	14.1	20.9	95.7	44.2	55.6	68.7	74.4	81.6
2011	250	65.2	13.9	24.8	96.9	46.2	55.4	68.1	74.7	81.3
2012	301	66.3	13.0	29.5	95.7	47.2	59.2	69.2	74.8	79.7
2013	259	62.7	15.8	16.0	96.7	41.2	51.1	66.1	74.1	80.7
2014	196	65.7	14.1	22.0	94.9	45.4	56.0	69.7	75.2	81.2
2015	197	66.9	14.5	23.7	90.1	46.9	57.9	71.2	77.6	83.1
2016	179	68.4	12.8	32.6	91.3	50.1	59.9	72.0	78.1	82.2
2017	159	66.7	15.1	0.4	92.0	46.8	57.7	68.8	77.7	83.3
2018	180	68.3	12.9	34.3	92.8	50.2	60.1	72.3	77.7	81.9
2019	257	69.3	12.6	30.4	101	51.5	60.8	72.2	78.2	82.3
1998-2019	3437	64.9	14.3	0.4	101	43.6	55.9	67.7	75.2	81.0

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	43	50.8	16.6	19.5	82.3	29.5	35.8	53.6	63.9	71.2
1999	49	49.6	17.4	11.8	95.1	26.5	33.8	54.8	59.5	68.5
2000	47	52.6	16.2	22.8	81.3	29.2	36.4	55.6	66.4	72.0
2001	50	52.5	14.8	24.2	82.2	32.8	39.6	54.0	62.7	71.8
2002	79	52.9	18.9	19.9	84.1	27.5	35.7	52.2	68.9	79.1
2003	83	59.3	15.5	22.1	90.3	37.2	50.7	61.7	68.0	79.1
2004	123	59.7	17.5	20.3	94.7	35.5	45.6	62.3	72.0	82.0
2005	140	61.9	15.9	22.9	95.2	39.5	47.9	64.1	75.0	81.4
2006	162	61.2	16.0	16.2	89.2	39.4	49.9	63.5	71.5	82.5
2007	141	63.4	16.3	20.0	91.6	39.6	51.2	67.3	73.8	84.0
2008	198	61.9	16.1	25.5	93.7	39.7	47.3	65.4	73.4	82.5
2009	175	62.4	16.7	15.4	94.6	37.3	50.3	66.8	74.0	82.0
2010	256	63.3	16.1	18.1	97.7	41.2	50.8	66.5	74.6	81.7
2011	315	59.9	16.5	19.6	96.8	36.0	46.5	62.3	73.1	80.5
2012	317	62.0	16.7	12.1	93.4	38.4	48.9	65.2	75.0	81.9
2013	285	60.9	17.3	17.4	95.6	33.9	48.1	64.5	74.5	81.5
2014	214	61.5	15.9	18.4	93.4	39.6	47.7	64.1	74.4	81.0
2015	188	61.7	16.0	23.4	93.9	36.6	50.5	64.9	74.6	80.1
2016	175	60.4	15.2	24.2	90.0	40.7	49.0	59.8	74.1	78.8
2017	137	63.7	14.3	27.3	90.7	43.4	53.5	65.7	75.5	80.8
2018	155	64.6	15.3	24.6	92.0	42.1	54.8	67.8	76.2	82.0
2019	204	66.9	15.0	28.3	96.0	44.8	55.2	69.4	79.1	83.0
1998-2019	3536	61.3	16.5	11.8	97.7	37.8	49.0	63.9	74.0	81.4

Table 4

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

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	1	0.0	0.0	1	0.0	0.0			0.0
5-9	0	0.0	0.0			0.0			0.0
10-14	2	0.0	0.1	1	0.0	0.1	1	0.0	0.0
15-19	10	0.2	0.2	4	0.1	0.2	6	0.2	0.3
20-24	22	0.4	0.6	6	0.2	0.4	16	0.6	0.8
25-29	87	1.6	2.2	22	0.8	1.3	65	2.4	3.2
30-34	121	2.2	4.4	32	1.2	2.4	89	3.2	6.4
35-39	196	3.6	8.0	70	2.6	5.0	126	4.6	11.0
40-44	274	5.0	13.0	118	4.3	9.4	156	5.7	16.6
45-49	379	6.9	19.9	147	5.4	14.8	232	8.4	25.0
50-54	411	7.5	27.5	193	7.1	21.9	218	7.9	32.9
55-59	413	7.5	35.0	203	7.5	29.4	210	7.6	40.5
60-64	526	9.6	44.6	277	10.2	39.6	249	9.0	49.6
65-69	697	12.7	57.3	365	13.4	53.0	332	12.0	61.6
70-74	887	16.2	73.5	500	18.4	71.4	387	14.0	75.6
75-79	726	13.3	86.8	428	15.8	87.2	298	10.8	86.4
80-84	443	8.1	94.9	212	7.8	95.0	231	8.4	94.8
85+	280	5.1	100.0	136	5.0	100.0	144	5.2	100.0
All ages	5475	100.0		2715	100.0		2760	100.0	

Table 5

Age-specific incidence
for period 2007-2019

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.
0- 4	1		0.1	
5- 9				
10-14	1	1	0.1	0.1
15-19	4	6	0.3	0.4
20-24	6	16	0.3	0.9
25-29	21	65	1.0	3.1
30-34	31	87	1.5	4.1
35-39	69	126	3.2	6.0
40-44	118	155	5.0	6.9
45-49	145	228	5.8	9.4
50-54	189	217	8.1	9.4
55-59	201	209	10.3	10.5
60-64	273	245	16.7	14.0
65-69	357	326	23.5	19.4
70-74	495	378	35.3	23.5
75-79	414	293	37.4	21.3
80-84	208	229	31.7	23.5
85+	131	141	30.7	14.6
All ages	2664	2722		
Incidence				
Raw			8.8	8.8
WS			4.7	4.8
ES			6.6	6.4
BRD-S			8.1	7.5

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

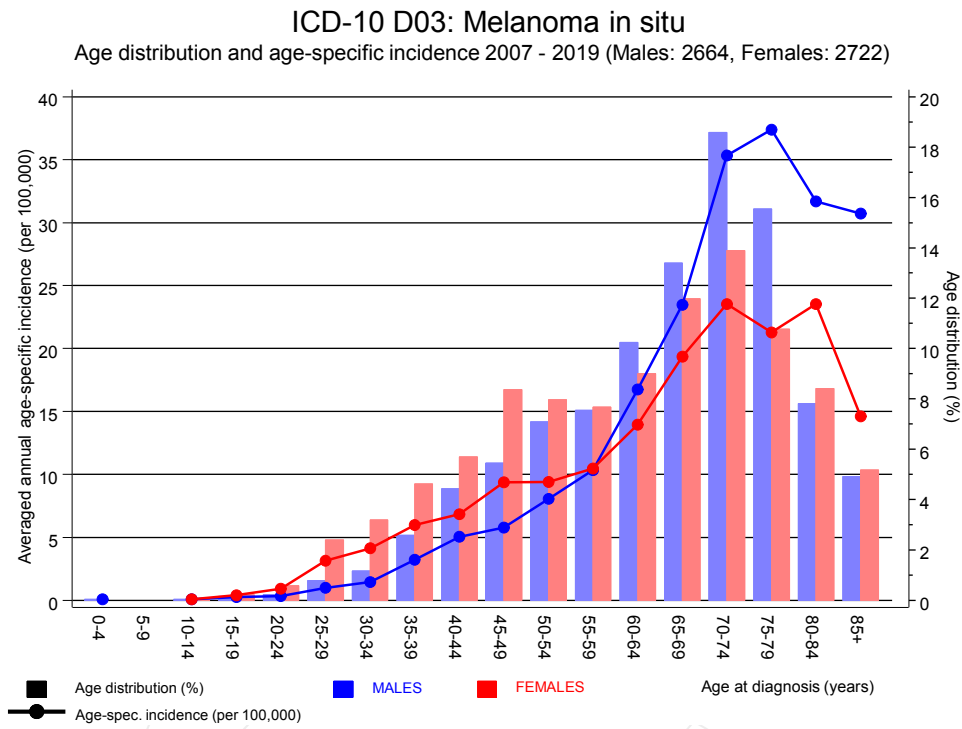


Figure 6. Age distribution (males: mean=66.0 yrs, median=68.8 yrs; females: mean=62.2 yrs, median=65.1 yrs) and age-specific incidence.

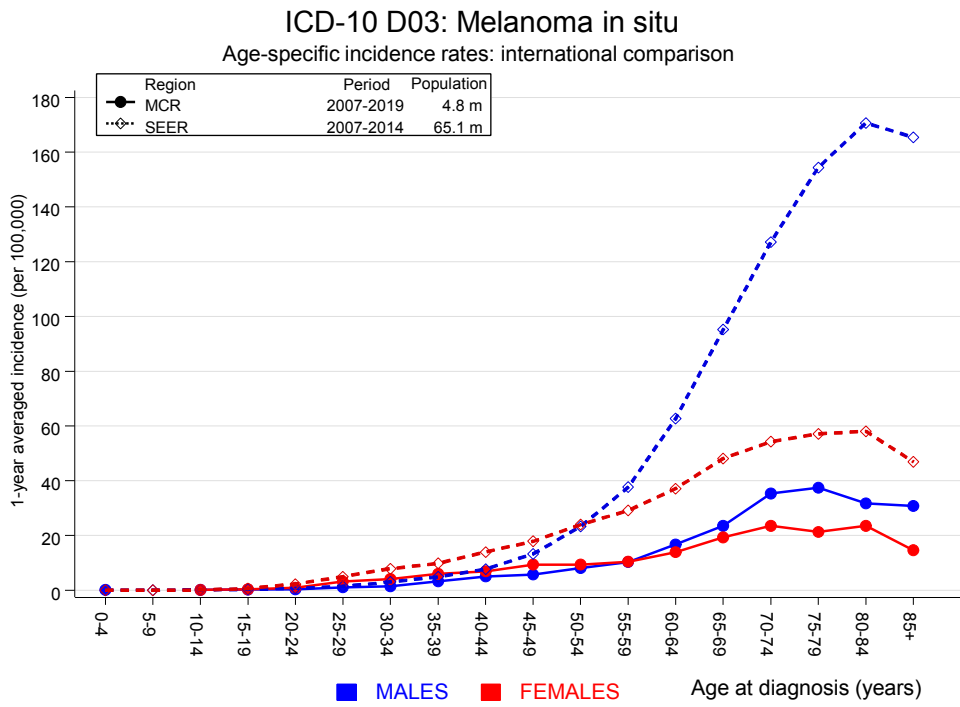


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
 Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 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 %
C03-C06 Oral cavity	2	1.3	1.5	0.2	5.4	0.6	
C15 Oesophagus	9	3.3	2.8	1.3	5.2 #	5.3	
C16 Stomach	16	6.9	2.3	1.3	3.7 #	8.4	
C17 Small intestine	5	1.1	4.8	1.5	11.1 #	3.7	
C18 Colon	24	17.0	1.4	0.9	2.1	6.5	12.5
C19-C20 Rectum	13	9.0	1.4	0.8	2.5	3.7	
C21 Anus/canal	1	0.4	2.4	0.1	13.5	0.5	
C22 Liver	8	5.0	1.6	0.7	3.1	2.8	12.5
C23-C24 Bile	6	1.9	3.2	1.2	7.0 #	3.8	
C25 Pancreas	16	7.0	2.3	1.3	3.7 #	8.3	12.5
C32 Larynx	2	1.7	1.2	0.1	4.4	0.3	50.0
C33-C34 Lung	32	20.2	1.6	1.1	2.2 #	11.0	9.4
C37 Thymus	1	0.1	10.3	0.3	57.4	0.8	100.0
C38,C45 Mesothelioma	1	1.3	0.8	0.0	4.4	-0.2	
C43 Malign. melanoma	292	7.9	36.9	32.8	41.4 #	262.6	0.3
C46,C49 Soft tissue	5	1.0	4.9	1.6	11.4 #	3.7	
C61 Prostate	136	48.1	2.8	2.4	3.3 #	81.3	8.8
C62 Testis	1	0.6	1.8	0.0	10.1	0.4	
C64 Kidney	16	5.9	2.7	1.6	4.4 #	9.3	
C65 Renal pelvis	1	0.8	1.3	0.0	7.0	0.2	
C66 Ureter	2	0.5	4.3	0.5	15.5	1.4	
C67 Bladder	24	8.5	2.8	1.8	4.2 #	14.3	8.3
C68 Urethra	2	0.2	11.7	1.4	42.4 #	1.7	
C69 Eye melanoma	2	0.2	10.7	1.3	38.7 #	1.7	
C70-C72 CNS cancer	7	2.2	3.2	1.3	6.6 #	4.5	
C73 Thyroid	5	1.1	4.7	1.5	10.9 #	3.6	
C74-C80 Cancer others	1	0.4	2.5	0.1	13.8	0.6	
C76-C79 CUP	4	3.0	1.3	0.4	3.4	0.9	
C82-C85 NHL	16	7.6	2.1	1.2	3.4 #	7.8	
C90 Mult. myeloma	7	2.4	3.0	1.2	6.1 #	4.3	14.3
C91-C96 Leukaemia	3	2.8	1.1	0.2	3.1	0.2	33.3
C96 Systemic	1	0.1	13.0	0.3	72.5	0.9	100.0

Not observed 0 5.8 0.0 0.0 0.6 # -5.3

All further malignancies 661 174.8 3.8 3.5 4.1 # 449.5 4.4

Patients 3104
Median age at next malignancy (years) 74.0
Person-years 10817
Mean observation time (years) 3.5
Median observation time (years) 1.3

The occurrence of further specified malignancy is statistically significant.

Table 7b

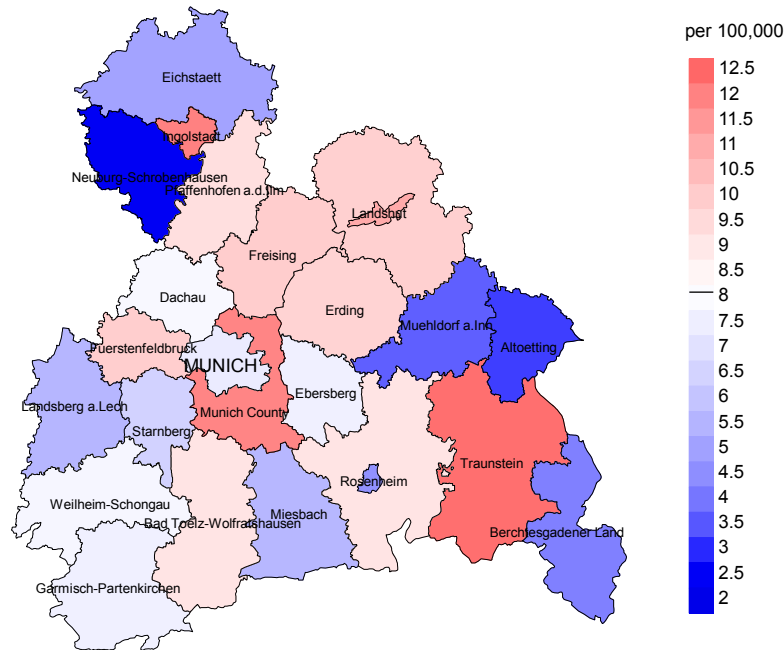
Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998-2019

FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	4	0.6	6.3	1.7	16.2 #	3.0	
C12-C13 Hypopharynx	1	0.1	8.6	0.2	47.7	0.8	
C15 Oesophagus	3	0.7	4.2	0.9	12.2	2.0	
C16 Stomach	8	3.7	2.2	0.9	4.3	3.9	
C17 Small intestine	2	0.6	3.4	0.4	12.3	1.3	
C18 Colon	29	10.5	2.8	1.8	4.0 #	16.6	6.9
C19-C20 Rectum	5	4.2	1.2	0.4	2.7	0.7	
C21 Anus/canal	2	0.6	3.3	0.4	11.9	1.3	
C22 Liver	2	1.4	1.5	0.2	5.3	0.6	
C23-C24 Bile	6	1.5	3.9	1.4	8.5 #	4.0	
C25 Pancreas	7	5.2	1.3	0.5	2.8	1.6	28.6
C30-C31 Sinuses	1	0.2	6.2	0.2	34.8	0.8	
C33-C34 Lung	21	8.1	2.6	1.6	3.9 #	11.5	4.8
C43 Malign. melanoma	188	4.4	42.6	36.7	49.1 #	164.7	
C46,C49 Soft tissue	3	0.6	4.7	1.0	13.6	2.1	
C48 Peritoneal	1	0.4	2.3	0.1	12.7	0.5	
C50 Breast	102	33.8	3.0	2.5	3.7 #	61.1	2.9
C51 Vulva	3	1.2	2.5	0.5	7.3	1.6	
C53 Cervix uteri	3	1.6	1.9	0.4	5.6	1.3	
C54 Corpus uteri	11	5.9	1.9	0.9	3.3	4.6	
C56 Ovary	12	4.3	2.8	1.4	4.8 #	6.9	
C57.9 Fem. urogen.	1	0.0	166.4	4.2	927.0 #	0.9	
C64 Kidney	9	2.5	3.6	1.6	6.8 #	5.8	11.1
C67 Bladder	4	2.2	1.8	0.5	4.7	1.6	
C70-C72 CNS cancer	3	1.4	2.1	0.4	6.2	1.4	
C73 Thyroid	3	1.9	1.5	0.3	4.5	0.9	
C76-C79 CUP	3	2.1	1.4	0.3	4.2	0.8	
C81 Hodgkin lymphoma	1	0.2	4.3	0.1	24.2	0.7	
C82-C85 NHL	19	4.3	4.4	2.7	6.9 #	13.2	
C90 Mult. myeloma	4	1.4	3.0	0.8	7.6	2.4	25.0
C91-C96 Leukaemia	7	1.7	4.2	1.7	8.6 #	4.8	28.6
Not observed	0	3.2	0.0	0.0	1.2	-2.9	
All further malignancies	468	110.8	4.2	3.8	4.6 #	320.4	2.6
Patients		3258					
Median age at next malignancy (years)		72.4					
Person-years		11147					
Mean observation time (years)		3.4					
Median observation time (years)		1.3					

The occurrence of further specified malignancy is statistically significant.

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



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

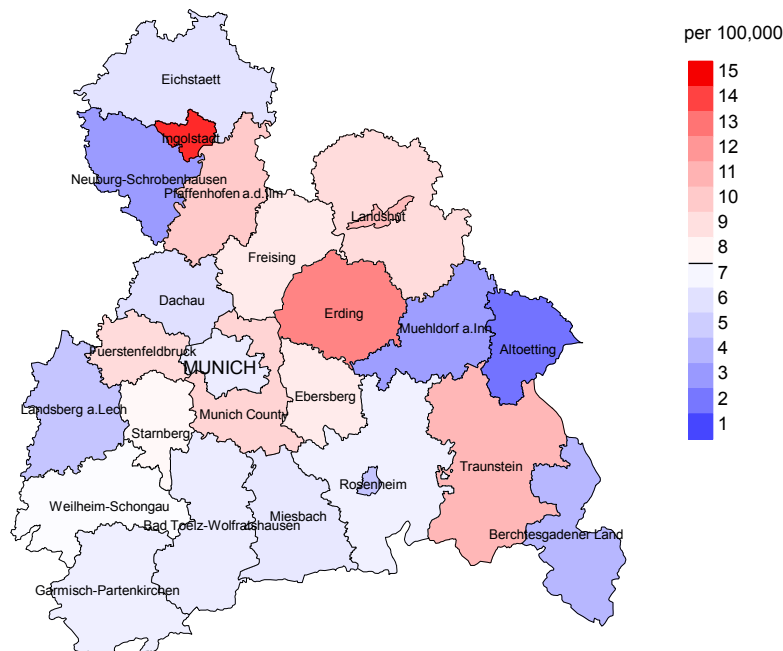
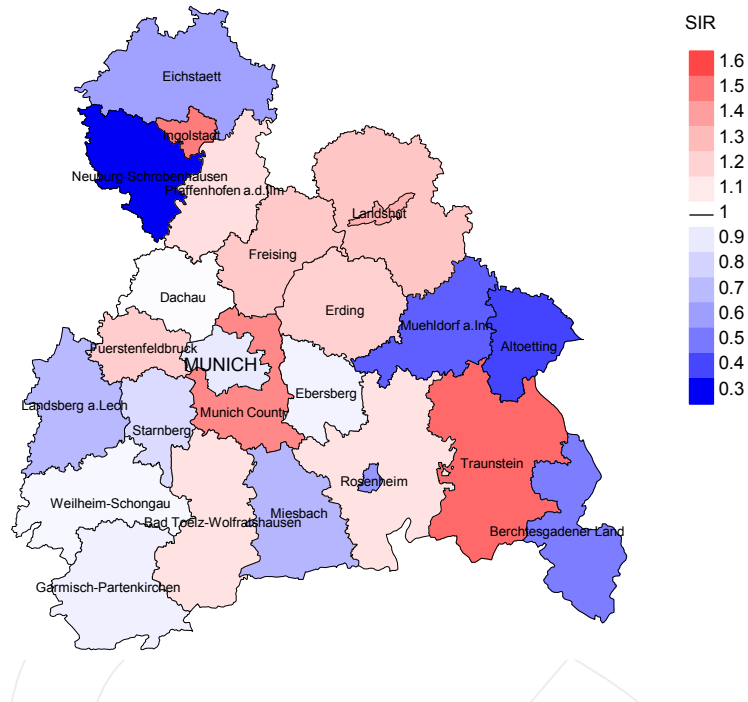


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 8.1/100,000 WS N=2,664, females 7.5/100,000 WS N=2,722).

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 87 women were identified with newly diagnosed melanoma in situ. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 8.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 6.3 and 11.2/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

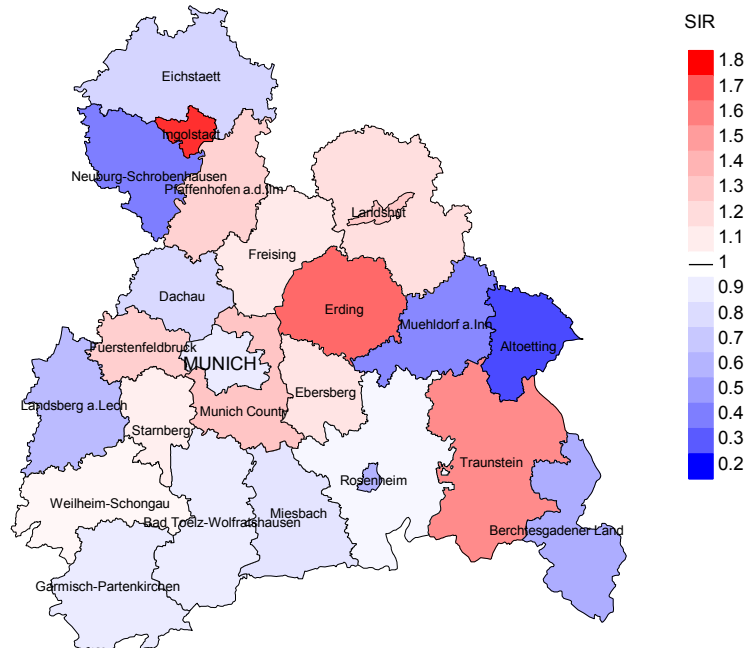


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=2,664, females N=2,722).

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 87 women were identified with newly diagnosed melanoma in situ. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.15. Though, the value of this parameter may vary with an underlying probability of 99% between 0.86 and 1.51, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status,
and deaths among the annual cohorts

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	78	96.2	26	33.3	92.3
1999	113	93.8	33	29.2	93.9
2000	108	94.4	28	25.9	78.6
2001	93	93.5	19	20.4	94.7
2002	145	93.8	44	30.3	90.9
2003	169	95.3	44	26.0	86.4
2004	239	93.3	65	27.2	96.9
2005	259	93.1	85	32.8	92.9
2006	294	89.5	73	24.8	83.6
2007	255	83.1	72	28.2	87.5
2008	388	96.1	86	22.2	90.7
2009	379	97.6	73	19.3	86.3
2010	485	95.9	85	17.5	90.6
2011	565	97.9	81	14.3	88.9
2012	618	97.6	98	15.9	79.6
2013	544	96.5	57	10.5	78.9
2014	410	95.6	41	10.0	90.2
2015	385	91.7	30	7.8	83.3
2016	354	98.3	26	7.3	53.8
2017	296	99.3	13	4.4	53.8
2018	335	98.8	3	0.9	33.3
2019	461	49.9	12	2.6	83.3
1998-2019	6973	92.4	1094	15.7	86.5

Table 9b

Annual cohorts of incident cancers and deaths,
and cases deceased within the same year of being diagnosed with cancer

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Deaths in same year n	Prop. deaths in same year %
1998	78	5		
1999	113	12		
2000	108	8		
2001	93	10	1	1.1
2002	145	16		
2003	169	15		
2004	239	14	1	0.4
2005	259	24		
2006	294	26	1	0.3
2007	255	38		
2008	388	38	4	1.0
2009	379	31	1	0.3
2010	485	65	4	0.8
2011	565	60	1	0.2
2012	618	74	5	0.8
2013	544	86	3	0.6
2014	410	93	2	0.5
2015	385	92		
2016	354	115	2	0.6
2017	296	117		
2018	335	100	2	0.6
2019	461	106	3	0.7
1998-2019	6973	1145	30	0.4

Table 9c

Annual cohorts of deaths, and proportion of cancer-related and non-cancer-related deaths

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	5	20.0	80.0	25.0
1999	12	33.3	66.7	33.3
2000	8	37.5	62.5	28.6
2001	10	40.0	60.0	62.5
2002	16	56.3	43.8	71.4
2003	15	46.7	53.3	57.1
2004	14	35.7	64.3	53.8
2005	24	50.0	50.0	52.2
2006	26	34.6	65.4	53.8
2007	38	36.8	63.2	50.0
2008	38	36.8	63.2	47.2
2009	31	38.7	61.3	58.6
2010	65	36.9	63.1	48.4
2011	60	38.3	61.7	39.0
2012	74	36.5	63.5	42.5
2013	86	47.7	52.3	51.8
2014	93	49.5	50.5	55.6
2015	92	38.0	62.0	43.3
2016	115	33.9	66.1	41.1
2017	117	23.9	76.1	31.0
2018	100	8.0	92.0	43.8
2019	106	9.4	90.6	37.3
1998–2019	1145	32.8	67.2	45.0

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	4	74.4	73.8	74.9	74.9
1999	9	79.3	69.9	83.1	69.9
2000	5	78.6	68.1	88.1	73.4
2001	7	73.7	81.0	72.2	75.9
2002	8	70.8	70.8	79.1	69.6
2003	9	81.7	74.5	82.5	67.2
2004	5	65.4	64.7	87.8	65.0
2005	17	77.3	78.3	76.4	78.3
2006	13	77.5	73.0	80.4	73.0
2007	23	78.3	77.1	78.3	79.1
2008	18	79.9	78.9	85.3	78.9
2009	19	81.7	78.3	84.7	79.4
2010	34	77.9	74.4	81.7	77.6
2011	31	82.3	81.4	83.3	81.4
2012	47	83.0	76.9	83.7	77.1
2013	48	80.0	79.4	80.7	79.8
2014	57	84.1	75.5	88.0	77.9
2015	48	83.1	80.1	85.1	80.2
2016	69	82.0	82.1	81.8	82.0
2017	61	83.6	81.3	83.8	84.1
2018	60	84.1	86.4	82.5	89.4
2019	58	82.6	82.4	82.6	80.1
1998-2019	650	81.6	79.1	83.1	79.3

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	1	76.8		76.8	
1999	3	89.3	91.8	83.9	78.5
2000	3	86.8		86.8	
2001	3	81.0	75.5	88.8	75.5
2002	8	78.1	63.9	79.1	73.5
2003	6	77.7	64.5	85.2	64.5
2004	9	81.5	65.2	85.5	79.3
2005	7	83.4	74.0	90.7	74.0
2006	13	82.1	78.4	82.7	78.9
2007	15	82.4	77.4	83.5	77.9
2008	20	85.2	73.3	86.6	85.0
2009	12	82.1	81.9	82.4	80.4
2010	31	85.3	76.6	86.5	77.3
2011	29	88.4	85.1	90.4	85.1
2012	27	85.7	85.5	85.8	87.4
2013	38	85.2	78.4	90.6	79.8
2014	36	81.7	73.1	90.3	73.1
2015	44	88.6	75.6	90.0	76.9
2016	46	83.4	74.9	85.5	78.7
2017	56	87.3	76.8	89.2	78.9
2018	40	84.4	80.0	86.1	82.4
2019	48	87.6	81.8	88.4	81.4
1998-2019	495	85.0	77.3	87.6	78.6

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

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

Table 11a

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

MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	1	0.1	0.03	0.1	0.03	0.1	0.03	0.1	0.03
1999	3	0.3	0.05	0.2	0.04	0.2	0.05	0.3	0.06
2000	3	0.3	0.05	0.2	0.05	0.2	0.05	0.3	0.06
2001	3	0.3	0.07	0.1	0.05	0.2	0.07	0.3	0.09
2002	6	0.3	0.09	0.2	0.09	0.3	0.10	0.4	0.11
2003	4	0.2	0.05	0.1	0.04	0.2	0.05	0.2	0.06
2004	3	0.2	0.03	0.1	0.02	0.1	0.02	0.1	0.02
2005	8	0.4	0.07	0.2	0.05	0.3	0.07	0.5	0.08
2006	6	0.3	0.05	0.1	0.04	0.2	0.04	0.3	0.06
2007	8	0.4	0.07	0.1	0.05	0.2	0.06	0.4	0.08
2008	10	0.4	0.05	0.2	0.04	0.3	0.05	0.5	0.07
2009	8	0.4	0.04	0.2	0.03	0.3	0.04	0.4	0.04
2010	16	0.7	0.07	0.3	0.05	0.5	0.06	0.7	0.07
2011	14	0.6	0.06	0.2	0.04	0.4	0.05	0.6	0.06
2012	18	0.8	0.06	0.3	0.05	0.6	0.06	0.8	0.07
2013	24	1.0	0.09	0.4	0.06	0.6	0.07	1.0	0.10
2014	29	1.2	0.15	0.5	0.11	0.8	0.13	1.1	0.14
2015	24	1.0	0.13	0.3	0.07	0.6	0.09	0.9	0.12
2016	25	1.0	0.14	0.4	0.11	0.7	0.13	0.9	0.14
2017	16	0.7	0.10	0.2	0.06	0.4	0.08	0.6	0.10
2018	5	0.2	0.03	0.1	0.02	0.1	0.02	0.2	0.02
2019	7	0.3	0.03	0.1	0.01	0.1	0.02	0.2	0.02
1998-2019	241	0.5	0.07	0.2	0.05	0.4	0.06	0.6	0.08

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									
1999	1	0.1	0.02	0.0	0.01	0.0	0.01	0.0	0.01
2000									
2001	1	0.1	0.02	0.0	0.01	0.0	0.01	0.1	0.02
2002	3	0.2	0.04	0.1	0.03	0.1	0.03	0.1	0.03
2003	3	0.2	0.04	0.1	0.04	0.1	0.04	0.1	0.04
2004	2	0.1	0.02	0.1	0.01	0.1	0.01	0.1	0.02
2005	4	0.2	0.03	0.1	0.02	0.1	0.02	0.1	0.02
2006	3	0.1	0.02	0.0	0.01	0.1	0.01	0.1	0.02
2007	6	0.3	0.04	0.1	0.03	0.2	0.04	0.2	0.05
2008	4	0.2	0.02	0.1	0.01	0.1	0.02	0.1	0.02
2009	4	0.2	0.02	0.0	0.01	0.1	0.01	0.1	0.02
2010	8	0.3	0.03	0.1	0.02	0.2	0.02	0.3	0.03
2011	9	0.4	0.03	0.1	0.01	0.2	0.02	0.2	0.02
2012	9	0.4	0.03	0.1	0.01	0.2	0.02	0.2	0.02
2013	17	0.7	0.06	0.2	0.03	0.4	0.04	0.5	0.05
2014	17	0.7	0.08	0.3	0.05	0.4	0.06	0.6	0.07
2015	11	0.5	0.06	0.1	0.03	0.2	0.04	0.3	0.04
2016	14	0.6	0.08	0.2	0.06	0.3	0.06	0.4	0.07
2017	12	0.5	0.09	0.2	0.06	0.3	0.06	0.4	0.08
2018	3	0.1	0.02	0.0	0.01	0.1	0.01	0.1	0.02
2019	3	0.1	0.01	0.0	0.01	0.0	0.01	0.1	0.01
1998-2019	134	0.3	0.04	0.1	0.02	0.2	0.03	0.2	0.03

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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