

Munich Cancer Registry



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

cSCC: Squamous-cell carcinoma

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	13,825
Diseases	16,606
Creation date	01/26/2021
Database export	01/07/2021
Population	4.92 m



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

https://www.tumorregister-muenchen.de/en/facts/base/bCSCC_E-cSCC-Squamous-cell-carcinoma-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 2016) used for specifying cancer site

ICD-10	Description
C44.-	Other malignant neoplasms of skin

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

Code	Description
8070/3	Squamous cell carcinoma, NOS
8071/3	Squamous cell carcinoma, keratinizing, NOS
8072/3	Squamous cell carcinoma, large cell, nonkeratinizing, NOS
8073/3	Squamous cell carcinoma, small cell, nonkeratinizing
8074/3	Squamous cell carcinoma, spindle cell
8075/3	Squamous cell carcinoma, adenoid
8076/3	Squamous cell carcinoma, microinvasive
8078/3	Squamous cell carcinoma with horn formation

INCIDENCE

Table 1

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

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	166	20.5	29.9	78.9	94.0
1999	207	25.7	29.8	79.2	95.2
2000	199	24.3	29.7	83.4	98.0
2001	173	25.4	29.6	79.2	96.5
2002	467	25.7	29.6	82.2	97.0 #
2003	454	26.5	29.3	79.3	97.6
2004	568	26.9	28.9	78.2	97.9
2005	521	27.3	28.5	77.5	96.0
2006	573	28.2	28.3	72.6	95.3
2007	817	29.5	27.9	71.4	92.7 #
2008	876	30.7	27.5	70.8	98.7
2009	1023	32.1	26.7	69.5	98.5
2010	986	33.3	25.8	66.5	98.8
2011	1005	34.5	24.9	61.3	98.4
2012	1192	35.7	23.7	60.1	98.3
2013	1248	36.8	22.6	53.8	97.0
2014	1269	37.9	21.3	50.4	96.4
2015	1085	39.2	19.3	47.2	97.1
2016	1010	39.8	16.9	37.2	98.0
2017	956	40.5	14.1	25.0	99.0
2018	1085	41.4	12.3	16.6	98.0
2019	726	42.0	7.4	12.9	65.7 ##
1998-2019	16606	42.0	29.9	55.5	96.0

16,606 cases diagnosed 1998-2019 are related to a total of 13,825 patients. Currently, in 7,239 (52.4 %) of these 13,825 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 4,010 / 1,754 / 1,475 (29.0 % / 12.7 % / 10.7 %) 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 956 cases has been diagnosed, of which 40.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 14.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

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

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	117	70.5	19.7	33.1	76.9	91.5
1999	123	59.4	24.2	32.9	82.9	95.9
2000	120	60.3	23.9	32.8	80.8	98.3
2001	116	67.1	26.3	32.8	81.0	97.4
2002	287	61.5	27.3	32.7	84.0	97.6 #
2003	278	61.2	28.5	32.4	82.4	97.5
2004	341	60.0	29.7	31.9	78.3	98.2
2005	328	63.0	30.2	31.5	78.4	96.6
2006	359	62.7	31.1	31.2	74.7	95.8
2007	484	59.2	32.7	30.6	72.1	93.8 #
2008	516	58.9	33.9	30.0	71.1	98.6
2009	644	63.0	35.6	29.1	69.3	98.8
2010	611	62.0	37.1	28.0	66.9	99.0
2011	626	62.3	38.4	27.0	60.9	98.9
2012	762	63.9	39.8	25.6	61.2	99.0
2013	764	61.2	41.2	24.3	55.6	97.0
2014	811	63.9	42.2	22.8	50.2	96.7
2015	682	62.9	43.4	20.6	47.4	97.1
2016	628	62.2	44.1	18.2	38.7	98.4
2017	615	64.3	44.8	15.1	26.7	98.7
2018	708	65.3	45.8	13.3	17.8	98.2
2019	480	66.1	46.5	7.8	14.6	67.7 ##
1998-2019	10400	62.6	46.5	33.1	56.0	96.3

10,400 cases diagnosed 1998-2019 are related to a total of 8,422 patients. Currently, in 4,818 (57.2 %) of these 8,422 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,543 / 1,182 / 1,093 (30.2 % / 14.0 % / 13.0 %) 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 2017, a subgroup of 615 cases has been diagnosed, of which 44.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 15.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

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

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	49	29.5	22.4	24.6	83.7	100.0
1999	84	40.6	28.6	24.6	73.8	94.0
2000	79	39.7	25.0	24.4	87.3	97.5
2001	57	32.9	23.8	24.4	75.4	94.7
2002	180	38.5	23.2	24.4	79.4	96.1 #
2003	176	38.8	23.2	24.2	74.4	97.7
2004	227	40.0	22.3	23.9	78.0	97.4
2005	193	37.0	22.5	23.6	76.2	94.8
2006	214	37.3	23.4	23.7	69.2	94.4
2007	333	40.8	24.2	23.6	70.3	91.0 #
2008	360	41.1	25.6	23.2	70.3	98.9
2009	379	37.0	26.5	22.6	69.9	98.2
2010	375	38.0	27.3	22.1	65.9	98.4
2011	379	37.7	28.2	21.3	62.0	97.6
2012	430	36.1	29.2	20.5	58.1	97.2
2013	484	38.8	29.7	19.8	51.0	97.1
2014	458	36.1	30.9	18.7	50.9	95.9
2015	403	37.1	32.2	17.0	46.9	97.3
2016	382	37.8	32.8	14.7	34.8	97.4
2017	341	35.7	33.4	12.2	22.0	99.4
2018	377	34.7	34.1	10.4	14.3	97.6
2019	246	33.9	34.5	6.8	9.8	61.8 ##
1998-2019	6206	37.4	34.5	24.6	54.8	95.6

6,206 cases diagnosed 1998-2019 are related to a total of 5,403 patients. Currently, in 2,421 (44.8 %) of these 5,403 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,467 / 572 / 382 (27.2 % / 10.6 % / 7.1 %) 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 341 cases has been diagnosed, of which 33.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 12.2 % 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 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	117	49	10.6	4.2	6.0	1.4	9.7	2.3	14.0	3.3
1999	123	84	11.0	7.1	6.4	2.5	10.2	4.0	14.2	5.7
2000	120	79	10.5	6.6	5.7	2.0	9.5	3.4	13.9	4.8
2001	116	57	10.0	4.7	5.4	1.7	9.1	2.7	13.2	3.7
2002	287	180	15.4	9.2	8.0	3.0	13.3	4.9	19.0	6.8
2003	278	176	14.8	8.9	7.4	2.9	12.4	4.7	18.1	6.6
2004	341	227	18.1	11.5	8.8	3.4	14.7	5.7	20.9	8.2
2005	328	193	17.3	9.7	8.1	3.0	13.7	4.8	19.8	6.7
2006	359	214	18.7	10.7	8.4	3.4	14.2	5.4	20.9	7.5
2007	484	333	21.8	14.4	9.6	4.1	16.2	6.9	23.7	9.8
2008	516	360	23.2	15.5	10.1	4.2	16.8	7.1	24.4	10.3
2009	644	379	28.9	16.3	11.7	4.3	20.0	7.3	29.9	10.5
2010	611	375	27.1	16.0	11.0	4.6	18.3	7.6	26.5	10.4
2011	626	379	28.0	16.2	10.7	4.5	18.3	7.5	27.6	10.4
2012	762	430	33.6	18.2	12.4	5.0	21.5	8.2	32.1	11.7
2013	764	484	33.2	20.3	11.7	5.5	20.5	9.2	31.1	13.2
2014	811	458	34.8	19.0	12.4	4.9	21.3	8.2	31.8	12.0
2015	682	403	28.7	16.6	9.9	4.1	17.2	7.1	25.7	10.2
2016	628	382	26.1	15.6	8.7	4.1	15.2	6.8	22.9	10.0
2017	615	341	25.5	13.8	8.5	3.5	14.7	5.9	21.9	8.8
2018	708	377	29.1	15.2	9.4	3.8	16.2	6.4	24.5	9.5
2019	480	246	19.7	9.9	6.0	2.5	10.6	4.3	16.5	6.3
1998-2019	10400	6206	23.6	13.6	9.4	3.8	16.1	6.3	24.0	9.1

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)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	166	74.1	12.0	32.5	96.0	58.7	65.7	76.3	83.4	87.4
1999	207	75.4	13.3	15.3	101	59.8	67.2	77.9	85.3	89.6
2000	199	76.2	11.9	32.8	99.4	60.3	69.1	77.7	85.3	89.4
2001	173	75.0	12.9	34.6	101	57.5	68.7	76.9	84.4	88.7
2002	467	76.6	11.8	27.3	106	60.6	70.5	78.1	85.6	90.1
2003	454	77.1	11.1	26.2	100	62.8	71.0	78.2	83.9	90.3
2004	568	77.1	10.9	39.1	106	62.9	69.9	78.5	84.9	90.7
2005	521	77.7	11.0	37.8	102	63.5	70.8	79.1	85.6	90.7
2006	573	77.3	11.2	35.2	102	64.3	70.7	78.6	85.2	90.6
2007	817	78.1	10.7	32.9	100	64.3	71.3	79.5	85.5	91.4
2008	876	78.2	10.7	33.7	103	64.5	71.2	79.3	86.0	91.3
2009	1023	78.6	10.5	20.3	104	66.2	72.4	80.1	86.2	89.9
2010	986	77.9	10.8	30.7	103	65.0	71.1	79.2	86.0	90.2
2011	1005	78.5	10.5	25.4	107	65.8	72.5	79.6	85.8	90.2
2012	1192	79.2	9.8	29.7	103	67.8	73.4	80.1	86.4	90.9
2013	1248	79.4	9.6	21.6	104	68.4	73.7	80.2	86.4	90.5
2014	1269	79.3	10.0	0.2	102	67.2	74.0	80.1	86.1	91.0
2015	1085	80.1	9.3	35.7	102	68.4	74.8	80.8	86.8	91.0
2016	1010	79.7	9.8	34.1	104	68.2	75.2	80.4	86.2	90.6
2017	956	79.3	9.6	26.5	104	68.0	75.0	79.8	85.7	90.2
2018	1085	79.4	9.6	24.1	100	67.5	75.5	80.4	85.6	89.8
2019	726	80.2	8.9	35.0	104	68.7	76.2	80.6	85.6	90.5
1998-2019	16606	78.6	10.4	0.2	107	65.7	72.9	79.8	85.9	90.4

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	117	72.8	11.2	40.2	95.6	58.7	64.4	74.2	82.4	86.1
1999	123	74.2	13.4	18.1	97.1	60.7	66.8	74.8	85.1	89.4
2000	120	73.9	11.3	38.7	92.0	59.4	66.0	75.0	82.7	87.7
2001	116	74.1	13.4	34.6	99.4	55.2	66.6	76.2	83.5	89.1
2002	287	75.4	11.5	27.3	96.9	59.8	69.9	76.4	83.8	89.1
2003	278	76.1	10.5	26.2	100	62.8	70.6	76.9	83.3	89.4
2004	341	75.4	10.5	39.1	99.3	62.3	68.3	75.8	83.1	89.2
2005	328	76.8	10.0	45.1	98.2	63.1	70.4	77.4	84.5	89.8
2006	359	76.7	10.3	40.8	96.7	64.3	71.1	77.7	84.3	88.4
2007	484	76.8	10.0	37.1	98.9	64.2	70.6	77.6	84.0	88.4
2008	516	76.2	10.4	33.7	97.2	63.2	69.7	77.3	83.2	88.3
2009	644	77.2	10.3	20.3	104	65.0	71.8	78.3	84.2	88.6
2010	611	77.0	9.9	39.1	100	65.8	70.7	77.4	84.0	89.0
2011	626	77.5	9.3	25.4	98.6	66.2	72.3	78.1	83.7	88.9
2012	762	78.5	9.1	29.7	101	68.2	73.2	79.3	85.1	89.3
2013	764	78.9	8.9	42.4	98.4	69.0	73.5	79.3	84.8	89.6
2014	811	78.5	9.4	21.1	99.9	67.1	73.4	79.3	84.8	89.5
2015	682	79.4	9.0	35.7	102	68.4	74.2	80.0	85.9	89.7
2016	628	79.4	9.1	40.4	104	69.0	75.3	80.3	85.7	88.9
2017	615	78.9	9.2	26.5	102	68.0	74.5	79.4	85.0	89.2
2018	708	79.0	9.3	24.1	100	67.5	75.3	80.1	84.9	89.1
2019	480	80.2	8.4	35.0	98.9	69.5	76.7	80.7	85.2	90.0
1998-2019	10400	77.8	9.9	18.1	104	65.5	72.4	78.8	84.6	89.2

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	49	77.2	13.2	32.5	96.0	56.1	72.9	80.3	86.8	90.3
1999	84	77.1	13.1	15.3	101	59.8	72.0	79.4	85.7	89.6
2000	79	79.8	11.8	32.8	99.4	64.2	73.7	82.2	87.7	91.7
2001	57	76.7	11.8	39.7	101	63.5	70.5	77.5	86.2	87.9
2002	180	78.4	12.1	41.0	106	62.2	72.2	80.2	87.4	91.3
2003	176	78.5	11.7	35.8	96.6	63.5	71.8	80.7	87.1	92.6
2004	227	79.6	11.0	41.0	106	65.0	73.8	81.0	87.6	91.4
2005	193	79.3	12.4	37.8	102	63.7	72.3	82.4	88.6	91.8
2006	214	78.2	12.5	35.2	102	64.1	70.2	80.3	86.7	92.4
2007	333	80.0	11.4	32.9	100	65.1	73.4	82.4	87.2	93.0
2008	360	81.1	10.5	43.5	103	67.3	74.4	82.9	88.0	93.1
2009	379	81.0	10.4	39.1	102	67.8	74.1	83.4	88.6	93.0
2010	375	79.5	12.0	30.7	103	63.3	72.5	83.0	88.3	91.0
2011	379	80.0	12.0	32.6	107	64.9	73.2	82.4	88.4	92.0
2012	430	80.3	10.9	38.3	103	66.4	73.8	82.3	88.5	91.9
2013	484	80.2	10.6	21.6	104	66.7	74.0	82.0	87.9	92.0
2014	458	80.9	10.9	0.2	102	67.7	75.4	82.0	88.4	92.6
2015	403	81.3	9.8	50.1	102	68.4	76.0	82.6	88.5	92.4
2016	382	80.1	10.9	34.1	103	67.0	75.1	80.5	88.0	92.6
2017	341	79.9	10.3	37.2	104	67.7	75.4	81.0	87.1	91.2
2018	377	80.1	10.0	40.9	100	67.5	75.9	80.9	86.5	92.2
2019	246	80.1	9.8	42.2	104	67.0	75.1	80.2	86.9	92.2
1998-2019	6206	80.0	11.1	0.2	107	65.8	74.1	81.7	87.8	92.2

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			0.0	1	0.0	0.0
5-9	0	0.0	0.0			0.0			0.0
10-14	0	0.0	0.0			0.0			0.0
15-19	0	0.0	0.0			0.0			0.0
20-24	4	0.0	0.0	3	0.0	0.0	1	0.0	0.0
25-29	3	0.0	0.1	3	0.0	0.1			0.0
30-34	10	0.1	0.1	4	0.0	0.1	6	0.1	0.2
35-39	23	0.2	0.3	12	0.1	0.3	11	0.2	0.4
40-44	36	0.3	0.6	18	0.2	0.5	18	0.4	0.7
45-49	108	0.8	1.4	69	0.8	1.3	39	0.8	1.5
50-54	186	1.4	2.8	113	1.4	2.7	73	1.5	3.0
55-59	227	1.7	4.5	134	1.6	4.3	93	1.9	4.9
60-64	455	3.4	7.9	295	3.5	7.8	160	3.2	8.1
65-69	976	7.4	15.3	645	7.7	15.6	331	6.7	14.8
70-74	1904	14.3	29.6	1344	16.1	31.7	560	11.3	26.1
75-79	2638	19.9	49.5	1821	21.9	53.5	817	16.5	42.7
80-84	2837	21.4	70.9	1869	22.4	76.0	968	19.6	62.2
85+	3870	29.1	100.0	2001	24.0	100.0	1869	37.8	100.0
All ages	13278	100.0		8331	100.0		4947	100.0	

Table 5

Age-specific incidence 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 Prop.all cancers n=143063 %	Females Prop.all cancers n=144724 %
0- 4		1		0.1		0.6
5- 9						
10-14						
15-19						
20-24	3	1	0.2	0.1	0.5	0.2
25-29	3		0.1		0.3	
30-34	4	6	0.2	0.3	0.3	0.3
35-39	12	11	0.6	0.5	0.7	0.3
40-44	17	18	0.7	0.8	0.7	0.3
45-49	68	39	2.7	1.6	1.4	0.4
50-54	108	73	4.6	3.2	1.4	0.6
55-59	130	87	6.7	4.4	1.1	0.7
60-64	283	154	17.4	8.8	1.7	1.1
65-69	619	322	40.7	19.1	2.7	1.8
70-74	1254	536	89.5	33.4	4.9	2.9
75-79	1694	784	153.0	56.9	7.7	4.3
80-84	1723	917	262.4	94.2	12.2	6.5
85+	1825	1760	428.0	182.3	18.6	11.4
All ages	7743	4709			5.4	3.3
Incidence						
Raw			25.7	15.1		
WS			9.5	4.1		
ES			16.2	6.8		
BRD-S			24.1	9.8		

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).

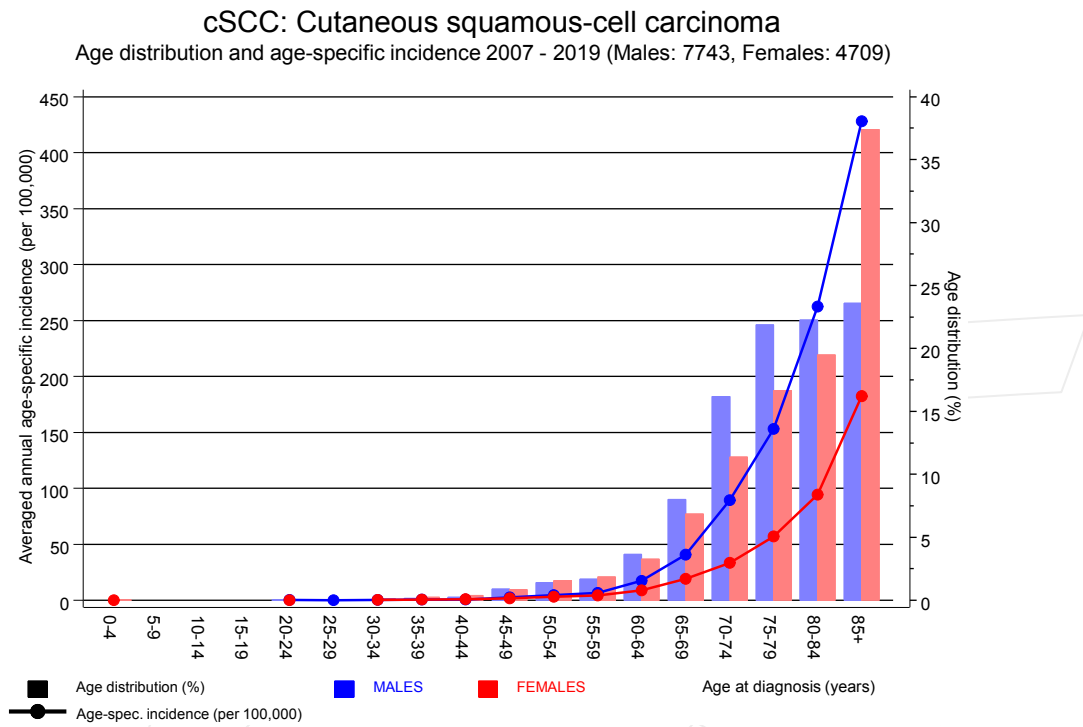


Figure 6. Age distribution (males: mean=78.2 yrs, median=79.1 yrs; females: mean=80.2 yrs, median=81.8 yrs) and age-specific incidence.

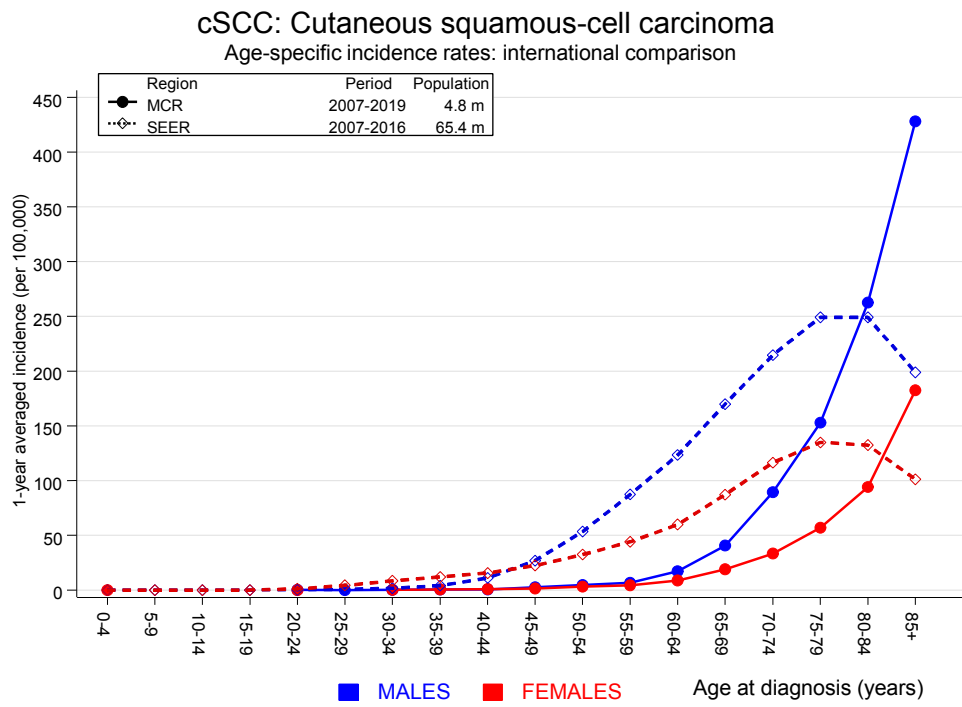


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C00 Lip	15	0.8	19.2	10.8	31.7 #	5.1	
C03–C06 Oral cavity	19	3.4	5.6	3.4	8.8 #	5.7	5.3
C07–C08 Salivary gland	39	1.7	22.3	15.9	30.5 #	13.5	7.7
C09–C10 Oropharynx	17	3.7	4.6	2.7	7.4 #	4.8	5.9
C12–C13 Hypopharynx	12	2.0	6.1	3.2	10.7 #	3.6	33.3
C15 Oesophagus	32	9.9	3.2	2.2	4.6 #	8.0	6.3
C16 Stomach	69	29.0	2.4	1.9	3.0 #	14.5	7.2
C17 Small intestine	10	3.6	2.8	1.3	5.1 #	2.3	10.0
C18 Colon	148	68.4	2.2	1.8	2.5 #	28.8	12.2
C19–C20 Rectum	52	30.2	1.7	1.3	2.3 #	7.9	3.8
C21 Anus/canal	5	1.4	3.7	1.2	8.6 #	1.3	20.0
C22 Liver	44	16.8	2.6	1.9	3.5 #	9.9	18.2
C23–C24 Bile	16	7.2	2.2	1.3	3.6 #	3.2	12.5
C25 Pancreas	64	27.1	2.4	1.8	3.0 #	13.4	23.4
C26 GI cancer	4	1.2	3.4	0.9	8.6	1.0	100.0
C30–C31 Sinuses	4	1.0	4.0	1.1	10.2 #	1.1	
C32 Larynx	20	4.7	4.2	2.6	6.5 #	5.5	10.0
C33–C34 Lung	192	68.6	2.8	2.4	3.2 #	44.7	21.4
C38,C45 Mesothelioma	11	4.5	2.4	1.2	4.4 #	2.4	9.1
C43 Malign. melanoma	203	26.0	7.8	6.8	9.0 #	64.1	2.5
C46,C49 Soft tissue	15	3.9	3.8	2.1	6.3 #	4.0	
C50 Breast	4	1.7	2.3	0.6	5.9	0.8	
C60 Penis	8	1.7	4.6	2.0	9.1 #	2.3	
C61 Prostate	282	165.5	1.7	1.5	1.9 #	42.2	17.0
C64 Kidney	33	19.1	1.7	1.2	2.4 #	5.0	3.0
C67 Bladder	66	37.1	1.8	1.4	2.3 #	10.5	18.2
C69 Eye carcinoma	8	0.3	27.2	11.7	53.6 #	2.8	
C73 Thyroid	6	2.6	2.3	0.8	5.0	1.2	16.7
C76–C79 CUP	42	12.1	3.5	2.5	4.7 #	10.8	9.5
C81 Hodgkin lymphoma	8	1.2	6.8	2.9	13.3 #	2.5	12.5
C82–C85 NHL	110	28.9	3.8	3.1	4.6 #	29.4	20.0
C90 Mult. myeloma	14	9.0	1.6	0.9	2.6	1.8	28.6
C91–C96 Leukaemia	30	11.6	2.6	1.8	3.7 #	6.7	53.3
Others, specified	29	18.2	1.6	1.1	2.3 #	3.9	31.0
Not observed	0	0.9	0.0	0.0	3.9	-0.3	
All further malignancies	1631	624.9	2.6	2.5	2.7 #	364.3	14.3

Patients	8162
Median age at next malignancy (years)	79.1
Person-years	27618
Mean observation time (years)	3.4
Median observation time (years)	2.1

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 3 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

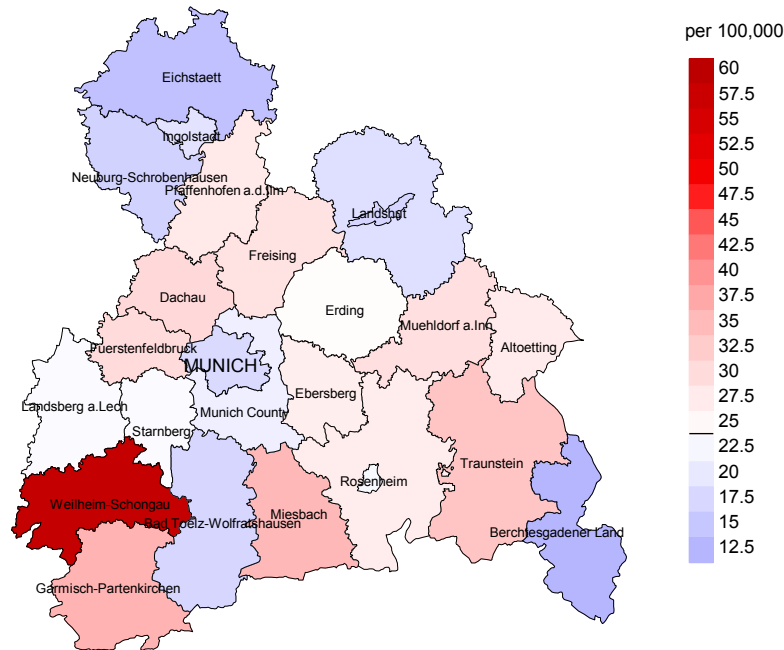
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	4	0.3	15.0	4.1	38.3 #	2.3	
C03–C06 Oral cavity	6	1.2	4.8	1.8	10.5 #	2.9	16.7
C07–C08 Salivary gland	13	0.5	27.6	14.7	47.1 #	7.7	7.7
C09–C10 Oropharynx	2	0.6	3.3	0.4	12.1	0.9	50.0
C15 Oesophagus	6	1.5	3.9	1.4	8.5 #	2.7	
C16 Stomach	29	11.4	2.5	1.7	3.7 #	10.8	6.9
C17 Small intestine	4	1.2	3.4	0.9	8.8	1.7	
C18 Colon	69	31.3	2.2	1.7	2.8 #	23.0	7.2
C19–C20 Rectum	9	11.1	0.8	0.4	1.5	-1.3	
C21 Anus/canal	7	1.3	5.4	2.2	11.2 #	3.5	42.9
C22 Liver	11	3.6	3.1	1.5	5.5 #	4.5	18.2
C23–C24 Bile	8	4.6	1.7	0.7	3.4	2.1	25.0
C25 Pancreas	33	15.1	2.2	1.5	3.1 #	10.9	39.4
C30–C31 Sinuses	3	0.4	7.6	1.6	22.3 #	1.6	
C33–C34 Lung	50	16.0	3.1	2.3	4.1 #	20.8	32.0
C43 Malign. melanoma	70	8.2	8.5	6.6	10.8 #	37.8	5.7
C44 Skin others	4	0.0	106.2	28.9	272.0 #	2.4	
C46,C49 Soft tissue	5	1.5	3.4	1.1	7.8 #	2.1	
C48 Peritoneal	6	0.8	7.8	2.8	16.9 #	3.2	16.7
C50 Breast	175	63.2	2.8	2.4	3.2 #	68.4	14.9
C51 Vulva	8	3.4	2.4	1.0	4.7 #	2.8	12.5
C52 Vagina	3	0.6	5.3	1.1	15.4 #	1.5	
C53 Cervix uteri	7	2.5	2.8	1.1	5.9 #	2.8	28.6
C54 Corpus uteri	24	11.6	2.1	1.3	3.1 #	7.6	4.2
C55,C57 Fem. genitals un	4	1.0	3.9	1.1	10.1 #	1.8	75.0
C56 Ovary	10	9.3	1.1	0.5	2.0	0.4	20.0
C64 Kidney	21	5.8	3.6	2.2	5.5 #	9.3	33.3
C66 Ureter	3	0.5	6.4	1.3	18.7 #	1.5	
C67 Bladder	10	7.0	1.4	0.7	2.6	1.8	30.0
C68 Urinary org.	2	0.2	10.0	1.2	36.2 #	1.1	
C70–C72 CNS cancer	7	2.9	2.4	1.0	5.0	2.5	57.1
C73 Thyroid	7	2.2	3.3	1.3	6.7 #	3.0	
C76–C79 CUP	19	6.7	2.9	1.7	4.5 #	7.5	10.5
C82–C85 NHL	47	10.8	4.4	3.2	5.8 #	22.2	21.3
C90 Mult. myeloma	6	3.4	1.8	0.7	3.9	1.6	50.0
C91–C96 Leukaemia	17	4.4	3.8	2.2	6.1 #	7.7	64.7
Others, specified	6	2.1	2.9	1.1	6.3 #	2.4	16.7
Not observed	0	3.7	0.0	0.0	1.0	-2.2	
All further malignancies	715	251.7	2.8	2.6	3.1 #	283.4	17.8

Patients	5217
Median age at next malignancy (years)	82.4
Person-years	16344
Mean observation time (years)	3.1
Median observation time (years)	1.9

The occurrence of further specified malignancy is statistically significant.

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

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



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

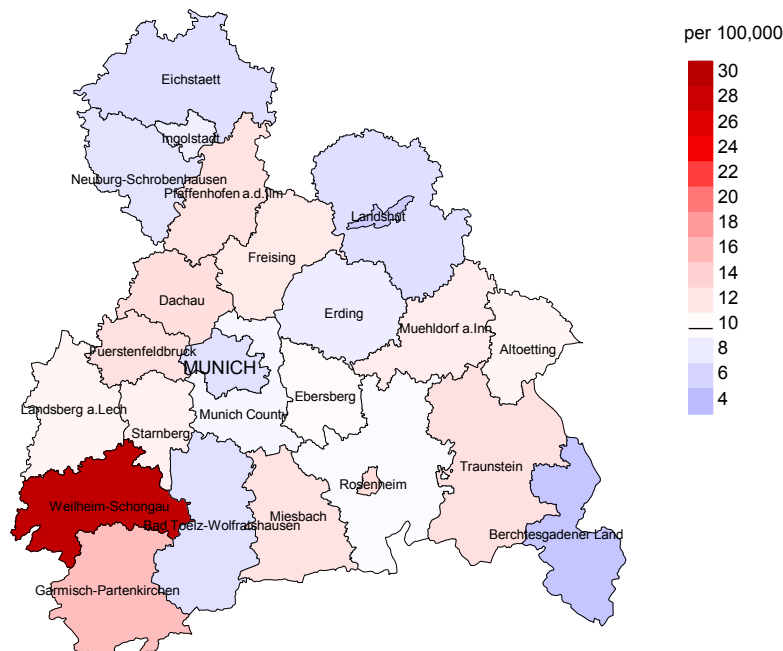
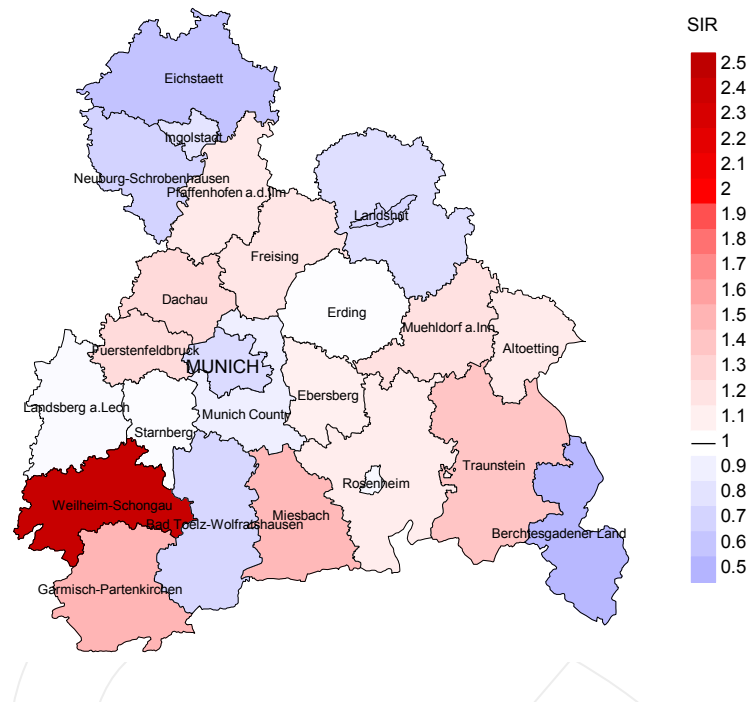


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 24.1/100,000 WS N=7,743, females 9.8/100,000 WS N=4,709).

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 141 women were identified with newly diagnosed squamous-cell carcinoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 10.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 8.0 and 12.7/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

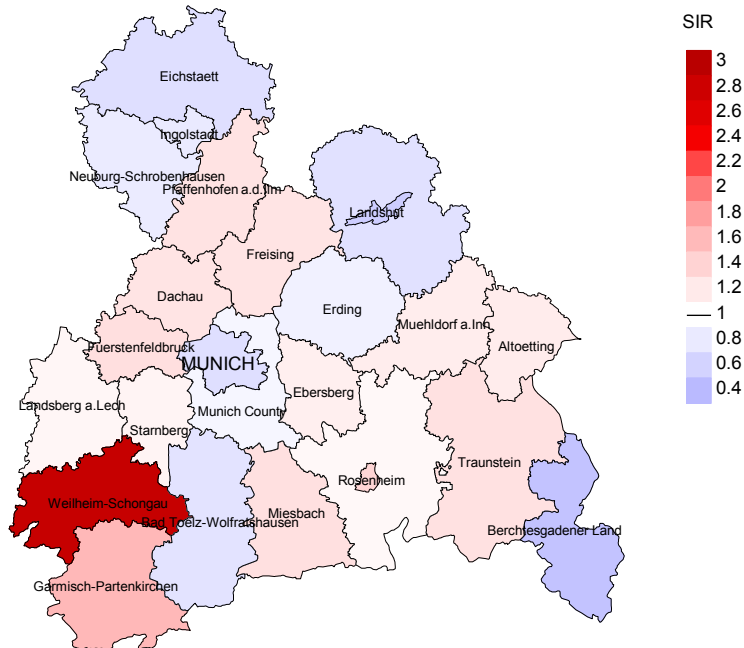


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=7,743, females N=4,709).

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 141 women were identified with newly diagnosed squamous-cell carcinoma. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.14. Though, the value of this parameter may vary with an underlying probability of 99% between 0.91 and 1.41, and is therefore not statistically striking.

MORTALITY

Table 9a

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

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

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	166	94.0	131	78.9	93.1
1999	207	95.2	164	79.2	91.5
2000	199	98.0	166	83.4	94.6
2001	173	96.5	137	79.2	91.2
2002	467	97.0	384	82.2	95.1
2003	454	97.6	360	79.3	94.2
2004	568	97.9	444	78.2	96.4
2005	521	96.0	404	77.5	96.3
2006	573	95.3	416	72.6	95.7
2007	817	92.7	583	71.4	95.9
2008	876	98.7	620	70.8	94.7
2009	1023	98.5	711	69.5	94.0
2010	986	98.8	656	66.5	94.8
2011	1005	98.4	616	61.3	93.3
2012	1192	98.3	716	60.1	92.3
2013	1248	97.0	672	53.8	89.9
2014	1269	96.4	640	50.4	86.9
2015	1085	97.1	512	47.2	84.8
2016	1010	98.0	376	37.2	79.8
2017	956	99.0	239	25.0	63.2
2018	1085	98.0	180	16.6	58.3
2019	726	65.7	94	12.9	81.9
1998-2019	16606	96.0	9221	55.5	90.8

Table 9b

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

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

Year of diagnosis/ death	Incident cases n	Deaths n	Deaths in same year n	Prop. deaths in same year %
1998	166	53	4	2.4
1999	207	57	9	4.3
2000	199	64	5	2.5
2001	173	86	18	10.4
2002	467	110	20	4.3
2003	454	152	21	4.6
2004	568	189	23	4.0
2005	521	199	37	7.1
2006	573	227	24	4.2
2007	817	281	44	5.4
2008	876	334	48	5.5
2009	1023	329	44	4.3
2010	986	391	52	5.3
2011	1005	452	45	4.5
2012	1192	501	63	5.3
2013	1248	573	83	6.7
2014	1269	588	66	5.2
2015	1085	684	79	7.3
2016	1010	665	54	5.3
2017	956	767	65	6.8
2018	1085	508	44	4.1
2019	726	461	41	5.6
1998-2019	16606	7671	889	5.4

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	53	45.3	54.7	61.2
1999	57	28.1	71.9	51.9
2000	64	40.6	59.4	54.0
2001	86	33.7	66.3	55.7
2002	110	41.8	58.2	49.1
2003	152	40.1	59.9	44.1
2004	189	39.7	60.3	51.1
2005	199	38.7	61.3	46.7
2006	227	40.5	59.5	46.1
2007	281	38.4	61.6	50.5
2008	334	28.7	71.3	36.4
2009	329	28.9	71.1	40.9
2010	391	35.5	64.5	42.4
2011	452	31.6	68.4	39.2
2012	501	35.1	64.9	42.7
2013	573	32.1	67.9	40.2
2014	588	31.1	68.9	37.0
2015	684	28.4	71.6	37.1
2016	665	31.0	69.0	39.2
2017	767	28.2	71.8	39.5
2018	508	11.0	89.0	31.1
2019	461	15.2	84.8	43.2
1998–2019	7671	30.1	69.9	41.2

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	39	84.7	77.4	88.5	80.1
1999	37	85.6	82.1	85.8	82.1
2000	40	86.6	82.2	87.1	83.9
2001	53	81.1	80.2	82.3	78.8
2002	59	83.2	80.6	84.6	86.3
2003	97	82.6	78.3	86.3	79.1
2004	113	84.3	79.1	87.4	81.4
2005	116	83.4	78.5	84.2	78.8
2006	146	82.1	77.4	86.1	78.5
2007	162	83.8	80.0	85.3	81.3
2008	211	85.0	80.3	86.8	80.5
2009	180	84.3	81.5	85.7	83.7
2010	233	84.9	81.6	86.6	82.2
2011	263	85.0	80.9	86.8	81.1
2012	281	84.5	81.4	85.6	81.4
2013	344	85.5	82.4	87.6	83.8
2014	376	85.7	83.1	86.9	84.2
2015	413	85.2	83.1	85.9	83.3
2016	430	84.8	83.2	86.6	83.4
2017	482	85.8	83.5	86.9	84.0
2018	318	86.0	82.2	87.2	82.5
2019	304	86.1	86.2	86.1	85.2
1998-2019	4697	85.0	81.7	86.5	82.6

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	14	88.6	87.4	89.8	88.1
1999	20	85.1	83.7	85.2	83.8
2000	24	86.7	81.0	90.7	81.8
2001	33	87.2	86.4	88.1	87.0
2002	51	87.2	83.3	89.3	83.6
2003	55	88.4	87.5	89.8	88.1
2004	76	86.1	80.3	90.2	81.6
2005	83	87.1	83.5	89.9	84.3
2006	81	89.2	88.7	89.3	88.6
2007	119	89.4	87.0	90.2	87.3
2008	123	90.3	84.1	91.5	88.2
2009	149	88.8	87.5	89.0	87.9
2010	158	89.8	87.8	90.6	86.2
2011	189	89.2	85.9	89.9	87.2
2012	220	88.5	83.7	89.7	85.2
2013	229	89.1	84.5	90.1	86.4
2014	212	89.8	84.7	90.8	85.7
2015	271	89.7	84.8	90.7	86.1
2016	235	89.9	88.0	90.3	89.0
2017	285	89.7	86.9	90.2	87.0
2018	190	89.3	84.0	89.9	84.6
2019	157	89.2	85.3	89.7	84.4
1998-2019	2974	89.3	85.7	90.1	86.5

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	18	1.6	0.17	0.9	0.15	1.5	0.17	2.4	0.19
1999	9	0.8	0.08	0.4	0.07	0.7	0.07	1.0	0.07
2000	16	1.4	0.14	0.7	0.13	1.3	0.14	1.8	0.13
2001	22	1.9	0.20	0.9	0.18	1.7	0.19	2.8	0.22
2002	28	1.5	0.10	0.8	0.10	1.4	0.11	1.9	0.10
2003	45	2.4	0.17	1.2	0.17	2.1	0.17	3.0	0.17
2004	47	2.5	0.15	1.2	0.15	2.1	0.15	3.0	0.15
2005	51	2.7	0.16	1.2	0.16	2.2	0.17	3.1	0.16
2006	67	3.5	0.19	1.5	0.19	2.7	0.19	3.9	0.19
2007	70	3.2	0.15	1.3	0.15	2.4	0.16	3.5	0.16
2008	70	3.1	0.14	1.3	0.14	2.3	0.15	3.4	0.15
2009	60	2.7	0.10	1.1	0.10	2.0	0.10	2.8	0.10
2010	91	4.0	0.16	1.6	0.15	2.7	0.16	4.0	0.16
2011	97	4.3	0.17	1.6	0.16	2.9	0.17	4.4	0.17
2012	115	5.1	0.16	1.8	0.16	3.3	0.17	5.0	0.17
2013	133	5.8	0.19	2.0	0.18	3.6	0.19	5.5	0.19
2014	133	5.7	0.18	1.9	0.16	3.5	0.18	5.2	0.18
2015	134	5.6	0.21	1.8	0.20	3.3	0.21	5.0	0.21
2016	165	6.9	0.28	2.2	0.27	3.9	0.28	6.0	0.28
2017	152	6.3	0.26	1.8	0.23	3.5	0.25	5.2	0.25
2018	47	1.9	0.07	0.5	0.05	0.9	0.06	1.6	0.07
2019	50	2.1	0.11	0.6	0.11	1.2	0.12	1.7	0.11
1998-2019	1620	3.7	0.17	1.4	0.16	2.5	0.17	3.8	0.17

Table 11b

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	6	0.5	0.13	0.1	0.07	0.2	0.09	0.3	0.10
1999	7	0.6	0.09	0.2	0.07	0.3	0.08	0.4	0.08
2000	10	0.8	0.13	0.2	0.12	0.4	0.12	0.6	0.14
2001	8	0.7	0.14	0.2	0.13	0.3	0.13	0.4	0.11
2002	19	1.0	0.11	0.2	0.09	0.4	0.09	0.7	0.10
2003	16	0.8	0.09	0.3	0.09	0.4	0.09	0.5	0.09
2004	29	1.5	0.13	0.4	0.13	0.7	0.13	1.1	0.13
2005	29	1.5	0.15	0.4	0.12	0.6	0.14	1.0	0.15
2006	26	1.3	0.12	0.3	0.08	0.5	0.09	0.7	0.09
2007	38	1.6	0.12	0.4	0.10	0.7	0.11	1.0	0.11
2008	27	1.2	0.08	0.3	0.07	0.5	0.08	0.8	0.08
2009	36	1.5	0.10	0.3	0.08	0.6	0.09	0.9	0.09
2010	51	2.2	0.14	0.5	0.10	0.8	0.11	1.2	0.12
2011	49	2.1	0.13	0.5	0.12	0.9	0.12	1.2	0.12
2012	64	2.7	0.16	0.7	0.15	1.2	0.15	1.7	0.15
2013	54	2.3	0.12	0.5	0.09	0.9	0.10	1.4	0.11
2014	52	2.2	0.12	0.5	0.11	0.9	0.11	1.3	0.11
2015	64	2.6	0.17	0.5	0.14	1.0	0.15	1.5	0.16
2016	46	1.9	0.13	0.4	0.09	0.7	0.10	0.9	0.10
2017	68	2.8	0.21	0.6	0.18	1.1	0.19	1.5	0.18
2018	14	0.6	0.04	0.1	0.03	0.2	0.03	0.3	0.04
2019	25	1.0	0.10	0.2	0.08	0.4	0.09	0.6	0.09
1998-2019	738	1.6	0.12	0.4	0.10	0.7	0.11	1.0	0.11

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									
20-24	1	0.1	0.1	1	0.1	0.1			0.0
25-29	0	0.0	0.1			0.1			0.0
30-34	0	0.0	0.1			0.1			0.0
35-39	1	0.1	0.1	1	0.1	0.2			0.0
40-44	3	0.2	0.3	1	0.1	0.2	2	0.3	0.3
45-49	5	0.3	0.5	2	0.2	0.4	3	0.5	0.9
50-54	16	0.8	1.4	11	0.8	1.2	5	0.9	1.7
55-59	29	1.5	2.9	21	1.6	2.8	8	1.4	3.1
60-64	41	2.2	5.0	28	2.1	4.9	13	2.2	5.3
65-69	80	4.2	9.2	58	4.4	9.3	22	3.7	9.0
70-74	164	8.6	17.8	134	10.2	19.5	30	5.1	14.1
75-79	339	17.8	35.6	251	19.1	38.6	88	15.0	29.1
80-84	399	20.9	56.6	298	22.6	61.2	101	17.2	46.3
85+	827	43.4	100.0	511	38.8	100.0	316	53.7	100.0
All ages	1905	100.0		1317	100.0		588	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		Females		Males		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24	1		0.1	0.33			1.5	
25-29								
30-34								
35-39	1		0.0	0.08			0.4	
40-44	1	2	0.0	0.06	0.1	0.11	0.2	0.2
45-49	2	3	0.1	0.03	0.1	0.08	0.1	0.2
50-54	11	5	0.5	0.10	0.2	0.07	0.4	0.2
55-59	21	8	1.1	0.16	0.4	0.09	0.5	0.2
60-64	28	13	1.7	0.10	0.7	0.08	0.5	0.3
65-69	58	22	3.8	0.09	1.3	0.07	0.7	0.3
70-74	134	30	9.6	0.11	1.9	0.06	1.2	0.4
75-79	251	88	22.7	0.15	6.4	0.11	2.2	1.0
80-84	298	101	45.4	0.17	10.4	0.11	3.2	1.2
85+	511	316	119.8	0.28	32.7	0.18	6.2	2.9
All ages	1317	588					2.1	1.0
Mortality								
Raw			4.4	0.17	1.9	0.12		
WS			1.5	0.16	0.4	0.10		
ES			2.7	0.17	0.8	0.11		
BRD-S			4.1	0.17	1.1	0.11		
PYLL-70								
per 100,000			3.6		1.8			
ES			3.1		1.4			
AYLL-70			7.8		8.7			

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	13	0.5	3	23.1	2	15.4	8	61.5
C03–C06 Oral cavity	38	1.4	17	44.7	3	7.9	18	47.4
C07–C08 Salivary gland	39	1.5	8	20.5	5	12.8	26	66.7
C09–C10 Oropharynx	35	1.3	18	51.4	4	11.4	13	37.1
C12–C13 Hypopharynx	14	0.5	7	50.0	1	7.1	6	42.9
C15 Oesophagus	24	0.9	4	16.7	1	4.2	19	79.2
C16 Stomach	58	2.2	11	19.0	4	6.9	43	74.1
C17 Small intestine	8	0.3	4	50.0			4	50.0
C18 Colon	119	4.5	49	41.2	6	5.0	64	53.8
C19–C20 Rectum	71	2.7	35	49.3	3	4.2	33	46.5
C21 Anus/canal	5	0.2	1	20.0	2	40.0	2	40.0
C22 Liver	45	1.7	9	20.0			36	80.0
C23–C24 Bile	11	0.4	3	27.3	1	9.1	7	63.6
C25 Pancreas	55	2.1	7	12.7	2	3.6	46	83.6
C26 GI cancer	5	0.2	2	40.0			3	60.0
C32 Larynx	25	0.9	12	48.0	4	16.0	9	36.0
C33–C34 Lung	194	7.3	24	12.4	8	4.1	162	83.5
C38,C45 Mesothelioma	11	0.4	2	18.2	1	9.1	8	72.7
C43 Malign. melanoma	121	4.6	47	38.8	18	14.9	56	46.3
C44 Skin others	970	36.5	1	0.1	175	18.0	794	81.9
C46,C49 Soft tissue	17	0.6	8	47.1	1	5.9	8	47.1
C50 Breast	5	0.2	2	40.0			3	60.0
C60 Penis	7	0.3	3	42.9			4	57.1
C61 Prostate	296	11.1	197	66.6	5	1.7	94	31.8
C62 Testis	5	0.2	4	80.0			1	20.0
C64 Kidney	37	1.4	24	64.9	2	5.4	11	29.7
C67 Bladder	66	2.5	30	45.5	1	1.5	35	53.0
C69 Eye carcinoma	7	0.3	1	14.3	1	14.3	5	71.4
C70–C72 CNS cancer	5	0.2	1	20.0			4	80.0
C73 Thyroid	6	0.2	3	50.0			3	50.0
C76–C79 CUP	33	1.2	3	9.1	1	3.0	29	87.9
C81 Hodgkin lymphoma	14	0.5	6	42.9	1	7.1	7	50.0
C82–C85 NHL	227	8.5	143	63.0	10	4.4	74	32.6
C90 Mult. myeloma	19	0.7	10	52.6			9	47.4
C91–C96 Leukaemia	30	1.1	7	23.3	3	10.0	20	66.7
Others, specified	24	0.9	6	25.0	2	8.3	16	66.7
All further malignancies	2659	100.0	712	26.8	267	10.0	1680	63.2

Further malignancies with number of cases 1 to 4 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	1	50.0	1	50.0		
C03–C06 Oral cavity	6	0.7	5	83.3			1	16.7
C07–C08 Salivary gland	8	0.9	1	12.5	1	12.5	6	75.0
C09–C10 Oropharynx	6	0.7	4	66.7			2	33.3
C12–C13 Hypopharynx	2	0.2	2	100.0				
C15 Oesophagus	3	0.3					3	100.0
C16 Stomach	23	2.5	7	30.4	1	4.3	15	65.2
C18 Colon	44	4.8	16	36.4	1	2.3	27	61.4
C19–C20 Rectum	13	1.4	9	69.2			4	30.8
C21 Anus/canal	6	0.7	3	50.0			3	50.0
C22 Liver	13	1.4	3	23.1	1	7.7	9	69.2
C23–C24 Bile	8	0.9			1	12.5	7	87.5
C25 Pancreas	27	3.0					27	100.0
C30–C31 Sinuses	5	0.5	2	40.0	2	40.0	1	20.0
C33–C34 Lung	53	5.8	12	22.6	2	3.8	39	73.6
C43 Malign. melanoma	41	4.5	19	46.3	4	9.8	18	43.9
C44 Skin others	291	31.8	1	0.3	46	15.8	244	83.8
C46,C49 Soft tissue	5	0.5	4	80.0			1	20.0
C48 Peritoneal	5	0.5					5	100.0
C50 Breast	134	14.6	84	62.7	5	3.7	45	33.6
C51 Vulva	7	0.8	3	42.9	2	28.6	2	28.6
C52 Vagina	2	0.2	1	50.0			1	50.0
C53 Cervix uteri	9	1.0	5	55.6			4	44.4
C54 Corpus uteri	34	3.7	18	52.9	2	5.9	14	41.2
C55,C57 Fem. genitals un	2	0.2					2	100.0
C56 Ovary	21	2.3	10	47.6	1	4.8	10	47.6
C64 Kidney	14	1.5	2	14.3	1	7.1	11	78.6
C66 Ureter	5	0.5	2	40.0			3	60.0
C67 Bladder	11	1.2	7	63.6	1	9.1	3	27.3
C68 Urinary org.	2	0.2					2	100.0
C70–C72 CNS cancer	9	1.0	1	11.1	1	11.1	7	77.8
C73 Thyroid	3	0.3	1	33.3			2	66.7
C76–C79 CUP	12	1.3					12	100.0
C81 Hodgkin lymphoma	3	0.3	2	66.7	1	33.3		
C82–C85 NHL	62	6.8	33	53.2	3	4.8	26	41.9
C90 Mult. myeloma	4	0.4	1	25.0			3	75.0
C91–C96 Leukaemia	15	1.6	2	13.3			13	86.7
Others, specified	5	0.5	2	40.0	1	20.0	2	40.0
All further malignancies	915	100.0	263	28.7	78	8.5	574	62.7

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

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

Table 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								
20-24	1		0.1	0.33			1.7	
25-29								
30-34								
35-39	1		0.0	0.11			0.4	
40-44	1	1	0.0	0.07	0.0	0.08	0.2	0.1
45-49		1			0.0	0.03		0.1
50-54	6	4	0.3	0.07	0.2	0.07	0.3	0.2
55-59	14	3	0.7	0.16	0.2	0.05	0.4	0.1
60-64	14	6	0.9	0.07	0.3	0.05	0.3	0.2
65-69	18	9	1.2	0.05	0.5	0.04	0.3	0.2
70-74	50	12	3.6	0.08	0.7	0.04	0.6	0.2
75-79	76	44	6.9	0.10	3.2	0.10	0.9	0.6
80-84	125	46	19.0	0.17	4.7	0.08	1.8	0.7
85+	214	154	50.2	0.26	16.0	0.14	3.6	1.8
All ages	520	280					1.0	0.6
Mortality								
Raw			1.7	0.14	0.9	0.10		
WS			0.6	0.12	0.2	0.08		
ES			1.1	0.13	0.4	0.08		
BRD-S			1.6	0.14	0.5	0.09		
PYLL-70								
per 100,000			2.0		0.9			
ES			1.8		0.7			
AYLL-70			9.8		9.4			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age- spec. mortal.	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								
20-24	1		0.1	0.33			1.7	
25-29								
30-34								
35-39								
40-44	1	1	0.0	0.08	0.0	0.09	0.2	0.1
45-49								
50-54	2	2	0.1	0.03	0.1	0.04	0.1	0.1
55-59	8		0.4	0.12			0.2	
60-64	4	2	0.2	0.03	0.1	0.02	0.1	0.1
65-69	4	4	0.3	0.01	0.2	0.03	0.1	0.1
70-74	19	6	1.4	0.04	0.4	0.03	0.2	0.1
75-79	19	17	1.7	0.03	1.2	0.05	0.2	0.3
80-84	41	17	6.2	0.07	1.7	0.04	0.6	0.3
85+	80	73	18.8	0.13	7.6	0.08	1.5	0.9
All ages	179	122					0.4	0.3
Mortality								
Raw			0.6	0.06	0.4	0.05		
WS			0.2	0.06	0.1	0.04		
ES			0.4	0.06	0.2	0.04		
BRD-S			0.6	0.06	0.2	0.05		
PYLL-70								
per 100,000			0.9		0.3			
ES			0.9		0.3			
AYLL-70			12.5		9.7			

* See corresponding tables with multiple malignancies.

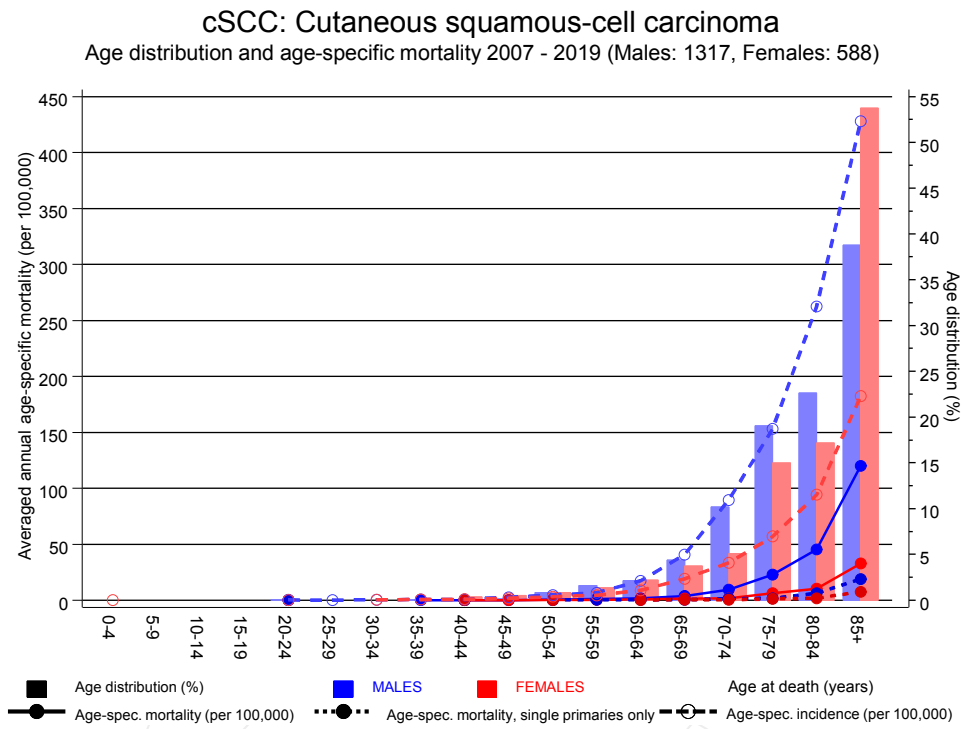
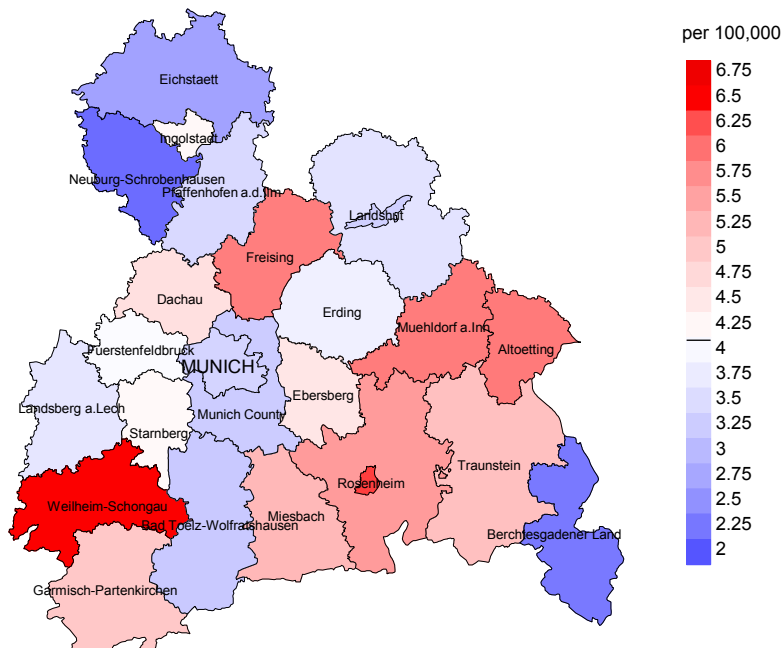


Figure 17. Distribution of age at death (bars; males: mean=77.8 yrs, median=78.7 yrs; females: mean=80.7 yrs, median=82.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

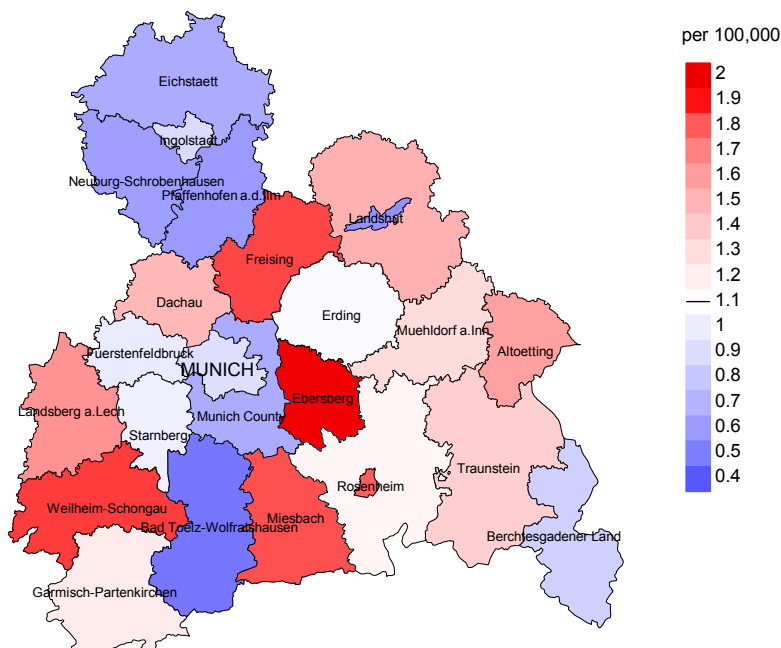
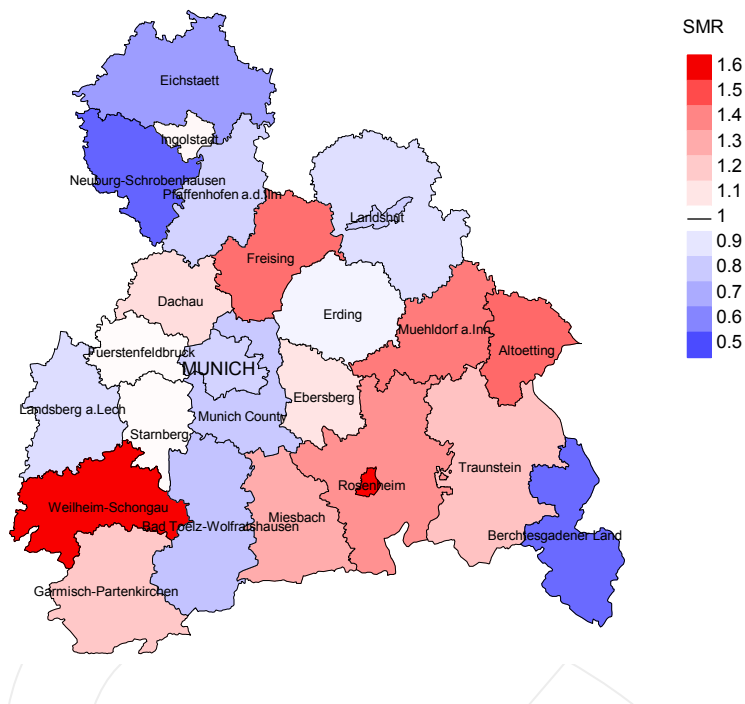


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 4.1/100,000 WS N=1,317, females 1.1/100,000 WS N=588).

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 26 women died from squamous-cell carcinoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 3.3/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

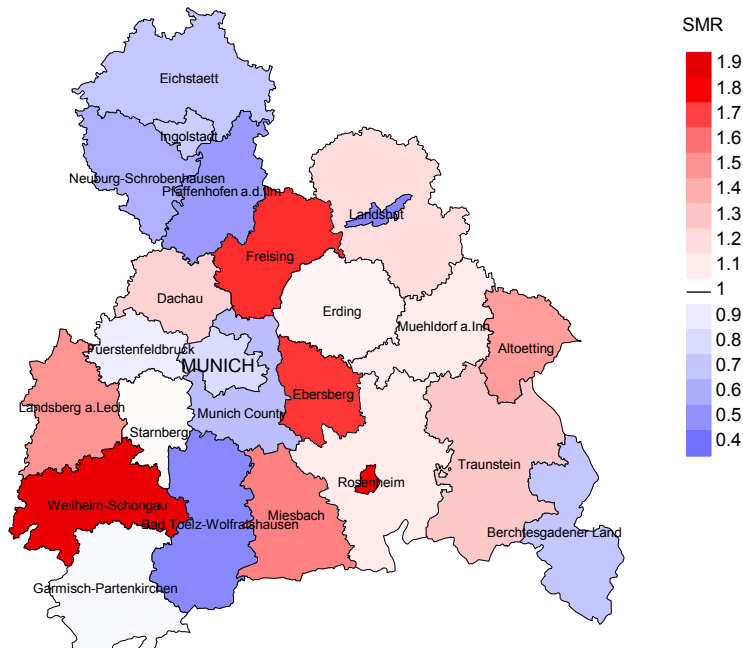


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,317, females N=588).

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 26 women died from squamous-cell carcinoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.72. Though, the value of this parameter may vary with an underlying probability of 99% between 0.97 and 2.79, 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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