Munich Cancer Registry

- Survival
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cSCC: Squamous-cell skin ca.

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	14,787
Diseases	17,761
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bCSCC_E-cSCC-Squamous-cell-skin-ca.-incidence-and-mortality.pdf

Index of figures and tables

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

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

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

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

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

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

Munich Cancer Registry, December 2021

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

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

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

ICD-10 codes (ICD-10 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
8035/3	Carcinoma with osteoclast-like giant cells
8051/3	Verrucous carcinoma
8070/2	Squamous cell carcinoma in situ (Morbus Bowen)
8070/3	Squamous cell carcinoma, NOS
8071/3	Keratoacanthoma
8074/3	Spindle cell SCC
8075/3	Acantholytic SCC
8082/3	Lymphoepithelioma-like carcinoma
8084/3	Clear cell SCC
8560/3	Adenosquamous carcinoma

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	163	20.2	30.2	80.4	94.5
1999	206	25.5	30.1	82.5	95.6
2000	201	24.0	30.0	86.1	99.0
2001	171	25.2	30.0	80.7	97.1
2002	445	25.3	29.9	83.6	97.3 #
2003	434	26.3	29.7	80.4	97.9
2004	553	26.6	29.4	80.8	98.2
2005	513	27.1	29.1	80.1	96.7
2006	568	27.9	28.9	75.0	95.8
2007	792	29.1	28.5	74.0	93.7 #
2008	878	30.4	28.2	73.8	98.7
2009	1027	31.8	27.4	72.9	98.6
2010	974	33.1	26.6	68.9	98.8
2011	998	34.3	25.8	65.7	98.6
2012	1187	35.6	24.8	64.3	98.3
2013	1249	36.7	23.8	59.2	97.6
2014	1290	37.7	22.7	54.7	96.9
2015	1121	39.1	20.9	54.7	97.3
2016	1082	39.7	18.8	45.6	97.7
2017	1040	40.5	16.4	35.4	99.1
2018	1251	41.6	14.6	28.5	98.3
2019	940	42.2	10.9	20.2	99.4
2020	678	42.9	7.0	14.3	98.5 ##
1998-2020	17761	42.9	30.2	57.7	97.8

17,761 cases diagnosed 1998-2020 are related to a total of 14,787 patients. Currently, in 7,893 (53.4 %) of these 14,787 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 4,323 / 1,919 / 1,651 (29.2 % / 13.0 % / 11.2 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 1,251 cases has been diagnosed, of which 41.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 14.6 % 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	114	69.9	19.3	33.5	78.9	92.1
1999	124	60.2	23.9	33.3	86.3	96.8
2000	119	59.2	23.5	33.3	84.9	99.2
2001	114	66.7	25.9	33.2	81.6	97.4
2002	268	60.2	26.7	33.2	85.4	97.8 #
2003	266	61.3	28.2	32.9	82.7	97.7
2004	334	60.4	29.2	32.5	81.4	98.5
2005	322	62.8	29.8	32.1	81.4	97.2
2006	357	62.9	30.7	31.8	77.3	96.6
2007	464	58.6	32.3	31.3	74.6	94.8 #
2008	519	59.1	33.6	30.9	73.8	98.8
2009	649	63.2	35.2	30.0	73.7	98.9
2010	598	61.4	36.8	29.0	69.7	99.2
2011	618	61.9	38.1	28.1	64.4	99.0
2012	759	63.9	39.5	26.9	65.0	98.9
2013	759	60.8	41.0	25.7	60.3	97.5
2014	826	64.0	41.9	24.4	54.4	97.2
2015	710	63.3	43.2	22.6	56.5	96.9
2016	671	62.0	43.9	20.7	48.4	97.9
2017	669	64.3	44.7	17.8	37.5	99.0
2018	808	64.6	45.9	16.1	31.1	98.5
2019	617	65.6	46.7	11.7	20.6	99.5
2020	428	63.1	47.4	7.6	15.4	98.4 ##
1998-2020	11113	62.6	47.4	33.5	58.4	98.0

11,113 cases diagnosed 1998-2020 are related to a total of 9,010 patients. Currently, in 5,253 (58.3 %) of these 9,010 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,747 / 1,291 / 1,215 (30.5 % / 14.3 % / 13.5 %) 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 808 cases has been diagnosed, of which 45.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 16.1 % 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	30.1	22.4	24.9	83.7	100.0
1999	82	39.8	28.2	24.9	76.8	93.9
2000	82	40.8	24.9	24.8	87.8	98.8
2001	57	33.3	24.1	24.7	78.9	96.5
2002	177	39.8	23.0	24.7	80.8	96.6 #
2003	168	38.7	23.3	24.6	76.8	98.2
2004	219	39.6	22.4	24.3	79.9	97.7
2005	191	37.2	22.7	24.1	78.0	95.8
2006	211	37.1	23.3	24.1	71.1	94.3
2007	328	41.4	24.1	24.0	73.2	92.1 #
2008	359	40.9	25.5	23.7	73.8	98.6
2009	378	36.8	26.4	23.1	71.7	98.1
2010	376	38.6	27.3	22.6	67.6	98.1
2011	380	38.1	28.2	21.8	67.9	97.9
2012	428	36.1	29.3	21.1	63.1	97.2
2013	490	39.2	29.8	20.6	57.6	97.8
2014	464	36.0	30.9	19.6	55.2	96.3
2015	411	36.7	32.3	17.9	51.6	98.1
2016	411	38.0	32.9	15.5	40.9	97.3
2017	371	35.7	33.6	14.0	31.5	99.5
2018	443	35.4	34.5	12.0	23.9	98.0
2019	323	34.4	34.8	9.5	19.5	99.1
2020	250	36.9	35.4	6.1	12.4	98.8 ##
1998-2020	6648	37.4	35.4	24.9	56.6	97.4

6,648 cases diagnosed 1998-2020 are related to a total of 5,777 patients. Currently, in 2,640 (45.7 %) of these 5,777 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,576 / 628 / 436 (27.3 % / 10.9 % / 7.5 %) 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 443 cases has been diagnosed, of which 34.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 12.0 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	114	49	10.3	4.2	5.8	1.4	9.5	2.3	13.5	3.3
1999	124	82	11.1	6.9	6.5	2.4	10.3	3.8	14.3	5.5
2000	119	82	10.4	6.8	5.7	2.1	9.4	3.5	13.8	5.0
2001	114	57	9.8	4.7	5.4	1.7	8.9	2.6	13.0	3.6
2002	268	177	14.4	9.0	7.5	2.9	12.4	4.8	17.6	6.6
2003	266	168	14.2	8.5	7.0	2.8	11.8	4.5	17.3	6.3
2004	334	219	17.8	11.1	8.7	3.2	14.4	5.4	20.5	7.9
2005	322	191	17.0	9.6	7.9	2.9	13.4	4.8	19.4	6.6
2006	357	211	18.6	10.5	8.4	3.3	14.2	5.4	20.8	7.4
2007	464	328	20.9	14.2	9.2	4.1	15.6	6.8	22.7	9.7
2008	519	359	23.3	15.5	10.1	4.2	16.8	7.1	24.6	10.3
2009	649	378	29.1	16.3	11.8	4.4	20.1	7.4	30.2	10.5
2010	598	376	26.5	16.1	10.7	4.6	18.0	7.6	26.0	10.5
2011	618	380	27.6	16.3	10.6	4.5	18.1	7.4	27.2	10.4
2012	759	428	33.4	18.1	12.3	4.9	21.4	8.2	31.9	11.7
2013	759	490	33.0	20.6	11.7	5.5	20.4	9.3	30.9	13.4
2014	826	464	35.4	19.3	12.8	5.0	21.8	8.4	32.3	12.2
2015	710	411	29.8	16.9	10.4	4.2	18.0	7.2	26.8	10.5
2016	671	411	27.9	16.7	9.2	4.4	16.1	7.3	24.5	10.6
2017	669	371	27.7	15.1	9.3	3.8	16.0	6.4	23.8	9.5
2018	808	443	33.2	17.8	10.6	4.4	18.4	7.5	27.9	11.1
2019	617	323	25.3	13.0	7.9	3.3	13.8	5.6	21.2	8.2
2020	428	250	17.6	10.1	5.5	2.5	9.7	4.3	14.6	6.1
1998-2020	11113	6648	23.9	13.8	9.5	3.8	16.2	6.4	24.0	9.2

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

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	163	73.9	12.0	32.5	96.0	58.7	65.5	75.7	83.4	87.4
1999	206	75.4	13.2	15.3	101	59.8	67.3	77.8	85.3	89.6
2000	201	76.2	12.0	32.8	99.4	60.4	69.1	77.7	85.3	89.4
2001	171	74.7	12.9	34.6	101	57.5	67.7	76.7	84.3	88.6
2002	445	76.5	12.1	27.3	106	59.8	70.3	78.2	85.8	90.1
2003	434	76.9	10.9	26.2	100	62.8	71.0	78.0	83.9	90.0
2004	553	77.1	10.8	39.1	106	63.1	69.9	78.4	84.9	90.4
2005	513	77.6	10.9	37.8	102	63.2	70.8	79.1	85.6	90.7
2006	568	77.1	11.2	35.2	102	64.1	70.4	78.4	85.1	90.6
2007	792	78.1	10.7	32.9	100	64.2	71.2	79.6	85.5	91.2
2008	878	78.1	10.7	33.7	103	64.5	71.2	79.3	85.8	90.8
2009	1027	78.5	10.5	20.3	104	66.3	72.3	80.0	86.1	89.9
2010	974	78.1	10.6	39.1	103	65.2	71.2	79.2	86.0	90.2
2011	998	78.4	10.6	25.4	107	65.7	72.5	79.6	85.8	90.2
2012	1187	79.2	9.8	29.7	103	67.8	73.4	80.1	86.4	90.9
2013	1249	79.4	9.6	21.6	104	68.3	73.8	80.1	86.3	90.4
2014	1290	79.2	10.2	0.2	102	67.1	73.7	79.9	86.1	91.0
2015	1121	80.0	9.3	35.7	102	68.4	74.6	80.7	86.7	91.0
2016	1082	79.7	9.8	34.1	104	68.6	75.2	80.4	86.2	90.8
2017	1040	79.4	9.6	26.5	104	68.1	75.1	80.0	86.0	90.2
2018	1251	79.7	9.4	24.1	100	68.2	75.8	80.5	85.7	90.1
2019	940	79.6	9.5	34.5	104	67.2	75.8	80.5	85.5	90.2
2020	678	80.5	10.2	34.0	100	66.0	76.6	81.9	86.8	91.5
1998-2020	17761	78.7	10.4	0.2	107	65.7	73.1	79.9	85.9	90.4

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	114	72.6	11.3	40.2	95.6	58.7	63.7	72.8	82.6	86.1
1999	124	74.2	13.3	18.1	97.1	60.7	66.8	74.7	84.9	89.4
2000	119	74.0	11.2	38.7	92.0	59.7	66.0	75.2	83.3	87.8
2001	114	73.7	13.3	34.6	99.4	55.2	66.6	76.1	81.6	89.0
2002	268	75.3	11.8	27.3	96.9	59.2	69.5	76.4	83.9	89.4
2003	266	75.8	10.4	26.2	100	62.8	70.6	76.6	83.0	88.8
2004	334	75.4	10.6	39.1	99.3	61.8	68.3	75.9	83.1	89.2
2005	322	76.7	9.9	45.1	96.8	63.1	69.8	77.3	84.2	89.2
2006	357	76.6	10.4	40.8	96.7	64.1	71.0	77.6	84.3	88.4
2007	464	76.8	10.0	37.1	98.9	64.0	70.7	77.6	84.1	88.0
2008	519	76.2	10.4	33.7	97.2	63.2	69.7	77.3	83.1	88.1
2009	649	77.2	10.3	20.3	104	65.0	71.7	78.2	84.1	88.6
2010	598	77.0	9.8	39.1	100	65.8	70.7	77.3	84.0	89.0
2011	618	77.3	9.5	25.4	98.6	66.1	72.3	77.9	83.6	88.9
2012	759	78.5	9.1	29.7	101	68.2	73.2	79.2	85.1	89.4
2013	759	78.7	8.9	42.4	98.4	68.9	73.5	79.2	84.8	89.5
2014	826	78.3	9.7	21.1	99.9	66.8	73.2	79.1	84.8	89.9
2015	710	79.3	9.0	35.7	102	68.4	74.2	79.9	85.7	89.6
2016	671	79.4	9.0	40.4	104	69.6	75.3	80.3	85.6	88.9
2017	669	79.0	9.3	26.5	102	68.1	74.6	79.7	85.2	89.2
2018	808	79.2	9.1	24.1	100	68.2	75.6	80.1	85.0	89.2
2019	617	79.5	9.1	35.0	98.9	67.8	76.0	80.5	84.7	89.9
2020	428	80.1	9.4	38.3	99.0	67.0	76.6	81.7	86.1	90.1
1998-2020	11113	77.8	9.9	18.1	104	65.6	72.5	79.0	84.7	89.2

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	49	77.0	13.1	32.5	96.0	56.1	72.9	80.3	86.5	89.5
1999	82	77.3	13.0	15.3	101	59.8	72.3	79.4	85.8	89.6
2000	82	79.4	12.4	32.8	99.4	64.2	73.7	82.0	87.7	90.8
2001	57	76.8	11.8	39.7	101	63.5	70.5	78.4	86.2	87.9
2002	177	78.4	12.2	41.0	106	62.1	72.2	80.2	87.4	91.3
2003	168	78.8	11.4	45.2	96.6	63.5	72.1	80.9	87.2	92.7
2004	219	79.7	10.7	41.0	106	65.4	73.8	81.0	87.3	91.4
2005	191	79.3	12.4	37.8	102	63.7	72.3	82.4	88.6	91.8
2006	211	78.0	12.4	35.2	102	64.1	70.1	79.9	86.4	91.9
2007	328	79.9	11.4	32.9	100	65.0	73.4	82.5	87.3	93.0
2008	359	81.0	10.4	45.1	103	67.0	74.4	82.9	87.9	93.0
2009	378	80.8	10.5	39.1	102	67.8	73.8	82.9	88.5	93.0
2010	376	79.7	11.6	39.7	103	63.5	72.6	82.9	88.3	91.0
2011	380	80.1	11.9	32.6	107	65.0	73.5	82.4	88.4	91.9
2012	428	80.4	10.8	38.3	103	65.8	73.8	82.3	88.7	91.9
2013	490	80.3	10.5	21.6	104	66.7	74.3	82.0	87.8	91.9
2014	464	80.8	11.0	0.2	102	67.7	75.2	82.0	88.4	92.6
2015	411	81.2	9.7	50.1	102	68.4	75.9	82.3	88.0	92.4
2016	411	80.3	10.9	34.1	103	67.1	75.1	80.7	88.8	92.6
2017	371	80.0	10.2	37.2	104	67.7	75.6	81.1	87.3	91.5
2018	443	80.4	9.8	40.9	100	68.1	76.2	81.3	87.0	92.3
2019	323	79.9	10.3	34.5	104	66.5	75.3	80.7	86.9	92.1
2020	250	81.1	11.5	34.0	100	64.9	76.6	82.5	89.0	93.8
1998-2020	6648	80.1	11.0	0.2	107	65.8	74.4	81.7	87.8	92.2

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	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	11	0.1	0.1	4	0.0	0.1	7	0.1	0.2
35-39	27	0.2	0.3	15	0.2	0.3	12	0.2	0.4
40-44	40	0.3	0.6	23	0.3	0.5	17	0.3	0.7
45-49	111	0.8	1.4	71	0.8	1.3	40	0.7	1.4
50-54	209	1.4	2.8	128	1.4	2.7	81	1.5	2.9
55-59	258	1.8	4.6	151	1.7	4.4	107	2.0	4.9
60-64	498	3.4	8.0	317	3.5	7.9	181	3.3	8.3
65-69	1038	7.2	15.2	688	7.6	15.4	350	6.5	14.7
70-74	2004	13.8	29.0	1419	15.6	31.0	585	10.8	25.5
75-79	2904	20.0	49.0	1996	21.9	53.0	908	16.8	42.3
80-84	3157	21.8	70.8	2077	22.8	75.8	1080	20.0	62.3
85+	4242	29.2	100.0	2200	24.2	100.0	2042	37.7	100.0
All ages	14507	100.0		9095	100.0		5412	100.0	

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0– 4		1		0.1		0.6
5– 9						
10–14						
15–19						
20–24	3	1	0.1	0.1	0.5	0.2
25–29	3		0.1		0.3	
30–34	4	7	0.2	0.3	0.3	0.3
35–39	15	12	0.6	0.5	0.8	0.3
40–44	21	17	0.8	0.7	0.8	0.3
45–49	70	40	2.6	1.5	1.4	0.4
50–54	123	81	4.8	3.2	1.5	0.6
55–59	148	101	7.0	4.6	1.2	0.8
60–64	305	175	17.3	9.2	1.7	1.1
65–69	668	340	40.9	18.8	2.8	1.8
70–74	1330	561	88.7	32.6	4.8	2.8
75–79	1855	871	153.3	58.0	7.7	4.5
80–84	1926	1024	266.0	96.2	12.5	6.6
85+	2007	1927	429.8	184.8	19.1	11.8
All ages	8478	5158			5.5	3.3
Incidence						
Raw			26.0	15.4		
WS			9.5	4.1		
ES			16.3	6.9		
BRD-S			24.2	9.9		

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).

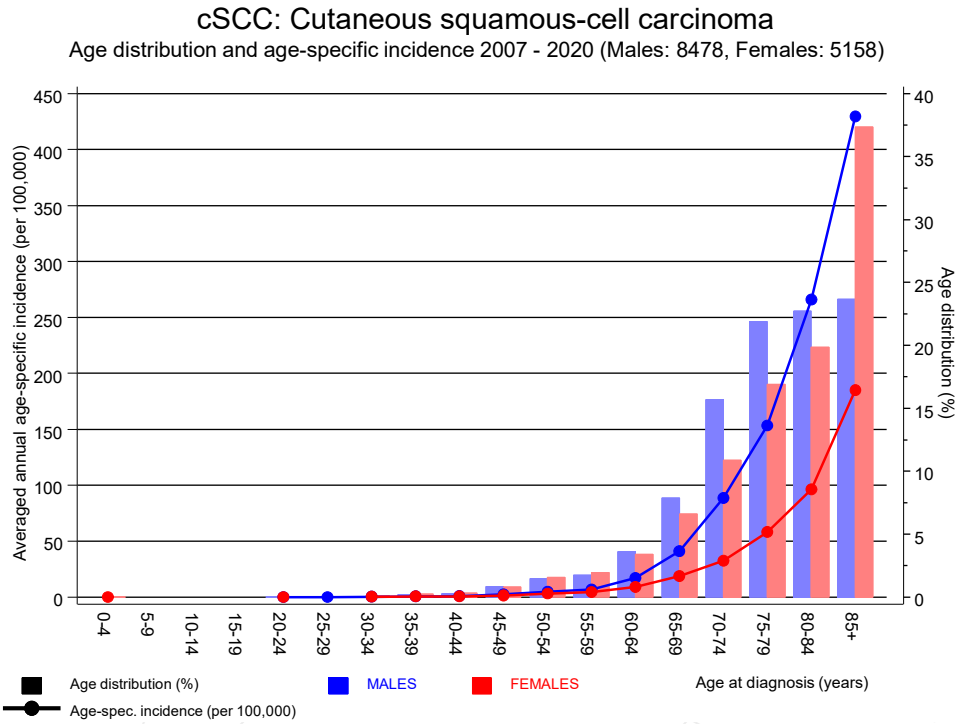


Figure 6. Age distribution (males: mean=78.2 yrs, median=79.3 yrs; females: mean=80.3 yrs, median=81.9 yrs) and age-specific incidence.

Table 7a

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

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	14	0.8	16.6	9.1	27.9	#	4.2	
C03–C06	Oral cavity	22	3.7	5.9	3.7	8.9	#	5.8	4.5
C07–C08	Salivary gland	46	2.1	22.1	16.2	29.5	#	14.0	6.5
C09–C10	Oropharynx	18	4.0	4.5	2.6	7.0	#	4.5	5.6
C12–C13	Hypopharynx	12	2.2	5.6	2.9	9.7	#	3.1	33.3
C15	Oesophagus	36	11.3	3.2	2.2	4.4	#	7.9	5.6
C16	Stomach	73	31.7	2.3	1.8	2.9	#	13.2	5.5
C17	Small intestine	13	4.2	3.1	1.7	5.3	#	2.8	7.7
C18	Colon	163	75.9	2.1	1.8	2.5	#	27.8	10.4
C19–C20	Rectum	64	33.3	1.9	1.5	2.5	#	9.8	3.1
C21	Anus/canal	5	1.6	3.2	1.0	7.5	#	1.1	20.0
C22	Liver	51	18.7	2.7	2.0	3.6	#	10.3	13.7
C23–C24	Bile	15	8.2	1.8	1.0	3.0	#	2.2	13.3
C25	Pancreas	66	30.4	2.2	1.7	2.8	#	11.4	22.7
C26	GI cancer	4	1.3	3.2	0.9	8.1		0.9	100.0
C30–C31	Sinuses	5	1.1	4.4	1.4	10.2	#	1.2	
C32	Larynx	20	5.2	3.8	2.3	5.9	#	4.7	10.0
C33–C34	Lung	205	75.3	2.7	2.4	3.1	#	41.5	20.5
C38,C45	Mesothelioma	11	5.1	2.1	1.1	3.8	#	1.9	
C43	Malign. melanoma	226	30.2	7.5	6.5	8.5	#	62.6	2.7
C46,C49	Soft tissue	19	4.5	4.2	2.5	6.6	#	4.6	
C50	Breast	4	2.0	2.0	0.6	5.2		0.6	
C60	Penis	7	1.9	3.6	1.5	7.5	#	1.6	
C61	Prostate	300	181.1	1.7	1.5	1.9	#	38.0	16.7
C64	Kidney	38	21.0	1.8	1.3	2.5	#	5.4	2.6
C65	Renal pelvis	4	3.4	1.2	0.3	3.0		0.2	
C66	Ureter	4	2.1	1.9	0.5	4.8		0.6	
C67	Bladder	72	41.7	1.7	1.3	2.2	#	9.7	15.3
C69	Eye carcinoma	8	0.3	24.5	10.6	48.2	#	2.5	
C70–C72	CNS cancer	4	7.6	0.5	0.1	1.4		−1.1	25.0
C73	Thyroid	6	2.8	2.1	0.8	4.6		1.0	16.7
C76–C79	CUP	42	13.3	3.2	2.3	4.3	#	9.2	9.5
C81	Hodgkin lymphoma	9	1.3	6.9	3.1	13.0	#	2.5	11.1
C82–C85	NHL	125	32.1	3.9	3.2	4.6	#	29.7	17.6
C90	Mult. myeloma	15	9.8	1.5	0.9	2.5		1.7	26.7
C91–C96	Leukaemia	28	12.7	2.2	1.5	3.2	#	4.9	53.6
	Others, specified	23	7.1	3.2	2.1	4.9	#	5.1	30.4
	Not observed	0	1.1	0.0	0.0	3.5		−0.3	
	All further malignancies	1777	692.2	2.6	2.4	2.7	#	346.8	13.0

Patients	8846
Median age at next malignancy (years)	79.2
Person-years	31280
Mean observation time (years)	3.5
Median observation time (years)	2.2

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 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	4	0.3	13.8	3.8	35.4	#	2.0	
C03–C06	Oral cavity	6	1.4	4.4	1.6	9.5	#	2.5	16.7
C07–C08	Salivary gland	13	0.5	24.5	13.1	41.9	#	6.7	7.7
C09–C10	Oropharynx	5	0.7	7.3	2.4	17.1	#	2.3	20.0
C15	Oesophagus	10	1.8	5.7	2.7	10.5	#	4.4	
C16	Stomach	29	12.5	2.3	1.6	3.3	#	8.9	6.9
C17	Small intestine	4	1.3	3.0	0.8	7.7		1.4	
C18	Colon	77	34.8	2.2	1.7	2.8	#	22.6	6.5
C19–C20	Rectum	11	12.1	0.9	0.5	1.6		−0.6	
C21	Anus/canal	7	1.4	4.8	1.9	10.0	#	3.0	42.9
C22	Liver	11	4.0	2.7	1.4	4.9	#	3.7	18.2
C23–C24	Bile	8	5.1	1.6	0.7	3.1		1.6	25.0
C25	Pancreas	35	16.9	2.1	1.4	2.9	#	9.7	37.1
C30–C31	Sinuses	3	0.4	7.1	1.5	20.8	#	1.4	
C33–C34	Lung	54	18.1	3.0	2.2	3.9	#	19.2	27.8
C43	Malign. melanoma	86	9.6	9.0	7.2	11.1	#	40.9	4.7
C44	Skin others	4	0.0	87.1	23.7	223.0	#	2.1	
C46,C49	Soft tissue	5	1.7	3.0	1.0	6.9		1.8	
C48	Peritoneal	8	0.9	8.7	3.8	17.2	#	3.8	12.5
C50	Breast	187	71.5	2.6	2.3	3.0	#	61.8	13.9
C51	Vulva	10	3.8	2.6	1.3	4.8	#	3.3	10.0
C52	Vagina	3	0.6	4.7	1.0	13.8		1.3	
C53	Cervix uteri	7	2.7	2.6	1.0	5.3	#	2.3	28.6
C54	Corpus uteri	27	13.0	2.1	1.4	3.0	#	7.5	3.7
C55,C57	Fem. genitals un	4	1.1	3.6	1.0	9.3		1.6	75.0
C56	Ovary	12	10.3	1.2	0.6	2.0		0.9	16.7
C64	Kidney	22	6.4	3.4	2.2	5.2	#	8.4	31.8
C66	Ureter	3	0.5	5.5	1.1	16.0	#	1.3	
C67	Bladder	9	7.8	1.2	0.5	2.2		0.6	22.2
C70–C72	CNS cancer	7	3.2	2.2	0.9	4.5		2.0	57.1
C73	Thyroid	8	2.4	3.4	1.5	6.7	#	3.0	
C76–C79	CUP	18	7.3	2.5	1.5	3.9	#	5.7	11.1
C82–C85	NHL	51	12.0	4.3	3.2	5.6	#	20.9	21.6
C90	Mult. myeloma	7	3.7	1.9	0.8	3.9		1.8	42.9
C91–C96	Leukaemia	16	4.9	3.2	1.9	5.3	#	5.9	56.3
Others, specified		9	2.5	3.6	1.6	6.8	#	3.5	11.1
Not observed		0	4.0	0.0	0.0	0.9	#	−2.1	
All further malignancies		780	281.3	2.8	2.6	3.0	#	267.1	15.9

Patients	5669
Median age at next malignancy (years)	82.4
Person-years	18674
Mean observation time (years)	3.3
Median observation time (years)	2.0

The occurrence of further specified malignancy is statistically significant.

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

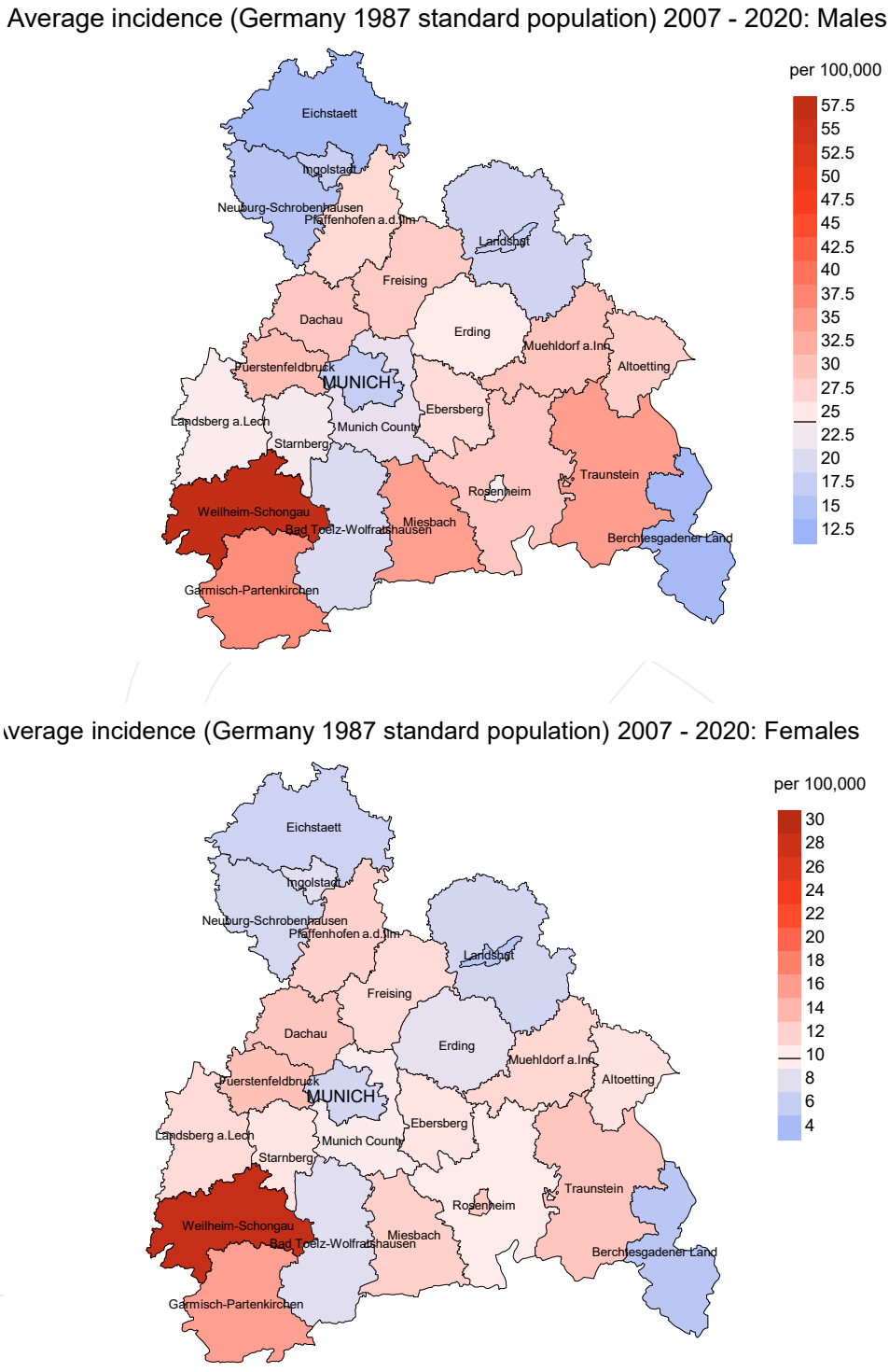
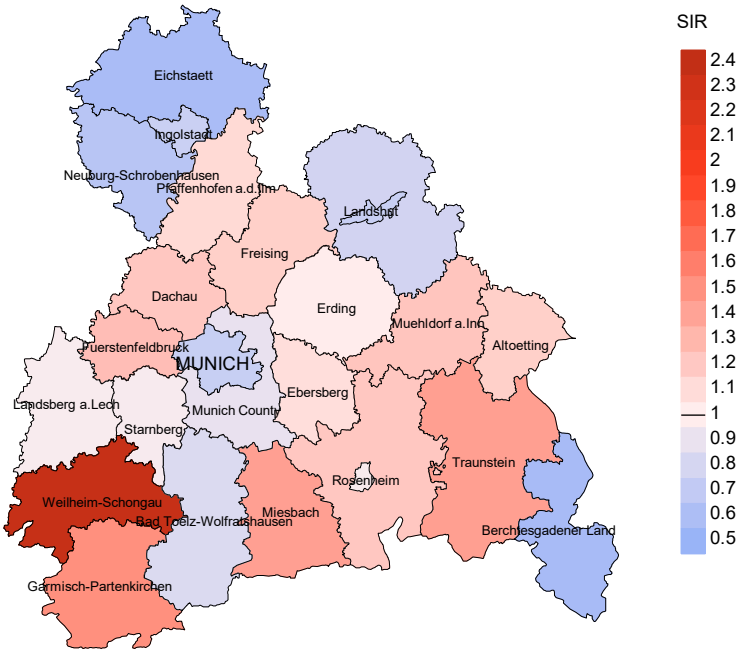


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 24.2/100,000 WS N=8,478, females 9.9/100,000 WS N=5,158).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 158 women were identified with newly diagnosed squamous-cell skin ca.. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 10.6/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 8.5 and 13.1/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

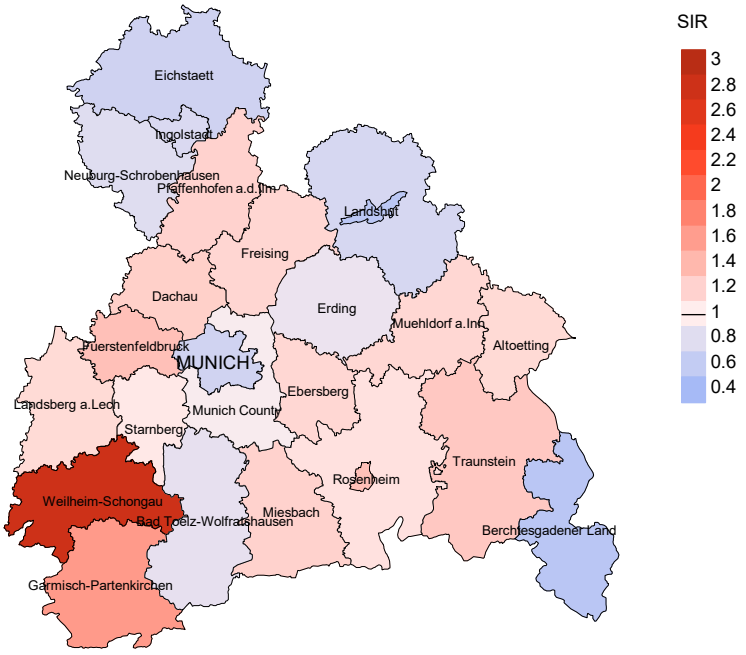


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=8,478, females N=5,158).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 158 women were identified with newly diagnosed squamous-cell skin ca.. 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 0.94 and 1.43, and is therefore not statistically striking.

MORTALITY

Table 9a

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	163	94.5	131	80.4	92.4
1999	206	95.6	170	82.5	90.0
2000	201	99.0	173	86.1	93.6
2001	171	97.1	138	80.7	89.9
2002	445	97.3	372	83.6	94.9
2003	434	97.9	349	80.4	94.3
2004	553	98.2	447	80.8	96.4
2005	513	96.7	411	80.1	96.4
2006	568	95.8	426	75.0	95.1
2007	792	93.7	586	74.0	95.9
2008	878	98.7	648	73.8	94.9
2009	1027	98.6	749	72.9	94.8
2010	974	98.8	671	68.9	96.0
2011	998	98.6	656	65.7	93.0
2012	1187	98.3	763	64.3	93.7
2013	1249	97.6	740	59.2	91.6
2014	1290	96.9	705	54.7	90.4
2015	1121	97.3	613	54.7	87.4
2016	1082	97.7	493	45.6	85.0
2017	1040	99.1	368	35.4	78.0
2018	1251	98.3	357	28.5	70.0
2019	940	99.4	190	20.2	80.0
2020	678	98.5	97	14.3	83.5
1998–2020	17761	97.8	10253	57.7	91.4

Table 9b

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Deaths in same year n	Prop. deaths in same year %
1998	163	51	4	2.5
1999	206	57	9	4.4
2000	201	65	5	2.5
2001	171	84	18	10.5
2002	445	108	19	4.3
2003	434	146	19	4.4
2004	553	177	20	3.6
2005	513	190	33	6.4
2006	568	223	24	4.2
2007	792	278	45	5.7
2008	878	328	46	5.2
2009	1027	325	44	4.3
2010	974	385	50	5.1
2011	998	440	45	4.5
2012	1187	499	62	5.2
2013	1249	567	82	6.6
2014	1290	585	66	5.1
2015	1121	680	76	6.8
2016	1082	662	54	5.0
2017	1040	764	65	6.3
2018	1251	601	58	4.6
2019	940	571	45	4.8
2020	678	667	41	6.0
1998–2020	17761	8453	930	5.2

Table 9c

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	51	43.1	56.9	59.6
1999	57	28.1	71.9	51.9
2000	65	40.0	60.0	54.7
2001	84	33.3	66.7	54.5
2002	108	42.6	57.4	50.0
2003	146	41.1	58.9	44.6
2004	177	39.0	61.0	51.5
2005	190	38.4	61.6	45.7
2006	223	40.4	59.6	46.0
2007	278	38.1	61.9	50.4
2008	328	29.0	71.0	36.8
2009	325	29.5	70.5	41.7
2010	385	35.6	64.4	42.6
2011	440	32.0	68.0	39.6
2012	499	35.3	64.7	42.7
2013	567	32.1	67.9	39.9
2014	585	30.8	69.2	36.8
2015	680	28.1	71.9	36.7
2016	662	31.7	68.3	39.6
2017	764	28.5	71.5	39.4
2018	601	20.8	79.2	34.5
2019	571	14.5	85.5	42.5
2020	667	22.2	77.8	45.1
1998-2020	8453	29.8	70.2	41.4

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	41	86.5	82.2	86.9	83.6
2001	51	81.1	80.1	83.2	78.8
2002	57	83.2	80.6	84.6	86.3
2003	93	82.6	77.7	86.2	79.1
2004	105	83.9	78.3	86.0	80.6
2005	110	83.3	78.5	83.9	78.8
2006	142	83.3	77.9	86.2	78.5
2007	163	83.7	79.8	85.1	81.2
2008	207	85.0	80.5	86.8	80.6
2009	179	84.2	81.4	85.7	83.7
2010	229	84.9	81.3	86.6	81.7
2011	256	85.1	81.0	86.5	82.1
2012	280	84.5	81.4	85.6	81.5
2013	344	85.4	82.4	87.6	83.8
2014	374	85.7	83.1	86.9	84.1
2015	415	85.2	83.2	85.9	83.3
2016	431	84.8	83.3	86.5	83.3
2017	475	85.8	83.5	86.8	84.0
2018	369	86.1	82.6	87.5	83.1
2019	372	86.0	83.9	86.1	85.6
2020	428	86.0	83.1	87.8	84.9
1998–2020	5197	85.1	82.0	86.5	82.9

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

Table 10b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	12	88.6	83.6	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	53	88.5	87.5	90.4	88.1
2004	72	85.6	80.3	90.2	81.6
2005	80	86.9	82.8	90.0	84.0
2006	81	89.2	88.7	89.3	88.6
2007	115	89.4	86.6	90.2	87.3
2008	121	90.4	84.1	91.8	88.2
2009	146	88.8	87.5	88.9	87.7
2010	156	89.8	87.8	90.6	86.2
2011	184	89.2	85.9	89.9	87.1
2012	219	88.5	83.3	89.7	85.1
2013	223	89.3	84.5	90.3	86.8
2014	211	89.7	84.3	90.7	85.7
2015	265	89.5	84.8	90.7	86.0
2016	231	90.0	88.0	90.4	89.1
2017	289	89.7	87.0	90.2	86.9
2018	232	89.6	83.5	90.6	84.6
2019	199	89.7	84.4	89.9	84.3
2020	239	89.3	85.5	89.8	85.9
1998–2020	3256	89.3	85.5	90.1	86.3

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	0.16	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	21	1.8	0.19	0.9	0.17	1.6	0.19	2.7	0.22
2002	28	1.5	0.11	0.8	0.11	1.4	0.12	1.9	0.11
2003	44	2.3	0.17	1.2	0.18	2.0	0.18	2.9	0.17
2004	41	2.2	0.13	1.1	0.13	1.9	0.14	2.6	0.13
2005	49	2.6	0.16	1.2	0.15	2.0	0.16	3.0	0.16
2006	65	3.4	0.19	1.5	0.19	2.6	0.19	3.8	0.19
2007	70	3.2	0.16	1.4	0.16	2.4	0.16	3.5	0.16
2008	69	3.1	0.14	1.3	0.14	2.3	0.14	3.4	0.14
2009	61	2.7	0.10	1.1	0.10	2.0	0.10	2.9	0.10
2010	89	3.9	0.16	1.5	0.15	2.7	0.16	3.9	0.16
2011	95	4.2	0.17	1.6	0.16	2.9	0.17	4.3	0.17
2012	116	5.1	0.16	1.9	0.16	3.4	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	131	5.6	0.17	1.8	0.16	3.4	0.17	5.1	0.17
2015	135	5.7	0.20	1.9	0.19	3.4	0.20	5.1	0.20
2016	168	7.0	0.27	2.2	0.25	4.0	0.27	6.1	0.27
2017	153	6.3	0.24	1.9	0.21	3.5	0.23	5.3	0.23
2018	97	4.0	0.13	1.1	0.11	2.1	0.12	3.3	0.13
2019	60	2.5	0.10	0.7	0.10	1.4	0.11	2.0	0.10
2020	108	4.4	0.27	1.2	0.24	2.3	0.25	3.6	0.26
1998-2020	1776	3.8	0.17	1.4	0.16	2.6	0.17	3.9	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	4	0.3	0.09	0.1	0.05	0.1	0.06	0.2	0.07
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	0.11	0.4	0.12	0.6	0.13
2001	8	0.7	0.15	0.2	0.14	0.3	0.13	0.4	0.12
2002	19	1.0	0.11	0.2	0.09	0.4	0.10	0.7	0.10
2003	16	0.8	0.10	0.3	0.10	0.4	0.10	0.5	0.09
2004	29	1.5	0.13	0.4	0.14	0.7	0.14	1.1	0.14
2005	27	1.4	0.15	0.3	0.12	0.6	0.13	1.0	0.15
2006	26	1.3	0.13	0.3	0.08	0.5	0.09	0.7	0.09
2007	36	1.6	0.12	0.4	0.09	0.7	0.10	1.0	0.10
2008	28	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	63	2.7	0.16	0.7	0.15	1.2	0.15	1.7	0.15
2013	52	2.2	0.11	0.5	0.09	0.9	0.10	1.3	0.11
2014	51	2.1	0.12	0.5	0.10	0.9	0.11	1.3	0.11
2015	60	2.5	0.16	0.5	0.13	0.9	0.14	1.4	0.14
2016	46	1.9	0.12	0.4	0.09	0.7	0.10	0.9	0.09
2017	69	2.8	0.19	0.6	0.17	1.1	0.17	1.5	0.17
2018	30	1.2	0.07	0.3	0.06	0.5	0.06	0.7	0.07
2019	29	1.2	0.09	0.2	0.07	0.4	0.08	0.7	0.08
2020	47	1.9	0.20	0.4	0.15	0.7	0.16	1.0	0.17
1998-2020	793	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 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24	1	0.0	0.0	1	0.1	0.1			0.0
25-29	0	0.0	0.0			0.1			0.0
30-34	0	0.0	0.0			0.1			0.0
35-39	1	0.0	0.1	1	0.1	0.1			0.0
40-44	3	0.1	0.2	1	0.1	0.2	2	0.3	0.3
45-49	4	0.2	0.4	1	0.1	0.3	3	0.5	0.8
50-54	17	0.8	1.2	12	0.8	1.1	5	0.8	1.5
55-59	28	1.3	2.5	21	1.4	2.5	7	1.1	2.6
60-64	48	2.3	4.8	36	2.4	4.9	12	1.9	4.5
65-69	85	4.0	8.8	60	4.0	9.0	25	3.9	8.3
70-74	180	8.4	17.2	145	9.8	18.7	35	5.4	13.8
75-79	383	18.0	35.2	287	19.3	38.0	96	14.8	28.6
80-84	460	21.6	56.8	342	23.0	61.1	118	18.2	46.8
85+	922	43.2	100.0	578	38.9	100.0	344	53.2	100.0
All ages	2132	100.0		1485	100.0		647	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24	1		0.0	0.33			1.4	
25-29								
30-34								
35-39	1		0.0	0.07			0.4	
40-44	1	2	0.0	0.05	0.1	0.12	0.2	0.2
45-49	1	3	0.0	0.01	0.1	0.08	0.1	0.2
50-54	12	5	0.5	0.10	0.2	0.06	0.5	0.2
55-59	21	7	1.0	0.14	0.3	0.07	0.5	0.2
60-64	36	12	2.0	0.12	0.6	0.07	0.6	0.2
65-69	60	25	3.7	0.09	1.4	0.07	0.7	0.4
70-74	145	35	9.7	0.11	2.0	0.06	1.2	0.4
75-79	287	96	23.7	0.15	6.4	0.11	2.3	1.0
80-84	342	118	47.2	0.18	11.1	0.12	3.3	1.3
85+	578	344	123.8	0.29	33.0	0.18	6.4	2.9
All ages	1485	647					2.1	1.0
Mortality								
Raw			4.6	0.18	1.9	0.13		
WS			1.6	0.16	0.4	0.10		
ES			2.8	0.17	0.8	0.11		
BRD-S			4.2	0.18	1.1	0.11		
PYLL-70								
per 100,000			3.6		1.6			
ES			3.1		1.3			
AYLL-70			7.7		8.3			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	14	0.5	3	21.4	2	14.3	9	64.3
C03–C06	Oral cavity	39	1.3	18	46.2	3	7.7	18	46.2
C07–C08	Salivary gland	39	1.3	9	23.1	5	12.8	25	64.1
C09–C10	Oropharynx	37	1.3	20	54.1	4	10.8	13	35.1
C12–C13	Hypopharynx	15	0.5	7	46.7	1	6.7	7	46.7
C15	Oesophagus	28	1.0	4	14.3	2	7.1	22	78.6
C16	Stomach	66	2.3	16	24.2	4	6.1	46	69.7
C17	Small intestine	8	0.3	4	50.0			4	50.0
C18	Colon	133	4.6	57	42.9	7	5.3	69	51.9
C19–C20	Rectum	77	2.6	40	51.9	3	3.9	34	44.2
C21	Anus/canal	5	0.2	1	20.0	2	40.0	2	40.0
C22	Liver	50	1.7	12	24.0			38	76.0
C23–C24	Bile	14	0.5	6	42.9			8	57.1
C25	Pancreas	60	2.1	8	13.3	3	5.0	49	81.7
C26	GI cancer	5	0.2	2	40.0			3	60.0
C30–C31	Sinuses	5	0.2			1	20.0	4	80.0
C32	Larynx	30	1.0	17	56.7	4	13.3	9	30.0
C33–C34	Lung	207	7.1	31	15.0	8	3.9	168	81.2
C38,C45	Mesothelioma	11	0.4	2	18.2	1	9.1	8	72.7
C43	Malign. melanoma	136	4.7	54	39.7	19	14.0	63	46.3
C44	Skin others	1082	37.0	1	0.1	195	18.0	886	81.9
C46,C49	Soft tissue	19	0.7	9	47.4	1	5.3	9	47.4
C50	Breast	5	0.2	2	40.0			3	60.0
C60	Penis	6	0.2	3	50.0			3	50.0
C61	Prostate	332	11.4	226	68.1	5	1.5	101	30.4
C62	Testis	6	0.2	5	83.3			1	16.7
C64	Kidney	43	1.5	27	62.8	1	2.3	15	34.9
C67	Bladder	71	2.4	33	46.5	1	1.4	37	52.1
C69	Eye carcinoma	7	0.2	1	14.3	1	14.3	5	71.4
C70–C72	CNS cancer	6	0.2	2	33.3			4	66.7
C73	Thyroid	7	0.2	4	57.1			3	42.9
C76–C79	CUP	33	1.1	3	9.1	1	3.0	29	87.9
C81	Hodgkin lymphoma	12	0.4	5	41.7	1	8.3	6	50.0
C82–C85	NHL	243	8.3	152	62.6	9	3.7	82	33.7
C90	Mult. myeloma	21	0.7	10	47.6			11	52.4
C91–C96	Leukaemia	29	1.0	7	24.1	3	10.3	19	65.5
Others, specified		20	0.7	6	30.0	2	10.0	12	60.0
All further malignancies		2921	100.0	807	27.6	289	9.9	1825	62.5

Further malignancies with number of cases 1 to 3 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 1998–2020
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	8	0.8	7	87.5			1	12.5
C07–C08	Salivary gland	9	0.9	1	11.1	1	11.1	7	77.8
C09–C10	Oropharynx	6	0.6	4	66.7			2	33.3
C12–C13	Hypopharynx	2	0.2	2	100.0				
C15	Oesophagus	4	0.4					4	100.0
C16	Stomach	24	2.4	7	29.2	1	4.2	16	66.7
C18	Colon	45	4.5	17	37.8	1	2.2	27	60.0
C19–C20	Rectum	14	1.4	10	71.4			4	28.6
C21	Anus/canal	5	0.5	2	40.0			3	60.0
C22	Liver	12	1.2	3	25.0	1	8.3	8	66.7
C23–C24	Bile	9	0.9	1	11.1	1	11.1	7	77.8
C25	Pancreas	28	2.8					28	100.0
C30–C31	Sinuses	5	0.5	2	40.0	2	40.0	1	20.0
C33–C34	Lung	57	5.7	13	22.8	2	3.5	42	73.7
C43	Malign. melanoma	48	4.8	25	52.1	4	8.3	19	39.6
C44	Skin others	319	32.0	1	0.3	51	16.0	267	83.7
C46,C49	Soft tissue	4	0.4	4	100.0				
C48	Peritoneal	5	0.5					5	100.0
C50	Breast	151	15.2	98	64.9	5	3.3	48	31.8
C51	Vulva	10	1.0	5	50.0	2	20.0	3	30.0
C52	Vagina	3	0.3	1	33.3			2	66.7
C53	Cervix uteri	9	0.9	5	55.6			4	44.4
C54	Corpus uteri	34	3.4	18	52.9	2	5.9	14	41.2
C55,C57	Fem. genitals un	2	0.2					2	100.0
C56	Ovary	22	2.2	10	45.5	1	4.5	11	50.0
C64	Kidney	17	1.7	4	23.5	2	11.8	11	64.7
C66	Ureter	5	0.5	2	40.0			3	60.0
C67	Bladder	12	1.2	9	75.0	1	8.3	2	16.7
C68	Urinary org.	2	0.2					2	100.0
C70–C72	CNS cancer	9	0.9	1	11.1	1	11.1	7	77.8
C73	Thyroid	3	0.3	1	33.3			2	66.7
C76–C79	CUP	13	1.3	1	7.7			12	92.3
C81	Hodgkin lymphoma	3	0.3	2	66.7	1	33.3		
C82–C85	NHL	71	7.1	38	53.5	4	5.6	29	40.8
C90	Mult. myeloma	5	0.5	2	40.0			3	60.0
C91–C96	Leukaemia	14	1.4	4	28.6			10	71.4
Others, specified		5	0.5	2	40.0	1	20.0	2	40.0
All further malignancies		996	100.0	303	30.4	85	8.5	608	61.0

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24	1		0.0	0.33			1.5	
25-29								
30-34								
35-39	1		0.0	0.09			0.4	
40-44	1	1	0.0	0.06	0.0	0.08	0.2	0.1
45-49		1			0.0	0.03		0.1
50-54	6	4	0.2	0.06	0.2	0.06	0.3	0.2
55-59	14	2	0.7	0.14	0.1	0.03	0.4	0.1
60-64	19	5	1.1	0.09	0.3	0.04	0.4	0.1
65-69	17	10	1.0	0.04	0.6	0.05	0.2	0.2
70-74	55	12	3.7	0.08	0.7	0.04	0.6	0.2
75-79	88	49	7.3	0.10	3.3	0.10	1.0	0.7
80-84	141	49	19.5	0.17	4.6	0.08	1.9	0.7
85+	234	166	50.1	0.27	15.9	0.14	3.6	1.8
All ages	577	299					1.1	0.6
Mortality								
Raw			1.8	0.14	0.9	0.10		
WS			0.6	0.12	0.2	0.07		
ES			1.1	0.14	0.3	0.08		
BRD-S			1.6	0.14	0.5	0.08		
PYLL-70								
per 100,000			2.0		0.7			
ES			1.8		0.6			
AYLL-70			9.7		9.0			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24	1		0.0	0.33			1.5	
25-29								
30-34								
35-39								
40-44	1	1	0.0	0.07	0.0	0.08	0.2	0.1
45-49								
50-54	2	2	0.1	0.02	0.1	0.03	0.1	0.1
55-59	8		0.4	0.10			0.2	
60-64	7	1	0.4	0.05	0.1	0.01	0.1	0.0
65-69	3	4	0.2	0.01	0.2	0.03	0.0	0.1
70-74	18	6	1.2	0.04	0.3	0.02	0.2	0.1
75-79	24	20	2.0	0.04	1.3	0.05	0.3	0.3
80-84	52	20	7.2	0.09	1.9	0.04	0.7	0.3
85+	94	86	20.1	0.14	8.2	0.09	1.6	1.0
All ages	210	140					0.4	0.3
Mortality								
Raw			0.6	0.07	0.4	0.06		
WS			0.2	0.06	0.1	0.04		
ES			0.4	0.07	0.2	0.05		
BRD-S			0.6	0.07	0.2	0.05		
PYLL-70								
per 100,000			0.9		0.3			
ES			0.8		0.2			
AYLL-70			12.3		10.0			

* See corresponding tables with multiple malignancies.

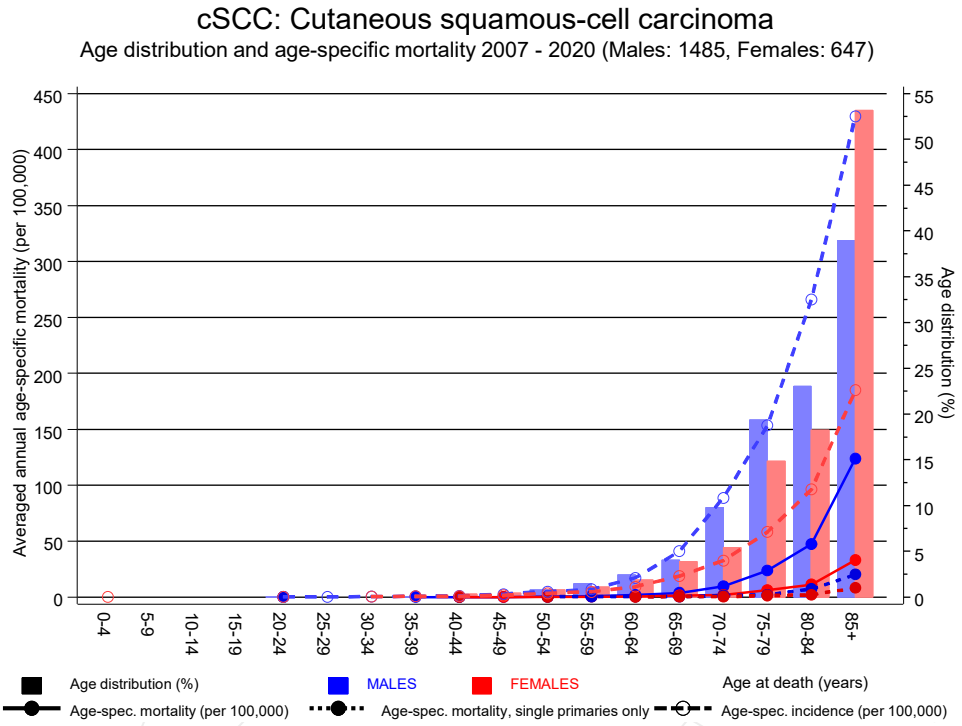


Figure 17. Distribution of age at death (bars; males: mean=77.9 yrs, median=78.8 yrs; females: mean=80.7 yrs, median=81.9 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

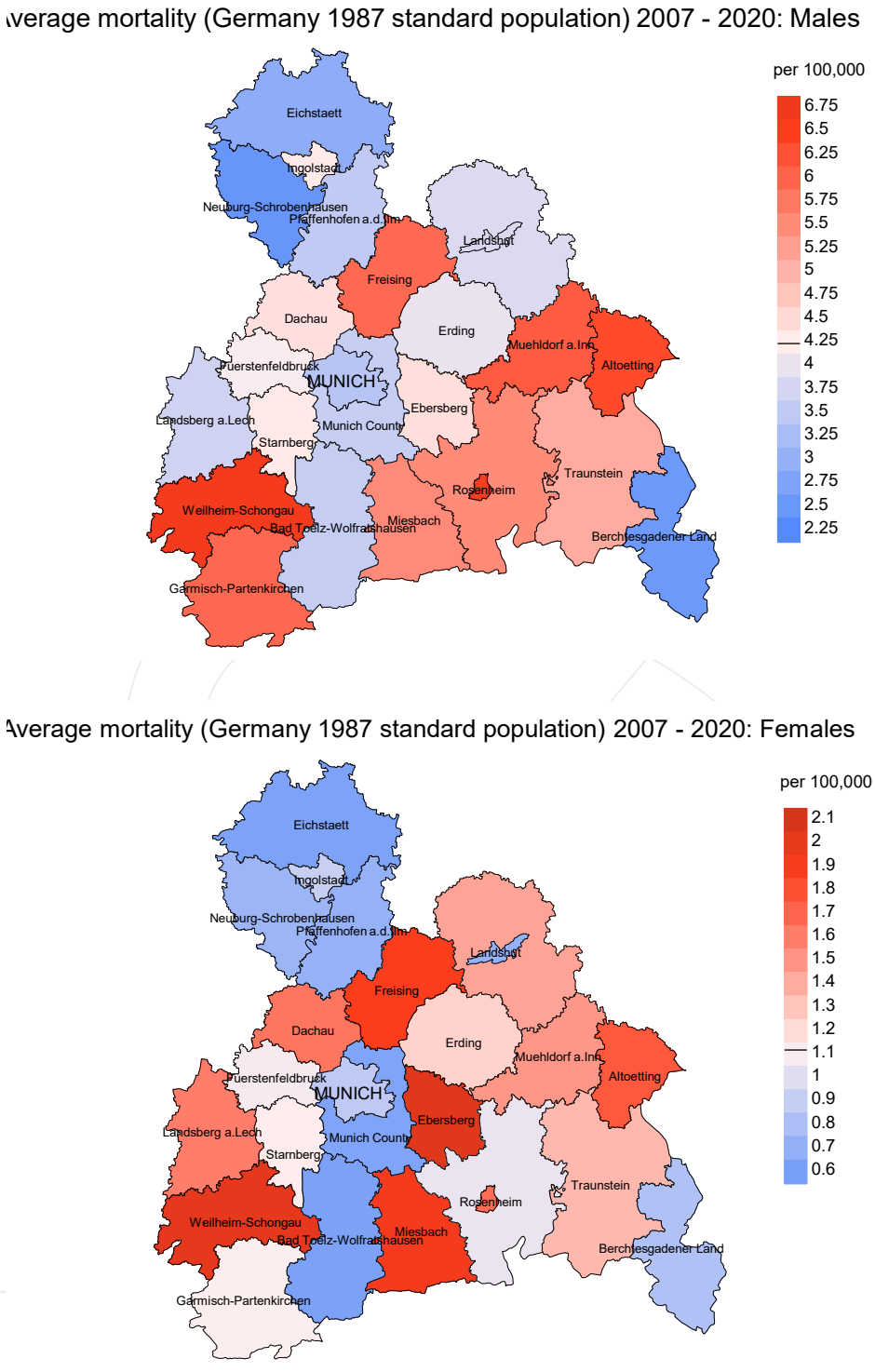


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 4.2/100,000 WS N=1,485, females 1.1/100,000 WS N=647).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 29 women died from squamous-cell skin ca.. 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 1.2 and 3.3/100,000.

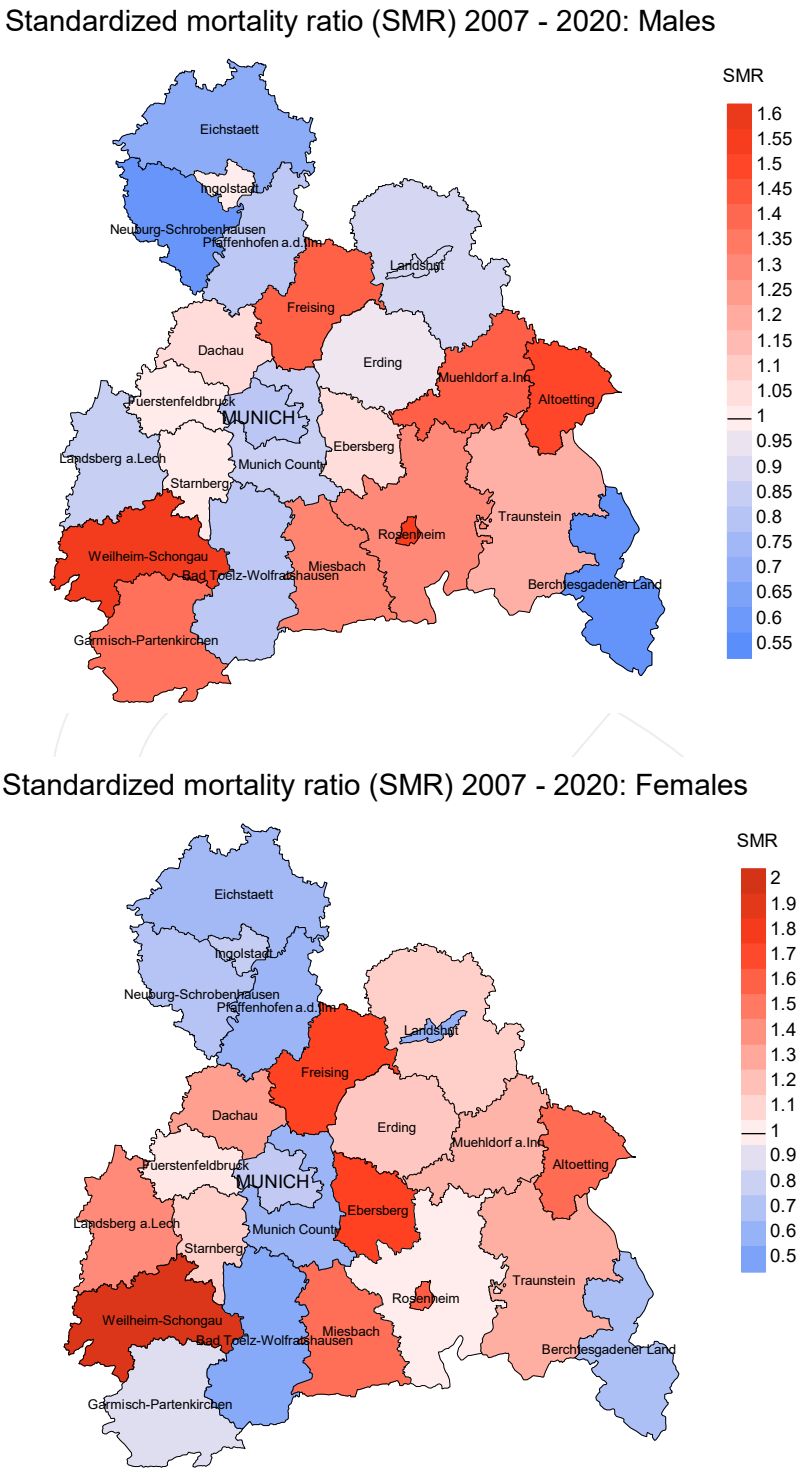


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,485, females N=647).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 29 women died from squamous-cell skin ca.. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.74. Though, the value of this parameter may vary with an underlying probability of 99% between 1.02 and 2.76, 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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