Munich Cancer Registry

- Survival
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- *Deutsch*

ICD-10 C22.0: Liver cell carcinoma

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	4,789
Diseases	4,789
Creation date	12/20/2021
Database export	12/20/2021
Population	4.95 m

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

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

https://www.tumorregister-muenchen.de/en/facts/base/bC220_E-ICD-10-C22.0-Liver-cell-carcinoma-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

Code	Description
C22.0	Liver cell 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	75	10.7	5.4	97.3	100.0
1999	92	9.0	5.4	96.7	97.8
2000	104	8.1	5.4	94.2	100.0
2001	101	9.4	5.3	96.0	98.0
2002	145	10.6	5.4	98.6	100.0 #
2003	153	10.7	5.3	94.1	98.7
2004	138	11.4	5.3	93.5	97.8
2005	180	12.1	5.2	95.6	98.9
2006	197	12.9	5.2	93.9	98.5
2007	252	13.2	5.2	93.7	98.0 #
2008	258	13.8	5.2	89.9	98.8
2009	257	14.7	5.1	87.2	100.0
2010	251	15.3	4.9	93.2	100.0
2011	255	15.8	4.8	88.6	99.2
2012	278	16.4	4.7	90.3	99.6
2013	274	16.4	4.3	83.9	98.5
2014	277	16.8	4.4	83.4	99.3
2015	284	17.1	3.9	81.0	97.2
2016	274	17.1	3.5	83.2	100.0
2017	260	17.4	3.0	74.2	99.6
2018	258	17.6	2.4	65.1	100.0
2019	216	17.9	2.6	61.6	100.0
2020	210	18.1	2.4	45.2	99.5 ##
1998-2020	4789	18.1	5.4	84.4	99.1

4,789 cases diagnosed 1998-2020 are related to a total of 4,789 patients. Currently, in 1,117 (23.3 %) of these 4,789 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 879 / 186 / 52 (18.4 % / 3.9 % / 1.1 %) 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 258 cases has been diagnosed, of which 17.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.4 % 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	56	74.7	12.5	5.8	98.2	100.0
1999	66	71.7	9.8	5.8	97.0	97.0
2000	86	82.7	8.7	5.8	96.5	100.0
2001	90	89.1	10.1	5.7	96.7	98.9
2002	115	79.3	10.7	5.8	99.1	100.0 #
2003	112	73.2	10.5	5.7	93.8	98.2
2004	115	83.3	11.6	5.7	93.0	97.4
2005	149	82.8	12.5	5.7	96.0	99.3
2006	158	80.2	13.1	5.7	95.6	98.7
2007	201	79.8	13.4	5.6	94.0	98.0 #
2008	212	82.2	13.9	5.6	89.2	98.6
2009	213	82.9	14.6	5.4	88.3	100.0
2010	227	90.4	15.3	5.2	92.5	100.0
2011	212	83.1	15.9	5.1	88.2	99.1
2012	227	81.7	16.5	5.1	91.6	99.6
2013	215	78.5	16.4	4.5	85.6	98.6
2014	235	84.8	17.0	4.5	84.3	99.1
2015	232	81.7	17.3	3.9	82.3	97.4
2016	217	79.2	17.2	3.7	85.7	100.0
2017	198	76.2	17.5	3.3	74.7	99.5
2018	195	75.6	17.7	2.8	62.1	100.0
2019	175	81.0	17.9	3.0	61.7	100.0
2020	167	79.5	18.3	2.4	44.9	99.4 ##
1998-2020	3873	80.9	18.3	5.8	85.0	99.1

3,873 cases diagnosed 1998-2020 are related to a total of 3,873 patients. Currently, in 919 (23.7 %) of these 3,873 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 714 / 158 / 47 (18.4 % / 4.1 % / 1.2 %) 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 195 cases has been diagnosed, of which 17.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	19	25.3	5.3	3.8	94.7	100.0
1999	26	28.3	6.7	3.8	96.2	100.0
2000	18	17.3	6.3	3.7	83.3	100.0
2001	11	10.9	6.8	3.7	90.9	90.9
2002	30	20.7	10.6	3.6	96.7	100.0 #
2003	41	26.8	11.7	3.7	95.1	100.0
2004	23	16.7	10.7	3.5	95.7	100.0
2005	31	17.2	10.6	3.4	93.5	96.8
2006	39	19.8	12.2	3.4	87.2	97.4
2007	51	20.2	12.1	3.6	92.2	98.0 #
2008	46	17.8	13.4	3.7	93.5	100.0
2009	44	17.1	15.3	3.8	81.8	100.0
2010	24	9.6	15.6	3.6	100.0	100.0
2011	43	16.9	15.5	3.5	90.7	100.0
2012	51	18.3	15.9	3.4	84.3	100.0
2013	59	21.5	16.4	3.6	78.0	98.3
2014	42	15.2	16.1	3.9	78.6	100.0
2015	52	18.3	16.2	3.8	75.0	96.2
2016	57	20.8	16.5	2.7	73.7	100.0
2017	62	23.8	17.0	1.9	72.6	100.0
2018	63	24.4	17.5	0.7	74.6	100.0
2019	41	19.0	17.8	1.2	61.0	100.0
2020	43	20.5	17.5	2.3	46.5	100.0 ##
1998-2020	916	19.1	17.5	3.8	81.9	99.2

916 cases diagnosed 1998-2020 are related to a total of 916 patients. Currently, in 198 (21.6 %) of these 916 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 165 / 28 / 5 (18.0 % / 3.1 % / 0.5 %) 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 63 cases has been diagnosed, of which 17.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis
(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	56	19	5.1	1.6	3.2	0.8	4.5	1.2	5.4	1.5
1999	66	26	5.9	2.2	3.5	1.1	5.2	1.6	6.4	2.0
2000	86	18	7.6	1.5	4.7	0.7	6.7	1.0	7.9	1.3
2001	90	11	7.8	0.9	4.6	0.4	6.8	0.6	8.9	0.8
2002	115	30	6.2	1.5	3.5	0.7	5.1	1.1	6.3	1.4
2003	112	41	6.0	2.1	3.3	0.9	4.9	1.3	6.3	1.8
2004	115	23	6.1	1.2	3.4	0.6	5.0	0.8	6.3	1.0
2005	149	31	7.9	1.6	4.3	0.8	6.2	1.1	7.7	1.3
2006	158	39	8.3	1.9	4.4	0.9	6.6	1.3	8.4	1.6
2007	201	51	9.1	2.2	4.9	1.1	7.2	1.5	9.1	1.8
2008	212	46	9.5	2.0	5.3	0.9	7.5	1.3	9.1	1.6
2009	213	44	9.5	1.9	4.9	0.8	7.1	1.2	8.9	1.5
2010	227	24	10.1	1.0	5.1	0.4	7.5	0.6	9.4	0.7
2011	212	43	9.5	1.8	4.6	0.8	6.8	1.1	8.7	1.5
2012	227	51	10.0	2.2	4.9	0.9	7.2	1.4	9.0	1.8
2013	215	59	9.3	2.5	4.7	1.2	6.9	1.7	8.6	2.1
2014	235	42	10.1	1.7	5.2	0.8	7.4	1.1	9.2	1.4
2015	232	52	9.8	2.1	4.8	1.0	7.0	1.4	8.9	1.8
2016	217	57	9.0	2.3	4.4	0.9	6.4	1.4	8.2	1.8
2017	198	62	8.2	2.5	3.8	1.2	5.6	1.6	7.3	2.0
2018	195	63	8.0	2.5	3.6	1.0	5.4	1.4	7.1	1.9
2019	175	41	7.2	1.7	3.6	0.7	5.2	1.0	6.5	1.3
2020	167	43	6.9	1.7	3.3	0.7	4.8	1.0	6.1	1.3
1998–2020	3873	916	8.3	1.9	4.3	0.9	6.3	1.2	7.9	1.6

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	75	64.4	10.2	34.6	82.7	51.1	58.5	65.4	70.9	77.8
1999	92	66.7	8.9	38.4	84.0	57.0	60.4	67.8	73.2	78.2
2000	104	66.5	10.2	37.6	94.2	54.2	60.4	65.7	72.8	78.8
2001	101	66.3	11.7	31.6	84.8	49.5	60.2	68.3	75.6	79.2
2002	145	66.7	9.7	36.0	88.9	55.1	60.9	66.8	74.0	78.9
2003	153	68.5	11.5	22.0	91.0	56.9	63.0	68.2	77.9	81.7
2004	138	67.4	9.8	41.7	93.4	53.1	61.1	67.8	74.3	80.4
2005	180	67.4	10.2	1.0	87.5	56.8	62.7	67.4	74.5	79.1
2006	197	67.9	11.0	20.4	89.1	53.6	60.5	68.7	76.3	81.3
2007	252	67.6	10.3	25.9	88.4	54.5	60.7	68.9	74.8	79.8
2008	258	66.8	10.9	6.5	86.1	53.1	60.8	68.2	74.1	78.8
2009	257	68.8	9.8	29.5	94.7	55.8	62.6	69.7	75.0	81.6
2010	251	69.0	10.1	15.6	90.0	55.9	62.7	70.0	75.0	81.4
2011	255	68.8	10.6	18.5	89.9	54.8	63.1	70.5	76.2	81.0
2012	278	69.0	9.9	22.1	88.5	54.9	64.0	70.6	75.8	79.5
2013	274	68.0	11.0	7.7	90.7	54.9	60.0	69.2	76.0	81.3
2014	277	68.8	9.7	18.4	93.5	56.3	62.3	70.1	74.8	80.5
2015	284	69.1	10.6	22.1	89.3	55.2	62.5	71.2	76.4	82.0
2016	274	70.6	10.8	16.9	91.9	57.0	64.5	72.4	77.9	82.3
2017	260	70.0	11.1	20.2	89.8	56.0	63.9	71.4	78.1	82.0
2018	258	70.9	10.4	35.1	97.5	55.7	63.4	72.7	78.2	83.1
2019	216	69.8	9.9	35.2	89.4	56.1	64.4	70.0	76.6	82.3
2020	210	69.8	11.2	24.9	91.9	55.9	62.3	71.8	78.1	82.4
1998–2020	4789	68.6	10.5	1.0	97.5	55.2	62.1	69.7	76.1	81.2

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	56	64.5	8.8	41.1	82.7	55.0	58.9	65.3	69.1	76.8
1999	66	66.4	8.7	38.4	84.0	56.4	60.0	68.4	72.4	76.4
2000	86	66.1	10.5	37.6	94.2	53.7	59.2	65.2	72.5	78.8
2001	90	66.0	11.5	31.6	84.8	48.7	60.2	68.3	74.6	78.1
2002	115	66.4	8.7	36.0	86.9	55.3	61.2	66.7	73.3	77.4
2003	112	67.5	11.4	25.1	91.0	54.0	62.3	68.0	75.6	81.6
2004	115	67.2	9.2	47.6	89.2	54.4	60.6	67.7	74.2	78.5
2005	149	67.4	8.3	37.2	86.0	57.1	62.9	67.3	73.5	77.8
2006	158	68.0	10.0	46.0	89.1	54.0	60.5	69.1	75.6	79.8
2007	201	67.5	9.5	28.0	85.2	56.0	60.8	68.4	74.2	79.3
2008	212	66.2	10.7	6.5	86.1	53.1	60.8	68.0	73.1	77.2
2009	213	68.5	9.7	29.5	94.7	56.1	62.4	69.3	74.6	80.2
2010	227	68.7	9.4	29.4	90.0	55.9	62.3	69.7	74.6	80.3
2011	212	68.6	9.7	31.0	88.3	54.9	63.1	70.2	75.6	79.8
2012	227	69.0	9.0	42.7	88.5	55.1	64.0	70.1	74.9	78.7
2013	215	68.1	11.0	7.7	90.7	55.2	60.0	69.4	76.1	81.1
2014	235	68.6	9.8	18.4	93.5	56.3	61.9	69.7	75.2	80.5
2015	232	69.4	10.0	28.1	88.1	56.6	63.2	71.5	76.3	81.5
2016	217	70.0	11.0	16.9	88.6	56.5	64.2	72.2	77.9	81.9
2017	198	70.4	10.1	33.7	89.8	57.1	64.9	71.2	77.9	81.9
2018	195	70.2	10.3	44.1	97.5	55.1	62.3	72.4	78.0	81.9
2019	175	69.5	9.4	42.6	88.1	56.9	64.0	69.9	76.2	81.7
2020	167	69.6	10.9	24.9	91.9	56.2	62.2	71.2	77.9	81.7
1998–2020	3873	68.4	10.0	6.5	97.5	55.6	62.1	69.4	75.6	80.4

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	19	64.0	13.8	34.6	78.2	38.3	52.8	65.5	76.3	78.1
1999	26	67.5	9.7	45.7	83.9	57.0	60.5	66.3	75.7	80.0
2000	18	68.5	8.6	51.3	83.0	55.8	63.6	67.9	75.3	82.7
2001	11	68.1	13.8	37.1	81.3	58.6	59.4	68.0	80.4	81.1
2002	30	67.8	12.9	38.8	88.9	48.7	59.9	68.6	78.9	82.1
2003	41	71.0	11.8	22.0	86.0	60.3	64.0	74.9	79.8	81.9
2004	23	68.1	12.7	41.7	93.4	49.6	61.3	69.2	74.9	84.2
2005	31	67.6	16.8	1.0	87.5	50.3	61.3	71.1	79.7	82.8
2006	39	67.6	14.4	20.4	86.0	52.6	57.1	68.6	79.5	83.0
2007	51	68.1	13.0	25.9	88.4	50.3	60.4	69.9	77.9	83.4
2008	46	69.5	11.5	40.7	85.6	55.7	62.9	70.5	78.6	83.2
2009	44	70.0	10.7	39.7	89.1	52.8	65.5	71.3	76.5	83.0
2010	24	72.2	15.6	15.6	88.8	54.8	68.6	71.7	84.2	86.9
2011	43	69.7	14.3	18.5	89.9	54.7	64.8	72.1	80.5	82.2
2012	51	69.0	13.3	22.1	86.0	54.2	64.3	74.2	77.7	80.9
2013	59	67.6	11.3	31.7	88.3	54.3	60.0	67.9	75.9	82.5
2014	42	69.7	9.2	38.7	86.7	57.0	66.7	71.1	74.5	78.6
2015	52	67.5	13.0	22.1	89.3	53.6	58.3	67.4	76.8	84.1
2016	57	72.8	9.9	45.7	91.9	60.2	69.0	73.7	78.2	86.4
2017	62	68.5	13.8	20.2	89.2	51.4	61.8	71.4	78.6	82.1
2018	63	73.2	10.5	35.1	92.0	62.1	67.6	74.3	81.3	84.8
2019	41	70.8	12.0	35.2	89.4	56.1	66.7	71.0	79.0	85.8
2020	43	70.6	12.4	26.2	87.3	55.4	62.9	72.7	80.3	83.2
1998–2020	916	69.4	12.4	1.0	93.4	53.6	62.9	71.1	78.2	83.1

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									
5-9	2	0.1	0.1	2	0.1	0.1			0.0
10-14	0	0.0	0.1			0.1			0.0
15-19	5	0.1	0.2	3	0.1	0.2	2	0.3	0.3
20-24	6	0.2	0.4	2	0.1	0.2	4	0.6	0.9
25-29	7	0.2	0.6	5	0.2	0.4	2	0.3	1.2
30-34	7	0.2	0.7	5	0.2	0.6	2	0.3	1.5
35-39	12	0.3	1.1	5	0.2	0.8	7	1.0	2.5
40-44	25	0.7	1.8	18	0.6	1.4	7	1.0	3.5
45-49	75	2.1	3.9	59	2.0	3.4	16	2.4	5.9
50-54	196	5.4	9.3	162	5.5	8.9	34	5.0	10.9
55-59	325	9.0	18.3	277	9.5	18.4	48	7.1	18.0
60-64	468	13.0	31.3	404	13.8	32.2	64	9.4	27.4
65-69	633	17.6	48.9	520	17.8	50.0	113	16.7	44.1
70-74	760	21.1	70.0	625	21.4	71.3	135	19.9	64.0
75-79	591	16.4	86.3	486	16.6	87.9	105	15.5	79.5
80-84	366	10.2	96.5	277	9.5	97.4	89	13.1	92.6
85+	126	3.5	100.0	76	2.6	100.0	50	7.4	100.0
All ages	3604	100.0		2926	100.0		678	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						
5- 9	2		0.1		1.7	
10-14						
15-19	3	2	0.2	0.1	0.9	0.8
20-24	2	4	0.1	0.2	0.3	0.8
25-29	5	2	0.2	0.1	0.5	0.2
30-34	5	2	0.2	0.1	0.4	0.1
35-39	5	7	0.2	0.3	0.3	0.2
40-44	18	7	0.7	0.3	0.6	0.1
45-49	59	16	2.2	0.6	1.2	0.2
50-54	162	34	6.4	1.4	1.9	0.3
55-59	277	48	13.0	2.2	2.2	0.4
60-64	404	64	22.9	3.4	2.3	0.4
65-69	520	113	31.9	6.2	2.1	0.6
70-74	625	135	41.7	7.9	2.3	0.7
75-79	486	105	40.2	7.0	2.0	0.5
80-84	277	89	38.3	8.4	1.8	0.6
85+	76	50	16.3	4.8	0.7	0.3
All ages	2926	678			1.9	0.4
Incidence						
Raw			9.0	2.0		
WS			4.5	0.9		
ES			6.5	1.3		
BRD-S			8.2	1.6		

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).

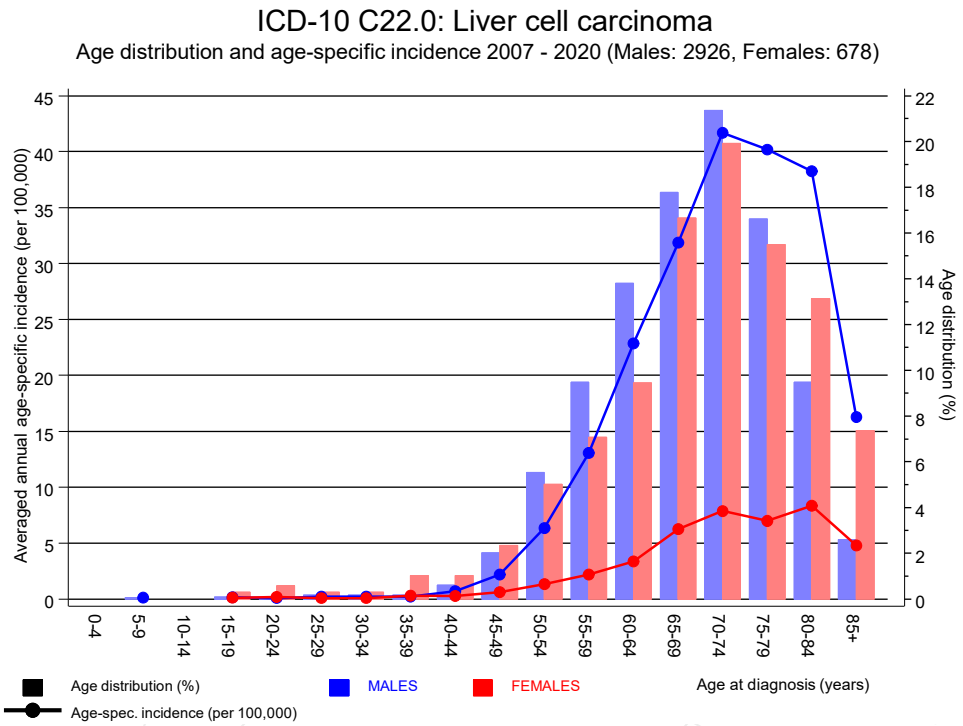


Figure 6. Age distribution (males: mean=68.9 yrs, median=70.0 yrs; females: mean=69.9 yrs, median=71.4 yrs) and age-specific incidence.

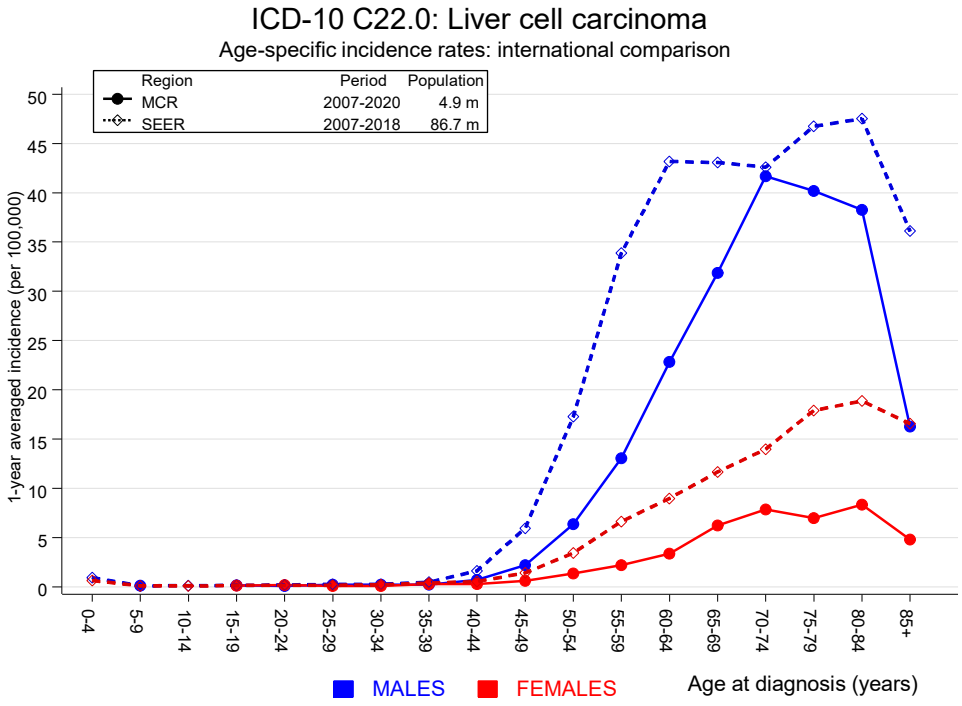


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 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 1998–2020
MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	1	0.1	9.0	0.2	50.4		1.3	
C03–C06	Oral cavity	7	0.9	8.1	3.3	16.7	#	9.3	
C09–C10	Oropharynx	3	1.1	2.7	0.6	8.0		2.9	
C12–C13	Hypopharynx	2	0.6	3.4	0.4	12.3		2.1	
C15	Oesophagus	16	2.2	7.2	4.1	11.6	#	20.8	6.3
C16	Stomach	7	4.0	1.8	0.7	3.6		4.6	
C17	Small intestine	1	0.7	1.5	0.0	8.4		0.5	
C18	Colon	24	10.1	2.4	1.5	3.6	#	21.1	8.3
C19–C20	Rectum	5	5.6	0.9	0.3	2.1		−0.9	40.0
C22	Liver	2	3.2	0.6	0.1	2.2		−1.9	50.0
C23–C24	Bile	2	1.2	1.7	0.2	6.2		1.3	
C25	Pancreas	14	4.2	3.3	1.8	5.5	#	14.8	
C32	Larynx	2	1.0	1.9	0.2	7.0		1.5	
C33–C34	Lung	43	12.7	3.4	2.5	4.6	#	45.9	20.9
C38,C45	Mesothelioma	1	0.8	1.3	0.0	7.4		0.4	100.0
C43	Malign. melanoma	5	4.9	1.0	0.3	2.4		0.1	
C48	Peritoneal	2	0.1	22.5	2.7	81.4	#	2.9	
C50	Breast	3	0.3	9.9	2.0	29.0	#	4.1	33.3
C61	Prostate	36	30.1	1.2	0.8	1.7		8.9	13.9
C64	Kidney	23	3.7	6.3	4.0	9.4	#	29.2	13.0
C67	Bladder	13	4.9	2.7	1.4	4.6	#	12.3	
C68	Urethra	1	0.1	9.0	0.2	50.4		1.3	
C73	Thyroid	2	0.7	3.0	0.4	10.8		2.0	
C76–C79	CUP	8	1.7	4.7	2.0	9.2	#	9.5	
C82–C85	NHL	10	4.4	2.3	1.1	4.2	#	8.5	
C90	Mult. myeloma	3	1.4	2.2	0.5	6.4		2.5	66.7
C91–C96	Leukaemia	4	1.6	2.6	0.7	6.6		3.7	50.0
Not observed		0	5.0	0.0	0.0	0.7	#	−7.6	
All further malignancies		240	107.1	2.2	2.0	2.5	#	201.0	12.1

Patients	3793
Median age at next malignancy (years)	71.9
Person-years	6612
Mean observation time (years)	1.7
Median observation time (years)	0.8

The occurrence of further specified malignancy is statistically significant.

Table 7b

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

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	1	0.1	10.7	0.3	59.5		5.8	
C09–C10	Oropharynx	3	0.1	41.9	8.6	122.5	#	18.8	
C11	Nasopharynx	1	0.0	176.9	4.5	985.4	#	6.4	
C16	Stomach	3	0.5	5.8	1.2	17.0	#	16.0	
C18	Colon	3	1.5	2.0	0.4	5.7		9.5	
C22	Liver	1	0.2	4.7	0.1	26.2		5.1	
C23–C24	Bile	2	0.2	8.8	1.1	32.0	#	11.4	
C32	Larynx	1	0.0	32.2	0.8	179.2		6.2	
C33–C34	Lung	6	1.3	4.5	1.7	9.8	#	30.0	
C37	Thymus	1	0.0	90.1	2.3	502.0	#	6.4	
C50	Breast	9	5.3	1.7	0.8	3.2		24.0	11.1
C54	Corpus uteri	2	1.0	2.1	0.2	7.5		6.6	
C64	Kidney	2	0.4	5.2	0.6	18.7		10.4	50.0
C82–C85	NHL	1	0.6	1.6	0.0	8.8		2.4	
Not observed		0	5.4	0.0	0.0	0.7	#	-34.9	
All further malignancies		36	16.7	2.2	1.5	3.0	#	124.1	5.6

Patients	884
Median age at next malignancy (years)	69.0
Person-years	1556
Mean observation time (years)	1.8
Median observation time (years)	0.8

The occurrence of further specified malignancy is statistically significant.

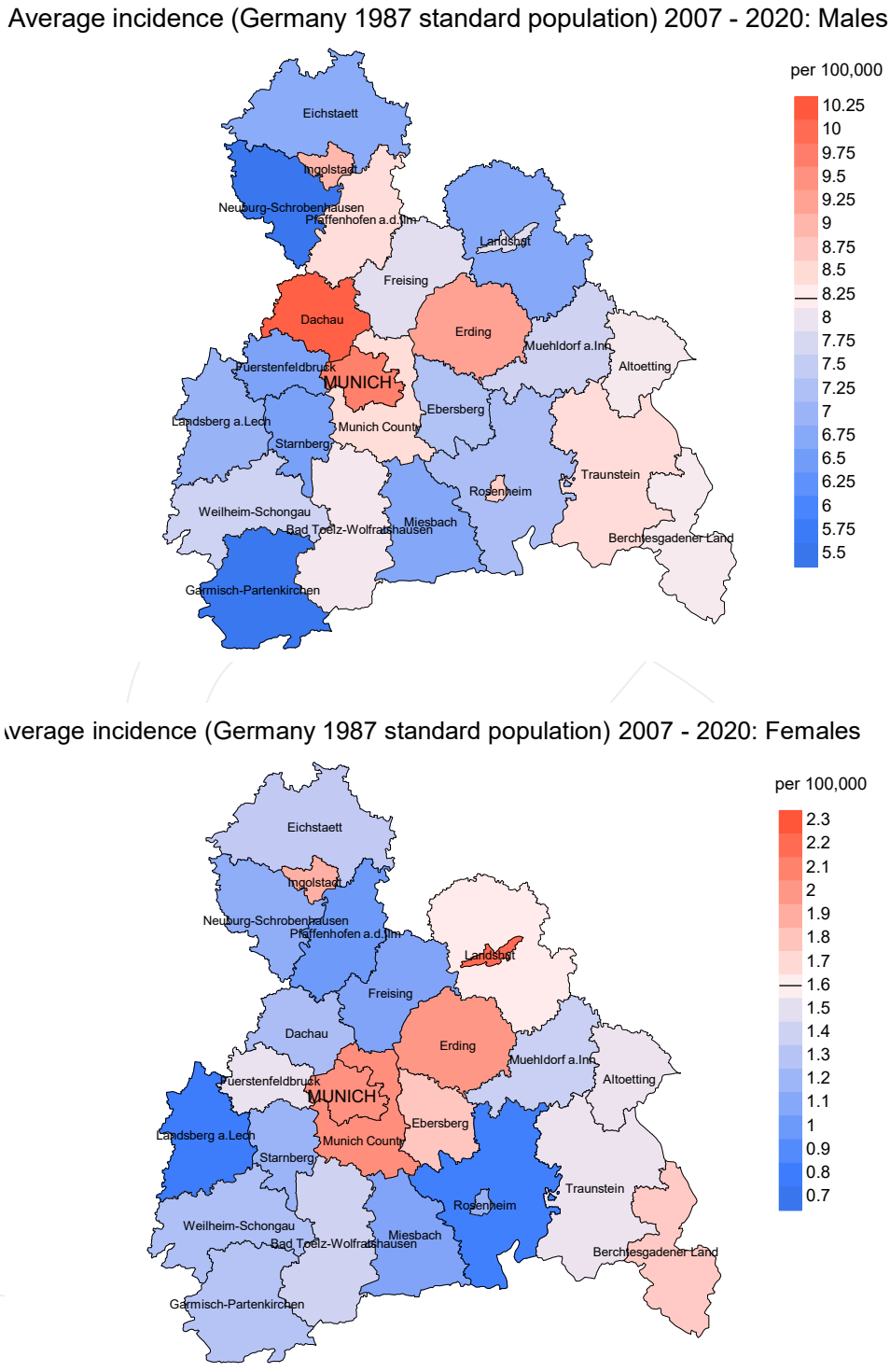
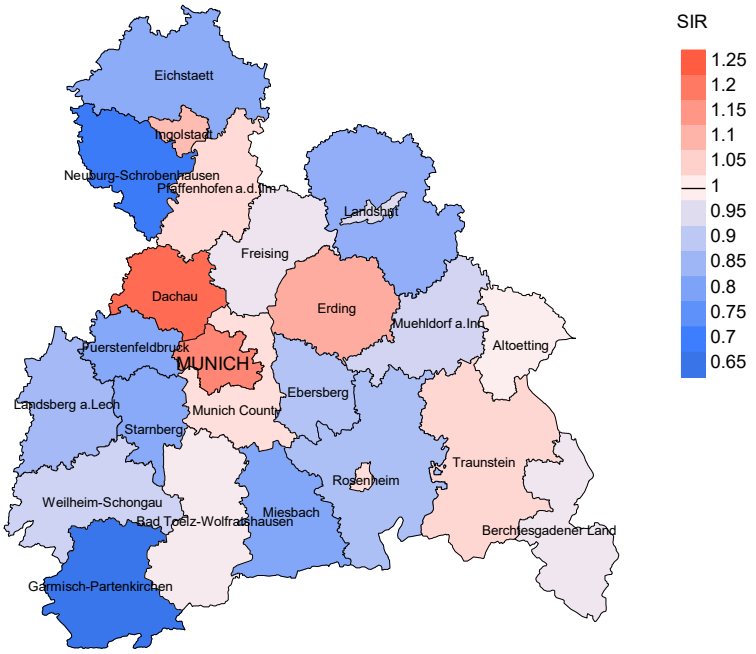


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 8.2/100,000 WS N=2,926, females 1.6/100,000 WS N=678).

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 20 women were identified with newly diagnosed liver cell carcinoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.8/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.9 and 3.1/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

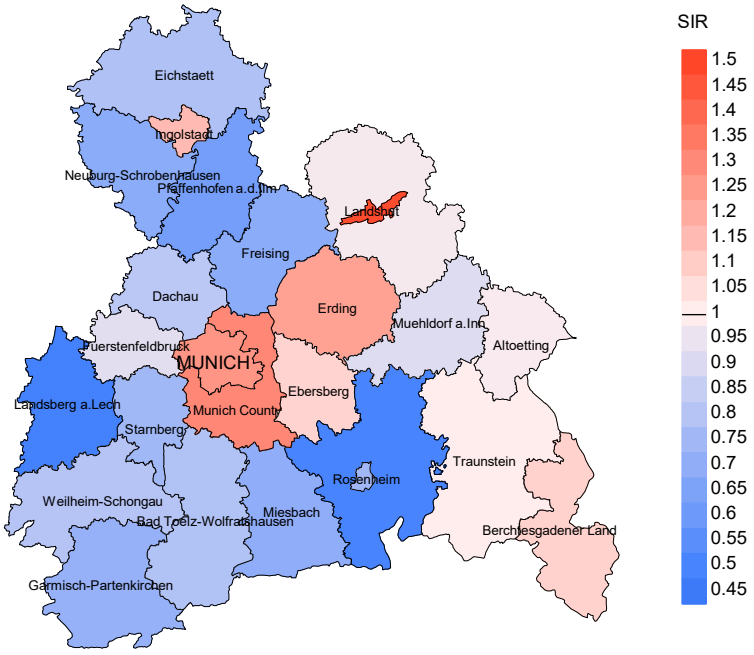


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=2,926, females N=678).

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 20 women were identified with newly diagnosed liver cell carcinoma. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.08. Though, the value of this parameter may vary with an underlying probability of 99% between 0.56 and 1.87, 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	75	100.0	73	97.3	91.8
1999	92	97.8	89	96.7	95.5
2000	104	100.0	98	94.2	90.8
2001	101	98.0	97	96.0	93.8
2002	145	100.0	143	98.6	96.5
2003	153	98.7	144	94.1	95.8
2004	138	97.8	129	93.5	96.1
2005	180	98.9	172	95.6	96.5
2006	197	98.5	185	93.9	98.4
2007	252	98.0	236	93.7	95.8
2008	258	98.8	232	89.9	97.8
2009	257	100.0	224	87.2	97.8
2010	251	100.0	234	93.2	98.7
2011	255	99.2	226	88.6	96.5
2012	278	99.6	251	90.3	95.6
2013	274	98.5	230	83.9	95.7
2014	277	99.3	231	83.4	92.2
2015	284	97.2	230	81.0	92.6
2016	274	100.0	228	83.2	89.9
2017	260	99.6	193	74.2	85.5
2018	258	100.0	168	65.1	65.5
2019	216	100.0	133	61.6	77.4
2020	210	99.5	95	45.2	93.7
1998–2020	4789	99.1	4041	84.4	93.0

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	75	70	35	46.7
1999	92	65	35	38.0
2000	104	81	39	37.5
2001	101	90	40	39.6
2002	145	117	60	41.4
2003	153	125	56	36.6
2004	138	120	45	32.6
2005	180	143	62	34.4
2006	197	176	78	39.6
2007	252	188	80	31.7
2008	258	206	88	34.1
2009	257	178	85	33.1
2010	251	220	79	31.5
2011	255	222	82	32.2
2012	278	232	90	32.4
2013	274	216	79	28.8
2014	277	246	81	29.2
2015	284	276	85	29.9
2016	274	250	90	32.8
2017	260	206	70	26.9
2018	258	213	80	31.0
2019	216	210	66	30.6
2020	210	228	65	31.0
1998–2020	4789	4078	1570	32.8

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	70	84.3	15.7	92.3
1999	65	86.2	13.8	88.3
2000	81	90.1	9.9	90.9
2001	90	94.4	5.6	98.8
2002	117	91.5	8.5	95.6
2003	125	94.4	5.6	96.7
2004	120	90.8	9.2	95.7
2005	143	90.2	9.8	97.8
2006	176	93.2	6.8	97.7
2007	188	89.4	10.6	92.9
2008	206	86.9	13.1	93.1
2009	178	93.3	6.7	97.1
2010	220	85.0	15.0	90.3
2011	222	87.4	12.6	91.2
2012	232	82.8	17.2	91.7
2013	216	85.6	14.4	91.5
2014	246	83.7	16.3	90.8
2015	276	86.2	13.8	91.6
2016	250	87.2	12.8	93.5
2017	206	85.0	15.0	90.2
2018	213	66.2	33.8	84.5
2019	210	57.6	42.4	78.4
2020	228	79.4	20.6	82.3
1998-2020	4078	84.6	15.4	91.7

Table 10a

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	51	64.5	65.5	61.2	65.5
1999	50	69.6	68.7	74.3	70.2
2000	64	68.7	68.9	64.9	69.1
2001	77	67.4	67.9	64.2	68.4
2002	89	68.6	68.7	68.3	68.3
2003	100	67.5	68.1	63.1	68.1
2004	94	69.5	69.4	73.0	69.4
2005	113	68.1	68.0	68.8	67.8
2006	144	70.4	70.4	70.4	70.9
2007	158	70.9	70.9	71.3	71.0
2008	166	69.4	69.4	69.3	69.4
2009	144	69.5	69.2	76.1	69.5
2010	176	72.1	72.1	71.5	72.2
2011	191	70.6	71.1	67.7	71.1
2012	193	71.3	71.4	70.6	71.4
2013	183	72.3	72.7	71.4	72.8
2014	206	71.8	71.3	73.8	72.0
2015	227	72.4	72.6	71.4	72.6
2016	207	73.3	74.1	69.3	73.5
2017	162	73.2	73.3	71.3	74.0
2018	162	74.9	75.1	73.5	75.8
2019	171	74.4	72.6	76.4	77.1
2020	183	72.4	71.1	77.7	71.7
1998-2020	3311	71.1	71.0	71.5	71.3

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

Table 10b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	19	69.5	68.9	78.3	70.0
1999	15	71.6	71.6		73.3
2000	17	73.5	72.7	75.3	72.0
2001	13	66.9	66.9		66.9
2002	28	70.2	67.6	83.3	69.6
2003	25	76.6	76.6		76.6
2004	26	75.8	75.3	79.7	75.3
2005	30	70.5	70.8	62.3	70.8
2006	32	74.1	74.1	77.1	74.1
2007	30	69.2	69.7	63.8	69.6
2008	40	74.3	73.7	78.1	74.7
2009	34	75.0	74.3	79.8	74.3
2010	44	76.0	76.4	72.3	76.0
2011	31	73.2	74.1	68.3	73.7
2012	39	72.0	74.2	70.4	75.5
2013	33	72.8	72.7	78.7	72.7
2014	40	73.4	73.2	74.3	73.2
2015	49	73.3	72.9	84.6	73.3
2016	43	73.7	73.6	74.6	73.6
2017	44	74.2	73.1	79.1	73.3
2018	51	74.7	74.4	75.7	76.5
2019	39	74.1	74.1	73.9	76.5
2020	45	77.3	76.2	77.3	73.1
1998–2020	767	73.5	73.1	76.0	73.2

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	41	3.7	0.73	2.3	0.71	3.3	0.73	4.1	0.77
1999	41	3.7	0.62	2.2	0.61	3.3	0.63	4.3	0.66
2000	59	5.2	0.69	3.0	0.65	4.5	0.67	5.8	0.74
2001	72	6.2	0.80	3.6	0.78	5.4	0.80	7.2	0.80
2002	82	4.4	0.71	2.5	0.72	3.7	0.73	4.7	0.75
2003	93	5.0	0.83	2.8	0.83	4.1	0.84	5.1	0.81
2004	84	4.5	0.73	2.5	0.72	3.6	0.72	4.6	0.73
2005	100	5.3	0.67	2.9	0.67	4.2	0.68	5.3	0.69
2006	134	7.0	0.85	3.6	0.81	5.4	0.82	7.1	0.85
2007	140	6.3	0.70	3.2	0.65	4.8	0.68	6.4	0.71
2008	149	6.7	0.70	3.5	0.66	5.2	0.69	6.7	0.74
2009	136	6.1	0.64	3.1	0.64	4.6	0.64	5.8	0.65
2010	151	6.7	0.67	3.2	0.61	4.8	0.63	6.4	0.68
2011	167	7.5	0.79	3.5	0.76	5.3	0.78	7.0	0.80
2012	160	7.0	0.70	3.2	0.66	4.8	0.67	6.4	0.71
2013	155	6.7	0.72	3.0	0.64	4.6	0.67	6.2	0.72
2014	171	7.3	0.73	3.5	0.68	5.2	0.70	6.7	0.73
2015	194	8.2	0.84	3.8	0.80	5.7	0.81	7.4	0.83
2016	180	7.5	0.83	3.2	0.74	4.9	0.78	6.7	0.82
2017	138	5.7	0.70	2.6	0.68	3.9	0.69	5.1	0.70
2018	108	4.4	0.55	1.8	0.49	2.8	0.51	3.9	0.55
2019	98	4.0	0.56	1.8	0.49	2.7	0.52	3.6	0.55
2020	147	6.0	0.88	2.9	0.87	4.2	0.88	5.4	0.88
1998-2020	2800	6.0	0.72	3.0	0.69	4.4	0.70	5.8	0.73

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	18	1.5	0.95	0.8	1.00	1.2	1.00	1.4	0.96
1999	15	1.3	0.58	0.6	0.52	0.9	0.54	1.2	0.58
2000	14	1.2	0.78	0.5	0.70	0.8	0.72	1.1	0.80
2001	13	1.1	1.18	0.5	1.42	0.8	1.40	1.0	1.24
2002	25	1.3	0.83	0.6	0.88	0.9	0.83	1.2	0.85
2003	25	1.3	0.61	0.5	0.54	0.7	0.57	1.0	0.58
2004	25	1.3	1.09	0.5	0.81	0.7	0.89	1.0	1.01
2005	29	1.5	0.94	0.6	0.79	0.9	0.86	1.2	0.89
2006	30	1.5	0.77	0.6	0.68	0.9	0.69	1.2	0.74
2007	28	1.2	0.55	0.5	0.48	0.7	0.49	0.9	0.51
2008	30	1.3	0.65	0.5	0.62	0.8	0.63	1.0	0.63
2009	30	1.3	0.68	0.6	0.69	0.8	0.69	1.1	0.70
2010	36	1.5	1.50	0.5	1.15	0.8	1.36	1.2	1.61
2011	27	1.2	0.63	0.4	0.52	0.6	0.57	0.9	0.58
2012	32	1.4	0.63	0.6	0.60	0.8	0.61	1.1	0.60
2013	30	1.3	0.51	0.5	0.43	0.8	0.44	1.0	0.48
2014	35	1.5	0.83	0.6	0.78	0.9	0.78	1.1	0.83
2015	44	1.8	0.85	0.7	0.72	1.1	0.75	1.4	0.80
2016	38	1.5	0.67	0.6	0.68	0.9	0.69	1.2	0.67
2017	37	1.5	0.60	0.6	0.50	0.9	0.53	1.1	0.55
2018	33	1.3	0.52	0.5	0.52	0.8	0.52	1.0	0.52
2019	23	0.9	0.56	0.4	0.50	0.5	0.51	0.7	0.54
2020	34	1.4	0.79	0.5	0.73	0.8	0.73	1.0	0.74
1998-2020	651	1.3	0.71	0.6	0.65	0.8	0.66	1.1	0.69

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	1	0.0	0.0	1	0.0	0.0			0.0
15-19	3	0.1	0.2	1	0.0	0.1	2	0.4	0.4
20-24	2	0.1	0.2	1	0.0	0.1	1	0.2	0.7
25-29	3	0.1	0.4	2	0.1	0.2	1	0.2	0.9
30-34	3	0.1	0.5	3	0.1	0.4			0.9
35-39	9	0.4	0.8	6	0.3	0.7	3	0.7	1.5
40-44	12	0.5	1.3	9	0.4	1.1	3	0.7	2.2
45-49	37	1.5	2.7	31	1.5	2.6	6	1.3	3.5
50-54	95	3.7	6.5	82	3.9	6.5	13	2.8	6.3
55-59	190	7.4	13.9	160	7.6	14.1	30	6.6	12.9
60-64	277	10.9	24.8	241	11.5	25.6	36	7.9	20.8
65-69	411	16.1	40.9	344	16.4	42.1	67	14.7	35.4
70-74	538	21.1	62.0	445	21.3	63.3	93	20.4	55.8
75-79	499	19.6	81.5	420	20.1	83.4	79	17.3	73.1
80-84	317	12.4	94.0	249	11.9	95.3	68	14.9	88.0
85+	154	6.0	100.0	99	4.7	100.0	55	12.0	100.0
All ages	2551	100.0		2094	100.0		457	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.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14	1		0.1	1.00			3.6	
15-19	1	2	0.1	0.33	0.1	1.00	2.1	8.0
20-24	1	1	0.0	0.50	0.1	0.25	1.4	2.3
25-29	2	1	0.1	0.40	0.0	0.50	2.2	1.0
30-34	3		0.1	0.60			2.1	
35-39	6	3	0.3	1.20	0.1	0.43	2.2	0.7
40-44	9	3	0.4	0.50	0.1	0.43	1.5	0.4
45-49	31	6	1.2	0.53	0.2	0.38	2.2	0.4
50-54	82	13	3.2	0.51	0.5	0.38	3.1	0.5
55-59	160	30	7.5	0.58	1.4	0.63	3.6	0.8
60-64	241	36	13.6	0.60	1.9	0.56	3.8	0.7
65-69	344	67	21.1	0.66	3.7	0.59	3.7	1.0
70-74	445	93	29.7	0.71	5.4	0.69	3.7	1.1
75-79	420	79	34.7	0.86	5.3	0.75	3.4	0.8
80-84	249	68	34.4	0.90	6.4	0.76	2.4	0.7
85+	99	55	21.2	1.30	5.3	1.10	1.1	0.5
All ages	2094	457					3.0	0.7
Mortality								
Raw			6.4	0.72	1.4	0.67		
WS			3.0	0.67	0.5	0.61		
ES			4.5	0.69	0.8	0.62		
BRD-S			5.9	0.72	1.0	0.65		
PYLL-70								
per 100,000			26.5		5.5			
ES			22.7		4.7			
AYLL-70			8.6		9.6			

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	2	0.3	1	50.0			1	50.0
C03–C06	Oral cavity	15	2.1	10	66.7	1	6.7	4	26.7
C07–C08	Salivary gland	2	0.3	1	50.0	1	50.0		
C09–C10	Oropharynx	19	2.6	16	84.2	2	10.5	1	5.3
C12–C13	Hypopharynx	10	1.4	7	70.0	2	20.0	1	10.0
C15	Oesophagus	27	3.7	8	29.6	8	29.6	11	40.7
C16	Stomach	17	2.4	8	47.1	6	35.3	3	17.6
C17	Small intestine	4	0.6	2	50.0	2	50.0		
C18	Colon	81	11.2	53	65.4	22	27.2	6	7.4
C19–C20	Rectum	47	6.5	37	78.7	8	17.0	2	4.3
C22	Liver	3	0.4					3	100.0
C23–C24	Bile	2	0.3	1	50.0	1	50.0		
C25	Pancreas	12	1.7			6	50.0	6	50.0
C32	Larynx	25	3.5	23	92.0	2	8.0		
C33–C34	Lung	73	10.1	27	37.0	19	26.0	27	37.0
C40–C41	Bone	2	0.3	1	50.0	1	50.0		
C43	Malign. melanoma	27	3.7	22	81.5	2	7.4	3	11.1
C44	Skin others	61	8.4	38	62.3	2	3.3	21	34.4
C46,C49	Soft tissue	3	0.4	2	66.7	1	33.3		
C48	Peritoneal	2	0.3			1	50.0	1	50.0
C50	Breast	4	0.6	2	50.0			2	50.0
C60	Penis	2	0.3	2	100.0				
C61	Prostate	136	18.8	110	80.9	7	5.1	19	14.0
C62	Testis	9	1.2	9	100.0				
C64	Kidney	39	5.4	24	61.5	7	17.9	8	20.5
C67	Bladder	32	4.4	18	56.3	5	15.6	9	28.1
C69	Eye melanoma	2	0.3	2	100.0				
C70–C72	CNS cancer	2	0.3	1	50.0			1	50.0
C73	Thyroid	5	0.7	4	80.0			1	20.0
C76–C79	CUP	8	1.1	3	37.5			5	62.5
C81	Hodgkin lymphoma	3	0.4	3	100.0				
C82–C85	NHL	27	3.7	21	77.8	3	11.1	3	11.1
C90	Mult. myeloma	5	0.7	3	60.0			2	40.0
C91–C96	Leukaemia	9	1.2	5	55.6			4	44.4
Others, specified		5	0.7	2	40.0			3	60.0
All further malignancies		722	100.0	466	64.5	109	15.1	147	20.4

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 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 ←%
C03–C06 Oral cavity	6	4.0	5	83.3	1	16.7		
C09–C10 Oropharynx	2	1.3	1	50.0			1	50.0
C11 Nasopharynx	1	0.7			1	100.0		
C12–C13 Hypopharynx	1	0.7			1	100.0		
C15 Oesophagus	2	1.3	2	100.0				
C16 Stomach	5	3.4			3	60.0	2	40.0
C18 Colon	16	10.7	13	81.3	3	18.8		
C19–C20 Rectum	2	1.3	2	100.0				
C22 Liver	1	0.7					1	100.0
C23–C24 Bile	2	1.3	1	50.0			1	50.0
C32 Larynx	1	0.7			1	100.0		
C33–C34 Lung	7	4.7	4	57.1			3	42.9
C37 Thymus	1	0.7	1	100.0				
C43 Malign. melanoma	6	4.0	6	100.0				
C44 Skin others	15	10.1	8	53.3	1	6.7	6	40.0
C50 Breast	47	31.5	39	83.0	3	6.4	5	10.6
C51 Vulva	3	2.0	3	100.0				
C52 Vagina	1	0.7	1	100.0				
C53 Cervix uteri	3	2.0	3	100.0				
C54 Corpus uteri	7	4.7	4	57.1	1	14.3	2	28.6
C56 Ovary	3	2.0	3	100.0				
C64 Kidney	1	0.7			1	100.0		
C69 Eye melanoma	1	0.7	1	100.0				
C73 Thyroid	3	2.0	3	100.0				
C76–C79 CUP	2	1.3	1	50.0			1	50.0
C82–C85 NHL	8	5.4	7	87.5	1	12.5		
C90 Mult. myeloma	1	0.7	1	100.0				
C91–C96 Leukaemia	1	0.7	1	100.0				
All further malignancies	149	100.0	110	73.8	17	11.4	22	14.8

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	1		0.1	1.00			3.6	
15-19	1	2	0.1	0.33	0.1	1.00	2.2	8.7
20-24	1	1	0.0	0.50	0.1	0.25	1.5	2.4
25-29	2	1	0.1	0.40	0.0	0.50	2.4	1.1
30-34	3		0.1	0.60			2.2	
35-39	6	3	0.3	1.20	0.1	0.43	2.4	0.8
40-44	9	2	0.4	0.50	0.1	0.33	1.6	0.3
45-49	28	6	1.0	0.52	0.2	0.43	2.2	0.4
50-54	70	10	2.7	0.48	0.4	0.38	3.0	0.4
55-59	151	25	7.1	0.61	1.1	0.60	3.9	0.8
60-64	203	33	11.5	0.58	1.7	0.56	3.8	0.8
65-69	284	55	17.4	0.68	3.0	0.65	3.9	1.0
70-74	352	68	23.5	0.75	4.0	0.62	3.9	1.0
75-79	305	62	25.2	0.90	4.1	0.76	3.3	0.8
80-84	178	49	24.6	0.94	4.6	0.75	2.4	0.7
85+	70	41	15.0	1.35	3.9	1.08	1.1	0.4
All ages	1664	358					3.1	0.7
Mortality								
Raw			5.1	0.72	1.1	0.66		
WS			2.5	0.67	0.4	0.60		
ES			3.6	0.69	0.6	0.61		
BRD-S			4.7	0.72	0.8	0.64		
PYLL-70								
per 100,000			23.6		4.8			
ES			20.3		4.2			
AYLL-70			8.9		9.8			

* 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.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14	1		0.1	1.00			3.6	
15-19	1	2	0.1	0.33	0.1	1.00	2.2	9.1
20-24	1	1	0.0	0.50	0.1	0.25	1.5	2.5
25-29	2	1	0.1	0.50	0.0	0.50	2.4	1.1
30-34	3		0.1	0.60			2.2	
35-39	4	3	0.2	0.80	0.1	0.43	1.6	0.8
40-44	9	2	0.4	0.50	0.1	0.40	1.6	0.3
45-49	28	6	1.0	0.52	0.2	0.43	2.2	0.4
50-54	70	10	2.7	0.50	0.4	0.42	3.0	0.5
55-59	147	23	6.9	0.63	1.1	0.59	3.9	0.7
60-64	197	32	11.1	0.59	1.7	0.59	3.7	0.8
65-69	268	54	16.4	0.68	3.0	0.64	3.7	1.0
70-74	335	67	22.3	0.76	3.9	0.64	3.8	1.0
75-79	288	58	23.8	0.89	3.9	0.74	3.3	0.8
80-84	166	46	22.9	0.92	4.3	0.73	2.4	0.7
85+	59	41	12.6	1.16	3.9	1.08	1.0	0.5
All ages	1579	346					3.1	0.7
Mortality								
Raw			4.8	0.72	1.0	0.66		
WS			2.3	0.67	0.4	0.61		
ES			3.5	0.69	0.6	0.62		
BRD-S			4.5	0.72	0.8	0.64		
PYLL-70								
per 100,000			22.9		4.7			
ES			19.7		4.1			
AYLL-70			9.0		9.9			

* See corresponding tables with multiple malignancies.

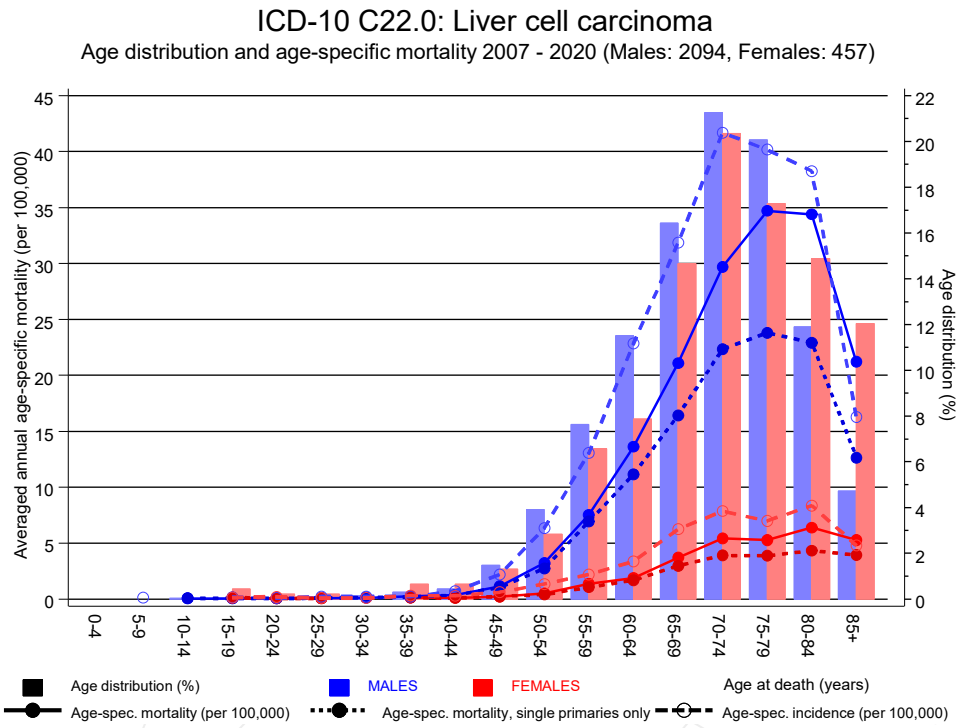


Figure 17. Distribution of age at death (bars; males: mean=69.1 yrs, median=70.3 yrs; females: mean=70.8 yrs, median=71.5 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

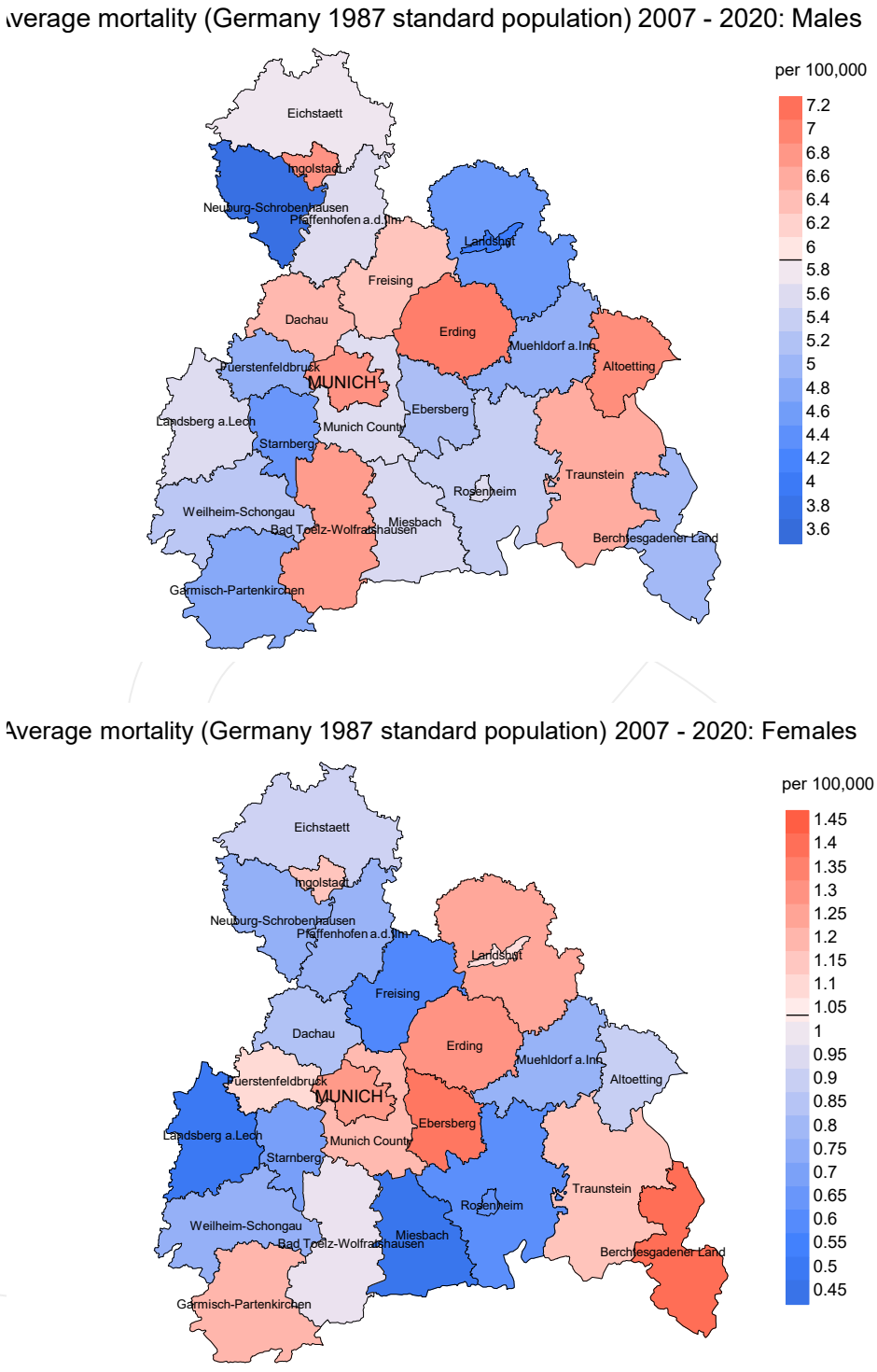


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 5.9/100,000 WS N=2,094, females 1.0/100,000 WS N=457).

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 17 women died from liver cell carcinoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 2.6/100,000.

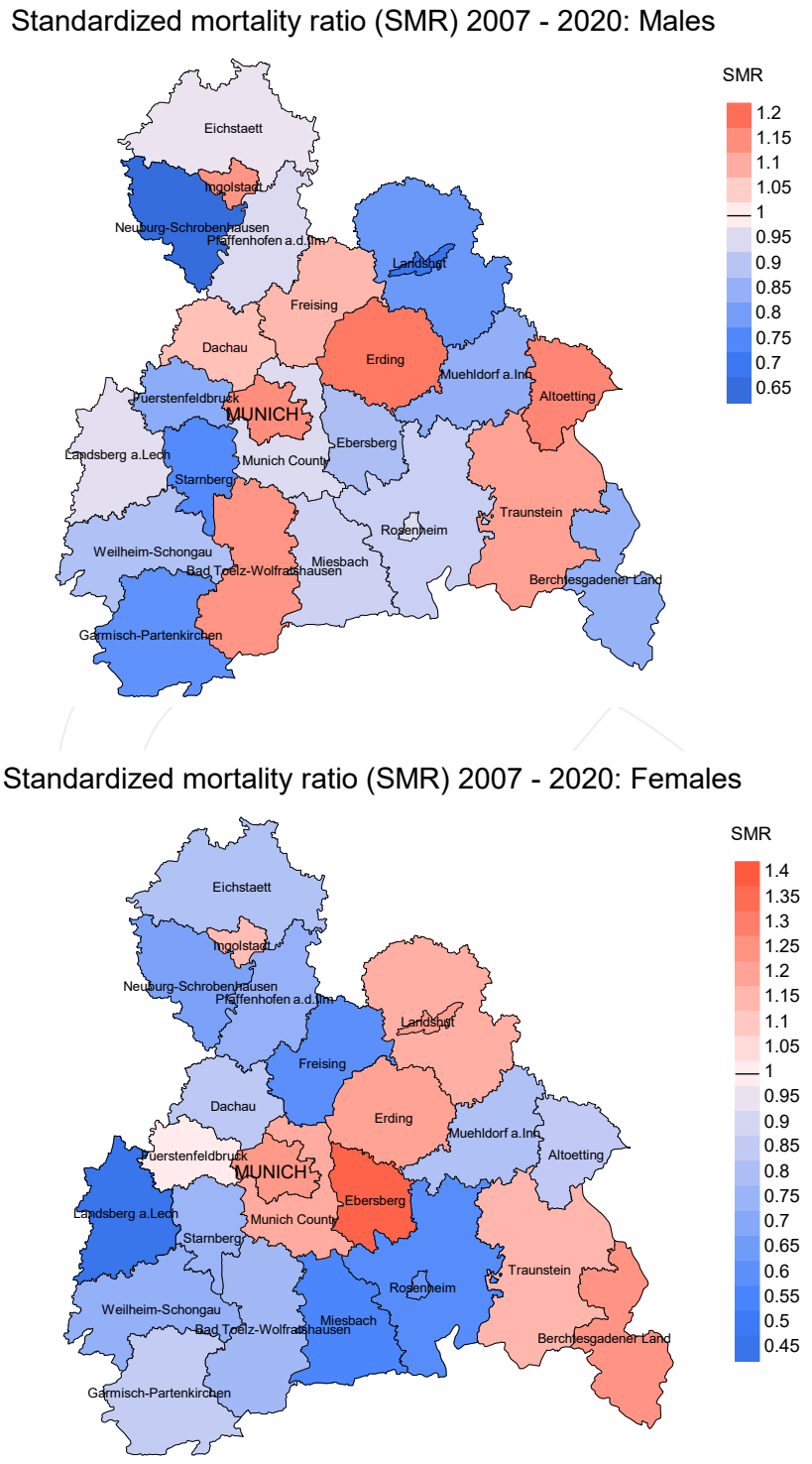


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=2,094, females N=457).

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 17 women died from liver cell carcinoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.37. Though, the value of this parameter may vary with an underlying probability of 99% between 0.67 and 2.49, 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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