Munich Cancer Registry

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ICD-10 C23: Gallbladder cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	1,513
Diseases	1,516
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC23__E-ICD-10-C23-Gallbladder-cancer-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
C23	Malignant neoplasm of gallbladder

INCIDENCE

Table 1

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

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	39	12	30.8	5.1	3.9	100.0	100.0
1999	44	7	15.9	10.8	3.9	97.7	100.0
2000	56	15	26.8	12.2	3.9	98.2	100.0
2001	49	17	34.7	11.7	3.9	87.8	95.9
2002	56	3	5.4	11.5	3.9	96.4	100.0 #
2003	65	23	35.4	9.7	4.1	95.4	100.0
2004	80	18	22.5	9.8	4.3	88.8	97.5
2005	60	18	30.0	10.9	4.3	95.0	98.3
2006	87	15	17.2	11.2	4.1	89.7	95.4
2007	71	7	9.9	12.0	4.1	97.2	100.0 #
2008	74	14	18.9	12.2	4.0	90.5	100.0
2009	83	18	21.7	12.3	4.2	86.7	100.0
2010	84	16	19.0	12.6	3.5	91.7	100.0
2011	71	8	11.3	13.4	3.8	93.0	98.6
2012	87	10	11.5	14.4	4.1	86.2	98.9
2013	75	17	22.7	14.7	3.8	89.3	98.7
2014	77	13	16.9	15.0	3.9	93.5	100.0
2015	70	10	14.3	15.3	3.9	84.3	98.6
2016	73	11	15.1	15.4	3.2	79.5	100.0
2017	62	8	12.9	16.1	2.3	77.4	100.0
2018	72			16.1	2.0	72.2	100.0
2019	51	1	2.0	16.5	1.3	72.5	100.0
2020	30			16.6	3.4	56.7	100.0 ##
1998-2020	1516	261	17.2	16.6	3.9	88.3	99.1

1,516 cases diagnosed 1998-2020 are related to a total of 1,513 patients. Currently, in 304 (20.1 %) of these 1,513 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 252 / 43 / 9 (16.7 % / 2.8 % / 0.6 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 72 cases has been diagnosed, of which 16.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.0 % 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 1a

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

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	10	25.6	3	30.0	10.0	4.9	100.0	100.0	
1999	8	18.2	1	12.5	22.2	4.8	100.0	100.0	
2000	20	35.7	6	30.0	21.1	4.9	95.0	100.0	
2001	16	32.7	7	43.8	18.5	4.6	100.0	100.0	
2002	18	32.1	2	11.1	15.3	4.5	100.0	100.0	#
2003	8	12.3	4	50.0	15.0	4.7	100.0	100.0	
2004	10	12.5	2	20.0	13.3	4.9	90.0	100.0	
2005	17	28.3	6	35.3	13.1	5.0	94.1	100.0	
2006	22	25.3	4	18.2	14.7	4.9	86.4	95.5	
2007	16	22.5			14.5	5.0	100.0	100.0	#
2008	21	28.4	3	14.3	13.9	4.9	95.2	100.0	
2009	28	33.7	5	17.9	15.5	4.9	89.3	100.0	
2010	21	25.0	4	19.0	15.8	3.4	85.7	100.0	
2011	26	36.6			15.8	3.2	92.3	100.0	
2012	18	20.7	1	5.6	15.8	3.1	94.4	100.0	
2013	27	36.0	7	25.9	16.1	2.3	92.6	100.0	
2014	26	33.8	3	11.5	16.3	2.7	96.2	100.0	
2015	16	22.9	5	31.3	16.8	2.5	93.8	100.0	
2016	21	28.8	2	9.5	16.6	2.9	76.2	100.0	
2017	26	41.9	3	11.5	18.1	2.4	84.6	100.0	
2018	30	41.7			18.3	1.8	73.3	100.0	
2019	17	33.3			17.8	0.0	64.7	100.0	
2020	11	36.7			17.8	0.0	45.5	100.0	##
1998-2020	433	28.6	68	15.7	17.8	4.9	88.7	99.8	

433 cases diagnosed 1998-2020 are related to a total of 432 patients. Currently, in 92 (21.3 %) of these 432 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 76 / 12 / 4 (17.6 % / 2.8 % / 0.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 30 cases has been diagnosed, of which 18.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.8 % 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 DCO, further malignancies, deaths, and active follow-up (FEMALES)
(incl. DCO)

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	29	74.4	9	31.0	3.4	3.5	100.0	100.0	
1999	36	81.8	6	16.7	7.7	3.5	97.2	100.0	
2000	36	64.3	9	25.0	8.9	3.5	100.0	100.0	
2001	33	67.3	10	30.3	9.0	3.6	81.8	93.9	
2002	38	67.9	1	2.6	9.9	3.7	94.7	100.0	#
2003	57	87.7	19	33.3	7.9	3.9	94.7	100.0	
2004	70	87.5	16	22.9	8.7	4.1	88.6	97.1	
2005	43	71.7	12	27.9	10.2	4.0	95.3	97.7	
2006	65	74.7	11	16.9	10.1	3.7	90.8	95.4	
2007	55	77.5	7	12.7	11.3	3.7	96.4	100.0	#
2008	53	71.6	11	20.8	11.7	3.6	88.7	100.0	
2009	55	66.3	13	23.6	11.2	3.9	85.5	100.0	
2010	63	75.0	12	19.0	11.5	3.5	93.7	100.0	
2011	45	63.4	8	17.8	12.5	4.0	93.3	97.8	
2012	69	79.3	9	13.0	13.9	4.5	84.1	98.6	
2013	48	64.0	10	20.8	14.2	4.5	87.5	97.9	
2014	51	66.2	10	19.6	14.5	4.6	92.2	100.0	
2015	54	77.1	5	9.3	14.8	4.7	81.5	98.1	
2016	52	71.2	9	17.3	15.0	3.3	80.8	100.0	
2017	36	58.1	5	13.9	15.3	2.3	72.2	100.0	
2018	42	58.3			15.2	2.1	71.4	100.0	
2019	34	66.7	1	2.9	16.0	1.9	76.5	100.0	
2020	19	63.3			16.2	5.6	63.2	100.0	##
1998-2020	1083	71.4	193	17.8	16.2	3.5	88.1	98.9	

1,083 cases diagnosed 1998-2020 are related to a total of 1,081 patients. Currently, in 212 (19.6 %) of these 1,081 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 176 / 31 / 5 (16.3 % / 2.9 % / 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 42 cases has been diagnosed, of which 15.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.1 % 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 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 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	10	29	0.9	2.5	0.5	0.9	0.9	1.4	1.3	1.9
1999	8	36	0.7	3.0	0.4	1.2	0.7	1.8	1.0	2.5
2000	20	36	1.8	3.0	1.0	1.0	1.5	1.6	2.0	2.4
2001	16	33	1.4	2.7	0.8	1.1	1.3	1.7	1.7	2.2
2002	18	38	1.0	1.9	0.6	0.7	0.8	1.1	1.0	1.6
2003	8	57	0.4	2.9	0.2	1.1	0.4	1.7	0.5	2.4
2004	10	70	0.5	3.5	0.3	1.3	0.5	2.0	0.5	2.8
2005	17	43	0.9	2.2	0.5	0.7	0.8	1.1	1.0	1.5
2006	22	65	1.1	3.2	0.6	1.0	0.9	1.7	1.2	2.4
2007	16	55	0.7	2.4	0.4	1.0	0.5	1.4	0.7	1.9
2008	21	53	0.9	2.3	0.4	0.7	0.7	1.1	1.0	1.5
2009	28	55	1.3	2.4	0.6	0.8	0.9	1.2	1.2	1.7
2010	21	63	0.9	2.7	0.4	1.0	0.6	1.5	0.9	2.0
2011	26	45	1.2	1.9	0.5	0.7	0.8	1.1	1.1	1.4
2012	18	69	0.8	2.9	0.3	1.0	0.5	1.6	0.7	2.2
2013	27	48	1.2	2.0	0.5	0.6	0.8	1.0	1.1	1.4
2014	26	51	1.1	2.1	0.5	0.6	0.7	1.0	1.0	1.5
2015	16	54	0.7	2.2	0.3	0.8	0.4	1.2	0.6	1.6
2016	21	52	0.9	2.1	0.4	0.6	0.6	1.0	0.8	1.4
2017	26	36	1.1	1.5	0.4	0.5	0.7	0.8	1.0	1.1
2018	30	42	1.2	1.7	0.5	0.6	0.8	0.9	1.1	1.2
2019	17	34	0.7	1.4	0.3	0.5	0.4	0.8	0.6	1.0
2020	11	19	0.5	0.8	0.2	0.3	0.3	0.5	0.4	0.6
1998–2020	433	1083	0.9	2.2	0.4	0.8	0.7	1.2	0.9	1.7

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	39	77.0	11.3	38.4	94.0	63.7	71.6	79.2	86.1	88.9
1999	44	76.3	12.6	43.7	95.0	58.5	70.4	76.6	85.8	91.3
2000	56	75.8	11.6	44.5	92.5	58.3	66.8	77.3	85.5	90.3
2001	49	73.8	12.5	42.1	92.8	56.5	65.9	76.7	82.0	90.9
2002	56	73.0	9.4	45.8	91.3	61.3	69.2	72.8	79.0	83.6
2003	65	74.3	10.3	37.2	89.4	59.5	70.2	76.2	81.3	86.2
2004	80	74.7	11.1	46.5	95.8	59.8	68.6	75.4	83.0	87.8
2005	60	75.8	11.5	47.1	92.8	59.8	66.6	79.4	84.2	89.6
2006	87	76.1	10.0	51.0	94.5	64.2	69.8	75.7	83.9	89.2
2007	71	71.9	12.0	35.2	93.8	57.3	66.2	73.0	79.4	85.7
2008	74	75.4	12.2	34.4	96.2	61.3	68.3	78.1	85.1	87.7
2009	83	75.6	11.3	45.7	97.7	61.2	67.9	76.2	85.4	88.6
2010	84	74.3	11.1	43.5	93.4	59.5	67.1	74.6	82.5	88.9
2011	71	73.9	11.7	43.7	96.2	59.7	65.2	74.0	83.1	88.3
2012	87	75.4	9.9	41.6	99.8	64.1	69.6	76.3	82.3	88.0
2013	75	76.4	9.7	48.8	95.3	65.7	71.1	77.4	82.3	87.8
2014	77	75.5	10.4	27.9	93.1	63.2	70.2	77.2	82.4	86.9
2015	70	75.5	10.7	46.3	93.7	60.6	68.5	77.1	83.3	88.5
2016	73	76.1	11.0	43.8	96.8	64.0	69.8	76.8	83.0	89.3
2017	62	74.7	10.3	49.7	96.7	57.8	69.6	76.0	82.1	86.0
2018	72	73.5	11.7	45.6	95.0	57.8	65.7	76.2	81.9	88.0
2019	51	73.9	9.8	52.3	93.1	59.4	66.4	74.8	81.8	83.1
2020	30	70.9	10.4	40.5	85.9	58.5	65.8	72.6	79.0	84.6
1998-2020	1516	74.9	11.0	27.9	99.8	60.3	68.3	76.1	82.7	88.1

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	10	76.2	10.3	54.7	88.9	60.8	72.5	76.5	83.6	88.0
1999	8	80.1	9.7	64.8	95.0	64.8	72.6	81.7	86.0	95.0
2000	20	72.9	13.8	44.5	92.5	58.1	61.9	72.8	85.5	91.9
2001	16	71.6	14.5	42.1	92.8	51.4	60.2	76.3	79.3	92.1
2002	18	68.9	7.7	46.5	78.1	59.4	65.4	70.7	72.8	77.8
2003	8	72.7	9.9	58.4	87.2	58.4	65.3	73.0	79.6	87.2
2004	10	65.2	10.8	46.6	83.7	50.4	57.0	68.5	70.2	78.3
2005	17	73.7	14.0	47.1	90.8	53.1	62.5	76.8	86.7	89.7
2006	22	70.8	10.9	51.0	94.5	57.5	65.1	70.2	80.7	84.2
2007	16	68.7	11.3	35.2	81.9	59.1	64.3	71.4	76.3	80.0
2008	21	72.4	11.1	43.6	93.1	61.3	64.1	74.6	78.9	84.0
2009	28	74.1	11.9	48.0	97.7	59.3	66.2	72.6	82.8	88.3
2010	21	71.9	11.6	43.5	89.7	59.0	70.2	74.2	78.6	84.9
2011	26	70.7	11.1	43.7	86.7	55.6	63.5	72.7	78.8	83.6
2012	18	75.7	7.9	62.4	89.9	64.5	70.7	74.4	82.7	85.8
2013	27	74.2	10.9	48.8	90.4	55.0	69.1	77.6	81.3	86.4
2014	26	72.3	13.1	27.9	89.0	57.2	67.1	73.9	81.4	86.3
2015	16	75.3	11.0	46.3	91.6	60.4	71.1	77.0	80.5	89.7
2016	21	71.8	12.6	43.8	92.8	55.0	65.0	73.8	79.4	85.4
2017	26	75.5	9.8	49.7	89.9	61.4	72.0	76.8	83.0	86.0
2018	30	73.6	10.1	48.3	89.5	59.1	70.5	76.0	80.4	85.0
2019	17	73.6	10.7	52.3	90.9	56.1	68.9	76.7	82.0	83.1
2020	11	69.3	13.8	40.5	85.9	55.5	61.3	71.8	80.8	84.9
1998-2020	433	72.7	11.4	27.9	97.7	57.8	65.8	73.9	80.8	86.1

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	29	77.2	11.8	38.4	94.0	63.7	71.6	79.2	86.1	91.3
1999	36	75.4	13.1	43.7	92.9	52.3	69.1	76.3	85.4	91.3
2000	36	77.5	10.1	51.1	92.2	58.3	74.3	78.3	84.9	89.7
2001	33	74.8	11.5	48.4	92.7	58.9	66.2	77.1	83.9	88.4
2002	38	74.9	9.7	45.8	91.3	61.3	71.0	76.0	81.1	87.0
2003	57	74.5	10.4	37.2	89.4	59.5	70.2	76.3	81.4	86.2
2004	70	76.0	10.5	46.5	95.8	62.1	69.1	76.5	83.4	89.2
2005	43	76.6	10.4	52.2	92.8	62.7	67.8	80.7	83.0	88.5
2006	65	77.9	9.0	53.0	93.9	67.7	71.5	77.8	85.0	89.3
2007	55	72.9	12.1	39.2	93.8	56.9	66.2	73.9	82.4	89.2
2008	53	76.5	12.6	34.4	96.2	65.2	69.0	80.1	86.1	87.9
2009	55	76.4	11.0	45.7	96.6	63.5	69.3	77.2	86.9	88.8
2010	63	75.1	10.9	47.5	93.4	60.5	66.9	75.4	83.6	89.6
2011	45	75.7	11.8	50.1	96.2	59.7	68.0	76.3	85.2	90.1
2012	69	75.4	10.4	41.6	99.8	64.0	69.6	76.5	82.2	88.5
2013	48	77.7	8.8	50.5	95.3	68.3	72.1	77.2	83.8	89.7
2014	51	77.2	8.5	56.4	93.1	64.1	70.3	78.1	84.1	87.0
2015	54	75.5	10.8	54.0	93.7	60.8	68.5	77.2	84.7	88.4
2016	52	77.8	9.9	47.2	96.8	65.7	72.0	77.0	85.4	89.8
2017	36	74.2	10.8	55.9	96.7	57.4	66.2	76.0	80.1	86.1
2018	42	73.4	12.8	45.6	95.0	56.3	64.2	76.5	84.0	89.1
2019	34	74.0	9.4	58.1	93.1	60.9	66.4	74.6	80.0	84.9
2020	19	71.9	8.1	56.8	85.6	60.3	65.9	73.5	77.8	84.3
1998-2020	1083	75.7	10.7	34.4	99.8	61.5	69.0	76.9	83.6	88.6

Table 4

Age distribution by 5-year age group and sex for period 2007-2020 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	1	0.1	0.1	1	0.3	0.3			0.0
30-34	1	0.1	0.2			0.3	1	0.1	0.1
35-39	2	0.2	0.4	1	0.3	0.7	1	0.1	0.3
40-44	9	0.9	1.3	5	1.6	2.3	4	0.6	0.9
45-49	17	1.7	3.1	9	3.0	5.3	8	1.2	2.1
50-54	21	2.1	5.2	6	2.0	7.2	15	2.2	4.3
55-59	41	4.2	9.4	11	3.6	10.9	30	4.4	8.7
60-64	77	7.9	17.2	30	9.9	20.7	47	7.0	15.7
65-69	127	13.0	30.2	35	11.5	32.2	92	13.6	29.3
70-74	156	15.9	46.1	57	18.8	51.0	99	14.6	43.9
75-79	206	21.0	67.1	67	22.0	73.0	139	20.6	64.5
80-84	148	15.1	82.2	50	16.4	89.5	98	14.5	79.0
85+	174	17.8	100.0	32	10.5	100.0	142	21.0	100.0
All ages	980	100.0		304	100.0		676	100.0	

Table 5

Age-specific incidence, DCO rate 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 DCO rate n=33 %	Females DCO rate n=100 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1		0.0				0.1	
30-34		1		0.0				0.0
35-39	1	1	0.0	0.0			0.1	0.0
40-44	5	4	0.2	0.2			0.2	0.1
45-49	9	8	0.3	0.3			0.2	0.1
50-54	6	15	0.2	0.6	16.7	6.7	0.1	0.1
55-59	11	30	0.5	1.4		6.7	0.1	0.2
60-64	30	47	1.7	2.5	3.3	8.5	0.2	0.3
65-69	35	92	2.1	5.1	8.6	5.4	0.1	0.5
70-74	57	99	3.8	5.8	1.8	11.1	0.2	0.5
75-79	67	138	5.5	9.2	16.4	10.1	0.3	0.7
80-84	50	98	6.9	9.2	18.0	17.3	0.3	0.6
85+	32	142	6.9	13.6	21.9	32.4	0.3	0.9
All ages	304	675			10.9	14.8	0.2	0.4
Incidence								
Raw			0.9	2.0				
WS			0.4	0.7				
ES			0.6	1.1				
BRD-S			0.9	1.5				

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

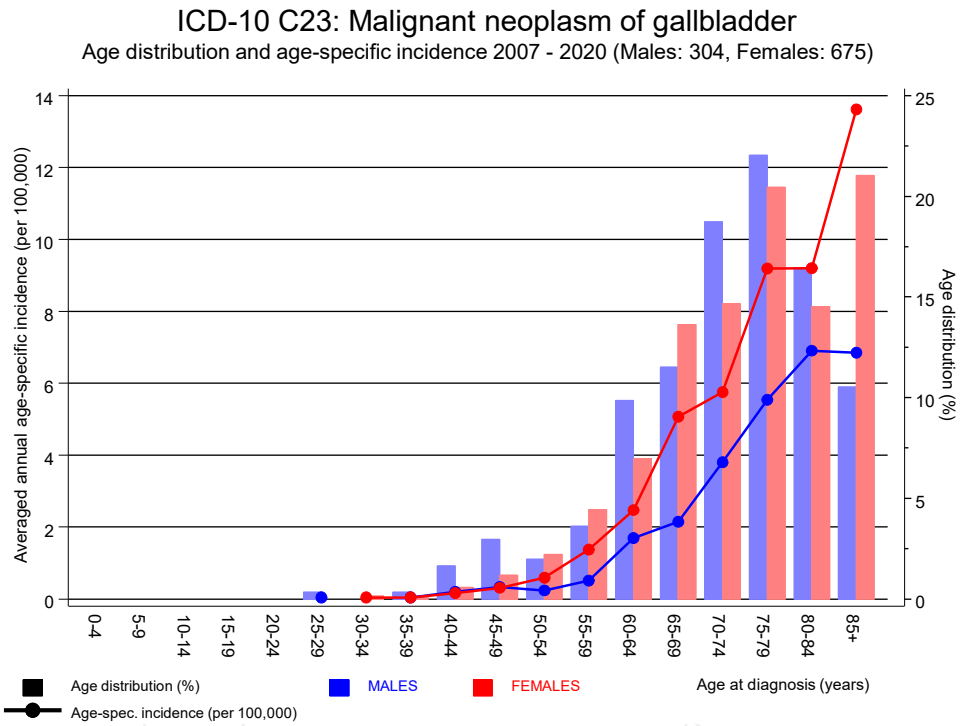


Figure 6. Age distribution (males: mean=73.0 yrs, median=74.8 yrs; females: mean=75.5 yrs, median=76.7 yrs) and age-specific incidence.

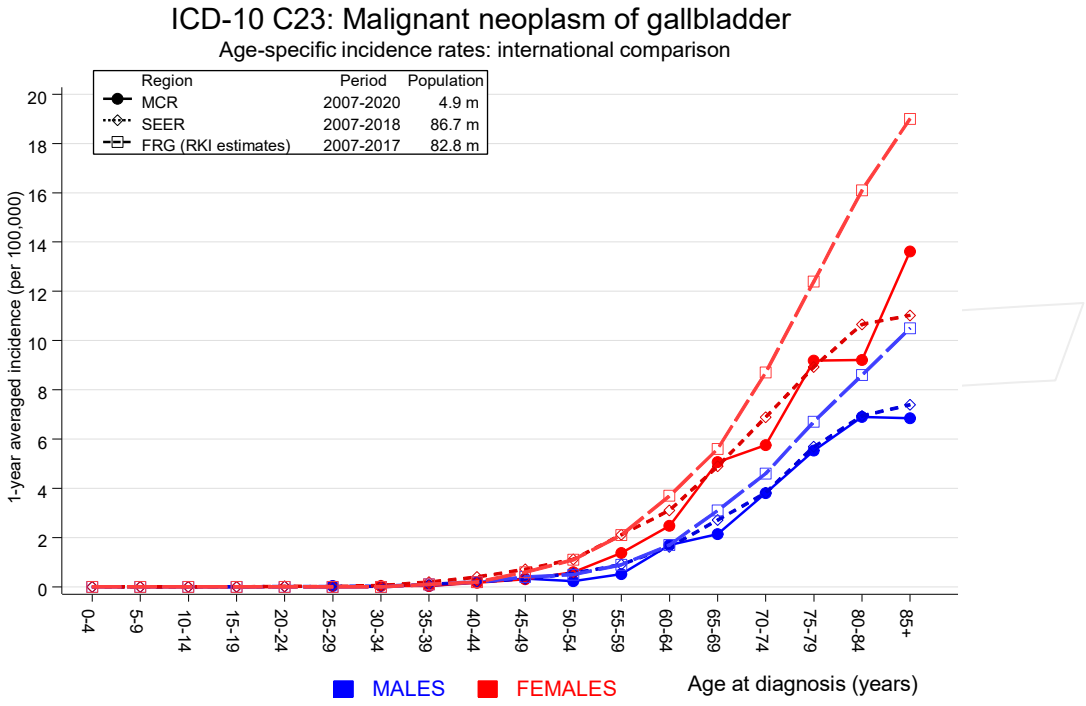


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
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 %
C17	Small intestine	1	0.0	20.0	0.5	111.5		19.3	
C18	Colon	5	0.8	6.0	2.0	14.0	#	84.5	60.0
C19–C20	Rectum	1	0.4	2.3	0.1	12.9		11.5	
C23–C24	Bile	1	0.1	10.2	0.3	56.8		18.3	100.0
C25	Pancreas	1	0.3	2.9	0.1	16.3		13.3	
C26	GI cancer	2	0.0	189.2	22.9	683.3	#	40.3	100.0
C33–C34	Lung	1	1.0	1.1	0.0	5.9		1.0	
C61	Prostate	4	2.3	1.7	0.5	4.4		33.9	
C64	Kidney	2	0.3	7.2	0.9	26.2		34.9	
C68	Urinary org.	1	0.0	156.0	3.9	869.0	#	20.1	
C82–C85	NHL	2	0.4	5.6	0.7	20.2		33.3	50.0
Not observed		0	2.7	0.0	0.0	1.4		-55.2	
All further malignancies		21	8.4	2.5	1.5	3.8	#	255.3	33.3

Patients	391
Median age at next malignancy (years)	72.9
Person-years	493
Mean observation time (years)	1.3
Median observation time (years)	0.6

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 %
C15	Oesophagus	1	0.1	9.7	0.2	54.1		7.4	
C16	Stomach	3	0.7	4.5	0.9	13.1		19.1	33.3
C17	Small intestine	1	0.1	12.1	0.3	67.6		7.5	
C18	Colon	7	1.8	3.8	1.5	7.8	#	42.2	71.4
C19–C20	Rectum	2	0.7	2.8	0.3	10.1		10.5	
C22	Liver	2	0.2	9.0	1.1	32.3	#	14.6	
C23–C24	Bile	5	0.3	17.9	5.8	41.7	#	38.7	20.0
C25	Pancreas	3	0.9	3.4	0.7	10.1		17.4	
C33–C34	Lung	1	1.2	0.8	0.0	4.7		−1.6	
C43	Malign. melanoma	3	0.6	5.3	1.1	15.5	#	19.9	
C50	Breast	6	4.5	1.3	0.5	2.9		12.0	
C51	Vulva	1	0.2	5.1	0.1	28.6		6.6	
C53	Cervix uteri	1	0.2	5.7	0.1	31.7		6.8	
C54	Corpus uteri	2	0.9	2.3	0.3	8.3		9.2	
C56	Ovary	5	0.7	7.6	2.5	17.6	#	35.6	20.0
C64	Kidney	2	0.4	4.9	0.6	17.8		13.1	50.0
C82–C85	NHL	1	0.7	1.5	0.0	8.2		2.6	
Not observed		0	2.5	0.0	0.0	1.5		−20.7	
All further malignancies		46	16.6	2.8	2.0	3.7	#	240.9	19.6

Patients	951
Median age at next malignancy (years)	77.6
Person-years	1220
Mean observation time (years)	1.3
Median observation time (years)	0.5

The occurrence of further specified malignancy is statistically significant.

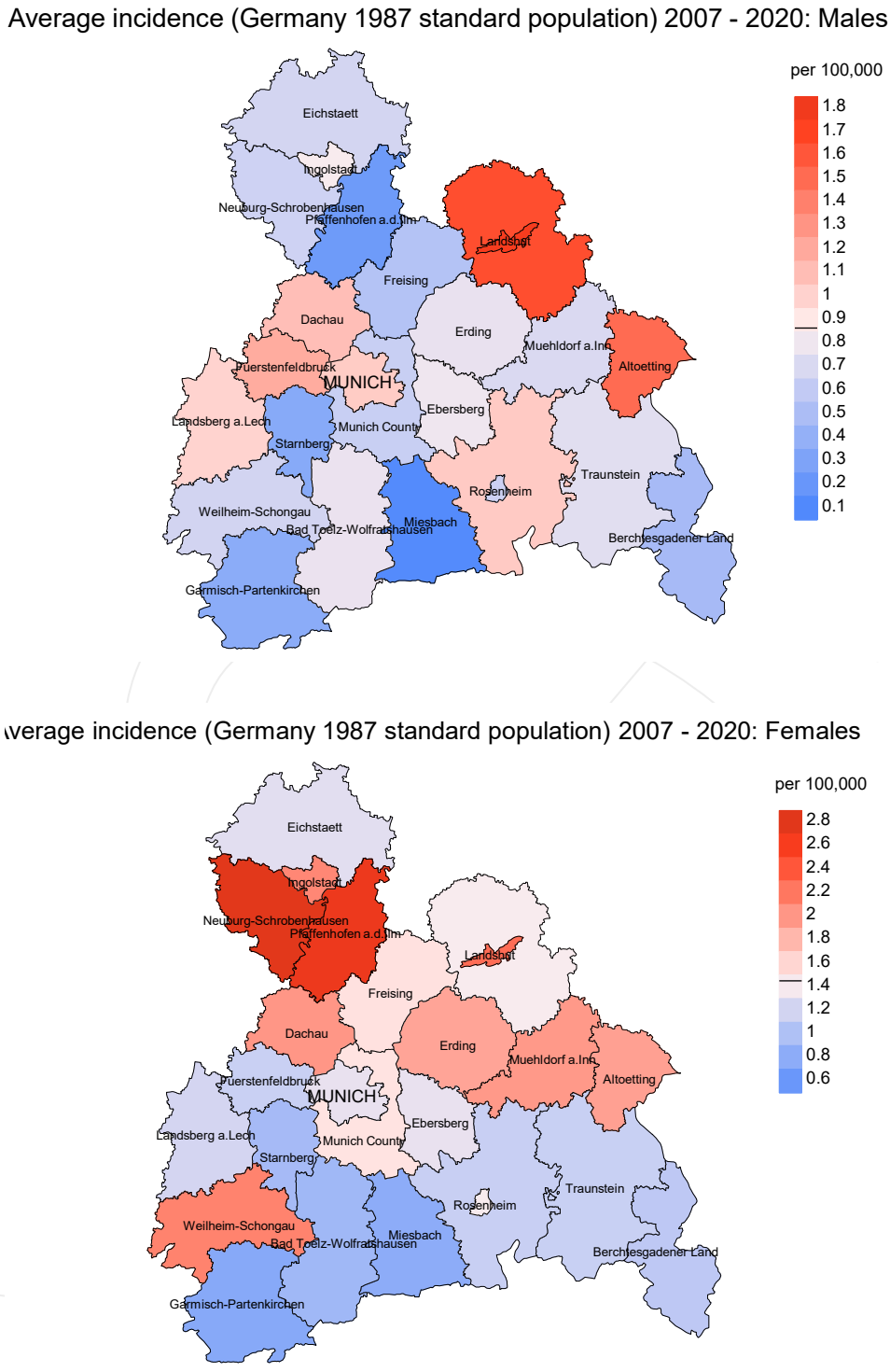
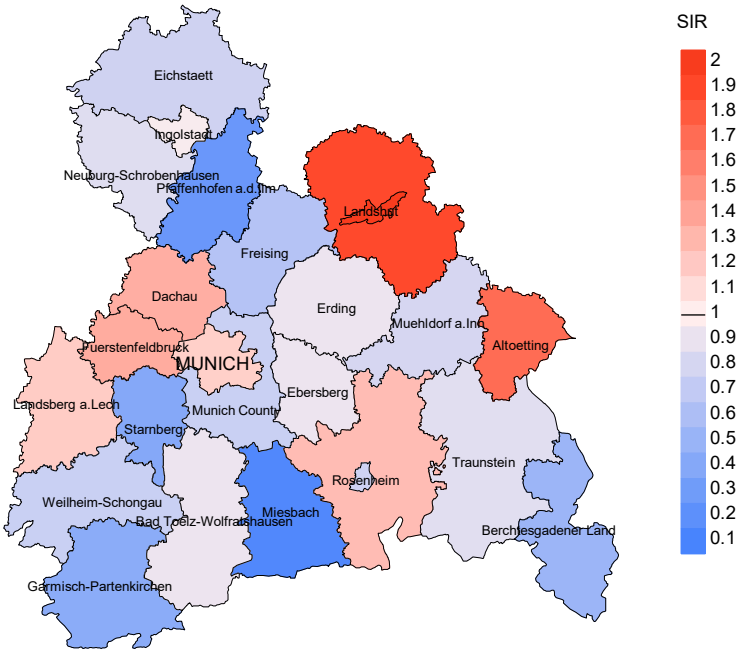


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.9/100,000 WS N=304, females 1.5/100,000 WS N=675).

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 15 women were identified with newly diagnosed gallbladder cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.6 and 2.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

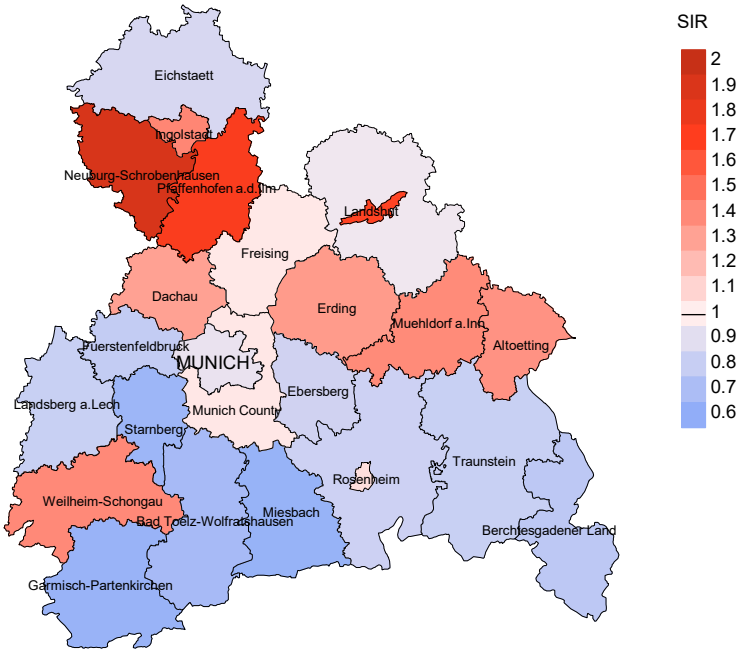


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=304, females N=675).

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 15 women were identified with newly diagnosed gallbladder cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.83. Though, the value of this parameter may vary with an underlying probability of 99% between 0.38 and 1.56, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	39	100.0	30.8	39	100.0	94.9
1999	44	100.0	15.9	43	97.7	93.0
2000	56	100.0	26.8	55	98.2	100.0
2001	49	95.9	34.7	43	87.8	95.3
2002	56	100.0	5.4	54	96.4	94.4
2003	65	100.0	35.4	62	95.4	100.0
2004	80	97.5	22.5	71	88.8	95.8
2005	60	98.3	30.0	57	95.0	98.2
2006	87	95.4	17.2	78	89.7	96.2
2007	71	100.0	9.9	69	97.2	97.1
2008	74	100.0	18.9	67	90.5	100.0
2009	83	100.0	21.7	72	86.7	98.6
2010	84	100.0	19.0	77	91.7	100.0
2011	71	98.6	11.3	66	93.0	100.0
2012	87	98.9	11.5	75	86.2	96.0
2013	75	98.7	22.7	67	89.3	95.5
2014	77	100.0	16.9	72	93.5	95.8
2015	70	98.6	14.3	59	84.3	96.6
2016	73	100.0	15.1	58	79.5	93.1
2017	62	100.0	12.9	48	77.4	83.3
2018	72	100.0		52	72.2	59.6
2019	51	100.0	2.0	37	72.5	78.4
2020	30	100.0		17	56.7	88.2
1998-2020	1516	99.1	17.2	1338	88.3	94.5

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	39	37	97.3	26	66.7
1999	44	41	92.7	23	52.3
2000	56	57	96.5	35	62.5
2001	49	45	97.8	25	51.0
2002	56	49	98.0	30	53.6
2003	65	39	94.9	36	55.4
2004	80	51	96.1	36	45.0
2005	60	55	96.4	33	55.0
2006	87	62	98.4	40	46.0
2007	71	74	98.6	31	43.7
2008	74	59	98.3	34	45.9
2009	83	58	98.3	31	37.3
2010	84	74	100.0	47	56.0
2011	71	59	100.0	33	46.5
2012	87	74	97.3	35	40.2
2013	75	74	97.3	36	48.0
2014	77	61	98.4	33	42.9
2015	70	68	97.1	32	45.7
2016	73	60	100.0	31	42.5
2017	62	52	98.1	25	40.3
2018	72	48	64.6	23	31.9
2019	51	51	47.1	20	39.2
2020	30	38	100.0	7	23.3
1998–2020	1516	1286	94.6	702	46.3

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	37	89.2	10.8	97.2
1999	41	85.4	14.6	94.7
2000	57	91.2	8.8	98.2
2001	45	91.1	8.9	95.5
2002	49	91.8	8.2	91.7
2003	39	84.6	15.4	91.9
2004	51	92.2	7.8	95.9
2005	55	89.1	10.9	90.6
2006	62	82.3	17.7	88.5
2007	74	94.6	5.4	93.2
2008	59	94.9	5.1	94.8
2009	58	86.2	13.8	89.5
2010	74	93.2	6.8	93.2
2011	59	89.8	10.2	96.6
2012	74	81.1	18.9	87.5
2013	74	85.1	14.9	90.3
2014	61	93.4	6.6	95.0
2015	68	92.6	7.4	95.5
2016	60	86.7	13.3	90.0
2017	52	75.0	25.0	86.3
2018	48	83.3	16.7	90.3
2019	51	78.4	21.6	87.5
2020	38	76.3	23.7	81.6
1998-2020	1286	87.6	12.4	92.1

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	10	75.2	75.2		75.2
1999	8	82.1	83.1	81.1	83.1
2000	13	73.9	73.1	85.1	73.9
2001	16	76.5	76.2	79.4	76.5
2002	15	70.1	67.8	95.0	70.1
2003	8	78.2	78.0	91.2	78.0
2004	13	70.2	70.1	74.6	70.1
2005	13	67.8	67.8		67.8
2006	14	76.9	73.4	89.3	76.9
2007	14	68.6	68.6		68.9
2008	15	75.3	74.0	77.9	74.0
2009	14	75.2	79.2	36.7	79.2
2010	23	75.1	74.9	82.2	74.9
2011	20	72.9	72.9		72.9
2012	20	76.3	71.1	80.1	73.8
2013	27	78.2	77.8	90.9	76.1
2014	18	78.8	78.8	78.0	78.0
2015	23	73.9	73.5	75.7	74.5
2016	20	76.6	75.8	91.8	75.8
2017	20	80.2	79.0	82.0	80.2
2018	17	73.4	73.4	77.2	74.5
2019	17	80.0	78.7	83.1	80.7
2020	14	78.8	76.6	91.4	78.6
1998–2020	372	75.2	74.5	82.1	75.0

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	27	79.6	76.4	87.1	79.6
1999	33	82.1	78.4	90.2	80.6
2000	44	80.4	79.8	80.7	81.0
2001	29	77.7	77.3	89.7	77.6
2002	34	76.9	76.9	81.2	76.3
2003	31	74.9	75.1	72.6	75.4
2004	38	76.8	76.1	80.8	77.4
2005	42	80.5	77.8	89.6	80.1
2006	48	79.5	77.1	89.2	77.6
2007	60	76.7	76.0	88.8	75.6
2008	44	73.8	73.8	78.0	74.1
2009	44	82.9	81.5	90.6	81.8
2010	51	79.4	79.4	81.1	77.3
2011	39	79.0	74.4	83.5	78.1
2012	54	78.0	77.7	86.8	77.7
2013	47	79.4	77.0	90.4	79.3
2014	43	79.1	78.0	94.0	78.6
2015	45	79.3	79.3	92.8	79.3
2016	40	81.7	79.8	87.4	79.9
2017	32	78.8	78.9	78.3	78.8
2018	31	75.9	72.9	84.8	72.9
2019	34	76.0	73.5	81.9	71.8
2020	24	79.2	75.0	84.4	77.0
1998–2020	914	78.6	77.6	86.8	77.9

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

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

Table 11a

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	10	0.9	1.00	0.5	0.92	0.8	0.96	1.3	0.98
1999	7	0.6	0.88	0.3	0.90	0.6	0.90	0.9	0.97
2000	12	1.1	0.63	0.6	0.64	0.9	0.65	1.3	0.68
2001	15	1.3	0.94	0.7	0.92	1.2	0.94	1.6	0.94
2002	14	0.8	0.78	0.4	0.76	0.6	0.78	0.8	0.76
2003	7	0.4	0.88	0.2	0.77	0.3	0.82	0.5	0.97
2004	12	0.6	1.20	0.4	1.12	0.5	1.15	0.7	1.23
2005	13	0.7	0.76	0.4	0.82	0.6	0.77	0.7	0.72
2006	12	0.6	0.55	0.3	0.51	0.5	0.53	0.6	0.54
2007	14	0.6	0.88	0.3	0.91	0.5	0.91	0.6	0.88
2008	14	0.6	0.67	0.3	0.62	0.4	0.64	0.7	0.68
2009	13	0.6	0.46	0.3	0.44	0.4	0.44	0.6	0.49
2010	22	1.0	1.05	0.4	0.99	0.7	1.05	0.9	1.04
2011	20	0.9	0.77	0.4	0.77	0.6	0.79	0.8	0.75
2012	17	0.7	0.94	0.4	1.12	0.5	1.07	0.7	0.98
2013	25	1.1	0.93	0.5	0.92	0.7	0.93	1.0	0.93
2014	16	0.7	0.62	0.2	0.48	0.4	0.57	0.6	0.60
2015	19	0.8	1.19	0.4	1.44	0.5	1.28	0.7	1.21
2016	19	0.8	0.90	0.3	0.75	0.5	0.81	0.7	0.90
2017	14	0.6	0.54	0.2	0.53	0.4	0.54	0.5	0.53
2018	15	0.6	0.50	0.3	0.58	0.4	0.57	0.5	0.49
2019	12	0.5	0.71	0.2	0.67	0.3	0.69	0.4	0.71
2020	12	0.5	1.09	0.2	0.82	0.3	0.91	0.4	1.06
1998-2020	334	0.7	0.77	0.3	0.76	0.5	0.77	0.7	0.77

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	23	2.0	0.79	0.7	0.80	1.1	0.82	1.5	0.79
1999	28	2.4	0.78	0.8	0.69	1.3	0.72	1.9	0.75
2000	40	3.3	1.11	1.1	1.14	1.8	1.11	2.6	1.08
2001	26	2.1	0.79	0.7	0.68	1.2	0.74	1.7	0.79
2002	31	1.6	0.82	0.6	0.83	0.9	0.82	1.3	0.81
2003	26	1.3	0.46	0.5	0.49	0.8	0.48	1.1	0.48
2004	35	1.8	0.50	0.6	0.50	1.0	0.51	1.4	0.51
2005	36	1.8	0.84	0.6	0.87	1.0	0.87	1.4	0.90
2006	39	1.9	0.60	0.6	0.63	1.0	0.61	1.4	0.59
2007	56	2.4	1.02	0.9	0.90	1.4	0.95	1.9	1.02
2008	42	1.8	0.79	0.6	0.88	1.0	0.87	1.3	0.87
2009	37	1.6	0.67	0.5	0.58	0.8	0.61	1.0	0.62
2010	47	2.0	0.75	0.7	0.74	1.1	0.75	1.5	0.73
2011	33	1.4	0.73	0.5	0.76	0.8	0.74	1.0	0.74
2012	43	1.8	0.63	0.5	0.54	0.9	0.58	1.3	0.60
2013	38	1.6	0.79	0.5	0.86	0.8	0.84	1.2	0.84
2014	41	1.7	0.80	0.5	0.79	0.8	0.79	1.2	0.81
2015	44	1.8	0.81	0.5	0.68	0.9	0.72	1.2	0.79
2016	33	1.3	0.63	0.4	0.58	0.6	0.60	0.9	0.62
2017	25	1.0	0.69	0.3	0.56	0.5	0.59	0.7	0.64
2018	25	1.0	0.60	0.4	0.62	0.6	0.62	0.8	0.62
2019	28	1.1	0.82	0.4	0.79	0.6	0.80	0.8	0.80
2020	17	0.7	0.89	0.2	0.79	0.4	0.81	0.5	0.84
1998-2020	793	1.6	0.73	0.5	0.71	0.9	0.72	1.2	0.73

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									
25-29	1	0.1	0.1	1	0.4	0.4			0.0
30-34	0	0.0	0.1			0.4			0.0
35-39	2	0.3	0.4			0.4	2	0.4	0.4
40-44	4	0.5	0.9	3	1.3	1.7	1	0.2	0.6
45-49	7	0.9	1.9	2	0.9	2.6	5	1.0	1.6
50-54	17	2.3	4.2	7	3.0	5.6	10	2.0	3.5
55-59	34	4.6	8.8	10	4.3	9.9	24	4.7	8.3
60-64	51	6.9	15.7	22	9.5	19.4	29	5.7	13.9
65-69	81	10.9	26.6	25	10.8	30.2	56	11.0	25.0
70-74	121	16.3	42.9	44	19.0	49.1	77	15.1	40.1
75-79	151	20.4	63.3	47	20.3	69.4	104	20.4	60.5
80-84	128	17.3	80.6	40	17.2	86.6	88	17.3	77.8
85+	144	19.4	100.0	31	13.4	100.0	113	22.2	100.0
All ages	741	100.0		232	100.0		509	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								
25-29	1		0.0	1.00			1.1	
30-34								
35-39		2			0.1	2.00		0.5
40-44	3	1	0.1	0.60	0.0	0.25	0.5	0.1
45-49	2	5	0.1	0.22	0.2	0.63	0.1	0.3
50-54	7	10	0.3	1.17	0.4	0.67	0.3	0.4
55-59	10	24	0.5	0.91	1.1	0.80	0.2	0.6
60-64	22	29	1.2	0.73	1.5	0.62	0.3	0.6
65-69	25	56	1.5	0.71	3.1	0.61	0.3	0.8
70-74	44	77	2.9	0.77	4.5	0.78	0.4	0.9
75-79	47	104	3.9	0.70	6.9	0.75	0.4	1.1
80-84	40	88	5.5	0.80	8.3	0.90	0.4	0.9
85+	31	113	6.6	0.97	10.8	0.80	0.3	0.9
All ages	232	509					0.3	0.8
Mortality								
Raw			0.7	0.76	1.5	0.75		
WS			0.3	0.75	0.5	0.71		
ES			0.5	0.76	0.8	0.73		
BRD-S			0.7	0.76	1.1	0.74		
PYLL-70								
per 100,000			2.3		3.7			
ES			1.9		3.0			
AYLL-70			9.2		8.2			

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 ←%
C09–C10	Oropharynx	1	1.3	1	100.0				
C15	Oesophagus	1	1.3	1	100.0				
C16	Stomach	6	7.5	5	83.3	1	16.7		
C17	Small intestine	1	1.3					1	100.0
C18	Colon	12	15.0	8	66.7	2	16.7	2	16.7
C19–C20	Rectum	3	3.8	2	66.7			1	33.3
C23–C24	Bile	2	2.5					2	100.0
C26	GI cancer	2	2.5			1	50.0	1	50.0
C30–C31	Sinuses	1	1.3	1	100.0				
C33–C34	Lung	3	3.8	2	66.7			1	33.3
C43	Malign. melanoma	5	6.3	5	100.0				
C44	Skin others	2	2.5					2	100.0
C61	Prostate	24	30.0	20	83.3	2	8.3	2	8.3
C62	Testis	1	1.3	1	100.0				
C64	Kidney	5	6.3	3	60.0			2	40.0
C67	Bladder	4	5.0	4	100.0				
C68	Urinary org.	1	1.3			1	100.0		
C76–C79	CUP	2	2.5	2	100.0				
C81	Hodgkin lymphoma	1	1.3	1	100.0				
C82–C85	NHL	2	2.5					2	100.0
C90	Mult. myeloma	1	1.3					1	100.0
All further malignancies		80	100.0	56	70.0	7	8.8	17	21.3

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 ←%
C07–C08	Salivary gland	1	0.7	1	100.0				
C15	Oesophagus	1	0.7					1	100.0
C16	Stomach	4	2.6	2	50.0	1	25.0	1	25.0
C17	Small intestine	1	0.7					1	100.0
C18	Colon	13	8.5	4	30.8	4	30.8	5	38.5
C19–C20	Rectum	7	4.6	3	42.9	3	42.9	1	14.3
C21	Anus/canal	1	0.7	1	100.0				
C22	Liver	3	2.0	1	33.3	1	33.3	1	33.3
C23–C24	Bile	5	3.3			2	40.0	3	60.0
C25	Pancreas	2	1.3			1	50.0	1	50.0
C32	Larynx	1	0.7	1	100.0				
C33–C34	Lung	4	2.6	4	100.0				
C43	Malign. melanoma	5	3.3	4	80.0			1	20.0
C44	Skin others	11	7.2	10	90.9	1	9.1		
C46,C49	Soft tissue	1	0.7	1	100.0				
C50	Breast	37	24.2	34	91.9	2	5.4	1	2.7
C51	Vulva	2	1.3	2	100.0				
C52	Vagina	2	1.3	1	50.0	1	50.0		
C53	Cervix uteri	6	3.9	5	83.3			1	16.7
C54	Corpus uteri	9	5.9	8	88.9			1	11.1
C55,C57	Fem. genitals un	1	0.7					1	100.0
C56	Ovary	5	3.3					5	100.0
C64	Kidney	11	7.2	8	72.7	2	18.2	1	9.1
C67	Bladder	3	2.0	3	100.0				
C69	Eye carcinoma	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	5	3.3	4	80.0	1	20.0		
C82–C85	NHL	7	4.6	6	85.7	1	14.3		
All further malignancies		153	100.0	108	70.6	20	13.1	25	16.3

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.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1		0.0	1.00			1.2	
30-34								
35-39		2			0.1	2.00		0.5
40-44	3	1	0.1	0.75	0.0	0.25	0.5	0.1
45-49	2	4	0.1	0.22	0.2	0.57	0.2	0.3
50-54	7	9	0.3	1.17	0.4	0.69	0.3	0.4
55-59	10	23	0.5	1.00	1.1	0.85	0.3	0.7
60-64	20	26	1.1	0.71	1.4	0.65	0.4	0.6
65-69	22	45	1.3	0.69	2.5	0.61	0.3	0.8
70-74	37	67	2.5	0.88	3.9	0.86	0.4	1.0
75-79	34	80	2.8	0.65	5.3	0.78	0.4	1.1
80-84	32	72	4.4	0.86	6.8	0.90	0.4	1.0
85+	18	90	3.9	0.78	8.6	0.83	0.3	1.0
All ages	186	419					0.3	0.9
Mortality								
Raw			0.6	0.76	1.2	0.78		
WS			0.3	0.75	0.4	0.74		
ES			0.4	0.76	0.7	0.75		
BRD-S			0.5	0.76	0.9	0.77		
PYLL-70								
per 100,000			2.2		3.3			
ES			1.9		2.7			
AYLL-70			9.6		8.5			

* 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								
15-19								
20-24								
25-29	1		0.0	1.00			1.2	
30-34								
35-39		2			0.1	2.00		0.5
40-44	3	1	0.1	0.75	0.0	0.25	0.5	0.1
45-49	2	4	0.1	0.25	0.2	0.57	0.2	0.3
50-54	5	9	0.2	0.83	0.4	0.69	0.2	0.4
55-59	10	22	0.5	1.11	1.0	0.85	0.3	0.7
60-64	18	25	1.0	0.75	1.3	0.68	0.3	0.6
65-69	22	44	1.3	0.71	2.4	0.64	0.3	0.8
70-74	35	66	2.3	0.83	3.8	0.86	0.4	1.0
75-79	32	76	2.6	0.62	5.1	0.78	0.4	1.0
80-84	31	67	4.3	0.86	6.3	0.85	0.4	1.0
85+	18	87	3.9	0.78	8.3	0.81	0.3	1.0
All ages	177	403					0.3	0.9
Mortality								
Raw			0.5	0.75	1.2	0.78		
WS			0.2	0.75	0.4	0.74		
ES			0.4	0.75	0.6	0.76		
BRD-S			0.5	0.75	0.9	0.77		
PYLL-70								
per 100,000			2.0		3.2			
ES			1.7		2.6			
AYLL-70			9.4		8.5			

* See corresponding tables with multiple malignancies.

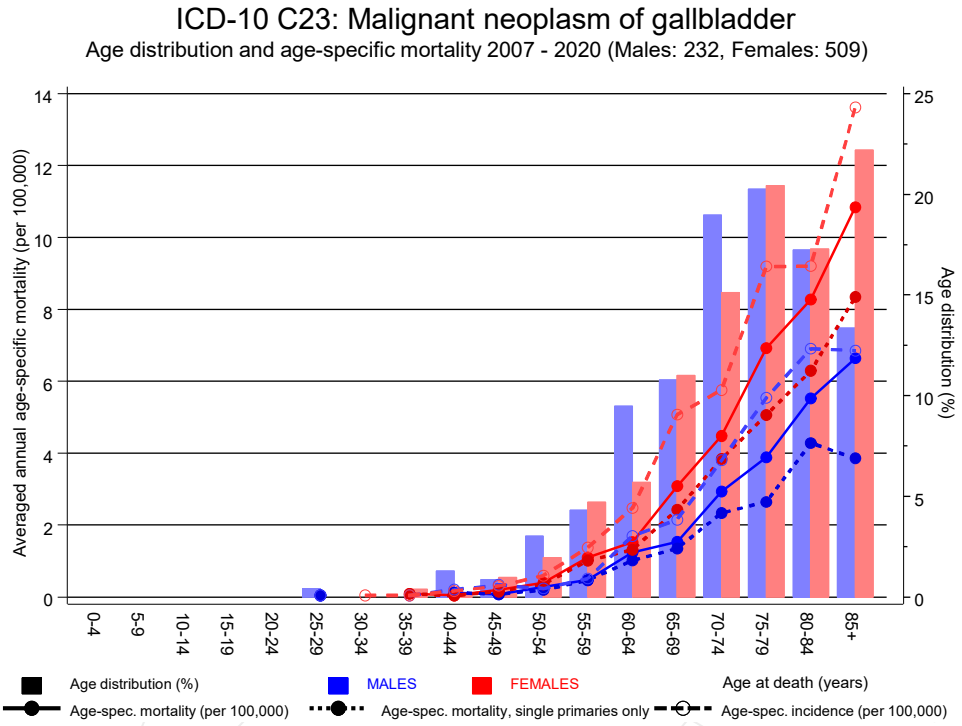


Figure 17. Distribution of age at death (bars; males: mean=72.6 yrs, median=73.9 yrs; females: mean=75.3 yrs, median=76.7 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

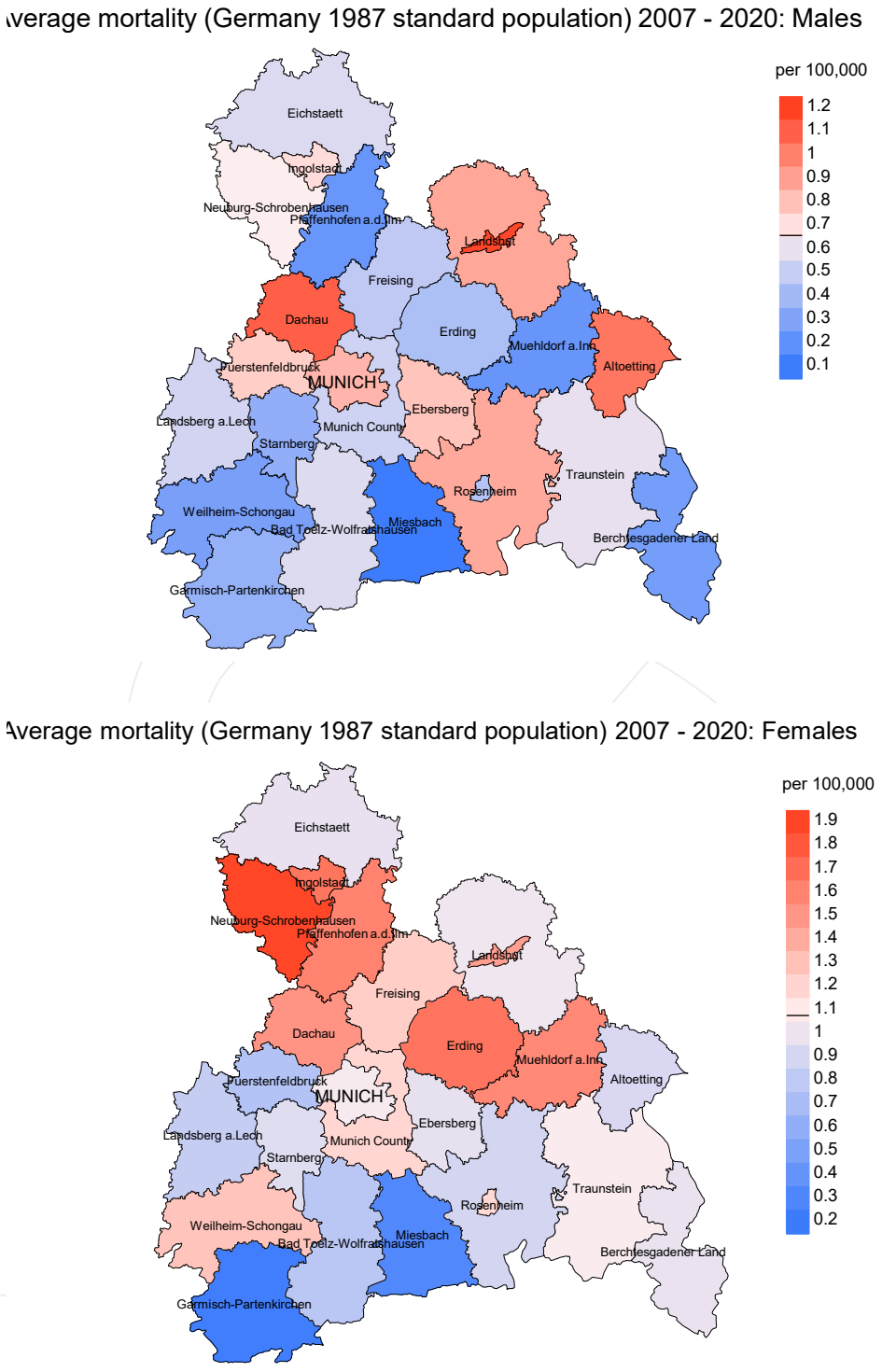
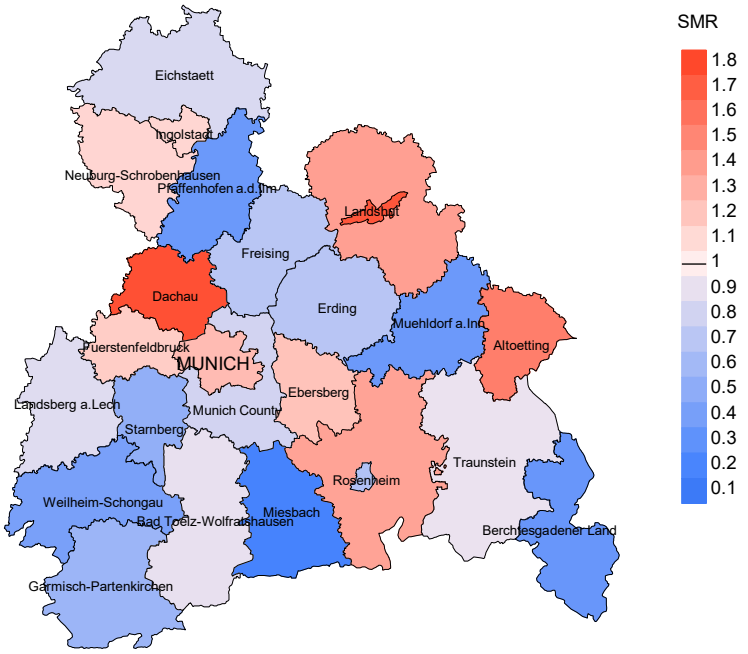


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.7/100,000 WS N=232, females 1.1/100,000 WS N=509).

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 11 women died from gallbladder cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.4 and 2.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

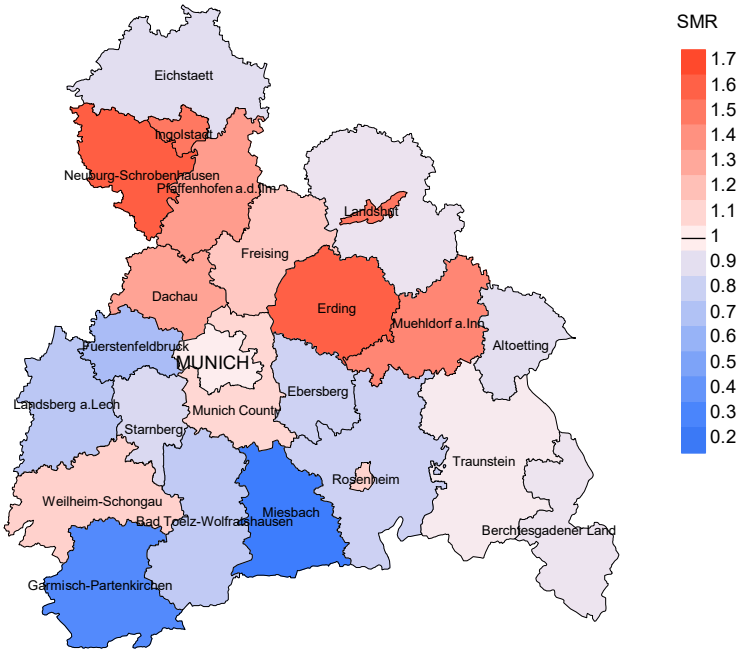


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=232, females N=509).

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 11 women died from gallbladder cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.81. Though, the value of this parameter may vary with an underlying probability of 99% between 0.32 and 1.68, 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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