Munich Cancer Registry

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ICD-10 C24: Biliary tract cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	3,448
Diseases	3,448
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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Marchioninistr. 15
Munich, 81377
Germany

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

https://www.tumorregister-muenchen.de/en/facts/base/bC24__E-ICD-10-C24-Biliary-tract-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
C24.-	Malignant neoplasm of other and unspecified parts of biliary tract
C24.0	Extrahepatic bile duct
C24.1	Ampulla of Vater
C24.8	Overlapping lesion of biliary tract
C24.9	Biliary tract, unspecified

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	69	15	21.7	5.8	3.8	91.3	100.0
1999	74	15	20.3	9.8	3.8	94.6	100.0
2000	59	17	28.8	9.9	3.7	98.3	100.0
2001	80	29	36.3	10.3	3.7	95.0	98.8
2002	180	79	43.9	12.3	3.8	98.3	100.0 #
2003	164	54	32.9	11.7	3.7	95.7	99.4
2004	154	48	31.2	11.3	3.6	90.3	97.4
2005	152	46	30.3	11.4	3.7	90.1	99.3
2006	163	40	24.5	12.4	3.8	95.1	100.0
2007	188	42	22.3	12.6	3.9	91.0	98.9 #
2008	188	48	25.5	13.5	3.7	91.5	98.9
2009	175	23	13.1	13.3	3.6	90.3	100.0
2010	152	27	17.8	13.7	3.4	85.5	100.0
2011	175	28	16.0	14.4	3.4	90.9	98.9
2012	163	23	14.1	14.8	3.6	87.7	98.8
2013	150	32	21.3	15.3	3.2	82.7	98.7
2014	183	33	18.0	15.4	3.0	86.3	99.5
2015	161	28	17.4	15.9	3.1	83.2	98.8
2016	188	37	19.7	16.1	3.1	80.3	99.5
2017	209	18	8.6	16.7	2.6	78.9	100.0
2018	143	13	9.1	17.2	1.7	64.3	100.0
2019	149			17.3	0.7	65.8	100.0
2020	129	1	0.8	17.5	0.0	45.7	100.0 ##
1998-2020	3448	696	20.2	17.5	3.8	85.4	99.4

3,448 cases diagnosed 1998-2020 are related to a total of 3,448 patients. Currently, in 748 (21.7 %) of these 3,448 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 598 / 117 / 33 (17.3 % / 3.4 % / 1.0 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 143 cases has been diagnosed, of which 17.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.7 % 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 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	28	40.6	5	17.9	10.7	3.9	82.1	100.0	
1999	39	52.7	8	20.5	11.9	3.7	89.7	100.0	
2000	32	54.2	5	15.6	12.1	3.6	100.0	100.0	
2001	33	41.3	6	18.2	12.1	3.6	97.0	100.0	
2002	84	46.7	30	35.7	13.4	3.7	97.6	100.0	#
2003	83	50.6	25	30.1	12.7	3.6	96.4	100.0	
2004	73	47.4	19	26.0	12.1	3.6	90.4	97.3	
2005	74	48.7	17	23.0	12.6	3.6	90.5	100.0	
2006	75	46.0	17	22.7	13.8	3.6	94.7	100.0	
2007	88	46.8	15	17.0	14.0	3.7	87.5	98.9	#
2008	103	54.8	18	17.5	14.6	3.5	91.3	100.0	
2009	99	56.6	10	10.1	13.8	3.3	91.9	100.0	
2010	84	55.3	8	9.5	14.2	3.4	82.1	100.0	
2011	92	52.6	8	8.7	15.3	3.6	85.9	97.8	
2012	97	59.5	11	11.3	15.7	4.0	87.6	99.0	
2013	81	54.0	11	13.6	16.1	3.8	81.5	100.0	
2014	96	52.5	15	15.6	15.9	3.8	81.3	99.0	
2015	89	55.3	13	14.6	16.7	4.1	86.5	98.9	
2016	111	59.0	18	16.2	16.7	4.2	80.2	100.0	
2017	127	60.8	6	4.7	17.8	3.6	79.5	100.0	
2018	87	60.8	4	4.6	18.6	2.1	59.8	100.0	
2019	96	64.4			18.7	1.3	68.8	100.0	
2020	71	55.0	1	1.4	18.8	0.0	42.3	100.0	##
1998-2020	1842	53.4	270	14.7	18.8	3.9	83.7	99.6	

1,842 cases diagnosed 1998-2020 are related to a total of 1,842 patients. Currently, in 427 (23.2 %) of these 1,842 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 334 / 73 / 20 (18.1 % / 4.0 % / 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 87 cases has been diagnosed, of which 18.6 % 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 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	41	59.4	10	24.4	2.4	3.7	97.6	100.0	
1999	35	47.3	7	20.0	7.9	3.8	100.0	100.0	
2000	27	45.8	12	44.4	7.8	3.8	96.3	100.0	
2001	47	58.8	23	48.9	8.7	3.8	93.6	97.9	
2002	96	53.3	49	51.0	11.4	3.9	99.0	100.0	#
2003	81	49.4	29	35.8	10.7	3.9	95.1	98.8	
2004	81	52.6	29	35.8	10.5	3.7	90.1	97.5	
2005	78	51.3	29	37.2	10.3	3.9	89.7	98.7	
2006	88	54.0	23	26.1	11.1	4.1	95.5	100.0	
2007	100	53.2	27	27.0	11.4	4.3	94.0	99.0	#
2008	85	45.2	30	35.3	12.4	4.0	91.8	97.6	
2009	76	43.4	13	17.1	12.8	4.1	88.2	100.0	
2010	68	44.7	19	27.9	13.3	3.4	89.7	100.0	
2011	83	47.4	20	24.1	13.6	3.2	96.4	100.0	
2012	66	40.5	12	18.2	14.0	3.1	87.9	98.5	
2013	69	46.0	21	30.4	14.5	2.4	84.1	97.1	
2014	87	47.5	18	20.7	14.8	1.9	92.0	100.0	
2015	72	44.7	15	20.8	15.1	1.8	79.2	98.6	
2016	77	41.0	19	24.7	15.4	1.5	80.5	98.7	
2017	82	39.2	12	14.6	15.5	1.2	78.0	100.0	
2018	56	39.2	9	16.1	15.7	1.2	71.4	100.0	
2019	53	35.6			15.8	0.0	60.4	100.0	
2020	58	45.0			16.0	0.0	50.0	100.0	##
1998-2020	1606	46.6	426	26.5	16.0	3.7	87.4	99.2	

1,606 cases diagnosed 1998-2020 are related to a total of 1,606 patients. Currently, in 321 (20.0 %) of these 1,606 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 264 / 44 / 13 (16.4 % / 2.7 % / 0.8 %) 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 56 cases has been diagnosed, of which 15.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.2 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis 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	28	41	2.5	3.5	1.4	1.6	2.3	2.4	3.4	2.9
1999	39	35	3.5	2.9	2.0	1.2	3.1	1.9	3.8	2.6
2000	32	27	2.8	2.2	1.6	0.7	2.5	1.2	3.5	1.8
2001	33	47	2.8	3.9	1.6	1.6	2.5	2.5	3.5	3.3
2002	84	96	4.5	4.9	2.5	1.6	3.8	2.7	4.9	3.8
2003	83	81	4.4	4.1	2.4	1.4	3.7	2.2	4.9	3.1
2004	73	81	3.9	4.1	2.1	1.5	3.2	2.3	4.2	3.1
2005	74	78	3.9	3.9	2.1	1.6	3.1	2.4	3.9	3.2
2006	75	88	3.9	4.4	2.0	1.5	3.0	2.3	4.0	3.2
2007	88	100	4.0	4.3	2.2	1.5	3.2	2.4	4.0	3.3
2008	103	85	4.6	3.7	2.2	1.4	3.4	2.1	4.7	2.8
2009	99	76	4.4	3.3	2.1	1.2	3.3	1.8	4.4	2.5
2010	84	68	3.7	2.9	1.8	1.1	2.8	1.6	3.7	2.2
2011	92	83	4.1	3.6	1.8	1.2	2.9	1.9	4.0	2.6
2012	97	66	4.3	2.8	2.0	1.0	3.0	1.6	3.9	2.1
2013	81	69	3.5	2.9	1.5	1.1	2.4	1.6	3.3	2.1
2014	96	87	4.1	3.6	1.9	1.1	2.8	1.8	3.7	2.6
2015	89	72	3.7	3.0	1.5	1.0	2.4	1.5	3.4	2.1
2016	111	77	4.6	3.1	2.1	1.0	3.1	1.6	4.2	2.2
2017	127	82	5.3	3.3	2.2	1.1	3.4	1.7	4.6	2.5
2018	87	56	3.6	2.3	1.6	0.7	2.4	1.2	3.2	1.6
2019	96	53	3.9	2.1	1.5	0.8	2.4	1.2	3.5	1.6
2020	71	58	2.9	2.3	1.3	1.0	1.9	1.4	2.5	1.8
1998–2020	1842	1606	4.0	3.3	1.9	1.2	2.9	1.8	3.8	2.5

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	69	71.4	13.1	28.5	99.5	54.3	62.3	72.7	79.5	89.3
1999	74	70.3	11.8	35.3	96.5	56.5	63.4	71.0	77.5	83.7
2000	59	74.4	10.5	49.5	94.0	60.0	66.4	75.3	81.8	86.8
2001	80	72.9	11.9	40.2	99.1	57.1	64.4	74.5	81.1	88.2
2002	180	74.0	12.2	34.1	94.5	56.8	65.4	75.7	82.7	89.0
2003	164	74.3	10.4	48.5	96.8	60.2	66.3	74.7	82.2	87.6
2004	154	73.0	12.3	34.0	100	55.6	65.5	73.7	82.6	88.0
2005	152	71.5	11.5	44.5	98.0	57.0	63.3	71.4	80.1	85.7
2006	163	73.6	12.8	36.7	99.2	56.9	65.3	74.1	83.5	87.1
2007	188	71.9	12.0	40.0	97.1	55.3	64.0	71.9	81.0	87.2
2008	188	73.3	11.5	32.9	99.3	58.5	66.8	73.2	82.4	86.5
2009	175	72.0	12.1	26.5	93.7	54.4	65.8	73.3	81.0	86.1
2010	152	72.2	11.2	45.3	93.8	55.9	64.4	73.8	79.5	87.0
2011	175	74.0	11.2	36.1	100	58.6	66.5	75.3	82.8	87.5
2012	163	72.4	10.8	29.3	93.9	57.9	64.8	73.7	79.8	86.7
2013	150	73.5	10.2	48.6	96.2	58.3	66.9	74.1	80.6	87.7
2014	183	73.2	12.1	30.3	97.2	54.9	66.5	75.5	81.4	87.1
2015	161	74.2	11.5	34.2	98.4	58.4	69.3	75.8	81.2	86.7
2016	188	73.8	11.0	41.1	96.4	58.4	67.1	75.4	80.9	86.9
2017	209	73.0	11.2	41.2	98.5	55.4	66.2	76.0	80.3	85.4
2018	143	72.3	10.7	39.1	94.0	56.8	66.0	75.1	79.6	83.3
2019	149	73.1	10.4	39.2	98.5	57.7	68.1	75.4	80.3	83.8
2020	129	71.0	12.1	29.0	92.3	54.8	61.6	72.7	80.1	85.4
1998–2020	3448	72.9	11.5	26.5	100	56.9	65.7	74.4	81.2	86.8

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	28	71.0	10.9	51.0	91.0	55.5	61.1	73.7	79.2	81.8
1999	39	66.7	13.2	35.3	89.8	49.9	58.2	68.1	76.9	85.6
2000	32	70.6	11.2	49.5	94.0	56.4	62.5	72.1	79.8	82.2
2001	33	72.7	10.6	52.5	89.8	58.4	66.1	72.8	80.5	88.0
2002	84	70.5	10.9	44.7	93.5	57.2	62.3	69.7	78.9	86.0
2003	83	72.0	9.7	52.5	95.2	58.9	63.9	72.0	79.7	84.8
2004	73	70.3	11.6	34.0	91.5	54.1	64.5	71.8	77.3	84.0
2005	74	69.2	10.2	47.0	98.0	57.0	63.3	69.1	75.8	82.1
2006	75	69.6	12.3	36.7	92.8	51.8	62.2	68.8	78.3	83.8
2007	88	67.7	11.3	40.0	93.1	53.6	61.4	66.4	76.2	84.2
2008	103	72.1	10.6	37.0	89.5	58.5	65.7	72.3	81.0	84.6
2009	99	70.6	10.9	43.3	91.0	52.8	64.7	71.3	79.3	82.3
2010	84	70.8	10.2	45.3	93.7	56.7	63.7	72.1	78.1	84.2
2011	92	71.9	10.9	38.9	92.1	56.9	65.4	74.3	79.5	84.3
2012	97	70.9	9.7	49.8	93.5	56.5	64.3	72.5	76.2	83.2
2013	81	72.9	9.3	48.6	93.8	60.7	66.9	74.1	79.6	83.0
2014	96	70.6	12.7	30.3	97.2	51.3	64.3	74.0	79.4	84.4
2015	89	73.3	10.9	34.2	95.1	58.2	68.8	75.5	79.2	84.8
2016	111	72.1	10.5	41.1	95.5	57.4	66.4	73.1	79.8	82.9
2017	127	72.4	11.3	43.5	93.5	53.5	64.3	75.1	80.3	86.6
2018	87	70.5	10.5	39.1	94.0	55.1	65.1	72.4	78.0	80.4
2019	96	74.0	8.6	51.9	98.5	60.5	69.1	75.3	79.8	84.0
2020	71	71.2	12.5	29.0	92.3	54.8	61.6	74.2	80.8	85.4
1998–2020	1842	71.2	10.9	29.0	98.5	56.5	64.1	72.6	79.2	84.0

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	41	71.7	14.6	28.5	99.5	54.3	62.6	71.6	83.7	89.9
1999	35	74.3	8.6	56.3	96.5	65.5	68.8	73.2	79.0	83.7
2000	27	78.9	7.4	64.9	92.4	66.4	74.0	78.9	82.4	90.2
2001	47	73.0	12.8	40.2	99.1	54.7	63.4	75.7	81.6	88.5
2002	96	77.0	12.6	34.1	94.5	56.8	72.7	80.5	84.9	90.0
2003	81	76.6	10.6	48.5	96.8	62.5	67.8	77.8	84.1	89.0
2004	81	75.5	12.4	44.2	100	58.0	67.7	77.0	84.2	90.0
2005	78	73.7	12.2	44.5	98.0	55.5	62.9	74.2	82.5	90.5
2006	88	76.9	12.2	43.2	99.2	59.3	71.2	78.9	85.7	91.3
2007	100	75.6	11.4	45.3	97.1	59.5	69.2	77.1	83.6	88.6
2008	85	74.7	12.4	32.9	99.3	59.1	68.6	76.9	83.5	88.4
2009	76	73.7	13.3	26.5	93.7	58.5	67.5	76.3	83.6	88.2
2010	68	74.0	12.2	45.3	93.8	55.3	68.1	75.4	83.7	88.3
2011	83	76.2	11.1	36.1	100	62.4	69.4	76.2	84.7	89.0
2012	66	74.7	12.0	29.3	93.9	60.4	67.8	74.9	83.8	90.3
2013	69	74.4	11.2	50.9	96.2	56.0	68.6	74.2	83.0	88.4
2014	87	75.9	10.9	44.5	91.6	56.5	70.6	78.5	83.0	88.7
2015	72	75.3	12.2	35.4	98.4	58.7	70.4	77.6	83.6	88.9
2016	77	76.3	11.3	46.3	96.4	59.0	70.0	77.7	85.1	89.7
2017	82	73.7	11.1	41.2	98.5	57.2	68.0	76.6	80.5	83.8
2018	56	75.1	10.6	49.0	92.3	57.3	69.0	77.7	82.2	88.0
2019	53	71.5	13.1	39.2	89.0	51.3	66.9	75.5	81.8	83.6
2020	58	70.7	11.6	41.2	91.7	55.5	61.2	72.0	79.1	85.0
1998-2020	1606	74.9	11.8	26.5	100	58.2	67.9	76.7	83.3	88.8

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	3	0.1	0.1	1	0.1	0.1	2	0.2	0.2
30-34	4	0.2	0.3	3	0.2	0.3	1	0.1	0.3
35-39	8	0.3	0.6	4	0.3	0.6	4	0.4	0.7
40-44	19	0.8	1.4	10	0.8	1.4	9	0.9	1.6
45-49	47	2.0	3.4	25	1.9	3.3	22	2.1	3.7
50-54	102	4.3	7.8	65	4.9	8.2	37	3.6	7.3
55-59	150	6.4	14.2	99	7.5	15.7	51	4.9	12.2
60-64	203	8.6	22.8	132	10.0	25.7	71	6.9	19.1
65-69	297	12.6	35.4	182	13.8	39.4	115	11.1	30.2
70-74	382	16.2	51.6	234	17.7	57.2	148	14.3	44.6
75-79	480	20.4	72.0	271	20.5	77.7	209	20.3	64.8
80-84	374	15.9	87.9	194	14.7	92.4	180	17.4	82.3
85+	284	12.1	100.0	101	7.6	100.0	183	17.7	100.0
All ages	2353	100.0		1321	100.0		1032	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=138 %	Females DCO rate n=215 %	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	2	0.0	0.1			0.1	0.2
30–34	3	1	0.1	0.0			0.2	0.0
35–39	4	4	0.2	0.2		25.0	0.2	0.1
40–44	10	9	0.4	0.4			0.4	0.1
45–49	25	22	0.9	0.8			0.5	0.2
50–54	65	37	2.6	1.5	4.6	2.7	0.8	0.3
55–59	99	51	4.7	2.3	2.0	3.9	0.8	0.4
60–64	132	71	7.5	3.7	5.3	9.9	0.8	0.5
65–69	182	115	11.2	6.3	4.4	7.0	0.7	0.6
70–74	234	148	15.6	8.6	9.4	5.4	0.9	0.7
75–79	271	209	22.4	13.9	8.5	14.4	1.1	1.1
80–84	194	180	26.8	16.9	18.0	29.4	1.3	1.2
85+	101	183	21.6	17.6	37.6	57.4	1.0	1.1
All ages	1321	1032			10.4	20.8	0.9	0.7
Incidence								
Raw			4.1	3.1				
WS			1.8	1.1				
ES			2.8	1.7				
BRD-S			3.7	2.3				

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).

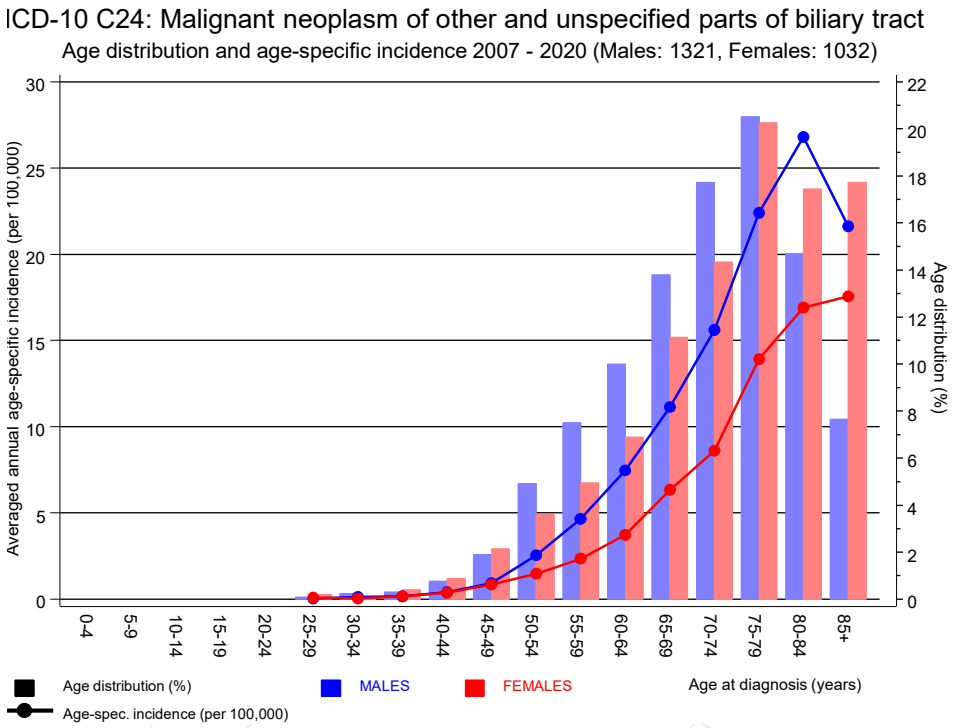


Figure 6. Age distribution (males: mean=71.5 yrs, median=73.5 yrs; females: mean=74.6 yrs, median=76.4 yrs) and age-specific incidence.

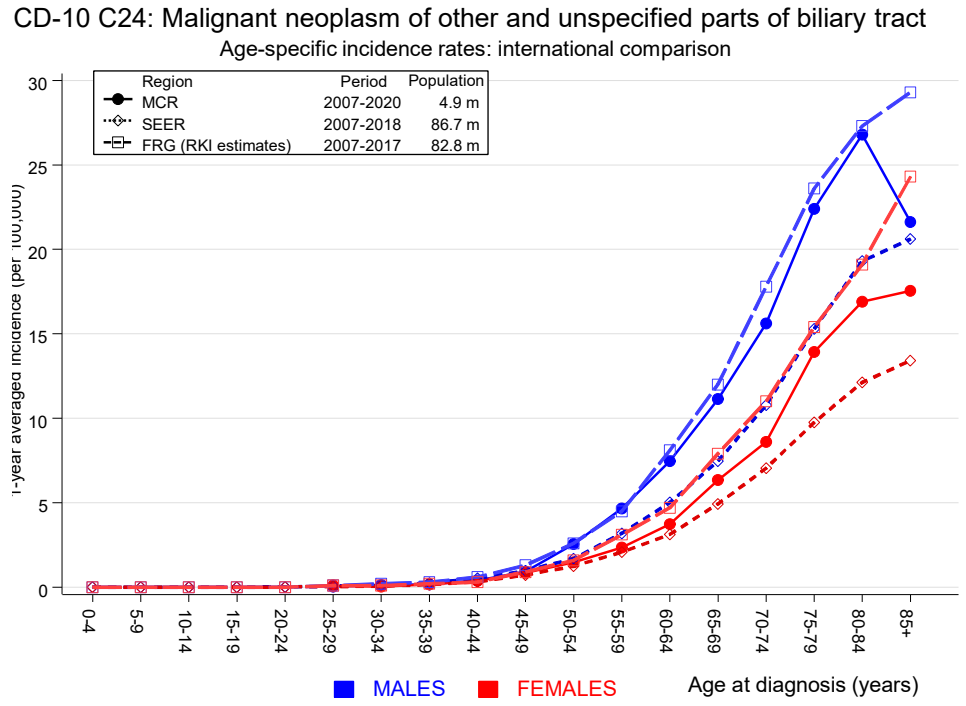


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C09–C10	Oropharynx	1	0.4	2.4	0.1	13.2		2.2	
C15	Oesophagus	2	0.9	2.3	0.3	8.3		4.2	
C16	Stomach	9	1.7	5.2	2.4	9.9	#	27.4	11.1
C17	Small intestine	9	0.3	33.8	15.5	64.2	#	32.9	
C18	Colon	13	4.3	3.0	1.6	5.2	#	32.8	15.4
C19–C20	Rectum	2	2.3	0.9	0.1	3.1		−1.1	
C22	Liver	5	1.3	3.9	1.3	9.1	#	14.0	
C25	Pancreas	10	1.7	5.7	2.7	10.5	#	31.1	20.0
C33–C34	Lung	14	5.1	2.7	1.5	4.6	#	33.5	
C38,C45	Mesothelioma	1	0.3	3.2	0.1	18.0		2.6	100.0
C43	Malign. melanoma	5	2.0	2.5	0.8	5.9		11.4	
C50	Breast	1	0.1	8.2	0.2	45.7		3.3	
C61	Prostate	16	12.4	1.3	0.7	2.1		13.4	18.8
C64	Kidney	3	1.5	2.0	0.4	5.9		5.7	
C65	Renal pelvis	1	0.2	5.0	0.1	28.1		3.0	
C67	Bladder	5	2.1	2.4	0.8	5.6		11.0	
C82–C85	NHL	2	1.8	1.1	0.1	3.9		0.6	
C91–C96	Leukaemia	1	0.7	1.5	0.0	8.4		1.3	
Not observed		0	5.1	0.0	0.0	0.7	#	−19.1	
All further malignancies		100	44.2	2.3	1.8	2.8	#	210.1	9.0

Patients	1656
Median age at next malignancy (years)	73.8
Person-years	2655
Mean observation time (years)	1.6
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 %
C16	Stomach	4	0.9	4.5	1.2	11.4	#	15.2	25.0
C18	Colon	9	2.5	3.5	1.6	6.7	#	31.6	11.1
C19–C20	Rectum	4	1.0	3.9	1.1	10.0	#	14.6	25.0
C23–C24	Bile	2	0.4	5.2	0.6	18.8		7.9	
C25	Pancreas	8	1.2	6.5	2.8	12.8	#	33.2	12.5
C33–C34	Lung	10	1.9	5.2	2.5	9.6	#	39.6	
C43	Malign. melanoma	1	0.9	1.1	0.0	6.0		0.4	
C46,C49	Soft tissue	1	0.1	6.9	0.2	38.7		4.2	
C48	Peritoneal	1	0.1	9.4	0.2	52.3		4.4	
C50	Breast	4	7.4	0.5	0.1	1.4		-16.7	
C53	Cervix uteri	2	0.3	7.1	0.9	25.6		8.4	50.0
C54	Corpus uteri	1	1.4	0.7	0.0	3.9		-2.0	100.0
C56	Ovary	5	1.0	4.9	1.6	11.4	#	19.5	20.0
C64	Kidney	4	0.6	6.5	1.8	16.6	#	16.6	25.0
C69	Eye carcinoma	1	0.0	172.5	4.4	961.0	#	4.9	
C74–C80	Cancer others	1	0.1	10.9	0.3	60.8		4.5	100.0
C76–C79	CUP	2	0.5	4.3	0.5	15.5		7.5	
C82–C85	NHL	4	1.0	4.0	1.1	10.1	#	14.6	50.0
C91–C96	Leukaemia	4	0.4	10.7	2.9	27.5	#	17.8	25.0
Not observed		0	3.4	0.0	0.0	1.1		-16.8	
All further malignancies		68	25.3	2.7	2.1	3.4	#	209.2	17.6

Patients	1302
Median age at next malignancy (years)	76.6
Person-years	2041
Mean observation time (years)	1.6
Median observation time (years)	0.6

The occurrence of further specified malignancy is statistically significant.

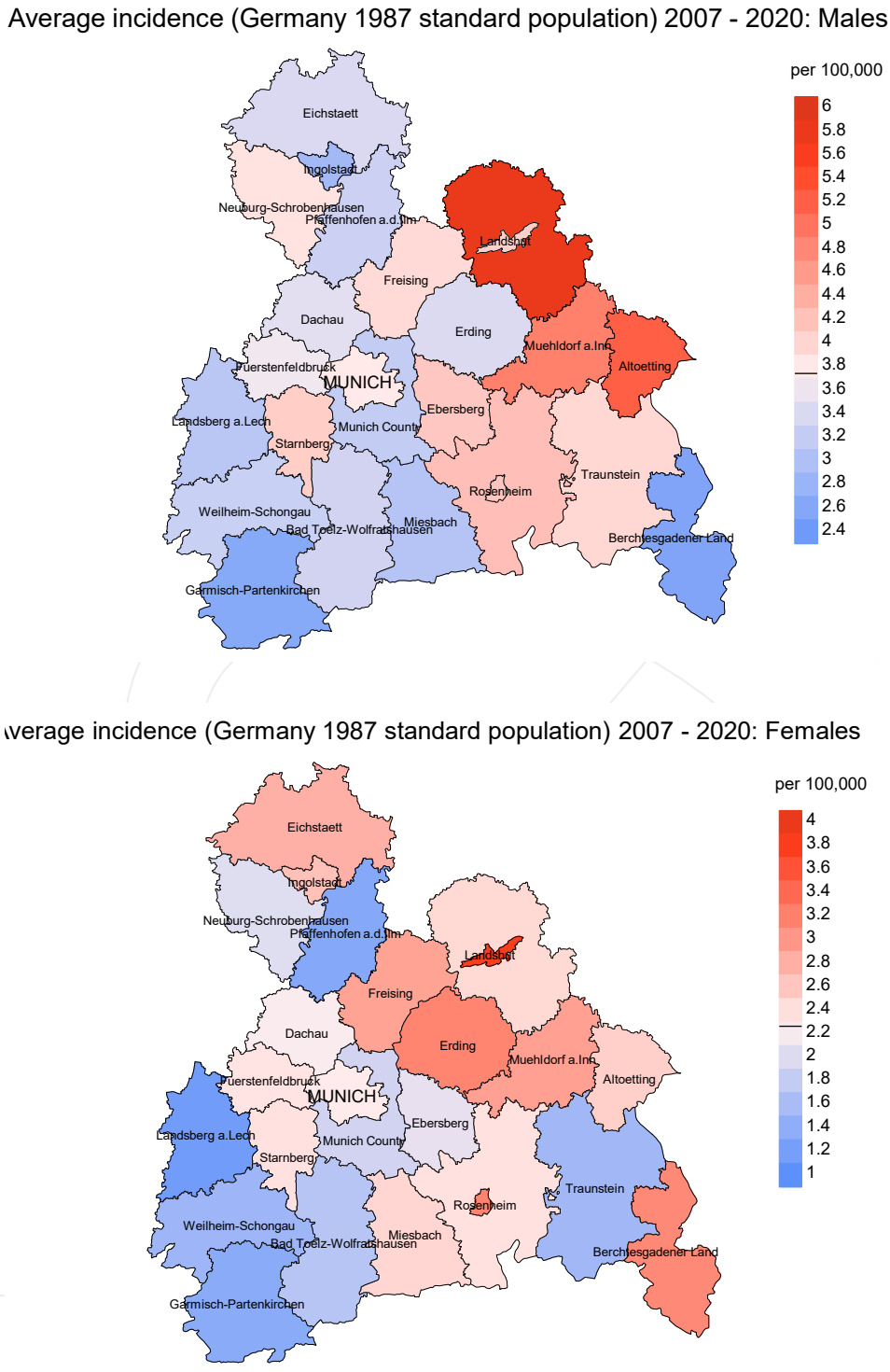
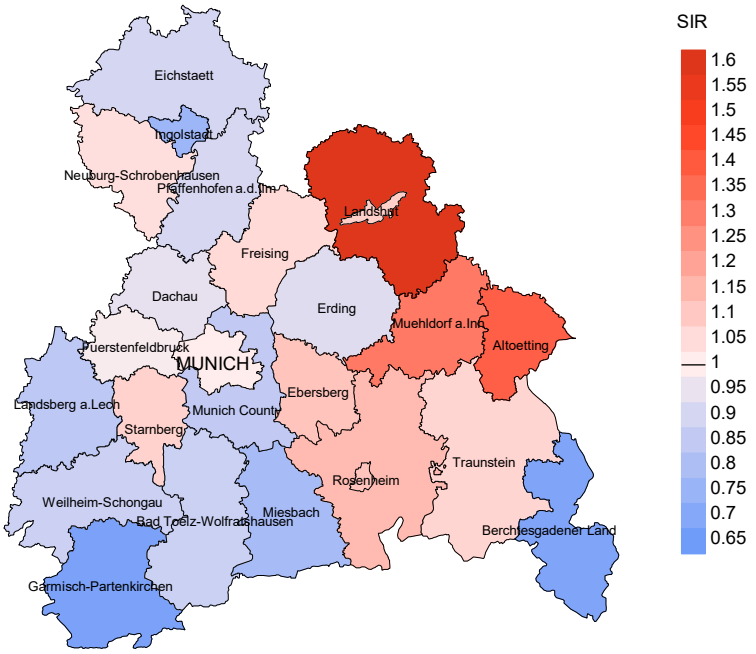


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.7/100,000 WS N=1,321, females 2.3/100,000 WS N=1,032).

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 25 women were identified with newly diagnosed biliary tract cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.2 and 3.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

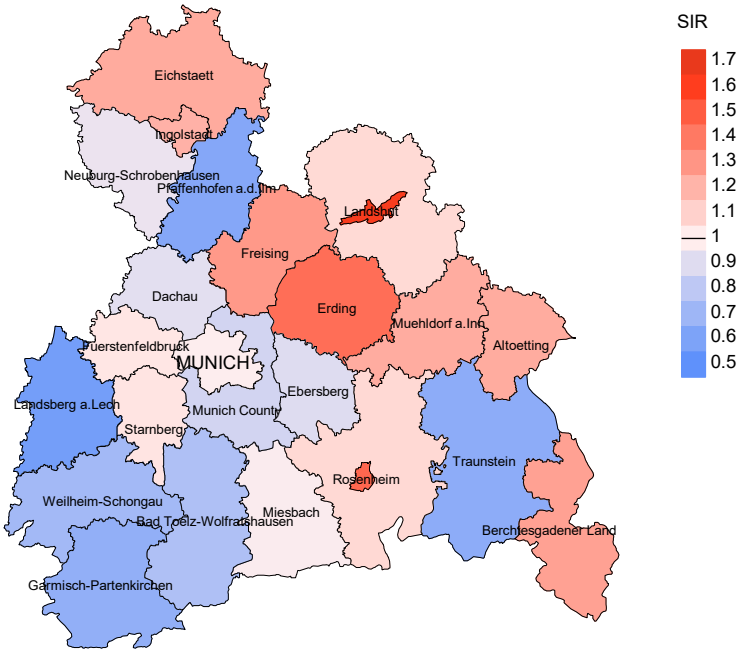


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,321, females N=1,032).

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 25 women were identified with newly diagnosed biliary tract cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.90. Though, the value of this parameter may vary with an underlying probability of 99% between 0.50 and 1.48, 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	69	100.0	21.7	63	91.3	92.1
1999	74	100.0	20.3	70	94.6	98.6
2000	59	100.0	28.8	58	98.3	91.4
2001	80	98.8	36.3	76	95.0	97.4
2002	180	100.0	43.9	177	98.3	99.4
2003	164	99.4	32.9	157	95.7	97.5
2004	154	97.4	31.2	139	90.3	98.6
2005	152	99.3	30.3	137	90.1	98.5
2006	163	100.0	24.5	155	95.1	100.0
2007	188	98.9	22.3	171	91.0	98.8
2008	188	98.9	25.5	172	91.5	98.3
2009	175	100.0	13.1	158	90.3	96.8
2010	152	100.0	17.8	130	85.5	98.5
2011	175	98.9	16.0	159	90.9	98.1
2012	163	98.8	14.1	143	87.7	97.2
2013	150	98.7	21.3	124	82.7	99.2
2014	183	99.5	18.0	158	86.3	96.8
2015	161	98.8	17.4	134	83.2	94.8
2016	188	99.5	19.7	151	80.3	93.4
2017	209	100.0	8.6	165	78.9	84.2
2018	143	100.0	9.1	92	64.3	67.4
2019	149	100.0		98	65.8	80.6
2020	129	100.0	0.8	59	45.7	94.9
1998-2020	3448	99.4	20.2	2946	85.4	95.2

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	69	56	91.1	32	46.4
1999	74	63	95.2	33	44.6
2000	59	65	95.4	29	49.2
2001	80	69	97.1	34	42.5
2002	180	142	99.3	116	64.4
2003	164	109	97.2	79	48.2
2004	154	105	99.0	73	47.4
2005	152	109	99.1	63	41.4
2006	163	140	97.9	86	52.8
2007	188	118	98.3	71	37.8
2008	188	143	97.9	89	47.3
2009	175	150	98.7	69	39.4
2010	152	136	100.0	47	30.9
2011	175	146	99.3	66	37.7
2012	163	158	97.5	70	42.9
2013	150	123	98.4	53	35.3
2014	183	133	99.2	71	38.8
2015	161	150	98.7	63	39.1
2016	188	155	98.7	84	44.7
2017	209	153	98.0	76	36.4
2018	143	125	64.8	43	30.1
2019	149	99	44.4	32	21.5
2020	129	150	96.7	32	24.8
1998–2020	3448	2797	94.7	1411	40.9

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	56	85.7	14.3	94.1
1999	63	81.0	19.0	95.0
2000	65	92.3	7.7	98.4
2001	69	89.9	10.1	97.0
2002	142	90.1	9.9	94.3
2003	109	90.8	9.2	97.2
2004	105	89.5	10.5	96.2
2005	109	93.6	6.4	98.1
2006	140	90.0	10.0	93.4
2007	118	92.4	7.6	97.4
2008	143	94.4	5.6	97.1
2009	150	90.0	10.0	94.6
2010	136	89.0	11.0	94.9
2011	146	91.1	8.9	95.2
2012	158	89.2	10.8	94.8
2013	123	90.2	9.8	95.0
2014	133	90.2	9.8	94.7
2015	150	90.0	10.0	95.3
2016	155	89.7	10.3	94.1
2017	153	92.2	7.8	95.3
2018	125	72.8	27.2	92.6
2019	99	62.6	37.4	90.9
2020	150	80.7	19.3	91.7
1998-2020	2797	88.1	11.9	95.1

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	25	75.6	73.6	77.4	75.6
1999	28	70.8	67.5	75.3	68.5
2000	29	75.5	75.5	65.8	76.3
2001	35	69.8	67.5	75.2	67.8
2002	66	71.9	72.0	71.6	71.7
2003	53	72.3	71.1	74.3	73.0
2004	46	73.5	73.5	73.7	73.8
2005	70	70.8	70.4	73.9	70.7
2006	65	70.9	70.9	72.0	70.9
2007	55	68.2	67.9	73.8	68.9
2008	62	70.8	70.8	70.5	70.7
2009	89	71.2	70.7	74.7	71.2
2010	67	73.1	71.6	82.2	72.0
2011	85	75.3	75.3	72.5	75.0
2012	87	73.8	72.8	76.9	73.6
2013	75	74.6	73.8	80.0	74.0
2014	75	74.9	74.8	79.3	74.8
2015	71	75.1	74.8	77.9	74.8
2016	70	76.0	76.1	74.7	76.0
2017	92	78.1	78.1	66.9	78.5
2018	77	76.6	74.8	80.3	77.3
2019	63	77.0	76.4	78.3	76.1
2020	100	76.2	75.1	79.1	75.7
1998–2020	1485	74.2	73.6	76.3	73.9

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	31	76.2	74.2	97.1	76.2
1999	35	76.3	76.8	72.0	76.7
2000	36	75.8	75.5	90.2	76.2
2001	34	78.6	78.3	91.9	78.9
2002	76	80.3	79.6	82.2	80.3
2003	56	79.6	78.8	85.0	79.5
2004	59	78.6	78.8	78.0	78.6
2005	39	77.1	77.4	64.9	77.1
2006	75	78.8	78.3	82.4	77.8
2007	63	77.2	76.9	83.4	77.2
2008	81	78.1	77.9	88.4	78.1
2009	61	79.2	77.9	84.1	77.9
2010	69	79.1	78.6	83.7	79.4
2011	61	77.7	77.6	87.5	77.7
2012	71	76.4	76.0	81.9	76.1
2013	48	78.8	77.8	81.2	78.8
2014	58	77.7	78.1	64.6	78.1
2015	79	79.5	79.2	85.2	79.1
2016	85	79.5	79.0	82.5	79.5
2017	61	77.2	77.1	80.3	77.1
2018	48	78.1	77.7	78.8	77.7
2019	36	78.7	77.4	80.1	77.4
2020	50	77.2	76.7	81.1	76.7
1998–2020	1312	78.1	77.9	82.2	78.0

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	19	1.7	0.68	1.0	0.73	1.6	0.70	2.5	0.74
1999	19	1.7	0.49	1.0	0.48	1.5	0.48	1.8	0.47
2000	27	2.4	0.84	1.3	0.78	2.2	0.86	3.0	0.88
2001	29	2.5	0.88	1.4	0.92	2.2	0.86	2.8	0.79
2002	57	3.1	0.68	1.7	0.66	2.6	0.68	3.5	0.71
2003	47	2.5	0.57	1.3	0.56	2.1	0.57	2.8	0.57
2004	42	2.2	0.58	1.1	0.55	1.8	0.57	2.5	0.59
2005	64	3.4	0.86	1.8	0.86	2.6	0.86	3.4	0.88
2006	57	3.0	0.76	1.5	0.74	2.3	0.76	3.1	0.78
2007	50	2.3	0.57	1.2	0.53	1.7	0.53	2.1	0.54
2008	58	2.6	0.56	1.3	0.59	2.0	0.59	2.7	0.58
2009	79	3.5	0.80	1.8	0.83	2.7	0.82	3.5	0.80
2010	60	2.7	0.71	1.3	0.70	2.0	0.71	2.6	0.70
2011	77	3.4	0.84	1.4	0.78	2.4	0.81	3.3	0.83
2012	76	3.3	0.78	1.5	0.77	2.4	0.78	3.2	0.81
2013	67	2.9	0.83	1.2	0.81	1.9	0.83	2.6	0.81
2014	65	2.8	0.68	1.2	0.64	1.9	0.66	2.6	0.69
2015	62	2.6	0.70	1.1	0.72	1.7	0.71	2.4	0.70
2016	61	2.5	0.55	1.0	0.46	1.5	0.49	2.3	0.54
2017	87	3.6	0.69	1.3	0.62	2.2	0.65	3.1	0.68
2018	52	2.1	0.60	0.9	0.54	1.3	0.55	1.8	0.58
2019	37	1.5	0.39	0.6	0.37	0.9	0.37	1.3	0.39
2020	77	3.2	1.08	1.2	0.98	2.0	1.03	2.8	1.09
1998-2020	1269	2.7	0.69	1.3	0.67	2.0	0.68	2.7	0.69

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	29	2.5	0.71	1.1	0.66	1.6	0.68	2.0	0.70
1999	32	2.7	0.91	1.0	0.86	1.6	0.86	2.3	0.87
2000	33	2.7	1.22	1.1	1.55	1.7	1.41	2.3	1.24
2001	33	2.7	0.70	0.9	0.58	1.5	0.63	2.3	0.69
2002	71	3.6	0.74	1.3	0.78	2.0	0.75	2.8	0.74
2003	52	2.6	0.64	1.0	0.67	1.5	0.67	2.0	0.65
2004	52	2.6	0.64	0.9	0.59	1.4	0.62	2.0	0.65
2005	38	1.9	0.49	0.7	0.43	1.1	0.44	1.5	0.48
2006	69	3.4	0.78	1.2	0.80	1.9	0.79	2.5	0.79
2007	59	2.6	0.59	0.9	0.56	1.4	0.57	1.9	0.58
2008	77	3.3	0.91	1.1	0.82	1.8	0.85	2.5	0.90
2009	56	2.4	0.74	0.7	0.60	1.2	0.67	1.9	0.76
2010	61	2.6	0.90	0.9	0.79	1.4	0.83	1.9	0.84
2011	56	2.4	0.67	0.9	0.71	1.3	0.68	1.8	0.68
2012	65	2.8	0.98	1.0	0.93	1.5	0.96	2.0	0.96
2013	44	1.8	0.64	0.6	0.58	0.9	0.58	1.3	0.62
2014	55	2.3	0.63	0.7	0.62	1.1	0.63	1.6	0.62
2015	73	3.0	1.01	0.8	0.87	1.4	0.91	2.1	0.98
2016	78	3.2	1.01	0.9	0.88	1.5	0.93	2.2	1.00
2017	54	2.2	0.66	0.7	0.67	1.2	0.67	1.6	0.65
2018	39	1.6	0.70	0.4	0.59	0.7	0.62	1.1	0.68
2019	25	1.0	0.47	0.3	0.37	0.5	0.41	0.7	0.43
2020	44	1.8	0.76	0.6	0.65	0.9	0.67	1.3	0.73
1998-2020	1195	2.5	0.74	0.8	0.70	1.3	0.71	1.8	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	2	0.1	0.1			0.0	2	0.3	0.3
30-34	0	0.0	0.1			0.0			0.3
35-39	2	0.1	0.2	1	0.1	0.1	1	0.1	0.4
40-44	7	0.4	0.6	5	0.6	0.7	2	0.3	0.6
45-49	21	1.2	1.9	9	1.0	1.7	12	1.5	2.2
50-54	62	3.7	5.5	40	4.4	6.1	22	2.8	5.0
55-59	89	5.3	10.8	56	6.2	12.2	33	4.2	9.2
60-64	126	7.4	18.2	83	9.1	21.4	43	5.5	14.6
65-69	188	11.1	29.3	119	13.1	34.5	69	8.8	23.4
70-74	282	16.6	46.0	165	18.2	52.6	117	14.9	38.3
75-79	362	21.4	67.4	193	21.3	73.9	169	21.5	59.8
80-84	300	17.7	85.1	142	15.6	89.5	158	20.1	79.9
85+	253	14.9	100.0	95	10.5	100.0	158	20.1	100.0
All ages	1694	100.0		908	100.0		786	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		2			0.1	1.00		2.0
30-34								
35-39	1	1	0.0	0.25	0.0	0.25	0.4	0.2
40-44	5	2	0.2	0.50	0.1	0.22	0.8	0.2
45-49	9	12	0.3	0.36	0.5	0.55	0.6	0.7
50-54	40	22	1.6	0.62	0.9	0.59	1.5	0.8
55-59	56	33	2.6	0.57	1.5	0.65	1.3	0.9
60-64	83	43	4.7	0.63	2.3	0.61	1.3	0.9
65-69	119	69	7.3	0.65	3.8	0.60	1.3	1.0
70-74	165	117	11.0	0.71	6.8	0.79	1.4	1.3
75-79	193	169	16.0	0.71	11.3	0.81	1.5	1.7
80-84	142	158	19.6	0.73	14.8	0.88	1.4	1.7
85+	95	158	20.3	0.94	15.2	0.86	1.0	1.3
All ages	908	786					1.3	1.3
Mortality								
Raw			2.8	0.69	2.3	0.76		
WS			1.2	0.66	0.8	0.69		
ES			1.9	0.67	1.2	0.71		
BRD-S			2.6	0.69	1.7	0.74		
PYLL-70								
per 100,000			9.4		6.1			
ES			8.0		5.0			
AYLL-70			8.6		9.4			

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	1	0.3	1	100.0				
C03–C06	Oral cavity	3	0.9	2	66.7			1	33.3
C09–C10	Oropharynx	1	0.3	1	100.0				
C12–C13	Hypopharynx	2	0.6	1	50.0			1	50.0
C15	Oesophagus	2	0.6			1	50.0	1	50.0
C16	Stomach	12	3.7	6	50.0	3	25.0	3	25.0
C17	Small intestine	6	1.8	1	16.7	4	66.7	1	16.7
C18	Colon	27	8.2	18	66.7	6	22.2	3	11.1
C19–C20	Rectum	18	5.5	16	88.9	2	11.1		
C22	Liver	5	1.5	1	20.0	4	80.0		
C23–C24	Bile	6	1.8					6	100.0
C25	Pancreas	12	3.7	3	25.0	4	33.3	5	41.7
C26	GI cancer	1	0.3			1	100.0		
C30–C31	Sinuses	2	0.6	2	100.0				
C32	Larynx	7	2.1	7	100.0				
C33–C34	Lung	16	4.9	5	31.3	3	18.8	8	50.0
C38,C45	Mesothelioma	1	0.3					1	100.0
C43	Malign. melanoma	15	4.6	10	66.7	2	13.3	3	20.0
C44	Skin others	31	9.5	21	67.7	3	9.7	7	22.6
C46,C49	Soft tissue	3	0.9	3	100.0				
C48	Peritoneal	1	0.3			1	100.0		
C50	Breast	1	0.3	1	100.0				
C60	Penis	1	0.3	1	100.0				
C61	Prostate	94	28.7	80	85.1	2	2.1	12	12.8
C62	Testis	7	2.1	7	100.0				
C64	Kidney	10	3.0	9	90.0	1	10.0		
C65	Renal pelvis	1	0.3	1	100.0				
C67	Bladder	15	4.6	10	66.7	3	20.0	2	13.3
C69	Eye melanoma	2	0.6	1	50.0			1	50.0
C70–C72	CNS cancer	1	0.3	1	100.0				
C73	Thyroid	1	0.3	1	100.0				
C76–C79	CUP	6	1.8	4	66.7	2	33.3		
C81	Hodgkin lymphoma	3	0.9	3	100.0				
C82–C85	NHL	9	2.7	7	77.8	1	11.1	1	11.1
C90	Mult. myeloma	3	0.9	3	100.0				
C91–C96	Leukaemia	2	0.6	1	50.0			1	50.0
All further malignancies		328	100.0	228	69.5	43	13.1	57	17.4

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	3	1.1	3	100.0				
C07–C08	Salivary gland	1	0.4	1	100.0				
C15	Oesophagus	1	0.4			1	100.0		
C16	Stomach	6	2.3	1	16.7			5	83.3
C17	Small intestine	1	0.4	1	100.0				
C18	Colon	31	11.8	21	67.7	3	9.7	7	22.6
C19–C20	Rectum	10	3.8	8	80.0			2	20.0
C22	Liver	1	0.4					1	100.0
C23–C24	Bile	3	1.1			2	66.7	1	33.3
C25	Pancreas	12	4.6	3	25.0	5	41.7	4	33.3
C33–C34	Lung	13	5.0	1	7.7	2	15.4	10	76.9
C37	Thymus	1	0.4			1	100.0		
C43	Malign. melanoma	10	3.8	9	90.0			1	10.0
C44	Skin others	13	5.0	7	53.8	2	15.4	4	30.8
C46,C49	Soft tissue	2	0.8	2	100.0				
C50	Breast	73	27.9	70	95.9	2	2.7	1	1.4
C51	Vulva	3	1.1	3	100.0				
C53	Cervix uteri	7	2.7	6	85.7			1	14.3
C54	Corpus uteri	21	8.0	20	95.2			1	4.8
C56	Ovary	16	6.1	8	50.0	3	18.8	5	31.3
C64	Kidney	8	3.1	5	62.5	2	25.0	1	12.5
C67	Bladder	3	1.1	3	100.0				
C70–C72	CNS cancer	1	0.4	1	100.0				
C73	Thyroid	2	0.8	2	100.0				
C74–C80	Cancer others	1	0.4			1	100.0		
C76–C79	CUP	4	1.5	1	25.0	1	25.0	2	50.0
C82–C85	NHL	11	4.2	9	81.8	1	9.1	1	9.1
C91–C96	Leukaemia	4	1.5					4	100.0
All further malignancies		262	100.0	185	70.6	26	9.9	51	19.5

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		2			0.1	1.00		2.2
30-34								
35-39	1	1	0.0	0.33	0.0	0.33	0.4	0.3
40-44	5	2	0.2	0.63	0.1	0.22	0.9	0.3
45-49	9	12	0.3	0.41	0.5	0.55	0.7	0.8
50-54	35	20	1.4	0.61	0.8	0.61	1.5	0.9
55-59	52	29	2.4	0.58	1.3	0.63	1.3	0.9
60-64	66	36	3.7	0.58	1.9	0.59	1.2	0.9
65-69	102	53	6.2	0.67	2.9	0.58	1.4	1.0
70-74	133	96	8.9	0.73	5.6	0.88	1.5	1.4
75-79	141	128	11.7	0.76	8.5	0.80	1.5	1.7
80-84	94	119	13.0	0.71	11.2	0.84	1.3	1.6
85+	72	133	15.4	0.99	12.8	0.90	1.1	1.4
All ages	710	631					1.3	1.3
Mortality								
Raw			2.2	0.69	1.9	0.76		
WS			1.0	0.66	0.6	0.69		
ES			1.5	0.68	1.0	0.71		
BRD-S			2.0	0.69	1.4	0.74		
PYLL-70								
per 100,000			8.3		5.5			
ES			7.0		4.5			
AYLL-70			8.8		10.0			

* 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.	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		2			0.1	1.00		2.3
30-34								
35-39	1	1	0.0	0.33	0.0	0.33	0.4	0.3
40-44	5	2	0.2	0.63	0.1	0.22	0.9	0.3
45-49	9	12	0.3	0.41	0.5	0.55	0.7	0.8
50-54	35	19	1.4	0.61	0.8	0.63	1.5	0.9
55-59	51	26	2.4	0.59	1.2	0.59	1.3	0.8
60-64	63	36	3.6	0.58	1.9	0.62	1.2	0.9
65-69	99	51	6.1	0.67	2.8	0.58	1.4	0.9
70-74	129	92	8.6	0.74	5.4	0.88	1.5	1.4
75-79	136	120	11.2	0.76	8.0	0.80	1.6	1.7
80-84	93	114	12.8	0.71	10.7	0.82	1.3	1.6
85+	67	128	14.3	0.97	12.3	0.87	1.1	1.4
All ages	688	603					1.3	1.3
Mortality								
Raw			2.1	0.70	1.8	0.76		
WS			0.9	0.66	0.6	0.69		
ES			1.5	0.68	0.9	0.71		
BRD-S			1.9	0.69	1.3	0.74		
PYLL-70								
per 100,000			8.2		5.3			
ES			6.9		4.4			
AYLL-70			8.9		10.1			

* See corresponding tables with multiple malignancies.

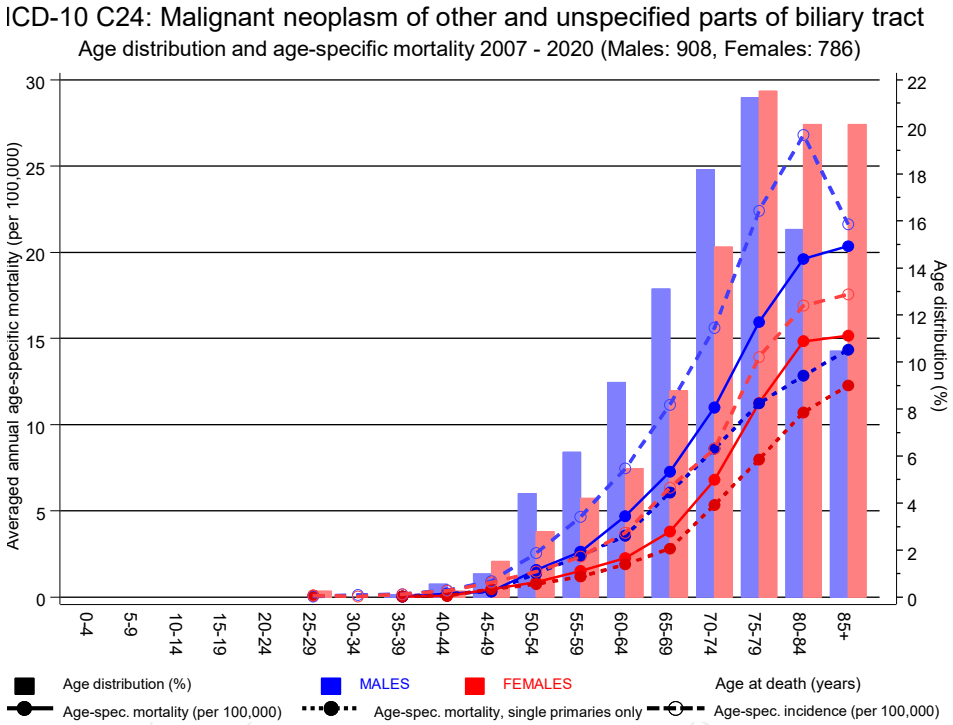


Figure 17. Distribution of age at death (bars; males: mean=71.5 yrs, median=73.3 yrs; females: mean=74.7 yrs, median=76.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

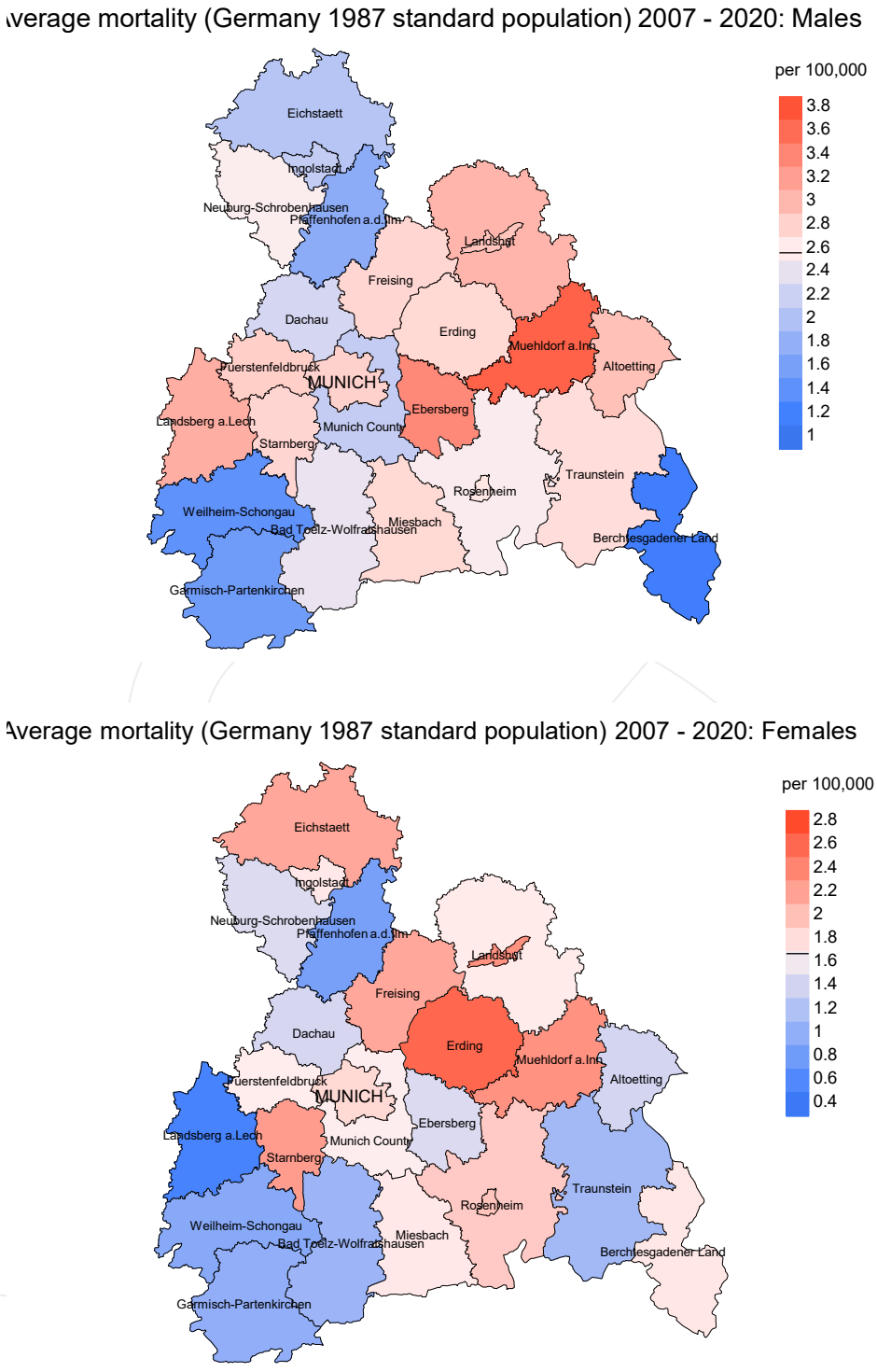
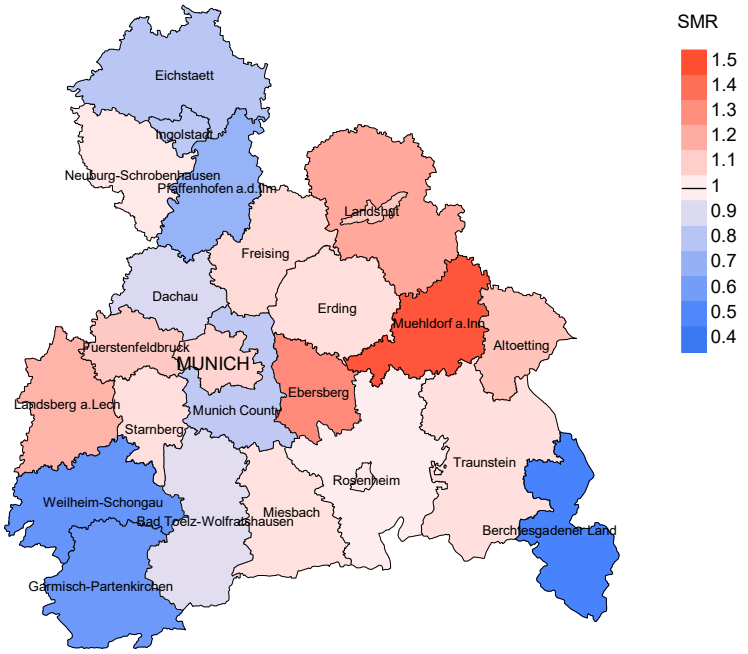


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.6/100,000 WS N=908, females 1.7/100,000 WS N=786).

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 18 women died from biliary tract cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 2.7/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

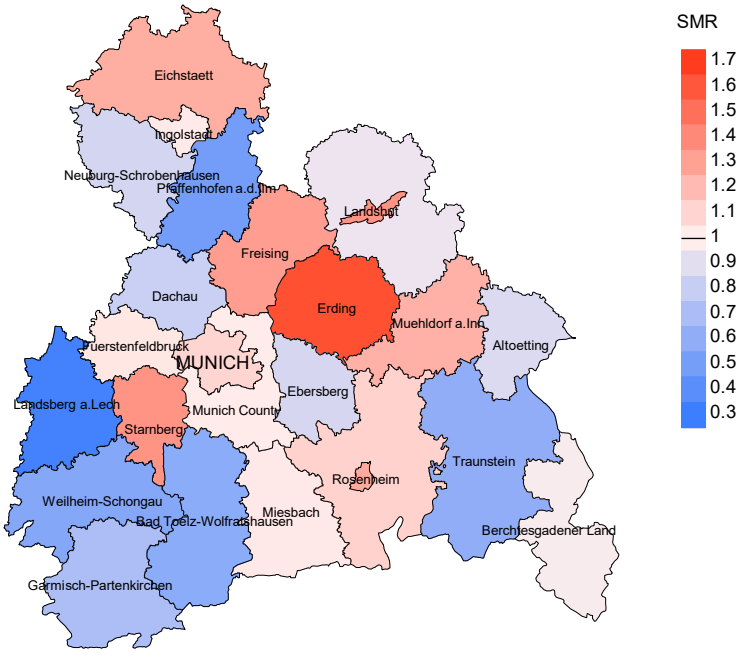


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=908, females N=786).

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 18 women died from biliary tract cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.86. Though, the value of this parameter may vary with an underlying probability of 99% between 0.43 and 1.53, 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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