Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

ICD-10 C17: Small intestine cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	2,642
Diseases	2,649
Creation date	12/20/2021
Database export	12/20/2021
Population	4.95 m

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

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

https://www.tumorregister-muenchen.de/en/facts/base/bC17__E-ICD-10-C17-Small-intestine-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 2015) used for specifying cancer site

Code	Description
C17.-	Malignant neoplasm of small intestine
C17.0	Duodenum
C17.1	Jejunum
C17.2	Ileum
C17.3	Meckel diverticulum
C17.8	Overlapping lesion of small intestine
C17.9	Small intestine, 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	27	1	3.7	11.1	10.7	77.8	100.0
1999	52	4	7.7	16.5	10.6	80.8	96.2
2000	40	2	5.0	16.8	10.7	77.5	100.0
2001	45	2	4.4	20.7	10.6	77.8	100.0
2002	69	8	11.6	21.5	10.4	72.5	97.1 #
2003	78	8	10.3	20.3	10.3	65.4	96.2
2004	103	4	3.9	18.8	9.9	66.0	91.3
2005	94	5	5.3	18.9	9.4	70.2	94.7
2006	100	1	1.0	19.2	9.3	71.0	95.0
2007	123	2	1.6	20.1	9.1	57.7	95.1 #
2008	114	6	5.3	19.9	8.9	53.5	99.1
2009	127	7	5.5	20.3	8.7	60.6	99.2
2010	147	3	2.0	20.6	8.6	49.7	99.3
2011	148	2	1.4	21.2	7.8	59.5	98.0
2012	167	4	2.4	22.0	7.4	50.9	95.2
2013	156	3	1.9	22.4	6.4	45.5	95.5
2014	166	2	1.2	22.2	6.3	48.8	98.8
2015	179	5	2.8	23.0	5.0	45.3	97.2
2016	161			23.4	4.5	40.4	100.0
2017	187	2	1.1	24.0	3.8	33.2	98.4
2018	138	3	2.2	24.2	2.9	27.5	99.3
2019	124			24.2	1.8	21.8	99.2
2020	104			24.4	2.0	13.5	100.0 ##
1998-2020	2649	74	2.8	24.4	10.7	50.2	97.5

2,649 cases diagnosed 1998-2020 are related to a total of 2,642 patients. Currently, in 935 (35.4 %) of these 2,642 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 677 / 196 / 62 (25.6 % / 7.4 % / 2.3 %) 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 138 cases has been diagnosed, of which 24.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.9 % 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	16	59.3	1	6.3	6.3	12.5	81.3	100.0
1999	24	46.2			10.0	12.4	79.2	95.8
2000	24	60.0	2	8.3	14.1	12.4	87.5	100.0
2001	25	55.6	1	4.0	19.1	12.4	88.0	100.0
2002	34	49.3	2	5.9	20.3	12.2	79.4	97.1 #
2003	42	53.8	6	14.3	20.6	12.0	73.8	95.2
2004	67	65.0	1	1.5	19.0	11.5	65.7	92.5
2005	48	51.1	3	6.3	20.4	10.8	75.0	95.8
2006	53	53.0	1	1.9	19.5	10.7	67.9	92.5
2007	74	60.2	1	1.4	20.6	10.5	56.8	97.3 #
2008	59	51.8	2	3.4	20.8	10.3	47.5	100.0
2009	71	55.9	3	4.2	21.4	10.0	60.6	98.6
2010	75	51.0	1	1.3	22.1	9.9	53.3	100.0
2011	75	50.7	1	1.3	23.0	9.3	64.0	97.3
2012	92	55.1	1	1.1	24.3	8.6	52.2	94.6
2013	101	64.7	3	3.0	24.8	7.2	44.6	96.0
2014	89	53.6	2	2.2	24.3	7.0	56.2	100.0
2015	101	56.4	1	1.0	24.9	5.9	47.5	98.0
2016	90	55.9			25.5	5.3	46.7	100.0
2017	99	52.9	2	2.0	26.7	4.1	33.3	100.0
2018	78	56.5	2	2.6	27.1	3.0	26.9	100.0
2019	69	55.6			27.0	1.6	23.2	98.6
2020	64	61.5			27.0	1.7	12.5	100.0 ##
1998-2020	1470	55.5	36	2.4	27.0	12.5	51.8	97.8

1,470 cases diagnosed 1998-2020 are related to a total of 1,468 patients. Currently, in 579 (39.4 %) of these 1,468 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 409 / 128 / 42 (27.9 % / 8.7 % / 2.9 %) 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 78 cases has been diagnosed, of which 27.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.0 % 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 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	11	40.7			18.2	8.4	72.7	100.0	
1999	28	53.8	4	14.3	23.1	8.4	82.1	96.4	
2000	16	40.0			20.0	8.5	62.5	100.0	
2001	20	44.4	1	5.0	22.7	8.3	65.0	100.0	
2002	35	50.7	6	17.1	22.7	8.1	65.7	97.1	#
2003	36	46.2	2	5.6	19.9	8.1	55.6	97.2	
2004	36	35.0	3	8.3	18.7	7.9	66.7	88.9	
2005	46	48.9	2	4.3	17.1	7.6	65.2	93.5	
2006	47	47.0			18.9	7.6	74.5	97.9	
2007	49	39.8	1	2.0	19.4	7.3	59.2	91.8	#
2008	55	48.2	4	7.3	18.7	7.2	60.0	98.2	
2009	56	44.1	4	7.1	18.9	7.2	60.7	100.0	
2010	72	49.0	2	2.8	18.7	7.0	45.8	98.6	
2011	73	49.3	1	1.4	19.1	5.9	54.8	98.6	
2012	75	44.9	3	4.0	19.4	5.7	49.3	96.0	
2013	55	35.3			19.4	5.3	47.3	94.5	
2014	77	46.4			19.6	5.5	40.3	97.4	
2015	78	43.6	4	5.1	20.8	3.9	42.3	96.2	
2016	71	44.1			20.7	3.6	32.4	100.0	
2017	88	47.1			20.8	3.4	33.0	96.6	
2018	60	43.5	1	1.7	20.6	2.6	28.3	98.3	
2019	55	44.4			20.9	2.2	20.0	100.0	
2020	40	38.5			21.1	2.6	15.0	100.0	##
1998-2020	1179	44.5	38	3.2	21.1	8.4	48.2	97.2	

1,179 cases diagnosed 1998-2020 are related to a total of 1,174 patients. Currently, in 356 (30.3 %) of these 1,174 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 268 / 68 / 20 (22.8 % / 5.8 % / 1.7 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 60 cases has been diagnosed, of which 20.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.6 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	16	11	1.4	0.9	0.9	0.5	1.3	0.7	1.8	0.8
1999	24	28	2.1	2.4	1.4	1.1	1.9	1.6	2.1	2.0
2000	24	16	2.1	1.3	1.3	0.8	1.8	1.0	2.1	1.2
2001	25	20	2.2	1.6	1.3	0.9	1.9	1.3	2.2	1.5
2002	34	35	1.8	1.8	1.1	0.9	1.5	1.4	1.9	1.6
2003	42	36	2.2	1.8	1.3	1.0	1.8	1.4	2.3	1.6
2004	67	36	3.6	1.8	2.1	0.9	2.9	1.3	3.6	1.6
2005	48	46	2.5	2.3	1.4	1.1	2.0	1.6	2.6	2.0
2006	53	47	2.8	2.3	1.5	1.2	2.2	1.6	2.8	2.0
2007	74	49	3.3	2.1	1.9	1.0	2.7	1.4	3.3	1.8
2008	59	55	2.7	2.4	1.5	1.2	2.1	1.7	2.6	1.9
2009	71	56	3.2	2.4	1.7	1.2	2.6	1.7	3.2	2.1
2010	75	72	3.3	3.1	1.9	1.7	2.7	2.4	3.1	2.7
2011	75	73	3.4	3.1	1.6	1.5	2.4	2.2	3.2	2.5
2012	92	75	4.1	3.2	2.0	1.4	2.9	2.1	3.7	2.5
2013	101	55	4.4	2.3	2.4	1.1	3.4	1.5	4.0	1.8
2014	89	77	3.8	3.2	1.9	1.5	2.7	2.2	3.4	2.6
2015	101	78	4.2	3.2	2.1	1.6	3.0	2.2	3.8	2.6
2016	90	71	3.7	2.9	1.9	1.4	2.7	1.9	3.4	2.4
2017	99	88	4.1	3.6	1.9	1.6	2.8	2.3	3.6	2.8
2018	78	60	3.2	2.4	1.6	1.2	2.3	1.6	2.8	1.9
2019	69	55	2.8	2.2	1.4	1.0	2.0	1.5	2.5	1.8
2020	64	40	2.6	1.6	1.4	0.7	1.9	1.0	2.4	1.3
1998–2020	1470	1179	3.2	2.4	1.7	1.2	2.4	1.7	3.0	2.0

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	27	67.5	12.5	45.1	90.0	50.5	55.9	67.1	75.6	85.1
1999	52	65.3	12.9	32.7	93.0	49.4	57.3	64.9	74.0	81.1
2000	40	62.2	14.3	34.4	93.2	41.7	53.3	63.3	72.8	76.4
2001	45	65.3	12.9	29.6	99.2	51.5	57.3	65.9	74.1	80.4
2002	69	66.2	12.9	28.7	101	47.7	59.4	67.6	72.9	82.7
2003	78	65.6	10.9	31.2	89.2	52.6	59.8	64.6	73.1	79.7
2004	103	65.0	12.5	36.6	94.4	47.7	56.3	66.5	73.2	81.2
2005	94	67.2	12.7	28.5	88.5	50.6	60.9	67.9	78.1	81.2
2006	100	66.6	12.6	38.6	93.7	49.1	56.6	66.5	76.2	82.9
2007	123	66.1	12.5	24.5	93.4	49.2	58.9	66.7	75.2	81.4
2008	114	65.2	12.7	27.2	88.0	49.2	57.6	66.4	73.4	80.2
2009	127	67.0	14.1	22.0	92.0	49.6	56.9	67.6	77.8	84.9
2010	147	63.9	12.4	26.3	90.1	48.1	55.7	63.9	72.5	80.1
2011	148	68.4	13.7	33.3	91.9	50.3	60.0	70.0	79.0	84.8
2012	167	68.8	12.6	30.9	94.4	52.1	60.4	69.9	78.1	85.4
2013	156	66.5	12.7	33.6	92.4	48.9	56.9	67.8	75.3	83.1
2014	166	68.3	12.1	36.4	96.3	50.3	60.4	70.0	76.8	82.2
2015	179	67.6	13.4	33.0	94.2	47.9	58.1	69.0	77.3	84.4
2016	161	67.2	13.8	32.4	98.3	48.4	56.6	69.5	77.5	82.7
2017	187	68.7	12.4	32.4	92.8	52.1	58.1	70.8	77.9	82.8
2018	138	66.8	13.0	27.4	89.5	51.4	58.0	68.6	77.9	82.0
2019	124	68.0	11.4	32.9	91.0	53.8	59.6	69.1	78.1	82.2
2020	104	66.7	15.0	22.7	101	47.1	57.2	69.2	78.5	83.9
1998-2020	2649	66.9	12.9	22.0	101	49.7	58.0	68.0	76.7	82.7

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	16	66.2	12.7	45.1	85.7	46.1	57.2	65.8	74.6	83.1
1999	24	60.0	11.2	32.7	85.3	47.5	52.8	60.2	67.2	73.5
2000	24	63.1	13.1	37.6	92.1	43.1	55.8	63.9	73.2	74.8
2001	25	65.2	11.1	31.9	85.2	53.9	60.0	65.9	72.5	77.8
2002	34	64.9	13.5	28.7	90.4	47.7	59.5	62.6	72.9	83.2
2003	42	66.3	8.8	45.3	85.0	55.0	61.1	65.5	73.1	76.9
2004	67	64.1	12.3	36.6	88.0	47.1	56.3	64.6	73.4	81.2
2005	48	66.3	12.8	28.5	87.0	48.7	60.0	66.8	76.1	82.2
2006	53	66.5	11.3	38.6	88.1	53.2	59.0	66.7	74.8	80.3
2007	74	64.1	13.0	24.5	93.4	44.7	57.1	65.2	74.0	79.2
2008	59	63.1	12.9	29.8	80.8	41.7	53.5	65.6	73.4	79.3
2009	71	66.3	13.8	31.4	90.1	50.6	56.6	65.3	77.8	83.0
2010	75	63.9	13.5	26.3	90.1	48.1	55.6	64.6	73.2	80.4
2011	75	70.0	12.6	33.3	91.9	53.5	62.3	70.7	80.6	84.2
2012	92	68.3	12.2	40.1	91.0	51.5	59.6	70.3	76.5	82.7
2013	101	65.3	12.4	38.6	92.3	48.5	55.8	65.5	74.8	81.6
2014	89	69.5	12.0	37.8	96.3	50.9	63.2	70.4	76.8	83.7
2015	101	67.5	13.9	33.1	88.9	47.9	55.5	71.2	77.3	84.2
2016	90	68.0	13.8	34.0	92.4	49.4	58.1	70.2	77.6	85.6
2017	99	68.9	12.5	32.4	92.8	52.7	58.5	71.5	78.0	83.1
2018	78	66.7	13.9	27.4	89.5	48.2	58.0	69.8	77.9	82.0
2019	69	68.1	12.4	32.9	91.0	50.6	59.9	69.2	78.3	83.1
2020	64	65.8	14.7	22.7	91.7	47.1	55.9	69.0	77.1	82.4
1998-2020	1470	66.5	12.9	22.7	96.3	49.5	57.8	67.8	76.5	82.1

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	11	69.5	12.7	51.6	90.0	54.3	54.8	69.8	80.8	85.1
1999	28	69.9	12.6	46.8	93.0	52.5	60.3	70.8	77.9	88.5
2000	16	60.8	16.3	34.4	93.2	37.6	48.3	62.6	71.0	81.0
2001	20	65.4	15.2	29.6	99.2	50.3	56.6	65.4	76.5	82.8
2002	35	67.4	12.2	44.1	101	49.4	58.9	69.2	74.8	81.0
2003	36	64.8	13.0	31.2	89.2	50.1	58.7	64.1	73.1	80.6
2004	36	66.6	12.9	38.7	94.4	51.8	57.4	67.2	72.8	83.9
2005	46	68.2	12.6	33.7	88.5	55.4	61.3	70.1	78.8	81.2
2006	47	66.6	14.0	42.7	93.7	46.1	56.0	66.2	78.2	84.8
2007	49	69.2	11.2	41.7	89.5	53.5	62.1	68.9	78.9	83.6
2008	55	67.4	12.3	27.2	88.0	52.6	58.8	67.4	78.5	84.7
2009	56	67.9	14.6	22.0	92.0	49.4	60.2	69.2	77.5	85.9
2010	72	63.8	11.2	39.7	89.6	49.0	56.7	63.5	71.0	78.0
2011	73	66.7	14.5	34.3	91.1	44.4	56.2	68.2	76.6	86.5
2012	75	69.4	13.2	30.9	94.4	52.9	60.5	69.7	78.4	86.3
2013	55	68.8	13.1	33.6	92.4	52.2	61.2	70.1	77.0	85.4
2014	77	66.8	12.2	36.4	91.0	49.1	57.3	69.3	75.6	79.6
2015	78	67.7	12.8	33.0	94.2	53.5	60.0	68.0	76.3	84.4
2016	71	66.3	13.8	32.4	98.3	46.0	56.0	69.5	77.3	81.2
2017	88	68.4	12.4	33.3	90.6	51.3	58.0	70.7	76.8	82.4
2018	60	66.8	11.8	43.8	85.3	52.1	57.5	67.8	78.0	81.9
2019	55	67.8	10.2	48.7	85.7	53.8	59.5	69.1	75.7	82.0
2020	40	68.1	15.4	33.3	101	47.2	57.5	70.9	79.5	85.0
1998-2020	1179	67.3	12.9	22.0	101	50.0	58.2	68.3	77.0	83.4

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	3	0.1	0.1	2	0.2	0.2	1	0.1	0.1
25-29	5	0.2	0.4	4	0.4	0.5	1	0.1	0.2
30-34	25	1.2	1.6	16	1.4	1.9	9	1.0	1.2
35-39	23	1.1	2.7	14	1.2	3.2	9	1.0	2.2
40-44	53	2.6	5.3	31	2.7	5.9	22	2.4	4.6
45-49	99	4.9	10.2	56	4.9	10.8	43	4.8	9.4
50-54	162	7.9	18.1	93	8.2	19.0	69	7.6	17.0
55-59	223	10.9	29.1	116	10.2	29.2	107	11.8	28.9
60-64	242	11.9	40.9	132	11.6	40.8	110	12.2	41.0
65-69	273	13.4	54.3	149	13.1	53.9	124	13.7	54.8
70-74	293	14.4	68.6	166	14.6	68.5	127	14.0	68.8
75-79	302	14.8	83.4	174	15.3	83.8	128	14.2	83.0
80-84	200	9.8	93.2	117	10.3	94.1	83	9.2	92.1
85+	138	6.8	100.0	67	5.9	100.0	71	7.9	100.0
All ages	2041	100.0		1137	100.0		904	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=19 %	Females DCO rate n=20 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0– 4								
5– 9								
10–14								
15–19								
20–24	2	1	0.1	0.1			0.3	0.2
25–29	4	1	0.2	0.0			0.4	0.1
30–34	16	9	0.7	0.4			1.2	0.4
35–39	14	9	0.6	0.4			0.8	0.3
40–44	31	22	1.2	0.9			1.1	0.4
45–49	55	43	2.0	1.7			1.1	0.5
50–54	93	69	3.6	2.7			1.1	0.6
55–59	116	107	5.5	4.9		0.9	0.9	0.8
60–64	132	110	7.5	5.8			0.8	0.7
65–69	149	123	9.1	6.8	0.7	0.8	0.6	0.6
70–74	166	127	11.1	7.4	1.8	0.8	0.6	0.6
75–79	174	128	14.4	8.5	3.4	2.3	0.7	0.7
80–84	117	82	16.2	7.7	1.7	7.3	0.8	0.5
85+	67	70	14.3	6.7	10.4	11.4	0.6	0.4
All ages	1136	901			1.7	2.2	0.7	0.6
Incidence								
Raw			3.5	2.7				
WS			1.8	1.3				
ES			2.6	1.8				
BRD-S			3.2	2.2				

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).

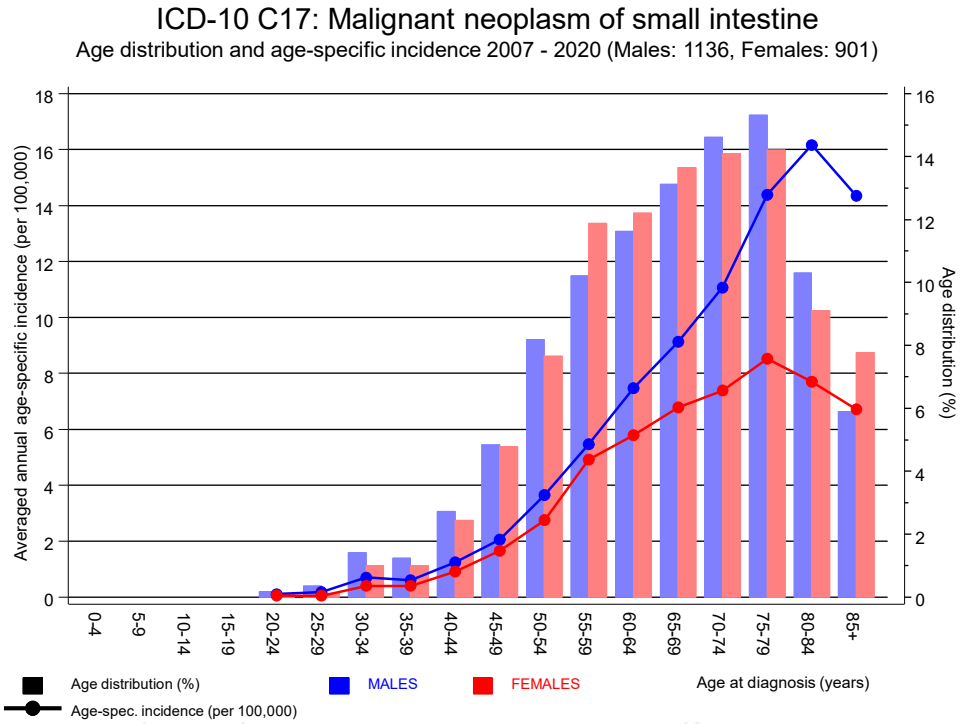


Figure 6. Age distribution (males: mean=67.0 yrs, median=68.8 yrs; females: mean=67.4 yrs, median=68.6 yrs) and age-specific incidence.

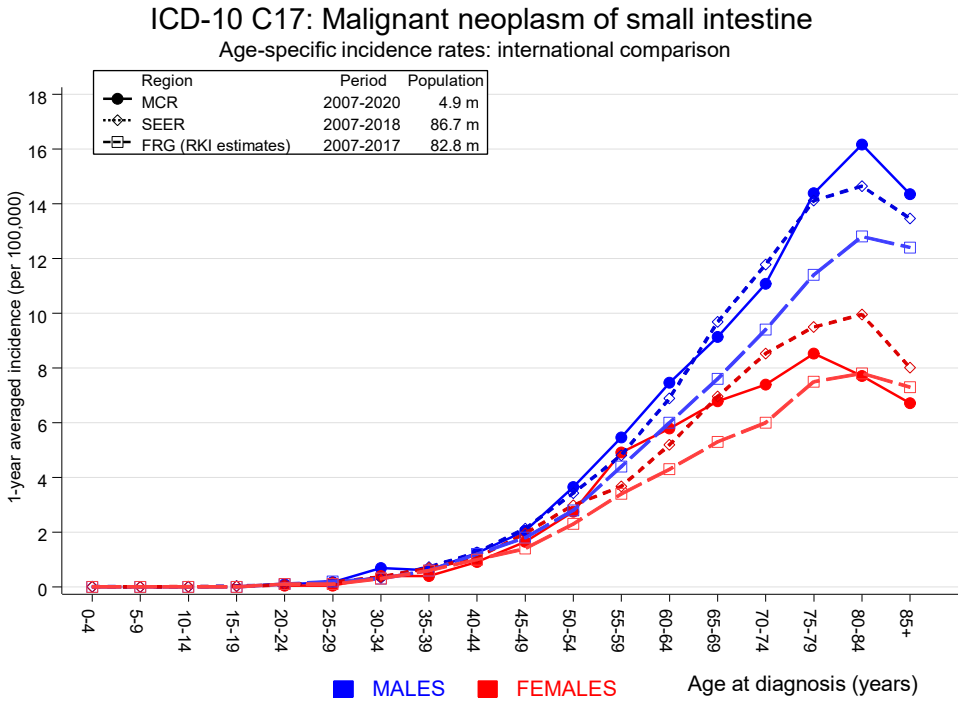


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C03–C06	Oral cavity	3	0.6	4.6	1.0	13.6		4.5	33.3
C07–C08	Salivary gland	1	0.2	5.3	0.1	29.6		1.6	
C09–C10	Oropharynx	1	0.8	1.3	0.0	7.0		0.4	
C12–C13	Hypopharynx	3	0.4	7.0	1.4	20.5	#	4.9	
C15	Oesophagus	5	1.6	3.1	1.0	7.2	#	6.5	
C16	Stomach	16	3.0	5.3	3.1	8.7	#	24.8	
C17	Small intestine	2	0.5	4.0	0.5	14.3		2.9	
C18	Colon	45	7.5	6.0	4.4	8.1	#	71.7	2.2
C19–C20	Rectum	12	4.1	2.9	1.5	5.1	#	15.1	8.3
C21	Anus/canal	1	0.2	5.1	0.1	28.3		1.5	
C22	Liver	4	2.3	1.7	0.5	4.4		3.2	
C23–C24	Bile	4	0.9	4.7	1.3	11.9	#	6.0	
C25	Pancreas	12	3.2	3.8	2.0	6.6	#	16.9	8.3
C26	GI cancer	1	0.1	12.3	0.3	68.8		1.8	100.0
C32	Larynx	2	0.7	2.7	0.3	9.6		2.4	
C33–C34	Lung	22	9.1	2.4	1.5	3.6	#	24.6	4.5
C38,C45	Mesothelioma	3	0.6	5.4	1.1	15.8	#	4.7	
C43	Malign. melanoma	11	3.7	3.0	1.5	5.3	#	14.0	
C46,C49	Soft tissue	7	0.5	15.3	6.2	31.5	#	12.5	14.3
C61	Prostate	26	21.4	1.2	0.8	1.8		8.8	3.8
C64	Kidney	10	2.7	3.7	1.8	6.9	#	14.0	
C65	Renal pelvis	2	0.4	5.6	0.7	20.2		3.1	
C66	Ureter	3	0.2	13.7	2.8	39.9	#	5.3	
C67	Bladder	8	3.7	2.2	0.9	4.3		8.2	
C70–C72	CNS cancer	4	1.0	4.1	1.1	10.5	#	5.8	
C73	Thyroid	3	0.5	5.8	1.2	17.0	#	4.7	
C76–C79	CUP	3	1.3	2.3	0.5	6.8		3.2	
C81	Hodgkin lymphoma	1	0.2	5.4	0.1	29.9		1.6	
C82–C85	NHL	17	3.3	5.1	3.0	8.2	#	26.1	
C90	Mult. myeloma	3	1.0	3.0	0.6	8.6		3.8	
C91–C96	Leukaemia	3	1.2	2.5	0.5	7.3		3.4	66.7
Not observed		0	1.6	0.0	0.0	2.3		−3.1	
All further malignancies		238	78.4	3.0	2.7	3.4	#	304.9	4.2

Patients	1432
Median age at next malignancy (years)	71.0
Person-years	5236
Mean observation time (years)	3.7
Median observation time (years)	1.9

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 %
C09–C10	Oropharynx	1	0.2	5.1	0.1	28.5		2.0	
C15	Oesophagus	1	0.3	3.2	0.1	18.0		1.7	
C16	Stomach	11	1.3	8.4	4.2	15.0	#	23.9	
C17	Small intestine	5	0.3	19.8	6.4	46.2	#	11.7	
C18	Colon	30	3.8	7.8	5.3	11.2	#	64.6	
C19–C20	Rectum	7	1.6	4.4	1.8	9.0	#	13.3	14.3
C21	Anus/canal	1	0.2	4.1	0.1	22.8		1.9	
C25	Pancreas	12	1.9	6.2	3.2	10.8	#	24.8	
C33–C34	Lung	14	3.5	4.0	2.2	6.7	#	26.0	
C43	Malign. melanoma	3	1.7	1.8	0.4	5.2		3.2	
C46,C49	Soft tissue	1	0.2	4.1	0.1	23.1		1.9	
C48	Peritoneal	1	0.2	5.2	0.1	28.8		2.0	
C50	Breast	26	13.6	1.9	1.2	2.8	#	30.5	7.7
C53	Cervix uteri	4	0.6	7.2	2.0	18.5	#	8.5	50.0
C54	Corpus uteri	7	2.4	2.9	1.2	5.9	#	11.2	
C56	Ovary	11	1.7	6.4	3.2	11.5	#	22.9	
C64	Kidney	3	1.0	3.1	0.6	9.1		5.0	
C65	Renal pelvis	1	0.1	7.5	0.2	41.9		2.1	
C67	Bladder	3	0.8	3.8	0.8	11.1		5.5	33.3
C69	Eye melanoma	1	0.0	20.5	0.5	114.0		2.3	
C70–C72	CNS cancer	2	0.5	3.8	0.5	13.6		3.6	
C76–C79	CUP	1	0.7	1.4	0.0	7.8		0.7	
C82–C85	NHL	7	1.6	4.3	1.7	9.0	#	13.3	
C91–C96	Leukaemia	1	0.6	1.7	0.0	9.4		1.0	100.0
C96	Systemic	1	0.0	106.1	2.7	590.9	#	2.4	100.0
Not observed		0	4.0	0.0	0.0	0.9	#	-9.8	
All further malignancies		155	43.0	3.6	3.1	4.2	#	276.5	5.2

Patients	1132
Median age at next malignancy (years)	71.7
Person-years	4051
Mean observation time (years)	3.6
Median observation time (years)	2.1

The occurrence of further specified malignancy is statistically significant.

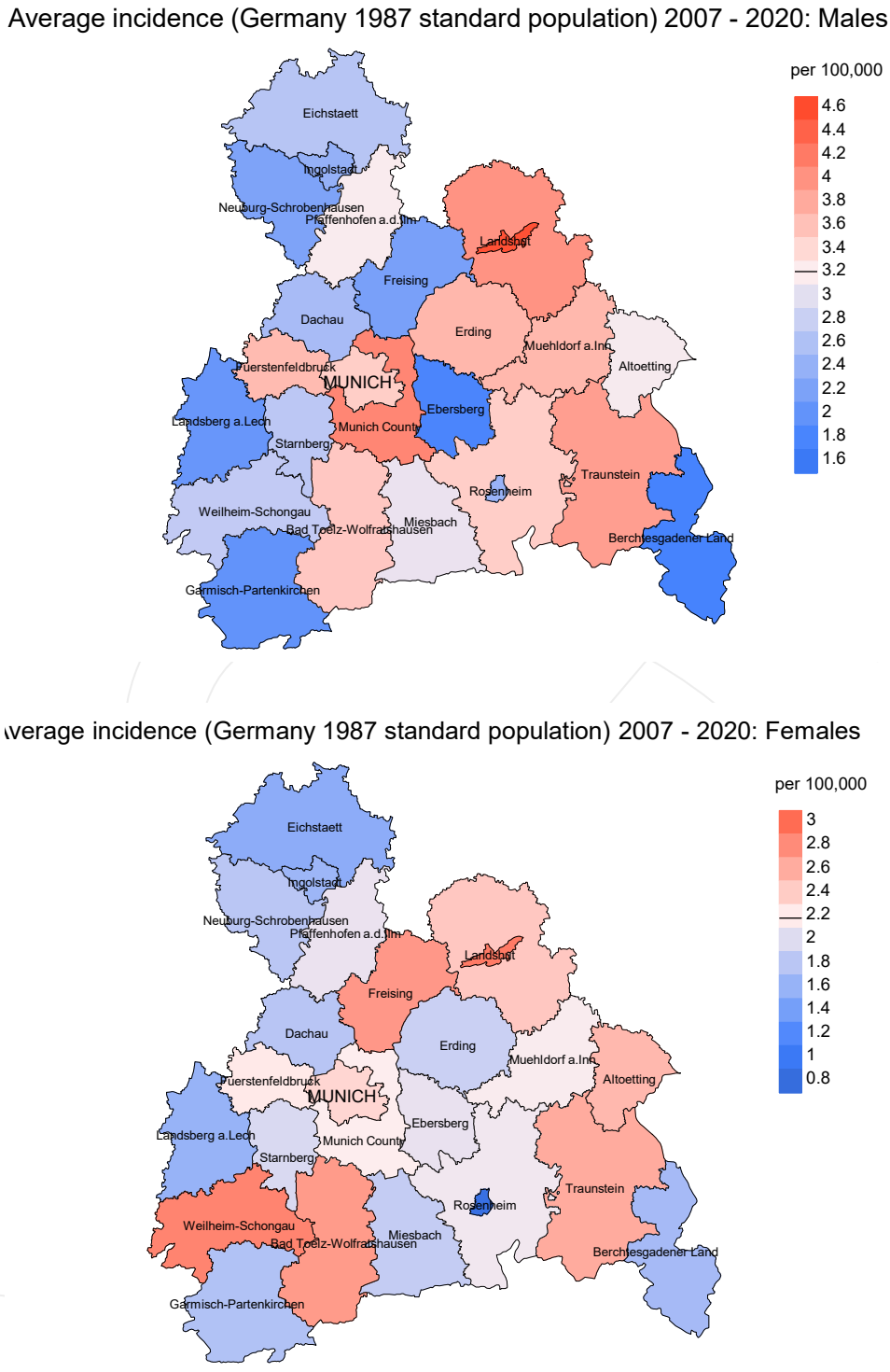
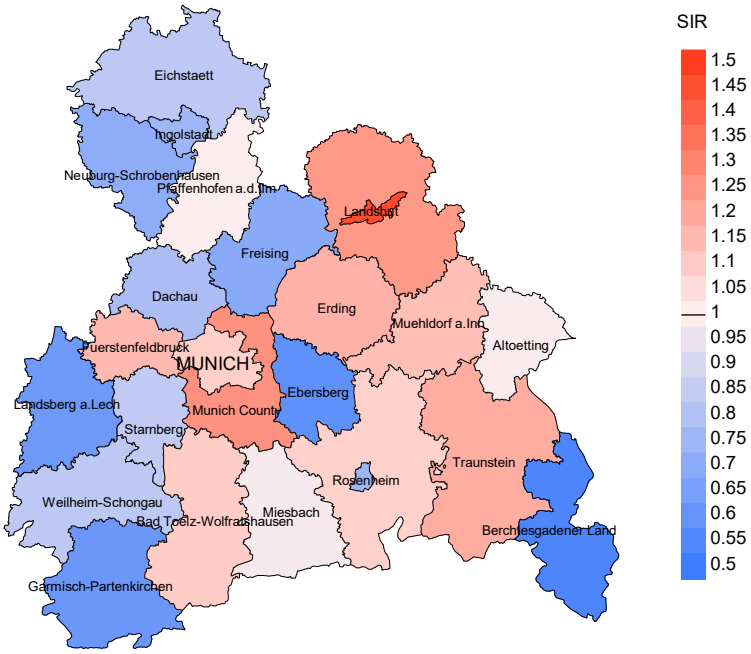


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.2/100,000 WS N=1,136, females 2.2/100,000 WS N=901).

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 23 women were identified with newly diagnosed small intestine 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 1.1 and 3.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

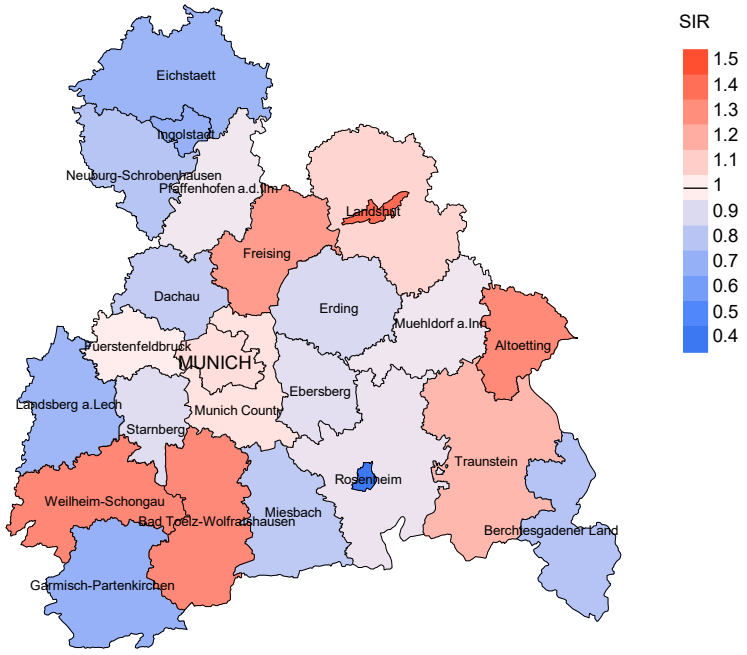


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,136, females N=901).

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 23 women were identified with newly diagnosed small intestine cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.93. Though, the value of this parameter may vary with an underlying probability of 99% between 0.50 and 1.55, 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	27	100.0	3.7	21	77.8	90.5
1999	52	96.2	7.7	42	80.8	100.0
2000	40	100.0	5.0	31	77.5	90.3
2001	45	100.0	4.4	35	77.8	100.0
2002	69	97.1	11.6	50	72.5	96.0
2003	78	96.2	10.3	51	65.4	94.1
2004	103	91.3	3.9	68	66.0	92.6
2005	94	94.7	5.3	66	70.2	92.4
2006	100	95.0	1.0	71	71.0	97.2
2007	123	95.1	1.6	71	57.7	97.2
2008	114	99.1	5.3	61	53.5	95.1
2009	127	99.2	5.5	77	60.6	96.1
2010	147	99.3	2.0	73	49.7	93.2
2011	148	98.0	1.4	88	59.5	94.3
2012	167	95.2	2.4	85	50.9	97.6
2013	156	95.5	1.9	71	45.5	90.1
2014	166	98.8	1.2	81	48.8	82.7
2015	179	97.2	2.8	81	45.3	92.6
2016	161	100.0		65	40.4	81.5
2017	187	98.4	1.1	62	33.2	90.3
2018	138	99.3	2.2	38	27.5	68.4
2019	124	99.2		27	21.8	85.2
2020	104	100.0		14	13.5	85.7
1998-2020	2649	97.5	2.8	1329	50.2	92.1

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	27	10	90.0	4	14.8
1999	52	23	91.3	11	21.2
2000	40	22	90.9	6	15.0
2001	45	17	100.0	6	13.3
2002	69	29	96.6	15	21.7
2003	78	27	96.3	12	15.4
2004	103	55	98.2	22	21.4
2005	94	35	97.1	11	11.7
2006	100	40	97.5	12	12.0
2007	123	43	100.0	9	7.3
2008	114	54	96.3	12	10.5
2009	127	62	100.0	20	15.7
2010	147	57	94.7	21	14.3
2011	148	66	98.5	19	12.8
2012	167	76	98.7	19	11.4
2013	156	78	98.7	16	10.3
2014	166	96	96.9	19	11.4
2015	179	102	99.0	28	15.6
2016	161	94	98.9	16	9.9
2017	187	111	98.2	29	15.5
2018	138	86	67.4	12	8.7
2019	124	88	42.0	11	8.9
2020	104	100	98.0	10	9.6
1998–2020	2649	1371	92.3	340	12.8

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	10	70.0	30.0	66.7
1999	23	73.9	26.1	95.2
2000	22	72.7	27.3	85.0
2001	17	76.5	23.5	64.7
2002	29	82.8	17.2	92.9
2003	27	70.4	29.6	84.6
2004	55	83.6	16.4	85.2
2005	35	91.4	8.6	91.2
2006	40	87.5	12.5	92.3
2007	43	88.4	11.6	86.0
2008	54	85.2	14.8	92.3
2009	62	79.0	21.0	87.1
2010	57	75.4	24.6	83.3
2011	66	83.3	16.7	90.8
2012	76	71.1	28.9	81.3
2013	78	79.5	20.5	84.4
2014	96	77.1	22.9	84.9
2015	102	66.7	33.3	76.2
2016	94	75.5	24.5	83.9
2017	111	76.6	23.4	84.4
2018	86	66.3	33.7	69.0
2019	88	62.5	37.5	81.1
2020	100	57.0	43.0	71.4
1998-2020	1371	74.6	25.4	83.0

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	6	63.1	66.8	59.3	66.8
1999	8	73.4	73.6	57.6	73.4
2000	14	67.6	66.3	79.6	66.3
2001	12	63.7	64.6	60.3	63.7
2002	17	72.0	72.0	69.4	72.0
2003	14	71.9	70.6	73.2	73.9
2004	32	69.6	65.3	78.6	66.4
2005	15	70.8	70.8	75.3	74.8
2006	20	72.3	72.3	69.2	72.9
2007	25	72.8	72.8	75.0	73.1
2008	29	72.1	72.0	77.0	72.0
2009	38	77.7	73.5	80.0	75.0
2010	36	73.4	73.3	73.5	73.4
2011	31	73.6	71.1	84.7	72.3
2012	39	77.9	77.7	79.8	77.7
2013	40	77.3	72.9	83.8	73.8
2014	60	76.3	74.1	79.8	74.1
2015	62	77.2	75.6	83.6	76.2
2016	60	77.1	76.8	80.9	76.8
2017	60	76.4	75.1	79.4	75.8
2018	52	72.9	70.9	80.4	72.3
2019	52	77.8	75.9	81.4	73.0
2020	61	80.7	77.7	82.1	78.1
1998-2020	783	75.8	73.3	80.6	73.8

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	4	79.4	71.9	83.3	85.1
1999	15	76.5	73.1	79.7	75.3
2000	8	72.6	64.0	77.4	68.4
2001	5	83.7	83.5	92.2	83.3
2002	12	77.7	77.7	77.8	77.7
2003	13	80.6	80.8	78.1	80.8
2004	23	72.9	72.9	72.6	75.2
2005	20	70.7	70.6	83.6	70.6
2006	20	74.2	74.2	75.1	74.2
2007	18	73.8	74.2	62.1	73.8
2008	25	71.6	67.9	84.3	68.8
2009	24	77.4	77.8	77.1	76.5
2010	21	73.2	72.3	80.7	73.2
2011	35	69.3	68.5	82.7	69.0
2012	37	81.1	74.2	91.3	79.6
2013	38	75.2	73.8	84.0	74.7
2014	36	74.4	72.0	85.0	73.9
2015	40	78.8	76.2	88.1	77.0
2016	34	75.9	74.2	79.8	74.6
2017	51	76.9	75.9	84.4	75.4
2018	34	78.8	78.4	85.0	76.4
2019	36	77.6	75.8	80.5	79.1
2020	39	79.5	79.5	83.4	79.5
1998–2020	588	76.5	74.2	83.0	75.3

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

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

Table 11a

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	5	0.5	0.31	0.3	0.32	0.4	0.30	0.6	0.34
1999	7	0.6	0.29	0.4	0.28	0.6	0.31	0.7	0.34
2000	12	1.1	0.50	0.7	0.55	1.0	0.54	1.2	0.60
2001	9	0.8	0.36	0.5	0.35	0.7	0.37	0.8	0.37
2002	14	0.8	0.41	0.4	0.38	0.6	0.42	0.8	0.44
2003	9	0.5	0.21	0.3	0.20	0.4	0.22	0.5	0.23
2004	25	1.3	0.37	0.7	0.35	1.0	0.35	1.3	0.36
2005	13	0.7	0.27	0.4	0.26	0.6	0.28	0.7	0.29
2006	18	0.9	0.34	0.4	0.29	0.7	0.32	1.0	0.36
2007	21	0.9	0.28	0.4	0.23	0.7	0.26	1.0	0.29
2008	25	1.1	0.42	0.6	0.38	0.9	0.42	1.2	0.46
2009	28	1.3	0.39	0.6	0.35	1.0	0.37	1.3	0.41
2010	25	1.1	0.33	0.5	0.28	0.8	0.31	1.1	0.34
2011	24	1.1	0.32	0.5	0.33	0.8	0.34	1.0	0.31
2012	28	1.2	0.30	0.5	0.27	0.9	0.30	1.2	0.33
2013	30	1.3	0.30	0.6	0.24	0.9	0.26	1.2	0.30
2014	47	2.0	0.53	0.9	0.46	1.4	0.50	1.8	0.53
2015	39	1.6	0.39	0.7	0.32	1.1	0.36	1.4	0.38
2016	45	1.9	0.50	0.8	0.41	1.2	0.44	1.7	0.50
2017	45	1.9	0.46	0.8	0.40	1.2	0.43	1.6	0.45
2018	32	1.3	0.41	0.6	0.39	0.9	0.40	1.2	0.41
2019	29	1.2	0.42	0.5	0.35	0.8	0.38	1.0	0.40
2020	31	1.3	0.48	0.5	0.36	0.8	0.41	1.1	0.46
1998-2020	561	1.2	0.38	0.6	0.33	0.9	0.36	1.2	0.39

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	2	0.2	0.18	0.1	0.16	0.1	0.17	0.2	0.19
1999	10	0.8	0.36	0.3	0.29	0.5	0.31	0.6	0.30
2000	4	0.3	0.25	0.2	0.21	0.2	0.24	0.3	0.22
2001	4	0.3	0.20	0.1	0.10	0.1	0.12	0.2	0.16
2002	10	0.5	0.29	0.2	0.19	0.3	0.20	0.4	0.25
2003	10	0.5	0.28	0.2	0.17	0.3	0.19	0.4	0.23
2004	21	1.1	0.58	0.4	0.47	0.7	0.49	0.8	0.53
2005	19	1.0	0.41	0.4	0.39	0.6	0.39	0.8	0.38
2006	17	0.8	0.36	0.4	0.30	0.6	0.34	0.7	0.35
2007	17	0.7	0.35	0.3	0.27	0.4	0.29	0.6	0.33
2008	21	0.9	0.38	0.4	0.35	0.6	0.36	0.7	0.37
2009	21	0.9	0.38	0.3	0.27	0.5	0.31	0.7	0.32
2010	18	0.8	0.25	0.3	0.19	0.5	0.21	0.6	0.24
2011	31	1.3	0.43	0.6	0.42	0.9	0.41	1.0	0.42
2012	26	1.1	0.35	0.4	0.29	0.6	0.30	0.8	0.31
2013	32	1.3	0.58	0.5	0.48	0.8	0.51	1.0	0.54
2014	27	1.1	0.35	0.5	0.30	0.7	0.31	0.9	0.33
2015	29	1.2	0.37	0.4	0.27	0.7	0.30	0.8	0.32
2016	26	1.1	0.37	0.4	0.29	0.6	0.31	0.8	0.34
2017	40	1.6	0.45	0.6	0.37	0.9	0.39	1.2	0.43
2018	25	1.0	0.42	0.3	0.30	0.5	0.32	0.7	0.39
2019	26	1.0	0.47	0.4	0.35	0.6	0.37	0.8	0.43
2020	26	1.0	0.67	0.3	0.44	0.5	0.49	0.7	0.60
1998-2020	462	1.0	0.39	0.4	0.31	0.6	0.33	0.7	0.36

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			0.0	1	0.3	0.3
30-34	1	0.1	0.2			0.0	1	0.3	0.5
35-39	3	0.4	0.6	2	0.4	0.4	1	0.3	0.8
40-44	9	1.1	1.7	6	1.3	1.8	3	0.8	1.6
45-49	14	1.7	3.4	6	1.3	3.1	8	2.2	3.8
50-54	38	4.7	8.1	25	5.6	8.7	13	3.6	7.4
55-59	64	7.9	16.0	33	7.3	16.0	31	8.5	15.9
60-64	62	7.6	23.6	34	7.6	23.6	28	7.7	23.6
65-69	97	11.9	35.5	54	12.0	35.6	43	11.8	35.3
70-74	127	15.6	51.1	70	15.6	51.2	57	15.6	51.0
75-79	145	17.8	68.9	87	19.4	70.6	58	15.9	66.8
80-84	131	16.1	85.0	67	14.9	85.5	64	17.5	84.4
85+	122	15.0	100.0	65	14.5	100.0	57	15.6	100.0
All ages	814	100.0		449	100.0		365	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		1.0
30-34		1			0.0	0.11		0.6
35-39	2	1	0.1	0.14	0.0	0.11	0.7	0.2
40-44	6	3	0.2	0.19	0.1	0.14	1.0	0.4
45-49	6	8	0.2	0.11	0.3	0.19	0.4	0.5
50-54	25	13	1.0	0.27	0.5	0.19	0.9	0.5
55-59	33	31	1.6	0.28	1.4	0.29	0.7	0.8
60-64	34	28	1.9	0.26	1.5	0.25	0.5	0.6
65-69	54	43	3.3	0.36	2.4	0.35	0.6	0.6
70-74	70	57	4.7	0.42	3.3	0.45	0.6	0.7
75-79	87	58	7.2	0.50	3.9	0.45	0.7	0.6
80-84	67	64	9.3	0.57	6.0	0.78	0.6	0.7
85+	65	57	13.9	0.97	5.5	0.81	0.7	0.5
All ages	449	365					0.6	0.6
Mortality								
Raw			1.4	0.40	1.1	0.41		
WS			0.6	0.34	0.4	0.32		
ES			0.9	0.37	0.6	0.34		
BRD-S			1.3	0.39	0.8	0.37		
PYLL-70								
per 100,000			5.6		4.6			
ES			4.8		3.8			
AYLL-70			10.0		10.1			

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 ←%
C03–C06	Oral cavity	5	1.5	2	40.0			3	60.0
C07–C08	Salivary gland	1	0.3					1	100.0
C09–C10	Oropharynx	1	0.3	1	100.0				
C12–C13	Hypopharynx	4	1.2	1	25.0			3	75.0
C15	Oesophagus	7	2.1	4	57.1	1	14.3	2	28.6
C16	Stomach	10	2.9	4	40.0	5	50.0	1	10.0
C17	Small intestine	1	0.3					1	100.0
C18	Colon	62	18.2	30	48.4	22	35.5	10	16.1
C19–C20	Rectum	25	7.3	15	60.0	5	20.0	5	20.0
C22	Liver	6	1.8	2	33.3	1	16.7	3	50.0
C23–C24	Bile	7	2.1	2	28.6	4	57.1	1	14.3
C25	Pancreas	15	4.4	2	13.3	8	53.3	5	33.3
C26	GI cancer	2	0.6			1	50.0	1	50.0
C32	Larynx	5	1.5	5	100.0				
C33–C34	Lung	25	7.3	8	32.0	7	28.0	10	40.0
C38,C45	Mesothelioma	2	0.6					2	100.0
C43	Malign. melanoma	11	3.2	7	63.6			4	36.4
C44	Skin others	26	7.6	16	61.5			10	38.5
C46,C49	Soft tissue	3	0.9	2	66.7			1	33.3
C50	Breast	1	0.3	1	100.0				
C61	Prostate	50	14.7	38	76.0	1	2.0	11	22.0
C62	Testis	5	1.5	5	100.0				
C64	Kidney	13	3.8	7	53.8	2	15.4	4	30.8
C65	Renal pelvis	2	0.6	1	50.0			1	50.0
C66	Ureter	2	0.6					2	100.0
C67	Bladder	12	3.5	7	58.3			5	41.7
C69	Eye carcinoma	1	0.3	1	100.0				
C70–C72	CNS cancer	2	0.6			1	50.0	1	50.0
C73	Thyroid	2	0.6	1	50.0			1	50.0
C76–C79	CUP	7	2.1	4	57.1	1	14.3	2	28.6
C81	Hodgkin lymphoma	3	0.9	2	66.7	1	33.3		
C82–C85	NHL	16	4.7	7	43.8	3	18.8	6	37.5
C90	Mult. myeloma	2	0.6					2	100.0
C91–C96	Leukaemia	5	1.5	1	20.0			4	80.0
All further malignancies		341	100.0	176	51.6	63	18.5	102	29.9

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 ←%
C15	Oesophagus	1	0.5					1	100.0
C16	Stomach	7	3.5	1	14.3	5	71.4	1	14.3
C17	Small intestine	1	0.5					1	100.0
C18	Colon	27	13.6	11	40.7	13	48.1	3	11.1
C19–C20	Rectum	18	9.0	8	44.4	8	44.4	2	11.1
C21	Anus/canal	2	1.0	1	50.0	1	50.0		
C22	Liver	1	0.5					1	100.0
C23–C24	Bile	2	1.0	1	50.0			1	50.0
C25	Pancreas	12	6.0	1	8.3	5	41.7	6	50.0
C26	GI cancer	1	0.5	1	100.0				
C33–C34	Lung	11	5.5	2	18.2	3	27.3	6	54.5
C43	Malign. melanoma	5	2.5	4	80.0			1	20.0
C44	Skin others	11	5.5	7	63.6			4	36.4
C46,C49	Soft tissue	1	0.5			1	100.0		
C48	Peritoneal	2	1.0			2	100.0		
C50	Breast	41	20.6	32	78.0	2	4.9	7	17.1
C52	Vagina	2	1.0	2	100.0				
C53	Cervix uteri	3	1.5	1	33.3			2	66.7
C54	Corpus uteri	12	6.0	8	66.7	3	25.0	1	8.3
C56	Ovary	13	6.5	5	38.5	4	30.8	4	30.8
C65	Renal pelvis	3	1.5	1	33.3			2	66.7
C66	Ureter	1	0.5					1	100.0
C67	Bladder	4	2.0	1	25.0	1	25.0	2	50.0
C69	Eye melanoma	1	0.5					1	100.0
C70–C72	CNS cancer	2	1.0	1	50.0			1	50.0
C74–C80	Cancer others	1	0.5	1	100.0				
C76–C79	CUP	4	2.0	2	50.0	1	25.0	1	25.0
C81	Hodgkin lymphoma	1	0.5	1	100.0				
C82–C85	NHL	7	3.5	2	28.6	2	28.6	3	42.9
C91–C96	Leukaemia	1	0.5	1	100.0				
C96	Systemic	1	0.5					1	100.0
All further malignancies		199	100.0	95	47.7	51	25.6	53	26.6

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

Table 15

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34		1			0.0	0.11		0.6
35-39	2	1	0.1	0.18	0.0	0.11	0.8	0.3
40-44	6	3	0.2	0.22	0.1	0.18	1.1	0.4
45-49	6	6	0.2	0.12	0.2	0.18	0.5	0.4
50-54	21	11	0.8	0.27	0.4	0.19	0.9	0.5
55-59	28	20	1.3	0.30	0.9	0.23	0.7	0.6
60-64	27	23	1.5	0.26	1.2	0.26	0.5	0.6
65-69	36	28	2.2	0.37	1.5	0.33	0.5	0.5
70-74	46	38	3.1	0.47	2.2	0.44	0.5	0.6
75-79	46	46	3.8	0.51	3.1	0.51	0.5	0.6
80-84	31	44	4.3	0.54	4.1	0.72	0.4	0.6
85+	39	40	8.4	1.03	3.8	0.82	0.6	0.4
All ages	288	261					0.5	0.5
Mortality								
Raw			0.9	0.38	0.8	0.39		
WS			0.4	0.32	0.3	0.30		
ES			0.6	0.35	0.4	0.32		
BRD-S			0.8	0.38	0.6	0.35		
PYLL-70								
per 100,000			4.8		3.4			
ES			4.1		2.9			
AYLL-70			10.9		10.5			

* 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.	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								
30-34		1			0.0	0.13		0.6
35-39	2	1	0.1	0.18	0.0	0.13	0.8	0.3
40-44	6	2	0.2	0.22	0.1	0.13	1.1	0.3
45-49	6	6	0.2	0.13	0.2	0.18	0.5	0.4
50-54	20	11	0.8	0.29	0.4	0.20	0.9	0.5
55-59	26	18	1.2	0.29	0.8	0.21	0.7	0.6
60-64	23	22	1.3	0.26	1.2	0.26	0.4	0.6
65-69	29	27	1.8	0.37	1.5	0.36	0.4	0.5
70-74	31	32	2.1	0.37	1.9	0.38	0.4	0.5
75-79	39	41	3.2	0.48	2.7	0.49	0.4	0.6
80-84	26	38	3.6	0.50	3.6	0.69	0.4	0.5
85+	29	38	6.2	0.81	3.6	0.81	0.5	0.4
All ages	237	237					0.5	0.5
Mortality								
Raw			0.7	0.35	0.7	0.37		
WS			0.3	0.30	0.3	0.29		
ES			0.5	0.32	0.4	0.31		
BRD-S			0.7	0.34	0.5	0.34		
PYLL-70								
per 100,000			4.5		3.2			
ES			3.8		2.7			
AYLL-70			11.5		10.3			

* See corresponding tables with multiple malignancies.

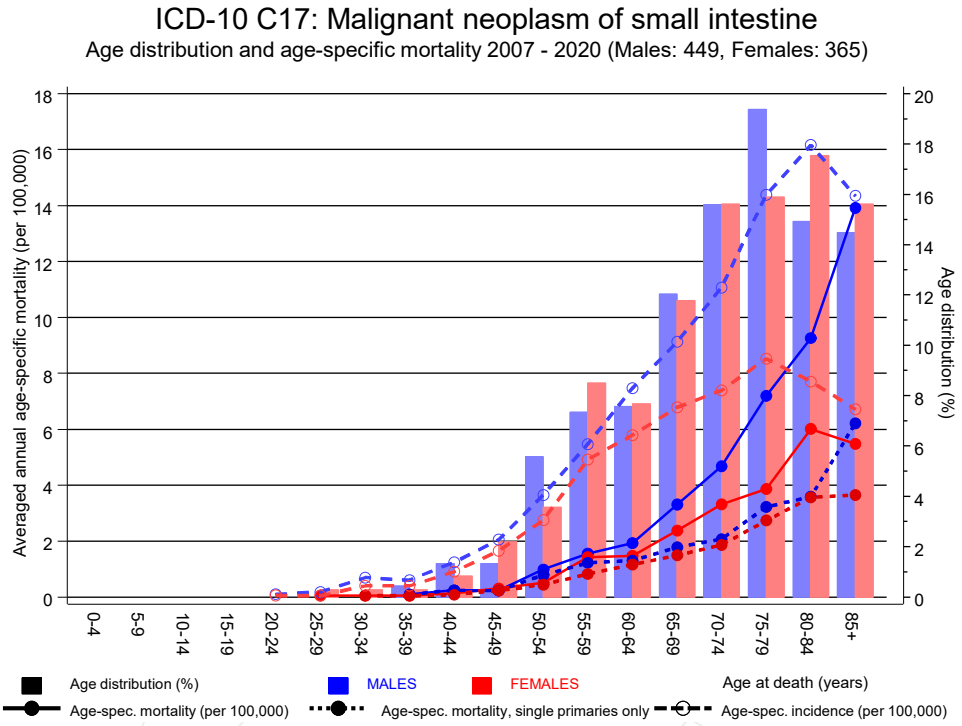


Figure 17. Distribution of age at death (bars; males: mean=69.2 yrs, median=70.7 yrs; females: mean=69.5 yrs, median=70.8 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

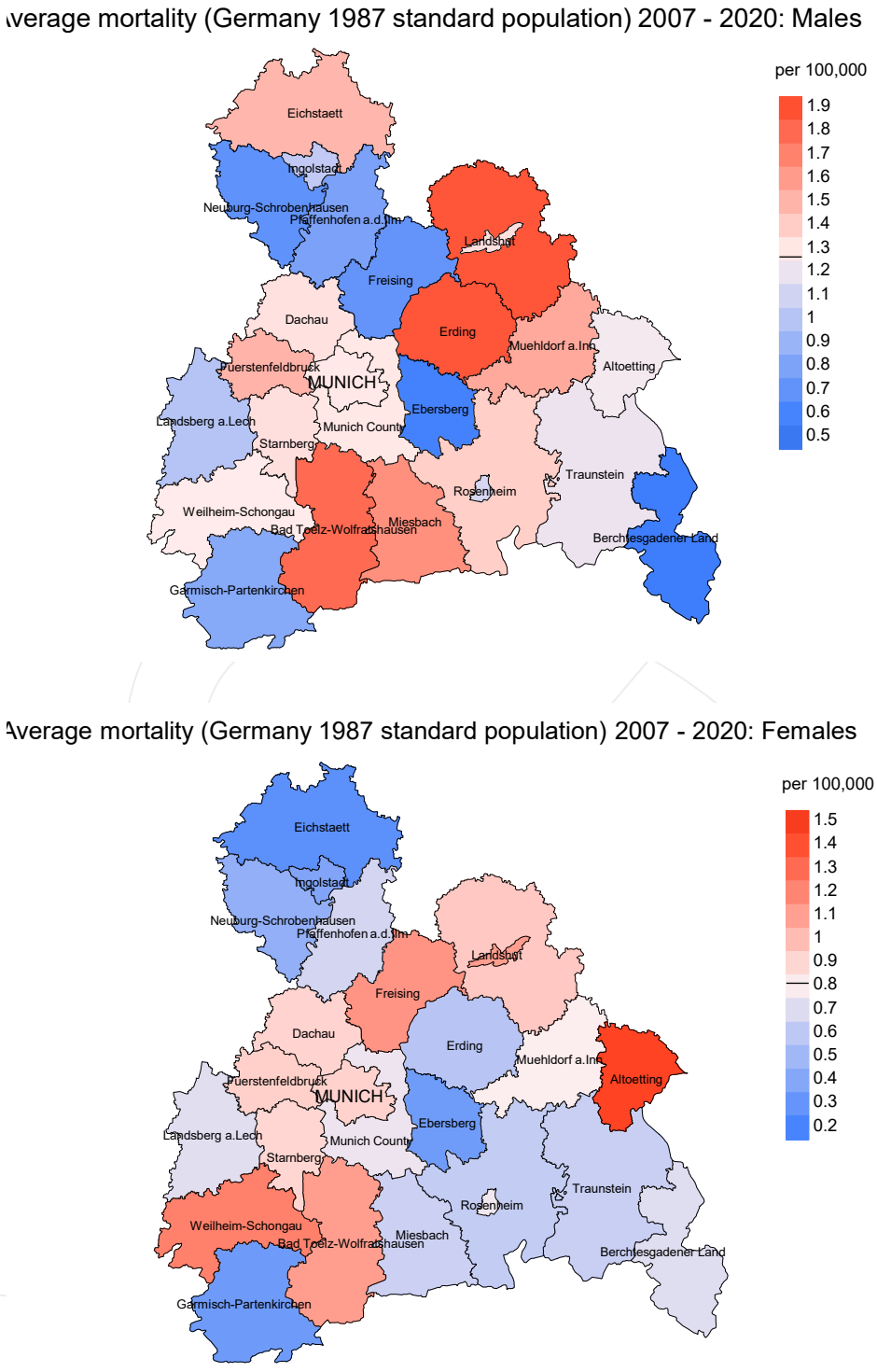
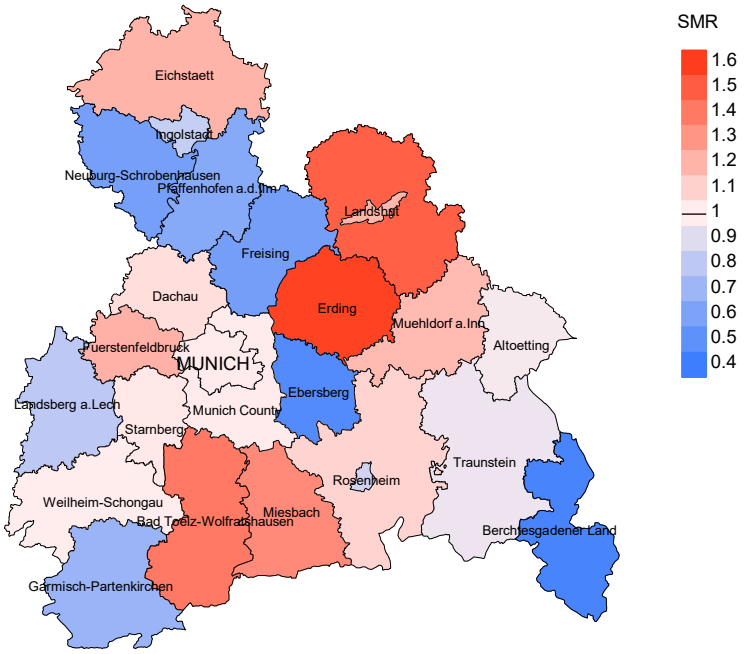


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.3/100,000 WS N=449, females 0.8/100,000 WS N=365).

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 4 women died from small intestine cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

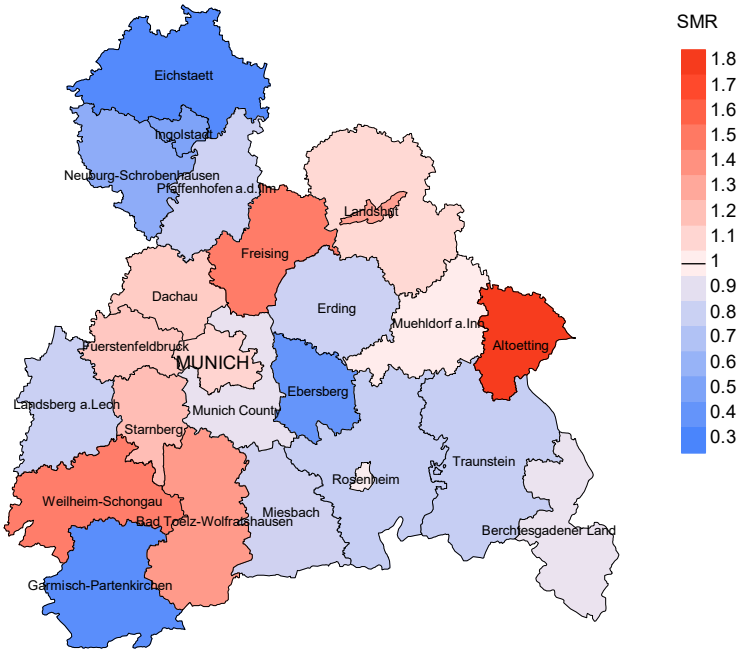


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=449, females N=365).

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 4 women died from small intestine cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.41. Though, the value of this parameter may vary with an underlying probability of 99% between 0.07 and 1.28, 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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