Munich Cancer Registry

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GEP-NET: Gastr.ent.pancr. neuroend. tumor

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	3,006
Diseases	3,038
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 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/bhDNETE-GEP-NET-Gastr.ent.pancr.-neuroend.-tumor-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, August 2018

[#] 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.

Topography codes (ICD-O-3 2000) used for specifying cancer site

Code	Description
C15	Esophagus
C16	Stomach
C17	Small intestine
C18	Colon
C19	Rectosigmoid junction
C20	Rectum
C21	Anus and anal canal
C22	Liver and intrahepatic bile ducts
C23	Gallbladder
C24	Other and unspecified parts of biliary tract
C25	Pancreas
C26	Other and ill-defined digestive organs

... if additionally existing any of ...

Morphology codes (ICD-O-3 2011) used for specifying cancer site

Code	Description
8013/3	Large cell neuroendocrine carcinoma
8041/3	Small cell carcinoma, NOS
8150/3	Pancreatic endocrine tumor, malignant
8151/3	Insulinoma, malignant
8152/1	Glucagonoma, NOS
8152/3	Glucagonoma, malignant
8153/3	Gastrinoma, malignant
8155/3	Vipoma, malignant
8156/3	Somatostatinoma, malignant
8240/3	Carcinoid tumor, NOS
8241/3	Enterochromaffin cell carcinoid
8243/3	Goblet cell carcinoid
8244/3	Mixed adenoneuroendocrine carcinoma
8245/1	Tubular carcinoid
8246/3	Neuroendocrine carcinoma, NOS
8249/3	Atypical carcinoid tumor

Reference:

Bosman FT, Carneiro F, Hruban RH, Theise ND, editors. WHO Classification of Tumours of the Digestive System 4th edition, IARC, Lyon (2010).

INCIDENCE

Table 1

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

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	56	8.9	9.3	66.1	100.0
1999	61	12.8	9.2	57.4	93.4
2000	49	12.7	9.2	53.1	98.0
2001	55	14.5	9.1	54.5	96.4
2002	95	13.6	8.7	52.6	94.7 #
2003	98	13.3	8.6	57.1	93.9
2004	124	14.1	8.2	50.8	90.3
2005	121	15.9	8.0	52.9	91.7
2006	156	15.6	7.6	50.6	93.6
2007	189	16.2	7.1	48.7	73.5 #
2008	186	16.4	6.7	43.5	69.9
2009	187	16.8	6.2	47.1	69.0
2010	215	17.6	6.0	39.5	68.4
2011	234	17.7	5.7	36.8	66.2
2012	252	18.3	4.7	30.6	61.5
2013	273	18.4	5.3	27.5	62.3
2014	256	18.7	5.1	32.8	64.8
2015	216	19.1	4.7	26.9	98.1
2016	215	19.7	3.8	14.0	74.4 ##
1998-2016	3038	19.7	9.3	39.4	76.6

3,038 cases diagnosed 1998-2016 are related to a total of 3,006 patients. Currently, in 862 (28.7 %) of these 3,006 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 654 / 168 / 40 (21.8 % / 5.6 % / 1.3 %) 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 2014, a subgroup of 256 cases has been diagnosed, of which 18.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.1 % 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 1a

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

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	31	55.4	12.9	10.7	74.2	100.0
1999	33	54.1	15.6	10.4	66.7	100.0
2000	23	46.9	16.1	10.3	60.9	100.0
2001	29	52.7	18.1	10.2	62.1	96.6
2002	53	55.8	14.2	9.9	56.6	96.2 #
2003	49	50.0	12.8	9.7	61.2	93.9
2004	71	57.3	13.1	9.3	50.7	90.1
2005	69	57.0	15.9	9.0	62.3	91.3
2006	96	61.5	15.9	8.5	51.0	91.7
2007	121	64.0	16.7	7.8	47.1	78.5 #
2008	94	50.5	16.9	7.2	47.9	69.1
2009	100	53.5	17.9	7.1	52.0	71.0
2010	106	49.3	19.3	7.0	41.5	67.0
2011	131	56.0	20.2	7.2	39.7	69.5
2012	126	50.0	20.8	5.8	33.3	65.1
2013	149	54.6	21.0	6.2	32.2	64.4
2014	127	49.6	20.8	5.6	33.9	61.4
2015	128	59.3	20.9	5.0	31.3	99.2
2016	116	54.0	21.2	5.3	16.4	73.3 ##
1998-2016	1652	54.4	21.2	10.7	42.8	78.0

1,652 cases diagnosed 1998-2016 are related to a total of 1,632 patients. Currently, in 510 (31.3 %) of these 1,632 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 374 / 107 / 29 (22.9 % / 6.6 % / 1.8 %) 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 2014, a subgroup of 127 cases has been diagnosed, of which 20.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.6 % 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 1b

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

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	25	44.6	4.0	7.7	56.0	100.0
1999	28	45.9	9.4	7.8	46.4	85.7
2000	26	53.1	8.9	7.8	46.2	96.2
2001	26	47.3	10.5	7.7	46.2	96.2
2002	42	44.2	12.9	7.3	47.6	92.9 #
2003	49	50.0	13.8	7.2	53.1	93.9
2004	53	42.7	15.3	7.0	50.9	90.6
2005	52	43.0	15.9	6.7	40.4	92.3
2006	60	38.5	15.2	6.6	50.0	96.7
2007	68	36.0	15.6	6.3	51.5	64.7 #
2008	92	49.5	15.7	6.0	39.1	70.7
2009	87	46.5	15.5	5.1	41.4	66.7
2010	109	50.7	15.5	4.8	37.6	69.7
2011	103	44.0	14.8	3.9	33.0	62.1
2012	126	50.0	15.3	3.5	27.8	57.9
2013	124	45.4	15.3	4.2	21.8	59.7
2014	129	50.4	16.3	4.6	31.8	68.2
2015	88	40.7	17.0	4.4	20.5	96.6
2016	99	46.0	17.8	2.1	11.1	75.8 ##
1998-2016	1386	45.6	17.8	7.7	35.3	75.0

1,386 cases diagnosed 1998-2016 are related to a total of 1,374 patients. Currently, in 352 (25.6 %) of these 1,374 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 280 / 61 / 11 (20.4 % / 4.4 % / 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 2014, a subgroup of 129 cases has been diagnosed, of which 16.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.6 % 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
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 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	31	25	2.8	2.1	1.7	1.3	2.4	1.7	2.9	1.9
1999	33	28	2.9	2.4	2.1	1.5	2.6	1.9	3.0	2.1
2000	23	26	2.0	2.2	1.3	1.2	1.8	1.6	2.2	1.9
2001	29	26	2.5	2.1	1.5	1.4	2.2	1.7	2.6	2.0
2002	53	42	2.8	2.1	1.8	1.3	2.5	1.7	2.8	2.0
2003	49	49	2.6	2.5	1.5	1.5	2.2	2.0	2.6	2.3
2004	71	53	3.8	2.7	2.3	1.6	3.1	2.1	3.8	2.4
2005	69	52	3.6	2.6	2.2	1.4	3.0	1.9	3.7	2.2
2006	96	60	5.0	3.0	2.8	1.7	4.0	2.2	4.9	2.6
2007	121	68	5.5	2.9	3.4	1.7	4.6	2.2	5.3	2.6
2008	94	92	4.2	4.0	2.6	2.2	3.5	2.9	4.1	3.4
2009	100	87	4.5	3.7	2.5	2.2	3.5	2.9	4.3	3.4
2010	106	109	4.7	4.7	2.7	2.8	3.8	3.7	4.5	4.1
2011	131	103	5.9	4.4	3.2	2.7	4.5	3.4	5.4	3.9
2012	126	126	5.6	5.3	3.2	3.4	4.3	4.2	5.1	4.7
2013	149	124	6.5	5.2	3.7	3.1	5.1	4.0	6.0	4.5
2014	127	129	5.4	5.4	3.1	2.9	4.2	3.8	5.1	4.5
2015	128	88	5.4	3.6	3.0	2.1	4.1	2.6	5.0	3.1
2016	116	99	4.8	4.0	2.8	2.4	3.8	3.1	4.5	3.6
1998-2016	1652	1386	4.5	3.6	2.6	2.1	3.6	2.8	4.3	3.2

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

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	56	62.7	14.8	13.2	87.9	46.6	55.9	63.4	71.2	81.7
1999	61	57.7	15.6	24.9	87.9	29.8	52.2	60.3	67.7	73.5
2000	49	60.9	16.5	24.7	92.1	37.6	49.5	60.1	74.4	80.6
2001	55	60.8	13.7	26.6	88.5	38.6	53.9	62.3	69.1	77.8
2002	95	60.9	15.9	17.7	90.9	36.0	50.2	62.7	72.0	80.3
2003	98	62.5	13.0	23.5	87.5	48.1	55.4	63.4	72.3	78.9
2004	124	61.5	14.6	13.8	93.3	40.8	52.3	63.3	72.3	77.8
2005	121	64.8	14.3	16.1	90.8	46.3	57.6	66.8	74.9	81.0
2006	156	64.3	13.1	16.8	91.9	45.6	56.2	66.5	73.8	79.2
2007	189	61.4	15.3	13.4	91.2	40.4	54.0	63.7	71.1	79.4
2008	186	62.4	15.5	18.9	93.9	40.6	53.0	65.8	73.1	80.2
2009	187	63.7	16.5	12.4	92.6	38.6	55.5	66.4	76.3	84.1
2010	215	62.4	14.1	14.9	92.4	44.6	53.8	62.7	72.7	79.8
2011	234	62.2	16.1	15.5	92.9	41.1	51.4	64.9	73.8	80.7
2012	252	61.6	17.8	9.7	101	31.8	53.3	65.2	74.6	80.4
2013	273	61.6	15.4	14.2	96.5	40.7	52.3	63.9	73.6	77.3
2014	256	63.8	16.1	15.8	92.6	42.4	53.2	67.3	75.2	82.2
2015	216	63.9	16.0	15.0	92.0	44.8	54.1	66.4	75.7	81.1
2016	215	61.7	15.4	16.1	98.3	41.4	52.5	63.0	73.7	79.8
1998-2016	3038	62.4	15.5	9.7	101	41.4	53.6	64.5	73.7	80.1

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	31	63.1	10.6	32.1	81.7	55.7	58.6	63.6	69.5	76.6
1999	33	56.6	16.5	24.9	85.3	27.6	52.2	59.7	67.7	73.5
2000	23	61.8	14.2	37.4	92.1	43.9	50.0	60.1	73.9	76.6
2001	29	62.7	11.8	34.3	88.5	50.5	54.9	62.3	69.1	79.8
2002	53	60.0	12.3	27.1	88.3	42.3	53.4	60.9	66.4	74.9
2003	49	64.6	9.9	32.4	85.0	52.9	58.8	64.1	70.9	76.9
2004	71	62.2	11.8	27.8	78.9	47.7	53.9	63.4	71.4	76.4
2005	69	64.7	13.4	19.0	87.6	47.7	57.8	66.3	74.8	79.4
2006	96	64.5	12.3	16.8	85.7	48.1	59.0	67.1	73.3	77.0
2007	121	61.2	14.1	15.8	91.2	42.3	54.8	63.1	69.6	78.1
2008	94	62.0	13.8	19.3	85.6	45.1	54.3	64.0	71.5	79.1
2009	100	65.7	13.3	12.4	89.0	50.4	58.3	67.2	74.6	81.8
2010	106	64.1	12.5	26.3	92.4	49.0	56.4	63.5	72.7	80.1
2011	131	64.3	13.1	15.5	89.3	46.5	55.4	66.6	73.8	80.6
2012	126	63.6	14.9	9.7	89.0	42.8	54.6	65.7	74.7	80.4
2013	149	62.4	13.9	19.4	90.4	45.2	52.7	63.6	73.0	78.3
2014	127	63.3	15.8	20.3	92.6	41.1	52.7	67.0	74.6	81.8
2015	128	63.7	15.0	18.3	87.7	45.4	53.3	65.8	75.4	80.4
2016	116	62.5	15.1	18.8	90.1	43.1	52.9	64.4	74.3	80.8
1998-2016	1652	63.1	13.8	9.7	92.6	45.3	55.1	64.7	73.1	79.2

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	25	62.2	19.0	13.2	87.9	32.4	54.3	62.1	77.0	84.2
1999	28	59.0	14.6	26.9	87.9	38.4	51.0	61.6	69.5	75.0
2000	26	60.1	18.6	24.7	92.0	33.1	41.6	62.0	75.5	81.0
2001	26	58.6	15.6	26.6	84.4	35.2	49.1	61.9	68.2	75.7
2002	42	62.1	19.6	17.7	90.9	31.5	49.1	66.2	76.4	84.7
2003	49	60.5	15.3	23.5	87.5	33.3	51.7	61.7	72.5	79.4
2004	53	60.6	17.7	13.8	93.3	35.4	51.7	62.6	74.4	78.9
2005	52	64.9	15.6	16.1	90.8	42.1	56.0	67.8	77.0	82.5
2006	60	64.0	14.4	29.9	91.9	43.8	52.5	64.5	74.0	83.0
2007	68	61.8	17.4	13.4	88.4	37.8	51.0	65.2	74.3	81.7
2008	92	62.8	17.2	18.9	93.9	39.2	49.7	67.1	74.1	82.2
2009	87	61.4	19.3	15.9	92.6	30.7	49.4	62.9	76.5	84.9
2010	109	60.7	15.5	14.9	89.6	39.8	50.9	61.1	72.5	79.8
2011	103	59.5	18.9	16.5	92.9	33.0	46.3	62.3	74.4	81.5
2012	126	59.7	20.3	13.7	101	25.8	46.9	63.5	74.6	83.7
2013	124	60.7	17.1	14.2	96.5	34.7	51.7	64.9	73.9	76.9
2014	129	64.2	16.4	15.8	91.1	43.3	53.6	67.4	76.6	82.6
2015	88	64.0	17.5	15.0	92.0	42.3	55.6	67.6	76.5	81.7
2016	99	60.7	15.8	16.1	98.3	40.6	49.7	61.9	71.2	78.9
1998-2016	1386	61.6	17.3	13.2	101	36.4	50.9	64.2	74.4	81.5

Table 4

Age distribution by 5-year age group and sex for period 2007-2016

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9	1	0.0	0.0	1	0.1	0.1			0.0
10-14	5	0.2	0.3	1	0.1	0.2	4	0.4	0.4
15-19	30	1.3	1.6	6	0.5	0.7	24	2.3	2.7
20-24	34	1.5	3.1	11	0.9	1.6	23	2.2	5.0
25-29	36	1.6	4.8	16	1.3	2.9	20	2.0	6.9
30-34	42	1.9	6.7	17	1.4	4.3	25	2.4	9.4
35-39	56	2.5	9.2	23	1.9	6.3	33	3.2	12.6
40-44	85	3.8	13.0	42	3.5	9.8	43	4.2	16.8
45-49	150	6.7	19.7	82	6.8	16.6	68	6.6	23.4
50-54	185	8.3	28.1	110	9.2	25.8	75	7.3	30.7
55-59	222	10.0	38.1	120	10.0	35.8	102	10.0	40.7
60-64	267	12.0	50.1	167	13.9	49.7	100	9.8	50.4
65-69	308	13.9	63.9	180	15.0	64.8	128	12.5	62.9
70-74	304	13.7	77.6	165	13.8	78.5	139	13.6	76.5
75-79	259	11.7	89.2	134	11.2	89.7	125	12.2	88.7
80-84	141	6.3	95.6	87	7.3	97.0	54	5.3	94.0
85+	98	4.4	100.0	36	3.0	100.0	62	6.0	100.0
All ages	2223	100.0		1198	100.0		1025	100.0	

Table 5

Age-specific incidence and proportion of all cancers
for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males Prop.all cancers n=113978 %	Females Prop.all cancers n=112253 %
0- 4						
5- 9	1		0.1		1.0	
10-14	1	4	0.1	0.4	0.9	4.0
15-19	6	24	0.5	2.1	2.4	11.6
20-24	11	23	0.8	1.7	2.4	6.1
25-29	16	20	1.0	1.3	2.3	2.4
30-34	17	25	1.1	1.6	1.8	1.7
35-39	23	33	1.4	2.1	1.7	1.3
40-44	42	43	2.3	2.4	1.9	0.9
45-49	82	66	4.2	3.5	2.1	1.0
50-54	110	75	6.4	4.4	1.8	0.9
55-59	120	102	8.5	6.9	1.3	1.1
60-64	164	100	13.4	7.5	1.2	0.9
65-69	176	126	14.9	9.7	0.9	0.9
70-74	162	139	14.6	11.0	0.8	0.9
75-79	134	121	16.8	12.1	0.8	0.9
80-84	85	54	18.5	7.6	0.8	0.5
85+	35	62	11.4	8.4	0.4	0.5
All ages	1185	1017			1.0	0.9
Incidence						
Raw			5.2	4.3		
WS			3.0	2.5		
ES			4.1	3.3		
BRD-S			4.9	3.8		

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).

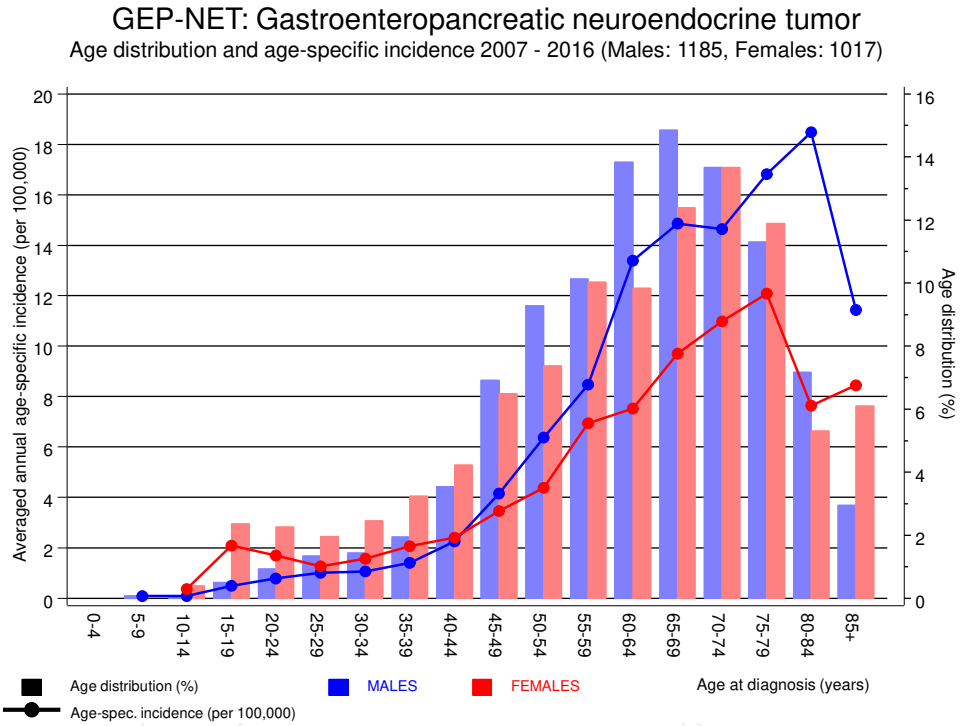


Figure 6. Age distribution (males: mean=63.2 yrs, median=65.0 yrs; females: mean=61.5 yrs, median=64.5 yrs) and age-specific incidence.

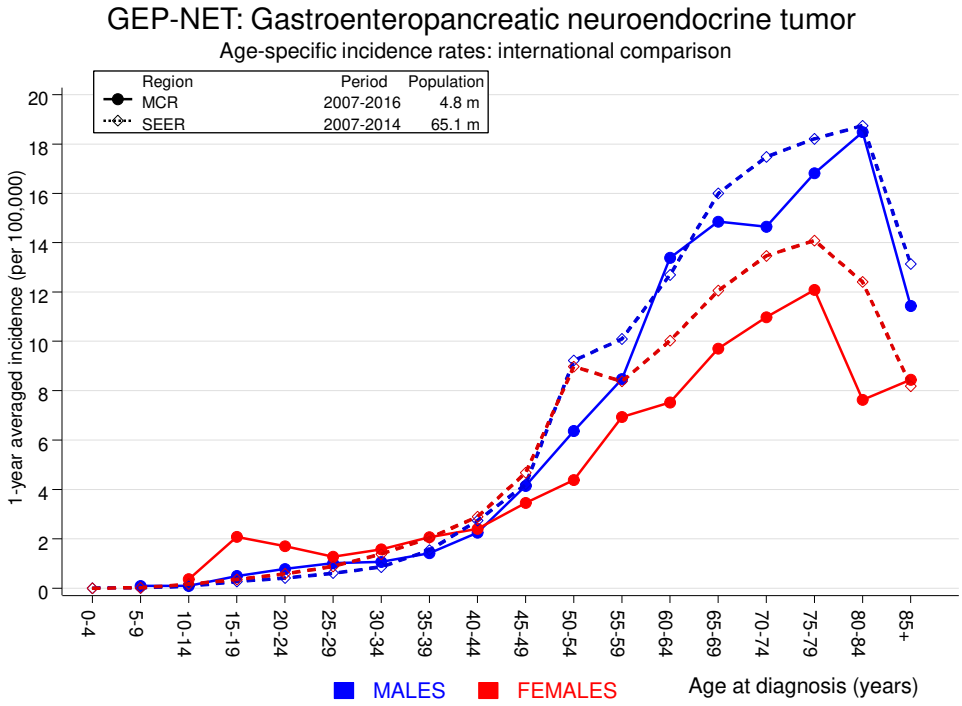


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 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 1998-2016

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C12-C13	Hypopharynx	2	0.4	4.7	0.6	17.1		3.4	
C15	Oesophagus	11	1.3	8.2	4.1	14.6	#	20.7	
C16	Stomach	10	2.5	4.0	1.9	7.3	#	16.0	
C17	Small intestine	5	0.4	12.8	4.2	29.9	#	9.9	
C18	Colon	33	6.2	5.3	3.7	7.5	#	57.5	
C19-C20	Rectum	20	3.6	5.5	3.4	8.5	#	35.1	
C22	Liver	6	2.0	3.0	1.1	6.6	#	8.6	16.7
C23-C24	Bile	2	0.6	3.1	0.4	11.1		2.9	
C25	Pancreas	14	2.5	5.6	3.1	9.4	#	24.6	14.3
C33-C34	Lung	21	8.1	2.6	1.6	4.0	#	27.8	9.5
C43	Malign. melanoma	11	3.1	3.5	1.8	6.3	#	16.9	
C46,C49	Soft tissue	3	0.4	8.0	1.7	23.4	#	5.6	
C61	Prostate	36	19.1	1.9	1.3	2.6	#	36.3	2.8
C64	Kidney	11	2.4	4.6	2.3	8.1	#	18.4	
C65	Renal pelvis	2	0.3	7.0	0.9	25.4		3.7	
C66	Ureter	3	0.2	18.7	3.9	54.6	#	6.1	
C67	Bladder	3	2.8	1.1	0.2	3.1		0.4	
C70-C72	CNS cancer	2	0.9	2.2	0.3	8.0		2.4	
C73	Thyroid	3	0.5	6.0	1.2	17.6	#	5.4	33.3
C76-C79	CUP	3	1.1	2.7	0.6	8.0		4.1	
C82-C85	NHL	12	2.7	4.5	2.3	7.8	#	20.0	8.3
C91-C96	Leukaemia	4	1.1	3.8	1.0	9.6	#	6.3	50.0
Others, specified		6	3.0	2.0	0.7	4.4		6.5	33.3
Not observed		0	2.4	0.0	0.0	1.5		-5.1	
All further malignancies		223	67.5	3.3	2.9	3.8	#	333.4	5.4

Patients	1528
Median age at next malignancy (years)	70.1
Person-years	4664
Mean observation time (years)	3.1
Median observation time (years)	1.5

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category “Others, specified”.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998-2016

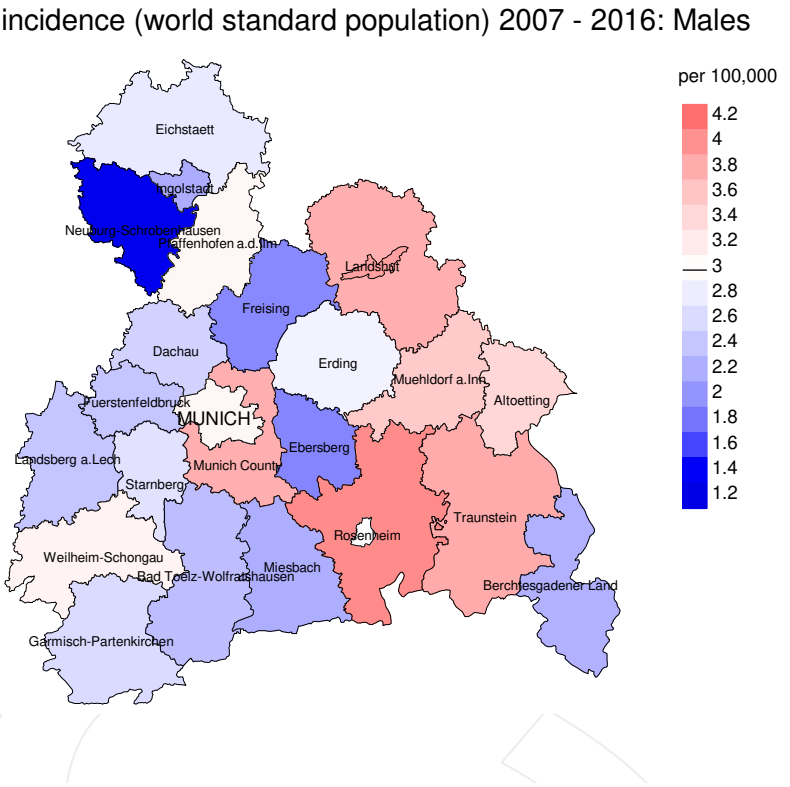
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C15	Oesophagus	3	0.3	11.7	2.4	34.1	#	6.7	
C16	Stomach	9	1.3	7.0	3.2	13.3	#	18.7	22.2
C17	Small intestine	7	0.2	33.8	13.6	69.6	#	16.5	
C18	Colon	20	3.6	5.5	3.4	8.6	#	39.8	
C19-C20	Rectum	9	1.5	5.9	2.7	11.1	#	18.1	11.1
C25	Pancreas	10	1.7	5.8	2.8	10.6	#	20.1	
C33-C34	Lung	10	3.0	3.3	1.6	6.2	#	17.0	40.0
C43	Malign. melanoma	4	1.6	2.6	0.7	6.5		5.9	
C50	Breast	31	12.3	2.5	1.7	3.6	#	45.4	6.5
C53	Cervix uteri	3	0.6	5.3	1.1	15.4	#	5.9	33.3
C54	Corpus uteri	4	2.2	1.8	0.5	4.7		4.4	
C56	Ovary	7	1.6	4.4	1.8	9.1	#	13.1	14.3
C64	Kidney	7	0.9	7.5	3.0	15.6	#	14.7	14.3
C82-C85	NHL	7	1.5	4.7	1.9	9.7	#	13.4	
Others, specified		10	3.5	2.9	1.4	5.3	#	15.8	20.0
Not observed		0	3.8	0.0	0.0	1.0	#	-9.2	
All further malignancies		141	39.5	3.6	3.0	4.2	#	246.5	9.9

Patients	1285
Median age at next malignancy (years)	69.4
Person-years	4119
Mean observation time (years)	3.2
Median observation time (years)	1.8

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category “Others, specified”.



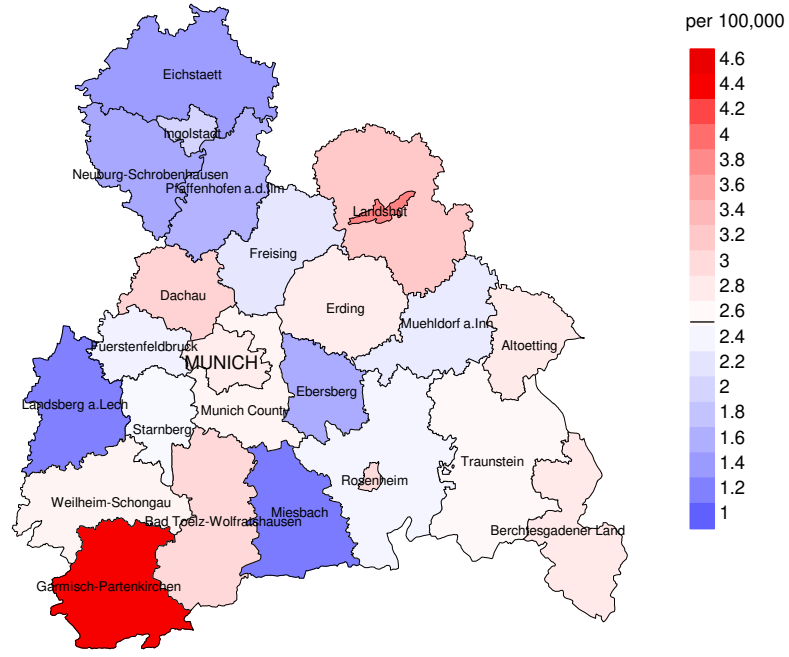
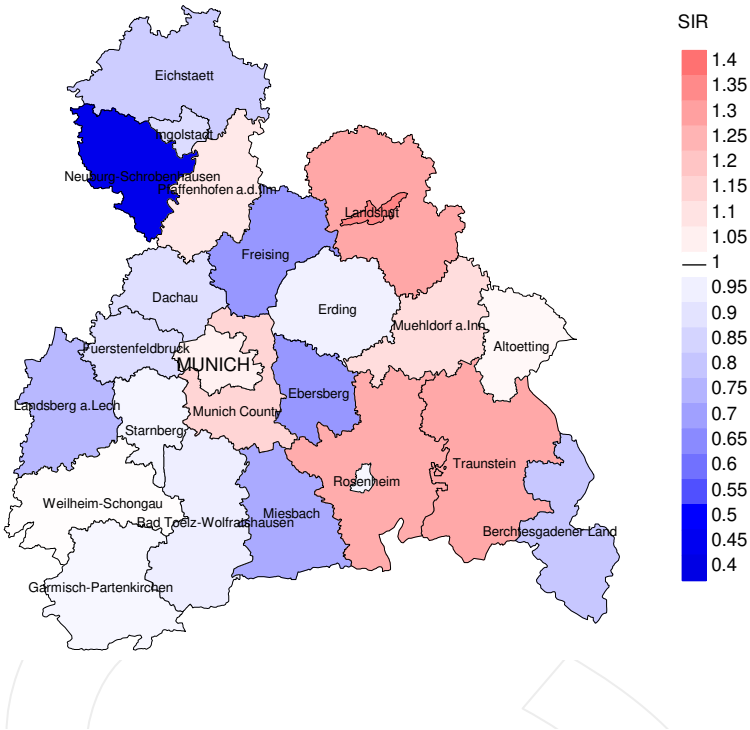


Figure 8a. Map of cancer incidence (world standard population) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.0/100,000 WS N=1,185, females 2.5/100,000 WS N=1,017).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 17 women were identified with newly diagnosed gastr.ent.pancr. neuroend. tumor. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 3.1/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

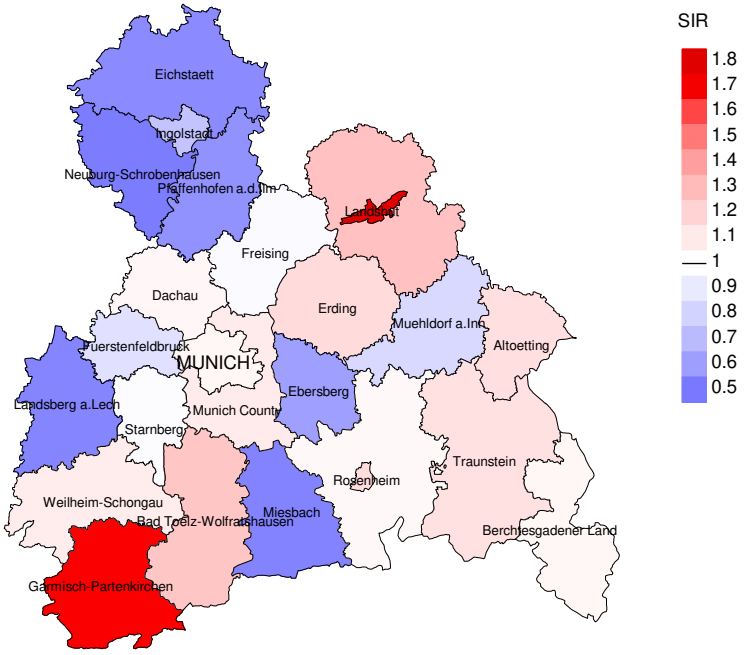


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,185, females N=1,017).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 17 women were identified with newly diagnosed gastr.ent.pancr. neuroend. tumor. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.61. Though, the value of this parameter may vary with an underlying probability of 99% between 0.29 and 1.10, and is therefore not statistically striking.

MORTALITY

Table 9a

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	56	100.0	37	66.1	91.9
1999	61	93.4	35	57.4	94.3
2000	49	98.0	26	53.1	88.5
2001	55	96.4	30	54.5	96.7
2002	95	94.7	50	52.6	98.0
2003	98	93.9	56	57.1	100.0
2004	124	90.3	63	50.8	96.8
2005	121	91.7	64	52.9	98.4
2006	156	93.6	79	50.6	98.7
2007	189	73.5	92	48.7	95.7
2008	186	69.9	81	43.5	97.5
2009	187	69.0	88	47.1	98.9
2010	215	68.4	85	39.5	95.3
2011	234	66.2	86	36.8	94.2
2012	252	61.5	77	30.6	93.5
2013	273	62.3	75	27.5	97.3
2014	256	64.8	84	32.8	92.9
2015	216	98.1	58	26.9	96.6
2016	215	74.4	30	14.0	66.7
1998-2016	3038	76.6	1196	39.4	95.4

Table 9b

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Deaths in same year n	Prop. deaths in same year %
1998	56	11	5	8.9
1999	61	16	7	11.5
2000	49	23	6	12.2
2001	55	15	3	5.5
2002	95	29	11	11.6
2003	98	41	14	14.3
2004	124	45	11	8.9
2005	121	54	20	16.5
2006	156	51	15	9.6
2007	189	72	21	11.1
2008	186	83	23	12.4
2009	187	83	29	15.5
2010	215	84	22	10.2
2011	234	80	23	9.8
2012	252	106	33	13.1
2013	273	124	25	9.2
2014	256	134	37	14.5
2015	216	134	33	15.3
2016	215	103	20	9.3
1998–2016	3038	1288	358	11.8

Table 9c

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	11	81.8	18.2	66.7
1999	16	87.5	12.5	93.8
2000	23	69.6	30.4	77.3
2001	15	80.0	20.0	86.7
2002	29	86.2	13.8	89.7
2003	41	70.7	29.3	82.5
2004	45	75.6	24.4	80.0
2005	54	70.4	29.6	80.4
2006	51	86.3	13.7	89.8
2007	72	83.3	16.7	84.3
2008	83	86.7	13.3	93.8
2009	83	71.1	28.9	79.3
2010	84	75.0	25.0	78.0
2011	80	80.0	20.0	88.5
2012	106	77.4	22.6	81.4
2013	124	80.6	19.4	83.5
2014	134	76.9	23.1	81.1
2015	134	74.6	25.4	78.9
2016	103	68.0	32.0	75.5
1998-2016	1288	77.2	22.8	82.4

Table 10a

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	5	70.5	70.9	59.3	68.5
1999	12	67.9	66.5	78.7	67.9
2000	16	68.6	67.8	84.5	67.8
2001	12	68.6	64.9	84.8	65.2
2002	21	66.6	66.1	92.4	66.1
2003	20	74.7	68.3	76.3	72.2
2004	19	69.0	63.7	75.1	64.5
2005	33	74.6	74.6	75.4	74.6
2006	29	73.8	73.3	76.8	73.3
2007	37	69.8	71.1	69.7	71.1
2008	56	68.9	68.1	77.2	68.1
2009	51	70.5	68.4	76.6	68.4
2010	51	72.7	69.9	75.0	69.8
2011	46	71.1	70.3	77.5	70.3
2012	53	76.3	73.2	79.8	73.5
2013	73	73.8	73.1	80.2	73.2
2014	81	72.9	70.7	78.2	70.8
2015	73	72.9	69.8	81.3	72.2
2016	63	75.8	74.2	80.9	74.1
1998-2016	751	72.2	70.2	77.3	70.7

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	6	83.7	83.6	88.1	83.7
1999	4	81.0	81.0		81.0
2000	7	73.7	57.6	77.5	71.6
2001	3	72.0	69.9	92.2	69.9
2002	8	69.4	66.4	72.4	65.6
2003	21	73.2	69.8	75.1	72.4
2004	26	75.8	75.6	79.1	76.1
2005	21	77.9	74.3	86.2	74.9
2006	22	74.8	74.4	75.1	76.1
2007	35	69.4	68.4	83.6	69.4
2008	27	78.9	75.8	90.4	78.9
2009	32	75.8	73.0	85.4	75.0
2010	33	73.2	68.0	81.9	71.2
2011	34	74.4	72.4	81.2	74.2
2012	53	80.1	73.2	89.9	74.8
2013	51	74.3	71.3	88.1	72.4
2014	53	76.1	73.9	85.7	73.9
2015	61	77.4	73.0	81.7	76.5
2016	40	77.5	76.3	81.9	77.4
1998-2016	537	75.7	73.2	83.8	74.3

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 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	4	0.4	0.13	0.2	0.13	0.3	0.14	0.5	0.16
1999	10	0.9	0.30	0.6	0.28	0.8	0.30	1.0	0.32
2000	13	1.1	0.57	0.7	0.58	1.1	0.59	1.2	0.57
2001	10	0.9	0.34	0.5	0.32	0.7	0.33	1.0	0.38
2002	20	1.1	0.38	0.6	0.34	0.9	0.36	1.1	0.39
2003	13	0.7	0.27	0.4	0.25	0.6	0.27	0.8	0.30
2004	11	0.6	0.15	0.3	0.14	0.5	0.16	0.6	0.16
2005	25	1.3	0.37	0.7	0.30	1.0	0.35	1.4	0.39
2006	25	1.3	0.26	0.6	0.22	1.0	0.25	1.4	0.29
2007	32	1.4	0.27	0.7	0.22	1.1	0.24	1.4	0.28
2008	50	2.2	0.53	1.3	0.49	1.8	0.52	2.2	0.54
2009	35	1.6	0.35	0.8	0.32	1.2	0.33	1.5	0.35
2010	39	1.7	0.38	0.9	0.34	1.3	0.35	1.7	0.39
2011	39	1.7	0.30	0.9	0.27	1.3	0.29	1.6	0.29
2012	40	1.8	0.32	0.8	0.25	1.2	0.29	1.7	0.34
2013	60	2.6	0.41	1.2	0.31	1.8	0.36	2.4	0.41
2014	61	2.6	0.49	1.3	0.41	1.9	0.45	2.3	0.47
2015	56	2.4	0.44	1.2	0.40	1.8	0.43	2.1	0.43
2016	42	1.7	0.37	0.8	0.28	1.2	0.31	1.6	0.36
1998-2016	585	1.6	0.36	0.8	0.31	1.2	0.34	1.6	0.37

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	5	0.4	0.20	0.1	0.08	0.2	0.12	0.4	0.21
1999	4	0.3	0.14	0.1	0.08	0.2	0.09	0.2	0.10
2000	3	0.2	0.12	0.1	0.10	0.2	0.12	0.2	0.10
2001	2	0.2	0.08	0.1	0.07	0.1	0.07	0.2	0.08
2002	5	0.3	0.12	0.1	0.09	0.2	0.10	0.2	0.10
2003	16	0.8	0.33	0.4	0.27	0.6	0.28	0.7	0.30
2004	23	1.2	0.43	0.5	0.31	0.7	0.35	1.0	0.40
2005	13	0.7	0.25	0.3	0.19	0.4	0.21	0.5	0.24
2006	19	0.9	0.32	0.3	0.21	0.5	0.24	0.7	0.29
2007	28	1.2	0.42	0.6	0.35	0.8	0.38	1.0	0.39
2008	22	0.9	0.24	0.4	0.16	0.5	0.19	0.8	0.22
2009	24	1.0	0.28	0.5	0.20	0.7	0.23	0.8	0.24
2010	24	1.0	0.22	0.5	0.19	0.7	0.20	0.9	0.22
2011	25	1.1	0.24	0.5	0.18	0.7	0.20	0.9	0.22
2012	42	1.8	0.34	0.7	0.21	1.1	0.26	1.3	0.28
2013	40	1.7	0.32	0.7	0.23	1.1	0.26	1.3	0.29
2014	42	1.7	0.33	0.7	0.25	1.0	0.28	1.4	0.31
2015	44	1.8	0.50	0.7	0.36	1.1	0.42	1.4	0.43
2016	28	1.1	0.29	0.4	0.16	0.6	0.19	0.8	0.24
1998-2016	409	1.1	0.30	0.5	0.21	0.7	0.24	0.8	0.27

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016
(**incl. multiple malignancies**)

Age at death	Cases			Males			Females		
Years	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19	1	0.1	0.1	1	0.2	0.2			0.0
20-24	0	0.0	0.1			0.2			0.0
25-29	3	0.4	0.5	2	0.4	0.7	1	0.3	0.3
30-34	4	0.5	1.0			0.7	4	1.3	1.6
35-39	5	0.6	1.7	1	0.2	0.9	4	1.3	2.8
40-44	15	1.9	3.6	6	1.3	2.2	9	2.8	5.6
45-49	17	2.2	5.8	6	1.3	3.5	11	3.4	9.1
50-54	40	5.2	11.0	24	5.3	8.8	16	5.0	14.1
55-59	72	9.3	20.3	45	9.9	18.7	27	8.5	22.6
60-64	83	10.7	31.0	54	11.9	30.6	29	9.1	31.7
65-69	114	14.7	45.8	76	16.7	47.4	38	11.9	43.6
70-74	126	16.3	62.1	82	18.1	65.4	44	13.8	57.4
75-79	123	15.9	78.0	76	16.7	82.2	47	14.7	72.1
80-84	95	12.3	90.3	52	11.5	93.6	43	13.5	85.6
85+	75	9.7	100.0	29	6.4	100.0	46	14.4	100.0
All ages	773	100.0		454	100.0		319	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**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	1		0.1	0.17			2.3	
20-24								
25-29	2	1	0.1	0.13	0.1	0.05	2.7	1.4
30-34		4			0.3	0.16		3.3
35-39	1	4	0.1	0.04	0.3	0.12	0.5	1.4
40-44	6	9	0.3	0.14	0.5	0.21	1.2	1.3
45-49	6	11	0.3	0.07	0.6	0.17	0.5	0.8
50-54	24	16	1.4	0.22	0.9	0.21	1.2	0.8
55-59	45	27	3.2	0.38	1.8	0.26	1.3	0.9
60-64	54	29	4.4	0.33	2.2	0.29	1.1	0.8
65-69	76	38	6.4	0.43	2.9	0.30	1.0	0.7
70-74	82	44	7.4	0.51	3.5	0.32	0.9	0.6
75-79	76	47	9.5	0.57	4.7	0.39	0.8	0.7
80-84	52	43	11.3	0.61	6.1	0.80	0.7	0.6
85+	29	46	9.5	0.83	6.3	0.74	0.4	0.5
All ages	454	319					0.9	0.7
Mortality								
Raw			2.0	0.38	1.3	0.31		
WS			1.0	0.33	0.6	0.23		
ES			1.4	0.35	0.8	0.26		
BRD-S			1.9	0.38	1.1	0.28		
PYLL-70								
per 100,000			10.1		8.8			
ES			8.9		7.4			
AYLL-70			9.5		12.6			

Table 14a

Further malignancies in deaths in period 1998–2016
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	3	1.1	2	66.7			1	33.3
C12–C13	Hypopharynx	3	1.1	1	33.3			2	66.7
C15	Oesophagus	6	2.2					6	100.0
C16	Stomach	7	2.6			1	14.3	6	85.7
C17	Small intestine	24	8.9			10	41.7	14	58.3
C18	Colon	27	10.0			17	63.0	10	37.0
C19–C20	Rectum	12	4.4			5	41.7	7	58.3
C22	Liver	4	1.5			1	25.0	3	75.0
C25	Pancreas	19	7.0			7	36.8	12	63.2
C32	Larynx	3	1.1	3	100.0				
C33–C34	Lung	22	8.1	7	31.8	3	13.6	12	54.5
C43	Malign. melanoma	7	2.6	3	42.9	1	14.3	3	42.9
C44	Skin others	16	5.9	10	62.5			6	37.5
C61	Prostate	58	21.4	41	70.7	4	6.9	13	22.4
C62	Testis	3	1.1	2	66.7			1	33.3
C64	Kidney	12	4.4	6	50.0	2	16.7	4	33.3
C67	Bladder	10	3.7	9	90.0			1	10.0
C73	Thyroid	4	1.5	2	50.0			2	50.0
C76–C79	CUP	4	1.5	3	75.0	1	25.0		
C82–C85	NHL	7	2.6	2	28.6	1	14.3	4	57.1
C91–C96	Leukaemia	5	1.8	2	40.0			3	60.0
Others, specified		15	5.5	6	40.0	2	13.3	7	46.7
All further malignancies		271	100.0	99	36.5	55	20.3	117	43.2

Further malignancies with number of cases 1 to 2 are pooled in category “Others, specified”.

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

Table 14b

Further malignancies in deaths in period 1998–2016
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C15	Oesophagus	2	1.2					2	100.0
C16	Stomach	8	4.8			3	37.5	5	62.5
C17	Small intestine	8	4.8			4	50.0	4	50.0
C18	Colon	16	9.6			9	56.3	7	43.8
C19–C20	Rectum	8	4.8			4	50.0	4	50.0
C25	Pancreas	8	4.8			4	50.0	4	50.0
C33–C34	Lung	15	9.0	5	33.3	1	6.7	9	60.0
C43	Malign. melanoma	3	1.8	3	100.0				
C44	Skin others	3	1.8	1	33.3			2	66.7
C48	Peritoneal	2	1.2	1	50.0	1	50.0		
C50	Breast	37	22.3	26	70.3	3	8.1	8	21.6
C51	Vulva	2	1.2	2	100.0				
C53	Cervix uteri	3	1.8	1	33.3	1	33.3	1	33.3
C54	Corpus uteri	9	5.4	4	44.4	3	33.3	2	22.2
C56	Ovary	13	7.8	6	46.2	5	38.5	2	15.4
C64	Kidney	5	3.0	2	40.0	1	20.0	2	40.0
C67	Bladder	6	3.6	3	50.0	1	16.7	2	33.3
C73	Thyroid	4	2.4	3	75.0			1	25.0
C82–C85	NHL	6	3.6	2	33.3			4	66.7
Others, specified		8	4.8	2	25.0			6	75.0
All further malignancies		166	100.0	61	36.7	40	24.1	65	39.2

Further malignancies with number of cases 1 are pooled in category “Others, specified”.

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

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**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	1		0.1	0.17			2.4	
20-24								
25-29	2	1	0.1	0.13	0.1	0.05	3.0	1.5
30-34		2			0.1	0.09		1.9
35-39	1	2	0.1	0.04	0.1	0.07	0.5	0.8
40-44	5	9	0.3	0.13	0.5	0.23	1.1	1.5
45-49	6	9	0.3	0.08	0.5	0.16	0.6	0.8
50-54	23	13	1.3	0.24	0.8	0.20	1.3	0.8
55-59	34	21	2.4	0.35	1.4	0.25	1.2	0.9
60-64	45	26	3.7	0.34	2.0	0.31	1.1	0.8
65-69	57	26	4.8	0.45	2.0	0.32	1.0	0.6
70-74	54	35	4.9	0.50	2.8	0.33	0.8	0.7
75-79	43	32	5.4	0.57	3.2	0.38	0.6	0.6
80-84	27	31	5.9	0.60	4.4	0.76	0.5	0.6
85+	19	33	6.2	1.00	4.5	0.77	0.4	0.4
All ages	317	240					0.8	0.6
Mortality								
Raw			1.4	0.36	1.0	0.30		
WS			0.7	0.31	0.4	0.21		
ES			1.0	0.33	0.6	0.24		
BRD-S			1.3	0.36	0.8	0.26		
PYLL-70								
per 100,000			8.7		6.9			
ES			7.6		5.9			
AYLL-70			10.1		12.7			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**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	1		0.1	0.17			2.4	
20-24								
25-29	2	1	0.1	0.13	0.1	0.05	3.0	1.5
30-34		2			0.1	0.09		1.9
35-39	1	2	0.1	0.04	0.1	0.07	0.5	0.8
40-44	5	8	0.3	0.13	0.4	0.21	1.1	1.4
45-49	6	8	0.3	0.09	0.4	0.15	0.6	0.7
50-54	23	13	1.3	0.26	0.8	0.22	1.3	0.8
55-59	31	18	2.2	0.34	1.2	0.22	1.1	0.8
60-64	42	25	3.4	0.36	1.9	0.32	1.0	0.8
65-69	49	22	4.1	0.44	1.7	0.30	0.9	0.5
70-74	45	33	4.1	0.46	2.6	0.34	0.6	0.6
75-79	35	25	4.4	0.50	2.5	0.32	0.6	0.5
80-84	23	25	5.0	0.53	3.5	0.66	0.4	0.5
85+	15	30	4.9	0.83	4.1	0.71	0.3	0.4
All ages	278	212					0.7	0.6
Mortality								
Raw			1.2	0.34	0.9	0.28		
WS			0.6	0.29	0.4	0.20		
ES			0.9	0.32	0.6	0.23		
BRD-S			1.1	0.34	0.7	0.25		
PYLL-70								
per 100,000			8.3		6.4			
ES			7.3		5.4			
AYLL-70			10.4		12.9			

* See corresponding tables with multiple malignancies.

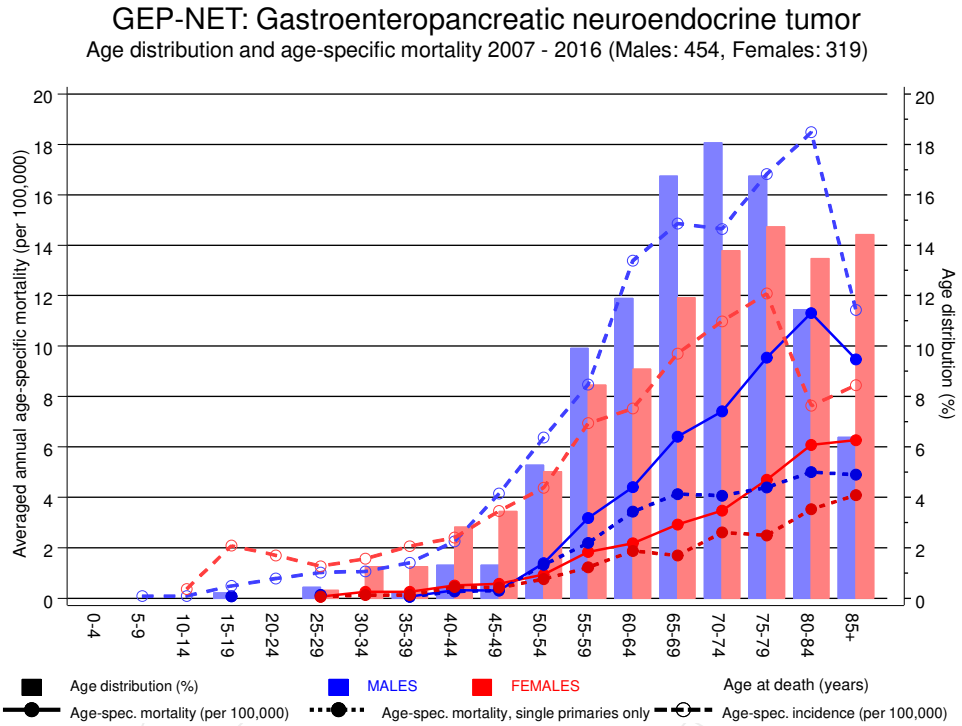
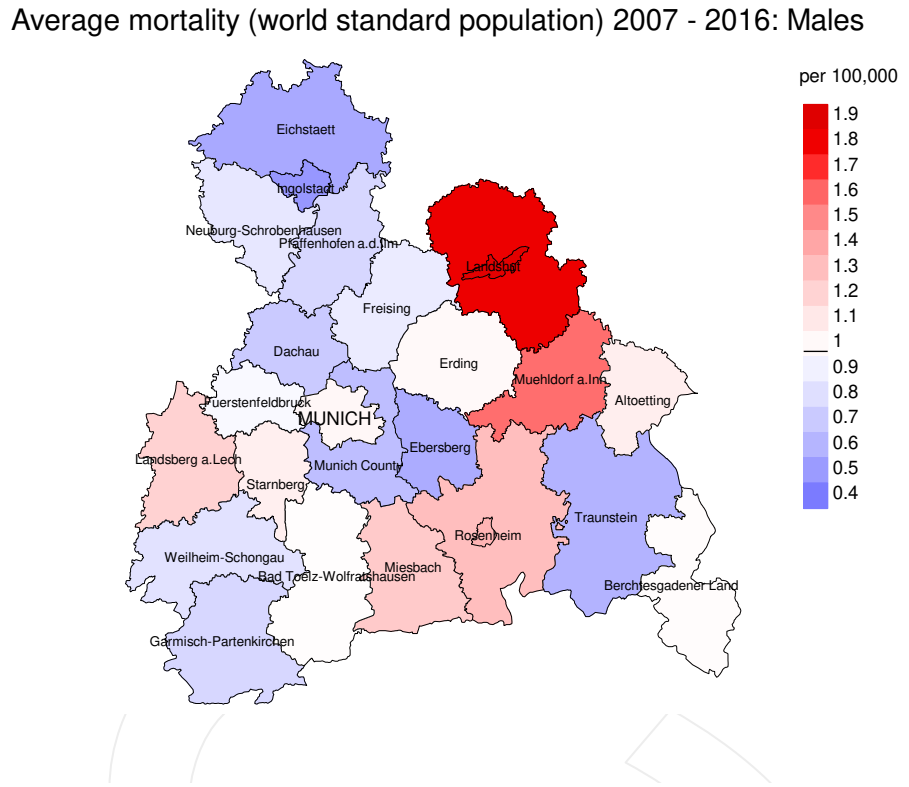


Figure 17. Distribution of age at death (bars; males: mean=67.0 yrs, median=67.8 yrs; females: mean=67.7 yrs, median=70.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at gastr.ent.pancr. neuroend. tumor-related death (see Table 10) should be considered.



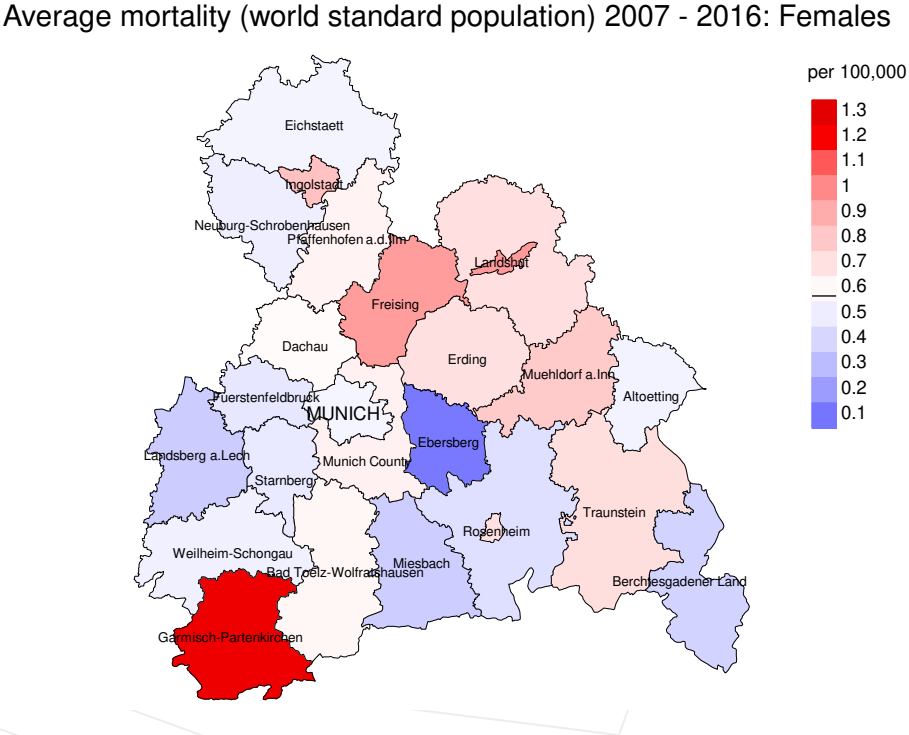
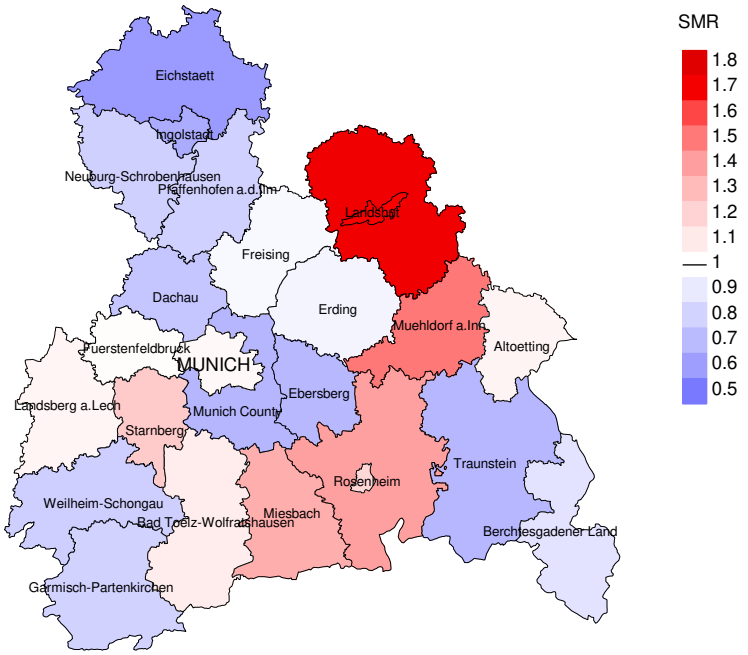


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.0/100,000 WS N=454, females 0.6/100,000 WS N=319).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 2 women died from gastr.ent.pancr. neuroend. tumor. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

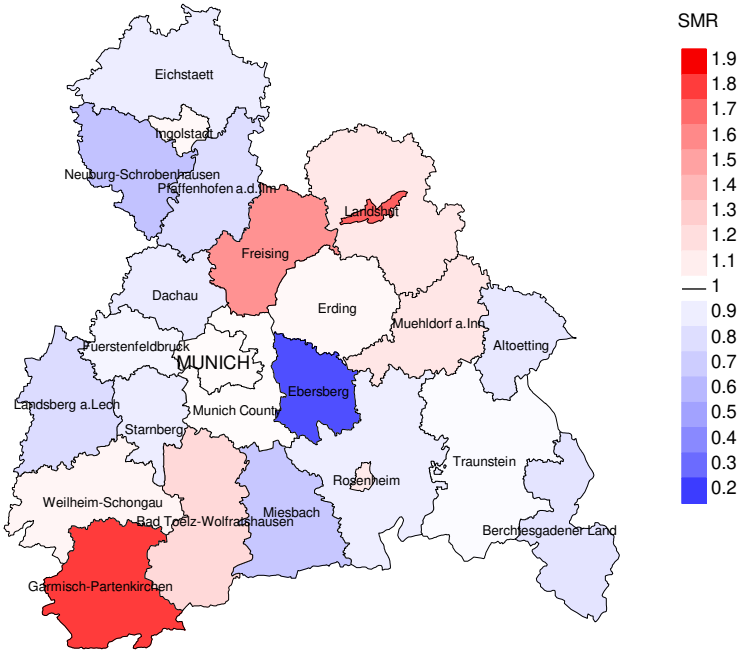


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=454, females N=319).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 2 women died from gastr.ent.pancr. neuroend. tumor. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.23. Though, the value of this parameter may vary with an underlying probability of 99% between 0.01 and 1.08, 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 index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic 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 MI- index. 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 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 between mortality and incidence
FRG	Federal Republic of Germany

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