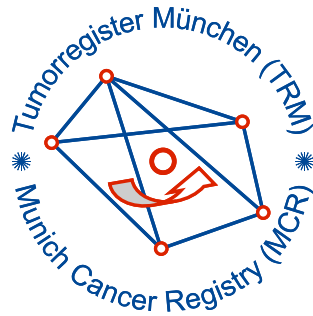


# Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage
- ▶ *Deutsch*

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

### Incidence and Mortality

Year of diagnosis	1998-2019
Patients	3,910
Diseases	3,950
Creation date	01/26/2021
Database export	01/07/2021
Population	4.92 m



Munich Cancer Registry  
Cancer Registry Bavaria - Upper Bavaria Regional Center  
at Klinikum Grosshadern/IBE  
Marchioninstr. 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>

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**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<sup>#</sup>, with a total of 4.69 million inhabitants, account for the frequency of cancer diseases<sup>##</sup> 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<sup>###</sup> 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](mailto:tumor@ibe.med.uni-muenchen.de).

Munich Cancer Registry, January 2021

- <sup>#</sup> 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).
- <sup>##</sup> 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.
- <sup>###</sup> 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	9.2	67.9	100.0
1999	61	12.8	9.1	59.0	93.4
2000	49	12.7	9.1	59.2	98.0
2001	55	14.5	9.0	60.0	100.0
2002	96	13.6	8.7	57.3	95.8 #
2003	98	13.3	8.6	60.2	93.9
2004	125	14.1	8.3	54.4	93.6
2005	126	15.8	8.1	59.5	93.7
2006	155	15.3	7.8	59.4	94.8
2007	191	16.0	7.3	54.5	91.1 #
2008	188	16.2	6.9	47.9	99.5
2009	189	16.7	6.5	50.8	100.0
2010	216	17.4	6.4	46.8	96.8
2011	238	17.6	6.0	42.4	97.9
2012	260	18.1	5.2	40.0	95.4
2013	285	18.2	5.3	33.7	96.5
2014	281	18.4	4.8	42.0	97.2
2015	255	18.8	4.0	34.5	92.9
2016	289	19.4	3.6	33.6	99.3
2017	287	19.7	2.8	24.4	99.0
2018	228	20.0	2.5	18.0	99.6
2019	222	20.0	1.9	17.6	73.0 ##
1998-2019	3950	20.0	9.2	41.3	95.4

3,950 cases diagnosed 1998-2019 are related to a total of 3,910 patients. Currently, in 1,129 (28.9 %) of these 3,910 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 840 / 231 / 58 (21.5 % / 5.9 % / 1.5 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 287 cases has been diagnosed, of which 19.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	10.6	74.2	100.0
1999	33	54.1	15.6	10.4	66.7	100.0
2000	23	46.9	16.1	10.3	73.9	100.0
2001	29	52.7	18.1	10.2	72.4	100.0
2002	54	56.3	14.1	9.9	61.1	96.3 #
2003	49	50.0	12.8	9.8	63.3	93.9
2004	72	57.6	13.1	9.4	54.2	94.4
2005	73	57.9	15.7	9.2	69.9	95.9
2006	95	61.3	15.5	8.7	62.1	93.7
2007	122	63.9	16.4	8.0	52.5	94.3 #
2008	96	51.1	16.5	7.5	51.0	100.0
2009	101	53.4	17.7	7.2	56.4	100.0
2010	106	49.1	19.1	7.2	49.1	97.2
2011	133	55.9	20.0	7.1	48.1	97.7
2012	129	49.6	20.5	5.9	45.0	94.6
2013	157	55.1	20.6	6.0	38.2	97.5
2014	140	49.8	20.4	5.0	43.6	97.9
2015	153	60.0	20.5	4.5	38.6	94.1
2016	151	52.2	20.9	4.2	39.7	100.0
2017	153	53.3	21.4	3.8	28.1	99.3
2018	115	50.4	21.7	3.6	17.4	100.0
2019	116	52.3	21.7	2.7	19.8	76.7 ##
1998-2019	2131	53.9	21.7	10.6	45.3	96.2

2,131 cases diagnosed 1998-2019 are related to a total of 2,105 patients. Currently, in 663 (31.5 %) of these 2,105 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 473 / 148 / 42 (22.5 % / 7.0 % / 2.0 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 153 cases has been diagnosed, of which 21.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

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

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	25	44.6	4.0	7.6	60.0	100.0
1999	28	45.9	9.4	7.6	50.0	85.7
2000	26	53.1	8.9	7.6	46.2	96.2
2001	26	47.3	10.5	7.6	46.2	100.0
2002	42	43.8	12.9	7.3	52.4	95.2 #
2003	49	50.0	13.8	7.2	57.1	93.9
2004	53	42.4	15.3	7.0	54.7	92.5
2005	53	42.1	15.9	6.9	45.3	90.6
2006	60	38.7	15.2	6.8	55.0	96.7
2007	69	36.1	15.5	6.6	58.0	85.5 #
2008	92	48.9	15.7	6.3	44.6	98.9
2009	88	46.6	15.4	5.7	44.3	100.0
2010	110	50.9	15.4	5.4	44.5	96.4
2011	105	44.1	14.6	4.8	35.2	98.1
2012	131	50.4	15.3	4.4	35.1	96.2
2013	128	44.9	15.3	4.6	28.1	95.3
2014	141	50.2	16.1	4.7	40.4	96.5
2015	102	40.0	16.7	3.5	28.4	91.2
2016	138	47.8	17.6	3.0	26.8	98.6
2017	134	46.7	17.8	1.8	20.1	98.5
2018	113	49.6	18.0	1.4	18.6	99.1
2019	106	47.7	18.0	1.0	15.1	68.9 ##
1998-2019	1819	46.1	18.0	7.6	36.5	94.4

1,819 cases diagnosed 1998-2019 are related to a total of 1,805 patients. Currently, in 466 (25.8 %) of these 1,805 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 367 / 83 / 16 (20.3 % / 4.6 % / 0.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 134 cases has been diagnosed, of which 17.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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 4.92 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	54	42	2.9	2.1	1.9	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	72	53	3.8	2.7	2.3	1.6	3.2	2.1	3.9	2.4
2005	73	53	3.9	2.7	2.3	1.4	3.2	1.9	3.8	2.3
2006	95	60	5.0	3.0	2.8	1.7	3.9	2.2	4.8	2.6
2007	122	69	5.5	3.0	3.5	1.8	4.6	2.3	5.3	2.6
2008	96	92	4.3	4.0	2.6	2.2	3.5	2.9	4.2	3.4
2009	101	88	4.5	3.8	2.5	2.3	3.6	2.9	4.3	3.4
2010	106	110	4.7	4.7	2.7	2.8	3.8	3.7	4.5	4.2
2011	133	105	5.9	4.5	3.3	2.8	4.5	3.5	5.5	4.0
2012	129	131	5.7	5.6	3.2	3.6	4.4	4.4	5.3	5.0
2013	157	128	6.8	5.4	3.9	3.2	5.4	4.2	6.3	4.7
2014	140	141	6.0	5.9	3.4	3.1	4.6	4.2	5.6	4.9
2015	153	102	6.4	4.2	3.6	2.4	5.0	3.1	5.9	3.6
2016	151	138	6.3	5.6	3.7	3.3	4.9	4.3	5.8	4.9
2017	153	134	6.3	5.4	3.5	3.4	4.8	4.3	5.7	4.9
2018	115	113	4.7	4.6	2.6	2.6	3.6	3.4	4.3	4.0
2019	116	106	4.8	4.3	2.7	2.4	3.7	3.2	4.3	3.7
1998-2019	2131	1819	4.8	4.0	2.8	2.4	3.9	3.0	4.6	3.5

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



Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			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	96	60.9	15.8	17.7	90.9	36.0	50.7	62.6	71.9	80.3
2003	98	62.5	13.0	23.5	87.5	48.1	55.4	63.4	72.3	78.9
2004	125	61.5	14.5	13.8	93.3	40.8	52.8	63.1	72.2	77.8
2005	126	64.0	14.9	16.1	90.8	42.4	56.3	66.1	74.8	81.0
2006	155	64.3	13.1	16.8	91.9	45.6	56.2	66.7	73.8	79.2
2007	191	61.5	15.2	13.4	91.2	41.0	54.0	64.0	71.1	79.3
2008	188	62.2	15.6	18.9	93.9	39.7	52.8	65.8	73.0	80.2
2009	189	63.6	16.4	12.4	92.6	38.6	55.5	65.4	75.3	84.1
2010	216	62.5	14.2	14.9	92.4	44.6	53.9	62.7	72.7	80.1
2011	238	62.1	16.1	15.5	92.9	41.1	51.3	64.7	73.8	81.1
2012	260	61.2	18.1	9.7	101	31.0	52.5	64.9	74.6	80.4
2013	285	61.5	15.5	14.2	96.5	40.7	52.3	63.8	73.6	77.6
2014	281	63.9	16.0	15.8	94.1	42.8	53.6	67.2	75.2	82.2
2015	255	63.1	16.4	11.4	92.0	42.3	53.3	65.6	75.5	80.9
2016	289	62.0	15.6	15.8	98.3	41.4	53.8	64.2	73.9	80.2
2017	287	61.8	16.2	14.5	92.3	36.6	52.5	63.7	74.3	80.3
2018	228	62.7	15.2	17.8	90.4	43.8	53.6	64.7	75.1	79.6
2019	222	62.8	15.0	17.7	96.9	43.9	53.3	64.4	74.8	80.3
1998-2019	3950	62.3	15.6	9.7	101	41.1	53.5	64.4	74.0	80.1

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			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	54	59.9	12.2	27.1	88.3	42.3	53.4	60.7	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	72	62.1	11.8	27.8	78.9	47.7	53.9	63.3	71.2	76.4
2005	73	64.0	13.7	19.0	87.6	46.3	57.8	65.4	74.5	77.6
2006	95	64.5	12.3	16.8	85.7	48.1	59.0	67.2	73.5	77.0
2007	122	61.3	14.0	15.8	91.2	42.3	54.8	63.2	69.6	78.1
2008	96	61.6	13.9	19.3	85.6	40.5	53.9	63.4	70.9	79.1
2009	101	65.6	13.2	12.4	89.0	50.6	58.6	67.1	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	133	64.5	13.1	15.5	89.3	46.5	55.8	66.6	73.8	80.7
2012	129	63.4	15.1	9.7	89.0	42.5	54.3	65.7	74.7	80.4
2013	157	62.3	13.8	19.4	90.4	45.2	52.7	63.0	73.0	78.3
2014	140	63.5	15.8	20.3	92.6	41.4	54.3	66.9	74.8	82.1
2015	153	63.2	15.2	18.3	87.7	42.5	53.1	65.6	74.8	80.2
2016	151	62.6	15.7	15.8	90.1	41.7	53.8	65.2	74.3	80.6
2017	153	64.3	14.6	19.1	92.3	47.3	55.5	67.1	74.7	80.3
2018	115	63.3	14.7	17.8	90.4	43.9	55.1	65.2	75.3	79.4
2019	116	62.5	14.9	22.6	89.3	42.2	53.5	63.0	75.0	79.9
1998-2019	2131	63.1	14.1	9.7	92.6	45.0	54.8	64.8	73.6	79.4

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	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	53	64.1	16.6	16.1	90.8	40.7	55.6	67.8	76.6	82.5
2006	60	64.0	14.4	29.9	91.9	43.8	52.5	64.5	74.0	83.0
2007	69	61.9	17.3	13.4	88.4	37.8	53.1	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	88	61.3	19.2	15.9	92.6	30.7	49.9	62.6	76.5	84.9
2010	110	61.0	15.6	14.9	89.6	39.8	50.9	61.2	72.7	80.0
2011	105	59.2	18.9	16.5	92.9	33.0	46.3	61.7	73.0	81.5
2012	131	59.1	20.6	13.7	101	25.8	45.6	63.3	74.6	80.4
2013	128	60.5	17.3	14.2	96.5	33.6	51.7	64.9	73.9	77.0
2014	141	64.3	16.3	15.8	94.1	43.5	52.8	67.4	76.6	82.2
2015	102	62.9	18.2	11.4	92.0	36.8	54.7	66.7	76.0	81.7
2016	138	61.4	15.5	16.1	98.3	41.4	53.1	62.5	72.0	79.8
2017	134	58.9	17.5	14.5	90.4	31.7	48.3	61.4	71.4	79.1
2018	113	62.0	15.7	19.3	87.1	43.8	52.0	62.8	74.5	79.7
2019	106	63.1	15.2	17.7	96.9	45.8	52.4	64.7	74.7	81.7
1998-2019	1819	61.4	17.2	11.4	101	36.4	50.9	63.9	74.4	81.3

Table 4

Age distribution by 5-year age group and sex for period 2007-2019

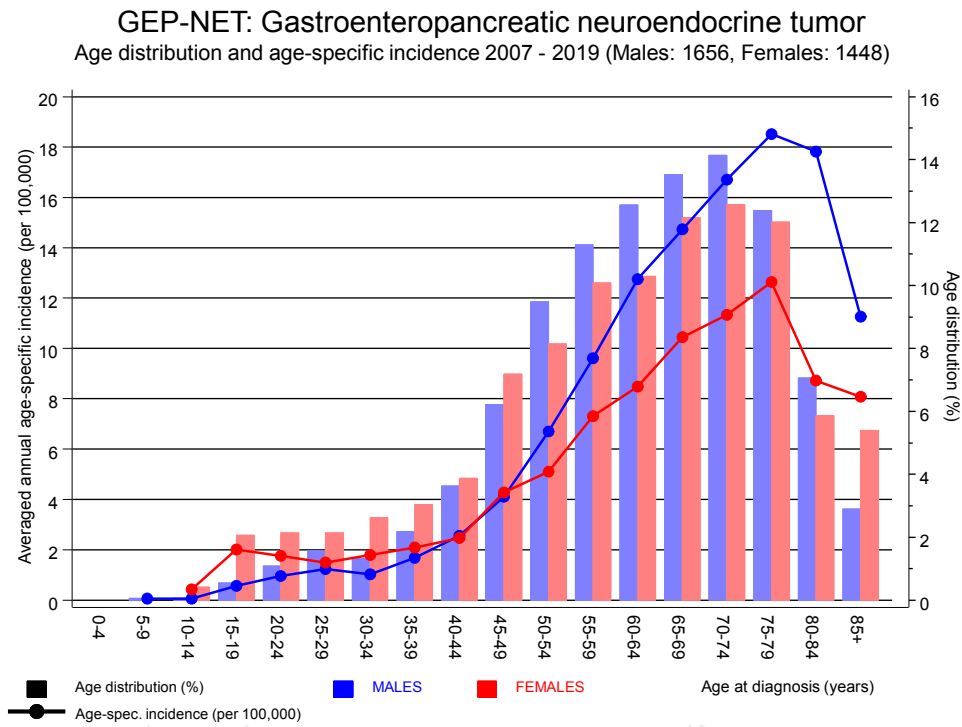
Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9	1	0.0	0.0	1	0.1	0.1			0.0
10-14	7	0.2	0.3	1	0.1	0.1	6	0.4	0.4
15-19	39	1.2	1.5	9	0.5	0.7	30	2.1	2.5
20-24	49	1.6	3.1	18	1.1	1.7	31	2.1	4.6
25-29	57	1.8	4.9	26	1.6	3.3	31	2.1	6.7
30-34	60	1.9	6.8	22	1.3	4.6	38	2.6	9.3
35-39	81	2.6	9.4	37	2.2	6.8	44	3.0	12.4
40-44	116	3.7	13.1	60	3.6	10.4	56	3.8	16.2
45-49	210	6.7	19.8	104	6.2	16.6	106	7.3	23.5
50-54	275	8.8	28.6	157	9.4	26.0	118	8.1	31.6
55-59	333	10.6	39.2	187	11.2	37.2	146	10.0	41.6
60-64	360	11.5	50.8	211	12.6	49.8	149	10.2	51.8
65-69	407	13.0	63.8	229	13.7	63.5	178	12.2	64.0
70-74	419	13.4	77.1	237	14.2	77.7	182	12.5	76.5
75-79	383	12.2	89.4	205	12.3	90.0	178	12.2	88.7
80-84	205	6.6	95.9	119	7.1	97.1	86	5.9	94.6
85+	127	4.1	100.0	49	2.9	100.0	78	5.4	100.0
All ages	3129	100.0		1672	100.0		1457	100.0	

Table 5

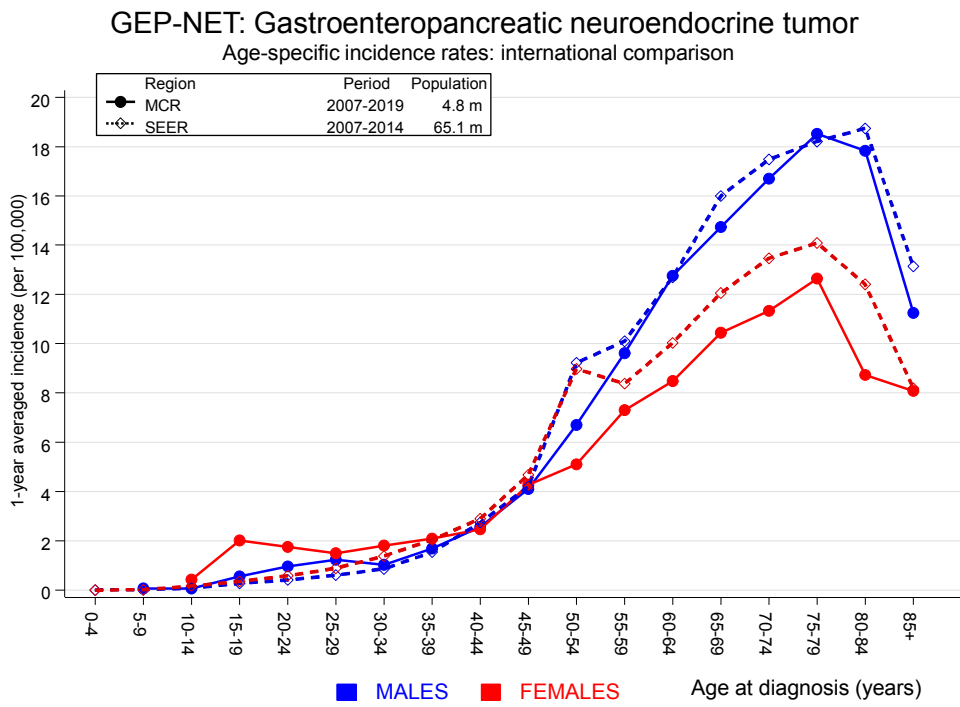
Age-specific incidence and proportion of all cancers for period 2007-2019

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males Prop.all cancers n=143063 %	Females Prop.all cancers n=144724 %
0- 4						
5- 9	1		0.1		0.9	
10-14	1	6	0.1	0.4	0.8	5.1
15-19	9	30	0.6	2.0	3.0	12.1
20-24	18	31	1.0	1.8	3.1	6.5
25-29	26	31	1.2	1.5	3.0	2.8
30-34	22	38	1.0	1.8	1.8	1.9
35-39	36	44	1.7	2.1	2.1	1.3
40-44	60	56	2.6	2.5	2.3	1.0
45-49	103	104	4.1	4.3	2.2	1.2
50-54	157	118	6.7	5.1	2.0	1.0
55-59	187	146	9.6	7.3	1.6	1.2
60-64	208	149	12.8	8.5	1.3	1.0
65-69	224	176	14.7	10.4	1.0	1.0
70-74	234	182	16.7	11.3	0.9	1.0
75-79	205	174	18.5	12.6	0.9	1.0
80-84	117	85	17.8	8.7	0.8	0.6
85+	48	78	11.3	8.1	0.5	0.5
All ages	1656	1448			1.2	1.0
Incidence						
Raw			5.5	4.7		
WS			3.1	2.8		
ES			4.3	3.5		
BRD-S			5.1	4.1		

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=61.3 yrs, median=64.0 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 2019, based on the November 2018 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 1998–2019

## MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	1	0.8	1.2	0.0	6.8	0.3	100.0
C09-C10 Oropharynx	2	1.0	2.0	0.2	7.0	1.5	
C12-C13 Hypopharynx	3	0.6	5.4	1.1	15.9 #	3.7	
C15 Oesophagus	15	1.9	7.9	4.4	13.1 #	19.8	
C16 Stomach	13	3.3	3.9	2.1	6.7 #	14.6	
C17 Small intestine	9	0.6	15.8	7.2	30.0 #	12.7	
C18 Colon	48	8.3	5.8	4.3	7.7 #	60.1	
C19-C20 Rectum	21	4.8	4.4	2.7	6.7 #	24.5	
C21 Anus/canal	1	0.2	4.4	0.1	24.4	1.2	
C22 Liver	7	2.7	2.6	1.1	5.4 #	6.6	14.3
C23-C24 Bile	4	0.9	4.3	1.2	11.0 #	4.6	
C25 Pancreas	16	3.5	4.6	2.6	7.4 #	18.9	12.5
C32 Larynx	1	0.9	1.1	0.0	6.0	0.1	
C33-C34 Lung	27	10.7	2.5	1.7	3.7 #	24.6	7.4
C38,C45 Mesothelioma	1	0.6	1.6	0.0	9.0	0.6	
C40-C41 Bone	1	0.1	13.4	0.3	74.4	1.4	
C43 Malign. melanoma	13	4.2	3.1	1.7	5.3 #	13.3	
C46,C49 Soft tissue	4	0.5	8.0	2.2	20.6 #	5.3	
C61 Prostate	52	24.9	2.1	1.6	2.7 #	41.0	3.8
C62 Testis	1	0.3	2.9	0.1	15.9	1.0	100.0
C64 Kidney	14	3.2	4.4	2.4	7.4 #	16.4	
C65 Renal pelvis	2	0.4	5.1	0.6	18.4	2.4	
C66 Ureter	3	0.2	13.0	2.7	38.0 #	4.2	
C67 Bladder	4	3.9	1.0	0.3	2.6	0.1	
C69 Eye melanoma	1	0.1	10.1	0.3	56.5	1.4	
C70-C72 CNS cancer	2	1.2	1.7	0.2	6.2	1.3	
C73 Thyroid	4	0.7	6.0	1.6	15.3 #	5.0	25.0
C74-C80 Cancer others	1	0.2	5.8	0.1	32.1	1.2	
C76-C79 CUP	3	1.5	2.1	0.4	6.0	2.3	
C81 Hodgkin lymphoma	1	0.2	4.3	0.1	23.8	1.2	
C82-C85 NHL	16	3.8	4.3	2.4	6.9 #	18.5	6.3
C90 Mult. myeloma	2	1.2	1.7	0.2	6.3	1.3	
C91-C96 Leukaemia	4	1.3	3.0	0.8	7.7	4.0	50.0
Not observed	0	1.5	0.0	0.0	2.4	-2.3	
All further malignancies	297	90.1	3.3	2.9	3.7 #	312.9	4.4
Patients		2040					
Median age at next malignancy (years)		70.7					
Person-years		6613					
Mean observation time (years)		3.2					
Median observation time (years)		1.5					

# The occurrence of further specified malignancy is statistically significant.



Table 7b

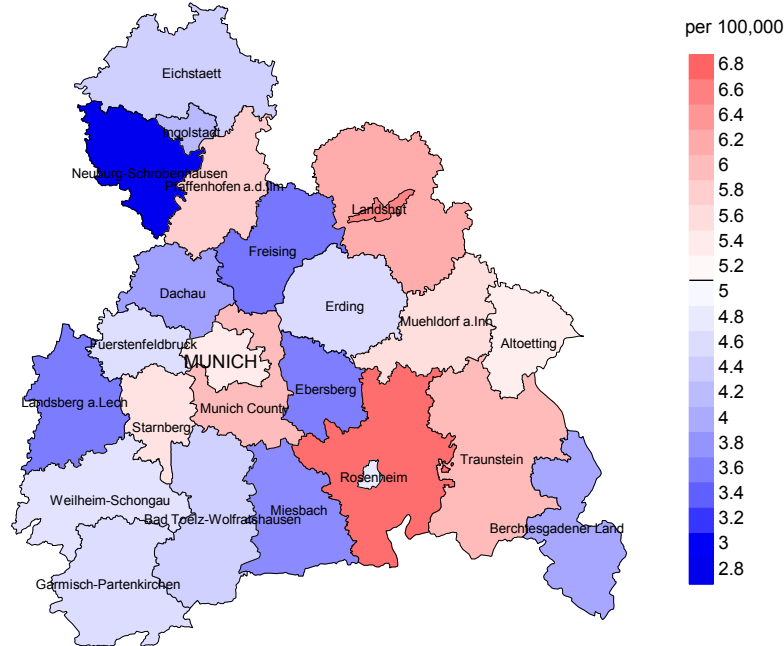
Standardized incidence ratio (SIR, with 95% confidence limits),  
excess absolute risk (EAR) and DCO rate of further malignancies  
for period 1998-2019

## FEMALES

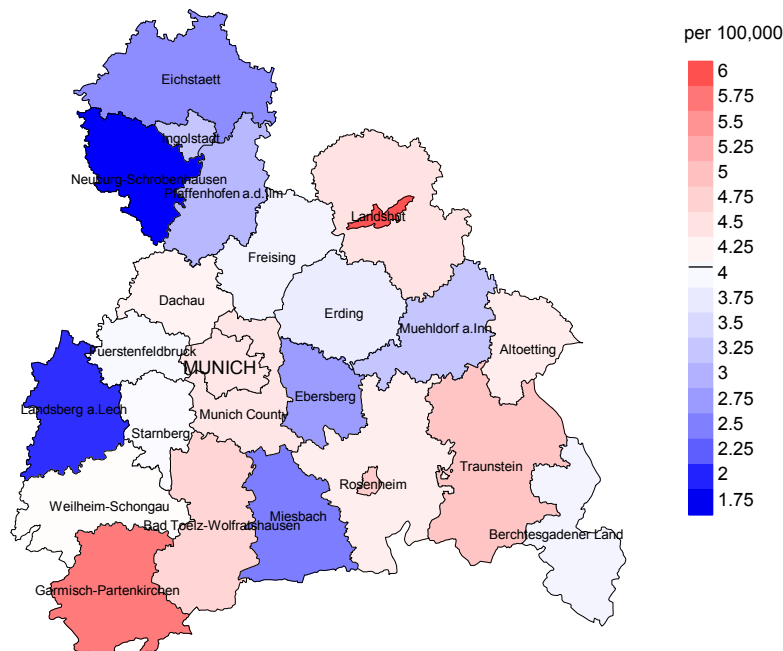
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C09-C10 Oropharynx	1	0.2	4.3	0.1	23.7	1.3	
C15 Oesophagus	3	0.4	8.3	1.7	24.2 #	4.5	
C16 Stomach	12	1.7	7.2	3.7	12.5 #	17.6	16.7
C17 Small intestine	8	0.3	26.3	11.4	51.8 #	13.2	
C18 Colon	31	4.8	6.4	4.4	9.1 #	44.7	
C19-C20 Rectum	11	2.0	5.5	2.7	9.8 #	15.4	9.1
C21 Anus/canal	1	0.3	3.3	0.1	18.4	1.2	
C22 Liver	2	0.7	3.1	0.4	11.1	2.3	
C25 Pancreas	14	2.4	5.8	3.2	9.8 #	19.8	7.1
C33-C34 Lung	15	4.2	3.6	2.0	5.9 #	18.5	26.7
C43 Malign. melanoma	6	2.1	2.8	1.0	6.1 #	6.6	
C48 Peritoneal	1	0.2	4.4	0.1	24.4	1.3	
C50 Breast	44	17.3	2.5	1.8	3.4 #	45.7	4.5
C51 Vulva	1	0.6	1.8	0.0	10.0	0.8	
C53 Cervix uteri	5	0.8	6.3	2.0	14.7 #	7.2	20.0
C54 Corpus uteri	5	3.0	1.7	0.5	3.9	3.4	
C56 Ovary	11	2.1	5.1	2.6	9.2 #	15.1	9.1
C64 Kidney	8	1.2	6.7	2.9	13.2 #	11.6	12.5
C66 Ureter	2	0.1	23.4	2.8	84.7 #	3.3	
C67 Bladder	1	1.0	1.0	0.0	5.7	0.0	
C69 Eye carcinoma	1	0.0	87.0	2.2	484.5 #	1.7	
C69 Eye melanoma	1	0.1	16.3	0.4	91.0	1.6	
C70-C72 CNS cancer	1	0.7	1.5	0.0	8.2	0.6	
C73 Thyroid	1	1.0	1.0	0.0	5.6	-0.0	
C76-C79 CUP	1	0.9	1.1	0.0	6.1	0.1	
C81 Hodgkin lymphoma	1	0.1	8.9	0.2	49.3	1.5	
C82-C85 NHL	8	2.0	4.0	1.7	7.8 #	10.2	
C90 Mult. myeloma	2	0.6	3.2	0.4	11.7	2.4	
C91-C96 Leukaemia	3	0.8	3.9	0.8	11.5	3.8	33.3
C96 Systemic	1	0.0	78.8	2.0	439.0 #	1.7	100.0
Not observed	0	2.5	0.0	0.0	1.5	-4.3	
All further malignancies	202	54.1	3.7	3.2	4.3 #	252.7	7.4
Patients		1734					
Median age at next malignancy (years)		70.3					
Person-years		5851					
Mean observation time (years)		3.4					
Median observation time (years)		1.8					

# The occurrence of further specified malignancy is statistically significant.

Average incidence (Germany 1987 standard population) 2007 - 2019: Males



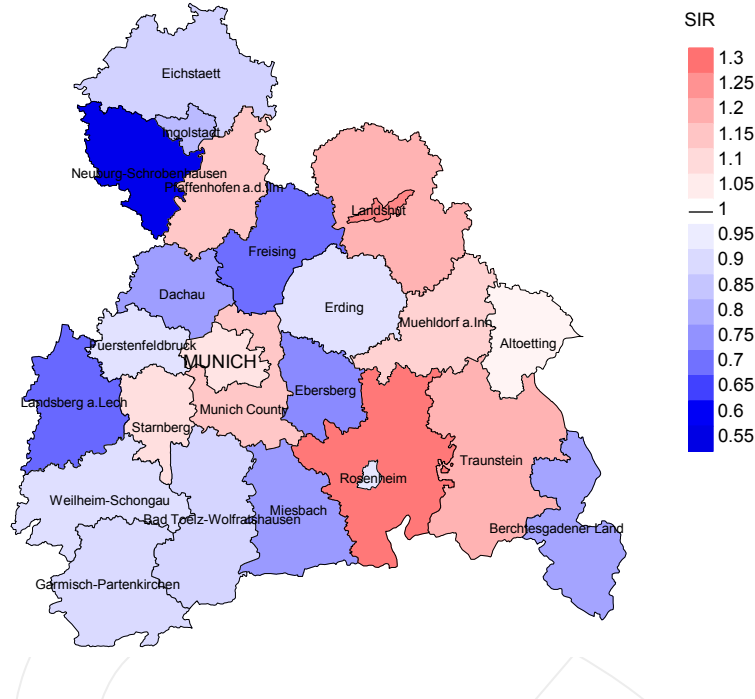
Average incidence (Germany 1987 standard population) 2007 - 2019: Females



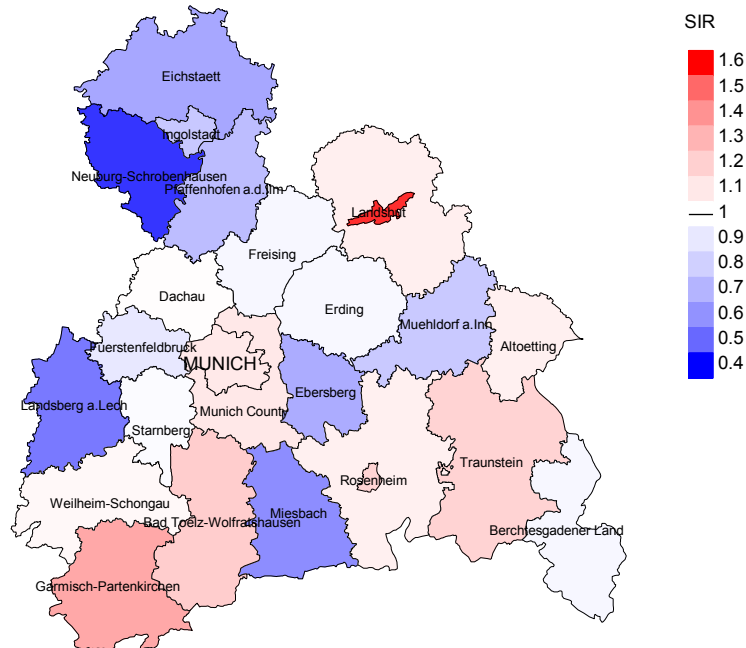
**Figure 8a.** Map of cancer incidence (german standard population) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 5.1/100,000 WS N=1,656, females 4.1/100,000 WS N=1,448).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 27 women were identified with newly diagnosed gastr.ent.panocr. neuroend. tumor. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.8/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.6 and 4.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females



**Figure 8b.** Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2019. 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=1,656, females N=1,448).

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 2019 a total of 27 women were identified with newly diagnosed gastr.ent.panocr. neuroend. tumor. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.67. Though, the value of this parameter may vary with an underlying probability of 99% between 0.39 and 1.08, 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 4.92 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	38	67.9	92.1
1999	61	93.4	36	59.0	97.2
2000	49	98.0	29	59.2	89.7
2001	55	100.0	33	60.0	93.9
2002	96	95.8	55	57.3	96.4
2003	98	93.9	59	60.2	98.3
2004	125	93.6	68	54.4	97.1
2005	126	93.7	75	59.5	93.3
2006	155	94.8	92	59.4	96.7
2007	191	91.1	104	54.5	96.2
2008	188	99.5	90	47.9	95.6
2009	189	100.0	96	50.8	97.9
2010	216	96.8	101	46.8	92.1
2011	238	97.9	101	42.4	96.0
2012	260	95.4	104	40.0	86.5
2013	285	96.5	96	33.7	89.6
2014	281	97.2	118	42.0	83.1
2015	255	92.9	88	34.5	87.5
2016	289	99.3	97	33.6	84.5
2017	287	99.0	70	24.4	61.4
2018	228	99.6	41	18.0	39.0
2019	222	73.0	39	17.6	84.6
1998-2019	3950	95.4	1630	41.3	89.4

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 4.92 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	96	29	11	11.5
2003	98	41	14	14.3
2004	125	45	11	8.8
2005	126	54	20	15.9
2006	155	51	15	9.7
2007	191	72	21	11.0
2008	188	83	23	12.2
2009	189	83	29	15.3
2010	216	84	22	10.2
2011	238	80	23	9.7
2012	260	107	33	12.7
2013	285	123	25	8.8
2014	281	134	37	13.2
2015	255	134	33	12.9
2016	289	118	27	9.3
2017	287	154	31	10.8
2018	228	108	12	5.3
2019	222	107	22	9.9
1998-2019	3950	1672	430	10.9

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 4.92 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	107	77.6	22.4	81.6
2013	123	80.5	19.5	83.5
2014	134	76.9	23.1	81.1
2015	134	75.4	24.6	79.1
2016	118	72.9	27.1	78.3
2017	154	74.0	26.0	78.5
2018	108	57.4	42.6	76.7
2019	107	67.3	32.7	74.5
1998–2019	1672	75.3	24.7	81.8

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	54	76.2	72.8	79.8	72.6
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	72	76.1	75.8	80.9	75.9
2017	101	75.1	73.5	76.1	73.5
2018	63	74.5	74.5	74.1	76.9
2019	59	70.5	67.9	77.3	70.5
1998-2019	984	72.7	70.5	77.2	71.2

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	50	74.7	71.4	88.1	72.4
2014	53	76.1	73.9	85.7	73.9
2015	61	77.7	73.2	82.2	76.7
2016	46	77.5	76.6	79.9	77.4
2017	53	76.8	76.6	80.2	75.8
2018	45	74.8	76.6	74.2	67.2
2019	48	75.7	71.9	82.0	73.9
1998-2019	688	75.9	73.2	81.6	74.3

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	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	0.37	0.6	0.34	0.9	0.35	1.1	0.38
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	0.35	0.7	0.29	1.0	0.33	1.4	0.37
2006	25	1.3	0.27	0.6	0.23	1.0	0.25	1.4	0.29
2007	32	1.4	0.27	0.7	0.21	1.1	0.24	1.4	0.27
2008	50	2.2	0.52	1.3	0.48	1.8	0.51	2.2	0.53
2009	35	1.6	0.35	0.8	0.31	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	0.29	0.9	0.27	1.3	0.29	1.6	0.29
2012	41	1.8	0.32	0.8	0.26	1.3	0.29	1.7	0.34
2013	60	2.6	0.39	1.2	0.30	1.8	0.34	2.4	0.39
2014	61	2.6	0.44	1.3	0.38	1.9	0.41	2.3	0.43
2015	56	2.4	0.37	1.2	0.33	1.8	0.36	2.1	0.36
2016	51	2.1	0.34	0.9	0.24	1.3	0.28	1.9	0.33
2017	74	3.1	0.49	1.4	0.41	2.1	0.44	2.7	0.48
2018	39	1.6	0.34	0.7	0.28	1.1	0.30	1.4	0.33
2019	42	1.7	0.36	0.9	0.32	1.2	0.33	1.5	0.36
1998-2019	750	1.7	0.35	0.8	0.30	1.3	0.33	1.7	0.36

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	0.18	0.4	0.20	0.5	0.23
2006	19	0.9	0.32	0.3	0.21	0.5	0.24	0.7	0.29
2007	28	1.2	0.41	0.6	0.34	0.8	0.37	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	0.23
2010	24	1.0	0.22	0.5	0.19	0.7	0.19	0.9	0.21
2011	25	1.1	0.24	0.5	0.18	0.7	0.20	0.9	0.22
2012	42	1.8	0.33	0.7	0.20	1.1	0.25	1.3	0.26
2013	39	1.6	0.30	0.7	0.22	1.0	0.24	1.3	0.27
2014	42	1.7	0.30	0.7	0.23	1.0	0.26	1.4	0.28
2015	45	1.8	0.44	0.8	0.31	1.1	0.36	1.4	0.38
2016	35	1.4	0.26	0.5	0.15	0.7	0.17	1.0	0.21
2017	40	1.6	0.30	0.6	0.17	0.9	0.21	1.2	0.24
2018	23	0.9	0.21	0.4	0.15	0.6	0.16	0.7	0.18
2019	30	1.2	0.28	0.5	0.22	0.8	0.24	1.0	0.26
1998-2019	509	1.1	0.28	0.5	0.20	0.7	0.23	0.9	0.25

Table 12

Age distribution of age at death (cancer-related) for period 2007-2019  
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	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	4	0.4	0.5	3	0.5	0.6	1	0.2	0.2
30-34	4	0.4	0.9			0.6	4	1.0	1.2
35-39	8	0.8	1.6	4	0.6	1.3	4	1.0	2.1
40-44	17	1.6	3.3	7	1.1	2.4	10	2.4	4.5
45-49	24	2.3	5.6	11	1.8	4.2	13	3.1	7.6
50-54	56	5.4	11.0	36	5.8	10.0	20	4.8	12.4
55-59	91	8.8	19.7	57	9.2	19.2	34	8.1	20.5
60-64	110	10.6	30.3	70	11.3	30.5	40	9.5	30.1
65-69	152	14.6	45.0	99	16.0	46.5	53	12.6	42.7
70-74	156	15.0	60.0	100	16.2	62.7	56	13.4	56.1
75-79	183	17.6	77.6	117	18.9	81.6	66	15.8	71.8
80-84	136	13.1	90.8	75	12.1	93.7	61	14.6	86.4
85+	96	9.2	100.0	39	6.3	100.0	57	13.6	100.0
All ages	1038	100.0		619	100.0		419	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2019  
(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	0.11			2.1	
20-24								
25-29	3	1	0.1	0.12	0.0	0.03	3.5	1.1
30-34		4			0.2	0.11		2.5
35-39	4	4	0.2	0.11	0.2	0.09	1.6	1.1
40-44	7	10	0.3	0.12	0.4	0.18	1.2	1.2
45-49	11	13	0.4	0.11	0.5	0.13	0.8	0.8
50-54	36	20	1.5	0.23	0.9	0.17	1.4	0.8
55-59	57	34	2.9	0.30	1.7	0.23	1.4	1.0
60-64	70	40	4.3	0.34	2.3	0.27	1.2	0.9
65-69	99	53	6.5	0.44	3.1	0.30	1.2	0.8
70-74	100	56	7.1	0.43	3.5	0.31	0.9	0.7
75-79	117	66	10.6	0.57	4.8	0.38	1.0	0.7
80-84	75	61	11.4	0.64	6.3	0.72	0.8	0.7
85+	39	57	9.1	0.81	5.9	0.73	0.5	0.5
All ages	619	419					1.0	0.7
Mortality								
Raw			2.1	0.37	1.3	0.29		
WS			1.0	0.31	0.6	0.20		
ES			1.5	0.34	0.8	0.23		
BRD-S			1.9	0.37	1.0	0.26		
PYLL-70								
per 100,000			10.8		8.0			
ES			9.3		6.7			
AYLL-70			9.9		11.7			

Table 14a

Further malignancies in deaths in period 1998-2019  
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	5	1.4	4	80.0			1	20.0
C07-C08 Salivary gland	1	0.3	1	100.0				
C09-C10 Oropharynx	1	0.3	1	100.0				
C12-C13 Hypopharynx	4	1.1	1	25.0			3	75.0
C15 Oesophagus	13	3.6	2	15.4	1	7.7	10	76.9
C16 Stomach	11	3.0	8	72.7	1	9.1	2	18.2
C17 Small intestine	8	2.2	2	25.0	4	50.0	2	25.0
C18 Colon	48	13.3	18	37.5	27	56.3	3	6.3
C19-C20 Rectum	19	5.3	9	47.4	8	42.1	2	10.5
C22 Liver	6	1.7			1	16.7	5	83.3
C23-C24 Bile	4	1.1	1	25.0	2	50.0	1	25.0
C25 Pancreas	20	5.5	3	15.0	11	55.0	6	30.0
C32 Larynx	3	0.8	3	100.0				
C33-C34 Lung	32	8.9	10	31.3	3	9.4	19	59.4
C38,C45 Mesothelioma	1	0.3					1	100.0
C43 Malign. melanoma	11	3.0	6	54.5	1	9.1	4	36.4
C44 Skin others	24	6.6	20	83.3			4	16.7
C46,C49 Soft tissue	4	1.1	1	25.0			3	75.0
C48 Peritoneal	1	0.3	1	100.0				
C50 Breast	1	0.3	1	100.0				
C61 Prostate	81	22.4	59	72.8	6	7.4	16	19.8
C62 Testis	3	0.8	2	66.7			1	33.3
C64 Kidney	15	4.2	9	60.0	3	20.0	3	20.0
C65 Renal pelvis	2	0.6					2	100.0
C66 Ureter	2	0.6					2	100.0
C67 Bladder	11	3.0	10	90.9			1	9.1
C70-C72 CNS cancer	2	0.6			1	50.0	1	50.0
C73 Thyroid	5	1.4	3	60.0			2	40.0
C76-C79 CUP	8	2.2	5	62.5	1	12.5	2	25.0
C81 Hodgkin lymphoma	1	0.3	1	100.0				
C82-C85 NHL	7	1.9	2	28.6	1	14.3	4	57.1
C90 Mult. myeloma	1	0.3					1	100.0
C91-C96 Leukaemia	6	1.7	2	33.3			4	66.7
All further malignancies	361	100.0	185	51.2	71	19.7	105	29.1

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 1998-2019  
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C15 Oesophagus	5	2.3			3	60.0	2	40.0
C16 Stomach	11	5.0	4	36.4	4	36.4	3	27.3
C17 Small intestine	4	1.8	1	25.0	2	50.0	1	25.0
C18 Colon	21	9.5	2	9.5	12	57.1	7	33.3
C19-C20 Rectum	16	7.3	4	25.0	8	50.0	4	25.0
C21 Anus/canal	1	0.5	1	100.0				
C23-C24 Bile	1	0.5			1	100.0		
C25 Pancreas	11	5.0	1	9.1	4	36.4	6	54.5
C33-C34 Lung	16	7.3	5	31.3	1	6.3	10	62.5
C38,C45 Mesothelioma	1	0.5	1	100.0				
C43 Malign. melanoma	4	1.8	4	100.0				
C44 Skin others	6	2.7	3	50.0			3	50.0
C46,C49 Soft tissue	1	0.5	1	100.0				
C48 Peritoneal	2	0.9	1	50.0	1	50.0		
C50 Breast	47	21.4	34	72.3	3	6.4	10	21.3
C51 Vulva	2	0.9	2	100.0				
C52 Vagina	1	0.5	1	100.0				
C53 Cervix uteri	3	1.4	1	33.3	1	33.3	1	33.3
C54 Corpus uteri	12	5.5	7	58.3	3	25.0	2	16.7
C55,C57 Fem. genitals un	1	0.5	1	100.0				
C56 Ovary	17	7.7	9	52.9	5	29.4	3	17.6
C64 Kidney	7	3.2	4	57.1	1	14.3	2	28.6
C65 Renal pelvis	2	0.9	1	50.0			1	50.0
C66 Ureter	2	0.9					2	100.0
C67 Bladder	6	2.7	3	50.0	1	16.7	2	33.3
C69 Eye melanoma	1	0.5					1	100.0
C70-C72 CNS cancer	1	0.5					1	100.0
C73 Thyroid	5	2.3	4	80.0			1	20.0
C76-C79 CUP	3	1.4	2	66.7			1	33.3
C81 Hodgkin lymphoma	2	0.9	2	100.0				
C82-C85 NHL	6	2.7	3	50.0			3	50.0
C91-C96 Leukaemia	1	0.5					1	100.0
C96 Systemic	1	0.5					1	100.0
All further malignancies	220	100.0	102	46.4	50	22.7	68	30.9

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 15

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2019  
(**First primaries only** \*)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1		0.1	0.11			2.2	
20-24								
25-29	3	1	0.1	0.12	0.0	0.03	3.9	1.2
30-34		2			0.1	0.06		1.4
35-39	4	2	0.2	0.12	0.1	0.05	1.8	0.6
40-44	6	9	0.3	0.11	0.4	0.18	1.1	1.3
45-49	11	10	0.4	0.12	0.4	0.11	0.9	0.7
50-54	33	17	1.4	0.25	0.7	0.17	1.5	0.8
55-59	45	24	2.3	0.30	1.2	0.20	1.3	0.8
60-64	58	31	3.6	0.33	1.8	0.25	1.2	0.8
65-69	76	37	5.0	0.49	2.2	0.31	1.1	0.7
70-74	67	43	4.8	0.43	2.7	0.33	0.8	0.7
75-79	69	46	6.2	0.58	3.3	0.38	0.8	0.7
80-84	38	43	5.8	0.61	4.4	0.68	0.6	0.7
85+	26	40	6.1	1.04	4.1	0.71	0.4	0.5
All ages	437	305					0.9	0.7
Mortality								
Raw			1.5	0.35	1.0	0.27		
WS			0.7	0.30	0.4	0.18		
ES			1.1	0.33	0.6	0.21		
BRD-S			1.3	0.35	0.8	0.23		
PYLL-70								
per 100,000			9.4		6.0			
ES			8.1		5.1			
AYLL-70			10.5		11.9			

\* See corresponding tables with multiple malignancies.

Table 16

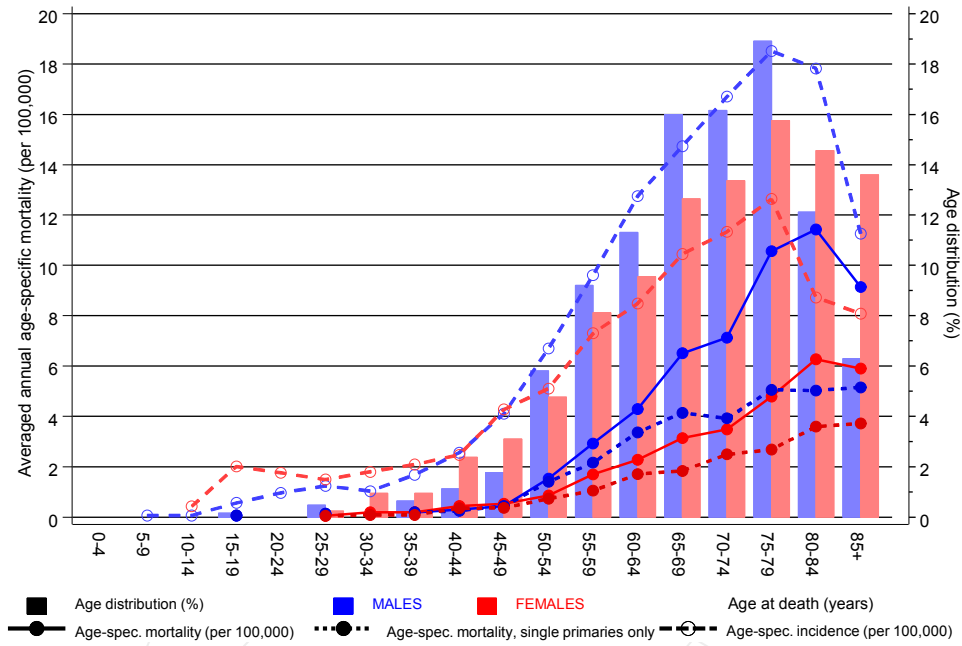
Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2019  
(**Single primaries only \***)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1		0.1	0.11			2.2	
20-24								
25-29	3	1	0.1	0.12	0.0	0.03	3.9	1.2
30-34		2			0.1	0.06		1.5
35-39	4	2	0.2	0.13	0.1	0.05	1.8	0.6
40-44	6	8	0.3	0.11	0.4	0.18	1.1	1.1
45-49	11	9	0.4	0.13	0.4	0.11	0.9	0.7
50-54	33	17	1.4	0.26	0.7	0.18	1.5	0.8
55-59	42	21	2.2	0.30	1.1	0.19	1.2	0.7
60-64	55	30	3.4	0.36	1.7	0.26	1.1	0.8
65-69	63	31	4.1	0.45	1.8	0.29	0.9	0.6
70-74	55	40	3.9	0.40	2.5	0.33	0.7	0.7
75-79	56	37	5.1	0.51	2.7	0.34	0.7	0.6
80-84	33	35	5.0	0.57	3.6	0.61	0.5	0.6
85+	22	36	5.2	0.92	3.7	0.65	0.4	0.4
All ages	384	269					0.8	0.6
Mortality								
Raw			1.3	0.34	0.9	0.25		
WS			0.7	0.29	0.4	0.17		
ES			1.0	0.31	0.5	0.20		
BRD-S			1.2	0.33	0.7	0.22		
PYLL-70								
per 100,000			9.0		5.6			
ES			7.8		4.7			
AYLL-70			11.0		12.1			

\* See corresponding tables with multiple malignancies.



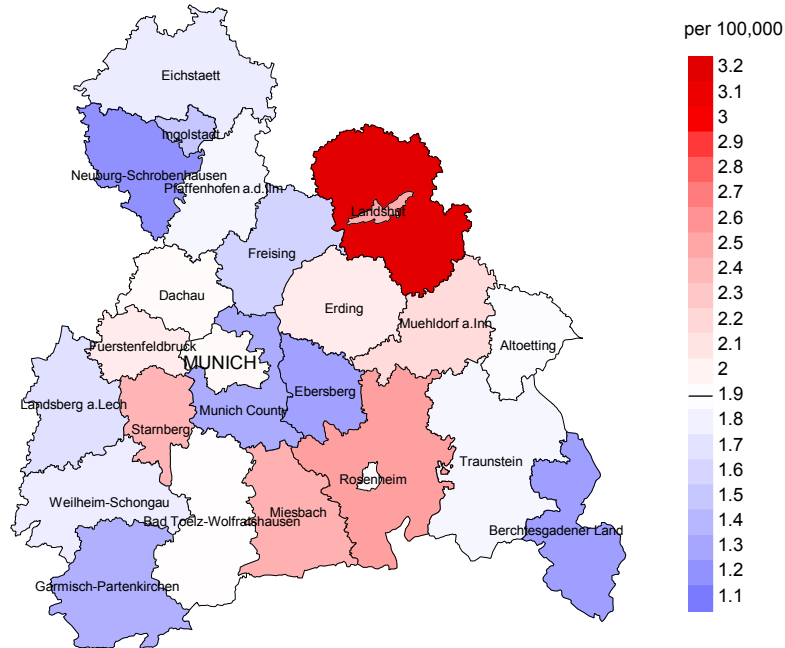
GEP-NET: Gastroenteropancreatic neuroendocrine tumor  
 Age distribution and age-specific mortality 2007 - 2019 (Males: 619, Females: 419)



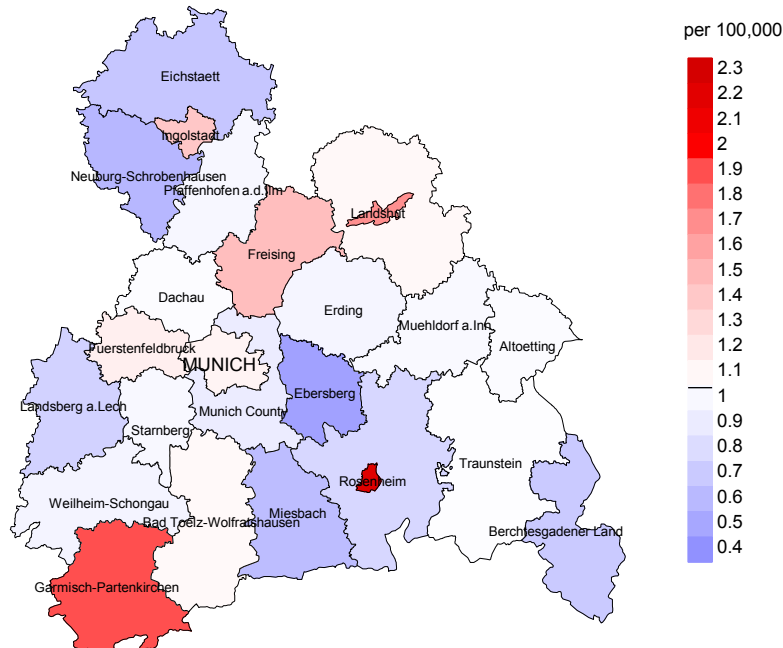
**Figure 17.** Distribution of age at death (bars; males: mean=66.8 yrs, median=67.8 yrs; females: mean=68.2 yrs, median=70.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed 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.

Average mortality (Germany 1987 standard population) 2007 - 2019: Males



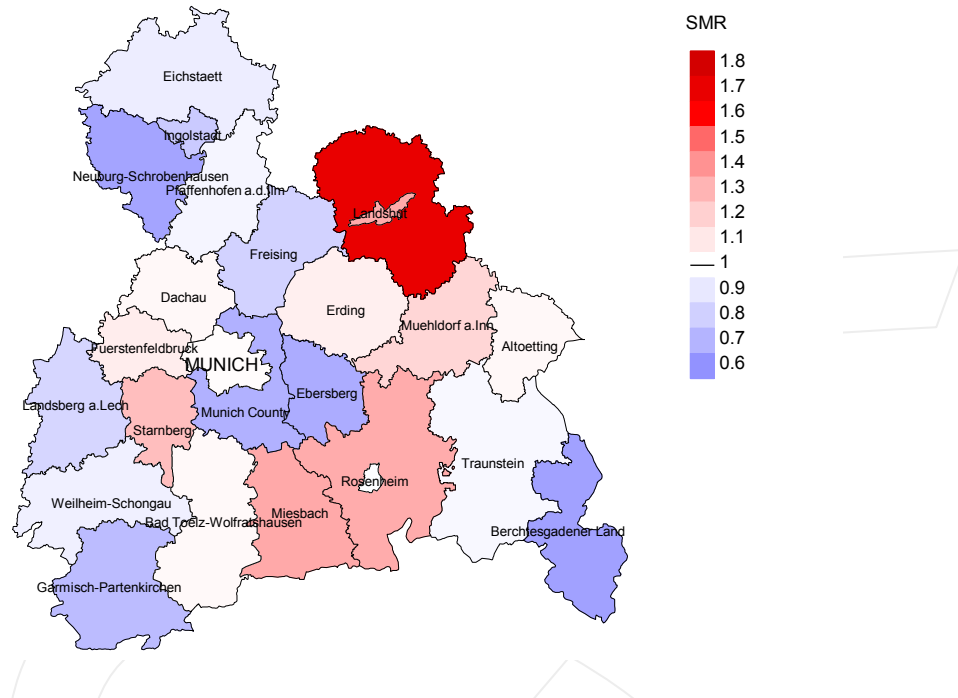
Average mortality (Germany 1987 standard population) 2007 - 2019: Females



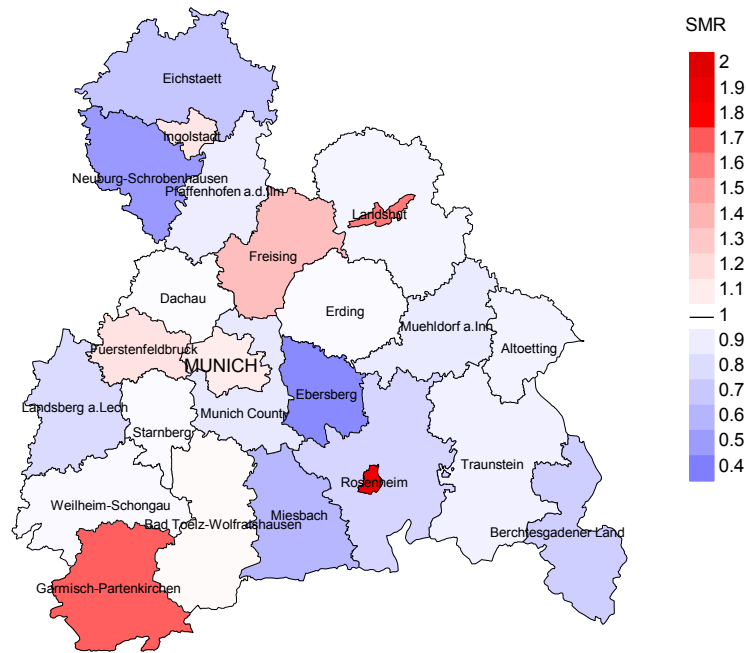
**Figure 18a.** Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.9/100,000 WS N=619, females 1.0/100,000 WS N=419).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 5 women died from gastr.ent.panocr. neuroend. tumor. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.4/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females



**Figure 18b.** Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2019. 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=619, females N=419).

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 2019 a total of 5 women died from gastr.ent.panchr. neuroend. tumor. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.44. Though, the value of this parameter may vary with an underlying probability of 99% between 0.09 and 1.24, 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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