Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

P-NET: Pancr. neuroend. tumor

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	750
Diseases	750
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

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

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

https://www.tumorregister-muenchen.de/en/facts/base/bhPNETE-P-NET-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, December 2021

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

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

Code	Description
C25.-	Malignant neoplasm of pancreas
C25.0	Head of pancreas
C25.1	Body of pancreas
C25.2	Tail of pancreas
C25.3	Pancreatic duct
C25.4	Endocrine pancreas
C25.7	Other parts of pancreas
C25.8	Overlapping lesion of pancreas
C25.9	Pancreas, unspecified

... 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
8152/3	Glucagonoma, malignant
8153/3	Gastrinoma, malignant
8155/3	Vipoma, malignant
8156/3	Somatostatinoma, malignant
8240/3	Carcinoid tumor, NOS
8241/3	Enterochromaffin cell carcinoid
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	9	11.1	7.8	88.9	100.0
1999	6	13.3	7.8	83.3	100.0
2000	5	10.0	7.7	80.0	100.0
2001	4	12.5	7.7	75.0	100.0
2002	13	10.8	7.4	84.6	100.0 #
2003	14	13.7	7.4	78.6	100.0
2004	11	14.5	7.4	72.7	100.0
2005	18	15.0	7.3	66.7	94.4
2006	14	16.0	6.9	78.6	100.0
2007	28	17.2	6.7	53.6	89.3 #
2008	18	15.7	6.5	61.1	94.4
2009	27	15.6	5.9	85.2	100.0
2010	39	18.4	6.0	66.7	100.0
2011	44	18.0	5.8	54.5	100.0
2012	54	19.4	5.8	50.0	96.3
2013	50	19.2	6.0	54.0	96.0
2014	44	18.8	5.5	52.3	97.7
2015	45	18.5	5.6	33.3	93.3
2016	58	20.6	4.7	39.7	100.0
2017	63	20.9	4.2	38.1	100.0
2018	51	20.8	4.5	11.8	98.0
2019	73	20.6	1.5	19.2	98.6
2020	62	20.4	0.0	9.7	100.0 ##
1998-2020	750	20.4	7.8	44.9	98.0

750 cases diagnosed 1998-2020 are related to a total of 750 patients. Currently, in 210 (28.0 %) of these 750 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 155 / 42 / 13 (20.7 % / 5.6 % / 1.7 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 51 cases has been diagnosed, of which 20.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.5 % 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	6	66.7	16.7	8.1	100.0	100.0	
1999	6	100.0	16.7	8.0	83.3	100.0	
2000	3	60.0	13.3	7.9	66.7	100.0	
2001	2	50.0	17.6	7.9	100.0	100.0	
2002	10	76.9	14.8	7.7	80.0	100.0	#
2003	6	42.9	15.2	7.9	100.0	100.0	
2004	9	81.8	16.7	7.8	77.8	100.0	
2005	10	55.6	17.3	7.7	80.0	90.0	
2006	12	85.7	18.8	7.0	75.0	100.0	
2007	19	67.9	19.3	6.9	47.4	94.7	#
2008	7	38.9	18.9	6.4	57.1	100.0	
2009	15	55.6	19.0	6.5	80.0	100.0	
2010	22	56.4	22.0	6.5	77.3	100.0	
2011	24	54.5	21.2	6.3	62.5	100.0	
2012	28	51.9	22.3	6.5	57.1	100.0	
2013	21	42.0	22.0	6.4	71.4	100.0	
2014	22	50.0	21.2	5.6	54.5	100.0	
2015	27	60.0	20.1	5.7	37.0	96.3	
2016	25	43.1	20.8	5.4	44.0	100.0	
2017	35	55.6	21.0	4.8	45.7	100.0	
2018	25	49.0	21.0	5.4	12.0	100.0	
2019	40	54.8	21.1	1.4	15.0	100.0	
2020	31	50.0	21.0	0.0	12.9	100.0	##
1998-2020	405	54.0	21.0	8.1	50.1	99.3	

405 cases diagnosed 1998-2020 are related to a total of 405 patients. Currently, in 118 (29.1 %) of these 405 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 83 / 29 / 6 (20.5 % / 7.2 % / 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 25 cases has been diagnosed, of which 21.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.4 % 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	3	33.3	0.0	7.4	66.7	100.0
1999	0					
2000	2	40.0	0.0	7.5	100.0	100.0
2001	2	50.0	0.0	7.5	50.0	100.0
2002	3	23.1	0.0	7.0	100.0	100.0 #
2003	8	57.1	11.1	6.7	62.5	100.0
2004	2	18.2	10.0	6.9	50.0	100.0
2005	8	44.4	10.7	6.9	50.0	100.0
2006	2	14.3	10.0	6.8	100.0	100.0
2007	9	32.1	12.8	6.5	66.7	77.8 #
2008	11	61.1	10.0	6.7	63.6	90.9
2009	12	44.4	9.7	5.2	91.7	100.0
2010	17	43.6	12.7	5.4	52.9	100.0
2011	20	45.5	13.1	5.4	45.0	100.0
2012	26	48.1	15.2	5.0	42.3	92.3
2013	29	58.0	15.6	5.6	41.4	93.1
2014	22	50.0	15.9	5.4	50.0	95.5
2015	18	40.0	16.5	5.5	27.8	88.9
2016	33	56.9	20.3	4.1	36.4	100.0
2017	28	44.4	20.8	3.5	28.6	100.0
2018	26	51.0	20.6	3.5	11.5	96.2
2019	33	45.2	20.1	1.7	24.2	97.0
2020	31	50.0	19.7	0.0	6.5	100.0 ##
1998-2020	345	46.0	19.7	7.4	38.8	96.5

345 cases diagnosed 1998-2020 are related to a total of 345 patients. Currently, in 92 (26.7 %) of these 345 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 72 / 13 / 7 (20.9 % / 3.8 % / 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 26 cases has been diagnosed, of which 20.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.5 % 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 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	6	3	0.5	0.3	0.3	0.2	0.5	0.2	0.6	0.3
1999	6		0.5		0.4		0.5		0.5	
2000	3	2	0.3	0.2	0.2	0.1	0.2	0.1	0.3	0.1
2001	2	2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
2002	10	3	0.5	0.2	0.4	0.0	0.5	0.1	0.5	0.1
2003	6	8	0.3	0.4	0.2	0.3	0.3	0.4	0.3	0.4
2004	9	2	0.5	0.1	0.3	0.1	0.4	0.1	0.5	0.1
2005	10	8	0.5	0.4	0.3	0.2	0.4	0.3	0.5	0.3
2006	12	2	0.6	0.1	0.4	0.0	0.5	0.1	0.6	0.1
2007	19	9	0.9	0.4	0.6	0.2	0.8	0.3	0.8	0.4
2008	7	11	0.3	0.5	0.2	0.3	0.3	0.3	0.3	0.4
2009	15	12	0.7	0.5	0.4	0.2	0.5	0.4	0.6	0.4
2010	22	17	1.0	0.7	0.5	0.4	0.8	0.6	0.9	0.7
2011	24	20	1.1	0.9	0.6	0.5	0.9	0.6	1.0	0.7
2012	28	26	1.2	1.1	0.7	0.6	0.9	0.8	1.1	1.0
2013	21	29	0.9	1.2	0.4	0.7	0.6	0.9	0.8	1.0
2014	22	22	0.9	0.9	0.5	0.5	0.7	0.6	0.9	0.8
2015	27	18	1.1	0.7	0.7	0.3	0.9	0.4	1.0	0.6
2016	25	33	1.0	1.3	0.6	0.8	0.8	1.0	1.0	1.2
2017	35	28	1.5	1.1	0.7	0.6	1.1	0.8	1.3	1.0
2018	25	26	1.0	1.0	0.6	0.7	0.8	0.9	0.9	1.0
2019	40	33	1.6	1.3	1.0	0.8	1.3	1.0	1.5	1.2
2020	31	31	1.3	1.2	0.7	0.7	0.9	1.0	1.1	1.1
1998-2020	405	345	0.9	0.7	0.5	0.4	0.7	0.5	0.8	0.6

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.	10%	25%	Median 50%	75%	90%
1998	9	59.0	14.1	28.2	77.8	28.2	57.0	62.0	63.4	77.8
1999	6	58.5	16.4	27.6	72.2	27.6	53.5	64.9	67.7	72.2
2000	5	57.9	17.5	33.1	74.8	33.1	50.0	57.5	73.9	74.8
2001	4	56.6	12.2	38.6	65.1	38.6	49.3	61.3	63.8	65.1
2002	13	59.9	15.2	36.0	87.6	42.3	49.0	64.3	66.3	83.5
2003	14	58.2	11.1	37.1	77.0	46.6	50.2	56.5	67.3	74.6
2004	11	60.7	12.2	40.8	77.5	46.1	48.3	62.3	74.1	76.2
2005	18	62.8	13.2	36.2	83.5	42.1	55.6	66.4	70.4	77.5
2006	14	58.6	19.3	16.8	78.1	29.1	42.3	64.8	73.1	76.8
2007	28	59.1	11.5	35.3	82.3	44.9	51.3	59.0	68.2	71.5
2008	18	57.6	18.3	23.8	81.2	28.0	47.1	56.8	74.8	79.4
2009	27	66.1	12.9	27.9	85.0	50.2	59.9	67.5	75.3	84.3
2010	39	63.0	12.5	37.5	83.6	46.3	52.5	62.4	74.6	79.0
2011	44	62.1	12.0	34.6	80.5	43.7	52.0	64.6	71.0	74.4
2012	54	62.6	14.9	27.6	101	42.3	56.2	66.0	71.6	76.5
2013	50	66.0	12.7	14.2	86.3	51.3	58.3	68.9	74.7	77.8
2014	44	64.7	11.8	38.5	82.9	47.4	56.4	67.2	74.3	77.9
2015	45	65.2	14.1	23.4	90.2	47.7	55.9	67.9	75.6	79.2
2016	58	60.4	15.1	18.8	83.3	41.4	46.5	59.2	74.5	78.6
2017	63	64.6	14.0	23.3	85.8	43.1	58.3	67.1	74.4	79.1
2018	51	59.1	16.0	24.4	83.2	40.3	46.7	57.1	74.3	79.4
2019	73	60.9	14.1	23.5	83.0	41.8	50.7	62.2	71.3	77.7
2020	62	62.3	13.5	29.8	86.8	45.2	53.6	61.9	73.7	79.7
1998-2020	750	62.2	14.0	14.2	101	43.7	52.3	64.3	73.1	78.4

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	6	66.0	7.1	58.9	77.8	58.9	62.0	63.0	71.5	77.8
1999	6	58.5	16.4	27.6	72.2	27.6	53.5	64.9	67.7	72.2
2000	3	60.5	12.2	50.0	73.9	50.0	50.0	57.5	73.9	73.9
2001	2	61.3	1.7	60.1	62.5	60.1	60.1	61.3	62.5	62.5
2002	10	54.2	11.0	36.0	66.8	39.2	46.4	53.1	65.1	66.2
2003	6	63.2	10.4	48.1	77.0	48.1	55.1	64.9	69.2	77.0
2004	9	62.7	12.4	40.8	77.5	40.8	58.7	63.0	74.1	77.5
2005	10	65.3	14.4	36.2	83.5	41.2	62.8	67.8	74.9	80.5
2006	12	56.9	20.5	16.8	78.1	29.1	40.4	60.8	73.9	76.8
2007	19	57.9	9.4	35.3	71.0	44.9	51.4	57.6	64.9	69.8
2008	7	51.0	17.7	28.0	79.4	28.0	35.4	49.3	67.5	79.4
2009	15	65.2	10.3	46.7	84.3	50.2	60.3	67.1	68.9	78.7
2010	22	65.6	11.0	44.6	83.6	52.8	58.0	64.4	74.6	79.0
2011	24	62.7	9.8	43.8	80.5	48.4	53.7	63.7	69.9	73.1
2012	28	63.5	13.9	27.6	84.2	42.1	59.5	68.4	71.4	76.8
2013	21	68.2	9.6	46.3	81.8	52.2	63.9	71.0	75.4	77.0
2014	22	64.8	12.3	38.5	82.9	47.8	56.4	67.3	73.9	79.1
2015	27	60.8	14.8	23.4	79.7	35.4	51.3	63.7	74.1	78.7
2016	25	61.5	16.5	18.8	83.3	43.1	50.2	62.8	75.1	80.6
2017	35	66.2	11.8	36.2	85.8	50.8	57.1	70.9	74.4	79.1
2018	25	61.8	16.1	27.0	83.1	43.9	50.8	64.3	74.7	82.4
2019	40	60.5	14.2	23.5	82.2	41.6	52.0	61.9	72.7	77.0
2020	31	65.7	12.4	29.8	85.8	55.0	57.8	65.5	78.2	80.4
1998–2020	405	62.7	13.3	16.8	85.8	45.2	54.3	64.8	73.1	78.2

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	3	45.0	15.0	28.2	57.0	28.2	28.2	49.7	57.0	57.0
2000	2	54.0	29.5	33.1	74.8	33.1	33.1	54.0	74.8	74.8
2001	2	51.8	18.8	38.6	65.1	38.6	38.6	51.8	65.1	65.1
2002	3	79.1	11.3	66.3	87.6	66.3	66.3	83.5	87.6	87.6
2003	8	54.5	10.8	37.1	74.6	37.1	48.4	55.6	58.0	74.6
2004	2	52.0	8.3	46.1	57.8	46.1	46.1	52.0	57.8	57.8
2005	8	59.6	11.7	42.1	69.6	42.1	49.1	64.5	68.9	69.6
2006	2	68.7	0.2	68.5	68.8	68.5	68.5	68.7	68.8	68.8
2007	9	61.6	15.5	37.8	82.3	37.8	48.9	63.5	71.5	82.3
2008	11	61.8	18.2	23.8	81.2	43.7	48.8	66.9	76.0	78.8
2009	12	67.2	16.0	27.9	85.0	52.2	58.7	72.3	76.9	84.9
2010	17	59.7	13.9	37.5	80.2	43.9	49.2	53.6	72.4	78.4
2011	20	61.5	14.5	34.6	79.2	39.8	45.3	67.2	71.7	76.0
2012	26	61.7	16.1	28.5	101	42.3	48.1	63.2	72.7	76.5
2013	29	64.4	14.6	14.2	86.3	50.9	56.0	66.7	74.6	78.7
2014	22	64.6	11.5	45.1	82.2	47.4	56.5	65.8	74.7	77.6
2015	18	71.6	10.2	52.0	90.2	53.0	64.6	73.6	77.2	85.4
2016	33	59.5	14.2	37.0	82.6	41.4	46.5	56.5	72.2	77.4
2017	28	62.5	16.4	23.3	83.6	31.6	58.4	66.3	74.1	80.7
2018	26	56.5	15.8	24.4	83.2	40.1	45.4	54.4	70.7	79.0
2019	33	61.4	14.1	31.3	83.0	47.1	49.5	64.7	71.3	78.3
2020	31	59.0	14.0	31.6	86.8	42.8	52.1	58.9	68.9	77.9
1998–2020	345	61.6	14.7	14.2	101	42.2	50.9	63.5	73.3	78.6

Table 4

Age distribution by 5-year age group and sex for period 2007-2020

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14	1	0.2	0.2			0.0	1	0.3	0.3
15-19	1	0.2	0.3	1	0.3	0.3			0.3
20-24	5	0.8	1.1	2	0.6	0.9	3	1.0	1.3
25-29	9	1.4	2.4	6	1.8	2.6	3	1.0	2.2
30-34	10	1.5	4.0	2	0.6	3.2	8	2.5	4.8
35-39	15	2.3	6.3	6	1.8	5.0	9	2.9	7.6
40-44	30	4.6	10.8	13	3.8	8.8	17	5.4	13.0
45-49	60	9.1	20.0	26	7.6	16.4	34	10.8	23.8
50-54	61	9.3	29.3	32	9.4	25.8	29	9.2	33.0
55-59	67	10.2	39.5	39	11.4	37.2	28	8.9	41.9
60-64	74	11.3	50.8	41	12.0	49.3	33	10.5	52.4
65-69	94	14.3	65.1	57	16.7	66.0	37	11.7	64.1
70-74	93	14.2	79.3	50	14.7	80.6	43	13.7	77.8
75-79	90	13.7	93.0	43	12.6	93.3	47	14.9	92.7
80-84	37	5.6	98.6	21	6.2	99.4	16	5.1	97.8
85+	9	1.4	100.0	2	0.6	100.0	7	2.2	100.0
All ages	656	100.0		341	100.0		315	100.0	

Table 5

Age-specific incidence and proportion of all cancers
for period 2007-2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4						
5- 9						
10-14		1		0.1		0.8
15-19	1		0.1		0.3	
20-24	2	3	0.1	0.2	0.3	0.6
25-29	6	3	0.3	0.1	0.6	0.3
30-34	2	8	0.1	0.4	0.2	0.4
35-39	6	9	0.3	0.4	0.3	0.3
40-44	13	17	0.5	0.7	0.5	0.3
45-49	26	34	1.0	1.3	0.5	0.4
50-54	32	29	1.3	1.2	0.4	0.2
55-59	39	28	1.8	1.3	0.3	0.2
60-64	41	33	2.3	1.7	0.2	0.2
65-69	57	37	3.5	2.0	0.2	0.2
70-74	50	43	3.3	2.5	0.2	0.2
75-79	43	47	3.6	3.1	0.2	0.2
80-84	21	16	2.9	1.5	0.1	0.1
85+	2	7	0.4	0.7	0.0	0.0
All ages	341	315			0.2	0.2
Incidence						
Raw			1.0	0.9		
WS			0.6	0.5		
ES			0.8	0.7		
BRD-S			1.0	0.8		

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).

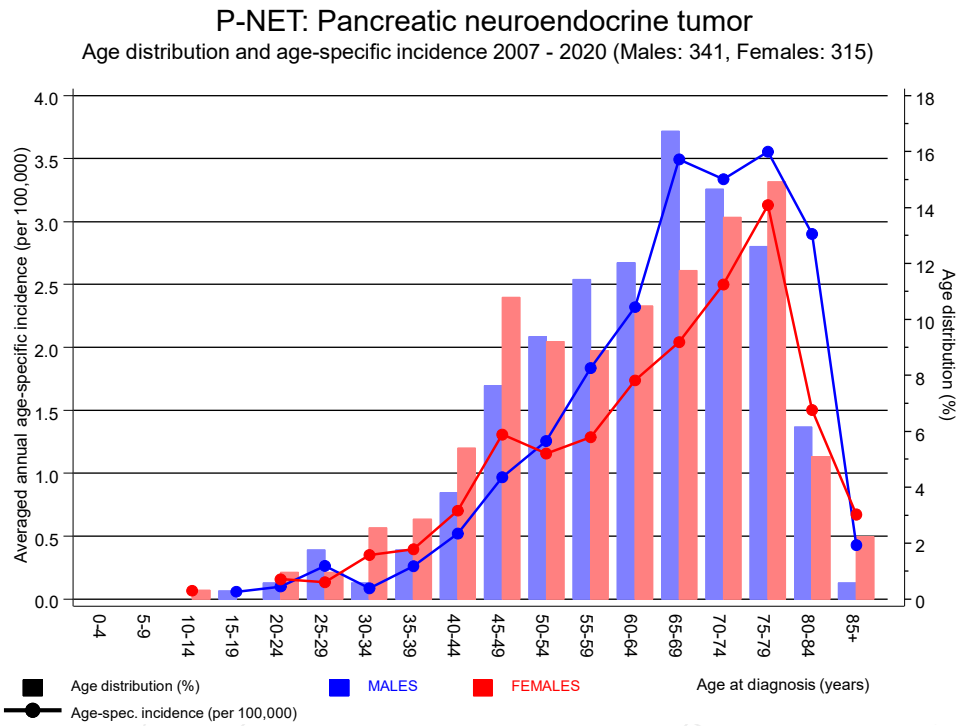


Figure 6. Age distribution (males: mean=63.1 yrs, median=65.1 yrs; females: mean=61.9 yrs, median=64.0 yrs) and age-specific incidence.

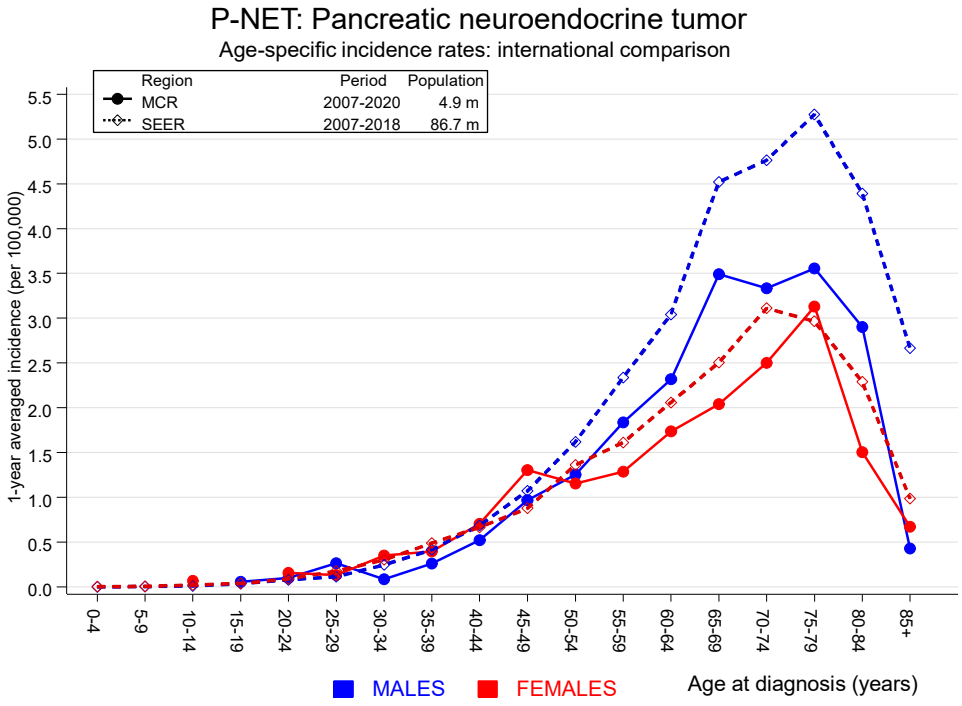


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 submission. http://www.seer.cancer.gov.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C15	Oesophagus	1	0.3	2.9	0.1	16.4		5.4	
C16	Stomach	2	0.5	3.7	0.5	13.5		11.9	
C17	Small intestine	2	0.1	19.8	2.4	71.4	#	15.4	
C18	Colon	5	1.4	3.7	1.2	8.6	#	29.7	
C19–C20	Rectum	2	0.8	2.5	0.3	9.2		9.8	
C23–C24	Bile	1	0.2	6.3	0.2	35.1		6.8	
C33–C34	Lung	5	1.8	2.8	0.9	6.6		26.2	20.0
C43	Malign. melanoma	1	0.7	1.4	0.0	7.5		2.1	
C61	Prostate	12	4.1	2.9	1.5	5.1	#	64.3	
C62	Testis	1	0.1	15.0	0.4	83.4		7.6	100.0
C64	Kidney	3	0.5	5.7	1.2	16.7	#	20.1	
C82–C85	NHL	1	0.6	1.6	0.0	9.2		3.2	
C90	Mult. myeloma	1	0.2	5.4	0.1	29.9		6.6	
Not observed		0	3.7	0.0	0.0	1.0		-29.9	
All further malignancies		37	15.0	2.5	1.7	3.4	#	179.3	5.4

Patients	404
Median age at next malignancy (years)	71.3
Person-years	1230
Mean observation time (years)	3.0
Median observation time (years)	1.4

The occurrence of further specified malignancy is statistically significant.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C16	Stomach	4	0.2	18.0	4.9	46.0	#	39.6	25.0
C17	Small intestine	2	0.0	40.1	4.9	144.8	#	20.4	
C23–C24	Bile	1	0.1	10.1	0.3	56.4		9.4	
C25	Pancreas	1	0.4	2.8	0.1	15.5		6.7	
C33–C34	Lung	3	0.7	4.6	0.9	13.3		24.5	100.0
C50	Breast	10	2.8	3.6	1.7	6.7	#	75.8	
C53	Cervix uteri	1	0.1	7.8	0.2	43.6		9.1	
C64	Kidney	1	0.2	6.0	0.2	33.5		8.7	
C66	Ureter	2	0.0	157.0	19.0	567.0	#	20.8	
C73	Thyroid	1	0.2	6.6	0.2	36.6		8.9	
C76–C79	CUP	1	0.1	8.0	0.2	44.5		9.2	
C82–C85	NHL	1	0.3	3.5	0.1	19.7		7.5	
Not observed		0	3.1	0.0	0.0	1.2		-32.9	
All further malignancies		28	8.2	3.4	2.3	5.0	#	207.9	14.3

Patients	340
Median age at next malignancy (years)	70.5
Person-years	955
Mean observation time (years)	2.8
Median observation time (years)	1.6

The occurrence of further specified malignancy is statistically significant.

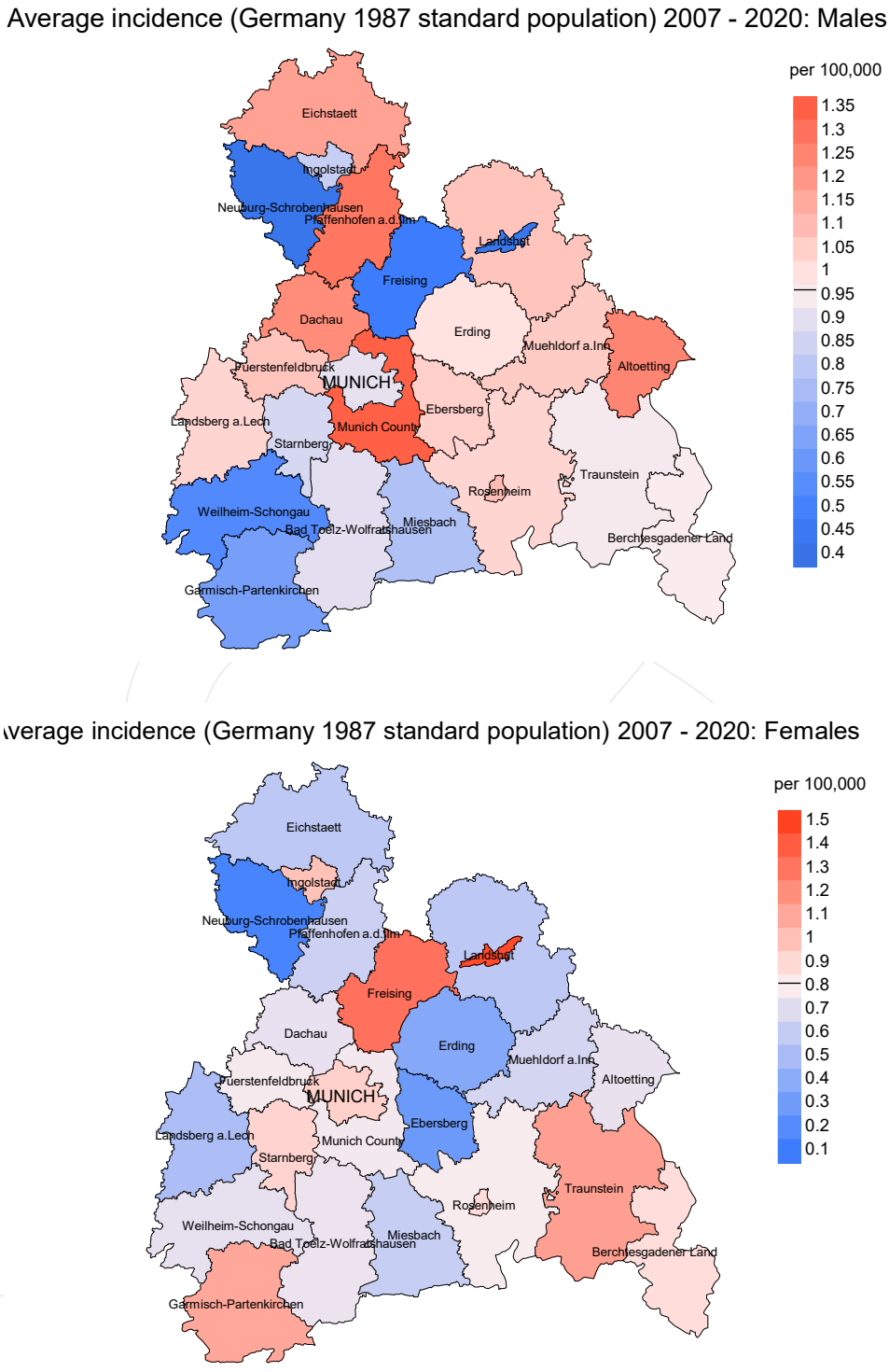


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.0/100,000 WS N=341, females 0.8/100,000 WS N=315).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 3 women were identified with newly diagnosed pancr. neuroend. tumor. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.1/100,000.

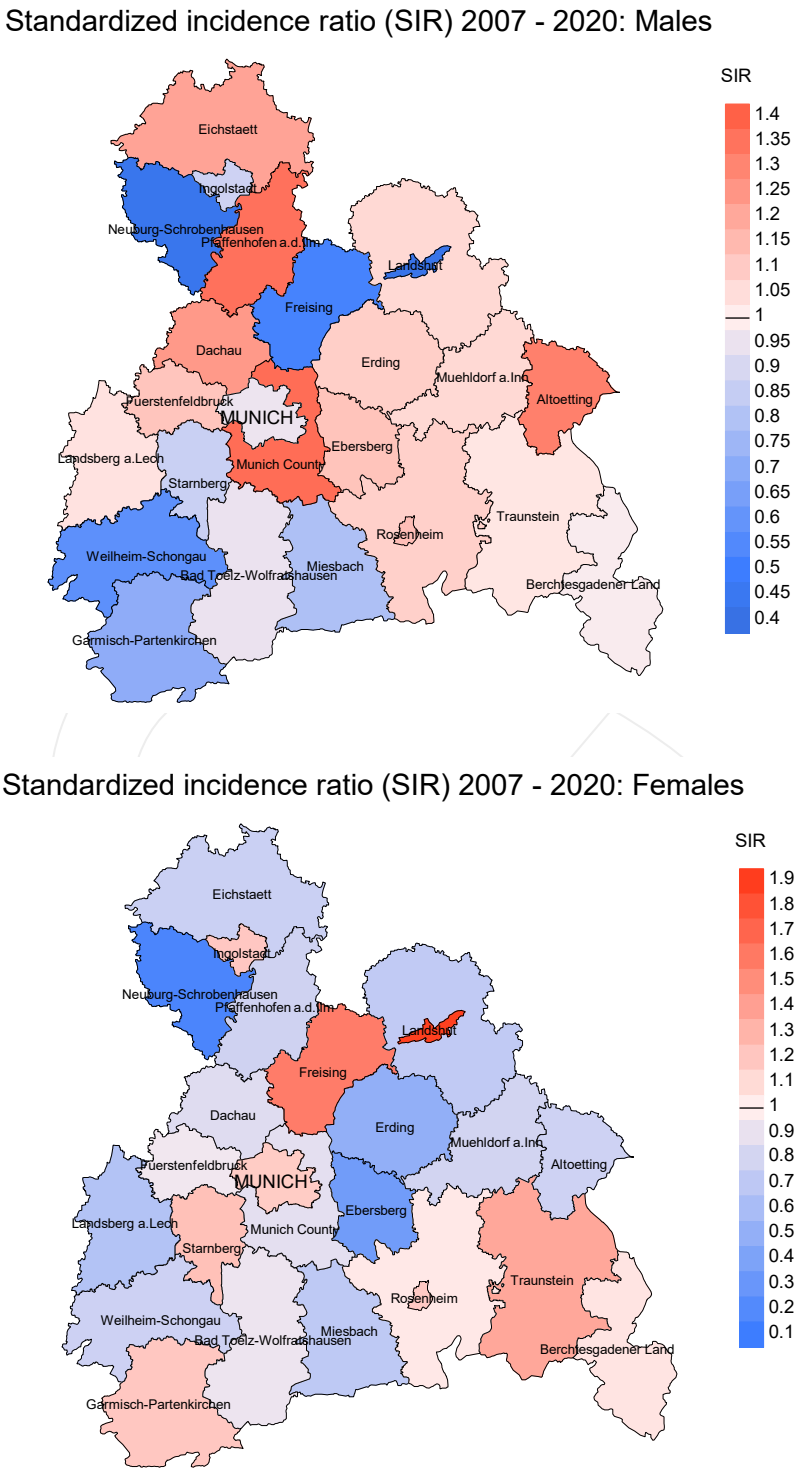


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=341, females N=315).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 3 women were identified with newly diagnosed pancr. neuroend. tumor. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.34. Though, the value of this parameter may vary with an underlying probability of 99% between 0.04 and 1.24, 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 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	9	100.0	8	88.9	87.5
1999	6	100.0	5	83.3	80.0
2000	5	100.0	4	80.0	100.0
2001	4	100.0	3	75.0	100.0
2002	13	100.0	11	84.6	81.8
2003	14	100.0	11	78.6	100.0
2004	11	100.0	8	72.7	100.0
2005	18	94.4	12	66.7	100.0
2006	14	100.0	11	78.6	90.9
2007	28	89.3	15	53.6	100.0
2008	18	94.4	11	61.1	90.9
2009	27	100.0	23	85.2	95.7
2010	39	100.0	26	66.7	92.3
2011	44	100.0	24	54.5	95.8
2012	54	96.3	27	50.0	81.5
2013	50	96.0	27	54.0	92.6
2014	44	97.7	23	52.3	95.7
2015	45	93.3	15	33.3	93.3
2016	58	100.0	23	39.7	91.3
2017	63	100.0	24	38.1	70.8
2018	51	98.0	6	11.8	33.3
2019	73	98.6	14	19.2	78.6
2020	62	100.0	6	9.7	83.3
1998-2020	750	98.0	337	44.9	89.3

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 4.94 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	9	2	1	11.1
1999	6	6	2	33.3
2000	5	3	1	20.0
2001	4	3		
2002	13	6	1	7.7
2003	14	7	2	14.3
2004	11	6	1	9.1
2005	18	6	3	16.7
2006	14	7	2	14.3
2007	28	14	4	14.3
2008	18	9	1	5.6
2009	27	12	7	25.9
2010	39	17	3	7.7
2011	44	17	5	11.4
2012	54	17	5	9.3
2013	50	26	7	14.0
2014	44	27	5	11.4
2015	45	27	4	8.9
2016	58	28	6	10.3
2017	63	30	7	11.1
2018	51	22	2	3.9
2019	73	25	9	12.3
2020	62	27	3	4.8
1998–2020	750	344	81	10.8

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 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	2	100.0		100.0
1999	6	100.0		100.0
2000	3	100.0		100.0
2001	3	100.0		100.0
2002	6	100.0		83.3
2003	7	100.0		100.0
2004	6	83.3	16.7	83.3
2005	6	100.0		100.0
2006	7	100.0		100.0
2007	14	92.9	7.1	92.9
2008	9	88.9	11.1	88.9
2009	12	83.3	16.7	90.9
2010	17	88.2	11.8	81.3
2011	17	82.4	17.6	94.1
2012	17	94.1	5.9	88.2
2013	26	92.3	7.7	92.3
2014	27	88.9	11.1	92.6
2015	27	85.2	14.8	80.0
2016	28	89.3	10.7	88.9
2017	30	86.7	13.3	92.9
2018	22	81.8	18.2	100.0
2019	25	76.0	24.0	83.3
2020	27	63.0	37.0	73.9
1998-2020	344	86.3	13.7	89.4

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	2	71.9	71.9		65.7
1999	6	64.3	64.3		64.3
2000	2	59.5	59.5		59.5
2001	1	64.6	64.6		64.6
2002	5	65.1	65.1		64.7
2003	4	63.9	63.9		63.9
2004	3	67.8	67.8		67.8
2005	5	70.5	70.5		70.5
2006	7	66.5	66.5		66.5
2007	6	61.5	61.5		61.5
2008	6	58.1	58.1		58.1
2009	5	54.4	58.3	43.5	58.3
2010	10	74.1	74.1	75.1	72.9
2011	8	68.4	68.4		68.4
2012	12	64.6	64.7	59.7	64.6
2013	19	72.6	72.4	81.4	72.4
2014	16	71.9	72.2	69.4	72.2
2015	16	69.0	68.8	74.6	69.1
2016	17	76.9	76.9	69.9	77.3
2017	18	74.1	75.4	72.9	66.6
2018	11	74.9	75.4	56.0	71.3
2019	14	77.0	75.9	84.2	73.8
2020	11	76.3	74.3	81.5	62.4
1998-2020	204	70.2	69.6	76.8	68.2

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					
1999					
2000	1	54.7	54.7		54.7
2001	2	69.9	69.9		69.9
2002	1	66.4	66.4		66.4
2003	3	36.4	36.4		36.4
2004	3	62.5	54.8	65.9	54.8
2005	1	90.8	90.8		90.8
2006					
2007	8	70.2	71.0	48.9	71.0
2008	3	78.9	71.5	81.8	71.5
2009	7	72.2	62.6	86.8	62.6
2010	7	68.2	68.2		68.8
2011	9	72.4	67.7	74.4	73.4
2012	5	58.5	58.5		58.5
2013	7	66.1	66.1		66.1
2014	11	68.2	68.2	67.8	66.9
2015	11	73.2	72.3	81.7	73.2
2016	11	77.7	78.0	72.3	77.7
2017	12	76.1	76.5	75.7	76.1
2018	11	78.6	67.2	81.6	66.2
2019	11	73.6	74.3	70.6	75.4
2020	16	76.2	75.6	78.4	72.7
1998-2020	140	71.9	71.1	75.7	71.3

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	2	0.2	0.33	0.1	0.34	0.2	0.38	0.2	0.44
1999	6	0.5	1.00	0.3	0.87	0.4	0.88	0.5	0.86
2000	2	0.2	0.67	0.1	0.75	0.2	0.71	0.2	0.67
2001	1	0.1	0.50	0.0	0.50	0.1	0.50	0.1	0.50
2002	5	0.3	0.50	0.2	0.43	0.2	0.44	0.2	0.45
2003	4	0.2	0.67	0.1	0.63	0.2	0.65	0.2	0.69
2004	3	0.2	0.33	0.1	0.30	0.1	0.33	0.2	0.35
2005	5	0.3	0.50	0.1	0.43	0.2	0.47	0.3	0.53
2006	7	0.4	0.58	0.2	0.40	0.3	0.48	0.3	0.53
2007	6	0.3	0.32	0.2	0.28	0.2	0.30	0.3	0.36
2008	6	0.3	0.86	0.2	0.95	0.3	0.94	0.3	0.90
2009	4	0.2	0.27	0.1	0.31	0.2	0.30	0.2	0.26
2010	8	0.4	0.36	0.2	0.30	0.3	0.34	0.4	0.39
2011	8	0.4	0.33	0.2	0.28	0.3	0.30	0.3	0.32
2012	11	0.5	0.39	0.3	0.41	0.4	0.41	0.4	0.40
2013	17	0.7	0.81	0.3	0.74	0.5	0.77	0.7	0.80
2014	15	0.6	0.68	0.3	0.56	0.4	0.62	0.6	0.65
2015	13	0.5	0.48	0.3	0.47	0.4	0.49	0.5	0.47
2016	15	0.6	0.60	0.2	0.32	0.3	0.43	0.5	0.56
2017	15	0.6	0.43	0.3	0.39	0.4	0.38	0.6	0.43
2018	10	0.4	0.40	0.2	0.27	0.3	0.33	0.4	0.38
2019	12	0.5	0.30	0.2	0.22	0.3	0.23	0.5	0.30
2020	5	0.2	0.16	0.1	0.15	0.1	0.16	0.2	0.16
1998-2020	180	0.4	0.44	0.2	0.39	0.3	0.41	0.4	0.45

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									
1999									
2000	1	0.1	0.50	0.1	0.63	0.1	0.68	0.1	0.57
2001	2	0.2	1.00	0.1	0.87	0.1	0.98	0.2	1.11
2002	1	0.1	0.33	0.0	0.62	0.0	0.52	0.0	0.41
2003	3	0.2	0.38	0.1	0.47	0.1	0.38	0.2	0.38
2004	2	0.1	1.00	0.1	0.96	0.1	0.88	0.1	0.92
2005	1	0.1	0.13	0.0	0.04	0.0	0.06	0.0	0.08
2006									
2007	7	0.3	0.78	0.2	0.72	0.2	0.75	0.3	0.75
2008	2	0.1	0.18	0.0	0.16	0.1	0.18	0.1	0.20
2009	6	0.3	0.50	0.1	0.55	0.2	0.54	0.2	0.47
2010	7	0.3	0.41	0.2	0.43	0.2	0.40	0.3	0.41
2011	6	0.3	0.30	0.1	0.26	0.2	0.27	0.2	0.31
2012	5	0.2	0.19	0.1	0.16	0.2	0.18	0.2	0.18
2013	7	0.3	0.24	0.1	0.22	0.2	0.21	0.2	0.21
2014	9	0.4	0.41	0.2	0.38	0.3	0.41	0.3	0.39
2015	10	0.4	0.56	0.2	0.60	0.3	0.59	0.3	0.57
2016	10	0.4	0.30	0.1	0.17	0.2	0.21	0.3	0.25
2017	11	0.4	0.39	0.1	0.23	0.2	0.28	0.3	0.32
2018	8	0.3	0.31	0.2	0.22	0.2	0.24	0.3	0.27
2019	7	0.3	0.21	0.1	0.13	0.2	0.16	0.2	0.18
2020	12	0.5	0.39	0.2	0.27	0.3	0.28	0.4	0.34
1998-2020	117	0.2	0.34	0.1	0.28	0.2	0.29	0.2	0.31

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19	1	0.4	0.4	1	0.7	0.7			0.0
20-24	0	0.0	0.4			0.7			0.0
25-29	2	0.8	1.2	1	0.7	1.4	1	0.9	0.9
30-34	1	0.4	1.6			1.4	1	0.9	1.9
35-39	2	0.8	2.4	1	0.7	2.1	1	0.9	2.8
40-44	7	2.8	5.2	3	2.1	4.1	4	3.7	6.5
45-49	8	3.2	8.3	3	2.1	6.2	5	4.7	11.2
50-54	17	6.7	15.1	10	6.9	13.1	7	6.5	17.8
55-59	20	7.9	23.0	11	7.6	20.7	9	8.4	26.2
60-64	23	9.1	32.1	17	11.7	32.4	6	5.6	31.8
65-69	33	13.1	45.2	19	13.1	45.5	14	13.1	44.9
70-74	47	18.7	63.9	28	19.3	64.8	19	17.8	62.6
75-79	46	18.3	82.1	29	20.0	84.8	17	15.9	78.5
80-84	32	12.7	94.8	18	12.4	97.2	14	13.1	91.6
85+	13	5.2	100.0	4	2.8	100.0	9	8.4	100.0
All ages	252	100.0		145	100.0		107	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007–2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0– 4								
5– 9								
10–14								
15–19	1		0.1	1.00			2.1	
20–24								
25–29	1	1	0.0	0.17	0.0	0.33	1.1	1.0
30–34		1			0.0	0.13		0.6
35–39	1	1	0.0	0.17	0.0	0.11	0.4	0.2
40–44	3	4	0.1	0.23	0.2	0.24	0.5	0.5
45–49	3	5	0.1	0.12	0.2	0.15	0.2	0.3
50–54	10	7	0.4	0.31	0.3	0.24	0.4	0.3
55–59	11	9	0.5	0.28	0.4	0.32	0.2	0.2
60–64	17	6	1.0	0.41	0.3	0.18	0.3	0.1
65–69	19	14	1.2	0.33	0.8	0.38	0.2	0.2
70–74	28	19	1.9	0.56	1.1	0.44	0.2	0.2
75–79	29	17	2.4	0.67	1.1	0.36	0.2	0.2
80–84	18	14	2.5	0.86	1.3	0.88	0.2	0.1
85+	4	9	0.9	2.00	0.9	1.29	0.0	0.1
All ages	145	107					0.2	0.2
Mortality								
Raw			0.4	0.43	0.3	0.34		
WS			0.2	0.36	0.1	0.27		
ES			0.3	0.39	0.2	0.29		
BRD-S			0.4	0.43	0.3	0.31		
PYLL-70								
per 100,000			2.7		2.3			
ES			2.4		2.0			
AYLL-70			11.6		13.5			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C07–C08	Salivary gland	1	1.4	1	100.0				
C12–C13	Hypopharynx	1	1.4	1	100.0				
C15	Oesophagus	3	4.3	1	33.3			2	66.7
C16	Stomach	7	10.0	5	71.4	1	14.3	1	14.3
C17	Small intestine	2	2.9	1	50.0			1	50.0
C18	Colon	3	4.3	2	66.7	1	33.3		
C19–C20	Rectum	2	2.9			1	50.0	1	50.0
C23–C24	Bile	1	1.4	1	100.0				
C25	Pancreas	2	2.9			2	100.0		
C33–C34	Lung	6	8.6	2	33.3			4	66.7
C43	Malign. melanoma	3	4.3	2	66.7	1	33.3		
C44	Skin others	8	11.4	4	50.0			4	50.0
C46,C49	Soft tissue	1	1.4					1	100.0
C61	Prostate	19	27.1	15	78.9	1	5.3	3	15.8
C62	Testis	1	1.4					1	100.0
C64	Kidney	4	5.7	3	75.0	1	25.0		
C67	Bladder	1	1.4	1	100.0				
C73	Thyroid	2	2.9	2	100.0				
C76–C79	CUP	1	1.4	1	100.0				
C90	Mult. myeloma	1	1.4					1	100.0
C91–C96	Leukaemia	1	1.4	1	100.0				
All further malignancies		70	100.0	43	61.4	8	11.4	19	27.1

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 1998–2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C15	Oesophagus	1	3.2			1	100.0		
C16	Stomach	1	3.2					1	100.0
C17	Small intestine	1	3.2	1	100.0				
C18	Colon	1	3.2	1	100.0				
C23–C24	Bile	1	3.2			1	100.0		
C25	Pancreas	1	3.2			1	100.0		
C33–C34	Lung	4	12.9	1	25.0			3	75.0
C38,C45	Mesothelioma	1	3.2	1	100.0				
C50	Breast	7	22.6	4	57.1	1	14.3	2	28.6
C54	Corpus uteri	1	3.2	1	100.0				
C55,C57	Fem. genitals un	1	3.2	1	100.0				
C56	Ovary	1	3.2	1	100.0				
C64	Kidney	1	3.2	1	100.0				
C66	Ureter	1	3.2					1	100.0
C67	Bladder	2	6.5	1	50.0			1	50.0
C73	Thyroid	4	12.9	3	75.0			1	25.0
C81	Hodgkin lymphoma	1	3.2	1	100.0				
C82–C85	NHL	1	3.2	1	100.0				
All further malignancies		31	100.0	18	58.1	4	12.9	9	29.0

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

Table 15

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1		0.1	1.00			2.2	
20-24								
25-29	1	1	0.0	0.17	0.0	0.33	1.2	1.1
30-34		1			0.0	0.13		0.6
35-39	1	1	0.0	0.25	0.0	0.11	0.4	0.3
40-44	3	4	0.1	0.25	0.2	0.27	0.5	0.5
45-49	3	3	0.1	0.14	0.1	0.10	0.2	0.2
50-54	10	6	0.4	0.33	0.2	0.24	0.4	0.3
55-59	8	7	0.4	0.26	0.3	0.35	0.2	0.2
60-64	15	5	0.8	0.47	0.3	0.19	0.3	0.1
65-69	14	10	0.9	0.33	0.6	0.37	0.2	0.2
70-74	21	17	1.4	0.68	1.0	0.50	0.2	0.3
75-79	16	12	1.3	0.55	0.8	0.38	0.2	0.2
80-84	12	12	1.7	0.92	1.1	1.20	0.2	0.2
85+	3	6	0.6	3.00	0.6	2.00	0.0	0.1
All ages	108	85					0.2	0.2
Mortality								
Raw			0.3	0.42	0.3	0.35		
WS			0.2	0.37	0.1	0.27		
ES			0.2	0.39	0.2	0.29		
BRD-S			0.3	0.42	0.2	0.31		
PYLL-70								
per 100,000			2.4		1.9			
ES			2.2		1.7			
AYLL-70			12.5		14.3			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1		0.1	1.00			2.2	
20-24								
25-29	1	1	0.0	0.17	0.0	0.33	1.2	1.1
30-34		1			0.0	0.13		0.6
35-39	1	1	0.0	0.33	0.0	0.13	0.4	0.3
40-44	3	3	0.1	0.25	0.1	0.23	0.5	0.4
45-49	3	2	0.1	0.16	0.1	0.07	0.2	0.1
50-54	10	6	0.4	0.34	0.2	0.25	0.4	0.3
55-59	7	7	0.3	0.24	0.3	0.35	0.2	0.2
60-64	14	5	0.8	0.47	0.3	0.21	0.3	0.1
65-69	12	9	0.7	0.30	0.5	0.35	0.2	0.2
70-74	20	16	1.3	0.69	0.9	0.53	0.2	0.2
75-79	13	11	1.1	0.48	0.7	0.35	0.1	0.2
80-84	9	11	1.2	0.75	1.0	1.10	0.1	0.2
85+	3	4	0.6	3.00	0.4	1.33	0.1	0.0
All ages	97	77					0.2	0.2
Mortality								
Raw			0.3	0.40	0.2	0.33		
WS			0.2	0.36	0.1	0.26		
ES			0.2	0.38	0.1	0.28		
BRD-S			0.3	0.40	0.2	0.30		
PYLL-70								
per 100,000			2.4		1.7			
ES			2.1		1.5			
AYLL-70			13.0		14.1			

* See corresponding tables with multiple malignancies.

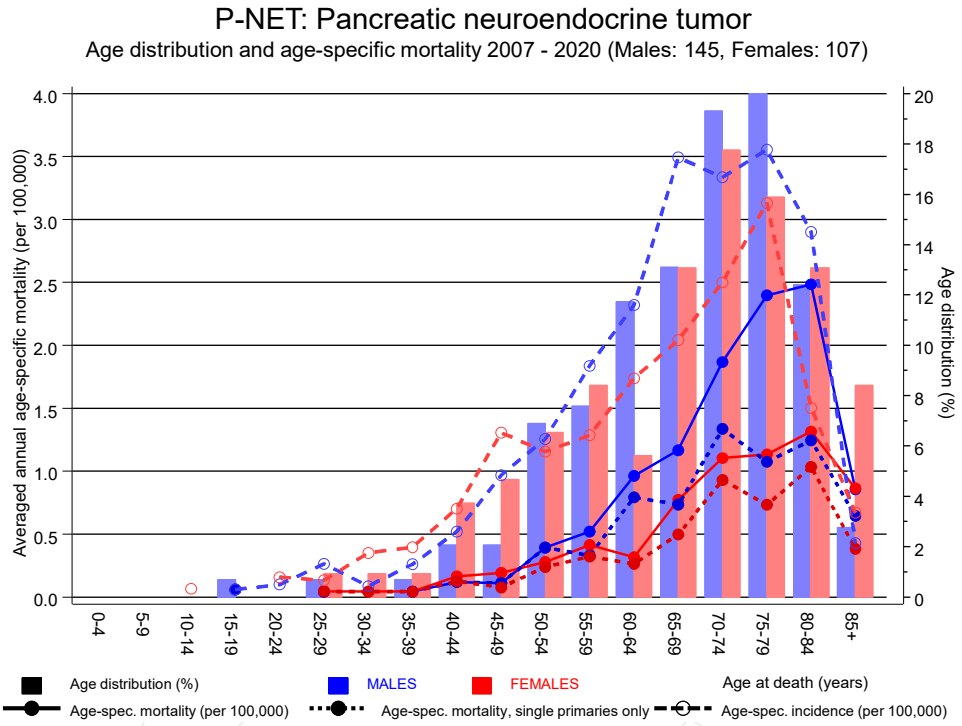
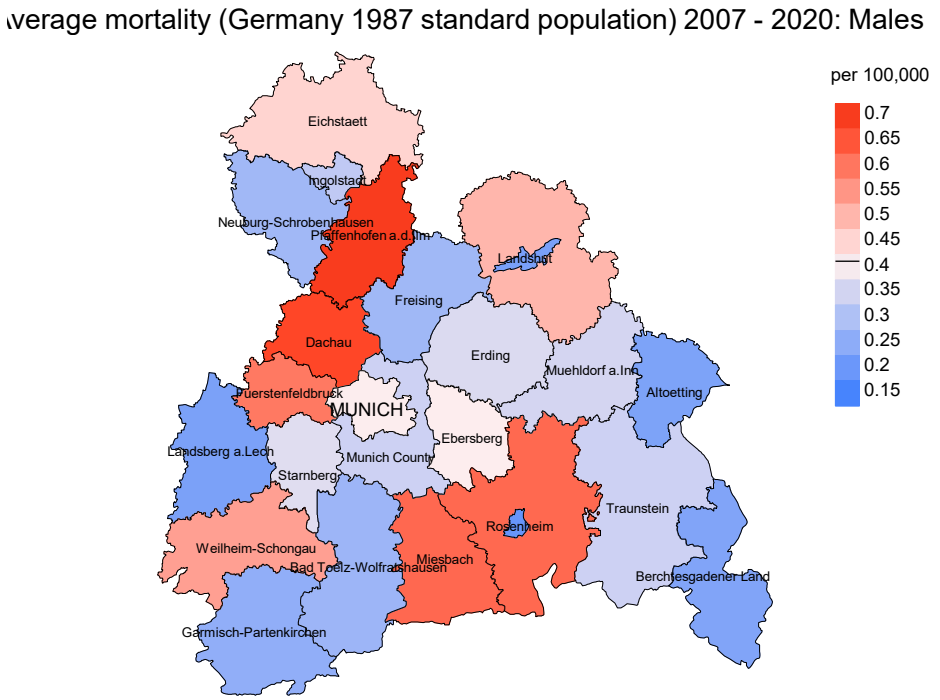


Figure 17. Distribution of age at death (bars; males: mean=66.0 yrs, median=67.5 yrs; females: mean=66.1 yrs, median=68.8 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



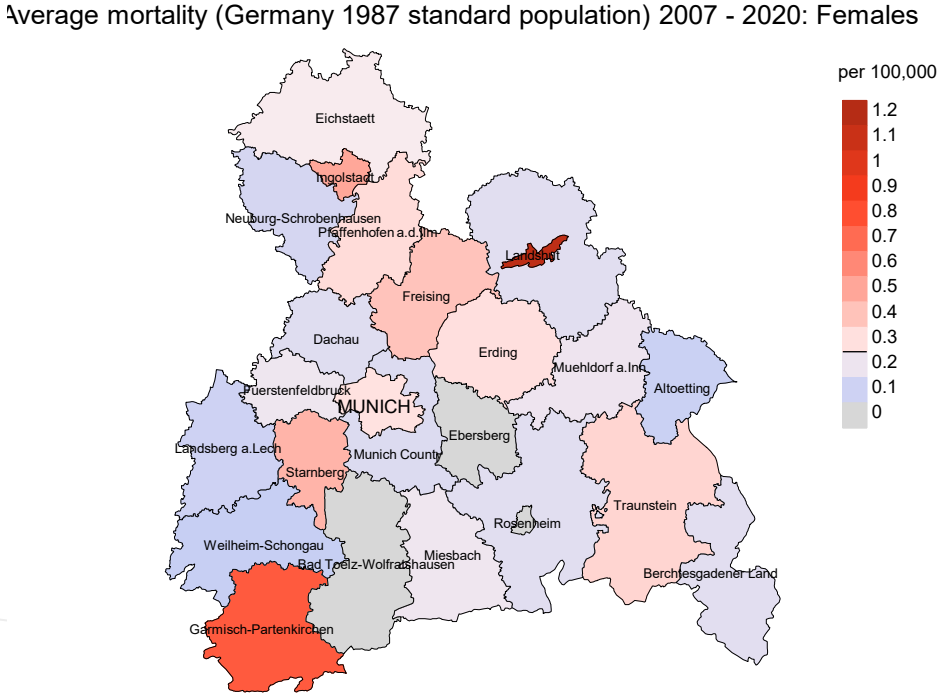
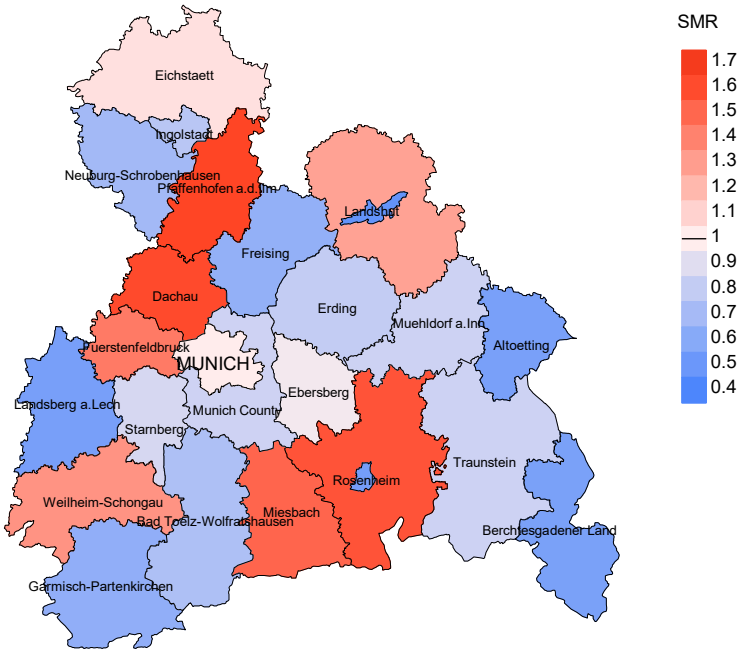


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.4/100,000 WS N=145, females 0.3/100,000 WS N=107).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 0 women died from pancr. neuroend. tumor. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

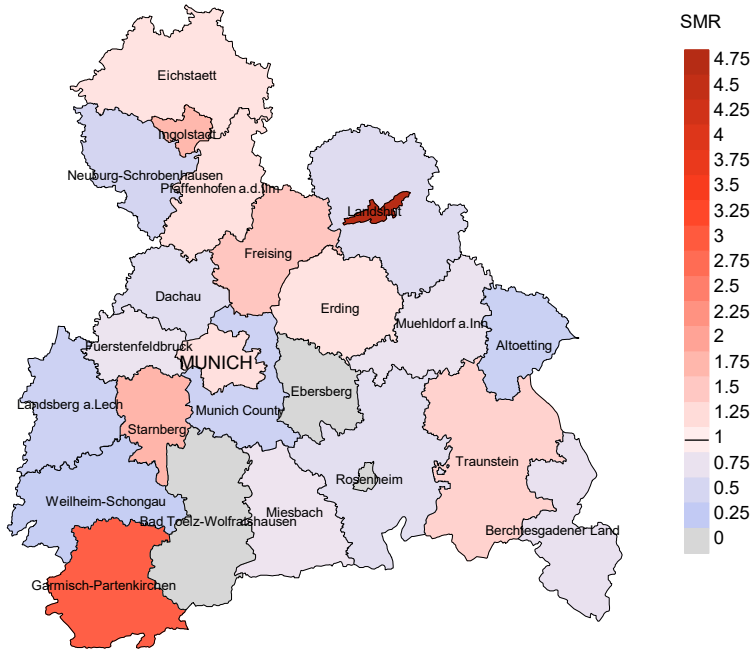


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=145, females N=107).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 0 women died from pancr. neuroend. tumor. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.00. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 1.80, 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

Recommended Citation

Munich Cancer Registry. P-NET: Pancr. neuroend. tumor - Incidence and Mortality [Internet]. 2021 [updated 2021 Dec 21; cited 2022 Feb 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/base/bhPNETE-P-NET-Pancr.-neuroend.-tumor-incidence-and-mortality.pdf

Copyright

Disclaimer