

Munich Cancer Registry



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

ICD-10 C51-C58: Fem. genitale cancer

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	28,074
Diseases	28,670
Creation date	01/25/2021
Database export	01/07/2021
Population (females)	2.48 m





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

<https://www.tumorregister-muenchen.de/en/facts/base/bC5158E-ICD-10-C51-C58-Fem.-genitale-cancer-incidence-and-mortality.pdf>

Index of figures and tables

Fig./Tbl.		Page
1	Annual cases, DCO, mult. malignancies, follow-up / yr	4
2	Incidence by year of diagnosis	5
3	Age distribution parameters by year of diagnosis	6
4	Age distribution by 5-year age group	7
5	Age-specific incidence, DCO rate, proportion malignancies	8
6	Age distribution and age-specific incidence (chart)	9
6a	Age-specific incidence internationally (chart)	10
7	Standardized incidence ratio of further malignancies	11
8a	Map of cancer incidence (BRD-S) by county (chart)	12
8b	Standardized incidence ratio (SIR) by county (chart)	13
9a	Pts incident cohorts and mortality / yr	14
9b	Incidence and mortality by year of diagnosis	15
9c	Cancer-related deaths, death certification available / yr	16
10	Medians of age at death / yr	17
11	Mortality by year of death	18
12	Distribution of age at death	19
13	Age-specific mortality	20
14	Further malignancies in deaths	21
15	Age-specific mortality (first primaries)	22
16	Age-specific mortality (single primaries)	23
17	Age distribution and age-specific mortality (chart)	24
18a	Map of cancer mortality (BRD-S) by county (chart)	25
18b	Standardized mortality ratio (SMR) by county (chart)	26

**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, January 2021

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

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

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

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C51.-	Malignant neoplasm of vulva
C52	Malignant neoplasm of vagina
C53.-	Malignant neoplasm of cervix uteri
C54.-	Malignant neoplasm of corpus uteri
C55	Malignant neoplasm of uterus, part unspecified
C56	Malignant neoplasm of ovary
C57.-	Malignant neoplasm of other and unspecified female genital organs
C58	Malignant neoplasm of placenta

INCIDENCE

Table 1

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

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	846	77	9.1	10.4	8.8	69.0	95.0
1999	838	69	8.2	11.1	8.6	65.6	95.1
2000	821	76	9.3	11.9	8.4	64.9	96.1
2001	811	77	9.5	11.9	8.3	64.4	94.3
2002	1338	162	12.1	12.4	8.1	66.1	96.5 #
2003	1338	140	10.5	12.2	7.9	65.0	95.6
2004	1280	129	10.1	12.3	7.5	65.7	95.9
2005	1304	102	7.8	12.3	7.2	61.1	94.4
2006	1304	82	6.3	12.3	7.0	58.3	93.4
2007	1554	133	8.6	12.4	6.8	59.7	92.2 #
2008	1569	116	7.4	12.5	6.3	55.6	98.0
2009	1455	93	6.4	12.6	6.0	54.2	96.8
2010	1504	117	7.8	12.9	5.7	55.2	97.5
2011	1492	91	6.1	13.1	5.2	50.7	97.1
2012	1466	91	6.2	13.4	4.8	50.4	97.5
2013	1524	101	6.6	13.5	4.3	48.0	97.4
2014	1511	98	6.5	13.8	4.0	43.7	96.6
2015	1423	93	6.5	13.9	3.5	41.0	95.0
2016	1423	75	5.3	14.2	3.3	37.2	99.2
2017	1434	80	5.6	14.4	2.9	28.3	99.0
2018	1312	18	1.4	14.5	2.7	20.0	99.3
2019	1123	3	0.3	14.5	1.6	13.2	70.3 ##
1998-2019	28670	2023	7.1	14.5	8.8	50.8	95.4

28,670 cases diagnosed 1998-2019 are related to a total of 28,074 patients. Currently, in 6,417 (22.9 %) of these 28,074 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 5,186 / 1,004 / 227 (18.5 % / 3.6 % / 0.8 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 1,434 cases has been diagnosed, of which 14.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	846	71.9	38.8	53.7	63.8
1999	838	70.6	36.8	51.2	61.2
2000	821	68.3	36.0	50.1	60.1
2001	811	66.7	35.5	49.0	58.0
2002	1338	68.3	34.8	48.6	58.4
2003	1338	67.9	34.5	48.4	57.7
2004	1280	64.8	33.2	46.3	54.9
2005	1304	65.5	33.2	46.0	54.8
2006	1304	64.9	32.6	45.5	54.1
2007	1554	67.3	33.8	47.4	56.3
2008	1569	67.6	34.3	47.7	56.5
2009	1455	62.6	31.8	44.1	52.3
2010	1504	64.3	31.4	44.1	52.8
2011	1492	63.8	31.7	44.2	52.6
2012	1466	62.1	30.4	42.2	50.5
2013	1524	63.9	32.1	44.4	52.6
2014	1511	62.8	31.1	43.1	51.1
2015	1423	58.5	29.3	40.5	47.8
2016	1423	58.0	29.0	40.0	47.0
2017	1434	58.2	29.5	40.7	47.6
2018	1312	52.8	27.2	37.3	43.4
2019	1123	45.2	22.4	31.1	36.8
1998-2019	28670	62.6	31.6	43.9	52.0

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

Table 3

Age distribution parameters by year of diagnosis
(incl. DCO)

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	846	64.7	15.3	14.6	97.0	43.5	54.7	65.7	76.4	84.5
1999	838	65.3	15.7	0.7	99.9	42.4	55.9	65.9	77.3	85.2
2000	821	64.9	14.9	19.9	98.0	42.8	55.1	65.4	76.8	83.1
2001	811	64.7	15.4	14.7	98.8	41.5	55.0	65.2	76.2	83.8
2002	1338	66.1	15.0	13.2	99.4	44.3	57.8	67.0	77.7	83.9
2003	1338	66.4	15.0	7.6	99.4	45.6	56.8	66.8	78.4	84.2
2004	1280	66.0	15.2	1.2	99.8	44.7	56.1	66.7	77.7	84.3
2005	1304	66.1	15.3	1.7	103	43.3	57.0	67.4	77.5	84.9
2006	1304	66.3	15.1	22.9	99.4	44.3	56.2	67.4	77.8	85.1
2007	1554	66.2	14.9	18.3	100	44.3	56.8	67.7	77.1	85.0
2008	1569	65.9	14.9	11.1	102	44.7	56.4	67.6	77.1	84.8
2009	1455	65.9	15.1	11.2	102	44.2	55.4	67.6	77.2	84.5
2010	1504	66.8	14.8	17.0	98.7	45.9	57.0	68.6	77.3	85.3
2011	1492	66.0	14.8	4.1	98.5	45.2	56.0	68.6	76.9	84.2
2012	1466	66.7	15.1	0.3	101	45.6	57.4	69.1	77.4	84.9
2013	1524	65.9	15.2	0.7	105	45.7	55.8	67.5	77.2	84.6
2014	1511	65.8	15.7	13.3	100	43.5	55.2	68.0	77.3	84.4
2015	1423	65.9	14.8	16.5	102	45.5	55.4	67.1	76.8	84.1
2016	1423	65.8	15.1	4.9	99.1	44.7	55.2	66.9	77.5	84.1
2017	1434	65.4	14.4	26.2	96.6	45.9	55.9	66.9	76.7	82.8
2018	1312	64.8	14.5	19.6	99.9	44.7	54.8	65.7	76.5	82.3
2019	1123	65.5	14.4	14.6	95.6	45.3	56.0	66.9	77.3	82.3
1998-2019	28670	65.9	15.0	0.3	105	44.6	56.0	67.3	77.2	84.3

Table 4

Age distribution by 5-year age group for period 2007-2019
(incl. DCO)

Age at diagnosis Years	Cases		Cum.%
	n	%	
0-4	4	0.0	0.0
5-9	2	0.0	0.0
10-14	9	0.0	0.1
15-19	21	0.1	0.2
20-24	31	0.2	0.4
25-29	154	0.8	1.2
30-34	342	1.8	3.0
35-39	507	2.7	5.7
40-44	810	4.3	10.0
45-49	1041	5.5	15.5
50-54	1477	7.9	23.4
55-59	1859	9.9	33.3
60-64	1990	10.6	43.9
65-69	2304	12.3	56.2
70-74	2491	13.3	69.4
75-79	2387	12.7	82.1
80-84	1726	9.2	91.3
85+	1635	8.7	100.0
All ages	18790	100.0	

Table 5

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

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=1093 %	Prop. all cancers n=144724 %
0- 4	4	0.3	25.0	2.5
5- 9	2	0.1		2.2
10-14	9	0.6		7.7
15-19	21	1.4		8.5
20-24	30	1.7		6.3
25-29	152	7.3	0.7	13.7
30-34	342	16.2	0.3	17.2
35-39	500	23.8	0.2	15.3
40-44	797	35.2	0.8	13.8
45-49	1016	41.8	1.3	11.5
50-54	1444	62.5	0.9	12.5
55-59	1829	91.5	1.9	14.8
60-64	1959	111.6	1.5	13.5
65-69	2263	134.3	2.8	12.7
70-74	2464	153.4	3.8	13.2
75-79	2352	170.8	5.7	13.0
80-84	1708	175.5	12.5	12.0
85+	1621	167.9	30.1	10.5
All ages	18513		5.9	12.8
Incidence				
Raw		59.5		
WS		29.7		
ES		41.3		
BRD-S		48.8		

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).

ICD-10 C51-C58: Malignant neoplasms of female genital organs
Age distribution and age-specific incidence 2007 - 2019 (n=18513)

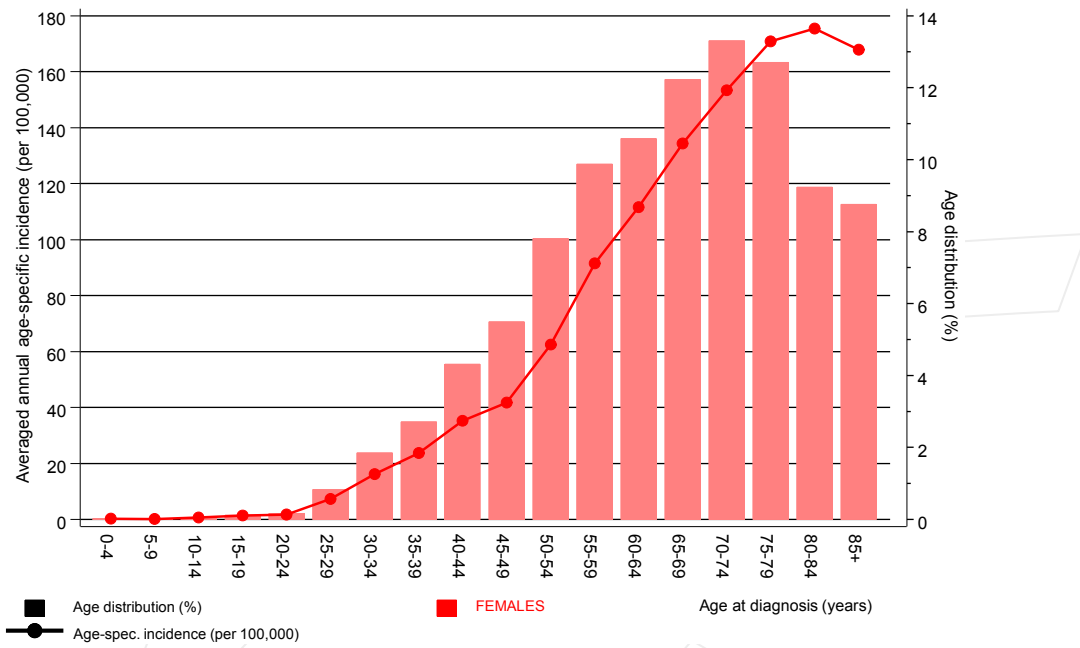


Figure 6. Age distribution (mean=65.9 yrs, median=67.7 yrs) and age-specific incidence.

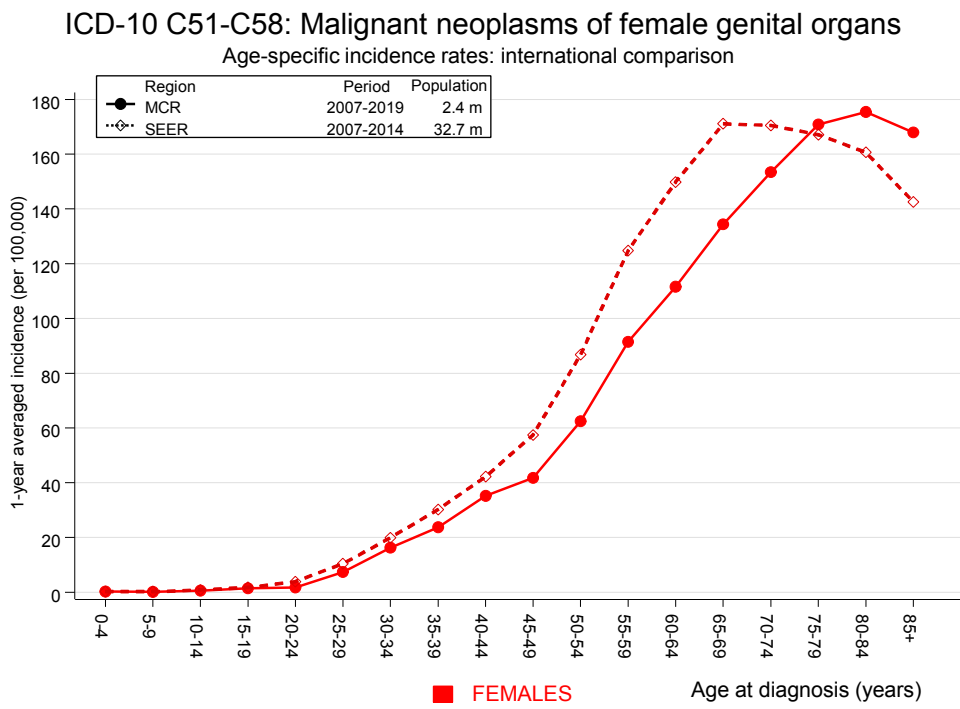


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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 7

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

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	8	5.6	1.4	0.6	2.8	0.3	
C09-C10 Oropharynx	8	4.0	2.0	0.9	3.9	0.4	
C15 Oesophagus	12	6.2	1.9	1.0	3.4 #	0.6	8.3
C16 Stomach	73	32.5	2.2	1.8	2.8 #	4.4	12.3
C17 Small intestine	24	5.1	4.7	3.0	7.0 #	2.1	4.2
C18 Colon	265	92.2	2.9	2.5	3.2 #	18.9	14.0
C19-C20 Rectum	82	38.4	2.1	1.7	2.6 #	4.8	11.0
C21 Anus/canal	21	5.3	4.0	2.5	6.1 #	1.7	4.8
C22 Liver	24	11.7	2.1	1.3	3.1 #	1.3	8.3
C23-C24 Bile	37	13.5	2.7	1.9	3.8 #	2.6	16.2
C25 Pancreas	90	43.8	2.1	1.7	2.5 #	5.0	28.9
C26 GI cancer	5	1.6	3.1	1.0	7.2 #	0.4	40.0
C33-C34 Lung	232	72.3	3.2	2.8	3.7 #	17.4	11.6
C43 Malign. melanoma	64	36.7	1.7	1.3	2.2 #	3.0	7.8
C46,C49 Soft tissue	20	5.5	3.7	2.2	5.7 #	1.6	
C48 Peritoneal	37	3.8	9.6	6.8	13.3 #	3.6	
C50 Breast	772	298.6	2.6	2.4	2.8 #	51.7	4.1
C51 Vulva	35	10.0	3.5	2.4	4.9 #	2.7	5.7
C52 Vagina	17	1.8	9.5	5.5	15.2 #	1.7	
C53 Cervix uteri	55	13.2	4.2	3.1	5.4 #	4.6	34.5
C54 Corpus uteri	199	53.8	3.7	3.2	4.2 #	15.8	13.6
C55,C57 Fem. genitals un	15	2.0	7.4	4.1	12.1 #	1.4	80.0
C56 Ovary	251	39.0	6.4	5.7	7.3 #	23.1	17.1
C64 Kidney	52	22.7	2.3	1.7	3.0 #	3.2	7.7
C65 Renal pelvis	13	3.0	4.4	2.3	7.5 #	1.1	7.7
C66 Ureter	7	1.6	4.5	1.8	9.3 #	0.6	14.3
C67 Bladder	55	18.4	3.0	2.3	3.9 #	4.0	5.5
C70-C72 CNS cancer	24	12.7	1.9	1.2	2.8 #	1.2	25.0
C73 Thyroid	41	16.7	2.5	1.8	3.3 #	2.7	2.4
C76-C79 CUP	42	17.3	2.4	1.8	3.3 #	2.7	9.5
C81 Hodgkin lymphoma	7	1.8	3.9	1.5	7.9 #	0.6	
C82-C85 NHL	79	37.5	2.1	1.7	2.6 #	4.5	2.5
C90 Mult. myeloma	17	11.9	1.4	0.8	2.3	0.6	11.8
C91-C96 Leukaemia	42	14.0	3.0	2.2	4.1 #	3.1	21.4
Others, specified	34	14.8	2.3	1.6	3.2 #	2.1	5.9
Not observed	0	1.5	0.0	0.0	2.5	-0.2	
All further malignancies	2759	970.3	2.8	2.7	3.0 #	195.2	10.7

Patients	25936
Median age at next malignancy (years)	71.4
Person-years	91620
Mean observation time (years)	3.5
Median observation time (years)	1.8

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 4 are pooled in category "Others, specified".

Average incidence (Germany 1987 standard population) 2007 - 2019

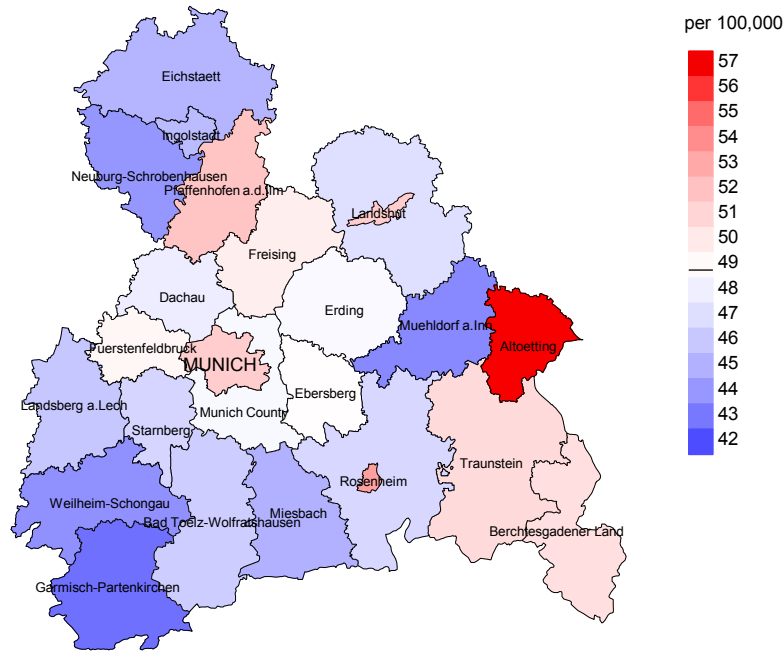


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (48.8/100,000 WS N=18,513).

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 516 women were identified with newly diagnosed fem. genitale cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 48.8/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 43.4 and 54.7/100,000.

Standardized incidence ratio (SIR) 2007 - 2019

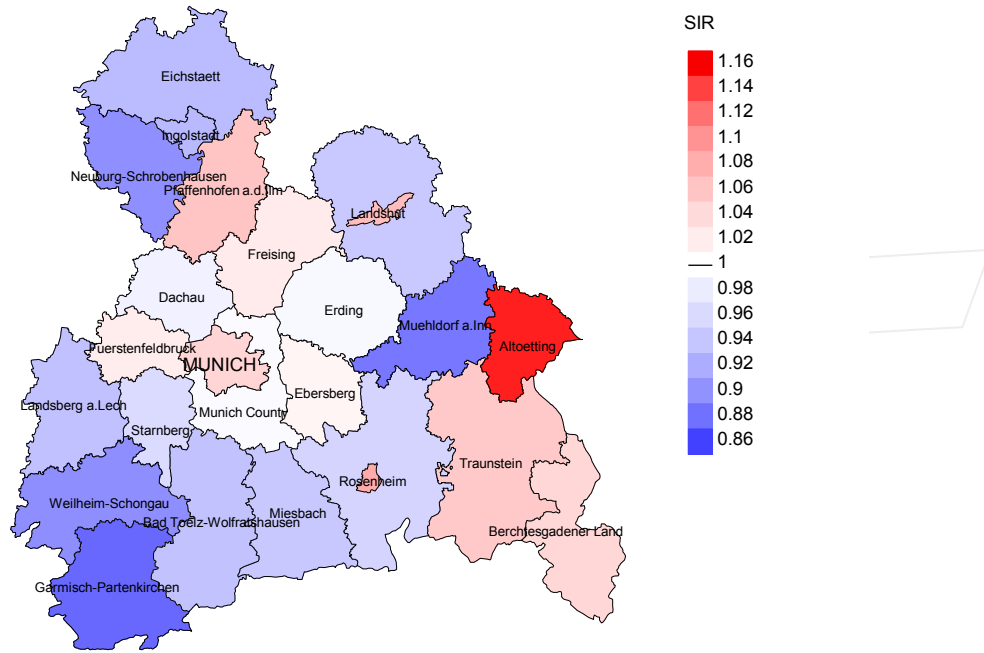


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=18,513).

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 516 women were identified with newly diagnosed fem. genitale cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.01. Though, the value of this parameter may vary with an underlying probability of 99% between 0.90 and 1.13, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	846	95.0	9.1	584	69.0	89.0
1999	838	95.1	8.2	550	65.6	93.3
2000	821	96.1	9.3	533	64.9	94.2
2001	811	94.3	9.5	522	64.4	96.4
2002	1338	96.5	12.1	885	66.1	95.7
2003	1338	95.6	10.5	870	65.0	96.3
2004	1280	95.9	10.1	841	65.7	95.6
2005	1304	94.4	7.8	797	61.1	94.9
2006	1304	93.4	6.3	760	58.3	96.2
2007	1554	92.2	8.6	927	59.7	95.7
2008	1569	98.0	7.4	872	55.6	95.2
2009	1455	96.8	6.4	788	54.2	94.5
2010	1504	97.5	7.8	830	55.2	93.9
2011	1492	97.1	6.1	756	50.7	95.0
2012	1466	97.5	6.2	739	50.4	94.2
2013	1524	97.4	6.6	732	48.0	91.1
2014	1511	96.6	6.5	661	43.7	90.0
2015	1423	95.0	6.5	584	41.0	87.8
2016	1423	99.2	5.3	529	37.2	79.4
2017	1434	99.0	5.6	406	28.3	74.1
2018	1312	99.3	1.4	263	20.0	50.6
2019	1123	70.3	0.3	148	13.2	79.7
1998-2019	28670	95.4	7.1	14577	50.8	92.0

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	846	464	88.6	130	15.4
1999	838	495	88.9	128	15.3
2000	821	481	92.3	128	15.6
2001	811	481	92.5	116	14.3
2002	1338	777	95.6	267	20.0
2003	1338	806	97.3	228	17.0
2004	1280	792	97.6	217	17.0
2005	1304	819	96.6	189	14.5
2006	1304	774	96.6	180	13.8
2007	1554	912	97.7	249	16.0
2008	1569	924	99.4	218	13.9
2009	1455	937	99.1	181	12.4
2010	1504	958	98.6	229	15.2
2011	1492	1008	97.6	210	14.1
2012	1466	934	97.8	212	14.5
2013	1524	1061	97.8	210	13.8
2014	1511	978	98.2	211	14.0
2015	1423	1016	98.0	187	13.1
2016	1423	1033	98.6	193	13.6
2017	1434	1037	96.4	184	12.8
2018	1312	763	29.5	99	7.5
2019	1123	655	52.4	74	6.6
1998–2019	28670	18105	92.5	4040	14.1

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates
(incl. DCO)

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	464	67.7	32.3	84.7
1999	495	69.7	30.3	83.9
2000	481	70.7	29.3	80.9
2001	481	68.2	31.8	82.9
2002	777	73.2	26.8	84.3
2003	806	73.7	26.3	82.9
2004	792	74.9	25.1	82.7
2005	819	75.3	24.7	82.8
2006	774	70.3	29.7	80.7
2007	912	73.4	26.6	80.5
2008	924	74.7	25.3	79.8
2009	937	70.9	29.1	78.0
2010	958	75.3	24.7	81.3
2011	1008	70.6	29.4	78.2
2012	934	69.2	30.8	77.8
2013	1061	70.3	29.7	77.2
2014	978	70.7	29.3	78.4
2015	1016	67.8	32.2	73.5
2016	1033	71.5	28.5	78.0
2017	1037	65.2	34.8	71.3
2018	763	48.4	51.6	69.8
2019	655	51.5	48.5	75.2
1998–2019	18105	69.6	30.4	79.2

Table 10

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

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	464	76.5	73.1	81.8	75.8
1999	495	78.2	74.4	83.8	77.8
2000	481	78.1	75.8	82.9	77.3
2001	481	77.9	73.0	82.7	76.0
2002	777	77.5	73.9	84.7	75.4
2003	806	77.2	74.1	84.4	75.1
2004	792	77.6	74.1	84.2	75.2
2005	819	78.2	74.0	84.4	75.4
2006	774	78.2	74.5	85.1	75.8
2007	912	79.1	75.2	85.9	77.0
2008	924	78.1	73.8	85.9	74.7
2009	937	77.4	72.9	85.1	74.4
2010	958	78.2	74.8	85.4	75.7
2011	1008	77.5	73.5	85.4	74.9
2012	934	79.5	76.2	87.0	76.7
2013	1061	78.3	74.5	86.8	75.9
2014	978	77.5	74.8	85.3	75.3
2015	1016	78.6	75.3	86.4	75.9
2016	1033	77.7	75.0	85.5	75.8
2017	1037	79.9	76.3	86.9	77.2
2018	763	78.3	73.0	82.4	77.5
2019	655	79.0	75.0	82.7	77.1
1998-2019	18105	78.2	74.6	85.0	75.8

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 11

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

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	314	26.7	0.38	11.7	0.31	17.5	0.33	22.3	0.36
1999	345	29.1	0.42	12.1	0.33	18.4	0.36	24.5	0.40
2000	341	28.4	0.42	11.4	0.32	17.5	0.35	23.3	0.40
2001	328	27.0	0.41	11.6	0.33	17.3	0.36	22.3	0.39
2002	569	29.1	0.43	12.3	0.36	18.4	0.38	23.8	0.41
2003	594	30.2	0.45	12.6	0.37	18.9	0.40	24.7	0.43
2004	593	30.0	0.47	12.3	0.38	18.4	0.40	23.8	0.44
2005	617	31.0	0.48	12.5	0.38	18.8	0.41	24.2	0.45
2006	544	27.1	0.42	10.8	0.34	16.2	0.36	21.4	0.40
2007	669	29.0	0.44	11.2	0.34	16.9	0.36	22.2	0.40
2008	690	29.7	0.45	11.8	0.35	17.7	0.38	22.9	0.41
2009	665	28.6	0.46	11.6	0.37	17.3	0.40	22.1	0.43
2010	721	30.8	0.48	11.9	0.38	17.8	0.41	23.2	0.44
2011	713	30.5	0.48	11.9	0.38	17.9	0.41	23.1	0.45
2012	647	27.4	0.45	9.9	0.33	15.3	0.37	20.4	0.41
2013	748	31.4	0.50	12.0	0.38	18.0	0.41	23.5	0.46
2014	692	28.7	0.46	10.8	0.35	16.2	0.38	21.4	0.42
2015	689	28.3	0.49	10.5	0.36	15.9	0.40	20.8	0.44
2016	739	30.1	0.53	11.8	0.41	17.5	0.44	22.4	0.48
2017	679	27.5	0.48	9.9	0.34	15.0	0.38	19.9	0.43
2018	372	15.0	0.29	6.1	0.23	9.0	0.24	11.4	0.27
2019	339	13.7	0.31	5.2	0.24	7.8	0.25	10.1	0.28
1998-2019	12608	27.5	0.45	10.8	0.35	16.2	0.38	21.1	0.41

Table 12

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

Age at death Years	Cases		Cum.%
	n	%	
0-4			
5-9	1	0.0	0.0
10-14	0	0.0	0.0
15-19	2	0.0	0.0
20-24	3	0.0	0.1
25-29	12	0.1	0.2
30-34	23	0.3	0.5
35-39	73	0.9	1.4
40-44	151	1.8	3.2
45-49	240	2.9	6.0
50-54	359	4.3	10.3
55-59	506	6.1	16.4
60-64	639	7.6	24.0
65-69	978	11.7	35.7
70-74	1262	15.1	50.8
75-79	1396	16.7	67.5
80-84	1252	15.0	82.5
85+	1466	17.5	100.0
All ages	8363	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	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9	1	0.1	0.50	4.3
10-14		0.0		
15-19	2	0.1	0.10	8.0
20-24	3	0.2	0.10	7.7
25-29	12	0.6	0.08	12.9
30-34	23	1.1	0.07	14.4
35-39	73	3.5	0.15	20.0
40-44	151	6.7	0.19	18.9
45-49	240	9.9	0.24	15.2
50-54	359	15.5	0.25	14.7
55-59	506	25.3	0.28	14.3
60-64	639	36.4	0.33	13.9
65-69	978	58.1	0.43	15.1
70-74	1262	78.6	0.51	15.4
75-79	1396	101.4	0.59	15.5
80-84	1252	128.6	0.73	14.7
85+	1466	151.9	0.90	13.3
All ages	8363			14.7
Mortality				
Raw		26.9	0.45	
WS		10.3	0.35	
ES		15.5	0.38	
BRD-S		20.1	0.41	
PYLL-70				
per 100,000		127.8		
ES		107.2		
AYLL-70		11.2		

Table 14

Further malignancies in deaths in period 1998-2019

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	28	0.6	9	32.1			19	67.9
C09-C10 Oropharynx	19	0.4	10	52.6			9	47.4
C15 Oesophagus	21	0.4	1	4.8	1	4.8	19	90.5
C16 Stomach	142	3.0	27	19.0	12	8.5	103	72.5
C17 Small intestine	25	0.5	6	24.0	6	24.0	13	52.0
C18 Colon	472	9.9	158	33.5	57	12.1	257	54.4
C19-C20 Rectum	230	4.8	86	37.4	19	8.3	125	54.3
C21 Anus/canal	45	0.9	18	40.0	1	2.2	26	57.8
C22 Liver	37	0.8	4	10.8	1	2.7	32	86.5
C23-C24 Bile	61	1.3	13	21.3	2	3.3	46	75.4
C25 Pancreas	177	3.7	13	7.3	10	5.6	154	87.0
C33-C34 Lung	388	8.2	38	9.8	28	7.2	322	83.0
C40-C41 Bone	12	0.3	3	25.0			9	75.0
C43 Malign. melanoma	140	2.9	83	59.3	6	4.3	51	36.4
C44 Skin others	204	4.3	91	44.6	18	8.8	95	46.6
C46,C49 Soft tissue	33	0.7	9	27.3	3	9.1	21	63.6
C48 Peritoneal	77	1.6	39	50.6	17	22.1	21	27.3
C50 Breast	1340	28.2	784	58.5	116	8.7	440	32.8
C51 Vulva	30	0.6	12	40.0	7	23.3	11	36.7
C52 Vagina	18	0.4	5	27.8	6	33.3	7	38.9
C53 Cervix uteri	133	2.8	93	69.9	16	12.0	24	18.0
C54 Corpus uteri	174	3.7	83	47.7	74	42.5	17	9.8
C55,C57 Fem. genitals un	20	0.4	10	50.0	4	20.0	6	30.0
C56 Ovary	154	3.2	36	23.4	66	42.9	52	33.8
C64 Kidney	87	1.8	34	39.1	6	6.9	47	54.0
C65 Renal pelvis	20	0.4	5	25.0			15	75.0
C66 Ureter	13	0.3	1	7.7			12	92.3
C67 Bladder	160	3.4	26	16.3	18	11.3	116	72.5
C70-C72 CNS cancer	50	1.1	8	16.0	2	4.0	40	80.0
C73 Thyroid	53	1.1	33	62.3	1	1.9	19	35.8
C76-C79 CUP	98	2.1	26	26.5	13	13.3	59	60.2
C82-C85 NHL	113	2.4	44	38.9	8	7.1	61	54.0
C90 Mult. myeloma	25	0.5	4	16.0	1	4.0	20	80.0
C91-C96 Leukaemia	70	1.5	13	18.6	6	8.6	51	72.9
Others, specified	91	1.9	42	46.2	5	5.5	44	48.4
All further malignancies	4760	100.0	1867	39.2	530	11.1	2363	49.6

Further malignancies with number of cases 1 to 11 are pooled in category "Others, specified".

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

Table 15

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

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9	1	0.1	0.50	4.3
10-14		0.0		
15-19	2	0.1	0.10	8.7
20-24	3	0.2	0.12	8.1
25-29	9	0.4	0.06	10.5
30-34	20	0.9	0.06	14.4
35-39	67	3.2	0.14	20.3
40-44	139	6.1	0.19	19.7
45-49	201	8.3	0.23	14.9
50-54	299	12.9	0.24	14.4
55-59	428	21.4	0.27	14.4
60-64	525	29.9	0.32	13.9
65-69	788	46.8	0.42	15.3
70-74	1013	63.1	0.52	16.0
75-79	1125	81.7	0.61	16.3
80-84	989	101.6	0.75	15.0
85+	1189	123.2	0.95	13.7
All ages	6798			15.0
Mortality				
Raw		21.9	0.44	
WS		8.5	0.34	
ES		12.7	0.36	
BRD-S		16.4	0.40	
PYLL-70				
per 100,000		108.7		
ES		91.4		
AYLL-70		11.5		

* 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	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9	1	0.1	0.50	4.3
10-14		0.0		
15-19	2	0.1	0.10	9.1
20-24	3	0.2	0.12	8.3
25-29	9	0.4	0.06	10.7
30-34	20	0.9	0.06	14.6
35-39	63	3.0	0.14	19.3
40-44	129	5.7	0.18	18.5
45-49	184	7.6	0.22	13.8
50-54	264	11.4	0.23	12.9
55-59	375	18.8	0.25	12.9
60-64	452	25.8	0.30	12.2
65-69	639	37.9	0.37	12.7
70-74	826	51.4	0.46	13.4
75-79	894	64.9	0.53	13.4
80-84	765	78.6	0.62	12.1
85+	918	95.1	0.77	11.0
All ages	5544			12.7
Mortality				
Raw		17.8	0.39	
WS		7.1	0.30	
ES		10.6	0.32	
BRD-S		13.5	0.35	
PYLL-70 per 100,000		97.3		
ES		82.1		
AYLL-70		11.9		

* See corresponding tables with multiple malignancies.

ICD-10 C51-C58: Malignant neoplasms of female genital organs
 Age distribution and age-specific mortality 2007 - 2019 (n=8363)

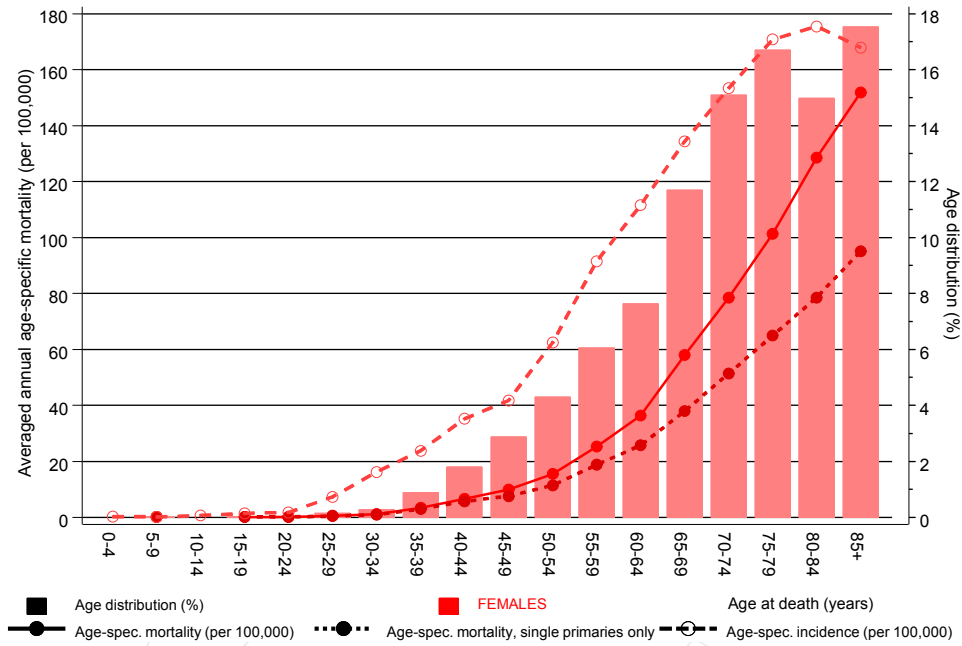


Figure 17. Distribution of age at death (bars; n=mean=67.8 yrs, median=69.6 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (Germany 1987 standard population) 2007 - 2019

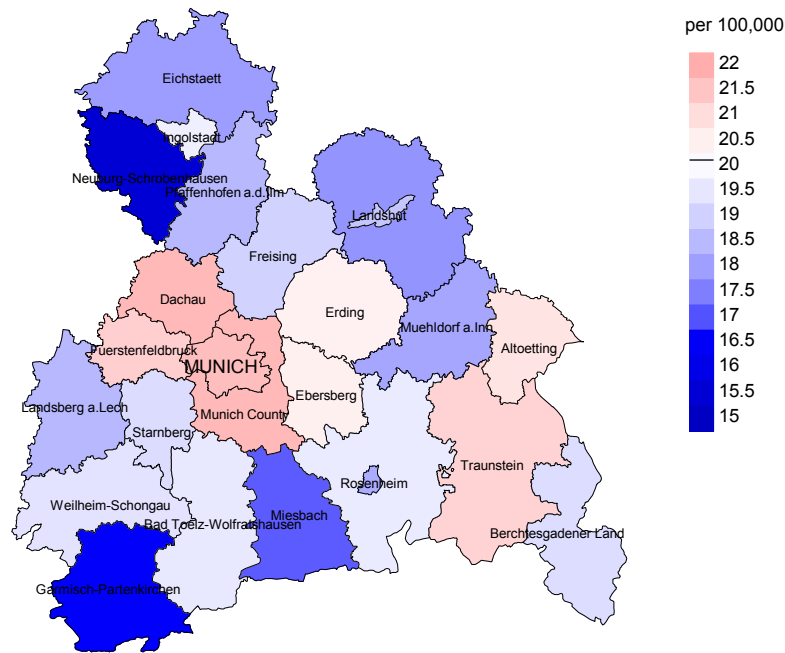


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (20.1/100,000 WS N=8,363).

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 235 women died from fem. genitale cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 20.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 17.1 and 24.3/100,000.

Standardized mortality ratio (SMR) 2007 - 2019

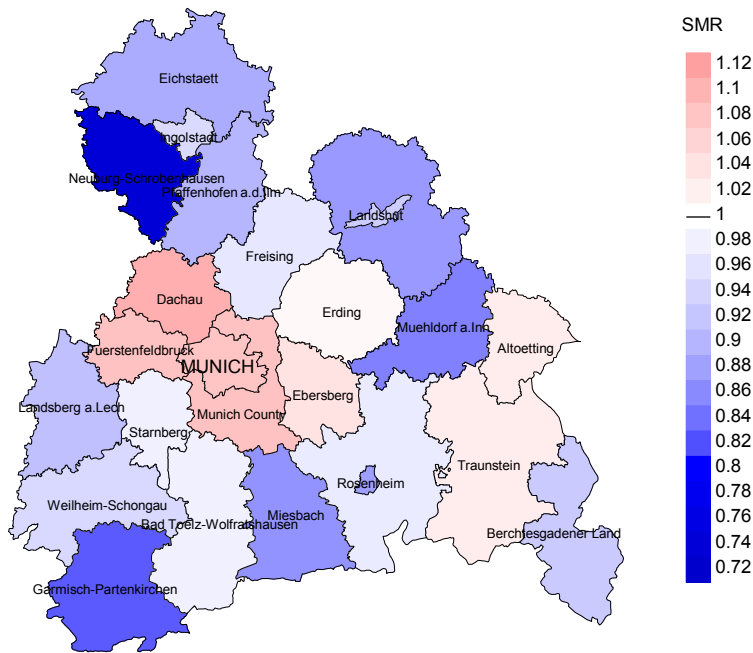


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=8,363).

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 235 women died from fem. genitale cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.04. Though, the value of this parameter may vary with an underlying probability of 99% between 0.87 and 1.23, 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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