

# Munich Cancer Registry



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

## ICD-10 D06: Ca. i.s. Cervix

### Incidence and Mortality

Year of diagnosis	1998-2019
Patients	7,995
Diseases	7,997
Creation date	01/26/2021
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/bD06\\_\\_E-ICD-10-D06-Ca.-i.s.-Cervix-incidence-and-mortality.pdf](https://www.tumorregister-muenchen.de/en/facts/base/bD06__E-ICD-10-D06-Ca.-i.s.-Cervix-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.

### ICD-10 codes (ICD-10 2016) used for specifying cancer site

Code	Description
D06.-	Carcinoma in situ of cervix uteri
D06.0	Endocervix
D06.1	Exocervix
D06.7	Other parts of cervix
D06.9	Cervix, unspecified

## INCIDENCE

Table 1

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up

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	33	3.0	5.0	9.1	78.8
1999	31	1.6	4.9	9.7	83.9
2000	50	5.3	4.9	18.0	84.0
2001	54	4.8	4.8	11.1	83.3
2002	73	6.2	4.8	5.5	87.7 #
2003	128	4.9	4.7	8.6	86.7
2004	213	4.8	4.5	8.0	86.9
2005	250	4.2	4.3	6.0	89.2
2006	274	4.4	4.1	7.3	78.8
2007	397	4.3	3.9	3.8	72.8 #
2008	446	3.8	3.8	2.0	94.6
2009	520	3.7	3.5	2.5	94.2
2010	558	3.2	3.5	1.6	94.6
2011	671	3.0	3.5	1.8	94.6
2012	587	3.3	3.4	1.9	95.6
2013	860	3.2	3.3	0.5	92.3
2014	693	3.2	3.0	0.6	79.9
2015	487	3.2	2.9	1.2	76.4
2016	431	3.2	2.6	0.5	98.4
2017	428	3.1	1.8	1.6	99.3
2018	421	3.2	1.4	1.0	99.8
2019	392	3.3	1.3	0.8	53.3 ##
1998-2019	7997	3.3	5.0	2.3	88.3

7,997 cases diagnosed 1998-2019 are related to a total of 7,995 patients. Currently, in 669 (8.4 %) of these 7,995 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 568 / 81 / 20 (7.1 % / 1.0 % / 0.3 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 428 cases has been diagnosed, of which 3.1 % 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	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	33	2.8	2.2	2.5	2.6
1999	31	2.6	2.1	2.3	2.4
2000	50	4.2	3.2	3.6	3.7
2001	54	4.4	3.6	4.0	4.2
2002	73	3.7	3.0	3.4	3.5
2003	128	6.5	5.5	6.1	6.4
2004	213	10.8	9.0	10.1	10.4
2005	250	12.6	10.6	11.9	12.3
2006	274	13.6	12.1	13.2	13.9
2007	397	17.2	16.0	17.0	18.0
2008	446	19.2	18.4	19.4	20.6
2009	520	22.4	21.5	22.7	23.9
2010	558	23.8	23.5	24.5	26.0
2011	671	28.7	27.6	29.4	31.0
2012	587	24.9	23.3	24.9	26.3
2013	860	36.1	34.9	36.9	38.9
2014	693	28.8	27.4	29.3	30.7
2015	487	20.0	18.2	20.1	20.8
2016	431	17.6	16.4	17.7	18.6
2017	428	17.4	16.4	17.7	18.5
2018	421	17.0	16.0	17.3	18.1
2019	392	15.8	14.4	15.9	16.6
1998-2019	7997	17.5	16.1	17.3	18.2

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

Table 3

## Age distribution parameters by year of diagnosis

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	33	39.3	12.6	21.3	77.3	28.3	31.2	35.2	45.4	50.4
1999	31	37.0	9.4	24.0	66.5	29.7	30.7	34.1	42.4	49.5
2000	50	40.8	12.9	26.8	87.1	29.2	33.8	37.0	43.7	60.6
2001	54	40.0	10.4	26.6	68.4	29.1	31.9	37.0	47.4	56.7
2002	73	39.4	10.5	22.3	82.4	29.4	31.5	37.6	43.0	52.7
2003	128	38.3	11.1	20.9	77.7	26.6	32.2	36.4	41.4	51.3
2004	213	39.8	12.3	18.8	91.7	28.1	31.8	36.6	44.2	56.8
2005	250	39.4	11.4	21.6	88.9	28.3	31.8	37.0	43.9	52.8
2006	274	38.5	11.6	18.4	94.0	26.4	30.1	37.3	43.7	52.8
2007	397	36.6	10.8	17.7	85.5	26.0	28.9	34.7	41.1	48.3
2008	446	35.6	10.2	17.7	82.5	25.3	28.7	33.8	40.4	46.6
2009	520	35.7	10.0	19.0	94.2	25.1	28.5	33.9	41.1	46.8
2010	558	34.7	9.0	18.1	85.1	25.4	28.0	32.9	39.7	46.0
2011	671	36.0	10.2	18.8	77.1	25.6	29.0	33.8	41.0	49.3
2012	587	37.6	12.3	17.6	85.5	25.9	29.4	34.2	43.1	51.4
2013	860	35.7	9.6	18.3	78.2	26.0	29.0	33.2	40.6	48.5
2014	693	36.0	9.4	18.9	87.6	26.6	29.4	33.8	40.1	48.2
2015	487	38.1	11.1	19.3	86.2	27.1	30.5	35.3	43.6	52.8
2016	431	37.6	11.4	17.7	87.1	26.8	29.7	34.9	43.2	51.4
2017	428	37.4	11.1	18.7	84.1	26.4	29.8	35.0	42.6	51.7
2018	421	37.6	11.5	18.6	94.0	26.5	29.8	34.8	42.8	52.7
2019	392	38.6	11.0	20.4	83.1	27.3	30.7	35.9	44.7	52.5
1998-2019	7997	36.9	10.7	17.6	94.2	26.2	29.5	34.5	41.8	50.3

Table 4

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

Age at diagnosis Years	Cases		Cum.%
	n	%	
0-4			
5-9			
10-14			
15-19	28	0.4	0.4
20-24	433	6.3	6.7
25-29	1553	22.5	29.2
30-34	1707	24.8	54.0
35-39	1169	17.0	71.0
40-44	844	12.2	83.2
45-49	486	7.1	90.3
50-54	265	3.8	94.1
55-59	137	2.0	96.1
60-64	85	1.2	97.3
65-69	66	1.0	98.3
70-74	54	0.8	99.1
75-79	38	0.6	99.6
80-84	17	0.2	99.9
85+	9	0.1	100.0
All ages	6891	100.0	

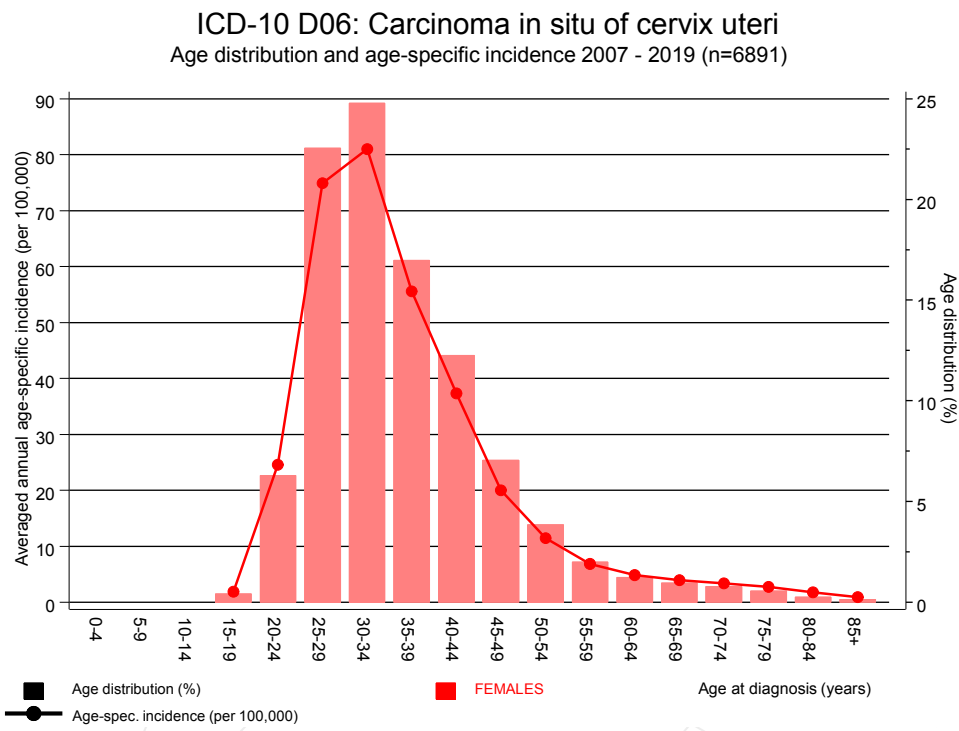
Table 5

Age-specific incidence  
for period 2007-2019

Age at diagnosis Years	Cases n	Age-spec. incidence
0- 4		0.0
5- 9		0.0
10-14		0.0
15-19	28	1.9
20-24	433	24.6
25-29	1553	74.9
30-34	1707	81.0
35-39	1169	55.6
40-44	844	37.3
45-49	486	20.0
50-54	265	11.5
55-59	137	6.9
60-64	85	4.8
65-69	66	3.9
70-74	54	3.4
75-79	38	2.8
80-84	17	1.7
85+	9	0.9
All ages	6891	
Incidence		
Raw		22.2
WS		21.0
ES		22.5
BRD-S		23.6

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 (mean=36.6 yrs, median=34.1 yrs) and age-specific incidence.

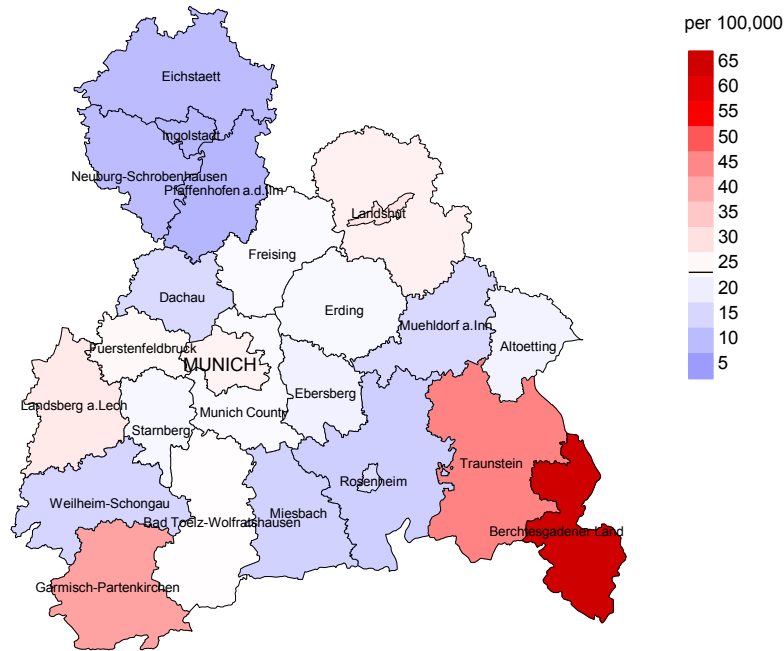
Table 7

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	1	0.3	2.9	0.1	16.2	0.3	
C11 Nasopharynx	1	0.0	31.0	0.8	172.6	0.4	
C12-C13 Hypopharynx	2	0.1	28.9	3.5	104.5 #	0.9	
C15 Oesophagus	2	0.3	7.8	1.0	28.3	0.8	
C16 Stomach	4	1.1	3.6	1.0	9.2	1.3	
C17 Small intestine	3	0.3	10.5	2.2	30.6 #	1.3	
C18 Colon	15	3.0	5.1	2.8	8.3 #	5.6	
C19-C20 Rectum	11	1.5	7.1	3.6	12.7 #	4.4	
C21 Anus/canal	8	0.3	24.9	10.8	49.1 #	3.6	
C22 Liver	3	0.4	7.5	1.5	21.8 #	1.2	33.3
C23-C24 Bile	1	0.3	2.9	0.1	16.4	0.3	
C25 Pancreas	5	1.2	4.0	1.3	9.4 #	1.7	20.0
C32 Larynx	1	0.1	11.2	0.3	62.7	0.4	
C33-C34 Lung	21	3.1	6.8	4.2	10.4 #	8.3	
C43 Malign. melanoma	12	4.4	2.7	1.4	4.8 #	3.5	
C46,C49 Soft tissue	2	0.4	5.1	0.6	18.5	0.7	
C50 Breast	106	23.6	4.5	3.7	5.4 #	38.1	0.9
C51 Vulva	15	0.5	32.7	18.3	53.9 #	6.7	
C52 Vagina	9	0.1	126.3	57.8	239.8 #	4.1	
C53 Cervix uteri	46	2.9	15.8	11.6	21.1 #	20.0	
C54 Corpus uteri	25	2.4	10.5	6.8	15.6 #	10.5	
C56 Ovary	15	2.1	7.3	4.1	12.0 #	6.0	6.7
C64 Kidney	4	0.9	4.7	1.3	11.9 #	1.5	
C65 Renal pelvis	1	0.1	13.3	0.3	74.2	0.4	
C67 Bladder	1	0.5	2.0	0.0	11.0	0.2	
C70-C72 CNS cancer	2	1.0	2.1	0.3	7.6	0.5	
C73 Thyroid	6	3.7	1.6	0.6	3.5	1.1	
C76-C79 CUP	4	0.5	7.3	2.0	18.6 #	1.6	
C81 Hodgkin lymphoma	1	0.5	2.1	0.1	11.9	0.2	
C82-C85 NHL	7	1.7	4.2	1.7	8.7 #	2.5	
C90 Mult. myeloma	2	0.4	5.4	0.7	19.7	0.8	
C91-C96 Leukaemia	4	0.8	4.8	1.3	12.3 #	1.5	
C96 Systemic	1	0.0	142.3	3.6	793.1 #	0.5	
Not observed	0	1.3	0.0	0.0	2.9	-0.6	
All further malignancies	341	59.7	5.7	5.1	6.4 #	130.3	1.2
Patients		7477					
Median age at next malignancy (years)		49.8					
Person-years		21589					
Mean observation time (years)		2.9					
Median observation time (years)		0.8					

# The occurrence of further specified malignancy is statistically significant.

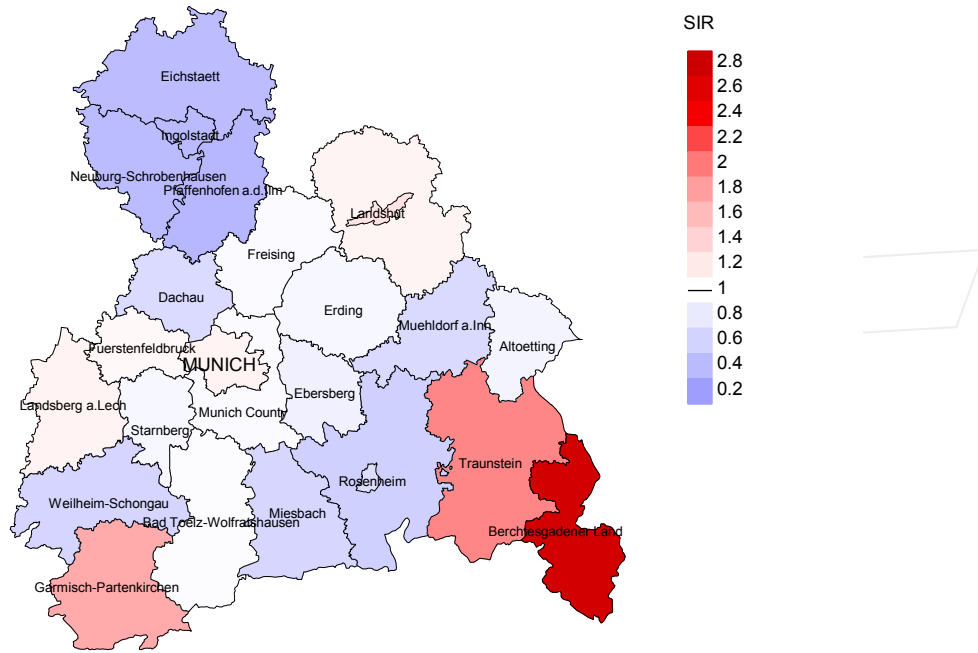
Average incidence (Germany 1987 standard population) 2007 - 2019



**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 (23.6/100,000 WS N=6,891).

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 156 women were identified with newly diagnosed ca. i.s. Cervix. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 20.8/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 16.6 and 25.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2019



**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 (N=6,891).

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 156 women were identified with newly diagnosed ca. i.s. Cervix. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.86. Though, the value of this parameter may vary with an underlying probability of 99% between 0.70 and 1.06, 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	33	78.8	3	9.1	100.0
1999	31	83.9	3	9.7	100.0
2000	50	84.0	9	18.0	100.0
2001	54	83.3	6	11.1	100.0
2002	73	87.7	4	5.5	100.0
2003	128	86.7	11	8.6	100.0
2004	213	86.9	17	8.0	82.4
2005	250	89.2	15	6.0	86.7
2006	274	78.8	20	7.3	85.0
2007	397	72.8	15	3.8	100.0
2008	446	94.6	9	2.0	66.7
2009	520	94.2	13	2.5	92.3
2010	558	94.6	9	1.6	77.8
2011	671	94.6	12	1.8	100.0
2012	587	95.6	11	1.9	72.7
2013	860	92.3	4	0.5	75.0
2014	693	79.9	4	0.6	50.0
2015	487	76.4	6	1.2	83.3
2016	431	98.4	2	0.5	50.0
2017	428	99.3	7	1.6	57.1
2018	421	99.8	4	1.0	50.0
2019	392	53.3	3	0.8	66.7
1998-2019	7997	88.3	187	2.3	85.0

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	33	3		
1999	31	2		
2000	50	1	1	2.0
2001	54	2		
2002	73	3		
2003	128	5		
2004	213	7	1	0.5
2005	250	7	1	0.4
2006	274	5		
2007	397	8	1	0.3
2008	446	8		
2009	520	12		
2010	558	12		
2011	671	9		
2012	587	14		
2013	860	20		
2014	693	25	1	0.1
2015	487	14	1	0.2
2016	431	21		
2017	428	24		
2018	421	22	1	0.2
2019	392	20	1	0.3
1998-2019	7997	244	8	0.1

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	3	66.7	33.3	100.0
1999	2	50.0	50.0	50.0
2000	1	100.0		100.0
2001	2	100.0		100.0
2002	3	66.7	33.3	100.0
2003	5	40.0	60.0	40.0
2004	7	100.0		100.0
2005	7	71.4	28.6	71.4
2006	5	80.0	20.0	80.0
2007	8	100.0		100.0
2008	8	62.5	37.5	87.5
2009	12	83.3	16.7	83.3
2010	12	75.0	25.0	66.7
2011	9	66.7	33.3	62.5
2012	14	57.1	42.9	53.8
2013	20	60.0	40.0	68.4
2014	25	64.0	36.0	68.0
2015	14	57.1	42.9	64.3
2016	21	66.7	33.3	71.4
2017	24	58.3	41.7	70.0
2018	22	22.7	77.3	87.5
2019	20	20.0	80.0	54.5
1998–2019	244	59.4	40.6	71.8

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	3	83.4	80.2	83.4	80.1
1999	2	71.9	62.6	81.2	62.6
2000	1	87.2	87.2		87.2
2001	2	62.4	62.4		62.4
2002	3	50.0	55.9	50.0	50.0
2003	5	76.6	74.7	76.6	74.7
2004	7	64.3	64.3		64.3
2005	7	73.5	68.4	85.1	68.4
2006	5	63.1	57.7	81.5	57.7
2007	8	75.7	75.7		75.7
2008	8	63.7	58.4	81.0	58.4
2009	12	59.2	57.9	91.1	57.9
2010	12	70.8	68.9	85.6	70.8
2011	9	59.4	58.5	64.7	59.4
2012	14	62.6	61.4	72.0	66.0
2013	20	59.4	58.7	62.8	59.1
2014	25	64.6	56.3	80.8	57.1
2015	14	76.1	66.5	86.0	72.2
2016	21	63.9	63.7	75.0	63.9
2017	24	58.9	57.8	75.5	58.9
2018	22	57.9	54.0	59.0	54.0
2019	20	59.2	63.4	56.0	63.4
1998-2019	244	63.1	60.9	72.6	62.6

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	2	0.2	0.06	0.0	0.02	0.1	0.03	0.2	0.06
1999	1	0.1	0.03	0.1	0.02	0.1	0.03	0.1	0.03
2000	1	0.1	0.02	0.0	0.00	0.0	0.01	0.0	0.01
2001	2	0.2	0.04	0.1	0.03	0.1	0.03	0.1	0.03
2002	2	0.1	0.03	0.1	0.03	0.1	0.03	0.1	0.03
2003	2	0.1	0.02	0.0	0.01	0.1	0.01	0.1	0.01
2004	7	0.4	0.03	0.2	0.02	0.2	0.02	0.3	0.03
2005	5	0.3	0.02	0.1	0.01	0.2	0.01	0.2	0.02
2006	4	0.2	0.01	0.1	0.01	0.2	0.01	0.2	0.01
2007	8	0.3	0.02	0.1	0.01	0.2	0.01	0.3	0.02
2008	5	0.2	0.01	0.1	0.01	0.2	0.01	0.2	0.01
2009	10	0.4	0.02	0.3	0.01	0.4	0.02	0.4	0.02
2010	9	0.4	0.02	0.2	0.01	0.3	0.01	0.3	0.01
2011	6	0.3	0.01	0.1	0.01	0.2	0.01	0.2	0.01
2012	8	0.3	0.01	0.2	0.01	0.3	0.01	0.3	0.01
2013	12	0.5	0.01	0.3	0.01	0.4	0.01	0.4	0.01
2014	16	0.7	0.02	0.4	0.02	0.5	0.02	0.6	0.02
2015	8	0.3	0.02	0.1	0.01	0.2	0.01	0.3	0.01
2016	14	0.6	0.03	0.3	0.02	0.4	0.02	0.5	0.03
2017	14	0.6	0.03	0.3	0.02	0.4	0.02	0.5	0.03
2018	5	0.2	0.01	0.1	0.01	0.1	0.01	0.2	0.01
2019	4	0.2	0.01	0.1	0.01	0.1	0.01	0.1	0.01
1998-2019	145	0.3	0.02	0.2	0.01	0.2	0.01	0.3	0.02

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			
10-14			
15-19			
20-24			
25-29	2	1.7	1.7
30-34	2	1.7	3.4
35-39	2	1.7	5.0
40-44	4	3.4	8.4
45-49	14	11.8	20.2
50-54	15	12.6	32.8
55-59	25	21.0	53.8
60-64	10	8.4	62.2
65-69	12	10.1	72.3
70-74	8	6.7	79.0
75-79	8	6.7	85.7
80-84	13	10.9	96.6
85+	4	3.4	100.0
All ages	119	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
0- 4		0.0	
5- 9		0.0	
10-14		0.0	
15-19		0.0	
20-24		0.0	
25-29	2	0.1	0.00
30-34	2	0.1	0.00
35-39	2	0.1	0.00
40-44	4	0.2	0.00
45-49	14	0.6	0.03
50-54	15	0.6	0.06
55-59	25	1.3	0.18
60-64	10	0.6	0.12
65-69	12	0.7	0.18
70-74	8	0.5	0.15
75-79	8	0.6	0.21
80-84	13	1.3	0.76
85+	4	0.4	0.44
All ages	119		
Mortality			
Raw		0.4	0.02
WS		0.2	0.01
ES		0.3	0.01
BRD-S		0.3	0.01
PYLL-70			
per 100,000		5.1	
ES		4.3	
AYLL-70		15.5	

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 ←%
C11 Nasopharynx	1	0.6					1	100.0
C15 Oesophagus	2	1.2					2	100.0
C16 Stomach	3	1.8	1	33.3			2	66.7
C18 Colon	9	5.4	1	11.1	4	44.4	4	44.4
C19-C20 Rectum	6	3.6			1	16.7	5	83.3
C21 Anus/canal	3	1.8	1	33.3			2	66.7
C22 Liver	2	1.2					2	100.0
C25 Pancreas	6	3.6	1	16.7			5	83.3
C33-C34 Lung	15	9.0			2	13.3	13	86.7
C43 Malign. melanoma	2	1.2			1	50.0	1	50.0
C44 Skin others	1	0.6	1	100.0				
C46,C49 Soft tissue	1	0.6	1	100.0				
C48 Peritoneal	1	0.6					1	100.0
C50 Breast	56	33.7	23	41.1	5	8.9	28	50.0
C51 Vulva	6	3.6			1	16.7	5	83.3
C52 Vagina	7	4.2	1	14.3			6	85.7
C53 Cervix uteri	10	6.0					10	100.0
C54 Corpus uteri	3	1.8			2	66.7	1	33.3
C56 Ovary	11	6.6	1	9.1	4	36.4	6	54.5
C65 Renal pelvis	1	0.6					1	100.0
C67 Bladder	3	1.8	1	33.3			2	66.7
C70-C72 CNS cancer	1	0.6	1	100.0				
C73 Thyroid	1	0.6					1	100.0
C76-C79 CUP	4	2.4			1	25.0	3	75.0
C82-C85 NHL	3	1.8					3	100.0
C90 Mult. myeloma	3	1.8					3	100.0
C91-C96 Leukaemia	4	2.4	1	25.0			3	75.0
C96 Systemic	1	0.6					1	100.0
All further malignancies	166	100.0	34	20.5	21	12.7	111	66.9

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	Cases n	Age-spec. mortality	MI-index
0- 4		0.0	
5- 9		0.0	
10-14		0.0	
15-19		0.0	
20-24		0.0	
25-29		0.0	
30-34	1	0.0	0.00
35-39	1	0.0	0.00
40-44	3	0.1	0.00
45-49	9	0.4	0.02
50-54	9	0.4	0.04
55-59	18	0.9	0.16
60-64	7	0.4	0.11
65-69	7	0.4	0.15
70-74	4	0.2	0.11
75-79	5	0.4	0.25
80-84	8	0.8	0.80
85+	2	0.2	0.33
All ages	74		
Mortality			
Raw		0.2	0.01
WS		0.1	0.01
ES		0.2	0.01
BRD-S		0.2	0.01
PYLL-70 per 100,000		3.1	
ES		2.6	
AYLL-70		14.7	

\* See corresponding tables with multiple malignancies.

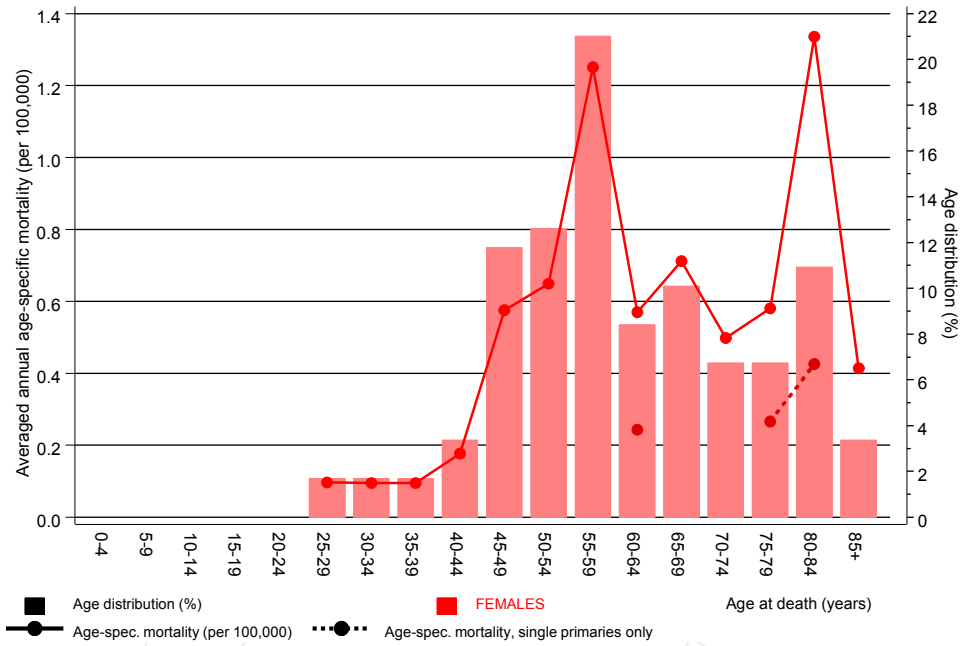
Table 16

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2015-2017  
(**Single primaries only \***)

Age at death Years	Cases n	Age-spec. mortality	MI-index
0- 4		0.0	
5- 9		0.0	
10-14		0.0	
15-19		0.0	
20-24		0.0	
25-29		0.0	
30-34		0.0	
35-39		0.0	
40-44		0.0	
45-49		0.0	
50-54		0.0	
55-59		0.0	
60-64	1	0.2	0.08
65-69		0.0	
70-74		0.0	
75-79	1	0.3	0.24
80-84	1	0.4	0.59
85+		0.0	
All ages	3		
Mortality			
Raw		0.0	0.00
WS		0.0	0.00
ES		0.0	0.00
BRD-S		0.0	0.00
PYLL-70 per 100,000		0.1	
ES		0.1	
AYLL-70		7.5	

\* See corresponding tables with multiple malignancies.

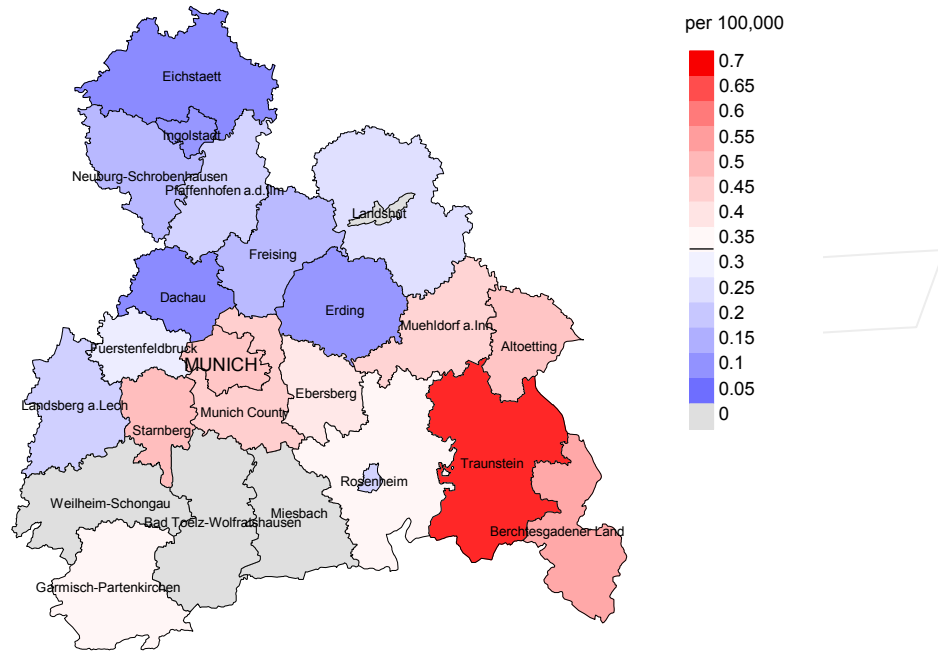
ICD-10 D06: Carcinoma in situ of cervix uteri  
Age distribution and age-specific mortality 2015 - 2017 (n=119)



**Figure 17.** Distribution of age at death (bars; n=mean=51.0 yrs, median=51.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line).

The difference between age at diagnosis (Table 3) and age at ca. i.s. Cervix-related death (see Table 10) should be considered.

Average mortality (Germany 1987 standard population) 2007 - 2019

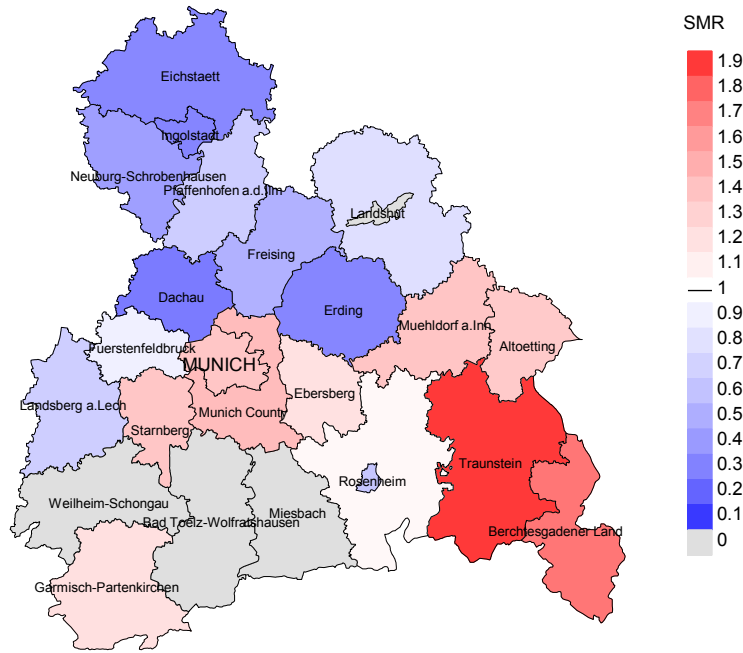


**Figure 18a.** Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (0.3/100,000 WS N=119).

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 4 women died from ca. i.s. Cervix. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.3/100,000.



Standardized mortality ratio (SMR) 2007 - 2019



**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 (N=119).

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 4 women died from ca. i.s. Cervix. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.20. Though, the value of this parameter may vary with an underlying probability of 99% between 0.20 and 3.78, 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**

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