

Munich Cancer Registry



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

ICD-10 C53: Cervical cancer

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	4,207
Diseases	4,210
Creation date	08/21/2018
Export date	08/09/2018
Population (females)	2.43 m





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

https://www.tumorregister-muenchen.de/en/facts/base/bC53__E-ICD-10-C53-Cervical-cancer-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[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases^{##} and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases^{###} are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, August 2018

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

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

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

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

Code	Description
C53.-	Malignant neoplasm of cervix uteri
C53.0	Endocervix
C53.1	Exocervix
C53.8	Overlapping lesion of cervix uteri
C53.9	Cervix uteri, unspecified

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	147	9	6.1	4.1	8.2	51.0	91.2
1999	163	2	1.2	5.2	7.9	40.5	88.3
2000	151	9	6.0	6.7	7.7	44.4	92.1
2001	155	6	3.9	6.8	7.3	43.2	91.0
2002	239	23	9.6	6.7	7.0	47.3	93.7 #
2003	219	10	4.6	6.5	6.7	52.5	90.9
2004	218	14	6.4	6.9	6.3	50.0	95.4
2005	236	12	5.1	6.5	6.1	43.2	90.7
2006	245	8	3.3	6.3	5.8	41.6	82.4
2007	244	8	3.3	6.4	5.5	40.2	72.5 #
2008	273	7	2.6	6.6	5.5	38.5	57.9
2009	274	10	3.6	6.7	5.0	43.1	55.1
2010	253	12	4.7	7.3	4.7	37.9	60.5
2011	247	8	3.2	7.2	4.1	32.0	60.7
2012	250	18	7.2	7.7	3.7	39.2	58.8
2013	244	10	4.1	7.8	3.2	35.2	64.8
2014	258	5	1.9	7.9	3.1	18.6	68.2
2015	199	13	6.5	8.1	2.1	24.1	96.0
2016	195	2	1.0	8.5	1.1	9.2	61.5 ##
1998-2016	4210	186	4.4	8.5	8.2	38.2	75.7

4,210 cases diagnosed 1998-2016 are related to a total of 4,207 patients. Currently, in 768 (18.3 %) of these 4,207 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 645 / 107 / 16 (15.3 % / 2.5 % / 0.4 %) 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 2014, a subgroup of 258 cases has been diagnosed, of which 7.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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 4.81 m as of 2007, respectively)

Year of diagnosis	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	147	12.5	8.2	10.5	11.4
1999	163	13.7	9.3	11.6	12.5
2000	151	12.6	8.3	10.5	11.4
2001	155	12.7	8.3	10.5	11.3
2002	239	12.2	7.7	9.8	10.9
2003	219	11.1	7.1	9.1	9.9
2004	218	11.0	7.0	9.0	9.7
2005	236	11.9	7.6	9.6	10.4
2006	245	12.2	7.9	10.0	10.8
2007	244	10.6	7.0	8.8	9.2
2008	273	11.8	7.8	9.8	10.4
2009	274	11.8	7.7	9.9	10.6
2010	253	10.8	7.1	9.0	9.6
2011	247	10.6	7.2	9.0	9.5
2012	250	10.6	6.7	8.5	9.3
2013	244	10.2	7.0	8.7	9.3
2014	258	10.7	7.3	9.2	9.8
2015	199	8.2	5.4	6.8	7.2
2016	195	7.9	5.4	6.7	7.2
1998-2016	4210	11.0	7.2	9.1	9.8

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.		Min.		Max.		Median		
		Mean	dev.			10%	25%	50%	75%	90%
1998	147	53.5	16.1	23.8	89.4	34.0	41.0	49.9	65.1	79.7
1999	163	51.2	16.4	24.4	90.0	33.8	37.5	47.8	63.8	77.7
2000	151	53.3	16.8	23.9	90.7	33.8	39.6	49.8	65.1	79.9
2001	155	53.9	17.1	22.9	96.0	34.1	40.0	48.9	63.5	80.9
2002	239	55.3	18.0	25.9	96.1	34.9	39.4	51.5	70.3	81.7
2003	219	56.1	17.0	27.3	93.4	35.7	42.7	53.4	67.5	82.0
2004	218	55.3	17.1	21.0	95.2	35.9	42.0	52.4	66.6	82.7
2005	236	55.2	17.6	24.0	100	34.9	40.1	54.1	68.7	80.8
2006	245	54.5	16.7	22.9	99.4	35.6	41.5	50.5	65.1	81.3
2007	244	53.0	17.0	22.0	96.6	34.4	40.7	48.7	66.1	79.9
2008	273	54.0	15.6	24.0	92.8	36.5	42.5	50.7	66.9	75.3
2009	274	55.2	17.0	23.1	95.1	36.1	41.1	52.2	67.1	81.9
2010	253	54.9	16.4	25.1	93.2	35.4	42.2	52.5	66.4	80.7
2011	247	52.8	16.2	25.7	95.6	32.9	40.7	50.1	63.0	77.8
2012	250	56.5	17.0	25.4	95.7	34.8	42.3	55.2	70.1	80.8
2013	244	53.3	15.7	22.1	96.0	34.5	42.8	50.4	63.4	77.1
2014	258	52.8	16.3	25.8	94.6	33.7	39.1	50.7	63.0	77.4
2015	199	55.7	17.4	27.9	96.7	35.8	42.4	51.9	67.9	84.2
2016	195	54.2	16.1	22.4	91.7	33.2	41.1	53.6	66.3	77.7
1998-2016	4210	54.3	16.7	21.0	100	34.8	41.1	51.4	66.4	79.8

Table 4

Age distribution by 5-year age group for period 2007-2016
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%
0-4			
5-9			
10-14			
15-19			
20-24	7	0.3	0.3
25-29	79	3.2	3.5
30-34	176	7.2	10.8
35-39	252	10.3	21.1
40-44	343	14.1	35.2
45-49	279	11.4	46.6
50-54	247	10.1	56.8
55-59	232	9.5	66.3
60-64	180	7.4	73.7
65-69	163	6.7	80.3
70-74	152	6.2	86.6
75-79	110	4.5	91.1
80-84	89	3.7	94.7
85+	128	5.3	100.0
All ages	2437	100.0	

Table 5

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

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=93 %	Prop. all cancers n=112253 %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	7	0.5		1.9
25-29	78	5.0		9.3
30-34	176	11.0		11.9
35-39	252	15.8	0.4	10.1
40-44	342	19.1		7.5
45-49	279	14.6	0.4	4.1
50-54	247	14.4	0.8	2.8
55-59	232	15.8	1.7	2.5
60-64	180	13.5	1.7	1.6
65-69	163	12.5	3.1	1.2
70-74	152	12.0	5.9	1.0
75-79	110	11.0	5.5	0.8
80-84	89	12.6	18.0	0.8
85+	128	17.4	35.9	1.0
All ages	2435		3.8	2.2
Incidence				
Raw		10.3		
WS		6.8		
ES		8.6		
BRD-S		9.2		

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 C53: Malignant neoplasm of cervix uteri
Age distribution and age-specific incidence 2007 - 2016 (n=2435)

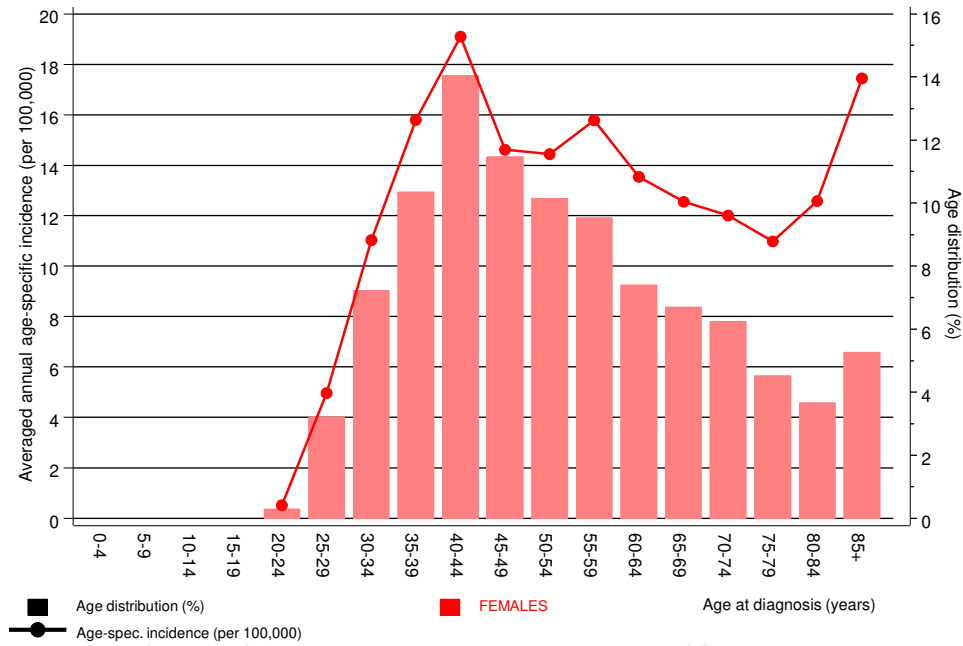


Figure 6. Age distribution (mean=54.2 yrs, median=51.4 yrs) and age-specific incidence.

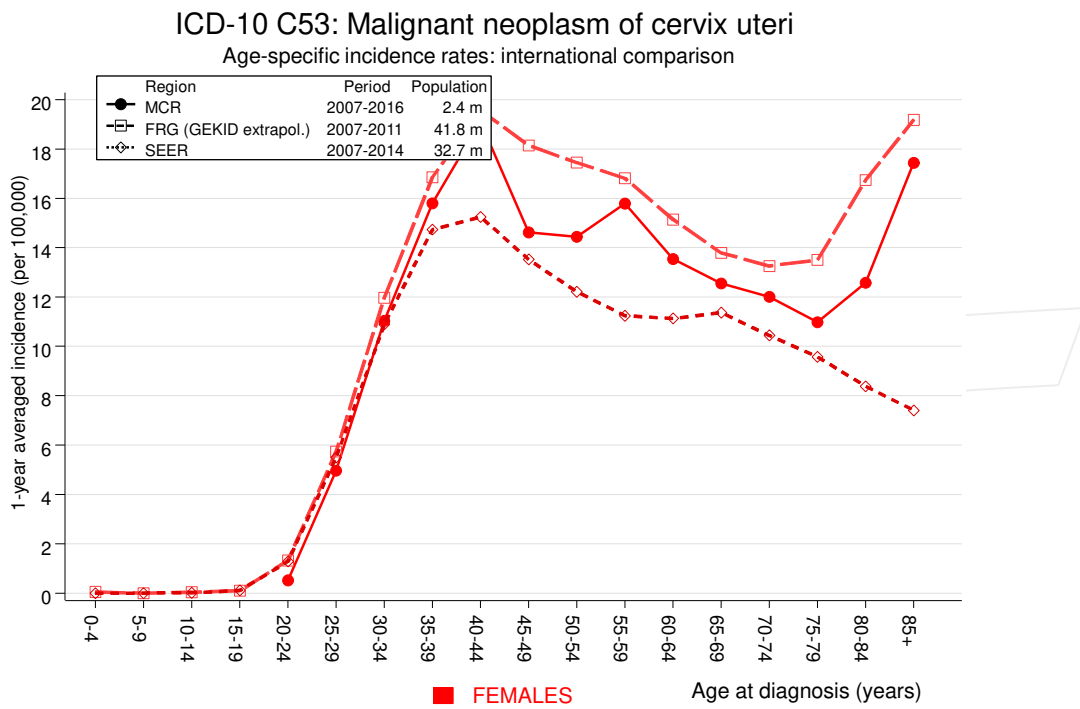


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. <http://www.gekid.de>. Last access: 02/11/2015
 Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. <http://www.seer.cancer.gov>.

Table 7

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

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	2	0.6	3.5	0.4	12.5	1.0	
C09-C10 Oropharynx	3	0.5	6.2	1.3	18.2 #	1.8	
C12-C13 Hypopharynx	2	0.1	16.4	2.0	59.3 #	1.4	
C15 Oesophagus	2	0.5	3.8	0.5	13.7	1.1	
C16 Stomach	3	2.5	1.2	0.2	3.5	0.3	33.3
C18 Colon	24	7.0	3.4	2.2	5.1 #	12.3	4.2
C19-C20 Rectum	18	3.3	5.5	3.3	8.7 #	10.6	11.1
C21 Anus/canal	6	0.5	11.5	4.2	25.0 #	3.9	16.7
C22 Liver	3	0.9	3.4	0.7	10.0	1.5	
C25 Pancreas	12	3.1	3.9	2.0	6.9 #	6.4	41.7
C30-C31 Sinuses	2	0.1	16.5	2.0	59.7 #	1.4	
C33-C34 Lung	49	6.4	7.7	5.7	10.2 #	30.7	10.2
C43 Malign. melanoma	10	4.4	2.3	1.1	4.2 #	4.0	
C46,C49 Soft tissue	4	0.5	7.5	2.0	19.2 #	2.5	
C50 Breast	67	32.5	2.1	1.6	2.6 #	24.8	3.0
C51 Vulva	8	0.8	10.4	4.5	20.6 #	5.2	
C52 Vagina	9	0.1	61.2	28.0	116.1 #	6.4	
C53 Cervix uteri	3	2.2	1.4	0.3	4.0	0.6	
C54 Corpus uteri	36	4.7	7.7	5.4	10.6 #	22.5	30.6
C55,C57 Fem. genitals un	2	0.2	12.7	1.5	45.7 #	1.3	50.0
C56 Ovary	36	3.6	9.9	6.9	13.7 #	23.3	36.1
C64 Kidney	3	1.9	1.6	0.3	4.7	0.8	
C65 Renal pelvis	2	0.2	9.6	1.2	34.7 #	1.3	
C67 Bladder	12	1.3	9.4	4.8	16.4 #	7.7	8.3
C73 Thyroid	9	2.8	3.3	1.5	6.2 #	4.5	
C76-C79 CUP	7	1.3	5.4	2.2	11.2 #	4.1	
C82-C85 NHL	7	3.1	2.3	0.9	4.7	2.8	
C91-C96 Leukaemia	8	1.3	6.3	2.7	12.3 #	4.8	25.0
Others, specified	8	2.8	2.9	1.2	5.7 #	3.8	
Not observed	0	2.8	0.0	0.0	1.3	-2.0	
All further malignancies	357	91.8	3.9	3.5	4.3 #	191.0	12.6
Patients		3839					
Median age at next malignancy (years)		62.6					
Person-years		13886					
Mean observation time (years)		3.6					
Median observation time (years)		1.8					

The occurrence of further malignancy listed is statistically significant.

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

Average incidence (world standard population) 2007 - 2016

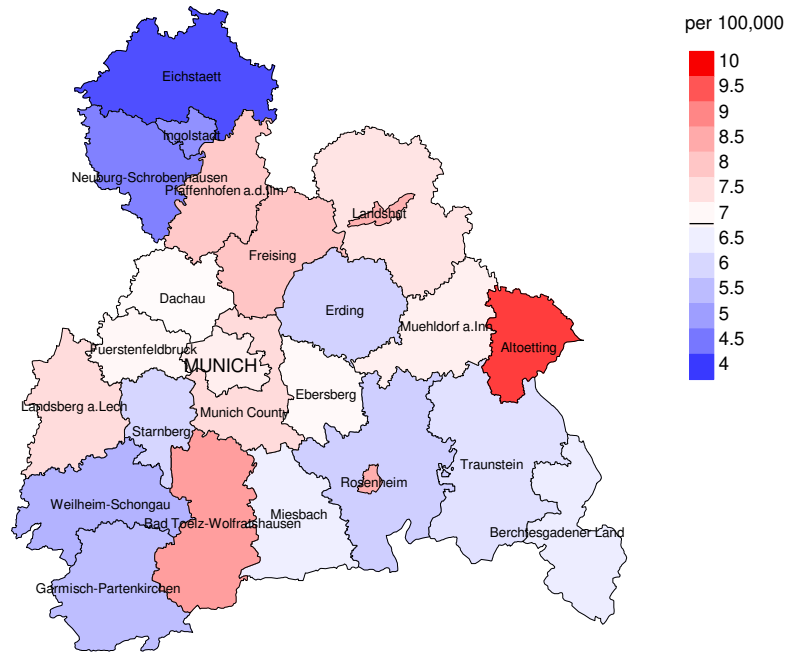


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (6.8/100,000 WS N=2,435).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 72 women were identified with newly diagnosed cervical cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 7.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 4.9 and 9.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2016

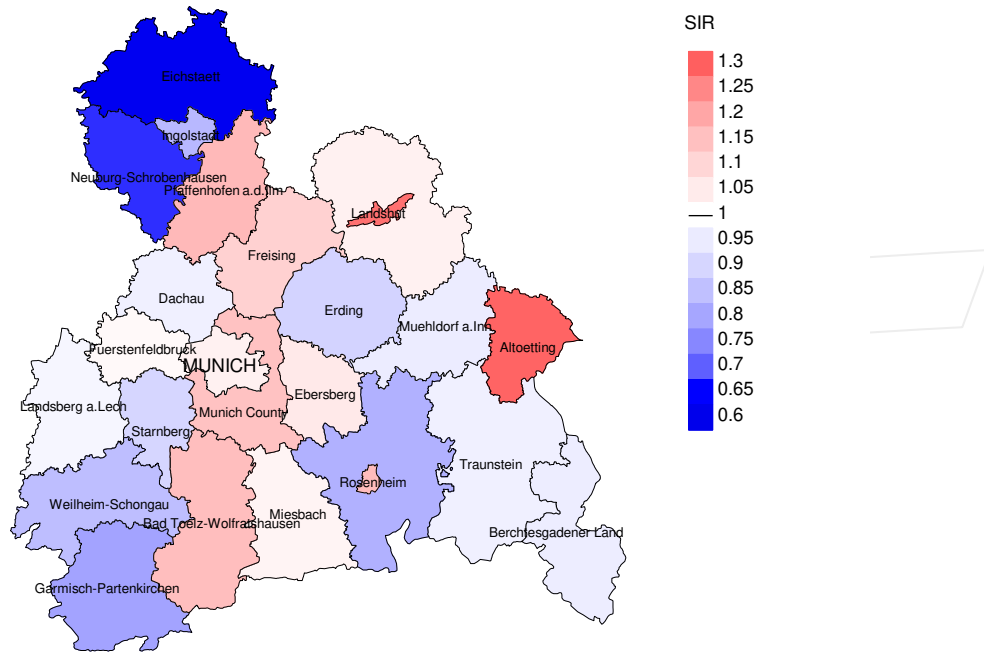


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=2,435).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 72 women were identified with newly diagnosed cervical cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.06. Though, the value of this parameter may vary with an underlying probability of 99% between 0.76 and 1.42, 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 4.81 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	147	91.2	6.1	75	51.0	85.3
1999	163	88.3	1.2	66	40.5	92.4
2000	151	92.1	6.0	67	44.4	95.5
2001	155	91.0	3.9	67	43.2	89.6
2002	239	93.7	9.6	113	47.3	95.6
2003	219	90.9	4.6	115	52.5	96.5
2004	218	95.4	6.4	109	50.0	97.2
2005	236	90.7	5.1	102	43.2	94.1
2006	245	82.4	3.3	102	41.6	100.0
2007	244	72.5	3.3	98	40.2	95.9
2008	273	57.9	2.6	105	38.5	100.0
2009	274	55.1	3.6	118	43.1	97.5
2010	253	60.5	4.7	96	37.9	99.0
2011	247	60.7	3.2	79	32.0	96.2
2012	250	58.8	7.2	98	39.2	98.0
2013	244	64.8	4.1	86	35.2	95.3
2014	258	68.2	1.9	48	18.6	93.8
2015	199	96.0	6.5	48	24.1	93.8
2016	195	61.5	1.0	18	9.2	72.2
1998-2016	4210	75.7	4.4	1610	38.2	95.5

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 4.81 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	147	92	85.9	15	10.2
1999	163	93	87.1	14	8.6
2000	151	91	92.3	16	10.6
2001	155	68	89.7	13	8.4
2002	239	132	93.9	36	15.1
2003	219	152	94.7	27	12.3
2004	218	153	96.7	26	11.9
2005	236	151	96.0	25	10.6
2006	245	143	95.1	19	7.8
2007	244	146	94.5	28	11.5
2008	273	165	98.8	24	8.8
2009	274	169	98.8	26	9.5
2010	253	175	98.9	29	11.5
2011	247	173	98.8	28	11.3
2012	250	152	96.1	39	15.6
2013	244	171	97.7	28	11.5
2014	258	157	96.8	21	8.1
2015	199	148	98.6	23	11.6
2016	195	135	97.0	15	7.7
1998-2016	4210	2666	95.9	452	10.7

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 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	92	58.7	41.3	83.5
1999	93	68.8	31.2	82.7
2000	91	67.0	33.0	83.3
2001	68	66.2	33.8	86.9
2002	132	71.2	28.8	83.1
2003	152	75.0	25.0	85.4
2004	153	67.3	32.7	76.4
2005	151	72.8	27.2	83.4
2006	143	64.3	35.7	79.4
2007	146	74.0	26.0	78.3
2008	165	70.3	29.7	76.1
2009	169	65.7	34.3	76.0
2010	175	74.3	25.7	81.5
2011	173	69.9	30.1	74.9
2012	152	67.1	32.9	79.5
2013	171	70.2	29.8	77.8
2014	157	66.9	33.1	80.9
2015	148	68.9	31.1	75.3
2016	135	74.1	25.9	80.9
1998-2016	2666	69.5	30.5	79.7

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	92	74.8	70.4	80.8	74.6
1999	93	74.8	71.5	79.6	75.1
2000	91	78.4	74.9	83.8	77.0
2001	68	74.6	70.0	81.7	71.5
2002	132	74.6	65.2	87.6	69.4
2003	152	73.1	66.6	81.9	72.3
2004	153	74.9	64.6	85.0	69.9
2005	151	76.9	68.4	84.0	70.0
2006	143	74.6	68.9	84.0	72.6
2007	146	71.8	68.5	83.4	69.5
2008	165	70.2	65.8	85.7	67.0
2009	169	75.1	66.0	86.0	68.0
2010	175	69.6	63.5	80.9	65.7
2011	173	74.1	68.4	84.9	69.6
2012	152	73.3	69.3	85.5	69.3
2013	171	70.9	62.3	82.3	65.3
2014	157	73.2	68.2	78.0	70.1
2015	148	73.8	69.4	80.6	72.2
2016	135	74.5	69.5	81.6	73.7
1998-2016	2666	73.3	67.8	83.1	70.1

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 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	54	4.6	0.37	2.2	0.27	3.2	0.31	4.0	0.35
1999	64	5.4	0.39	2.5	0.27	3.7	0.32	4.7	0.38
2000	61	5.1	0.40	2.3	0.27	3.3	0.32	4.2	0.37
2001	45	3.7	0.29	1.8	0.21	2.5	0.24	3.1	0.27
2002	94	4.8	0.39	2.5	0.32	3.5	0.36	4.2	0.38
2003	114	5.8	0.52	2.9	0.41	4.1	0.45	4.9	0.50
2004	103	5.2	0.47	2.7	0.39	3.8	0.43	4.6	0.47
2005	110	5.5	0.47	2.6	0.34	3.7	0.39	4.5	0.43
2006	92	4.6	0.38	2.1	0.27	3.0	0.30	3.7	0.34
2007	108	4.7	0.44	2.3	0.33	3.2	0.37	3.8	0.42
2008	116	5.0	0.42	2.5	0.33	3.5	0.36	4.0	0.38
2009	111	4.8	0.41	2.4	0.31	3.3	0.34	3.9	0.37
2010	130	5.6	0.51	2.9	0.41	4.0	0.44	4.6	0.47
2011	121	5.2	0.49	2.5	0.34	3.5	0.39	4.1	0.43
2012	102	4.3	0.41	2.0	0.30	2.9	0.34	3.5	0.38
2013	120	5.0	0.49	2.7	0.39	3.7	0.42	4.3	0.46
2014	105	4.4	0.41	2.1	0.28	2.9	0.32	3.5	0.35
2015	102	4.2	0.51	2.0	0.37	2.8	0.41	3.3	0.45
2016	100	4.1	0.51	1.9	0.35	2.7	0.40	3.2	0.45
1998-2016	1852	4.8	0.44	2.4	0.33	3.3	0.37	4.0	0.40

Table 12

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

Age at death Years	Cases n	%	Cum.%
0-4			
5-9			
10-14			
15-19			
20-24	1	0.1	0.1
25-29	5	0.4	0.5
30-34	8	0.7	1.3
35-39	39	3.5	4.8
40-44	71	6.4	11.1
45-49	86	7.7	18.8
50-54	87	7.8	26.6
55-59	121	10.9	37.5
60-64	91	8.2	45.7
65-69	123	11.0	56.7
70-74	123	11.0	67.7
75-79	111	10.0	77.7
80-84	111	10.0	87.6
85+	138	12.4	100.0
All ages	1115	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(incl. multiple malignancies)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	1	0.1	0.14	3.0
25-29	5	0.3	0.06	6.8
30-34	8	0.5	0.05	6.7
35-39	39	2.4	0.15	13.7
40-44	71	4.0	0.21	10.6
45-49	86	4.5	0.31	6.6
50-54	87	5.1	0.35	4.4
55-59	121	8.2	0.52	4.2
60-64	91	6.8	0.51	2.4
65-69	123	9.5	0.75	2.3
70-74	123	9.7	0.81	1.8
75-79	111	11.1	1.01	1.6
80-84	111	15.7	1.25	1.6
85+	138	18.8	1.08	1.5
All ages	1115			2.4
Mortality				
Raw		4.7	0.46	
WS		2.3	0.34	
ES		3.3	0.38	
BRD-S		3.8	0.41	
PYLL-70				
per 100,000		48.8		
ES		41.6		
AYLL-70		15.4		

Table 14

Further malignancies in deaths in period 1998–2016

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	9	1.1	1	11.1			8	88.9
C09-C10 Oropharynx	9	1.1	3	33.3			6	66.7
C16 Stomach	16	1.9	1	6.3	1	6.3	14	87.5
C18 Colon	67	7.9	13	19.4	5	7.5	49	73.1
C19-C20 Rectum	52	6.1	12	23.1	1	1.9	39	75.0
C21 Anus/canal	17	2.0	2	11.8			15	88.2
C23-C24 Bile	9	1.1	2	22.2			7	77.8
C25 Pancreas	26	3.1	1	3.8	1	3.8	24	92.3
C33-C34 Lung	121	14.3	8	6.6	8	6.6	105	86.8
C43 Malign. melanoma	21	2.5	7	33.3	1	4.8	13	61.9
C44 Skin others	17	2.0	4	23.5			13	76.5
C50 Breast	143	16.9	43	30.1	11	7.7	89	62.2
C51 Vulva	15	1.8	3	20.0	4	26.7	8	53.3
C52 Vagina	12	1.4			4	33.3	8	66.7
C54 Corpus uteri	38	4.5	8	21.1	5	13.2	25	65.8
C56 Ovary	65	7.7	4	6.2	12	18.5	49	75.4
C64 Kidney	16	1.9	6	37.5	1	6.3	9	56.3
C67 Bladder	63	7.4	5	7.9	7	11.1	51	81.0
C70-C72 CNS cancer	9	1.1					9	100.0
C76-C79 CUP	17	2.0	2	11.8	3	17.6	12	70.6
C82-C85 NHL	17	2.0	4	23.5	1	5.9	12	70.6
C91-C96 Leukaemia	11	1.3			2	18.2	9	81.8
Others, specified	77	9.1	14	18.2	1	1.3	62	80.5
All further malignancies	847	100.0	143	16.9	68	8.0	636	75.1

Further malignancies with number of cases 1 to 8 are pooled in category "Others, specified".

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

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**First primaries only ***)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	1	0.1	0.17	3.2
25-29	5	0.3	0.07	7.5
30-34	7	0.4	0.04	6.6
35-39	37	2.3	0.15	14.4
40-44	69	3.9	0.21	11.6
45-49	76	4.0	0.30	6.7
50-54	76	4.4	0.35	4.5
55-59	105	7.1	0.51	4.4
60-64	79	5.9	0.52	2.6
65-69	102	7.9	0.77	2.4
70-74	103	8.1	0.90	1.9
75-79	93	9.3	1.09	1.7
80-84	95	13.4	1.51	1.8
85+	117	15.9	1.27	1.6
All ages	965			2.6
Mortality				
Raw		4.1	0.45	
WS		2.1	0.33	
ES		2.8	0.37	
BRD-S		3.3	0.41	
PYLL-70				
per 100,000		44.2		
ES		37.8		
AYLL-70		15.8		

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**Single primaries only ***)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	1	0.1	0.17	3.2
25-29	5	0.3	0.07	7.7
30-34	7	0.4	0.04	6.7
35-39	36	2.3	0.15	14.2
40-44	63	3.5	0.20	10.7
45-49	63	3.3	0.27	5.6
50-54	58	3.4	0.28	3.5
55-59	83	5.6	0.44	3.5
60-64	53	4.0	0.38	1.8
65-69	66	5.1	0.53	1.6
70-74	53	4.2	0.54	1.0
75-79	52	5.2	0.66	1.0
80-84	50	7.1	0.86	1.0
85+	74	10.1	0.85	1.1
All ages	664			1.8
Mortality				
Raw		2.8	0.33	
WS		1.5	0.26	
ES		2.1	0.28	
BRD-S		2.3	0.30	
PYLL-70 per 100,000		37.4		
ES		32.1		
AYLL-70		17.1		

* See corresponding tables with multiple malignancies.

ICD-10 C53: Malignant neoplasm of cervix uteri
Age distribution and age-specific mortality 2007 - 2016 (n=1115)

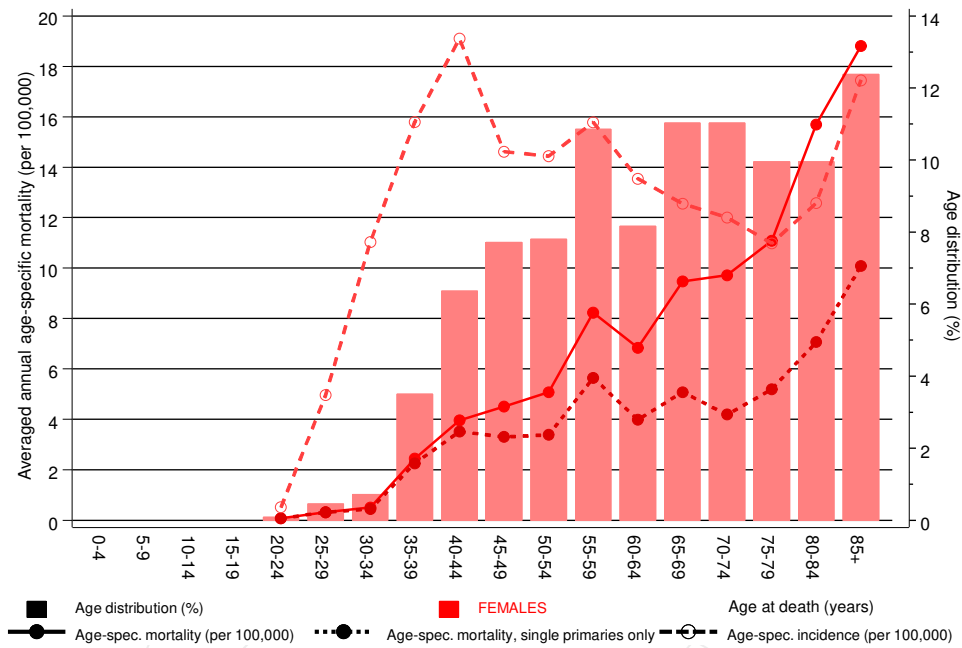


Figure 17. Distribution of age at death (bars; n=mean=57.0 yrs, median=55.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2007 - 2016

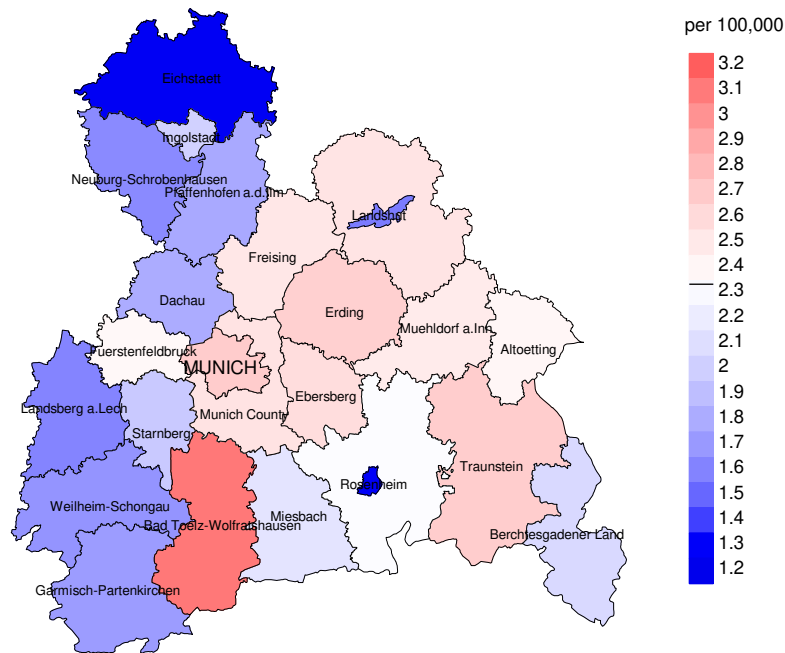


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (2.3/100,000 WS N=1,115).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 30 women died from cervical cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.5 and 4.3/100,000.

Standardized mortality ratio (SMR) 2007 - 2016

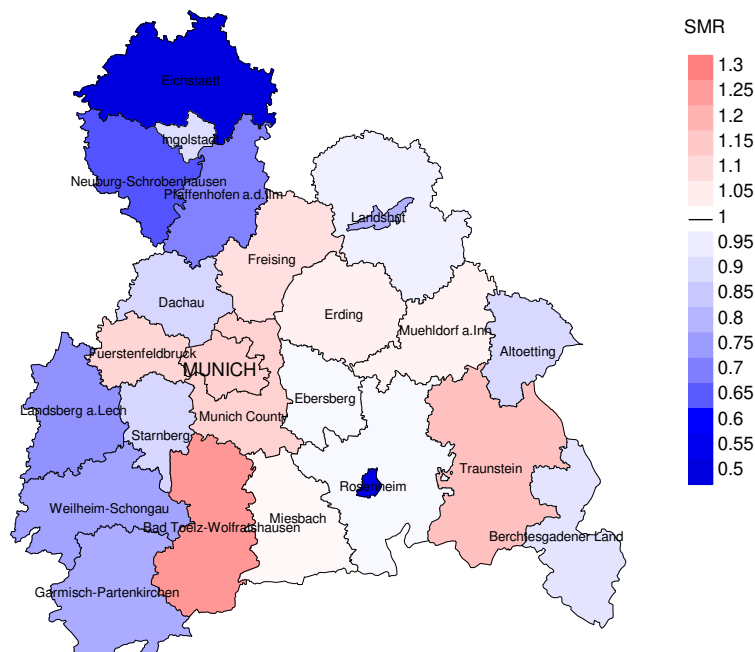


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=1,115).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 30 women died from cervical cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.98. Though, the value of this parameter may vary with an underlying probability of 99% between 0.58 and 1.54, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. All multiple primaries included

The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. First singular primary (no information about other prior or synchronous malignancy)

The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. Single primary (no information about other prior, syn- or metachronous malignancy)

The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head/neck and lung).

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio between mortality and incidence
FRG	Federal Republic of Germany

Recommended Citation

Munich Cancer Registry. ICD-10 C53: Cervical cancer - Incidence and Mortality [Internet]. 2018 [updated 2018 Aug 21; cited 2018 Oct 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/base/bC53__E-ICD-10-C53-Cervical-cancer-incidence-and-mortality.pdf

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