Munich Cancer Registry

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ICD-10 C51-C58: Fem. genitale cancer

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	23,695
Diseases	24,205
Creation date	08/21/2018
Export date	08/09/2018
Population (females)	2.43 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
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Marchioninistr. 15
Munich, 81377
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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

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
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	847	69	8.1	10.5	8.7	66.6	94.7
1999	838	61	7.3	11.2	8.5	62.8	94.6
2000	820	72	8.8	11.9	8.3	62.4	95.6
2001	811	70	8.6	11.9	8.1	61.8	94.2
2002	1339	156	11.7	12.4	7.9	62.9	96.2 #
2003	1335	134	10.0	12.2	7.6	61.8	94.8
2004	1279	124	9.7	12.3	7.3	61.1	95.0
2005	1300	100	7.7	12.4	7.0	56.3	93.3
2006	1303	77	5.9	12.3	6.7	53.8	91.9
2007	1548	127	8.2	12.5	6.5	54.8	79.8 #
2008	1560	106	6.8	12.6	6.0	51.2	68.4
2009	1449	86	5.9	12.7	5.7	49.2	66.8
2010	1501	110	7.3	13.0	5.2	48.2	67.6
2011	1484	90	6.1	13.1	4.7	44.5	67.5
2012	1463	92	6.3	13.5	4.1	43.3	66.5
2013	1502	93	6.2	13.6	3.4	38.7	67.7
2014	1472	88	6.0	13.9	3.2	32.2	73.5
2015	1238	86	6.9	14.0	2.5	27.9	97.3
2016	1116	60	5.4	14.2	2.1	17.4	69.5 ##
1998-2016	24205	1801	7.4	14.2	8.7	49.4	81.2

24,205 cases diagnosed 1998-2016 are related to a total of 23,695 patients. Currently, in 5,334 (22.5 %) of these 23,695 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 4,345 / 810 / 179 (18.3 % / 3.4 % / 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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 1,472 cases has been diagnosed, of which 13.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.2 % 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	847	72.0	38.9	53.8	63.9
1999	838	70.6	36.9	51.3	61.2
2000	820	68.3	35.9	50.1	60.0
2001	811	66.7	35.5	49.0	58.0
2002	1339	68.4	34.8	48.6	58.4
2003	1335	67.8	34.4	48.2	57.6
2004	1279	64.7	33.1	46.2	54.9
2005	1300	65.3	33.1	45.9	54.6
2006	1303	64.9	32.6	45.4	54.1
2007	1548	67.0	33.6	47.2	56.1
2008	1560	67.2	34.0	47.3	56.1
2009	1449	62.3	31.6	44.0	52.1
2010	1501	64.1	31.4	44.1	52.7
2011	1484	63.5	31.5	43.9	52.3
2012	1463	62.0	30.3	42.1	50.4
2013	1502	63.0	31.6	43.6	51.8
2014	1472	61.1	30.2	41.8	49.7
2015	1238	50.9	25.6	35.4	41.6
2016	1116	45.5	22.8	31.5	36.9
1998-2016	24205	63.1	31.9	44.3	52.6

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	847	64.7	15.3	14.6	97.0	43.5	54.6	65.7	76.4	84.5
1999	838	65.2	15.8	0.7	99.9	42.4	55.9	65.9	77.3	85.2
2000	820	64.9	14.9	19.9	98.0	42.8	55.3	65.4	76.8	83.1
2001	811	64.8	15.4	14.7	98.8	41.7	55.1	65.3	76.2	83.8
2002	1339	66.2	15.0	13.2	99.4	44.3	57.8	67.0	77.7	83.9
2003	1335	66.4	15.0	7.6	99.4	45.9	56.9	66.9	78.4	84.2
2004	1279	66.0	15.2	1.2	99.8	44.7	56.1	66.7	77.8	84.3
2005	1300	66.2	15.3	1.7	103	43.3	57.0	67.4	77.5	84.9
2006	1303	66.3	15.1	22.9	99.4	44.4	56.2	67.4	77.8	85.1
2007	1548	66.2	14.9	18.3	100	44.3	56.8	67.7	77.3	85.0
2008	1560	66.0	14.8	11.1	102	44.9	56.6	67.7	77.2	84.8
2009	1449	65.9	15.1	11.2	102	44.2	55.5	67.6	77.1	84.5
2010	1501	66.8	14.8	17.0	98.7	46.0	57.0	68.6	77.3	85.3
2011	1484	66.1	14.8	4.1	98.5	45.4	56.2	68.7	77.0	84.2
2012	1463	66.7	15.1	0.3	101	45.6	57.3	69.1	77.4	84.9
2013	1502	66.0	15.2	0.7	105	45.7	55.9	67.6	77.3	84.6
2014	1472	65.9	15.7	13.3	100	43.4	55.2	68.3	77.4	84.5
2015	1238	65.9	14.8	16.5	102	45.3	55.7	66.9	76.7	84.2
2016	1116	65.7	15.0	14.3	99.1	44.7	55.1	66.7	77.5	84.1
1998-2016	24205	66.0	15.1	0.3	105	44.6	56.2	67.4	77.3	84.6

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%
0-4	3	0.0	0.0
5-9	2	0.0	0.0
10-14	8	0.1	0.1
15-19	20	0.1	0.2
20-24	26	0.2	0.4
25-29	118	0.8	1.2
30-34	244	1.7	2.9
35-39	388	2.7	5.6
40-44	623	4.3	10.0
45-49	780	5.4	15.4
50-54	1099	7.7	23.1
55-59	1344	9.4	32.5
60-64	1507	10.5	43.0
65-69	1769	12.3	55.3
70-74	1998	13.9	69.3
75-79	1743	12.2	81.4
80-84	1314	9.2	90.6
85+	1347	9.4	100.0
All ages	14333	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=929 %	Prop. all cancers n=112253 %
0- 4	3	0.3	33.3	2.0
5- 9	2	0.2		2.4
10-14	8	0.7		7.9
15-19	20	1.7		9.7
20-24	25	1.8		6.6
25-29	116	7.4	0.9	13.9
30-34	244	15.3	0.4	16.5
35-39	381	23.9	0.3	15.2
40-44	613	34.2	1.0	13.5
45-49	762	39.9	1.3	11.1
50-54	1077	62.9	0.9	12.4
55-59	1326	90.2	2.1	14.2
60-64	1484	111.6	1.8	13.2
65-69	1737	133.7	2.9	12.4
70-74	1972	155.8	4.0	13.3
75-79	1712	170.9	6.5	12.8
80-84	1300	183.7	13.2	11.9
85+	1338	182.3	32.4	10.5
All ages	14120		6.6	12.6
Incidence				
Raw		59.6		
WS		29.7		
ES		41.3		
BRD-S		49.0		

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).

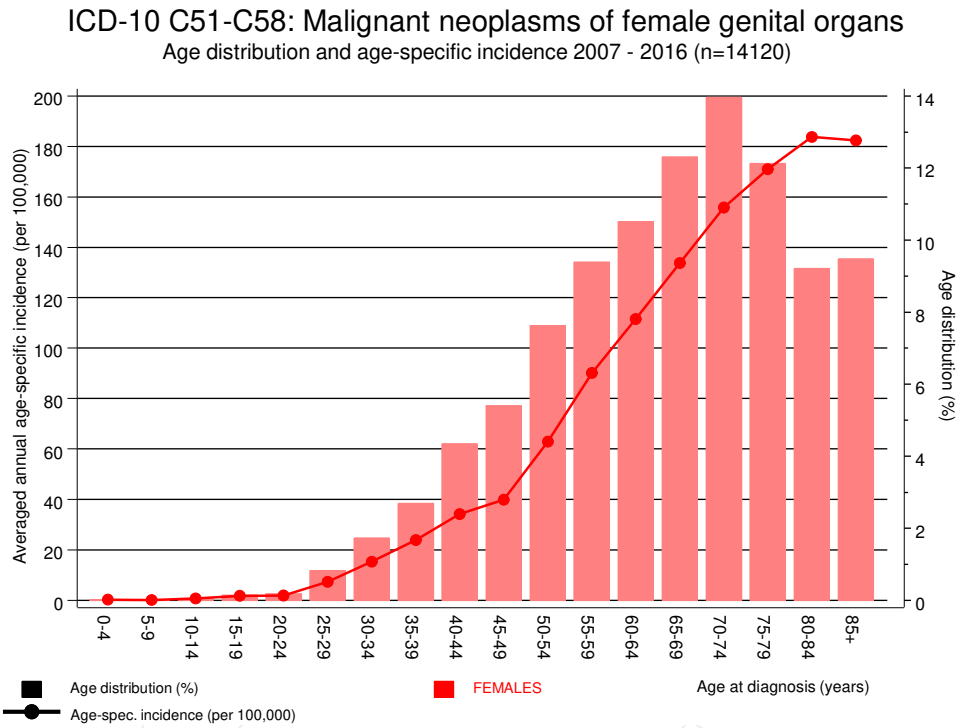

Figure 6. Age distribution (mean=66.2 yrs, median=68.0 yrs) and age-specific incidence.

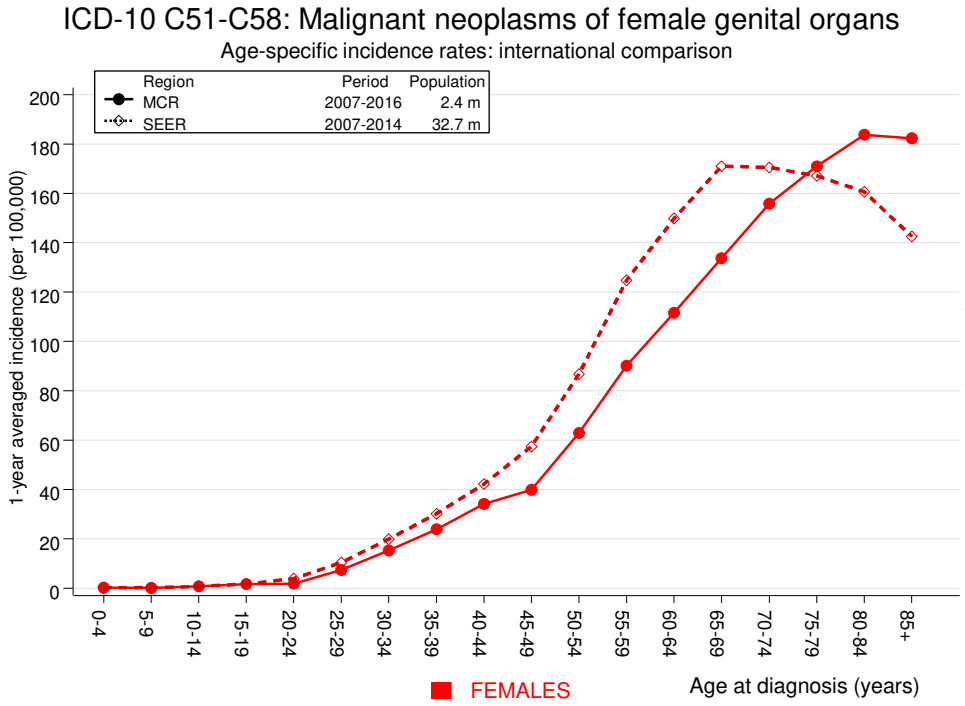

Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 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	8	4.6	1.7	0.8	3.4		0.5	
C09–C10	Oropharynx	7	3.2	2.2	0.9	4.4		0.5	
C15	Oesophagus	10	4.9	2.0	1.0	3.8		0.7	10.0
C16	Stomach	57	27.3	2.1	1.6	2.7	#	4.0	15.8
C17	Small intestine	21	3.9	5.4	3.3	8.2	#	2.3	4.8
C18	Colon	229	75.9	3.0	2.6	3.4	#	20.7	14.4
C19–C20	Rectum	70	32.3	2.2	1.7	2.7	#	5.1	11.4
C21	Anus/canal	17	4.2	4.1	2.4	6.5	#	1.7	5.9
C22	Liver	17	9.4	1.8	1.1	2.9	#	1.0	11.8
C23–C24	Bile	28	11.0	2.5	1.7	3.7	#	2.3	14.3
C25	Pancreas	77	35.0	2.2	1.7	2.8	#	5.7	29.9
C26	GI cancer	5	1.4	3.6	1.2	8.5	#	0.5	40.0
C30–C31	Sinuses	4	1.1	3.8	1.0	9.7	#	0.4	
C33–C34	Lung	181	57.9	3.1	2.7	3.6	#	16.6	13.8
C38,C45	Mesothelioma	4	1.4	2.8	0.8	7.1		0.3	
C43	Malign. melanoma	54	29.8	1.8	1.4	2.4	#	3.3	11.1
C46,C49	Soft tissue	20	4.5	4.4	2.7	6.8	#	2.1	
C48	Peritoneal	27	3.0	9.1	6.0	13.2	#	3.2	
C50	Breast	595	240.0	2.5	2.3	2.7	#	47.9	4.7
C51	Vulva	31	7.8	4.0	2.7	5.6	#	3.1	6.5
C52	Vagina	17	1.5	11.6	6.8	18.6	#	2.1	
C53	Cervix uteri	43	10.9	4.0	2.9	5.3	#	4.3	34.9
C54	Corpus uteri	166	43.6	3.8	3.3	4.4	#	16.5	14.5
C55,C57	Fem. genitals un	11	1.8	6.2	3.1	11.2	#	1.2	72.7
C56	Ovary	211	32.1	6.6	5.7	7.5	#	24.2	19.4
C64	Kidney	40	19.1	2.1	1.5	2.8	#	2.8	7.5
C65	Renal pelvis	12	2.4	5.0	2.6	8.7	#	1.3	8.3
C66	Ureter	4	1.2	3.3	0.9	8.5		0.4	25.0
C67	Bladder	45	14.6	3.1	2.2	4.1	#	4.1	6.7
C70–C72	CNS cancer	21	10.8	2.0	1.2	3.0	#	1.4	19.0
C73	Thyroid	34	14.0	2.4	1.7	3.4	#	2.7	2.9
C76–C79	CUP	36	14.0	2.6	1.8	3.6	#	3.0	11.1
C81	Hodgkin lymphoma	6	1.5	4.0	1.5	8.6	#	0.6	
C82–C85	NHL	61	30.4	2.0	1.5	2.6	#	4.1	3.3
C90	Mult. myeloma	15	9.7	1.5	0.9	2.6		0.7	13.3
C91–C96	Leukaemia	34	12.5	2.7	1.9	3.8	#	2.9	26.5
Others, specified		16	9.1	1.8	1.0	2.9	#	0.9	12.5
Not observed		0	1.6	0.0	0.0	2.3		-0.2	
All further malignancies		2234	789.3	2.8	2.7	3.0	#	195.1	11.9

Patients	21368
Median age at next malignancy (years)	71.2
Person-years	74043
Mean observation time (years)	3.5
Median observation time (years)	1.9

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 to 3 are pooled in category “Others, specified”.

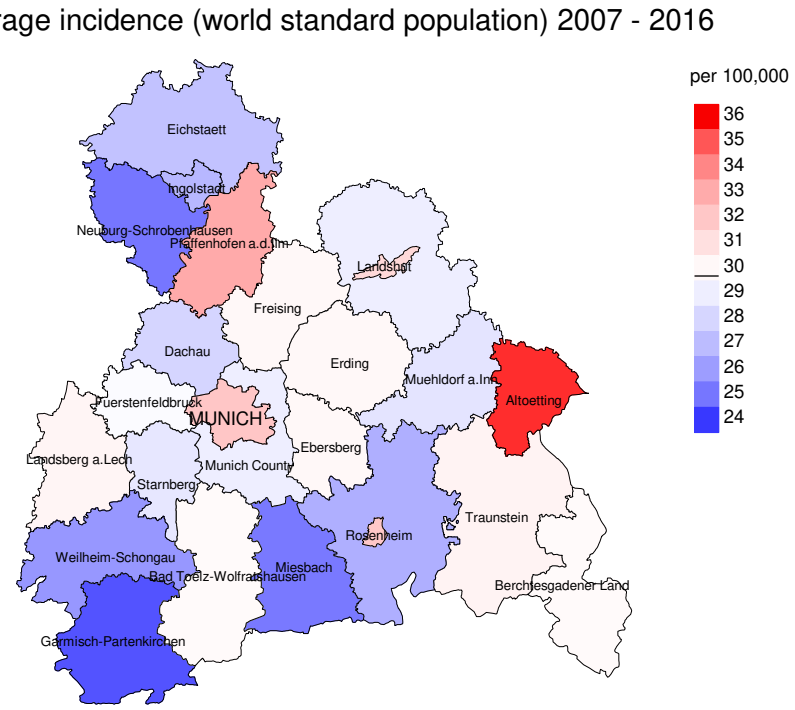

Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (29.7/100,000 WS N=14,120).

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 397 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 30.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 26.0 and 34.6/100,000.

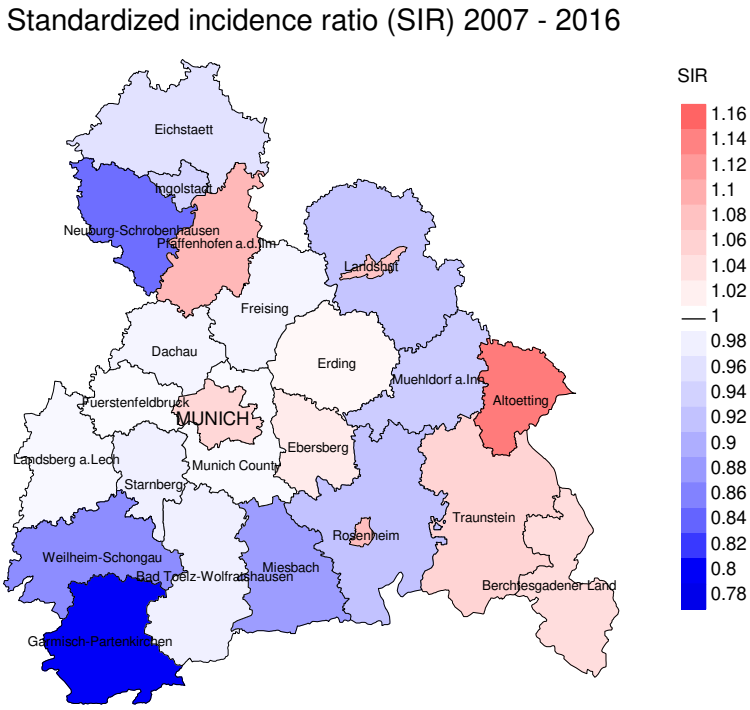

Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=14,120).

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 397 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 1.03. Though, the value of this parameter may vary with an underlying probability of 99% between 0.90 and 1.17, 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	847	94.7	8.1	564	66.6	90.1
1999	838	94.6	7.3	526	62.8	94.5
2000	820	95.6	8.8	512	62.4	94.7
2001	811	94.2	8.6	501	61.8	97.0
2002	1339	96.2	11.7	842	62.9	97.1
2003	1335	94.8	10.0	825	61.8	97.6
2004	1279	95.0	9.7	782	61.1	98.0
2005	1300	93.3	7.7	732	56.3	97.4
2006	1303	91.9	5.9	701	53.8	98.3
2007	1548	79.8	8.2	849	54.8	97.9
2008	1560	68.4	6.8	799	51.2	97.9
2009	1449	66.8	5.9	713	49.2	98.2
2010	1501	67.6	7.3	724	48.2	97.8
2011	1484	67.5	6.1	660	44.5	97.9
2012	1463	66.5	6.3	633	43.3	97.5
2013	1502	67.7	6.2	581	38.7	95.2
2014	1472	73.5	6.0	474	32.2	97.0
2015	1238	97.3	6.9	346	27.9	91.3
2016	1116	69.5	5.4	194	17.4	79.9
1998-2016	24205	81.2	7.4	11958	49.4	96.5

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	847	464	88.6	130	15.3
1999	838	495	88.9	128	15.3
2000	820	481	92.3	128	15.6
2001	811	481	92.5	116	14.3
2002	1339	780	95.6	269	20.1
2003	1335	806	97.3	229	17.2
2004	1279	792	97.6	217	17.0
2005	1300	819	96.6	189	14.5
2006	1303	774	96.6	180	13.8
2007	1548	912	97.7	249	16.1
2008	1560	927	99.4	218	14.0
2009	1449	937	99.1	181	12.5
2010	1501	958	98.6	229	15.3
2011	1484	1008	97.5	211	14.2
2012	1463	932	97.7	213	14.6
2013	1502	1061	97.8	210	14.0
2014	1472	977	98.1	210	14.3
2015	1238	1012	97.9	186	15.0
2016	1116	894	97.4	161	14.4
1998-2016	24205	15510	96.8	3654	15.1

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 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	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	780	73.3	26.7	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	927	74.8	25.2	79.9
2009	937	70.9	29.1	78.0
2010	958	75.1	24.9	81.3
2011	1008	70.6	29.4	78.2
2012	932	69.1	30.9	77.7
2013	1061	70.3	29.7	77.2
2014	977	70.1	29.9	78.4
2015	1012	68.0	32.0	73.8
2016	894	70.6	29.4	77.6
1998-2016	15510	71.6	28.4	79.9

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	780	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	927	77.9	73.7	85.9	74.7
2009	937	77.4	72.9	85.1	74.4
2010	958	78.2	74.9	85.4	75.7
2011	1008	77.5	73.5	85.5	74.9
2012	932	79.6	76.3	87.0	76.8
2013	1061	78.3	74.5	86.8	75.9
2014	977	77.5	74.8	85.3	75.3
2015	1012	78.7	75.3	86.4	75.9
2016	894	77.7	74.9	85.2	76.0
1998-2016	15510	78.0	74.5	85.1	75.7

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	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	572	29.2	0.43	12.4	0.36	18.5	0.39	24.0	0.42
2003	594	30.2	0.45	12.6	0.37	18.9	0.40	24.7	0.44
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	0.42	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	0.37	22.2	0.41
2008	693	29.9	0.45	11.9	0.36	17.7	0.38	23.0	0.42
2009	665	28.6	0.46	11.6	0.37	17.3	0.40	22.1	0.43
2010	719	30.7	0.48	11.8	0.38	17.7	0.41	23.1	0.44
2011	713	30.5	0.49	11.9	0.38	17.9	0.41	23.1	0.45
2012	645	27.3	0.45	9.9	0.33	15.2	0.37	20.3	0.41
2013	748	31.4	0.51	12.0	0.39	18.0	0.42	23.5	0.46
2014	686	28.5	0.47	10.6	0.36	16.1	0.39	21.2	0.43
2015	688	28.3	0.56	10.5	0.42	15.8	0.45	20.8	0.51
2016	631	25.7	0.58	10.1	0.45	15.0	0.49	19.2	0.53
1998-2016	11105	29.0	0.47	11.5	0.37	17.2	0.39	22.4	0.43

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	1	0.0	0.0
10-14	0	0.0	0.0
15-19	2	0.0	0.0
20-24	2	0.0	0.1
25-29	11	0.2	0.2
30-34	18	0.3	0.5
35-39	59	0.9	1.4
40-44	130	1.9	3.3
45-49	211	3.1	6.3
50-54	278	4.1	10.4
55-59	413	6.0	16.4
60-64	510	7.4	23.8
65-69	809	11.8	35.6
70-74	1061	15.5	51.1
75-79	1103	16.1	67.2
80-84	1007	14.7	81.9
85+	1242	18.1	100.0
All ages	6857	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	1	0.1	0.50	5.6
10-14		0.0		
15-19	2	0.2	0.10	9.1
20-24	2	0.1	0.08	6.1
25-29	11	0.7	0.09	15.1
30-34	18	1.1	0.07	15.0
35-39	59	3.7	0.15	20.7
40-44	130	7.3	0.21	19.4
45-49	211	11.1	0.28	16.1
50-54	278	16.2	0.26	14.1
55-59	413	28.1	0.31	14.5
60-64	510	38.4	0.34	13.6
65-69	809	62.3	0.47	15.2
70-74	1061	83.8	0.54	15.6
75-79	1103	110.1	0.64	15.7
80-84	1007	142.3	0.77	14.8
85+	1242	169.2	0.93	13.5
All ages	6857			14.8
Mortality				
Raw		29.0	0.49	
WS		11.2	0.38	
ES		16.8	0.41	
BRD-S		21.8	0.45	
PYLL-70				
per 100,000		137.8		
ES		116.1		
AYLL-70		11.3		

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 ←%
C16	Stomach	128	3.1	21	16.4	10	7.8	97	75.8
C18	Colon	430	10.4	139	32.3	55	12.8	236	54.9
C19-C20	Rectum	215	5.2	77	35.8	18	8.4	120	55.8
C23-C24	Bile	51	1.2	11	21.6	2	3.9	38	74.5
C25	Pancreas	156	3.8	11	7.1	9	5.8	136	87.2
C33-C34	Lung	349	8.4	31	8.9	25	7.2	293	84.0
C43	Malign. melanoma	116	2.8	64	55.2	2	1.7	50	43.1
C44	Skin others	152	3.7	64	42.1	17	11.2	71	46.7
C48	Peritoneal	67	1.6	32	47.8	15	22.4	20	29.9
C50	Breast	1156	27.8	671	58.0	100	8.7	385	33.3
C51	Vulva	43	1.0			3	7.0	40	93.0
C54	Corpus uteri	80	1.9			27	33.8	53	66.3
C56	Ovary	223	5.4			110	49.3	113	50.7
C64	Kidney	78	1.9	30	38.5	6	7.7	42	53.8
C67	Bladder	147	3.5	24	16.3	17	11.6	106	72.1
C70-C72	CNS cancer	47	1.1	7	14.9	2	4.3	38	80.9
C73	Thyroid	48	1.2	30	62.5	1	2.1	17	35.4
C76-C79	CUP	88	2.1	22	25.0	11	12.5	55	62.5
C82-C85	NHL	96	2.3	31	32.3	7	7.3	58	60.4
C91-C96	Leukaemia	66	1.6	11	16.7	6	9.1	49	74.2
Others, specified		415	10.0	89	21.4	35	8.4	291	70.1
All further malignancies		4151	100.0	1365	32.9	478	11.5	2308	55.6

Further malignancies with number of cases 1 to 39 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	1	0.1	0.50	5.6
10-14		0.0		
15-19	2	0.2	0.10	10.0
20-24	2	0.1	0.09	6.5
25-29	8	0.5	0.07	11.9
30-34	15	0.9	0.06	14.2
35-39	54	3.4	0.15	21.0
40-44	120	6.7	0.21	20.2
45-49	177	9.3	0.27	15.6
50-54	229	13.4	0.25	13.7
55-59	350	23.8	0.30	14.7
60-64	415	31.2	0.33	13.5
65-69	651	50.1	0.45	15.4
70-74	854	67.5	0.54	16.1
75-79	885	88.4	0.66	16.3
80-84	803	113.5	0.80	15.1
85+	1014	138.2	0.98	13.8
All ages	5580			15.1
Mortality				
Raw		23.6	0.48	
WS		9.2	0.36	
ES		13.7	0.39	
BRD-S		17.8	0.43	
PYLL-70				
per 100,000		116.8		
ES		98.6		
AYLL-70		11.5		

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**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	5.6
10-14		0.0		
15-19	2	0.2	0.10	10.5
20-24	2	0.1	0.09	6.5
25-29	8	0.5	0.08	12.3
30-34	15	0.9	0.06	14.4
35-39	50	3.1	0.14	19.8
40-44	112	6.3	0.21	19.0
45-49	161	8.4	0.26	14.4
50-54	199	11.6	0.23	12.1
55-59	308	21.0	0.28	13.1
60-64	352	26.5	0.30	11.7
65-69	531	40.9	0.40	12.8
70-74	693	54.8	0.48	13.5
75-79	698	69.7	0.57	13.3
80-84	612	86.5	0.64	11.9
85+	783	106.7	0.79	11.1
All ages	4527			12.6
Mortality				
Raw		19.1	0.41	
WS		7.7	0.32	
ES		11.4	0.35	
BRD-S		14.6	0.38	
PYLL-70				
per 100,000		104.1		
ES		88.1		
AYLL-70		11.9		

* See corresponding tables with multiple malignancies.

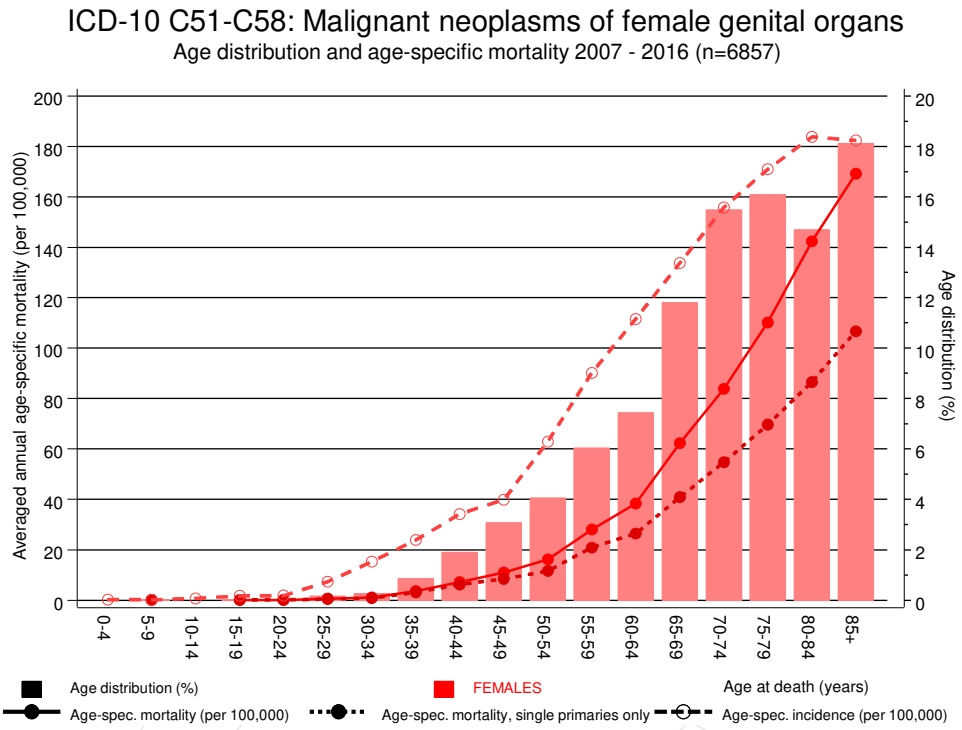

Figure 17. Distribution of age at death (bars; n=mean=67.9 yrs, median=69.7 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

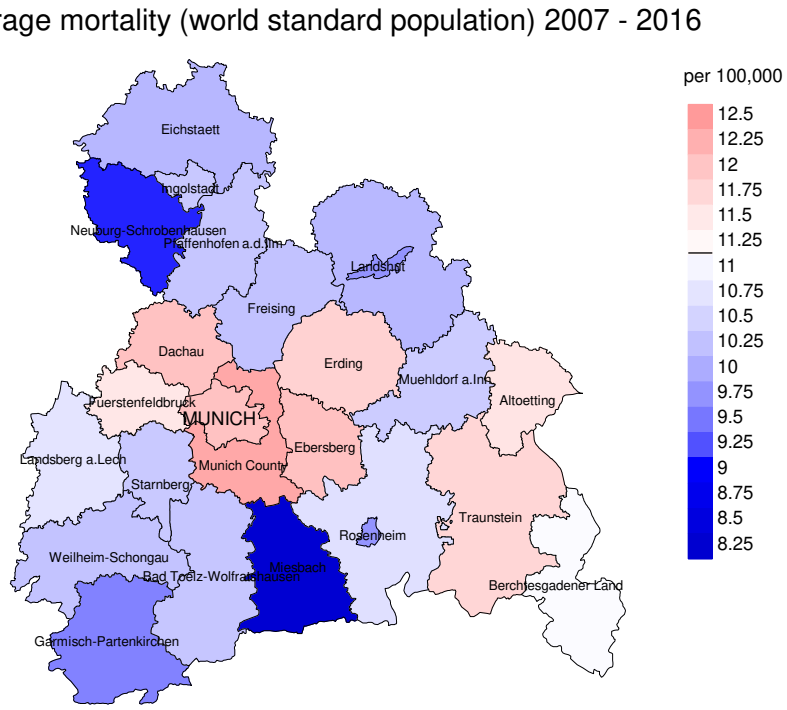

Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (11.2/100,000 WS N=6,857).

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 200 women died from fem. genitale cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 12.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 9.7 and 14.9/100,000.

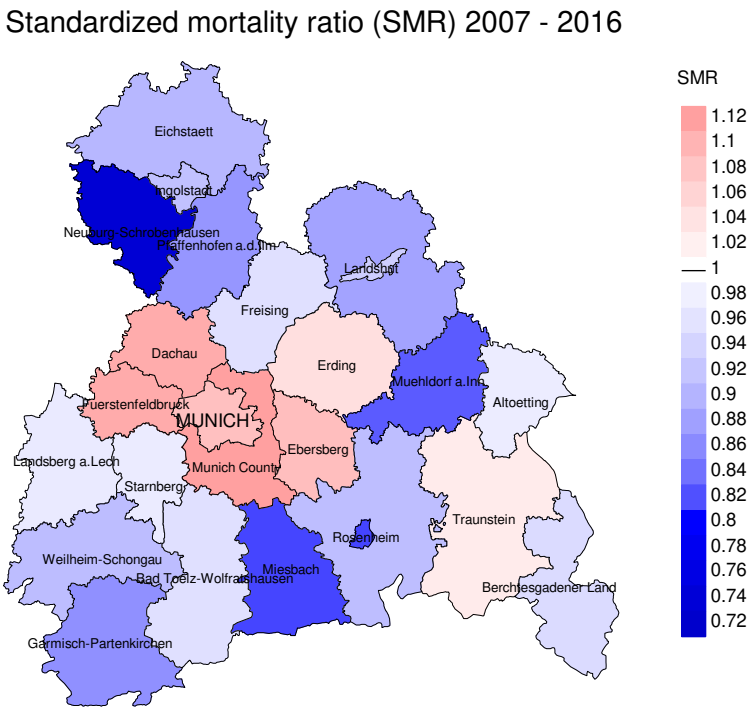

Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=6,857).

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 200 women died from fem. genitale cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.09. Though, the value of this parameter may vary with an underlying probability of 99% between 0.90 and 1.30, 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

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