

Munich Cancer Registry



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

ICD-10 C81: Hodgkin lymphoma

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	1,895
Diseases	1,895
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m





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

https://www.tumorregister-muenchen.de/en/facts/base/bC81__E-ICD-10-C81-Hodgkin-lymphoma-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
C81.-	Hodgkin lymphoma
C81.0	Nodular lymphocyte predominant Hodgkin lymphoma
C81.1	Nodular sclerosis (classical) Hodgkin lymphoma
C81.2	Mixed cellularity (classical) Hodgkin lymphoma
C81.3	Lymphocyte depleted (classical) Hodgkin lymphoma
C81.4	Lymphocyte-rich (classical) Hodgkin lymphoma
C81.7	Other (classical) Hodgkin lymphoma
C81.9	Hodgkin lymphoma, unspecified

INCIDENCE

Table 1

Cases by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS) (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	86	4	4.7	2.3	8.1	24.4	89.5
1999	66	6	9.1	4.6	7.8	37.9	90.9
2000	62	5	8.1	4.2	7.6	27.4	95.2
2001	59	3	5.1	4.4	7.1	28.8	83.1
2002	101	6	5.9	5.3	7.1	30.7	87.1 #
2003	113	4	3.5	5.1	6.8	22.1	87.6
2004	110	3	2.7	5.7	6.9	19.1	90.0
2005	116	3	2.6	6.7	6.3	18.1	83.6
2006	87	2	2.3	7.4	5.9	27.6	87.4
2007	113	2	1.8	7.3	5.3	23.9	58.4 #
2008	119	1	0.8	7.6	4.6	20.2	47.9
2009	102	3	2.9	7.7	4.0	16.7	45.1
2010	122	2	1.6	7.2	3.3	17.2	42.6
2011	113	3	2.7	7.2	3.3	22.1	46.9
2012	154	5	3.2	7.9	3.3	20.1	47.4
2013	129	6	4.7	8.2	3.3	16.3	50.4
2014	118	6	5.1	8.3	3.3	16.1	57.6
2015	72	4	5.6	8.5	4.1	23.6	98.6
2016	53	1	1.9	8.7	2.0	15.1	64.2 ##
1998-2016	1895	69	3.6	8.7	8.1	21.7	68.0

1,895 cases diagnosed 1998-2016 are related to a total of 1,895 patients. Currently, in 315 (16.6 %) of these 1,895 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 261 / 43 / 11 (13.8 % / 2.3 % / 0.6 %) 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 118 cases has been diagnosed, of which 8.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.3 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

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

Year of diagnosis	Males n	Males %	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	51	59.3	3	5.9	3.9	8.2	31.4	94.1
1999	33	50.0	1	3.0	6.0	7.8	33.3	97.0
2000	31	50.0	3	9.7	6.1	7.7	35.5	100.0
2001	27	45.8	2	7.4	5.6	7.3	33.3	88.9
2002	58	57.4	4	6.9	6.0	7.3	36.2	87.9 #
2003	62	54.9	2	3.2	6.1	6.9	27.4	85.5
2004	61	55.5	1	1.6	6.2	6.7	13.1	88.5
2005	62	53.4	2	3.2	7.5	6.4	22.6	83.9
2006	51	58.6	1	2.0	8.3	6.0	25.5	90.2
2007	68	60.2	1	1.5	7.7	5.4	25.0	60.3 #
2008	63	52.9	1	1.6	7.9	4.8	17.5	44.4
2009	61	59.8	1	1.6	8.1	4.2	19.7	49.2
2010	73	59.8	1	1.4	7.6	3.5	16.4	35.6
2011	67	59.3	1	1.5	7.6	3.6	19.4	44.8
2012	97	63.0	1	1.0	8.7	3.7	21.6	50.5
2013	81	62.8	1	1.2	9.2	3.5	13.6	45.7
2014	80	67.8	4	5.0	9.4	3.4	17.5	62.5
2015	34	47.2	2	5.9	9.4	4.4	29.4	97.1
2016	35	66.0	1	2.9	9.4	2.9	11.4	65.7 ##
1998-2016	1095	57.8	33	3.0	9.4	8.2	22.4	67.4

1,095 cases diagnosed 1998-2016 are related to a total of 1,095 patients. Currently, in 192 (17.5 %) of these 1,095 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 160 / 25 / 7 (14.6 % / 2.3 % / 0.6 %) 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 80 cases has been diagnosed, of which 9.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.4 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

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

Year of diagnosis	Females n	Females %	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	35	40.7	1	2.9	0.0	7.9	14.3	82.9
1999	33	50.0	5	15.2	2.9	7.7	42.4	84.8
2000	31	50.0	2	6.5	2.0	7.4	19.4	90.3
2001	32	54.2	1	3.1	3.1	6.9	25.0	78.1
2002	43	42.6	2	4.7	4.6	6.8	23.3	86.0 #
2003	51	45.1	2	3.9	4.0	6.8	15.7	90.2
2004	49	44.5	2	4.1	5.1	7.2	26.5	91.8
2005	54	46.6	1	1.9	5.8	6.2	13.0	83.3
2006	36	41.4	1	2.8	6.3	5.8	30.6	83.3
2007	45	39.8	1	2.2	6.8	5.1	22.2	55.6 #
2008	56	47.1			7.1	4.4	23.2	51.8
2009	41	40.2	2	4.9	7.1	3.6	12.2	39.0
2010	49	40.2	1	2.0	6.8	3.1	18.4	53.1
2011	46	40.7	2	4.3	6.8	2.9	26.1	50.0
2012	57	37.0	4	7.0	6.8	2.6	17.5	42.1
2013	48	37.2	5	10.4	6.8	2.9	20.8	58.3
2014	38	32.2	2	5.3	6.9	3.3	13.2	47.4
2015	38	52.8	2	5.3	7.3	3.7	18.4	100.0
2016	18	34.0			7.6	0.0	22.2	61.1 ##
1998-2016	800	42.2	36	4.5	7.6	7.9	20.9	68.9

800 cases diagnosed 1998-2016 are related to a total of 800 patients. Currently, in 123 (15.4 %) of these 800 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 101 / 18 / 4 (12.6 % / 2.3 % / 0.5 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 38 cases has been diagnosed, of which 6.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.3 % 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	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	51	35	4.6	3.0	4.1	3.1	4.4	3.1	4.7	3.2
1999	33	33	2.9	2.8	2.5	2.7	2.7	2.7	2.9	3.1
2000	31	31	2.7	2.6	2.1	2.9	2.4	2.8	2.5	3.0
2001	27	32	2.3	2.6	2.0	2.4	2.2	2.6	2.2	2.8
2002	58	43	3.1	2.2	2.5	2.1	2.8	2.2	3.0	2.4
2003	62	51	3.3	2.6	2.8	2.8	3.1	2.7	3.3	3.0
2004	61	49	3.2	2.5	3.1	2.3	3.1	2.4	3.3	2.7
2005	62	54	3.3	2.7	3.0	2.4	3.1	2.6	3.5	2.9
2006	51	36	2.7	1.8	2.2	1.9	2.5	1.8	2.7	1.9
2007	68	45	3.1	1.9	2.9	1.7	3.0	1.8	3.2	2.0
2008	63	56	2.8	2.4	2.6	2.2	2.7	2.2	3.0	2.5
2009	61	41	2.7	1.8	2.2	1.7	2.5	1.8	2.7	1.9
2010	73	49	3.2	2.1	2.8	2.0	3.0	2.0	3.3	2.3
2011	67	46	3.0	2.0	2.6	1.7	2.8	1.8	3.2	2.0
2012	97	57	4.3	2.4	3.5	2.3	3.8	2.3	4.3	2.6
2013	81	48	3.5	2.0	3.1	1.8	3.3	1.9	3.5	2.1
2014	80	38	3.4	1.6	2.8	1.7	3.1	1.6	3.5	1.8
2015	34	38	1.4	1.6	1.0	1.1	1.2	1.3	1.4	1.4
2016	35	18	1.5	0.7	1.1	0.5	1.3	0.5	1.4	0.6
1998-2016	1095	800	3.0	2.1	2.6	2.0	2.8	2.0	3.0	2.2

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

Table 3

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	86	39.3	19.3	6.1	94.0	18.2	24.7	34.2	56.0	64.0
1999	66	44.1	21.5	9.1	84.3	17.3	28.8	39.1	61.5	77.0
2000	62	40.9	19.8	6.6	85.3	18.8	24.3	35.6	57.7	69.1
2001	59	43.9	19.3	9.4	86.0	19.6	28.5	41.2	58.5	72.3
2002	101	42.9	19.3	7.5	82.6	20.8	27.9	38.6	60.9	70.3
2003	113	39.9	18.6	6.1	85.1	19.1	25.2	36.1	54.3	69.1
2004	110	39.8	17.8	11.2	85.7	20.6	26.2	36.1	52.1	66.0
2005	116	43.9	21.1	12.6	86.4	17.5	24.8	39.8	62.5	76.1
2006	87	43.1	21.2	9.2	89.9	16.9	26.5	39.1	59.1	77.7
2007	113	43.3	19.7	5.2	84.2	20.2	27.1	41.5	58.1	72.3
2008	119	43.6	21.8	5.5	87.7	17.1	24.0	39.0	61.6	76.6
2009	102	44.7	20.9	7.9	92.1	20.4	28.3	40.2	63.0	73.3
2010	122	45.6	21.9	3.2	85.5	20.2	25.6	42.4	66.0	75.3
2011	113	46.6	21.3	6.9	96.6	21.9	26.8	46.0	62.0	79.8
2012	154	46.9	22.7	11.0	93.4	19.4	26.2	42.7	68.5	78.2
2013	129	44.9	20.7	8.1	90.8	19.8	28.8	40.6	59.2	76.5
2014	118	45.9	22.6	4.9	99.5	21.0	27.1	41.9	62.4	80.4
2015	72	55.8	22.5	8.8	94.8	24.8	37.4	59.6	74.5	84.5
2016	53	53.4	21.6	17.4	92.9	28.1	33.5	55.7	74.4	82.8
1998–2016	1895	44.4	21.0	3.2	99.5	19.3	26.9	40.1	62.1	75.9

Table 3a

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	51	41.0	19.4	6.1	94.0	19.2	25.5	35.6	56.0	63.3
1999	33	42.7	18.4	12.5	77.8	22.2	30.9	38.7	55.6	69.7
2000	31	48.4	18.6	6.6	85.3	31.8	35.7	52.0	62.1	69.2
2001	27	42.2	17.9	9.4	72.9	17.5	29.9	39.8	56.9	67.7
2002	58	44.4	17.7	11.2	76.7	24.2	31.6	39.5	62.5	70.3
2003	62	42.9	19.0	6.1	85.1	20.4	30.5	38.9	57.6	69.1
2004	61	36.7	15.2	14.3	81.7	18.5	26.6	35.5	42.5	62.7
2005	62	43.9	21.9	12.6	84.7	17.3	23.3	39.9	65.5	72.7
2006	51	46.0	19.2	9.2	81.0	19.1	33.5	45.0	61.8	73.4
2007	68	41.9	20.0	5.2	80.4	18.4	25.6	39.2	58.6	71.3
2008	63	42.0	20.5	5.5	82.2	17.8	23.3	38.8	58.5	73.7
2009	61	46.6	20.1	7.9	80.0	23.3	30.4	44.8	68.6	73.3
2010	73	46.1	21.5	3.2	85.5	20.3	28.1	43.0	65.7	74.0
2011	67	45.8	20.3	6.9	96.6	21.9	26.8	47.2	59.8	75.7
2012	97	48.6	21.6	11.0	83.4	18.9	31.5	44.6	68.5	77.5
2013	81	44.2	19.3	8.1	89.9	22.5	29.6	41.3	56.7	70.4
2014	80	49.4	22.6	4.9	99.5	21.7	28.4	50.5	66.1	80.5
2015	34	55.7	22.8	8.8	91.1	22.8	37.4	62.1	74.3	82.8
2016	35	52.0	20.0	17.4	82.9	26.7	34.4	55.7	64.8	80.6
1998–2016	1095	45.1	20.3	3.2	99.5	20.1	28.8	41.4	62.1	74.0

Table 3b

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

Year of diagnosis	Cases n	Std. dev.		Min. Max.		10% 25%		Median		
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	35	37.0	19.2	12.4	87.5	17.2	23.9	30.7	56.7	64.0
1999	33	45.5	24.4	9.1	84.3	17.3	23.6	41.4	67.3	80.8
2000	31	33.5	18.4	11.4	79.5	15.6	21.6	29.4	35.1	62.8
2001	32	45.4	20.6	11.4	86.0	20.8	27.6	43.3	59.9	74.0
2002	43	40.8	21.2	7.5	82.6	20.0	21.7	35.7	60.6	77.5
2003	51	36.4	17.6	11.9	77.4	18.4	22.6	31.7	41.8	64.2
2004	49	43.7	20.0	11.2	85.7	21.4	25.4	39.3	61.1	70.1
2005	54	43.9	20.4	15.3	86.4	18.1	27.7	39.8	60.1	77.7
2006	36	39.0	23.5	11.2	89.9	13.8	23.1	30.0	57.0	78.3
2007	45	45.3	19.3	7.3	84.2	24.9	28.7	43.7	58.1	74.7
2008	56	45.3	23.2	11.8	87.7	17.1	26.5	40.1	69.6	78.1
2009	41	41.9	22.0	13.7	92.1	18.6	24.8	35.0	58.4	72.7
2010	49	44.8	22.6	9.8	84.8	19.2	24.3	41.7	66.2	76.0
2011	46	47.8	22.9	16.7	90.5	20.4	26.6	45.7	64.0	80.8
2012	57	44.1	24.4	13.0	93.4	19.4	24.3	34.6	67.3	80.7
2013	48	45.9	23.0	12.4	90.8	19.2	27.9	38.9	64.3	78.8
2014	38	38.5	20.9	5.7	88.7	17.3	24.6	32.8	48.0	77.9
2015	38	55.9	22.6	20.6	94.8	24.8	37.4	56.1	76.0	84.9
2016	18	56.3	24.9	27.9	92.9	28.1	32.3	52.6	79.7	88.8
1998-2016	800	43.5	22.0	5.7	94.8	19.0	25.3	37.5	61.3	77.7

Table 4

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

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	3	0.3	0.3	3	0.5	0.5			0.0
5-9	12	1.1	1.4	9	1.4	1.8	3	0.7	0.7
10-14	22	2.0	3.4	14	2.1	3.9	8	1.8	2.5
15-19	68	6.2	9.6	34	5.2	9.1	34	7.8	10.3
20-24	105	9.6	19.2	56	8.5	17.6	49	11.2	21.6
25-29	121	11.1	30.2	63	9.6	27.2	58	13.3	34.9
30-34	92	8.4	38.6	54	8.2	35.4	38	8.7	43.6
35-39	80	7.3	45.9	55	8.3	43.7	25	5.7	49.3
40-44	80	7.3	53.2	52	7.9	51.6	28	6.4	55.7
45-49	57	5.2	58.4	37	5.6	57.2	20	4.6	60.3
50-54	61	5.6	64.0	41	6.2	63.4	20	4.6	64.9
55-59	66	6.0	70.0	43	6.5	70.0	23	5.3	70.2
60-64	46	4.2	74.2	30	4.6	74.5	16	3.7	73.9
65-69	61	5.6	79.8	41	6.2	80.7	20	4.6	78.4
70-74	79	7.2	87.0	55	8.3	89.1	24	5.5	83.9
75-79	65	5.9	93.0	35	5.3	94.4	30	6.9	90.8
80-84	46	4.2	97.2	25	3.8	98.2	21	4.8	95.6
85+	31	2.8	100.0	12	1.8	100.0	19	4.4	100.0
All ages	1095	100.0		659	100.0		436	100.0	

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=14 %	Females DCO rate n=19 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0– 4	3		0.3				1.5	
5– 9	9	3	0.8	0.3			8.7	3.6
10–14	14	8	1.2	0.7			12.2	7.9
15–19	34	34	2.8	3.0			13.4	16.4
20–24	56	49	4.0	3.6			12.2	13.0
25–29	63	58	4.0	3.7			9.2	6.9
30–34	54	38	3.4	2.4			5.7	2.6
35–39	55	25	3.4	1.6		4.0	4.0	1.0
40–44	52	28	2.8	1.6		3.6	2.4	0.6
45–49	37	20	1.9	1.0		5.0	0.9	0.3
50–54	41	20	2.4	1.2			0.7	0.2
55–59	43	23	3.0	1.6	2.3		0.5	0.2
60–64	30	16	2.4	1.2		6.3	0.2	0.1
65–69	41	20	3.5	1.5	4.9	5.0	0.2	0.1
70–74	55	24	5.0	1.9	1.8		0.3	0.2
75–79	35	30	4.4	3.0	5.7	6.7	0.2	0.2
80–84	25	21	5.4	3.0	20.0	19.0	0.2	0.2
85+	12	19	3.9	2.6	25.0	42.1	0.2	0.1
All ages	659	436			2.1	4.4	0.6	0.4
Incidence								
Raw			2.9	1.8				
WS			2.4	1.7				
ES			2.7	1.7				
BRD-S			2.9	1.9				

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

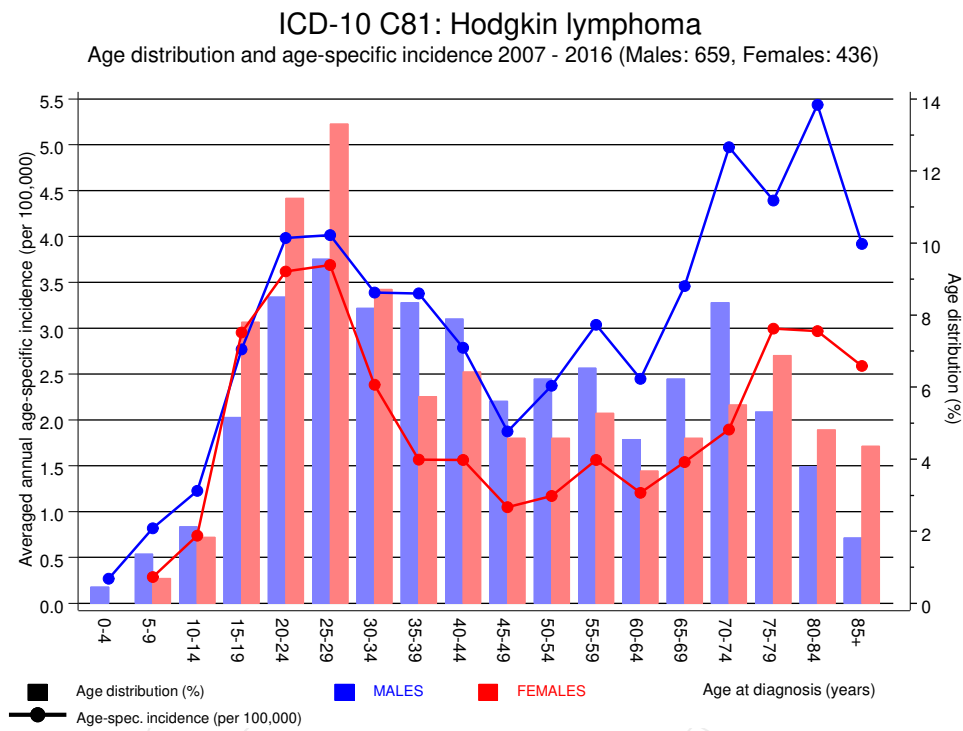


Figure 6. Age distribution (males: mean=46.6 yrs, median=44.1 yrs; females: mean=45.9 yrs, median=40.8 yrs) and age-specific incidence.

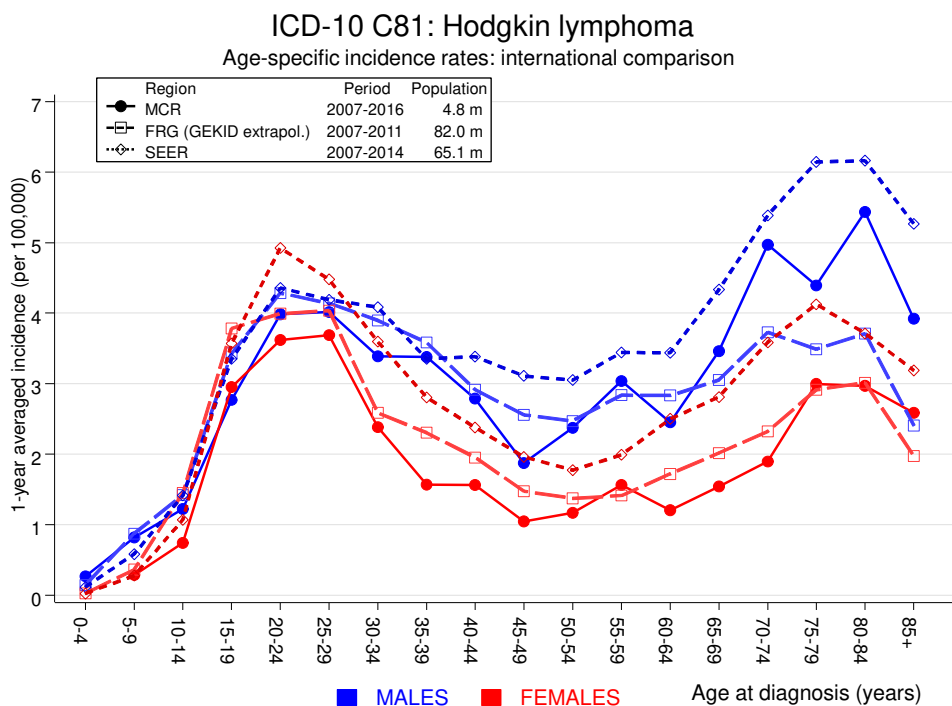


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 7a

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

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C16 Stomach	3	0.9	3.5	0.7	10.3	5.1	33.3
C17 Small intestine	2	0.1	14.4	1.7	52.1 #	4.5	
C18 Colon	3	2.0	1.5	0.3	4.4	2.4	
C19–C20 Rectum	2	1.3	1.6	0.2	5.7	1.7	
C23–C24 Bile	2	0.2	9.7	1.2	35.2 #	4.3	
C25 Pancreas	3	0.8	3.7	0.8	10.9	5.2	33.3
C33–C34 Lung	16	2.7	6.0	3.4	9.7 #	31.8	12.5
C43 Malign. melanoma	4	1.3	3.1	0.8	8.0	6.5	
C60 Penis	2	0.1	36.3	4.4	131.1 #	4.7	
C61 Prostate	12	6.0	2.0	1.0	3.5 #	14.4	
C64 Kidney	5	0.9	5.6	1.8	13.1 #	9.8	
C73 Thyroid	2	0.3	6.9	0.8	25.0	4.1	
C82–C85 NHL	20	1.0	20.1	12.3	31.0 #	45.4	
C91–C96 Leukaemia	6	0.4	15.2	5.6	33.0 #	13.4	
Others, specified	4	2.2	1.8	0.5	4.7	4.3	25.0
Not observed	0	3.6	0.0	0.0	1.0	-8.5	
All further malignancies	86	23.7	3.6	2.9	4.5 #	149.1	5.8
Patients		1030					
Median age at next malignancy (years)		62.6					
Person-years		4182					
Mean observation time (years)		4.1					
Median observation time (years)		2.4					

The occurrence of further malignancy listed is statistically significant.

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

Table 7b

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

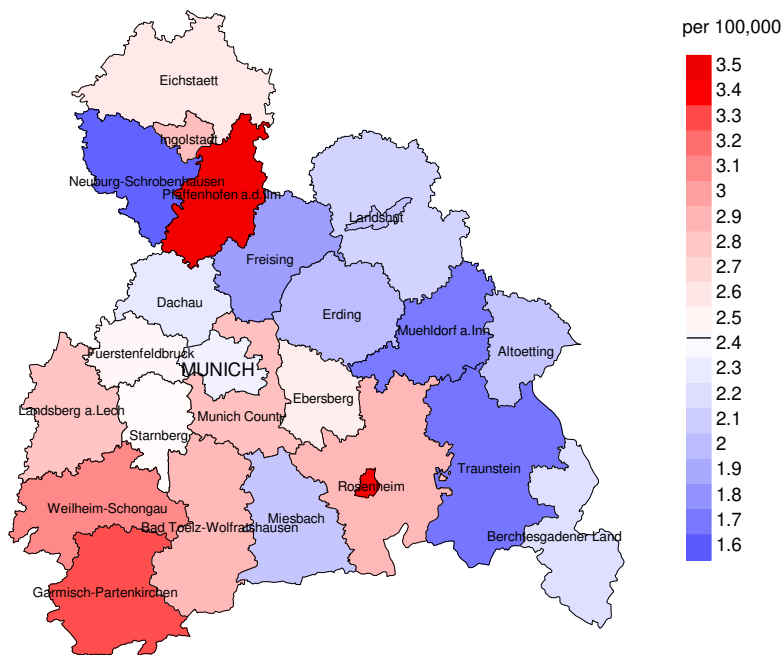
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C16 Stomach	2	0.4	5.5	0.7	19.7	4.8	
C18 Colon	3	1.0	2.9	0.6	8.5	5.8	
C33–C34 Lung	5	1.0	5.2	1.7	12.1 #	11.9	
C50 Breast	9	4.8	1.9	0.9	3.5	12.3	
C55,C57 Fem. genitals un	2	0.0	97.9	11.9	353.7 #	5.8	
C73 Thyroid	3	0.5	5.9	1.2	17.3 #	7.3	
C82–C85 NHL	17	0.5	34.8	20.3	55.7 #	48.5	
C91–C96 Leukaemia	2	0.2	9.3	1.1	33.6 #	5.2	
Others, specified	12	3.5	3.4	1.8	6.0 #	25.0	
Not observed	0	2.2	0.0	0.0	1.7	-6.5	
All further malignancies	55	14.1	3.9	2.9	5.1 #	120.0	
Patients		737					
Median age at next malignancy (years)		63.9					
Person-years		3404					
Mean observation time (years)		4.6					
Median observation time (years)		3.2					

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: Males



Average incidence (world standard population) 2007 - 2016: Females

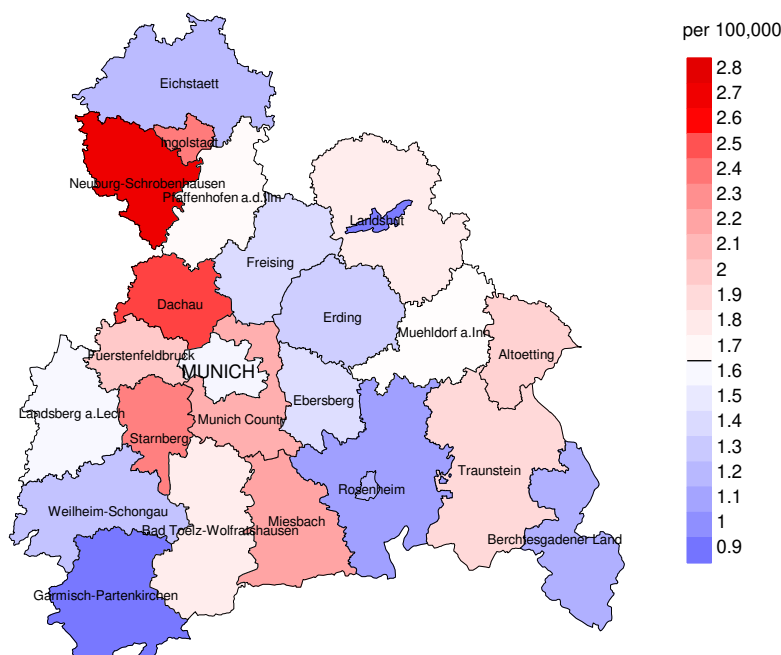
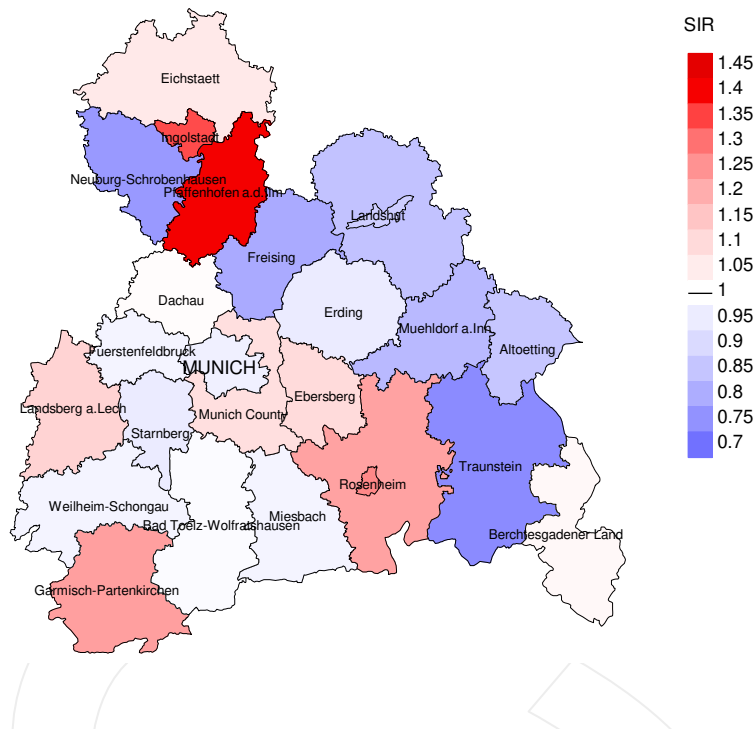


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.4/100,000 WS N=659, females 1.7/100,000 WS N=436).

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 10 women were identified with newly diagnosed hodgkin lymphoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.4 and 3.4/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

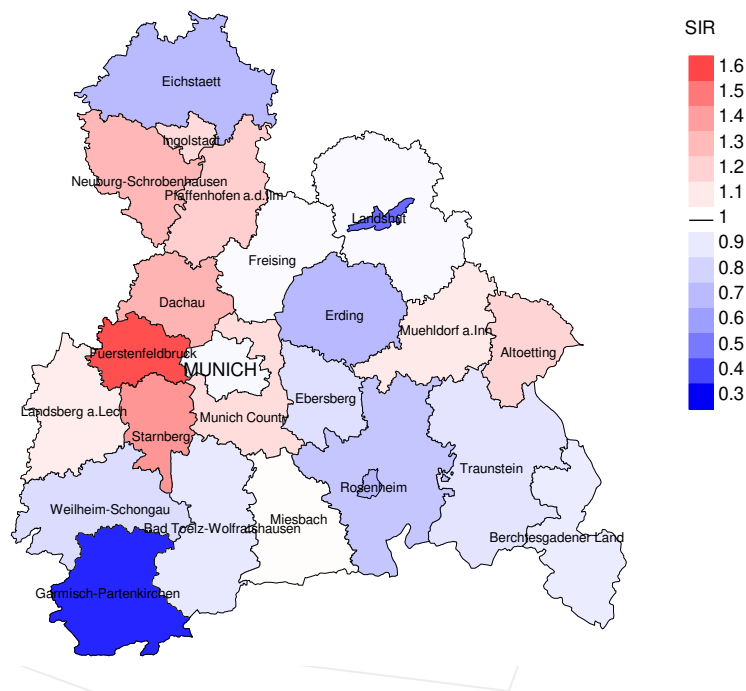


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=659, females N=436).

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 10 women were identified with newly diagnosed hodgkin lymphoma. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.85. Though, the value of this parameter may vary with an underlying probability of 99% between 0.32 and 1.83, 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	86	89.5	4.7	21	24.4	100.0
1999	66	90.9	9.1	25	37.9	96.0
2000	62	95.2	8.1	17	27.4	94.1
2001	59	83.1	5.1	17	28.8	94.1
2002	101	87.1	5.9	31	30.7	96.8
2003	113	87.6	3.5	25	22.1	96.0
2004	110	90.0	2.7	21	19.1	100.0
2005	116	83.6	2.6	21	18.1	100.0
2006	87	87.4	2.3	24	27.6	100.0
2007	113	58.4	1.8	27	23.9	96.3
2008	119	47.9	0.8	24	20.2	100.0
2009	102	45.1	2.9	17	16.7	100.0
2010	122	42.6	1.6	21	17.2	100.0
2011	113	46.9	2.7	25	22.1	100.0
2012	154	47.4	3.2	31	20.1	100.0
2013	129	50.4	4.7	21	16.3	100.0
2014	118	57.6	5.1	19	16.1	94.7
2015	72	98.6	5.6	17	23.6	100.0
2016	53	64.2	1.9	8	15.1	87.5
1998-2016	1895	68.0	3.6	412	21.7	98.1

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	86	23	82.6	4	4.7
1999	66	28	92.9	8	12.1
2000	62	22	100.0	8	12.9
2001	59	18	94.4	4	6.8
2002	101	36	100.0	8	7.9
2003	113	34	97.1	5	4.4
2004	110	33	97.0	5	4.5
2005	116	36	94.4	8	6.9
2006	87	28	100.0	5	5.7
2007	113	38	97.4	7	6.2
2008	119	46	97.8	7	5.9
2009	102	37	100.0	6	5.9
2010	122	47	95.7	7	5.7
2011	113	50	98.0	9	8.0
2012	154	53	100.0	15	9.7
2013	129	59	98.3	13	10.1
2014	118	57	96.5	13	11.0
2015	72	61	100.0	15	20.8
2016	53	44	100.0	7	13.2
1998-2016	1895	750	97.5	154	8.1

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	23	52.2	47.8	89.5
1999	28	60.7	39.3	88.5
2000	22	54.5	45.5	90.9
2001	18	55.6	44.4	70.6
2002	36	66.7	33.3	86.1
2003	34	52.9	47.1	87.9
2004	33	69.7	30.3	81.3
2005	36	75.0	25.0	91.2
2006	28	64.3	35.7	82.1
2007	38	60.5	39.5	78.4
2008	46	69.6	30.4	82.2
2009	37	81.1	18.9	94.6
2010	47	63.8	36.2	93.3
2011	50	72.0	28.0	81.6
2012	53	64.2	35.8	84.9
2013	59	72.9	27.1	87.9
2014	57	59.6	40.4	89.1
2015	61	73.8	26.2	82.0
2016	44	59.1	40.9	70.5
1998-2016	750	65.9	34.1	85.0

Table 10a

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	11	43.0	38.7	43.8	44.9
1999	13	56.8	56.4	61.5	60.0
2000	13	64.8	59.2	67.2	66.1
2001	10	58.0	71.3	55.6	59.3
2002	20	63.0	65.0	55.4	65.8
2003	23	64.3	64.3	64.7	64.3
2004	16	70.8	64.4	75.0	72.5
2005	18	69.3	67.9	71.9	69.3
2006	17	72.3	68.7	74.3	72.3
2007	21	67.8	66.2	71.1	64.7
2008	23	61.1	60.2	62.2	61.6
2009	20	66.9	68.7	65.0	66.9
2010	30	67.8	71.3	64.3	71.9
2011	34	72.0	72.0	68.6	72.0
2012	29	68.9	72.1	59.2	65.8
2013	35	62.1	67.5	58.7	64.4
2014	34	71.6	70.7	74.1	70.7
2015	38	72.8	73.2	71.8	73.3
2016	22	71.6	74.0	68.1	71.6
1998–2016	427	67.3	67.5	67.0	67.7

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

Table 10b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	12	52.3	51.1	58.1	63.5
1999	15	53.2	41.4	61.0	50.7
2000	9	50.2	47.8	50.3	50.3
2001	8	79.1	77.2	83.9	79.1
2002	16	63.4	58.3	77.1	63.4
2003	11	52.6	37.5	54.0	54.0
2004	17	71.7	71.7	74.6	71.5
2005	18	73.3	71.5	75.4	71.6
2006	11	81.0	81.0	79.9	79.7
2007	17	76.8	76.8	73.8	73.3
2008	23	66.8	65.6	67.6	66.8
2009	17	70.5	70.5	71.6	70.5
2010	17	72.1	71.0	75.1	71.5
2011	16	67.9	67.9	60.2	67.9
2012	24	69.2	69.2	70.6	68.5
2013	24	68.1	65.4	73.0	65.4
2014	23	72.6	71.1	75.1	72.3
2015	23	79.5	79.5	79.9	79.5
2016	22	76.8	72.7	78.6	76.0
1998–2016	323	71.0	69.8	74.6	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 11a

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

MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	6	0.5	0.12	0.5	0.12	0.5	0.12	0.6	0.12
1999	10	0.9	0.30	0.6	0.26	0.8	0.30	0.9	0.31
2000	5	0.4	0.16	0.3	0.17	0.4	0.17	0.5	0.20
2001	4	0.3	0.15	0.2	0.09	0.3	0.14	0.5	0.21
2002	13	0.7	0.22	0.4	0.16	0.6	0.22	0.7	0.24
2003	13	0.7	0.21	0.4	0.15	0.6	0.18	0.7	0.22
2004	10	0.5	0.16	0.3	0.10	0.4	0.14	0.6	0.17
2005	13	0.7	0.21	0.4	0.13	0.5	0.17	0.7	0.19
2006	11	0.6	0.22	0.3	0.16	0.5	0.19	0.6	0.22
2007	12	0.5	0.18	0.3	0.11	0.4	0.14	0.5	0.16
2008	16	0.7	0.25	0.4	0.17	0.6	0.22	0.6	0.21
2009	15	0.7	0.25	0.4	0.16	0.5	0.21	0.6	0.24
2010	19	0.8	0.26	0.5	0.16	0.6	0.21	0.8	0.25
2011	24	1.1	0.36	0.5	0.20	0.8	0.27	1.0	0.32
2012	16	0.7	0.16	0.3	0.10	0.5	0.13	0.6	0.15
2013	26	1.1	0.32	0.6	0.20	0.9	0.26	1.1	0.30
2014	23	1.0	0.29	0.6	0.21	0.8	0.25	0.9	0.27
2015	26	1.1	0.76	0.5	0.52	0.8	0.65	1.0	0.72
2016	14	0.6	0.40	0.3	0.26	0.4	0.30	0.6	0.39
1998-2016	276	0.7	0.25	0.4	0.17	0.6	0.21	0.7	0.25

Table 11b

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

FEMALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	6	0.5	0.17	0.5	0.16	0.5	0.17	0.6	0.19
1999	7	0.6	0.21	0.5	0.17	0.5	0.20	0.6	0.20
2000	7	0.6	0.23	0.5	0.17	0.6	0.20	0.6	0.21
2001	6	0.5	0.19	0.2	0.07	0.3	0.11	0.4	0.16
2002	11	0.6	0.26	0.4	0.17	0.5	0.21	0.6	0.24
2003	5	0.3	0.10	0.2	0.07	0.2	0.08	0.3	0.09
2004	13	0.7	0.27	0.3	0.14	0.5	0.19	0.6	0.21
2005	14	0.7	0.26	0.3	0.13	0.5	0.18	0.6	0.21
2006	7	0.3	0.19	0.1	0.08	0.2	0.11	0.3	0.15
2007	11	0.5	0.24	0.2	0.12	0.3	0.15	0.4	0.19
2008	16	0.7	0.29	0.4	0.20	0.5	0.23	0.6	0.25
2009	15	0.6	0.37	0.3	0.19	0.4	0.25	0.5	0.28
2010	11	0.5	0.22	0.2	0.11	0.3	0.14	0.4	0.16
2011	12	0.5	0.26	0.3	0.16	0.3	0.19	0.4	0.21
2012	18	0.8	0.32	0.3	0.15	0.5	0.21	0.6	0.24
2013	17	0.7	0.35	0.3	0.19	0.5	0.25	0.6	0.27
2014	11	0.5	0.29	0.2	0.11	0.3	0.17	0.4	0.20
2015	19	0.8	0.50	0.2	0.23	0.4	0.32	0.6	0.38
2016	12	0.5	0.67	0.2	0.43	0.3	0.53	0.3	0.53
1998-2016	218	0.6	0.27	0.3	0.15	0.4	0.19	0.5	0.22

Table 12

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19	2	0.6	0.6	1	0.5	0.5	1	0.7	0.7
20-24	2	0.6	1.2	1	0.5	1.0	1	0.7	1.4
25-29	6	1.8	3.0	3	1.6	2.6	3	2.1	3.5
30-34	5	1.5	4.5	3	1.6	4.2	2	1.4	4.9
35-39	5	1.5	6.0	3	1.6	5.8	2	1.4	6.3
40-44	15	4.5	10.5	11	5.8	11.5	4	2.8	9.2
45-49	27	8.1	18.6	17	8.9	20.4	10	7.0	16.2
50-54	20	6.0	24.6	15	7.9	28.3	5	3.5	19.7
55-59	14	4.2	28.8	8	4.2	32.5	6	4.2	23.9
60-64	30	9.0	37.8	17	8.9	41.4	13	9.2	33.1
65-69	42	12.6	50.5	21	11.0	52.4	21	14.8	47.9
70-74	46	13.8	64.3	29	15.2	67.5	17	12.0	59.9
75-79	45	13.5	77.8	27	14.1	81.7	18	12.7	72.5
80-84	38	11.4	89.2	20	10.5	92.1	18	12.7	85.2
85+	36	10.8	100.0	15	7.9	100.0	21	14.8	100.0
All ages	333	100.0		191	100.0		142	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	Males n	Females n	Males Age- spec. mortal.	Males MI-index	Females Age- spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1	1	0.1	0.03	0.1	0.03	2.3	4.5
20-24	1	1	0.1	0.02	0.1	0.02	1.8	3.0
25-29	3	3	0.2	0.05	0.2	0.05	4.1	4.1
30-34	3	2	0.2	0.06	0.1	0.05	2.9	1.7
35-39	3	2	0.2	0.05	0.1	0.08	1.5	0.7
40-44	11	4	0.6	0.21	0.2	0.14	2.2	0.6
45-49	17	10	0.9	0.46	0.5	0.50	1.5	0.8
50-54	15	5	0.9	0.37	0.3	0.25	0.7	0.3
55-59	8	6	0.6	0.19	0.4	0.26	0.2	0.2
60-64	17	13	1.4	0.57	1.0	0.81	0.3	0.3
65-69	21	21	1.8	0.51	1.6	1.05	0.3	0.4
70-74	29	17	2.6	0.53	1.3	0.71	0.3	0.3
75-79	27	18	3.4	0.77	1.8	0.60	0.3	0.3
80-84	20	18	4.3	0.80	2.5	0.86	0.3	0.3
85+	15	21	4.9	1.25	2.9	1.11	0.2	0.2
All ages	191	142					0.4	0.3
Mortality								
Raw			0.8	0.29	0.6	0.33		
WS			0.4	0.18	0.3	0.17		
ES			0.6	0.24	0.4	0.22		
BRD-S			0.8	0.27	0.5	0.25		
PYLL-70								
per 100,000			8.3		5.1			
ES			7.2		4.5			
AYLL-70			16.7		14.9			

Table 14a

Further malignancies in deaths in period 1998–2016
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	3	1.4	1	33.3			2	66.7
C09–C10 Oropharynx	3	1.4					3	100.0
C15 Oesophagus	10	4.8					10	100.0
C16 Stomach	7	3.3	1	14.3	1	14.3	5	71.4
C18 Colon	7	3.3	1	14.3			6	85.7
C19–C20 Rectum	7	3.3	3	42.9			4	57.1
C23–C24 Bile	3	1.4					3	100.0
C25 Pancreas	8	3.8	1	12.5			7	87.5
C33–C34 Lung	45	21.4			1	2.2	44	97.8
C44 Skin others	16	7.6	6	37.5	1	6.3	9	56.3
C61 Prostate	17	8.1	8	47.1	1	5.9	8	47.1
C64 Kidney	6	2.9	2	33.3			4	66.7
C67 Bladder	3	1.4	1	33.3			2	66.7
C76–C79 CUP	5	2.4					5	100.0
C82–C85 NHL	39	18.6	15	38.5	4	10.3	20	51.3
C90 Mult. myeloma	4	1.9	2	50.0			2	50.0
C91–C96 Leukaemia	7	3.3	2	28.6			5	71.4
Others, specified	20	9.5	4	20.0	1	5.0	15	75.0
All further malignancies	210	100.0	47	22.4	9	4.3	154	73.3

Further malignancies with number of cases 1 to 2 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 14b

Further malignancies in deaths in period 1998–2016
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C16 Stomach	3	2.1					3	100.0
C18 Colon	9	6.3			1	11.1	8	88.9
C19–C20 Rectum	3	2.1	1	33.3			2	66.7
C22 Liver	2	1.4					2	100.0
C25 Pancreas	5	3.5					5	100.0
C33–C34 Lung	18	12.6			1	5.6	17	94.4
C43 Malign. melanoma	2	1.4					2	100.0
C44 Skin others	10	7.0	1	10.0	1	10.0	8	80.0
C50 Breast	40	28.0	14	35.0			26	65.0
C51 Vulva	2	1.4					2	100.0
C54 Corpus uteri	4	2.8	2	50.0			2	50.0
C56 Ovary	3	2.1			1	33.3	2	66.7
C70–C72 CNS cancer	2	1.4	1	50.0			1	50.0
C73 Thyroid	2	1.4					2	100.0
C76–C79 CUP	4	2.8					4	100.0
C82–C85 NHL	18	12.6	3	16.7			15	83.3
C91–C96 Leukaemia	6	4.2			1	16.7	5	83.3
Others, specified	10	7.0	1	10.0			9	90.0
All further malignancies	143	100.0	23	16.1	5	3.5	115	80.4

Further malignancies with number of cases 1 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	Males n	Females n	Males Age- spec. mortal.	Males MI-index	Females Age- spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1	1	0.1	0.03	0.1	0.03	2.4	5.0
20-24	1	1	0.1	0.02	0.1	0.02	2.0	3.2
25-29	3	2	0.2	0.05	0.1	0.04	4.5	3.0
30-34	3	2	0.2	0.06	0.1	0.05	2.9	1.9
35-39	3	2	0.2	0.06	0.1	0.10	1.6	0.8
40-44	11	4	0.6	0.22	0.2	0.15	2.4	0.7
45-49	15	10	0.8	0.43	0.5	0.56	1.4	0.9
50-54	15	5	0.9	0.39	0.3	0.29	0.8	0.3
55-59	8	6	0.6	0.21	0.4	0.30	0.3	0.3
60-64	14	13	1.1	0.52	1.0	1.00	0.3	0.4
65-69	15	19	1.3	0.60	1.5	1.00	0.3	0.4
70-74	22	14	2.0	0.50	1.1	0.78	0.3	0.3
75-79	16	13	2.0	0.73	1.3	0.62	0.2	0.2
80-84	15	17	3.3	1.07	2.4	0.89	0.3	0.3
85+	11	16	3.6	1.38	2.2	1.07	0.2	0.2
All ages	153	125					0.4	0.3
Mortality								
Raw			0.7	0.26	0.5	0.32		
WS			0.4	0.17	0.3	0.17		
ES			0.5	0.21	0.3	0.22		
BRD-S			0.6	0.24	0.4	0.24		
PYLL-70								
per 100,000			7.8		4.8			
ES			6.9		4.3			
AYLL-70			17.8		14.9			

* 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	Males n	Females n	Males Age- spec. mortal.	Males MI-index	Females Age- spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	1		0.1	0.03			2.4	
20-24	1		0.1	0.02			2.0	
25-29	1	1	0.1	0.02	0.1	0.02	1.5	1.5
30-34	3		0.2	0.06			2.9	
35-39	1	1	0.1	0.02	0.1	0.05	0.5	0.4
40-44	3	1	0.2	0.07	0.1	0.04	0.7	0.2
45-49	5	1	0.3	0.15	0.1	0.07	0.5	0.1
50-54								
55-59	2		0.1	0.06			0.1	
60-64	5	6	0.4	0.20	0.5	0.50	0.1	0.2
65-69	8	5	0.7	0.33	0.4	0.29	0.1	0.1
70-74	12	8	1.1	0.31	0.6	0.53	0.2	0.2
75-79	7	8	0.9	0.37	0.8	0.40	0.1	0.2
80-84	11	11	2.4	0.92	1.6	0.65	0.2	0.2
85+	5	13	1.6	0.63	1.8	0.93	0.1	0.2
All ages	65	55					0.2	0.2
Mortality								
Raw			0.3	0.12	0.2	0.15		
WS			0.2	0.07	0.1	0.05		
ES			0.2	0.09	0.1	0.08		
BRD-S			0.3	0.11	0.2	0.10		
PYLL-70								
per 100,000			2.8		0.9			
ES			2.6		0.8			
AYLL-70			18.8		12.2			

* See corresponding tables with multiple malignancies.

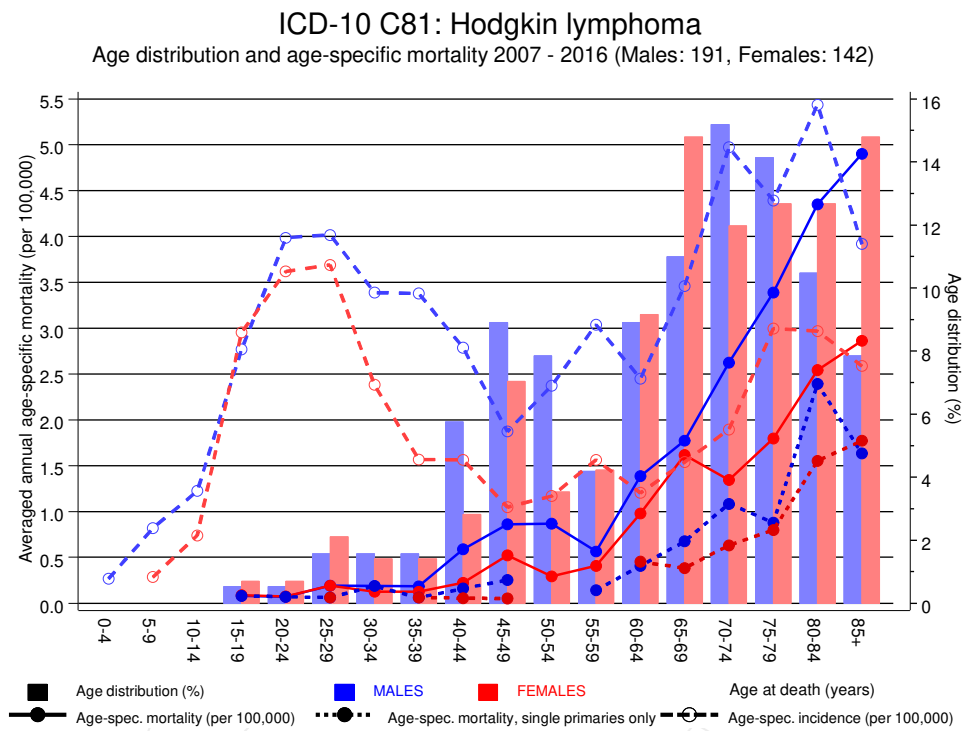
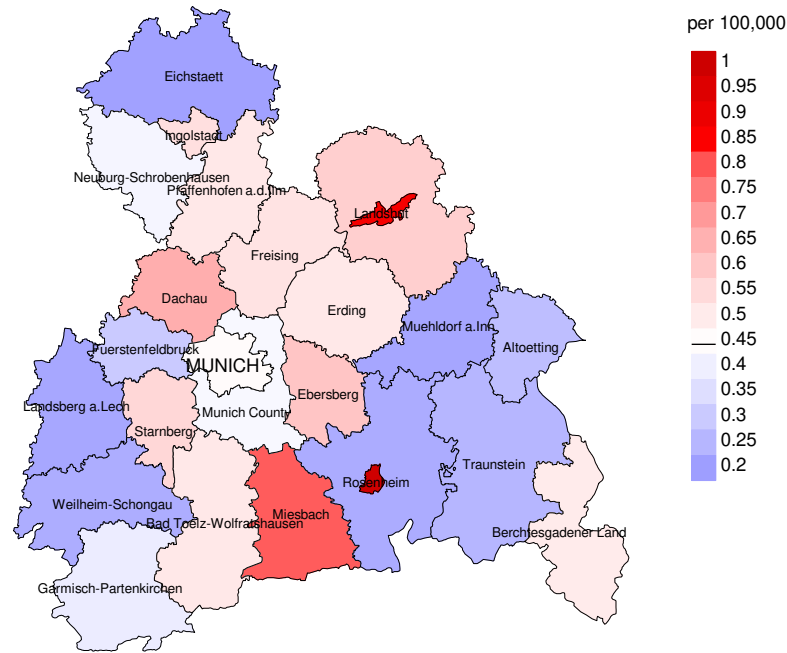


Figure 17. Distribution of age at death (bars; males: mean=55.0 yrs, median=60.3 yrs; females: mean=55.3 yrs, median=60.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2007 - 2016: Males



Average mortality (world standard population) 2007 - 2016: Females

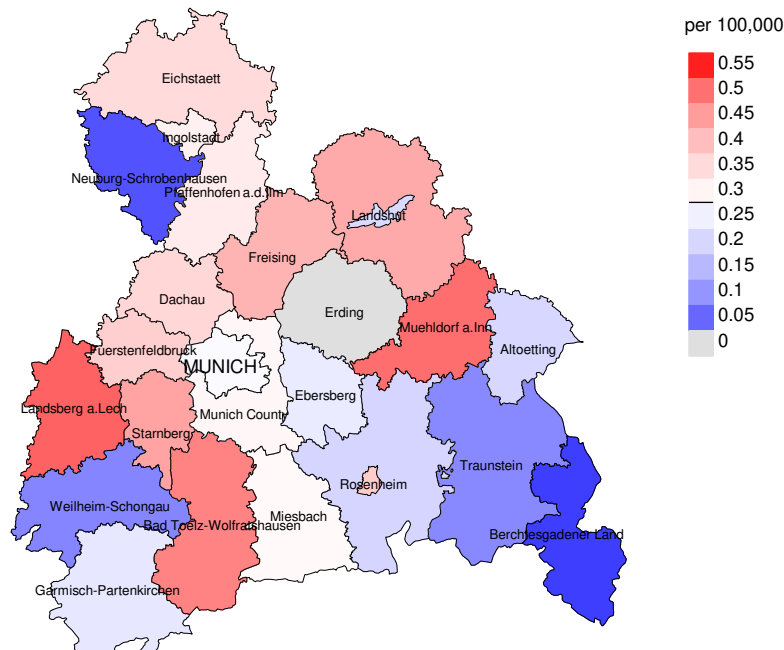
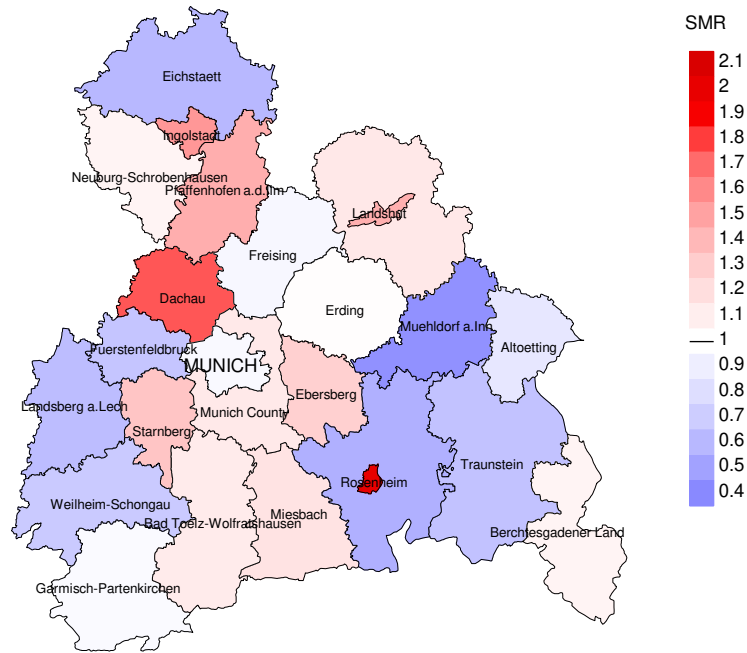


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.4/100,000 WS N=191, females 0.3/100,000 WS N=142).

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 5 women died from hodgkin lymphoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.2/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

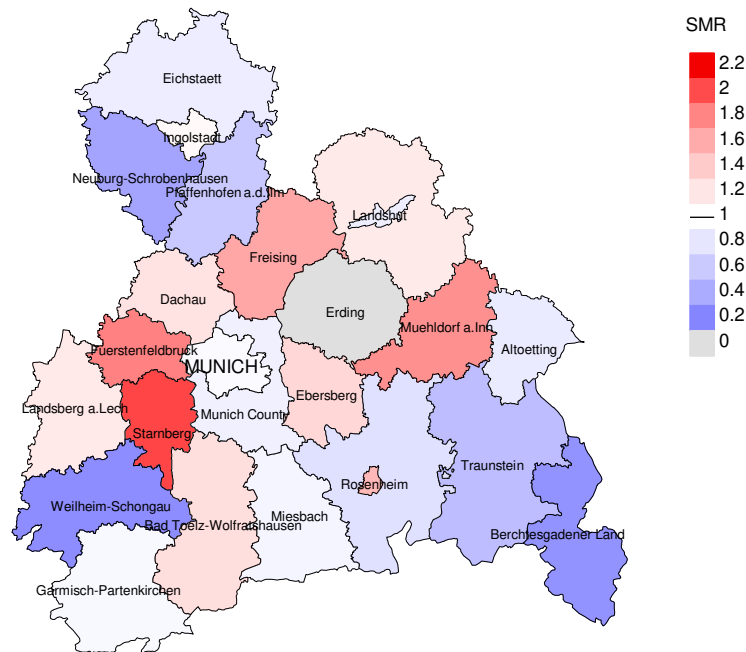


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=191, females N=142).

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 5 women died from hodgkin lymphoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.31. Though, the value of this parameter may vary with an underlying probability of 99% between 0.28 and 3.69, 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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