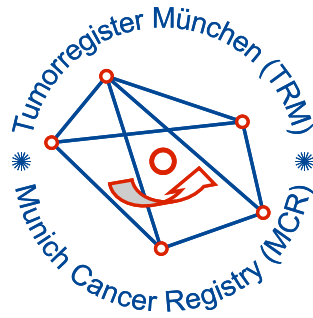


Munich Cancer Registry



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

ICD-10 C81: Hodgkin lymphoma

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	2,156
Diseases	2,156
Creation date	01/26/2021
Database export	01/07/2021
Population	4.92 m





Munich Cancer Registry
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at Klinikum Grosshadern/IBE
Marchioninstr. 15
Munich, 81377
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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, January 2021

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

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

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

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

Code	Description
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	9.9	26.7	90.7
1999	67	6	9.0	4.6	9.6	38.8	92.5
2000	62	5	8.1	4.2	9.4	30.6	95.2
2001	59	3	5.1	4.4	9.1	35.6	89.8
2002	103	7	6.8	5.3	9.0	33.0	88.3 #
2003	114	4	3.5	5.1	8.6	23.7	90.4
2004	110	3	2.7	5.7	8.7	20.0	94.5
2005	116	3	2.6	6.7	8.3	22.4	87.9
2006	88	2	2.3	7.3	7.9	28.4	94.3
2007	115	2	1.7	7.4	7.3	27.8	87.8 #
2008	119	1	0.8	7.6	7.0	23.5	97.5
2009	101	3	3.0	7.8	6.6	23.8	97.0
2010	122	2	1.6	7.4	6.3	20.5	96.7
2011	114	3	2.6	7.3	6.0	23.7	97.4
2012	156	6	3.8	8.0	6.1	26.3	96.2
2013	131	6	4.6	8.3	6.0	20.6	93.1
2014	119	7	5.9	8.5	6.0	18.5	94.1
2015	115	4	3.5	8.7	6.0	19.1	87.8
2016	82	3	3.7	8.9	4.7	18.3	98.8
2017	76	1	1.3	9.0	3.4	7.9	100.0
2018	52	1	1.9	9.0	4.0	11.5	100.0
2019	49			9.0	4.1	6.1	71.4 ##
1998-2019	2156	76	3.5	9.0	9.9	23.2	93.1

2,156 cases diagnosed 1998-2019 are related to a total of 2,156 patients. Currently, in 397 (18.4 %) of these 2,156 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 319 / 60 / 18 (14.8 % / 2.8 % / 0.8 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 76 cases has been diagnosed, of which 9.0 % 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 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	9.9	33.3	94.1
1999	34	50.7	1	2.9	5.9	9.6	35.3	97.1
2000	31	50.0	3	9.7	6.0	9.4	41.9	100.0
2001	27	45.8	2	7.4	5.6	9.1	33.3	88.9
2002	59	57.3	4	6.8	5.9	9.2	39.0	88.1 #
2003	63	55.3	2	3.2	6.0	8.6	28.6	90.5
2004	61	55.5	1	1.6	6.1	8.5	14.8	95.1
2005	62	53.4	2	3.2	7.5	8.3	27.4	88.7
2006	51	58.0	1	2.0	8.2	7.9	27.5	98.0
2007	70	60.9	1	1.4	7.9	7.2	27.1	84.3 #
2008	63	52.9	1	1.6	8.0	6.9	19.0	98.4
2009	61	60.4	1	1.6	8.2	6.5	23.0	96.7
2010	73	59.8	1	1.4	7.6	6.1	21.9	95.9
2011	68	59.6	1	1.5	7.6	6.0	20.6	95.6
2012	97	62.2	2	2.1	8.6	6.3	27.8	95.9
2013	82	62.6	1	1.2	9.2	6.5	17.1	90.2
2014	80	67.2	5	6.3	9.5	6.3	21.3	95.0
2015	61	53.0	2	3.3	9.6	5.7	24.6	86.9
2016	52	63.4	2	3.8	9.6	4.7	17.3	98.1
2017	44	57.9			9.6	3.0	6.8	100.0
2018	33	63.5	1	3.0	9.6	3.6	15.2	100.0
2019	23	46.9			9.6	4.3	8.7	69.6 ##
1998–2019	1246	57.8	37	3.0	9.6	9.9	24.0	93.3

1,246 cases diagnosed 1998-2019 are related to a total of 1,246 patients. Currently, in 239 (19.2 %) of these 1,246 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 193 / 34 / 12 (15.5 % / 2.7 % / 1.0 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 44 cases has been diagnosed, of which 9.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.0 % 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	9.9	17.1	85.7
1999	33	49.3	5	15.2	2.9	9.7	42.4	87.9
2000	31	50.0	2	6.5	2.0	9.4	19.4	90.3
2001	32	54.2	1	3.1	3.1	9.1	37.5	90.6
2002	44	42.7	3	6.8	4.6	8.7	25.0	88.6 #
2003	51	44.7	2	3.9	4.0	8.6	17.6	90.2
2004	49	44.5	2	4.1	5.1	9.1	26.5	93.9
2005	54	46.6	1	1.9	5.8	8.3	16.7	87.0
2006	37	42.0	1	2.7	6.3	8.0	29.7	89.2
2007	45	39.1	1	2.2	6.8	7.6	28.9	93.3 #
2008	56	47.1			7.1	7.1	28.6	96.4
2009	40	39.6	2	5.0	7.3	6.9	25.0	97.5
2010	49	40.2	1	2.0	7.0	6.5	18.4	98.0
2011	46	40.4	2	4.3	7.0	6.0	28.3	100.0
2012	59	37.8	4	6.8	7.1	5.9	23.7	96.6
2013	49	37.4	5	10.2	7.0	5.3	26.5	98.0
2014	39	32.8	2	5.1	7.1	5.6	12.8	92.3
2015	54	47.0	2	3.7	7.5	6.3	13.0	88.9
2016	30	36.6	1	3.3	7.9	4.7	20.0	100.0
2017	32	42.1	1	3.1	8.1	3.9	9.4	100.0
2018	19	36.5			8.3	4.4	5.3	100.0
2019	26	53.1			8.2	3.8	3.8	73.1 ##
1998-2019	910	42.2	39	4.3	8.2	9.9	22.2	92.9

910 cases diagnosed 1998-2019 are related to a total of 910 patients. Currently, in 158 (17.4 %) of these 910 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 126 / 26 / 6 (13.8 % / 2.9 % / 0.7 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 32 cases has been diagnosed, of which 8.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

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

Year of diagnosis	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	34	33	3.0	2.8	2.6	2.7	2.8	2.7	3.1	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	59	44	3.2	2.2	2.6	2.2	2.8	2.2	3.0	2.4
2003	63	51	3.4	2.6	2.9	2.8	3.2	2.7	3.4	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	37	2.7	1.8	2.2	2.0	2.5	1.9	2.7	2.0
2007	70	45	3.2	1.9	3.0	1.7	3.1	1.8	3.3	2.0
2008	63	56	2.8	2.4	2.6	2.2	2.7	2.2	3.0	2.5
2009	61	40	2.7	1.7	2.2	1.7	2.5	1.7	2.7	1.9
2010	73	49	3.2	2.1	2.8	2.0	3.0	2.0	3.3	2.3
2011	68	46	3.0	2.0	2.6	1.7	2.9	1.8	3.2	2.0
2012	97	59	4.3	2.5	3.5	2.3	3.9	2.4	4.3	2.7
2013	82	49	3.6	2.1	3.1	1.9	3.4	2.0	3.6	2.1
2014	80	39	3.4	1.6	2.8	1.7	3.1	1.7	3.5	1.8
2015	61	54	2.6	2.2	2.1	1.9	2.3	2.0	2.6	2.2
2016	52	30	2.2	1.2	1.7	0.9	1.9	1.0	2.2	1.2
2017	44	32	1.8	1.3	1.5	1.0	1.7	1.2	1.8	1.3
2018	33	19	1.4	0.8	1.0	0.7	1.2	0.7	1.3	0.8
2019	23	26	0.9	1.0	0.8	0.9	0.9	1.0	1.0	1.1
1998-2019	1246	910	2.8	2.0	2.4	1.9	2.6	1.9	2.9	2.1

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	67	43.6	21.6	9.1	84.3	17.3	27.6	38.5	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	103	43.2	19.3	7.5	82.6	20.8	27.9	38.9	61.0	70.3
2003	114	39.8	18.6	6.1	85.1	19.1	24.7	35.9	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	88	42.9	21.1	9.2	89.9	16.9	26.7	39.0	59.0	77.7
2007	115	43.3	19.9	5.2	84.2	19.8	26.7	41.5	59.8	73.2
2008	119	43.6	21.8	5.5	87.7	17.1	24.0	39.0	61.6	76.6
2009	101	44.7	21.0	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	114	46.7	21.2	6.9	96.6	21.9	26.8	46.6	62.0	79.8
2012	156	47.1	22.7	11.0	93.4	19.4	26.2	42.7	68.7	78.2
2013	131	44.9	20.9	8.1	90.8	19.8	28.0	40.2	59.3	76.5
2014	119	45.3	22.7	4.9	99.5	19.7	27.0	41.3	62.4	80.4
2015	115	48.9	23.2	8.8	94.8	21.3	26.9	44.1	70.0	79.5
2016	82	49.7	22.2	16.8	101	23.4	30.8	46.5	69.5	80.7
2017	76	48.8	19.0	14.3	92.0	21.7	32.5	50.5	62.9	74.4
2018	52	49.8	19.0	18.6	86.8	27.1	31.0	47.9	67.7	74.1
2019	49	45.8	18.9	18.6	87.1	24.3	30.0	40.8	62.3	70.9
1998-2019	2156	44.6	20.9	3.2	101	19.7	27.1	40.3	62.1	75.4

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	34	42.0	18.5	12.5	77.8	18.9	28.8	38.6	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	59	44.5	17.6	11.2	76.7	24.2	31.6	40.1	62.5	70.3
2003	63	42.5	19.1	6.1	85.1	20.0	29.9	37.9	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	70	42.0	20.4	5.2	80.4	17.9	25.1	39.2	60.2	71.8
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	68	45.9	20.1	6.9	96.6	21.9	26.8	47.2	58.8	75.7
2012	97	48.2	21.5	11.0	83.4	18.9	31.5	44.2	68.0	77.5
2013	82	44.5	19.7	8.1	89.9	22.5	29.6	41.3	59.2	72.7
2014	80	49.0	22.8	4.9	99.5	21.7	27.9	48.3	66.1	80.5
2015	61	49.1	23.4	8.8	91.1	21.1	27.2	47.9	71.7	79.1
2016	52	49.1	21.6	17.4	101	21.7	30.5	49.1	64.3	80.0
2017	44	49.6	18.2	19.0	82.8	21.3	32.9	51.7	64.6	71.9
2018	33	51.7	19.5	18.6	86.8	27.7	36.6	48.3	68.2	77.3
2019	23	47.0	19.4	18.6	78.5	25.9	30.0	44.6	64.0	70.9
1998-2019	1246	45.3	20.3	3.2	101	20.2	28.8	41.9	62.6	74.2

Table 3b

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

Year of diagnosis	Cases n	Std.		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	45.1	24.5	9.1	84.3	17.3	23.6	38.2	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	44	41.5	21.4	7.5	82.6	20.0	22.4	36.7	60.8	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	37	38.8	23.2	11.2	89.9	13.8	24.3	29.4	55.2	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	40	42.0	22.2	13.7	92.1	18.2	24.5	34.3	58.8	74.8
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	59	45.1	24.5	13.0	93.4	19.4	24.3	35.7	70.5	80.7
2013	49	45.4	23.1	12.4	90.8	19.2	27.9	38.4	59.3	78.8
2014	39	37.9	20.9	5.7	88.7	17.3	24.4	32.0	48.0	77.9
2015	54	48.6	23.1	14.9	94.8	21.7	26.9	41.6	68.3	83.9
2016	30	50.6	23.5	16.8	92.9	26.3	30.8	39.5	74.4	84.8
2017	32	47.8	20.3	14.3	92.0	23.1	31.7	46.4	60.7	78.8
2018	19	46.4	18.1	19.9	72.8	21.2	29.4	45.7	59.8	72.8
2019	26	44.7	18.7	20.6	87.1	24.3	27.8	37.7	57.3	69.2
1998-2019	910	43.6	21.7	5.7	94.8	19.2	25.6	37.6	60.6	77.6

Table 4

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

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0–4	3	0.2	0.2	3	0.4	0.4			0.0
5–9	12	0.9	1.1	9	1.1	1.5	3	0.6	0.6
10–14	26	1.9	3.0	16	2.0	3.5	10	1.8	2.4
15–19	83	6.1	9.2	43	5.3	8.8	40	7.4	9.7
20–24	131	9.7	18.9	70	8.7	17.5	61	11.2	21.0
25–29	150	11.1	30.0	80	9.9	27.4	70	12.9	33.8
30–34	117	8.7	38.6	67	8.3	35.7	50	9.2	43.0
35–39	100	7.4	46.0	65	8.1	43.7	35	6.4	49.4
40–44	94	7.0	53.0	59	7.3	51.1	35	6.4	55.9
45–49	77	5.7	58.7	52	6.4	57.5	25	4.6	60.5
50–54	79	5.8	64.5	49	6.1	63.6	30	5.5	66.0
55–59	85	6.3	70.8	52	6.4	70.0	33	6.1	72.1
60–64	57	4.2	75.1	35	4.3	74.3	22	4.0	76.1
65–69	75	5.6	80.6	53	6.6	80.9	22	4.0	80.1
70–74	95	7.0	87.6	66	8.2	89.1	29	5.3	85.5
75–79	79	5.8	93.5	44	5.5	94.5	35	6.4	91.9
80–84	52	3.8	97.3	29	3.6	98.1	23	4.2	96.1
85+	36	2.7	100.0	15	1.9	100.0	21	3.9	100.0
All ages	1351	100.0		807	100.0		544	100.0	

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=18 %	Females DCO rate n=21 %	Males	Females
							Prop.all cancers n=143063 %	Prop.all cancers n=144724 %
0- 4	3		0.2				1.4	
5- 9	9	3	0.6	0.2			7.9	3.2
10-14	16	10	1.1	0.7			12.0	8.5
15-19	43	40	2.7	2.7			14.4	16.2
20-24	70	61	3.8	3.5			11.9	12.9
25-29	80	70	3.8	3.4			9.1	6.3
30-34	67	50	3.1	2.4			5.6	2.5
35-39	65	35	3.0	1.7		2.9	3.8	1.1
40-44	59	35	2.5	1.5		2.9	2.3	0.6
45-49	52	25	2.1	1.0		4.0	1.1	0.3
50-54	49	30	2.1	1.3			0.6	0.3
55-59	52	33	2.7	1.7	1.9		0.4	0.3
60-64	35	22	2.1	1.3		4.5	0.2	0.2
65-69	53	22	3.5	1.3	3.8	4.5	0.2	0.1
70-74	66	29	4.7	1.8	1.5		0.3	0.2
75-79	44	35	4.0	2.5	6.8	5.7	0.2	0.2
80-84	29	23	4.4	2.4	24.1	17.4	0.2	0.2
85+	15	21	3.5	2.2	26.7	47.6	0.2	0.1
All ages	807	544			2.2	3.9	0.6	0.4
Incidence								
Raw			2.7	1.7				
WS			2.3	1.6				
ES			2.5	1.6				
BRD-S			2.7	1.8				

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

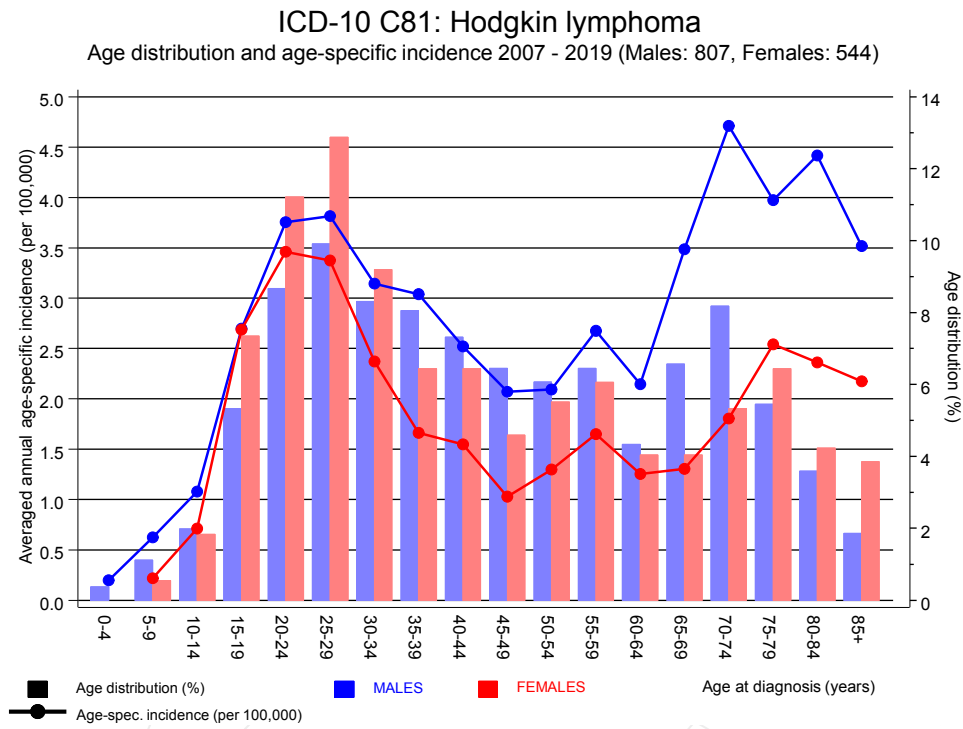


Figure 6. Age distribution (males: mean=46.7 yrs, median=44.6 yrs; females: mean=45.5 yrs, median=40.4 yrs) and age-specific incidence.

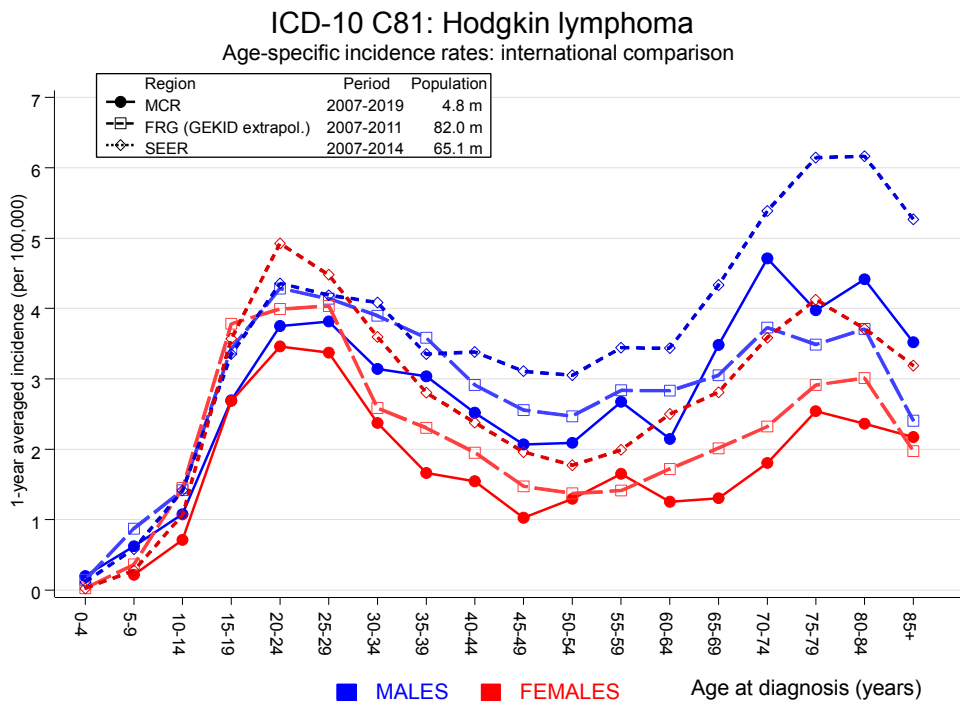


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 2019, based on the November 2018 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 1998–2019

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C07–C08 Salivary gland	1	0.1	14.6	0.4	81.3	1.7	
C09–C10 Oropharynx	1	0.4	2.3	0.1	12.9	1.1	
C15 Oesophagus	1	0.6	1.6	0.0	8.7	0.7	
C16 Stomach	3	1.1	2.8	0.6	8.1	3.5	33.3
C17 Small intestine	2	0.2	10.3	1.3	37.3 #	3.3	
C18 Colon	8	2.6	3.1	1.3	6.1 #	10.0	
C19–C20 Rectum	3	1.6	1.8	0.4	5.4	2.5	
C22 Liver	1	0.8	1.2	0.0	6.6	0.3	
C23–C24 Bile	2	0.3	7.1	0.9	25.7	3.2	
C25 Pancreas	3	1.1	2.8	0.6	8.1	3.6	33.3
C33–C34 Lung	25	3.5	7.2	4.7	10.7 #	39.9	8.0
C43 Malign. melanoma	6	1.6	3.6	1.3	7.9 #	8.1	
C60 Penis	2	0.1	26.7	3.2	96.4 #	3.6	
C61 Prostate	17	7.7	2.2	1.3	3.5 #	17.3	
C62 Testis	2	0.7	3.0	0.4	10.7	2.5	
C64 Kidney	8	1.1	7.1	3.1	13.9 #	12.7	
C67 Bladder	1	1.2	0.9	0.0	4.8	-0.3	
C70–C72 CNS cancer	1	0.5	1.9	0.0	10.7	0.9	100.0
C73 Thyroid	2	0.4	5.4	0.7	19.5	3.0	
C76–C79 CUP	1	0.5	2.1	0.1	11.8	1.0	
C82–C85 NHL	26	1.3	19.6	12.8	28.7 #	45.7	
C90 Mult. myeloma	1	0.4	2.7	0.1	15.0	1.2	
C91–C96 Leukaemia	7	0.5	14.6	5.9	30.0 #	12.1	
Not observed	0	2.3	0.0	0.0	1.6	-4.2	
All further malignancies	124	30.5	4.1	3.4	4.8 #	173.2	4.0

Patients	1191
Median age at next malignancy (years)	63.8
Person-years	5399
Mean observation time (years)	4.5
Median observation time (years)	2.9

The occurrence of further specified malignancy is statistically significant.

Table 7b

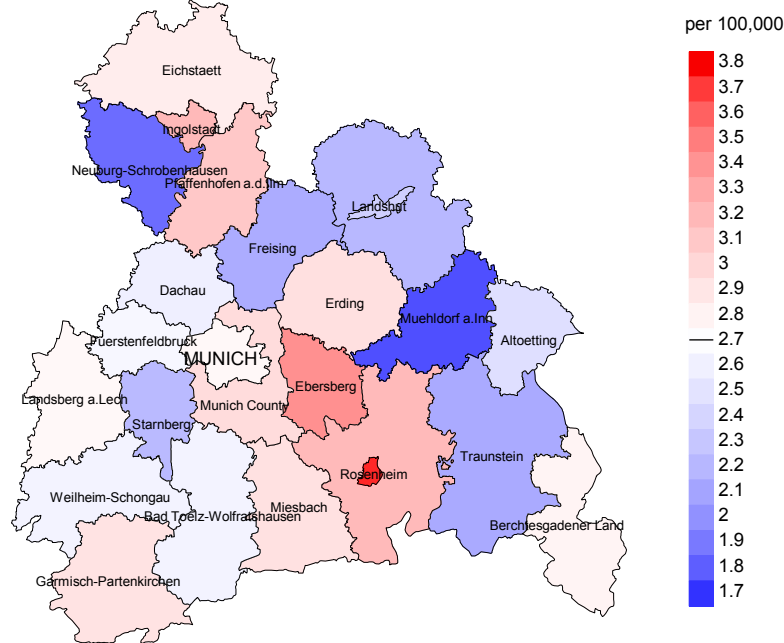
Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2019

FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C15 Oesophagus	2	0.1	18.2	2.2	65.6 #	4.2	
C16 Stomach	2	0.5	4.0	0.5	14.5	3.3	
C18 Colon	4	1.4	2.8	0.8	7.1	5.7	
C22 Liver	1	0.2	5.2	0.1	29.2	1.8	
C25 Pancreas	1	0.7	1.5	0.0	8.3	0.7	
C33–C34 Lung	6	1.3	4.6	1.7	9.9 #	10.4	
C43 Malign. melanoma	1	1.0	1.0	0.0	5.5	-0.0	
C50 Breast	17	6.5	2.6	1.5	4.2 #	23.5	
C51 Vulva	1	0.2	5.9	0.1	32.8	1.8	
C54 Corpus uteri	1	1.0	1.0	0.0	5.7	0.0	
C55,C57 Fem. genitals un	2	0.0	71.6	8.7	258.7 #	4.4	
C56 Ovary	2	0.7	2.7	0.3	9.7	2.8	
C64 Kidney	1	0.4	2.5	0.1	14.1	1.3	
C67 Bladder	1	0.3	3.7	0.1	20.6	1.6	
C69 Eye lymphoma	1	0.0	177.6	4.5	989.3 #	2.2	
C69 Eye melanoma	1	0.0	37.9	1.0	211.0	2.2	
C73 Thyroid	4	0.7	6.1	1.6	15.5 #	7.4	
C82–C85 NHL	23	0.7	34.3	21.7	51.4 #	49.7	
C90 Mult. myeloma	2	0.2	10.4	1.3	37.6 #	4.0	
C91–C96 Leukaemia	2	0.3	7.2	0.9	26.0	3.8	
Not observed	0	3.0	0.0	0.0	1.2	-6.7	
All further malignancies	75	19.1	3.9	3.1	4.9 #	124.5	
Patients		852					
Median age at next malignancy (years)		61.8					
Person-years		4489					
Mean observation time (years)		5.3					
Median observation time (years)		3.9					

The occurrence of further specified malignancy is statistically significant.

Average incidence (Germany 1987 standard population) 2007 - 2019: Males



Average incidence (Germany 1987 standard population) 2007 - 2019: Females

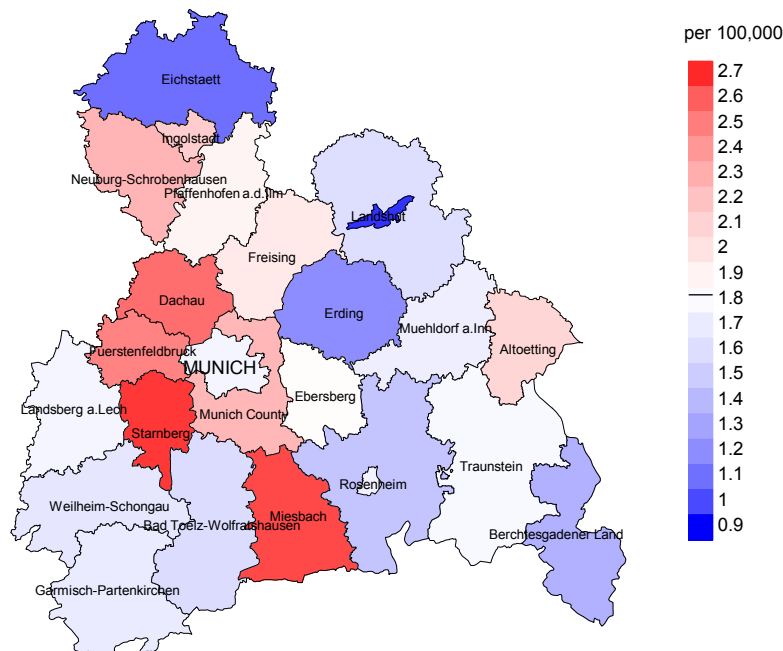
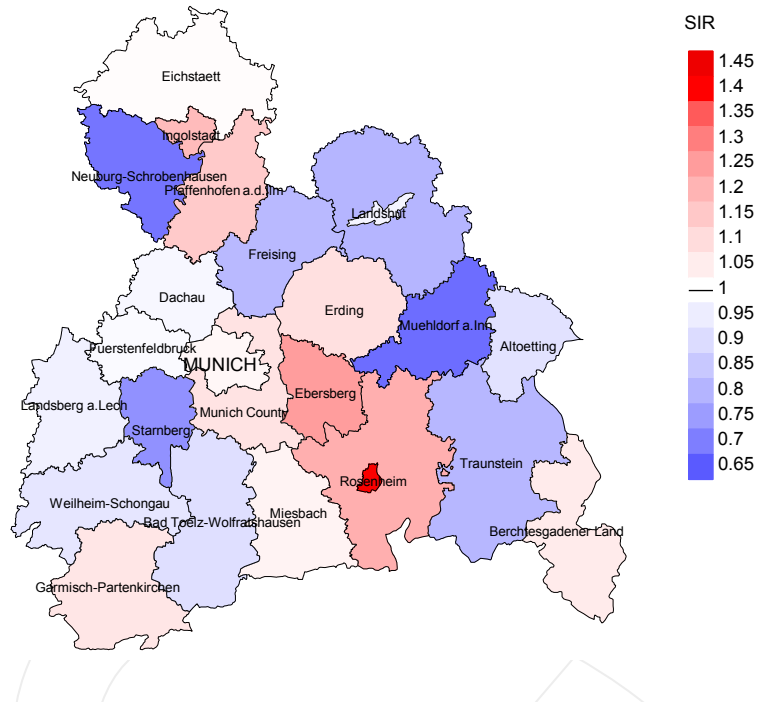


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.7/100,000 WS N=807, females 1.8/100,000 WS N=544).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 15 women were identified with newly diagnosed hodgkin lymphoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.8/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.8 and 3.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

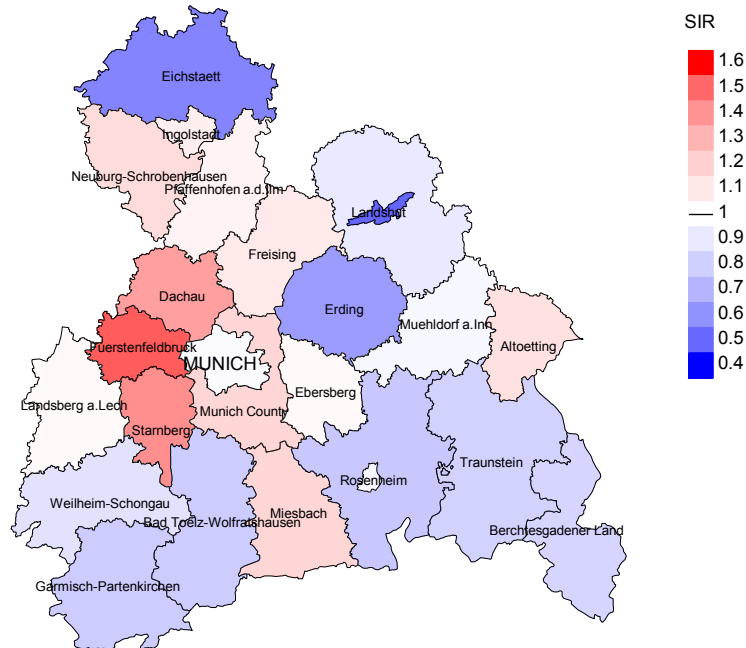


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=807, females N=544).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 15 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 1.02. Though, the value of this parameter may vary with an underlying probability of 99% between 0.47 and 1.92, and is therefore not statistically striking.

MORTALITY

Table 9a

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

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	86	90.7	4.7	23	26.7	91.3
1999	67	92.5	9.0	26	38.8	96.2
2000	62	95.2	8.1	19	30.6	84.2
2001	59	89.8	5.1	21	35.6	95.2
2002	103	88.3	6.8	34	33.0	97.1
2003	114	90.4	3.5	27	23.7	92.6
2004	110	94.5	2.7	22	20.0	100.0
2005	116	87.9	2.6	26	22.4	88.5
2006	88	94.3	2.3	25	28.4	100.0
2007	115	87.8	1.7	32	27.8	87.5
2008	119	97.5	0.8	28	23.5	92.9
2009	101	97.0	3.0	24	23.8	79.2
2010	122	96.7	1.6	25	20.5	84.0
2011	114	97.4	2.6	27	23.7	100.0
2012	156	96.2	3.8	41	26.3	95.1
2013	131	93.1	4.6	27	20.6	88.9
2014	119	94.1	5.9	22	18.5	95.5
2015	115	87.8	3.5	22	19.1	95.5
2016	82	98.8	3.7	15	18.3	86.7
2017	76	100.0	1.3	6	7.9	66.7
2018	52	100.0	1.9	6	11.5	66.7
2019	49	71.4		3	6.1	100.0
1998-2019	2156	93.1	3.5	501	23.2	91.8

Table 9b

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

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

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	86	23	82.6	4	4.7
1999	67	28	92.9	8	11.9
2000	62	22	100.0	8	12.9
2001	59	18	94.4	4	6.8
2002	103	36	100.0	8	7.8
2003	114	34	97.1	5	4.4
2004	110	33	97.0	5	4.5
2005	116	36	94.4	8	6.9
2006	88	28	100.0	5	5.7
2007	115	38	97.4	7	6.1
2008	119	46	97.8	7	5.9
2009	101	37	100.0	6	5.9
2010	122	47	95.7	7	5.7
2011	114	50	98.0	9	7.9
2012	156	53	100.0	15	9.6
2013	131	59	98.3	13	9.9
2014	119	55	98.2	13	10.9
2015	115	63	100.0	16	13.9
2016	82	49	100.0	8	9.8
2017	76	52	98.1	2	2.6
2018	52	43	30.2	2	3.8
2019	49	26	34.6	1	2.0
1998–2019	2156	876	92.5	161	7.5

Table 9c

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

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

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	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	55	60.0	40.0	88.9
2015	63	74.6	25.4	82.5
2016	49	63.3	36.7	73.5
2017	52	63.5	36.5	80.4
2018	43	32.6	67.4	61.5
2019	26	26.9	73.1	77.8
1998–2019	876	63.2	36.8	84.3

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	32	72.6	70.7	74.1	70.7
2015	40	73.2	73.4	71.8	73.6
2016	25	71.6	74.0	64.6	71.6
2017	31	70.9	69.8	74.8	71.7
2018	25	67.0	64.4	69.7	54.6
2019	14	68.3	71.4	67.7	68.8
1998-2019	500	67.7	67.8	67.7	67.9

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	71.8	75.5	72.6
2015	23	79.5	79.5	79.9	79.5
2016	24	76.8	68.8	80.1	76.0
2017	21	74.1	64.9	79.3	74.1
2018	18	71.6	65.5	78.4	51.7
2019	12	81.6	80.3	84.4	80.3
1998-2019	376	71.5	70.0	76.3	70.7

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

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

Table 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	0.29	0.6	0.24	0.8	0.29	0.9	0.30
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	0.21	0.7	0.24
2003	13	0.7	0.21	0.4	0.14	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	0.17	0.3	0.10	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	0.35	0.5	0.20	0.8	0.26	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	21	0.9	0.26	0.5	0.18	0.7	0.22	0.8	0.24
2015	28	1.2	0.46	0.6	0.27	0.8	0.36	1.1	0.41
2016	16	0.7	0.31	0.3	0.19	0.4	0.23	0.6	0.29
2017	19	0.8	0.43	0.4	0.26	0.6	0.33	0.7	0.39
2018	6	0.2	0.18	0.1	0.14	0.2	0.16	0.2	0.16
2019	3	0.1	0.13	0.1	0.08	0.1	0.10	0.1	0.12
1998-2019	306	0.7	0.25	0.4	0.16	0.5	0.20	0.7	0.24

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	0.25	0.4	0.17	0.5	0.21	0.6	0.23
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	0.10	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	0.38	0.3	0.20	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	0.31	0.3	0.15	0.5	0.21	0.6	0.24
2013	17	0.7	0.35	0.3	0.19	0.5	0.24	0.6	0.26
2014	12	0.5	0.31	0.2	0.12	0.3	0.18	0.4	0.21
2015	19	0.8	0.35	0.2	0.13	0.4	0.20	0.6	0.25
2016	15	0.6	0.50	0.3	0.34	0.4	0.38	0.4	0.38
2017	14	0.6	0.44	0.3	0.30	0.4	0.34	0.5	0.36
2018	8	0.3	0.42	0.2	0.24	0.2	0.30	0.3	0.33
2019	4	0.2	0.15	0.0	0.04	0.1	0.07	0.1	0.11
1998-2019	248	0.5	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 2007-2019
(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	0.5	0.5			0.0	2	1.2	1.2
20-24	3	0.8	1.3	1	0.5	0.5	2	1.2	2.3
25-29	7	1.8	3.1	4	1.8	2.3	3	1.7	4.1
30-34	6	1.5	4.6	3	1.4	3.6	3	1.7	5.8
35-39	5	1.3	5.9	3	1.4	5.0	2	1.2	7.0
40-44	17	4.3	10.2	11	5.0	10.0	6	3.5	10.5
45-49	28	7.1	17.3	18	8.1	18.1	10	5.8	16.3
50-54	26	6.6	23.9	17	7.7	25.8	9	5.2	21.5
55-59	19	4.8	28.8	11	5.0	30.8	8	4.7	26.2
60-64	37	9.4	38.2	22	10.0	40.7	15	8.7	34.9
65-69	47	12.0	50.1	25	11.3	52.0	22	12.8	47.7
70-74	53	13.5	63.6	31	14.0	66.1	22	12.8	60.5
75-79	56	14.2	77.9	35	15.8	81.9	21	12.2	72.7
80-84	47	12.0	89.8	24	10.9	92.8	23	13.4	86.0
85+	40	10.2	100.0	16	7.2	100.0	24	14.0	100.0
All ages	393	100.0		221	100.0		172	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007–2019
(incl. multiple malignancies)

Age at death Years	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		2			0.1	0.05		8.0
20-24	1	2	0.1	0.01	0.1	0.03	1.5	5.1
25-29	4	3	0.2	0.05	0.1	0.04	4.7	3.2
30-34	3	3	0.1	0.04	0.1	0.06	2.3	1.9
35-39	3	2	0.1	0.05	0.1	0.06	1.2	0.5
40-44	11	6	0.5	0.19	0.3	0.17	1.9	0.7
45-49	18	10	0.7	0.35	0.4	0.40	1.3	0.6
50-54	17	9	0.7	0.35	0.4	0.30	0.7	0.4
55-59	11	8	0.6	0.21	0.4	0.24	0.3	0.2
60-64	22	15	1.3	0.63	0.9	0.68	0.4	0.3
65-69	25	22	1.6	0.47	1.3	1.00	0.3	0.3
70-74	31	22	2.2	0.47	1.4	0.76	0.3	0.3
75-79	35	21	3.2	0.80	1.5	0.60	0.3	0.2
80-84	24	23	3.7	0.83	2.4	1.00	0.3	0.3
85+	16	24	3.8	1.07	2.5	1.14	0.2	0.2
All ages	221	172					0.3	0.3
Mortality								
Raw			0.7	0.27	0.6	0.32		
WS			0.4	0.17	0.3	0.17		
ES			0.5	0.22	0.4	0.22		
BRD-S			0.7	0.25	0.4	0.24		
PYLL-70								
per 100,000			6.8		5.0			
ES			5.9		4.6			
AYLL-70			15.6		16.1			

Table 14a

Further malignancies in deaths in period 1998-2019
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	3	1.2	1	33.3			2	66.7
C09-C10 Oropharynx	4	1.6	1	25.0			3	75.0
C11 Nasopharynx	2	0.8	2	100.0				
C12-C13 Hypopharynx	2	0.8					2	100.0
C15 Oesophagus	10	4.0					10	100.0
C16 Stomach	7	2.8	1	14.3	1	14.3	5	71.4
C17 Small intestine	3	1.2			1	33.3	2	66.7
C18 Colon	9	3.6	1	11.1			8	88.9
C19-C20 Rectum	8	3.2	3	37.5			5	62.5
C21 Anus/canal	2	0.8					2	100.0
C22 Liver	2	0.8					2	100.0
C23-C24 Bile	4	1.6					4	100.0
C25 Pancreas	9	3.6	1	11.1			8	88.9
C33-C34 Lung	53	21.5			1	1.9	52	98.1
C38,C45 Mesothelioma	1	0.4					1	100.0
C40-C41 Bone	1	0.4					1	100.0
C43 Malign. melanoma	3	1.2	1	33.3			2	66.7
C44 Skin others	26	10.5	9	34.6	1	3.8	16	61.5
C46,C49 Soft tissue	1	0.4					1	100.0
C50 Breast	1	0.4	1	100.0				
C60 Penis	1	0.4					1	100.0
C61 Prostate	22	8.9	12	54.5	1	4.5	9	40.9
C64 Kidney	6	2.4	2	33.3			4	66.7
C67 Bladder	4	1.6	1	25.0			3	75.0
C69 Eye lymphoma	1	0.4					1	100.0
C70-C72 CNS cancer	1	0.4					1	100.0
C73 Thyroid	1	0.4					1	100.0
C76-C79 CUP	5	2.0					5	100.0
C82-C85 NHL	44	17.8	17	38.6	4	9.1	23	52.3
C90 Mult. myeloma	4	1.6	2	50.0			2	50.0
C91-C96 Leukaemia	7	2.8	2	28.6			5	71.4
All further malignancies	247	100.0	57	23.1	9	3.6	181	73.3

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 1998-2019
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	1	0.6	1	100.0				
C16 Stomach	3	1.8					3	100.0
C17 Small intestine	1	0.6					1	100.0
C18 Colon	10	6.1			1	10.0	9	90.0
C19-C20 Rectum	4	2.4	1	25.0			3	75.0
C21 Anus/canal	1	0.6					1	100.0
C22 Liver	3	1.8					3	100.0
C25 Pancreas	6	3.7					6	100.0
C33-C34 Lung	21	12.8			1	4.8	20	95.2
C38,C45 Mesothelioma	2	1.2					2	100.0
C40-C41 Bone	1	0.6					1	100.0
C43 Malign. melanoma	3	1.8	1	33.3			2	66.7
C44 Skin others	11	6.7	1	9.1	1	9.1	9	81.8
C48 Peritoneal	1	0.6					1	100.0
C50 Breast	46	28.0	15	32.6	1	2.2	30	65.2
C51 Vulva	2	1.2					2	100.0
C53 Cervix uteri	1	0.6					1	100.0
C54 Corpus uteri	5	3.0	2	40.0	1	20.0	2	40.0
C56 Ovary	3	1.8			1	33.3	2	66.7
C64 Kidney	1	0.6					1	100.0
C67 Bladder	1	0.6					1	100.0
C69 Eye melanoma	1	0.6					1	100.0
C70-C72 CNS cancer	2	1.2	1	50.0			1	50.0
C73 Thyroid	2	1.2					2	100.0
C76-C79 CUP	5	3.0					5	100.0
C82-C85 NHL	20	12.2	3	15.0			17	85.0
C90 Mult. myeloma	1	0.6					1	100.0
C91-C96 Leukaemia	6	3.7			1	16.7	5	83.3
All further malignancies	164	100.0	25	15.2	7	4.3	132	80.5

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

Table 15

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

Age at death Years	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		2			0.1	0.05		8.7
20-24	1	2	0.1	0.01	0.1	0.03	1.7	5.4
25-29	4	2	0.2	0.05	0.1	0.03	5.2	2.3
30-34	3	2	0.1	0.05	0.1	0.04	2.4	1.4
35-39	3	2	0.1	0.05	0.1	0.07	1.3	0.6
40-44	11	6	0.5	0.20	0.3	0.18	2.1	0.9
45-49	16	10	0.6	0.32	0.4	0.43	1.3	0.7
50-54	17	9	0.7	0.38	0.4	0.35	0.8	0.4
55-59	11	8	0.6	0.23	0.4	0.30	0.3	0.3
60-64	19	14	1.2	0.66	0.8	0.78	0.4	0.4
65-69	19	20	1.2	0.54	1.2	1.00	0.3	0.4
70-74	25	18	1.8	0.46	1.1	0.86	0.3	0.3
75-79	21	16	1.9	0.81	1.2	0.67	0.3	0.2
80-84	15	21	2.3	1.00	2.2	1.05	0.2	0.3
85+	11	19	2.6	1.10	2.0	1.19	0.2	0.2
All ages	176	151					0.4	0.3
Mortality								
Raw			0.6	0.25	0.5	0.31		
WS			0.3	0.15	0.2	0.16		
ES			0.4	0.20	0.3	0.21		
BRD-S			0.5	0.22	0.4	0.24		
PYLL-70								
per 100,000			6.5		4.7			
ES			5.6		4.3			
AYLL-70			16.5		15.9			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19		1			0.1	0.03		4.5
20-24	1	1	0.1	0.01	0.1	0.02	1.7	2.8
25-29	2	1	0.1	0.03	0.0	0.01	2.6	1.2
30-34	3		0.1	0.05			2.4	
35-39	1	1	0.0	0.02	0.0	0.04	0.4	0.3
40-44	3	2	0.1	0.06	0.1	0.06	0.6	0.3
45-49	5	1	0.2	0.10	0.0	0.05	0.4	0.1
50-54		1			0.0	0.04		0.0
55-59	3		0.2	0.07			0.1	
60-64	5	6	0.3	0.21	0.3	0.38	0.1	0.2
65-69	9	6	0.6	0.27	0.4	0.35	0.1	0.1
70-74	15	10	1.1	0.33	0.6	0.63	0.2	0.2
75-79	8	9	0.7	0.38	0.7	0.41	0.1	0.1
80-84	10	14	1.5	0.77	1.4	0.78	0.2	0.2
85+	5	14	1.2	0.56	1.5	0.93	0.1	0.2
All ages	70	67					0.1	0.2
Mortality								
Raw			0.2	0.11	0.2	0.15		
WS			0.1	0.06	0.1	0.06		
ES			0.2	0.08	0.1	0.08		
BRD-S			0.2	0.10	0.2	0.10		
PYLL-70								
per 100,000			2.1		1.3			
ES			1.9		1.2			
AYLL-70			17.8		16.5			

* See corresponding tables with multiple malignancies.

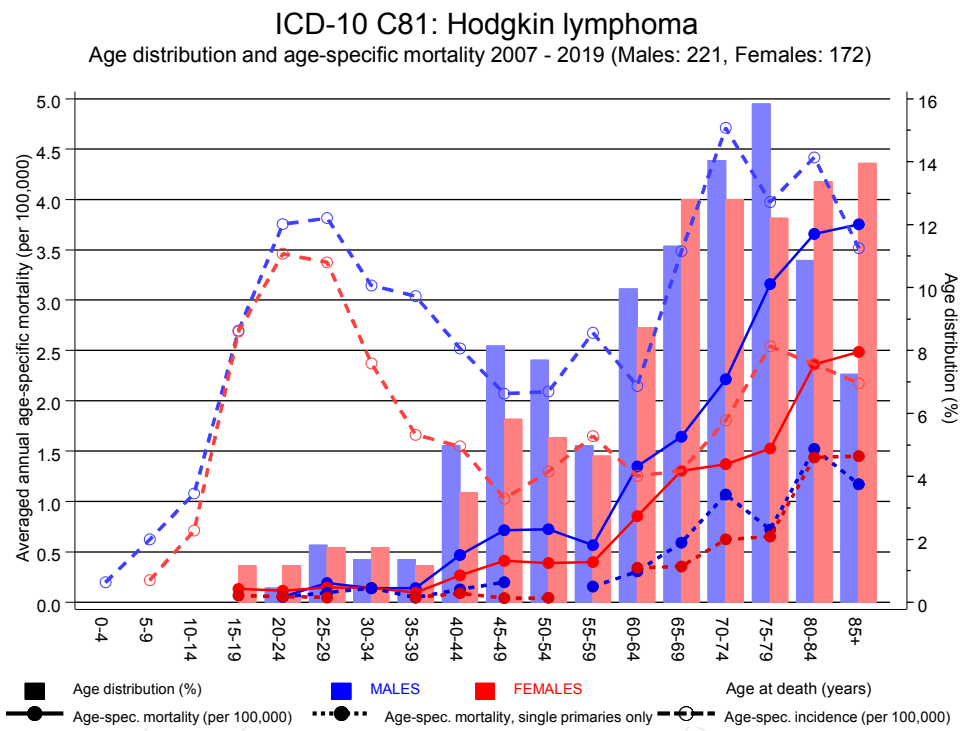
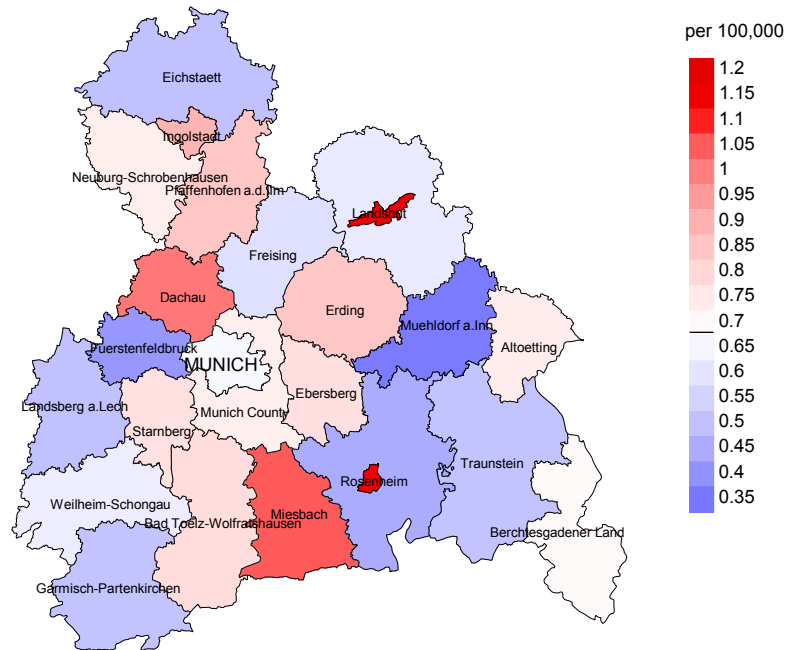


Figure 17. Distribution of age at death (bars; males: mean=54.3 yrs, median=59.6 yrs; females: mean=53.7 yrs, median=58.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (Germany 1987 standard population) 2007 - 2019: Males



Average mortality (Germany 1987 standard population) 2007 - 2019: Females

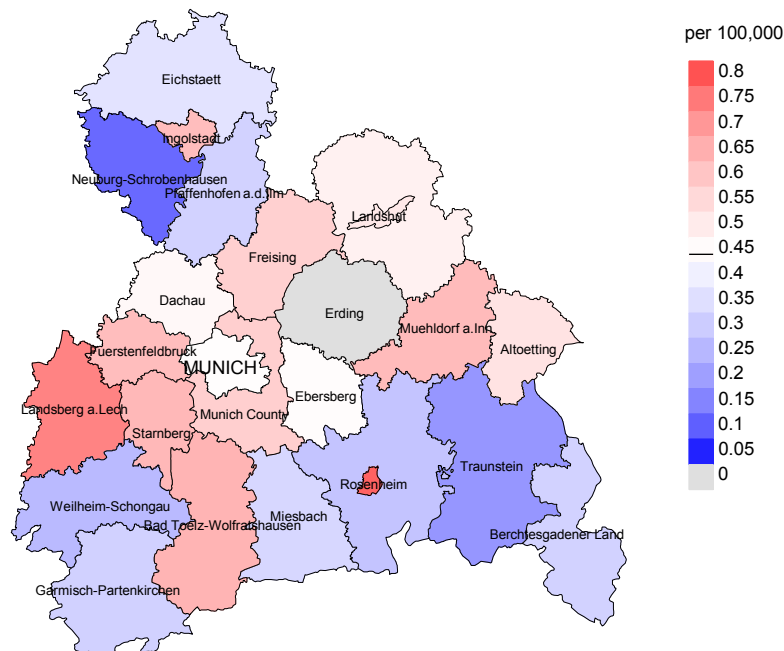
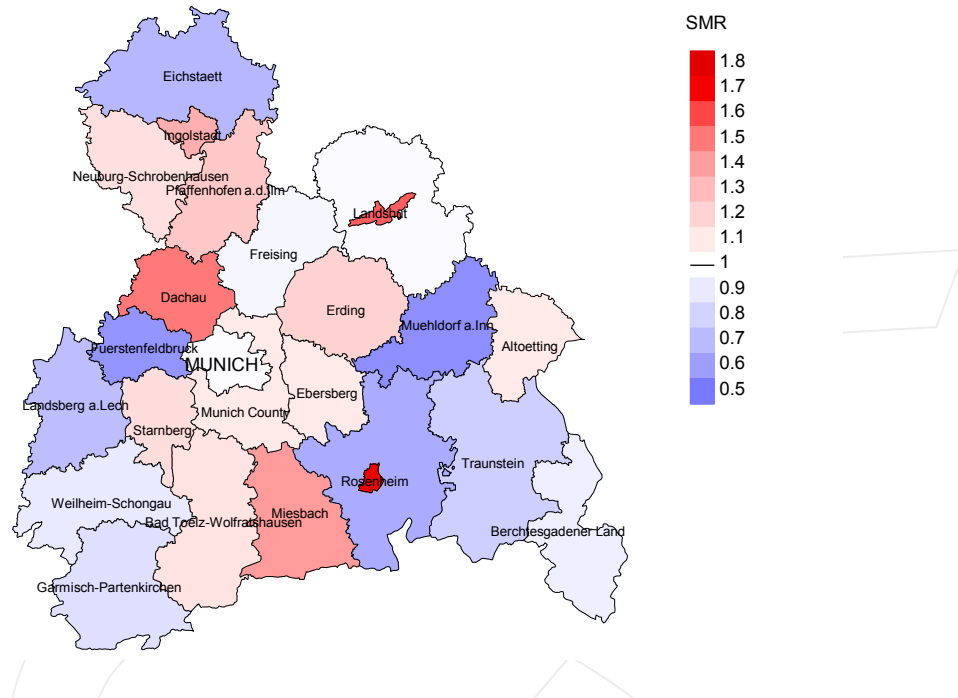


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.7/100,000 WS N=221, females 0.4/100,000 WS N=172).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 5 women died from hodgkin lymphoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.4/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

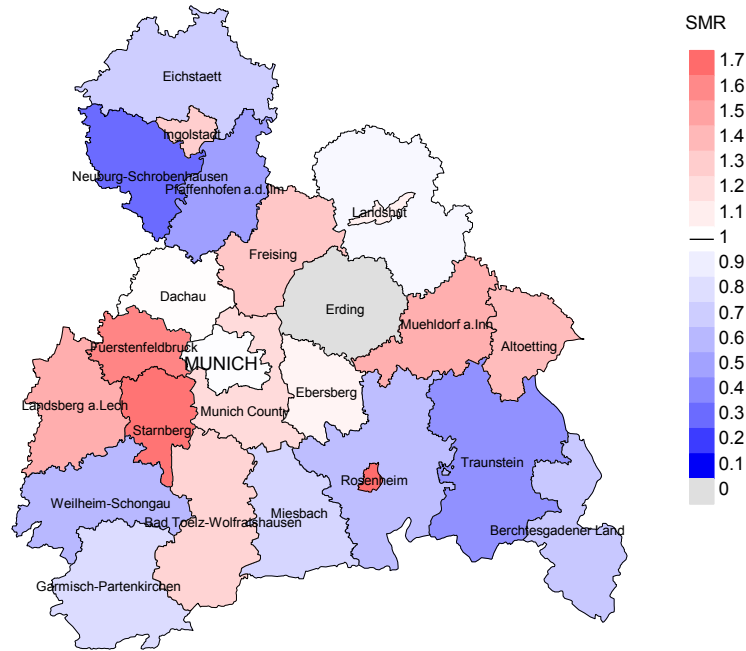


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=221, females N=172).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 5 women died from hodgkin lymphoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.07. Though, the value of this parameter may vary with an underlying probability of 99% between 0.23 and 3.02, and is therefore not statistically striking.

Statistical Notes

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

1. All multiple primaries included

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

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

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

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

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

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

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

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

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

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

Shortcuts

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

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