Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

ICD-10 C81: Hodgkin lymphoma

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	2,254
Diseases	2,254
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
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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

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, December 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	10.2	26.7	90.7	
1999	67	6	9.0	4.6	9.9	38.8	92.5	
2000	62	5	8.1	4.2	9.8	30.6	95.2	
2001	59	3	5.1	4.4	9.4	37.3	89.8	
2002	103	7	6.8	5.3	9.2	35.0	88.3	#
2003	114	4	3.5	5.1	8.8	25.4	92.1	
2004	110	3	2.7	5.7	8.9	20.9	94.5	
2005	117	3	2.6	6.7	8.5	25.6	88.9	
2006	88	2	2.3	7.3	8.0	30.7	94.3	
2007	116	3	2.6	7.4	7.5	28.4	87.9	#
2008	119	1	0.8	7.6	7.0	23.5	99.2	
2009	101	3	3.0	7.8	6.6	24.8	97.0	
2010	123	2	1.6	7.4	6.2	22.8	95.9	
2011	114	3	2.6	7.3	6.0	24.6	97.4	
2012	156	6	3.8	7.9	6.1	28.8	96.2	
2013	131	6	4.6	8.3	5.7	22.1	93.9	
2014	122	7	5.7	8.4	5.4	18.9	95.1	
2015	119	4	3.4	8.7	5.0	21.0	91.6	
2016	92	3	3.3	9.0	3.8	18.5	97.8	
2017	83	1	1.2	9.1	2.8	10.8	100.0	
2018	56	1	1.8	9.2	2.9	16.1	100.0	
2019	57			9.2	2.6	12.3	100.0	
2020	59			9.2	0.0	3.4	100.0	##
1998-2020	2254	77	3.4	9.2	10.2	24.1	94.5	

2,254 cases diagnosed 1998-2020 are related to a total of 2,254 patients. Currently, in 425 (18.9 %) of these 2,254 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 337 / 68 / 20 (15.0 % / 3.0 % / 0.9 %) 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 2018, a subgroup of 56 cases has been diagnosed, of which 9.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.9 % 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 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	10.0	33.3	94.1	
1999	34	50.7	1	2.9	5.9	9.7	35.3	97.1	
2000	31	50.0	3	9.7	6.0	9.6	41.9	100.0	
2001	27	45.8	2	7.4	5.6	9.3	37.0	88.9	
2002	59	57.3	4	6.8	5.9	9.4	40.7	88.1	#
2003	63	55.3	2	3.2	6.0	8.7	30.2	92.1	
2004	61	55.5	1	1.6	6.1	8.5	16.4	95.1	
2005	62	53.0	2	3.2	7.5	8.3	33.9	88.7	
2006	51	58.0	1	2.0	8.2	7.9	31.4	98.0	
2007	71	61.2	2	2.8	7.8	7.2	28.2	84.5	#
2008	63	52.9	1	1.6	8.0	6.9	19.0	98.4	
2009	61	60.4	1	1.6	8.2	6.6	23.0	96.7	
2010	74	60.2	1	1.4	7.6	6.3	24.3	95.9	
2011	68	59.6	1	1.5	7.6	6.2	20.6	95.6	
2012	97	62.2	2	2.1	8.6	6.4	28.9	95.9	
2013	82	62.6	1	1.2	9.2	6.2	19.5	91.5	
2014	80	65.6	5	6.3	9.5	5.6	22.5	95.0	
2015	64	53.8	2	3.1	9.6	5.0	26.6	90.6	
2016	59	64.1	2	3.4	9.8	4.0	18.6	98.3	
2017	50	60.2			9.9	2.8	10.0	100.0	
2018	33	58.9	1	3.0	9.9	3.3	21.2	100.0	
2019	27	47.4			9.9	3.4	18.5	100.0	
2020	32	54.2			9.9	0.0		100.0	##
1998–2020	1300	57.7	38	2.9	9.9	10.0	25.2	94.5	

1,300 cases diagnosed 1998-2020 are related to a total of 1,300 patients. Currently, in 254 (19.5 %) of these 1,300 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 202 / 39 / 13 (15.5 % / 3.0 % / 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 33 cases has been diagnosed, of which 9.9 % 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 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	10.5	17.1	85.7
1999	33	49.3	5	15.2	2.9	10.2	42.4	87.9
2000	31	50.0	2	6.5	2.0	10.0	19.4	90.3
2001	32	54.2	1	3.1	3.1	9.6	37.5	90.6
2002	44	42.7	3	6.8	4.6	9.1	27.3	88.6 #
2003	51	44.7	2	3.9	4.0	8.9	19.6	92.2
2004	49	44.5	2	4.1	5.1	9.4	26.5	93.9
2005	55	47.0	1	1.8	5.8	8.6	16.4	89.1
2006	37	42.0	1	2.7	6.3	8.3	29.7	89.2
2007	45	38.8	1	2.2	6.8	7.9	28.9	93.3 #
2008	56	47.1			7.1	7.1	28.6	100.0
2009	40	39.6	2	5.0	7.3	6.7	27.5	97.5
2010	49	39.8	1	2.0	7.0	6.2	20.4	95.9
2011	46	40.4	2	4.3	7.0	5.6	30.4	100.0
2012	59	37.8	4	6.8	7.1	5.5	28.8	96.6
2013	49	37.4	5	10.2	7.0	4.9	26.5	98.0
2014	42	34.4	2	4.8	7.0	5.0	11.9	95.2
2015	55	46.2	2	3.6	7.4	5.1	14.5	92.7
2016	33	35.9	1	3.0	7.8	3.5	18.2	97.0
2017	33	39.8	1	3.0	8.0	2.7	12.1	100.0
2018	23	41.1			8.2	2.5	8.7	100.0
2019	30	52.6			8.2	1.8	6.7	100.0
2020	27	45.8			8.2	0.0	7.4	100.0 ##
1998-2020	954	42.3	39	4.1	8.2	10.5	22.6	94.4

954 cases diagnosed 1998-2020 are related to a total of 954 patients. Currently, in 171 (17.9 %) of these 954 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 135 / 29 / 7 (14.2 % / 3.0 % / 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 23 cases has been diagnosed, of which 8.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.5 % 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 4.94 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	55	3.3	2.8	3.0	2.5	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	71	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	74	49	3.3	2.1	2.8	2.0	3.1	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	42	3.4	1.7	2.8	1.9	3.1	1.8	3.5	2.0
2015	64	55	2.7	2.3	2.2	1.9	2.4	2.1	2.7	2.3
2016	59	33	2.5	1.3	1.9	1.1	2.2	1.2	2.5	1.3
2017	50	33	2.1	1.3	1.6	1.1	1.9	1.2	2.0	1.3
2018	33	23	1.4	0.9	1.0	0.8	1.2	0.9	1.3	1.0
2019	27	30	1.1	1.2	0.9	1.0	1.0	1.1	1.1	1.2
2020	32	27	1.3	1.1	1.1	1.1	1.2	1.1	1.3	1.2
1998–2020	1300	954	2.8	2.0	2.4	1.9	2.6	1.9	2.8	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	Mean	Std. dev.	Min.	Max.	10%	25%	Median 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	117	43.9	21.0	12.6	86.4	17.5	25.8	40.1	62.2	76.1
2006	88	42.9	21.1	9.2	89.9	16.9	26.7	39.0	59.0	77.7
2007	116	43.6	20.2	5.2	84.2	19.8	26.9	41.6	60.0	73.6
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	123	45.7	21.8	3.2	85.5	20.2	25.6	42.7	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	122	45.2	22.6	4.9	99.5	21.0	27.0	40.9	62.2	79.3
2015	119	48.4	23.0	8.8	94.8	21.1	26.9	43.9	70.0	79.5
2016	92	49.1	22.4	16.8	101	23.4	29.4	45.1	69.2	80.7
2017	83	48.9	19.9	6.7	92.0	21.7	31.8	50.6	63.6	74.8
2018	56	50.6	19.6	18.6	86.8	24.5	31.0	48.6	69.4	75.0
2019	57	46.9	18.6	18.6	87.1	25.4	30.4	44.6	63.1	70.9
2020	59	44.5	19.8	18.6	85.5	21.6	27.4	39.7	60.2	79.6
1998-2020	2254	44.6	20.9	3.2	101	19.8	27.1	40.3	62.1	75.7

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 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	71	42.5	20.7	5.2	80.8	18.4	25.1	39.6	61.8	72.3
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	74	46.2	21.4	3.2	85.5	20.3	28.1	43.2	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	64	48.6	23.2	8.8	91.1	20.3	26.3	47.2	71.6	79.1
2016	59	49.2	22.0	17.4	101	21.0	29.3	49.0	69.0	80.6
2017	50	49.9	19.9	6.7	84.5	20.6	32.6	53.1	66.1	74.1
2018	33	51.7	19.5	18.6	86.8	27.7	36.6	48.3	68.2	77.3
2019	27	49.5	19.4	18.6	78.5	25.9	30.4	52.4	66.3	74.0
2020	32	46.1	19.0	19.0	81.9	26.1	29.5	40.3	61.4	78.0
1998–2020	1300	45.5	20.4	3.2	101	20.2	28.8	41.9	62.7	74.4

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 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	55	43.9	20.2	15.3	86.4	18.1	27.7	40.1	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	42	38.1	20.6	5.7	88.7	17.5	24.4	32.8	48.0	72.7
2015	55	48.2	23.0	14.9	94.8	21.7	26.9	41.1	68.3	83.9
2016	33	48.9	23.3	16.8	92.9	24.4	29.5	37.7	71.0	82.8
2017	33	47.3	20.2	14.3	92.0	23.1	31.7	45.8	60.6	78.8
2018	23	49.0	20.1	19.9	81.7	21.2	29.4	51.9	70.8	72.8
2019	30	44.6	18.0	20.6	87.1	24.9	27.8	39.4	57.3	68.6
2020	27	42.6	20.8	18.6	85.5	19.9	22.6	38.8	56.0	79.7
1998-2020	954	43.5	21.6	5.7	94.8	19.3	25.6	37.8	60.6	77.5

Table 4

Age distribution by 5-year age group and sex for period 2007-2020
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	3	0.2	0.2	3	0.3	0.3			0.0
5-9	13	0.9	1.1	10	1.2	1.5	3	0.5	0.5
10-14	26	1.8	2.9	16	1.9	3.4	10	1.7	2.2
15-19	89	6.1	9.0	46	5.3	8.7	43	7.3	9.5
20-24	142	9.8	18.9	71	8.2	17.0	71	12.1	21.6
25-29	164	11.3	30.2	90	10.5	27.4	74	12.6	34.2
30-34	121	8.4	38.5	70	8.1	35.5	51	8.7	42.9
35-39	112	7.7	46.3	72	8.4	43.9	40	6.8	49.7
40-44	98	6.8	53.0	61	7.1	51.0	37	6.3	56.0
45-49	82	5.7	58.7	54	6.3	57.3	28	4.8	60.8
50-54	86	5.9	64.6	53	6.2	63.4	33	5.6	66.4
55-59	89	6.1	70.8	53	6.2	69.6	36	6.1	72.6
60-64	64	4.4	75.2	40	4.6	74.2	24	4.1	76.7
65-69	80	5.5	80.7	57	6.6	80.8	23	3.9	80.6
70-74	99	6.8	87.6	68	7.9	88.7	31	5.3	85.9
75-79	84	5.8	93.4	48	5.6	94.3	36	6.1	92.0
80-84	59	4.1	97.4	34	3.9	98.3	25	4.3	96.3
85+	37	2.6	100.0	15	1.7	100.0	22	3.7	100.0
All ages	1448	100.0		861	100.0		587	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007-2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=19 %	Females DCO rate n=21 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4	3		0.2				1.4	
5- 9	10	3	0.6	0.2			8.5	3.0
10-14	16	10	1.0	0.7			11.7	7.8
15-19	46	43	2.7	2.7			14.4	16.2
20-24	71	71	3.5	3.7			11.3	13.7
25-29	90	74	4.0	3.3			9.4	6.2
30-34	70	51	3.0	2.2			5.4	2.4
35-39	72	40	3.1	1.8		2.5	3.9	1.1
40-44	61	37	2.4	1.5		2.7	2.2	0.6
45-49	54	28	2.0	1.1		3.6	1.1	0.3
50-54	53	33	2.1	1.3			0.6	0.3
55-59	53	36	2.5	1.7	1.9		0.4	0.3
60-64	40	24	2.3	1.3		4.2	0.2	0.2
65-69	57	23	3.5	1.3	3.5	4.3	0.2	0.1
70-74	68	31	4.5	1.8	1.5		0.2	0.2
75-79	48	36	4.0	2.4	6.3	5.6	0.2	0.2
80-84	34	25	4.7	2.3	23.5	16.0	0.2	0.2
85+	15	22	3.2	2.1	26.7	45.5	0.1	0.1
All ages	861	587			2.2	3.6	0.6	0.4
Incidence								
Raw			2.6	1.7				
WS			2.2	1.6				
ES			2.4	1.7				
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).

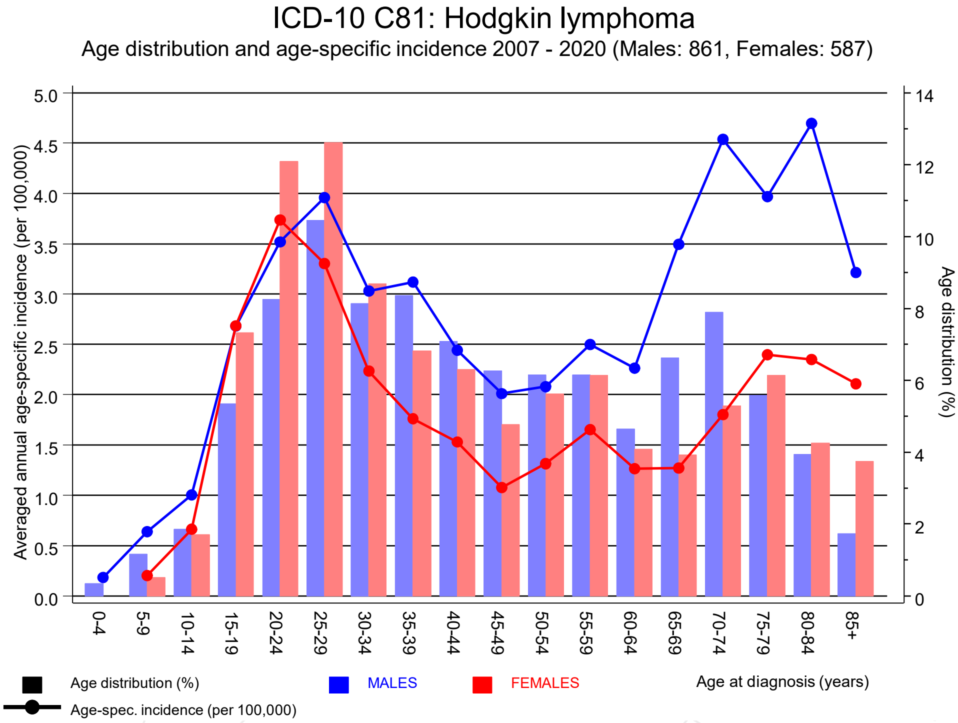


Figure 6. Age distribution (males: mean=46.8 yrs, median=44.6 yrs; females: mean=45.3 yrs, median=40.3 yrs) and age-specific incidence.

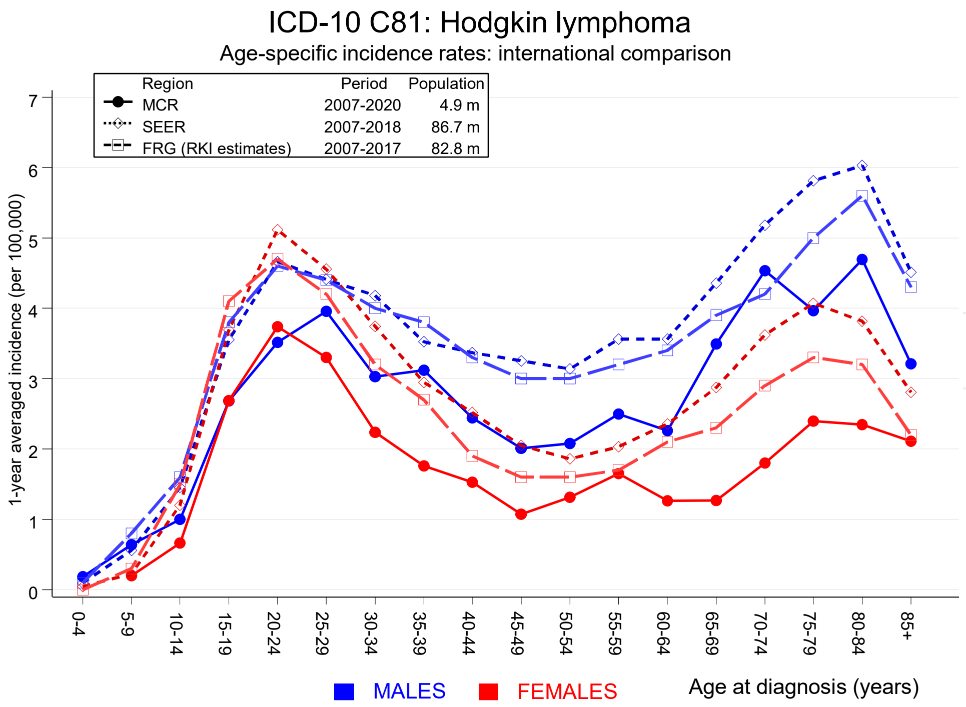


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 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 1998-2020
MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C07-C08	Salivary gland	1	0.1	12.2	0.3	67.8		1.5	
C09-C10	Oropharynx	1	0.5	2.1	0.1	11.7		0.8	
C15	Oesophagus	1	0.7	1.4	0.0	7.5		0.4	
C16	Stomach	3	1.2	2.4	0.5	7.1		2.8	33.3
C17	Small intestine	2	0.2	8.8	1.1	31.9	#	2.9	
C18	Colon	8	3.0	2.7	1.1	5.2	#	8.1	
C19-C20	Rectum	3	1.9	1.6	0.3	4.7		1.8	
C22	Liver	1	1.0	1.0	0.0	5.8		0.1	
C23-C24	Bile	2	0.3	6.1	0.7	21.9		2.7	
C25	Pancreas	3	1.3	2.4	0.5	6.9		2.8	33.3
C33-C34	Lung	27	3.9	6.9	4.5	10.0	#	37.3	7.4
C43	Malign. melanoma	7	1.9	3.7	1.5	7.5	#	8.2	
C60	Penis	2	0.1	23.1	2.8	83.4	#	3.1	
C61	Prostate	20	8.8	2.3	1.4	3.5	#	18.2	
C62	Testis	2	0.8	2.7	0.3	9.6		2.0	
C64	Kidney	8	1.3	6.3	2.7	12.3	#	10.9	
C67	Bladder	1	1.4	0.7	0.0	4.1		-0.6	
C70-C72	CNS cancer	1	0.6	1.7	0.0	9.5		0.7	100.0
C73	Thyroid	3	0.4	7.2	1.5	21.1	#	4.2	
C76-C79	CUP	1	0.5	1.8	0.0	10.3		0.7	
C82-C85	NHL	27	1.5	17.8	11.7	25.9	#	41.2	
C90	Mult. myeloma	2	0.4	4.7	0.6	17.0		2.5	
C91-C96	Leukaemia	7	0.6	12.7	5.1	26.2	#	10.4	
Not observed		0	2.6	0.0	0.0	1.4		-4.2	
All further malignancies		133	34.9	3.8	3.2	4.5	#	158.5	3.8

Patients	1257
Median age at next malignancy (years)	64.4
Person-years	6191
Mean observation time (years)	4.9
Median observation time (years)	3.3

The occurrence of further specified malignancy is statistically significant.

Table 7b

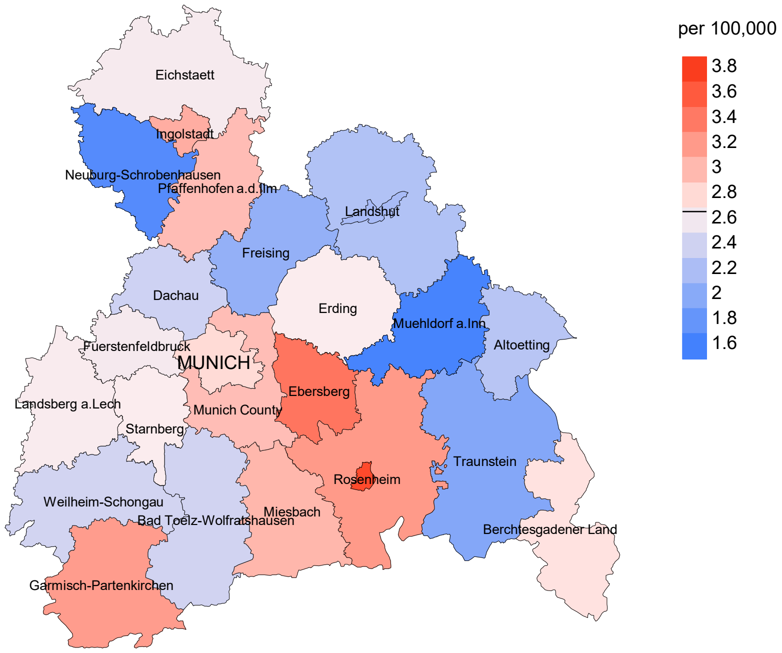
Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998-2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C15	Oesophagus	2	0.1	16.0	1.9	57.8	#	3.7	
C16	Stomach	2	0.5	3.7	0.4	13.2		2.9	
C18	Colon	5	1.6	3.2	1.0	7.4	#	6.7	
C22	Liver	1	0.2	4.7	0.1	26.2		1.5	
C25	Pancreas	1	0.7	1.3	0.0	7.5		0.5	
C33-C34	Lung	7	1.5	4.8	1.9	9.9	#	10.9	
C43	Malign. melanoma	2	1.1	1.8	0.2	6.4		1.7	
C50	Breast	21	7.2	2.9	1.8	4.5	#	27.2	
C51	Vulva	2	0.2	10.6	1.3	38.2	#	3.6	
C54	Corpus uteri	1	1.1	0.9	0.0	5.1		-0.2	
C55,C57	Fem. genitals un	2	0.0	65.3	7.9	235.9	#	3.9	
C56	Ovary	3	0.8	3.7	0.8	10.7		4.3	
C64	Kidney	1	0.4	2.3	0.1	13.0		1.1	
C67	Bladder	1	0.3	3.3	0.1	18.5		1.4	
C69	Eye lymphoma	1	0.0	166.0	4.2	924.7	#	2.0	
C69	Eye melanoma	1	0.0	34.8	0.9	194.0		1.9	
C73	Thyroid	4	0.7	5.5	1.5	14.0	#	6.4	
C76-C79	CUP	1	0.3	3.5	0.1	19.6		1.4	
C82-C85	NHL	24	0.7	32.6	20.9	48.5	#	45.7	
C90	Mult. myeloma	2	0.2	9.6	1.2	34.6	#	3.5	
C91-C96	Leukaemia	3	0.3	9.8	2.0	28.6	#	5.3	
Not observed		0	3.0	0.0	0.0	1.2		-5.9	
All further malignancies		87	21.2	4.1	3.3	5.1	#	129.4	

Patients	908
Median age at next malignancy (years)	61.7
Person-years	5088
Mean observation time (years)	5.6
Median observation time (years)	4.2

The occurrence of further specified malignancy is statistically significant.

Average incidence (Germany 1987 standard population) 2007 - 2020: Males



verage incidence (Germany 1987 standard population) 2007 - 2020: Females

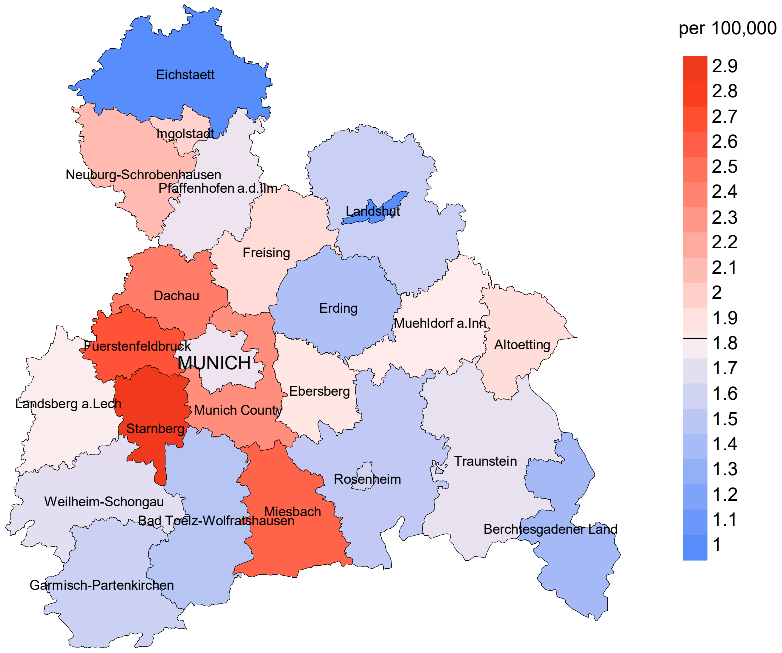
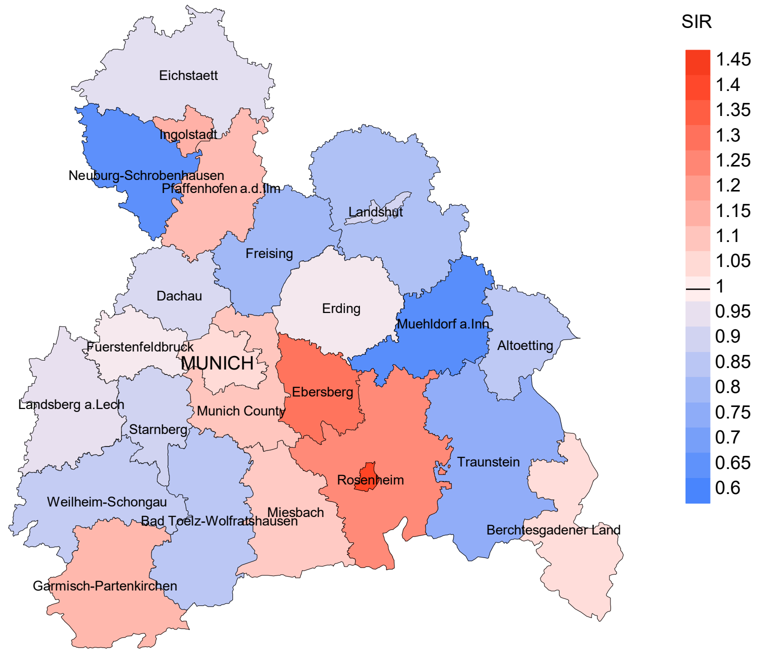


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.7/100,000 WS N=861, females 1.8/100,000 WS N=587).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 16 women were identified with newly diagnosed hodgkin lymphoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.9/100,000 (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 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

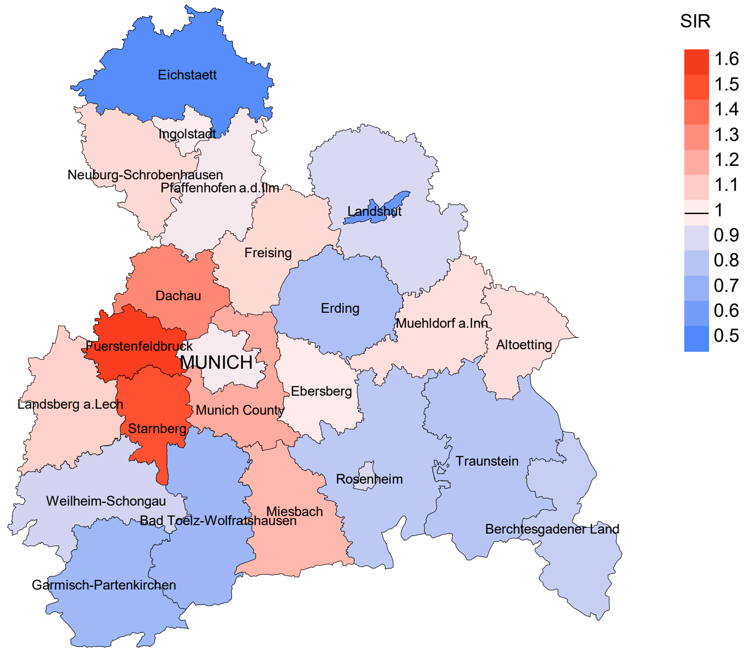


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=861, females N=587).

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 2020 a total of 16 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 1.01. Though, the value of this parameter may vary with an underlying probability of 99% between 0.48 and 1.86, 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 4.94 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	22	37.3	95.5
2002	103	88.3	6.8	36	35.0	97.2
2003	114	92.1	3.5	29	25.4	89.7
2004	110	94.5	2.7	23	20.9	100.0
2005	117	88.9	2.6	30	25.6	93.3
2006	88	94.3	2.3	27	30.7	96.3
2007	116	87.9	2.6	33	28.4	90.9
2008	119	99.2	0.8	28	23.5	92.9
2009	101	97.0	3.0	25	24.8	80.0
2010	123	95.9	1.6	28	22.8	85.7
2011	114	97.4	2.6	28	24.6	100.0
2012	156	96.2	3.8	45	28.8	95.6
2013	131	93.9	4.6	29	22.1	96.6
2014	122	95.1	5.7	23	18.9	95.7
2015	119	91.6	3.4	25	21.0	96.0
2016	92	97.8	3.3	17	18.5	94.1
2017	83	100.0	1.2	9	10.8	88.9
2018	56	100.0	1.8	9	16.1	77.8
2019	57	100.0		7	12.3	85.7
2020	59	100.0		2	3.4	100.0
1998-2020	2254	94.5	3.4	543	24.1	93.0

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 4.94 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	117	37	91.9	8	6.8
2006	88	29	100.0	5	5.7
2007	116	38	97.4	7	6.0
2008	119	46	97.8	7	5.9
2009	101	37	100.0	6	5.9
2010	123	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	122	55	98.2	13	10.7
2015	119	63	100.0	16	13.4
2016	92	50	100.0	9	9.8
2017	83	54	98.1	4	4.8
2018	56	46	65.2	3	5.4
2019	57	34	32.4	3	5.3
2020	59	44	84.1		
1998-2020	2254	936	92.9	167	7.4

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 4.94 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	37	73.0	27.0	91.2
2006	29	62.1	37.9	82.8
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	50	64.0	36.0	74.0
2017	54	63.0	37.0	79.2
2018	46	45.7	54.3	70.0
2019	34	20.6	79.4	72.7
2020	44	38.6	61.4	62.2
1998-2020	936	62.0	38.0	83.1

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	26	71.6	76.4	64.6	71.6
2017	33	71.7	70.7	78.7	72.5
2018	26	68.3	71.1	61.8	68.5
2019	17	69.1	71.4	68.9	68.9
2020	29	68.6	75.2	66.1	67.6
1998–2020	536	68.0	68.2	67.7	68.2

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	19	71.6	71.5	71.6	71.6
2006	12	79.7	81.0	78.3	78.3
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	20	71.6	65.5	78.4	56.1
2019	17	80.8	80.3	80.8	80.3
2020	15	70.7	67.6	71.4	67.3
1998–2020	400	71.3	70.0	76.0	70.6

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

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

Table 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	0.15
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	0.44	0.6	0.25	0.8	0.34	1.1	0.39
2016	17	0.7	0.29	0.3	0.17	0.5	0.21	0.7	0.27
2017	20	0.8	0.40	0.4	0.24	0.6	0.30	0.7	0.36
2018	11	0.5	0.33	0.2	0.23	0.3	0.27	0.4	0.30
2019	3	0.1	0.11	0.1	0.07	0.1	0.09	0.1	0.10
2020	7	0.3	0.22	0.1	0.10	0.2	0.15	0.2	0.18
1998–2020	320	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	0.25	0.3	0.13	0.5	0.17	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	0.29	0.2	0.11	0.3	0.16	0.4	0.19
2015	19	0.8	0.35	0.2	0.13	0.4	0.20	0.6	0.25
2016	15	0.6	0.45	0.3	0.29	0.4	0.34	0.4	0.33
2017	14	0.6	0.42	0.3	0.28	0.4	0.33	0.5	0.35
2018	10	0.4	0.43	0.2	0.25	0.3	0.31	0.3	0.34
2019	4	0.2	0.13	0.0	0.04	0.1	0.06	0.1	0.09
2020	10	0.4	0.37	0.2	0.17	0.3	0.24	0.3	0.26
1998-2020	260	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 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19	2	0.5	0.5			0.0	2	1.1	1.1
20-24	3	0.7	1.2	1	0.4	0.4	2	1.1	2.2
25-29	7	1.7	2.9	4	1.7	2.1	3	1.6	3.8
30-34	6	1.4	4.3	3	1.3	3.4	3	1.6	5.4
35-39	6	1.4	5.7	3	1.3	4.7	3	1.6	7.1
40-44	17	4.1	9.8	11	4.7	9.4	6	3.3	10.3
45-49	28	6.7	16.5	18	7.7	17.0	10	5.4	15.8
50-54	27	6.4	22.9	17	7.2	24.3	10	5.4	21.2
55-59	22	5.3	28.2	12	5.1	29.4	10	5.4	26.6
60-64	41	9.8	37.9	24	10.2	39.6	17	9.2	35.9
65-69	47	11.2	49.2	25	10.6	50.2	22	12.0	47.8
70-74	57	13.6	62.8	34	14.5	64.7	23	12.5	60.3
75-79	62	14.8	77.6	39	16.6	81.3	23	12.5	72.8
80-84	52	12.4	90.0	27	11.5	92.8	25	13.6	86.4
85+	42	10.0	100.0	17	7.2	100.0	25	13.6	100.0
All ages	419	100.0		235	100.0		184	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

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		2			0.1	0.05		8.0
20-24	1	2	0.0	0.01	0.1	0.03	1.4	4.7
25-29	4	3	0.2	0.04	0.1	0.04	4.3	3.0
30-34	3	3	0.1	0.04	0.1	0.06	2.1	1.7
35-39	3	3	0.1	0.04	0.1	0.08	1.1	0.7
40-44	11	6	0.4	0.18	0.2	0.16	1.8	0.7
45-49	18	10	0.7	0.33	0.4	0.36	1.3	0.6
50-54	17	10	0.7	0.32	0.4	0.30	0.6	0.4
55-59	12	10	0.6	0.23	0.5	0.28	0.3	0.3
60-64	24	17	1.4	0.60	0.9	0.71	0.4	0.3
65-69	25	22	1.5	0.44	1.2	0.96	0.3	0.3
70-74	34	23	2.3	0.50	1.3	0.74	0.3	0.3
75-79	39	23	3.2	0.81	1.5	0.64	0.3	0.2
80-84	27	25	3.7	0.79	2.3	1.00	0.3	0.3
85+	17	25	3.6	1.13	2.4	1.14	0.2	0.2
All ages	235	184					0.3	0.3
Mortality								
Raw			0.7	0.27	0.5	0.31		
WS			0.4	0.17	0.3	0.16		
ES			0.5	0.22	0.4	0.21		
BRD-S			0.7	0.25	0.4	0.24		
PYLL-70								
per 100,000			6.4		5.0			
ES			5.5		4.5			
AYLL-70			15.5		16.0			

Table 14a

Further malignancies in deaths in period 1998-2020
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	1.5	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	11	4.2					11	100.0
C16	Stomach	7	2.7	1	14.3	1	14.3	5	71.4
C17	Small intestine	3	1.2			1	33.3	2	66.7
C18	Colon	9	3.5	1	11.1			8	88.9
C19-C20	Rectum	8	3.1	3	37.5			5	62.5
C21	Anus/canal	2	0.8					2	100.0
C22	Liver	3	1.2					3	100.0
C23-C24	Bile	4	1.5					4	100.0
C25	Pancreas	9	3.5	1	11.1			8	88.9
C33-C34	Lung	56	21.5			1	1.8	55	98.2
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	28	10.8	9	32.1	1	3.6	18	64.3
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	25	9.6	15	60.0	1	4.0	9	36.0
C64	Kidney	6	2.3	2	33.3			4	66.7
C67	Bladder	4	1.5	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	1.9					5	100.0
C82-C85	NHL	46	17.7	18	39.1	4	8.7	24	52.2
C90	Mult. myeloma	4	1.5	2	50.0			2	50.0
C91-C96	Leukaemia	8	3.1	2	25.0			6	75.0
All further malignancies		260	100.0	61	23.5	9	3.5	190	73.1

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 1998-2020
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	1.7					3	100.0
C17	Small intestine	1	0.6					1	100.0
C18	Colon	11	6.3	1	9.1	1	9.1	9	81.8
C19-C20	Rectum	4	2.3	1	25.0			3	75.0
C21	Anus/canal	1	0.6					1	100.0
C22	Liver	3	1.7					3	100.0
C25	Pancreas	6	3.4					6	100.0
C33-C34	Lung	21	12.0			1	4.8	20	95.2
C38,C45	Mesothelioma	2	1.1					2	100.0
C40-C41	Bone	1	0.6					1	100.0
C43	Malign. melanoma	4	2.3	1	25.0			3	75.0
C44	Skin others	12	6.9	1	8.3	1	8.3	10	83.3
C48	Peritoneal	1	0.6					1	100.0
C50	Breast	50	28.6	15	30.0	1	2.0	34	68.0
C51	Vulva	2	1.1					2	100.0
C53	Cervix uteri	1	0.6					1	100.0
C54	Corpus uteri	5	2.9	2	40.0	1	20.0	2	40.0
C56	Ovary	4	2.3			1	25.0	3	75.0
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	1.1	1	50.0			1	50.0
C73	Thyroid	2	1.1					2	100.0
C76-C79	CUP	6	3.4			1	16.7	5	83.3
C82-C85	NHL	21	12.0	3	14.3	1	4.8	17	81.0
C90	Mult. myeloma	1	0.6					1	100.0
C91-C96	Leukaemia	7	4.0			1	14.3	6	85.7
All further malignancies		175	100.0	26	14.9	9	5.1	140	80.0

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 2007-2020
(**First 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		2			0.1	0.05		8.7
20-24	1	2	0.0	0.01	0.1	0.03	1.5	4.9
25-29	4	2	0.2	0.04	0.1	0.03	4.7	2.2
30-34	3	2	0.1	0.04	0.1	0.04	2.2	1.3
35-39	3	3	0.1	0.04	0.1	0.09	1.2	0.8
40-44	11	6	0.4	0.19	0.2	0.17	2.0	0.8
45-49	16	10	0.6	0.31	0.4	0.38	1.2	0.7
50-54	17	10	0.7	0.35	0.4	0.34	0.7	0.4
55-59	12	10	0.6	0.24	0.5	0.33	0.3	0.3
60-64	21	16	1.2	0.64	0.8	0.80	0.4	0.4
65-69	19	20	1.2	0.50	1.1	0.95	0.3	0.4
70-74	28	19	1.9	0.52	1.1	0.86	0.3	0.3
75-79	24	17	2.0	0.86	1.1	0.68	0.3	0.2
80-84	16	23	2.2	1.00	2.2	1.05	0.2	0.3
85+	12	20	2.6	1.20	1.9	1.25	0.2	0.2
All ages	187	162					0.3	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	0.23		
PYLL-70								
per 100,000			6.1		4.7			
ES			5.3		4.2			
AYLL-70			16.3		15.9			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**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	0.0	0.01	0.1	0.01	1.5	2.5
25-29	2	1	0.1	0.02	0.0	0.01	2.4	1.1
30-34	3		0.1	0.05			2.2	
35-39	1	2	0.0	0.01	0.1	0.06	0.4	0.5
40-44	3	2	0.1	0.06	0.1	0.06	0.5	0.3
45-49	5	1	0.2	0.10	0.0	0.05	0.4	0.1
50-54		2			0.1	0.08		0.1
55-59	4		0.2	0.09			0.1	
60-64	5	7	0.3	0.18	0.4	0.41	0.1	0.2
65-69	9	6	0.6	0.25	0.3	0.33	0.1	0.1
70-74	16	10	1.1	0.36	0.6	0.59	0.2	0.2
75-79	10	9	0.8	0.43	0.6	0.39	0.1	0.1
80-84	10	16	1.4	0.71	1.5	0.80	0.1	0.2
85+	5	15	1.1	0.56	1.4	1.00	0.1	0.2
All ages	74	73					0.1	0.2
Mortality								
Raw			0.2	0.10	0.2	0.15		
WS			0.1	0.06	0.1	0.06		
ES			0.2	0.08	0.1	0.09		
BRD-S			0.2	0.09	0.2	0.10		
PYLL-70								
per 100,000			2.0		1.4			
ES			1.8		1.3			
AYLL-70			17.7		16.8			

* See corresponding tables with multiple malignancies.

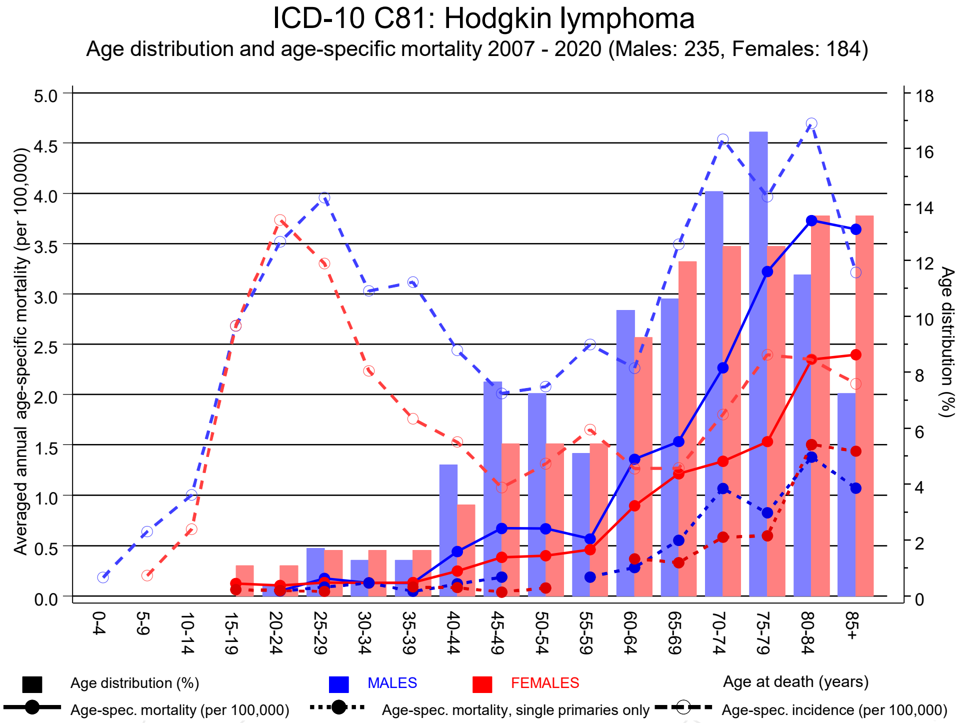
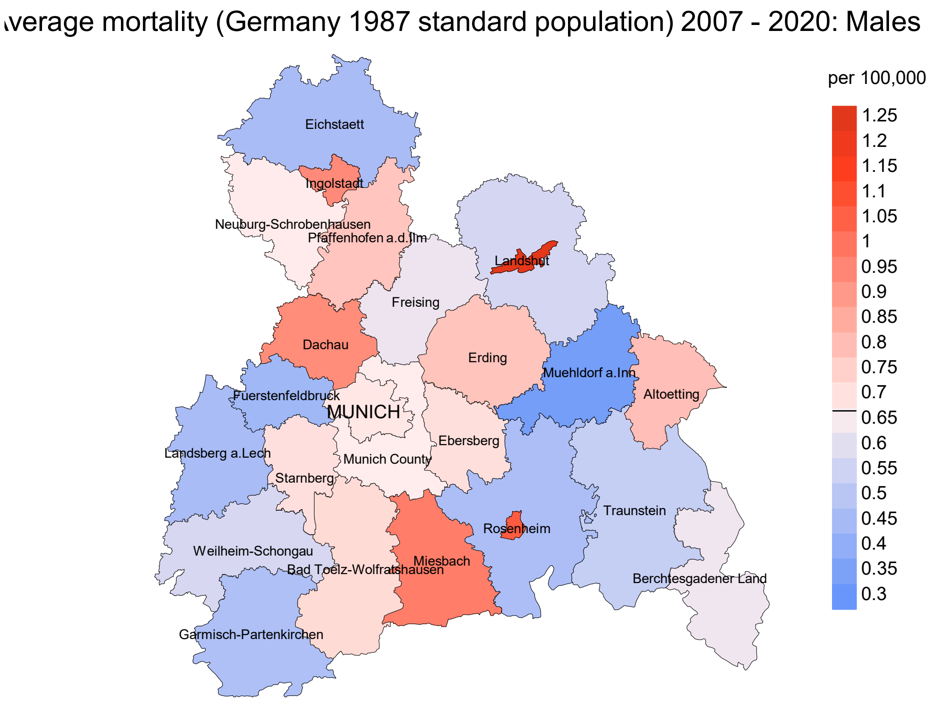


Figure 17. Distribution of age at death (bars; males: mean=54.7 yrs, median=59.9 yrs; females: mean=53.0 yrs, median=57.6 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



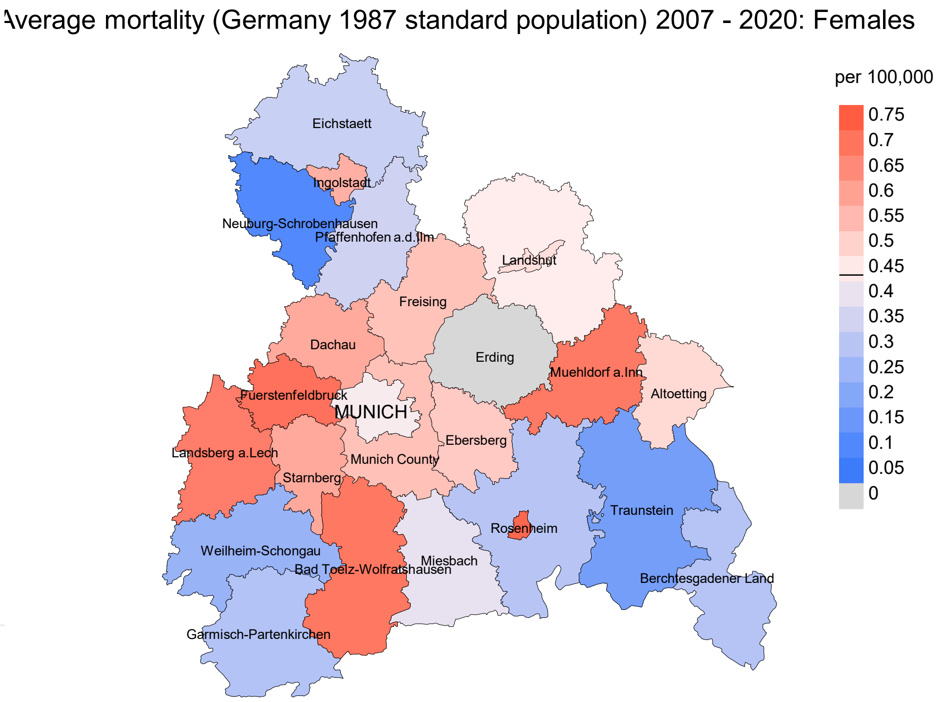
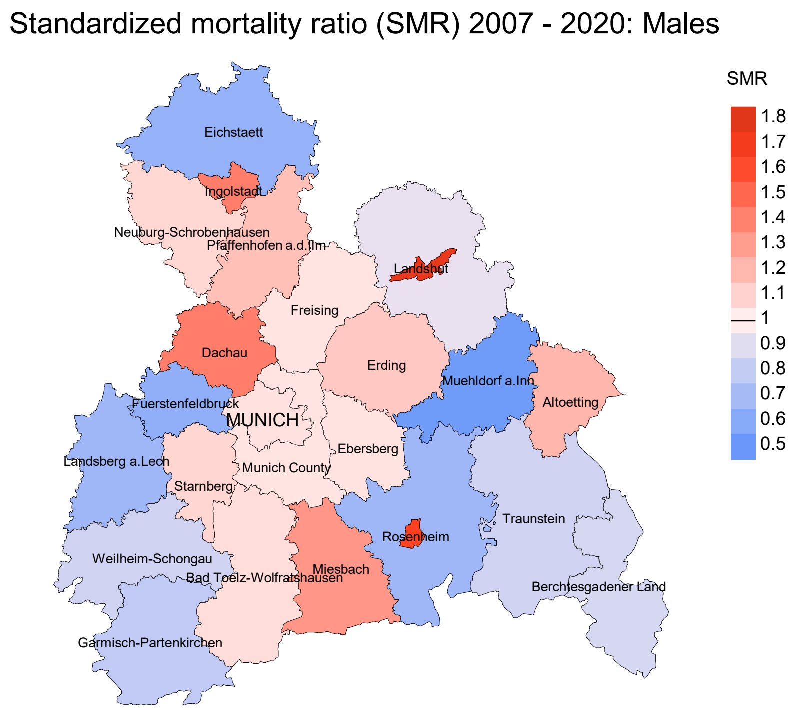


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.7/100,000 WS N=235, females 0.4/100,000 WS N=184).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 6 women died from hodgkin lymphoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.5/100,000 (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.



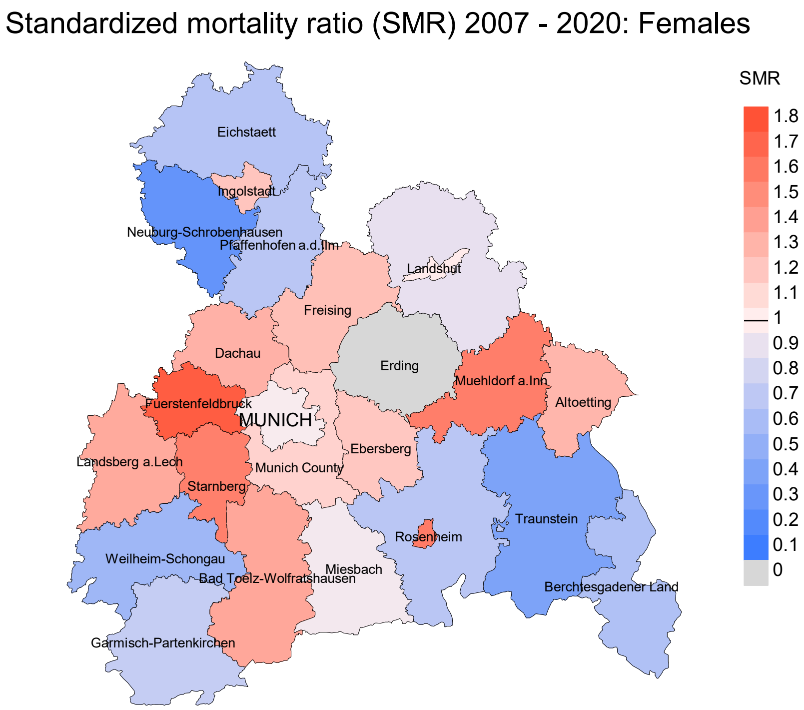


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=235, females N=184).

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 2020 a total of 6 women died from hodgkin lymphoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.20. Though, the value of this parameter may vary with an underlying probability of 99% between 0.31 and 3.13, 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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