

# Munich Cancer Registry



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## ICD-10 C81: Hodgkin lymphoma

### Survival

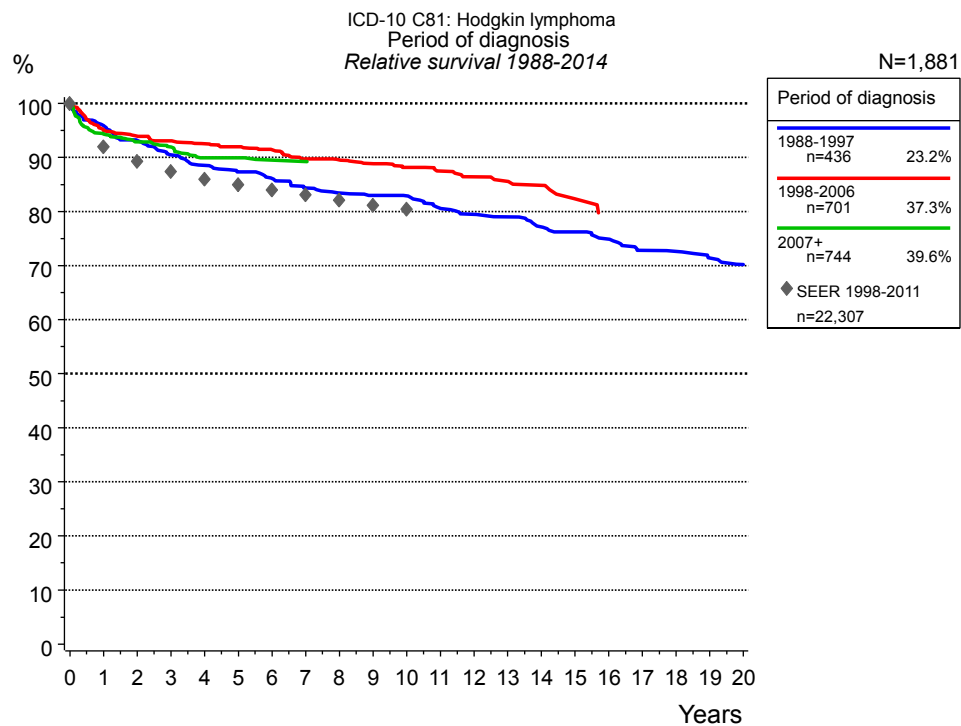
Year of diagnosis	1988-1997	1998-2014
Patients	453	1,661
Diseases	453	1,661
Cases evaluated	438	1,461
Creation date	03/02/2016	
Export date	12/23/2015	
Population	4.64 m	



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Germany

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

[http://www.tumorregister-muenchen.de/en/facts/surv/sC81\\_\\_E-ICD-10-C81-Hodgkin-lymphoma-survival.pdf](http://www.tumorregister-muenchen.de/en/facts/surv/sC81__E-ICD-10-C81-Hodgkin-lymphoma-survival.pdf)



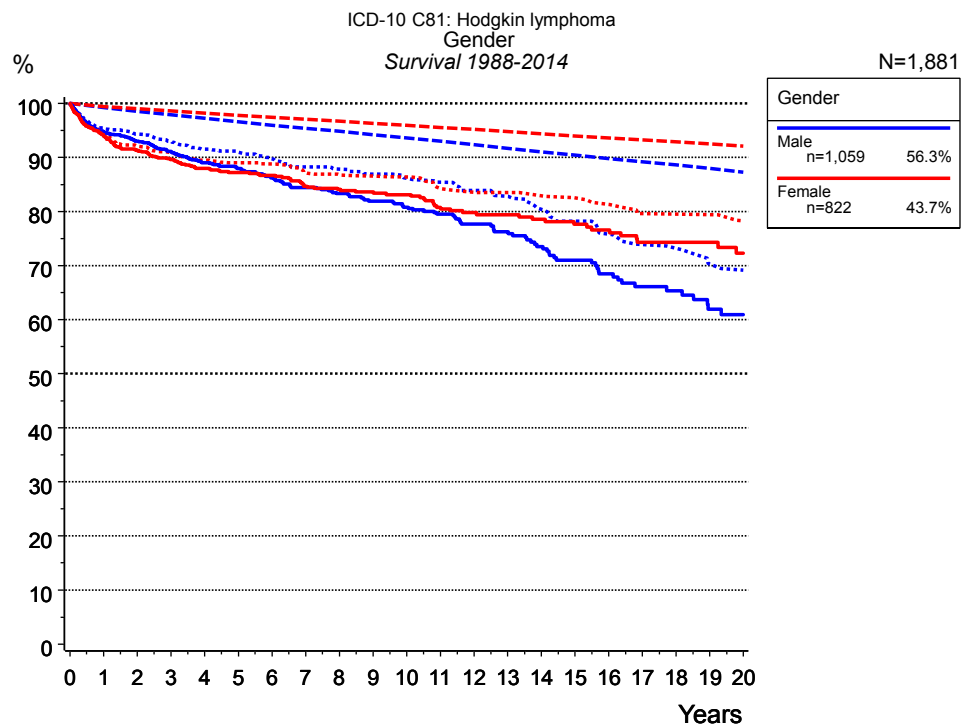
**Figure 1a.** Relative survival of patients with Hodgkin lymphoma by period of diagnosis. Included in the evaluation are 1,881 cases diagnosed between 1988 and 2014.

The survival results of the SEER program (Surveillance, Epidemiology, and End Results) of the American National Cancer Institute (NCI) are summarized as the period of diagnosis from 1998 to 2011, and are represented by gray diamonds in order to facilitate comparisons between MCR and SEER.

The presented survival curves are derived from clinical records with valid follow-up informations, which means that death certificate cases (DCO) cases are omitted from the analysis. With this one restriction, the MCR has provided population-based statistics since 1998, collecting data on all cancer cases in the region of southern Bavaria. Historical data of previous time periods can be heavily selected, therefore, univariate survival comparisons of the presented time periods must be carefully considered. Nonetheless, all calculable survival curves are depicted to facilitate the comparison of long time follow-up analyses of relative survival between particular cancers.

Years	Period of diagnosis					
	1988-1997 n=436		1998-2006 n=701		2007+ n=744	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	95.3	95.9	94.6	95.1	93.7	94.3
2	92.2	93.1	93.1	93.9	91.6	92.9
3	89.0	90.5	91.9	93.1	90.1	91.9
4	86.7	88.5	90.8	92.5	87.4	89.9
5	84.9	87.3	89.8	92.0	87.4	89.9
6	83.4	86.1	88.8	91.4	86.2	89.5
7	81.3	84.4	86.7	89.7	86.2	89.2
8	79.9	83.4	86.2	89.5		
9	79.1	83.0	85.1	88.9		
10	78.8	82.9	83.9	88.2		
11	76.3	80.6	82.8	87.5		
12	74.8	79.5	81.4	86.4		
13	74.0	79.0	80.4	85.6		
14	71.9	77.1	79.3	84.8		
15	70.7	76.2	75.9	82.3		
16	69.2	74.9				
17	66.7	72.8				
18	66.4	72.6				
19	64.8	71.4				
20	63.3	70.2				

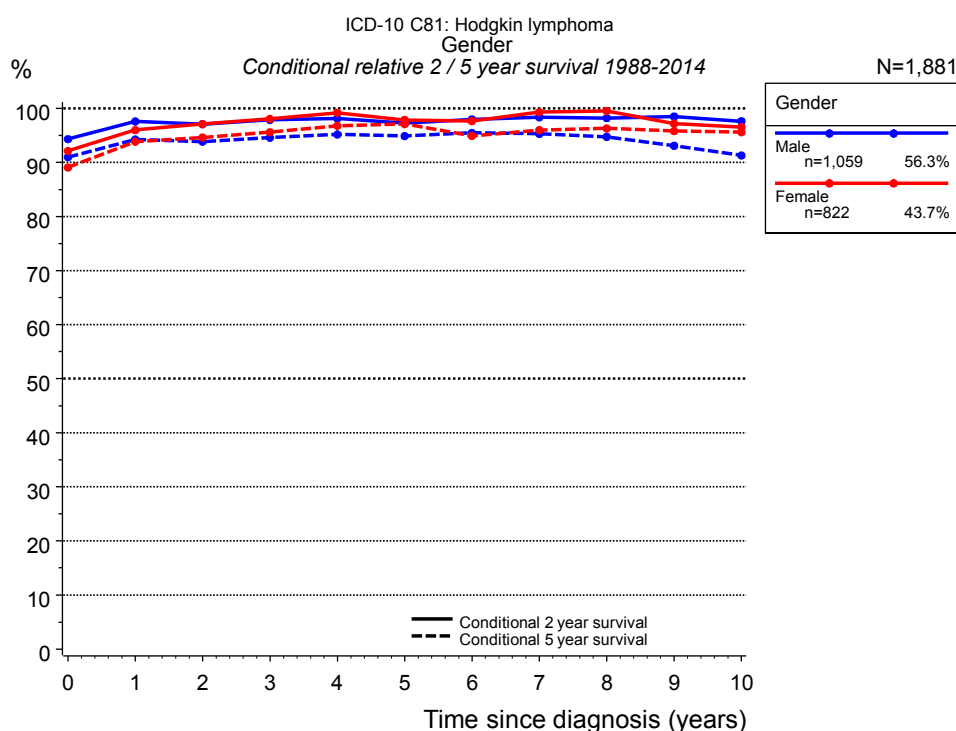
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with Hodgkin lymphoma by period of diagnosis for period 1988-2014 (N=1,881).



**Figure 2a.** Survival of patients with Hodgkin lymphoma by gender. Included in the evaluation are 1,881 cases diagnosed between 1988 and 2014.

Years	Gender			
	Male n=1,059		Female n=822	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	94.6	95.3	94.2	94.6
2	93.0	94.3	91.3	92.1
3	91.1	93.0	89.6	90.9
4	89.1	91.5	88.0	89.5
5	88.0	91.0	87.2	89.0
6	86.2	89.7	86.7	88.8
7	84.4	88.3	84.7	87.2
8	83.3	87.8	84.1	86.8
9	81.9	86.9	83.6	86.6
10	80.8	86.1	83.1	86.4
11	79.5	85.4	80.8	84.2
12	77.7	83.9	79.8	83.5
13	76.3	82.8	79.4	83.5
14	73.5	80.4	78.6	82.9
15	71.0	78.2	77.6	82.6
16	68.4	75.8	76.6	81.3
17	66.1	73.9	74.3	79.6
18	65.4	73.2	74.3	79.5
19	61.9	70.3	74.3	79.4
20	60.9	69.1	72.3	78.3

**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with Hodgkin lymphoma by gender for period 1988-2014 (N=1,881).

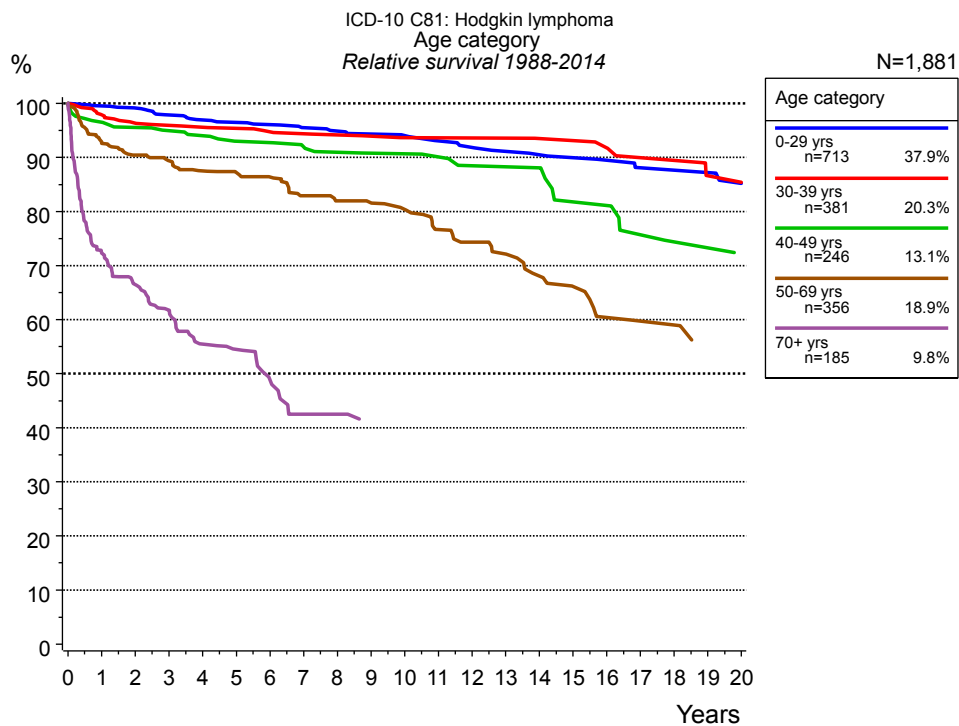


**Figure 2c.** Conditional relative 2 / 5-year survival of patients with Hodgkin lymphoma by gender. For 1,881 of 1,881 cases diagnosed between 1988 and 2014 valid data could be obtained for this item.

Years	Gender					
	Male			Female		
	n	Cond. surv. % 2 yrs	Cond. surv. % 5 yrs	n	Cond. surv. % 2 yrs	Cond. surv. % 5 yrs
0	1,059	94.3	91.0	822	92.1	89.1
1	949	97.6	94.2	736	96.0	93.8
2	864	97.1	93.8	677	97.1	94.6
3	781	97.9	94.6	622	98.0	95.6
4	696	98.1	95.2	561	99.2	96.8
5	621	97.2	94.9	520	97.9	97.1
6	559	97.9	95.5	469	97.7	94.9
7	490	98.4	95.3	419	99.3	96.0
8	438	98.2	94.7	375	99.5	96.3
9	392	98.5	93.1	343	97.2	95.8
10	344	97.6	91.3	304	96.5	95.6

**Table 2d.** Conditional relative 2 / 5-year survival of patients with Hodgkin lymphoma by gender for period 1988-2014 (N=1,881).

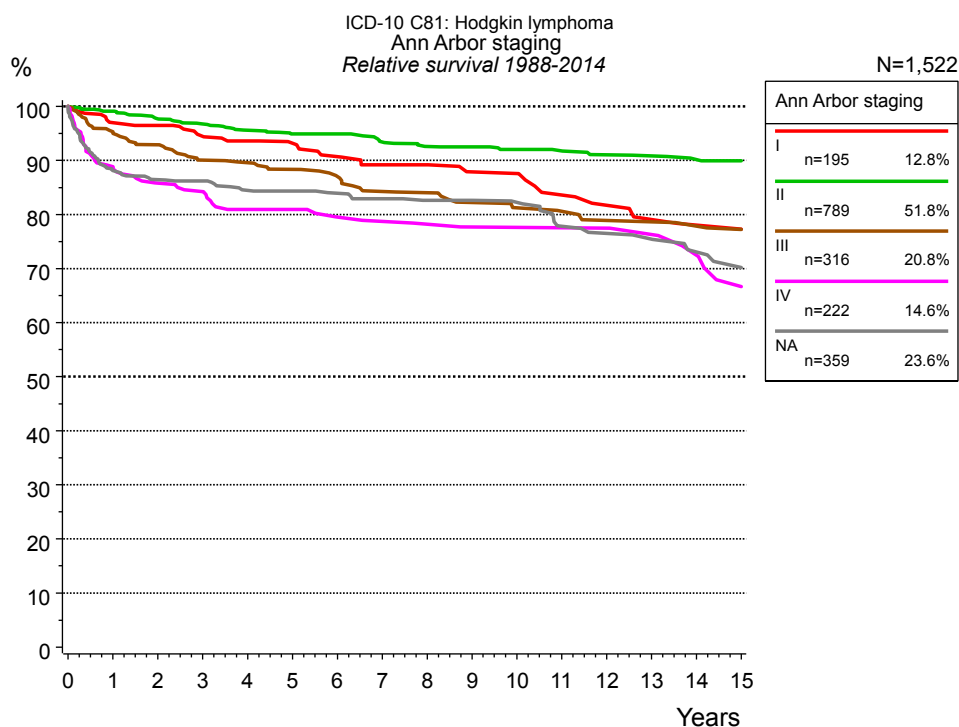
Conditional relative survival rates refer to the relative survival probability, in this case for 2 and 5 years after cancer diagnosis, compared to the age- and sex-matched population (=100%) under the condition of being alive for a certain time period (x-axis in Figure 2a). The results illustrate to what extent the cancer induced mortality of particular subgroups declines in the subsequent years after detection of the malignancy. For instance, according to the presented survival statistics, patients in the subgroup gender="Male", who are alive at least 3 years after cancer diagnosis, the conditional relative 2-year survival rate is 97.9% (n=781).



**Figure 3a.** Relative survival of patients with Hodgkin lymphoma by age category. Included in the evaluation are 1,881 cases diagnosed between 1988 and 2014.

Years	Age category									
	0-29 yrs n=713		30-39 yrs n=381		40-49 yrs n=246		50-69 yrs n=356		70+ yrs n=185	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	99.6	99.5	97.8	97.9	96.7	96.5	92.0	92.9	69.6	72.4
2	99.1	99.1	96.4	96.4	95.4	95.6	88.8	90.4	61.2	66.5
3	97.7	97.8	95.8	95.9	94.4	95.0	86.9	89.4	54.4	61.8
4	96.8	96.9	95.5	95.6	93.4	94.0	84.2	87.5	46.1	55.5
5	96.4	96.5	95.2	95.4	91.8	93.0	83.0	87.2	42.9	54.5
6	96.0	96.1	94.4	94.7	91.8	92.8	81.0	86.4	36.5	48.8
7	95.2	95.5	94.0	94.4	90.5	92.0	76.6	82.9	30.3	42.5
8	94.7	94.9	93.6	94.2	89.1	91.0	74.6	82.0	30.3	42.5
9	94.1	94.3	93.1	93.9	88.3	90.8	73.5	81.6	25.8	41.6
10	93.7	94.0	92.5	93.6	88.3	90.7	71.2	80.4		
11	92.6	93.0	92.5	93.6	87.3	90.1	66.4	76.7		
12	91.7	91.9	92.5	93.6	84.9	88.5	63.4	74.3		
13	90.7	91.1	92.5	93.6	84.9	88.3	60.7	72.1		
14	90.2	90.5	91.6	93.5	84.9	88.1	55.9	68.1		
15	89.6	89.9	91.6	93.1	77.2	81.8	52.7	66.2		
16	88.9	89.5	90.4	91.7	77.2	81.1	47.4	60.4		
17	87.3	88.1	87.8	89.9	70.8	75.7	45.7	59.7		
18	87.3	87.6	87.8	89.4	68.2	74.4	45.7	59.0		
19	87.3	87.2	83.4	86.6	68.2	73.3	41.2	56.3		
20	84.7	85.2	83.4	85.4	64.6	72.2	41.2	56.2		

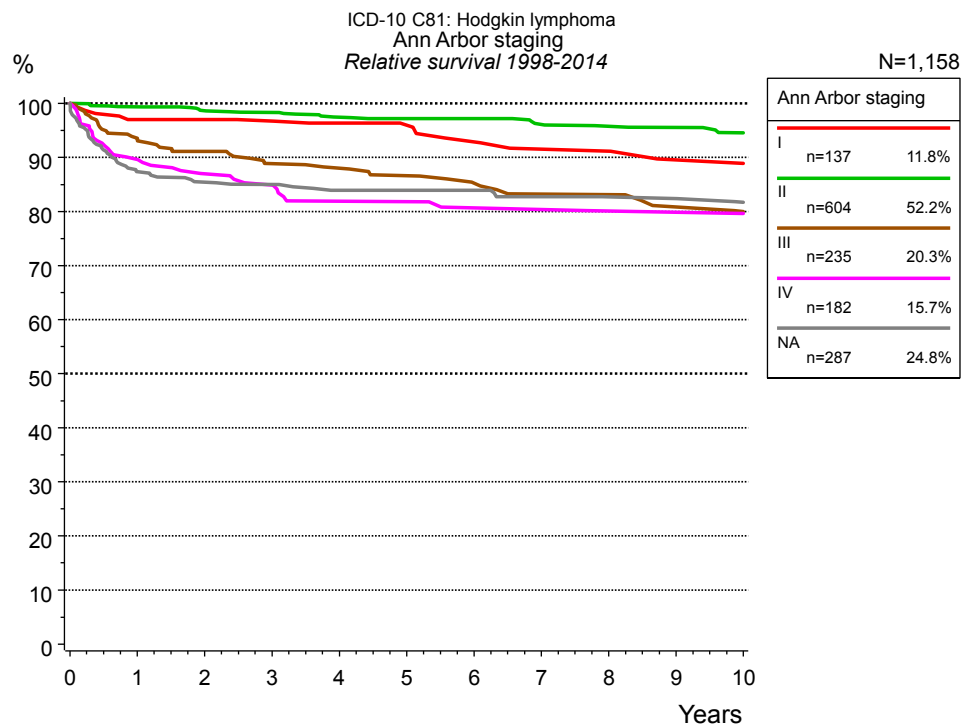
**Table 3b.** Observed (obs.) and relative (rel.) survival of patients with Hodgkin lymphoma by age category for period 1988-2014 (N=1,881).



**Figure 4a.** Relative survival of patients with Hodgkin lymphoma by Ann Arbor staging. For 1,522 of 1,881 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. The grey line represents the subgroup of 359 patients with missing values regarding Ann Arbor staging (19.1% of 1,881 patients, the percent values of all other categories are related to n=1,522).

Ann Arbor staging											
Years	I n=195		II n=789		III n=316		IV n=222		NA n=359		
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1	96.2	97.0	98.8	99.1	94.5	95.3	88.1	88.8	87.3	88.1	
2	95.1	96.5	97.1	97.7	91.8	92.9	84.6	85.8	85.2	86.5	
3	92.1	94.5	95.7	96.7	88.2	90.0	83.0	84.2	84.6	86.2	
4	90.2	93.6	94.3	95.6	87.4	89.6	79.0	80.9	82.0	84.4	
5	88.8	93.2	93.2	94.9	85.7	88.3	79.0	80.9	81.7	84.3	
6	85.8	90.7	93.1	94.9	83.8	87.0	76.7	79.5	80.4	83.9	
7	83.4	89.2	91.3	93.4	80.8	84.2	75.8	78.7	79.0	82.9	
8	83.4	89.2	90.2	92.6	80.3	84.0	74.9	78.2	77.9	82.6	
9	80.4	87.9	89.9	92.5	77.9	82.2	73.8	77.7	77.9	82.6	
10	80.4	87.6	89.0	92.0	76.5	81.2	73.8	77.6	76.7	82.2	
11	75.8	83.6	88.7	91.7	75.7	80.6	73.8	77.5	71.9	77.8	
12	73.3	81.7	87.5	91.1	73.9	78.9	73.8	77.5	70.3	76.5	
13	70.4	79.0	87.0	90.8	73.9	78.7	72.1	76.3	69.4	75.4	
14	68.7	78.0	86.0	90.1	72.8	77.8	68.3	72.5	66.4	73.1	
15	68.7	77.3	85.4	89.9	71.6	77.2	62.2	66.7	62.9	70.2	

**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with Hodgkin lymphoma by Ann Arbor staging for period 1988-2014 (N=1,522).

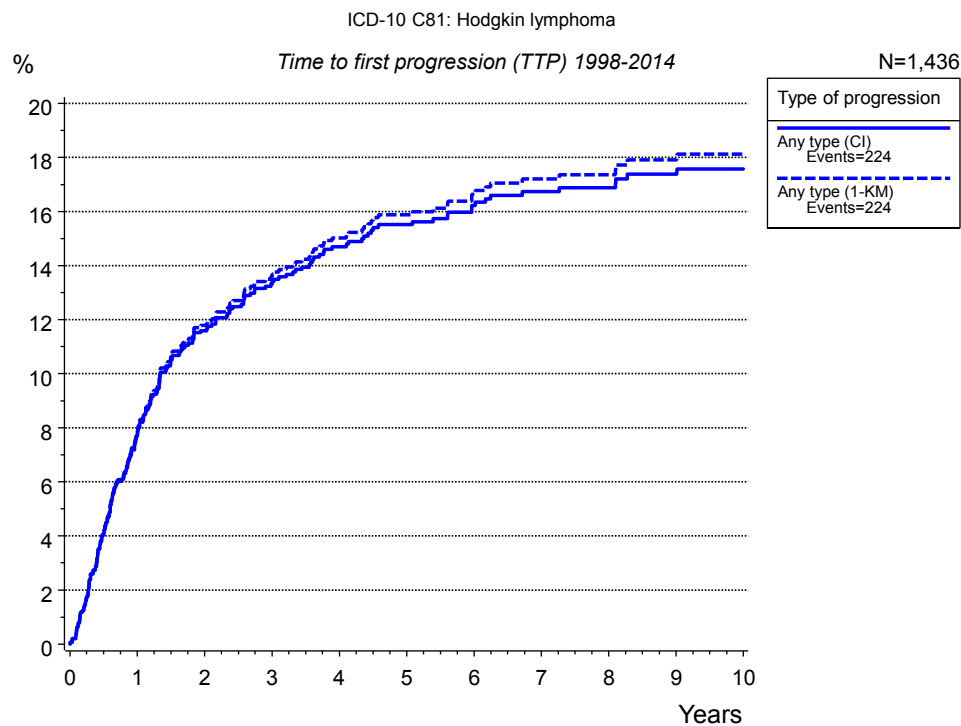


**Figure 4c.** Relative survival of patients with Hodgkin lymphoma by Ann Arbor staging. For 1,158 of 1,445 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. The grey line represents the subgroup of 287 patients with missing values regarding Ann Arbor staging (19.9% of 1,445 patients, the percent values of all other categories are related to n=1,158).

Ann Arbor staging											
Years	I n=137		II n=604		III n=235		IV n=182		NA n=287		
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1	96.2	97.0	99.2	99.4	92.6	93.4	89.4	89.6	86.6	87.3	
2	96.2	97.0	98.1	98.6	89.9	91.1	85.8	87.0	84.3	85.4	
3	94.5	96.8	97.5	98.3	86.8	88.9	83.7	84.9	83.5	85.0	
4	92.6	96.3	96.2	97.4	85.7	88.0	80.1	81.9	81.6	83.9	
5	91.5	96.0	95.7	97.2	83.9	86.6	80.1	81.8	81.6	83.9	
6	88.1	92.9	95.7	97.2	81.7	85.3	78.0	80.6	81.0	83.9	
7	85.5	91.5	94.1	96.1	79.4	83.2	78.0	80.4	79.0	82.7	
8	85.5	91.1	93.4	95.8	79.4	83.1	76.7	80.1	78.2	82.7	
9	82.2	89.6	93.0	95.6	76.3	80.8	76.7	79.9	78.2	82.4	
10	82.2	88.9	91.5	94.5	74.9	80.0	76.7	79.6	76.2	81.7	

**Table 4d.** Observed (obs.) and relative (rel.) survival of patients with Hodgkin lymphoma by Ann Arbor staging for period 1998-2014 (N=1,158).

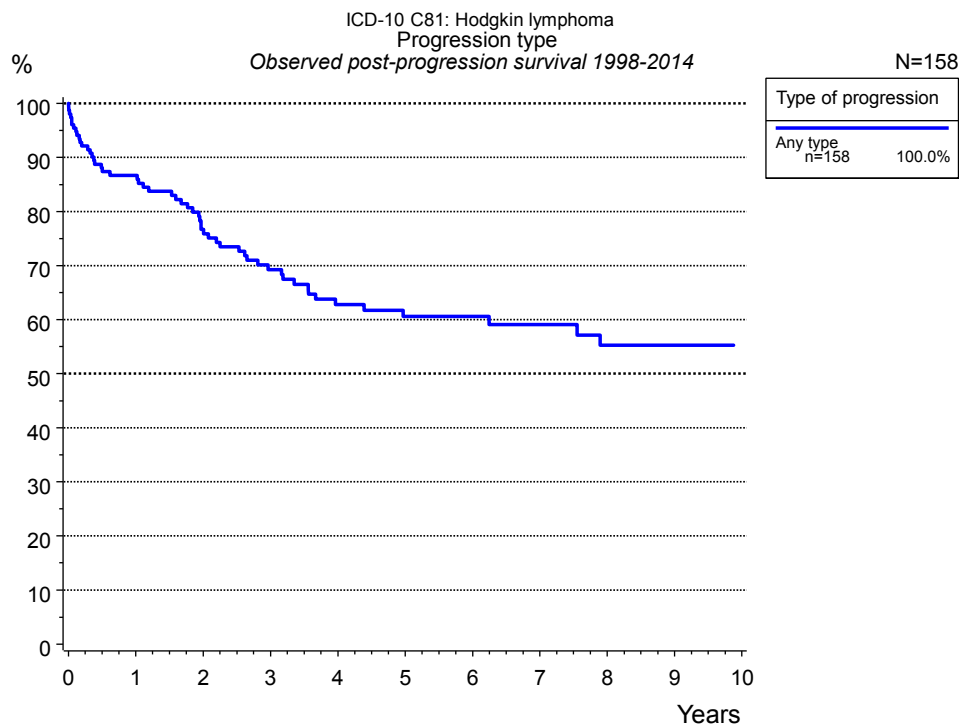




**Figure 5a.** Time to first progression of 1,436 patients with Hodgkin lymphoma diagnosed between 1998 and 2014 (M0 only in solid cancers) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Years	Type of progression	
	Any type (CI) n=1,436	Any type (1-KM) n=1,436
	%	%
0	0.0	0.0
1	7.7	7.8
2	11.6	11.8
3	13.3	13.6
4	14.7	15.0
5	15.5	15.9
6	16.2	16.6
7	16.7	17.2
8	16.9	17.4
9	17.4	17.9
10	17.6	18.1

**Table 5b.** Time to first progression of patients with Hodgkin lymphoma for period 1998-2014 (N=1,436).

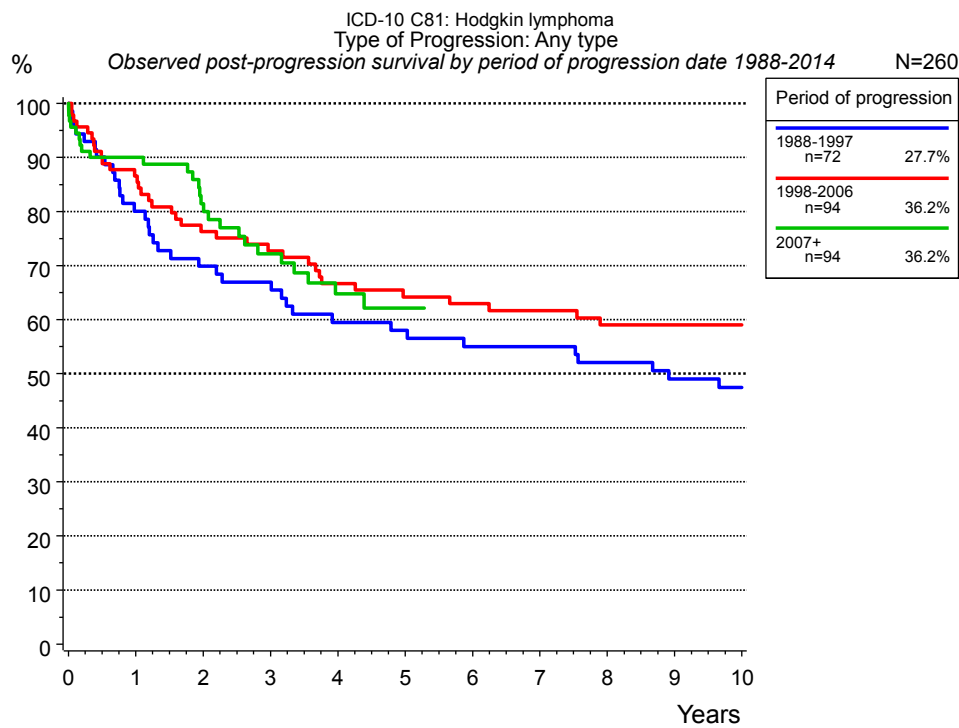


**Figure 5c.** Observed post-progression survival of 158 patients with Hodgkin lymphoma diagnosed between 1998 and 2014. These 158 patients with documented progression events during their course of disease represent 11.0 % of the totally 1,436 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=66, 4.6 %).

Medical record documentation often lacks the linguistic severity to distinguish between local relapse, regional lymph node metastasis and distant spread in solid cancers. Frequently, the statement “not specified” is the only information in registries regarding relapse of the disease. The category “Any type” denotes all cases who suffered from at least one relapse during the course of disease (incl. primary M1-status). Although, the real number of relapsed patients is likely to be much higher. The accumulated percentage of patients with local relapse or distant metastasis exceeds the 100% value because patients are potentially considered in more than one subgroup.

Type of progression	
Any type n=158	
Years	%
0	100.0
1	86.7
2	76.7
3	69.2
4	62.8
5	60.6
6	60.6
7	59.1
8	55.2
9	55.2
10	55.2

**Table 5d.** Observed post-progression survival of patients with Hodgkin lymphoma for period 1998-2014 (N=158).



**Figure 5e.** Observed post-progression (any type) survival of 260 patients with Hodgkin lymphoma diagnosed between 1988 and 2014 by period of progression.

Years	Period of progression		
	1988-1997 n=72 %	1998-2006 n=94 %	2007+ n=94 %
0	100.0	100.0	100.0
1	80.0	86.6	90.0
2	69.9	76.3	81.5
3	66.9	72.7	72.2
4	59.5	66.7	64.7
5	58.0	64.2	62.2
6	55.0	62.9	62.2
7	55.0	61.6	62.2
8	52.1	59.0	
9	49.0	59.0	
10	47.5	59.0	

**Table 5f.** Observed post-progression (any type) survival of patients with Hodgkin lymphoma for period 1988-2014 by period of progression (N=260).

## Shortcuts

MCR Munich Cancer Registry, Germany

NCI National Cancer Institute, USA

SEER Surveillance, Epidemiology, and End Results, USA

UICC Union for International Cancer Control, Geneva

DCO Death certificate only Death certificate provides the only notification to the registry.

NA Not available

NOS Not otherwise specified

OS Overall/Observed survival Overall/Observed survival (Kaplan-Meier estimate)

Date of entry: diagnosis  
Event: death from any cause

RS Relative survival Survival compared to “general population”, ratio of observed to expected survival (Ederer II method), reflecting cancer specific survival

AS Assembled survival Assembled chart of observed, expected, relative survival

CS Conditional survival Survival probability under the condition of surviving a given period of time

TTP Time to progression Time to first progression / relapse  
Date of entry: diagnosis  
Event: (progression / relapse): first local-, lymph node recurrence, distant metastasis or unspecified progression

1-KM 1 minus Kaplan-Meier estimator (“inverse” Kaplan-Meier estimator)

CI Cumulative incidence  
Death as competing risk (according to Kalbfleisch und Prentice)

PPS Post-progression survival Survival since first progression / relapse (Kaplan-Meier estimate)  
Date of entry (progression / relapse): first local-, lymph node recurrence, distant metastasis or unspecified progression  
Event: death from any cause

## Recommended Citation

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