

# Munich Cancer Registry



- Incidence and Mortality
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- *Deutsch*

## ICD-10 C82-C85: NHL

### Survival

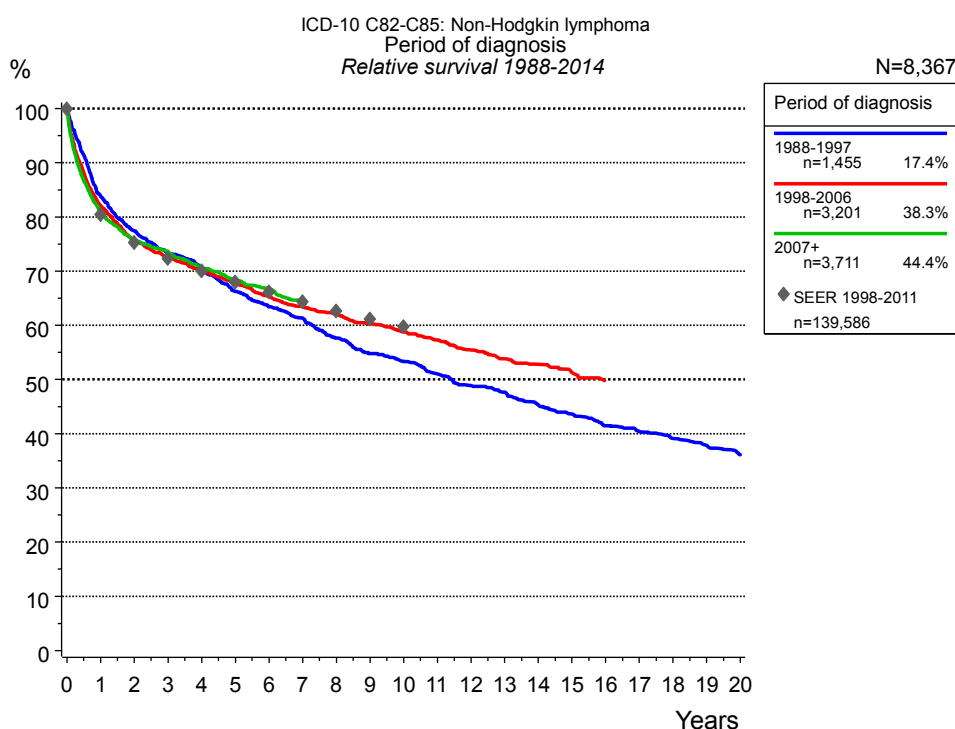
Year of diagnosis	1988-1997	1998-2014
Patients	1,639	9,416
Diseases	1,646	9,498
Cases evaluated	1,456	7,005
Creation date	04/11/2016	
Export date	12/23/2015	
Population	4.64 m	



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

<http://www.tumorregister-muenchen.de/en/facts/surv/sC8285E-ICD-10-C82-C85-NHL-survival.pdf>



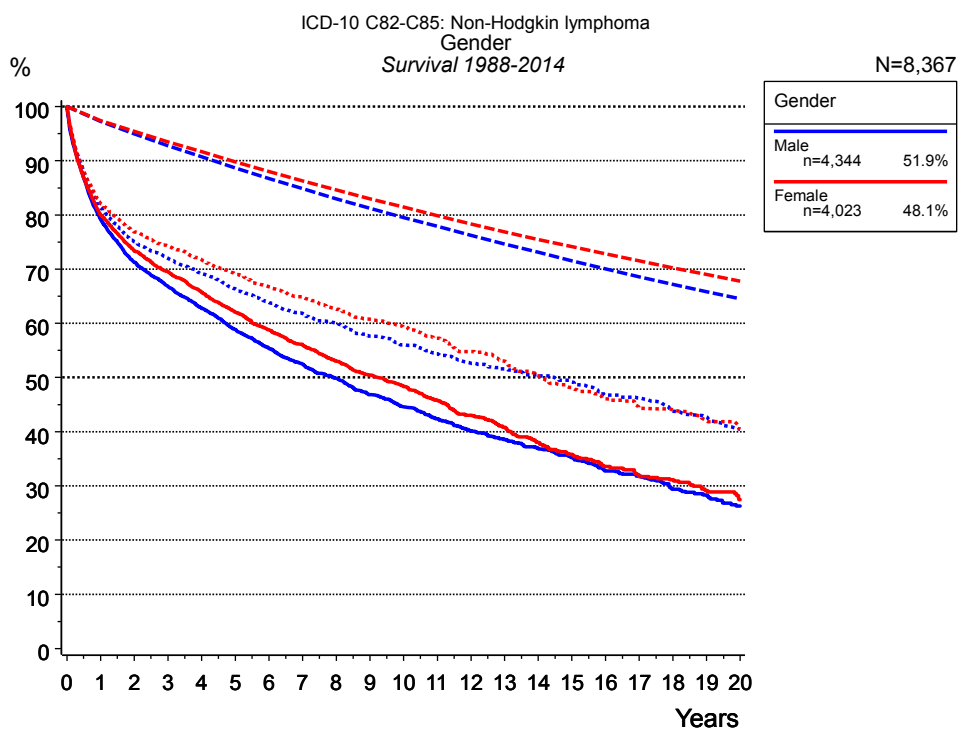
**Figure 1a.** Relative survival of patients with nHL by period of diagnosis. Included in the evaluation are 8,367 cases diagnosed between 1988 and 2014.

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=1,455		1998-2006 n=3,201		2007+ n=3,711	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	81.7	83.7	79.9	82.0	78.6	80.8
2	74.0	77.4	72.0	75.6	71.9	75.7
3	68.5	73.3	67.9	72.7	68.5	73.7
4	64.8	70.6	64.1	70.2	64.2	70.7
5	59.4	66.3	60.7	67.8	60.8	68.5
6	55.7	63.4	57.3	65.3	57.9	66.7
7	52.8	61.3	54.6	63.5	54.7	64.4
8	48.7	57.7	52.2	62.0		
9	45.4	54.8	49.7	60.2		
10	43.3	53.3	47.4	58.8		
11	40.8	51.1	45.4	57.3		
12	38.3	48.9	43.0	55.5		
13	36.6	47.7	40.8	53.8		
14	34.2	45.3	39.3	52.8		
15	32.3	43.6	37.3	51.3		
16	30.0	41.4				
17	28.7	40.4				
18	27.3	39.1				
19	26.0	37.9				
20	24.3	36.1				

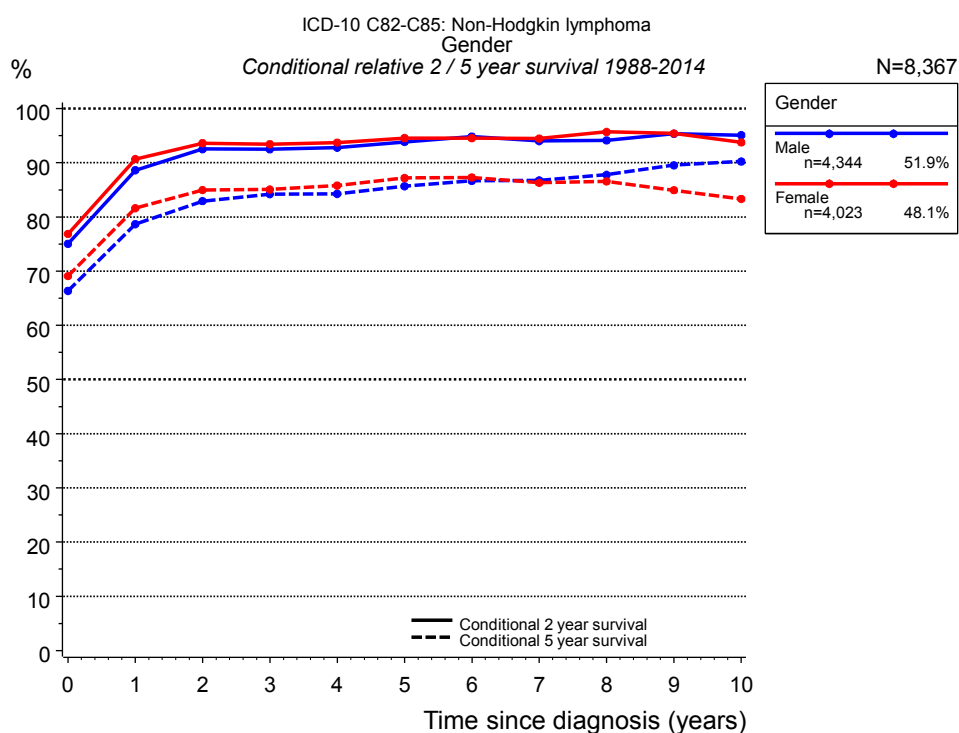
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with nHL by period of diagnosis for period 1988-2014 (N=8,367).



**Figure 2a.** Survival of patients with nHL by gender. Included in the evaluation are 8,367 cases diagnosed between 1988 and 2014.

Years	Gender			
	Male n=4,344		Female n=4,023	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	79.2	81.5	80.0	82.1
2	71.3	75.1	73.4	76.9
3	66.9	72.1	69.5	74.3
4	62.8	69.2	65.7	71.7
5	58.9	66.4	62.1	69.1
6	55.4	63.9	58.8	66.8
7	52.5	61.8	56.0	64.8
8	49.9	60.1	53.0	62.6
9	46.8	57.6	50.4	60.7
10	44.5	56.0	48.3	59.3
11	42.4	54.4	45.8	57.3
12	40.2	52.6	43.1	54.8
13	38.6	51.6	40.8	53.0
14	36.9	50.4	38.0	50.3
15	35.2	49.2	35.8	48.1
16	32.8	46.7	33.6	46.1
17	31.8	46.2	31.7	44.3
18	29.4	43.8	31.1	44.0
19	28.3	42.7	29.1	42.0
20	26.3	40.4	27.5	40.5

**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with nHL by gender for period 1988-2014 (N=8,367).

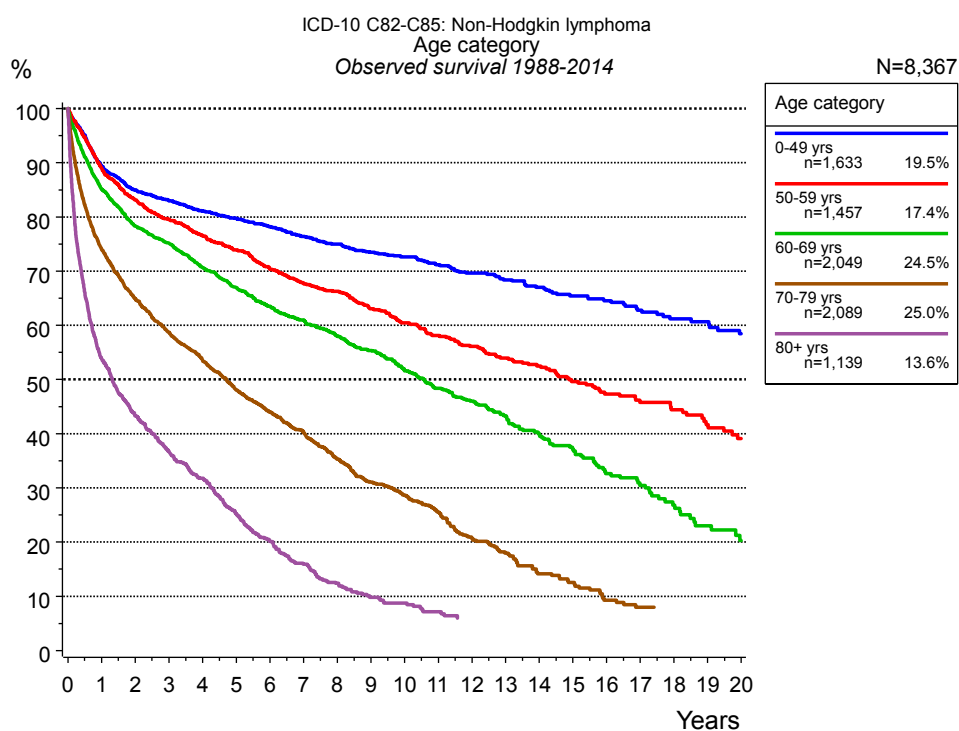


**Figure 2c.** Conditional relative 2 / 5-year survival of patients with nHL by gender. For 8,367 of 8,367 cases diagnosed between 1988 and 2014 valid data could be obtained for this item.

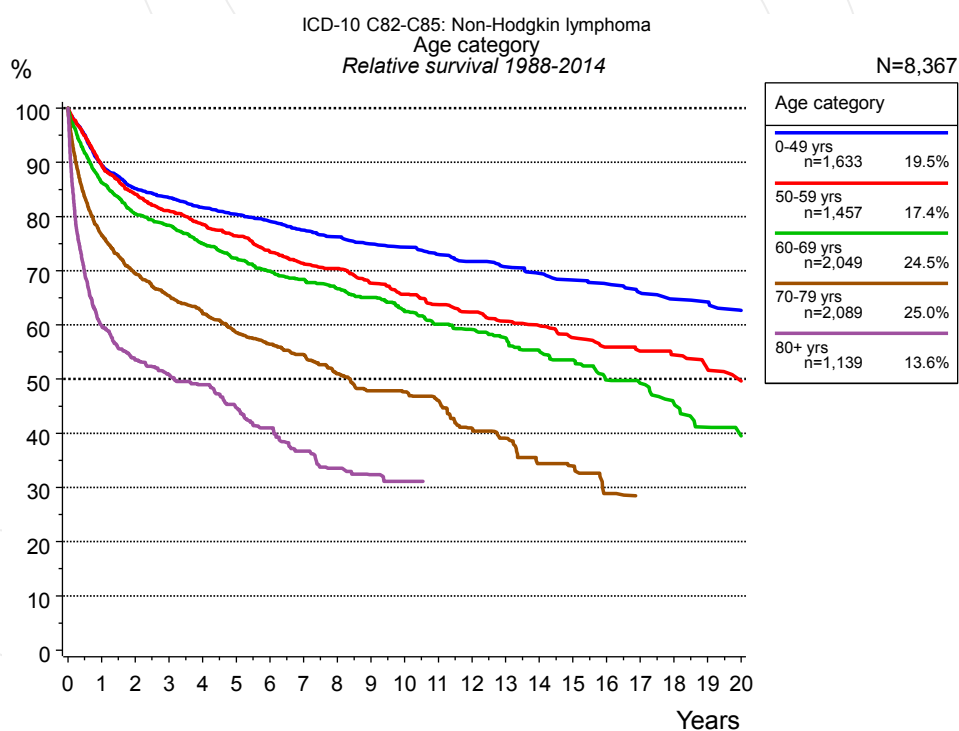
Years	Gender					
	Male			Female		
	n	Cond. surv. % 2 yrs	Cond. surv. % 5 yrs	n	Cond. surv. % 2 yrs	Cond. surv. % 5 yrs
0	4,344	75.1	66.4	4,023	76.9	69.1
1	3,305	88.6	78.7	3,101	90.7	81.6
2	2,813	92.5	82.9	2,683	93.6	85.0
3	2,464	92.5	84.2	2,388	93.4	85.1
4	2,137	92.8	84.3	2,107	93.7	85.8
5	1,837	93.8	85.7	1,806	94.6	87.2
6	1,546	94.8	86.7	1,551	94.6	87.3
7	1,307	94.0	86.8	1,319	94.5	86.3
8	1,105	94.1	87.8	1,117	95.7	86.6
9	895	95.3	89.5	964	95.4	84.9
10	749	95.1	90.2	815	93.8	83.3

**Table 2d.** Conditional relative 2 / 5-year survival of patients with nHL by gender for period 1988-2014 (N=8,367).

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 92.5% (n=2,464).



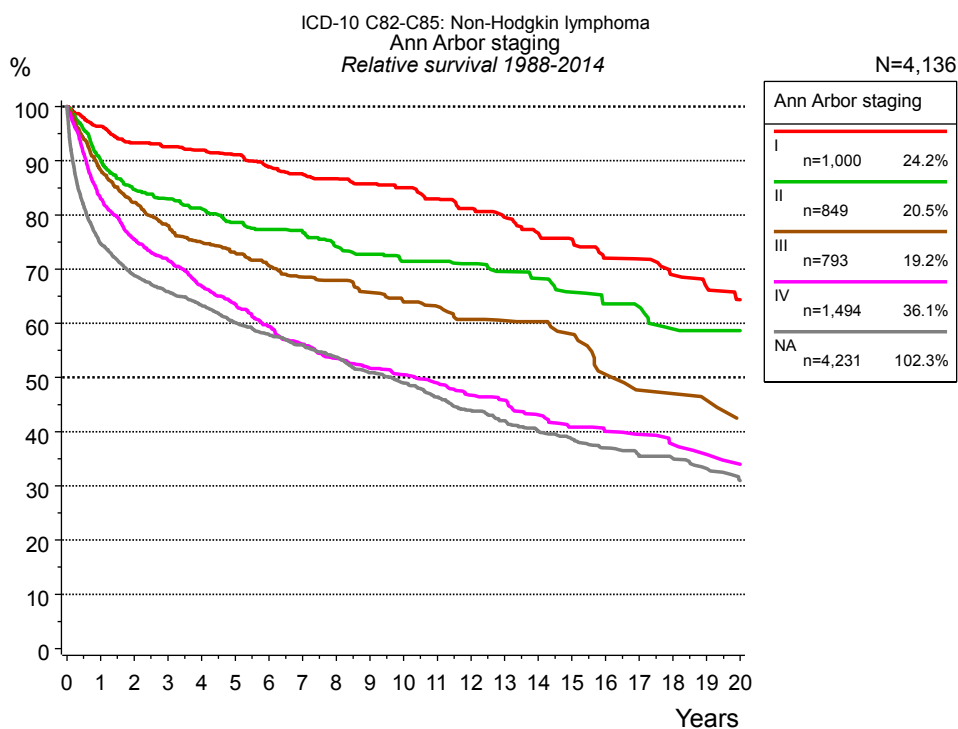
**Figure 3a.** Observed survival of patients with nHL by age category. Included in the evaluation are 8,367 cases diagnosed between 1988 and 2014.



**Figure 3b.** Relative survival of patients with nHL by age category. Included in the evaluation are 8,367 cases diagnosed between 1988 and 2014.

Years	Age category									
	0-49 yrs n=1,633		50-59 yrs n=1,457		60-69 yrs n=2,049		70-79 yrs n=2,089		80+ yrs n=1,139	
	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	89.5	89.6	89.0	89.5	85.1	86.2	74.1	76.6	53.8	59.8
2	85.0	85.2	83.1	84.1	78.3	80.5	64.9	69.5	43.3	53.5
3	83.1	83.5	79.6	81.1	75.1	78.4	58.7	65.4	36.8	50.8
4	81.1	81.6	76.6	78.6	70.7	75.0	53.6	62.2	31.7	49.0
5	79.7	80.4	73.9	76.4	66.9	72.3	48.1	58.6	25.2	44.7
6	78.2	79.1	70.3	73.4	63.6	69.9	44.0	56.4	20.2	41.0
7	76.4	77.5	67.8	71.3	61.0	68.4	40.3	54.5	15.9	36.7
8	75.0	76.3	66.3	70.4	58.1	66.7	35.3	51.0	12.4	33.5
9	73.4	74.9	63.0	67.7	55.4	65.0	31.1	47.9	9.8	32.4
10	72.7	74.3	60.5	65.7	51.6	62.5	28.6	47.6	8.7	31.1
11	71.1	73.0	58.1	63.7	48.4	60.1	25.6	46.0	7.2	31.1
12	69.6	71.7	56.1	62.4	46.0	59.2	20.7	40.9		
13	68.4	70.7	54.0	60.7	43.3	57.6	17.9	39.1		
14	67.0	69.5	52.5	59.9	39.8	55.3	14.2	34.4		
15	65.4	68.2	49.6	57.6	37.2	53.5	12.5	34.0		
16	64.5	67.6	47.3	55.9	32.6	49.9	9.3	28.9		
17	62.8	65.9	45.8	55.1	30.5	49.3	8.0	28.5		
18	61.2	64.7	44.4	54.4	26.8	45.6				
19	60.7	64.2	41.7	51.8	23.0	41.1				
20	58.4	62.6	39.1	49.6	20.3	39.5				

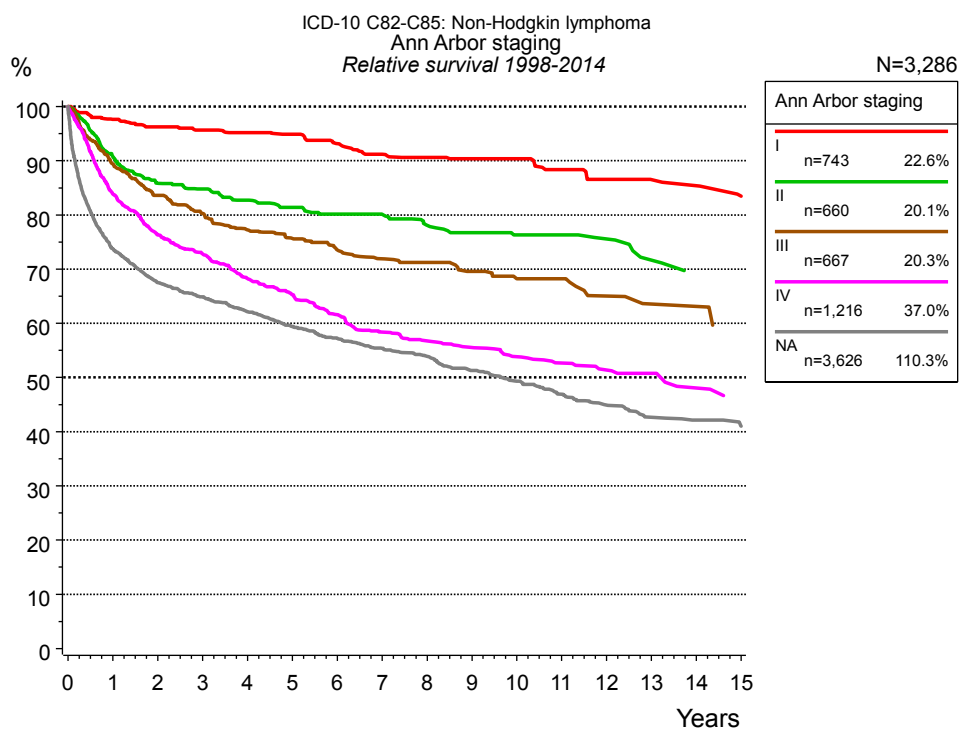
**Table 3c.** Observed (obs.) and relative (rel.) survival of patients with nHL by age category for period 1988-2014 (N=8,367).



**Figure 4a.** Relative survival of patients with nHL by Ann Arbor staging. For 4,140 of 8,367 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 4,136 cases an evaluable classification was established. The grey line represents the subgroup of 4,231 patients with missing values regarding Ann Arbor staging (50.6% of 8,367 patients, the percent values of all other categories are related to n=4,136).

Ann Arbor staging											
Years	I n=1,000		II n=849		III n=793		IV n=1,494		NA n=4,231		
	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	94.4	96.4	88.0	90.0	86.5	88.3	81.4	83.0	72.4	74.8	
2	89.7	93.3	81.3	84.7	79.2	82.3	72.6	75.4	64.9	68.8	
3	87.3	92.6	78.2	83.0	73.7	78.1	68.0	71.7	60.5	65.9	
4	85.1	92.0	75.1	81.2	69.4	74.9	62.1	66.8	56.8	63.3	
5	82.6	91.1	71.3	78.6	66.4	73.0	58.0	63.5	52.6	60.1	
6	78.8	88.8	69.3	77.4	63.0	70.6	53.4	59.5	49.4	57.9	
7	76.2	87.6	67.2	76.9	60.1	68.6	49.5	56.2	46.7	56.0	
8	73.9	86.7	63.6	74.2	58.7	67.9	46.3	53.6	43.8	53.8	
9	71.8	85.7	61.5	72.7	55.6	65.7	44.0	51.7	40.5	50.9	
10	69.8	85.0	59.4	71.5	53.0	64.0	42.3	50.5	38.1	49.0	
11	66.6	83.0	58.7	71.5	51.5	63.1	40.4	49.0	35.3	46.4	
12	63.7	81.2	57.3	71.0	48.8	60.7	37.8	46.7	32.7	43.9	
13	61.0	79.6	55.3	69.6	47.6	60.5	36.5	45.8	30.7	42.0	
14	57.8	76.6	53.4	68.3	46.9	60.3	33.6	43.1	28.6	40.1	
15	55.8	75.5	50.7	65.7	44.6	58.0	31.2	40.9	27.0	38.7	
16	51.8	72.0	48.2	63.6	38.3	50.6	29.9	40.1	25.3	37.0	
17	50.8	71.9	47.5	63.0	35.2	47.7	28.9	39.5	23.7	35.4	
18	47.8	69.0	43.7	59.0	35.2	47.0	27.1	37.7	23.0	35.0	
19	45.6	66.7	42.8	58.6	33.6	45.8	25.7	35.8	21.4	33.2	
20	42.9	64.4	42.8	58.6	30.4	42.3	24.1	34.0	19.4	31.0	

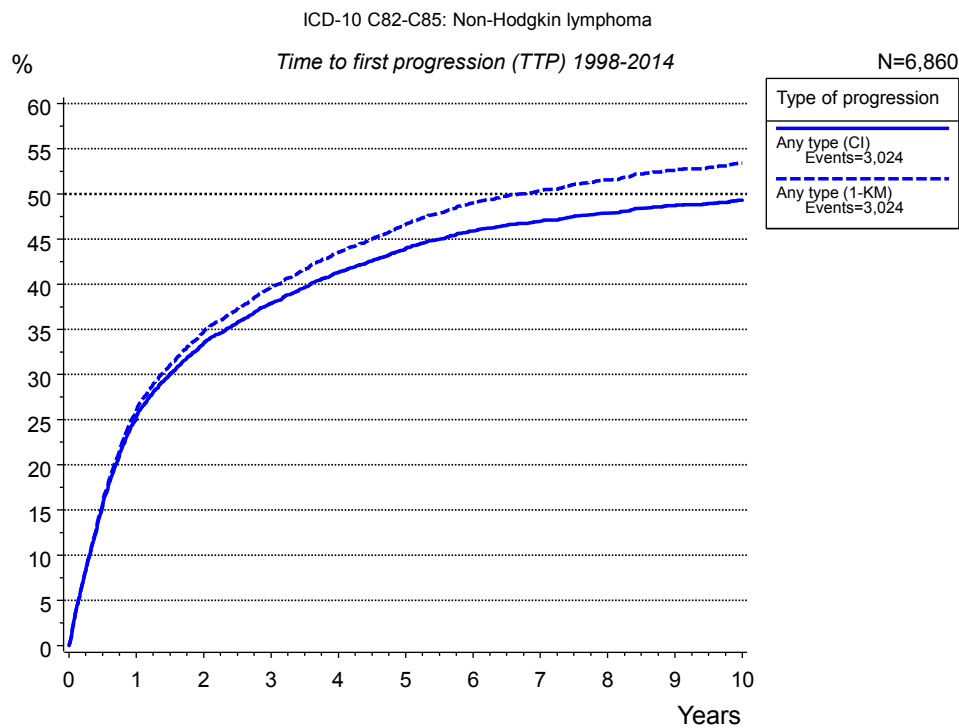
**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with nHL by Ann Arbor staging for period 1988-2014 (N=4,136).



**Figure 4c.** Relative survival of patients with nHL by Ann Arbor staging. For 3,289 of 6,912 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 3,286 cases an evaluable classification was established. The grey line represents the subgroup of 3,626 patients with missing values regarding Ann Arbor staging (52.5% of 6,912 patients, the percent values of all other categories are related to n=3,286).

Ann Arbor staging											
Years	I n=743		II n=660		III n=667		IV n=1,216		NA n=3,626		
	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	95.8	97.7	88.8	90.7	87.6	89.4	82.2	83.9	71.4	73.8	
2	92.7	96.2	82.5	85.9	80.3	83.6	73.4	76.3	63.7	67.5	
3	90.4	95.6	80.0	84.8	75.6	80.3	68.9	72.8	59.7	64.9	
4	88.7	95.2	76.8	82.8	71.2	77.3	63.2	68.3	55.7	62.2	
5	86.6	94.9	73.8	81.4	68.4	75.7	59.4	65.3	52.0	59.4	
6	83.1	93.2	71.8	80.2	65.1	73.6	55.1	61.6	48.9	57.3	
7	80.0	91.2	70.1	80.1	62.5	71.9	51.3	58.4	46.2	55.4	
8	78.2	90.6	66.9	78.1	61.0	71.2	48.9	56.8	43.9	53.9	
9	76.6	90.4	65.1	76.7	58.1	69.6	47.1	55.6	40.8	51.3	
10	75.2	90.4	63.2	76.3	55.6	68.2	44.9	53.8	38.3	49.3	
11	71.6	88.4	63.2	76.3	54.9	68.2	43.1	52.7	35.8	46.9	
12	68.7	86.5	61.0	75.6	51.1	65.0	41.5	51.4	33.5	44.9	
13	67.0	86.5	57.1	71.7	48.5	63.6	40.5	50.8	31.2	42.7	
14	65.8	85.4			48.5	63.1	37.5	48.1	30.1	42.2	
15	62.0	83.5			43.5	56.0	35.2	46.2	28.7	41.0	

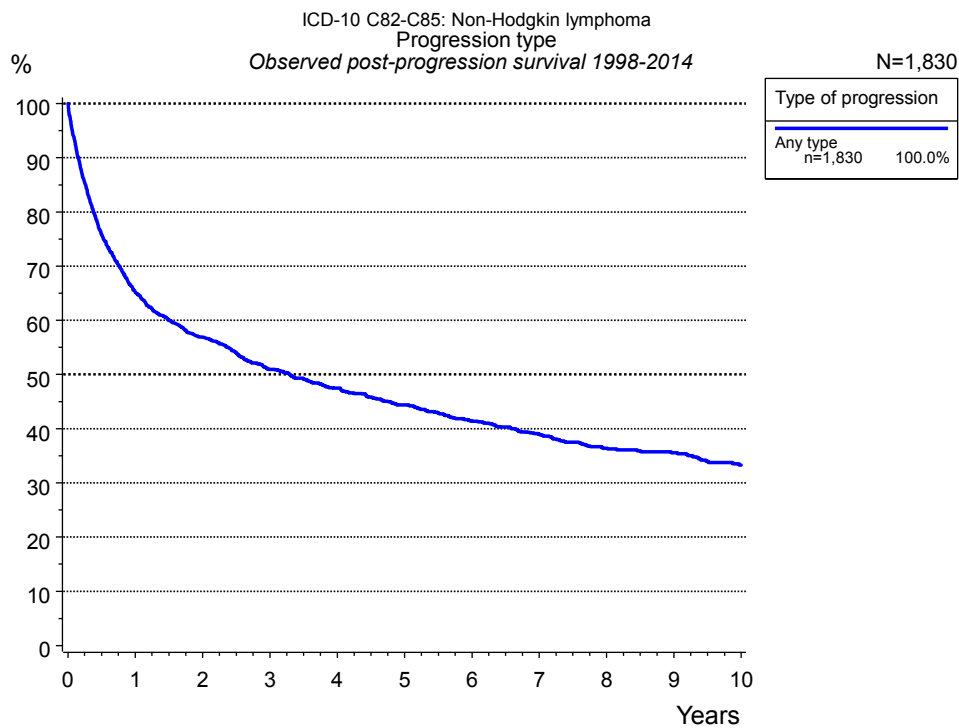
**Table 4d.** Observed (obs.) and relative (rel.) survival of patients with nHL by Ann Arbor staging for period 1998-2014 (N=3,286).



**Figure 5a.** Time to first progression of 6,860 patients with nHL 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)	Any type (1-KM)
	n=6,860 %	n=6,860 %
0	0.0	0.0
1	25.2	26.0
2	33.4	34.7
3	37.9	39.7
4	41.3	43.5
5	44.0	46.7
6	45.9	49.0
7	47.0	50.3
8	47.9	51.5
9	48.7	52.6
10	49.3	53.4

**Table 5b.** Time to first progression of patients with nHL for period 1998-2014 (N=6,860).

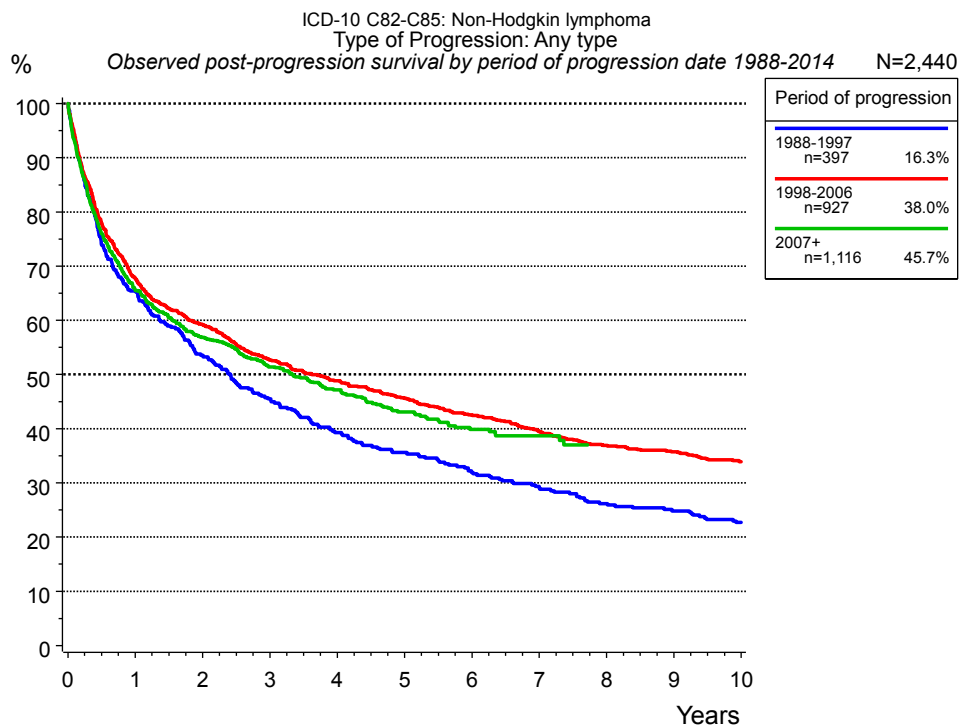


**Figure 5c.** Observed post-progression survival of 1,830 patients with nHL diagnosed between 1998 and 2014. These 1,830 patients with documented progression events during their course of disease represent 26.7 % of the totally 6,861 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=1,195, 17.4 %).

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=1,830	
Years	%
0	100.0
1	65.1
2	56.9
3	51.0
4	47.5
5	44.4
6	41.5
7	39.0
8	36.4
9	35.6
10	33.3

**Table 5d.** Observed post-progression survival of patients with nHL for period 1998-2014 (N=1,830).



**Figure 5e.** Observed post-progression (any type) survival of 2,440 patients with nHL diagnosed between 1988 and 2014 by period of progression.

Years	Period of progression		
	1988-1997 n=397 %	1998-2006 n=927 %	2007+ n=1,116 %
0	100.0	100.0	100.0
1	65.4	67.8	65.5
2	53.5	59.2	56.8
3	45.5	52.7	51.4
4	39.3	48.9	47.1
5	35.6	45.6	43.1
6	32.0	42.6	39.9
7	29.1	39.5	38.7
8	26.2	36.9	37.0
9	24.9	35.8	
10	22.7	33.9	

**Table 5f.** Observed post-progression (any type) survival of patients with nHL for period 1988-2014 by period of progression (N=2,440).

## 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

Munich Cancer Registry. Survival ICD-10 C82-C85: NHL [Internet]. 2016 [updated 2016 Apr 11; cited 2016 Jun 1]. Available from: <http://www.tumorregister-muenchen.de/en/facts/surv/sC8285E-ICD-10-C82-C85-NHL-survival.pdf>

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