Munich Cancer Registry

ICD-10 C82-C86: NHL

Survival

Year of diagnosis	1988-1997	1998-2020
Patients	1,652	12,649
Diseases	1,659	12,818
Cases evaluated	1,471	9,311
Creation date	04/15/2022	
Database export	12/20/2021	
Population	4.92 m	

Index of figures and tables

ICD-10 C82-C86: Non-Hodgkin lymphoma
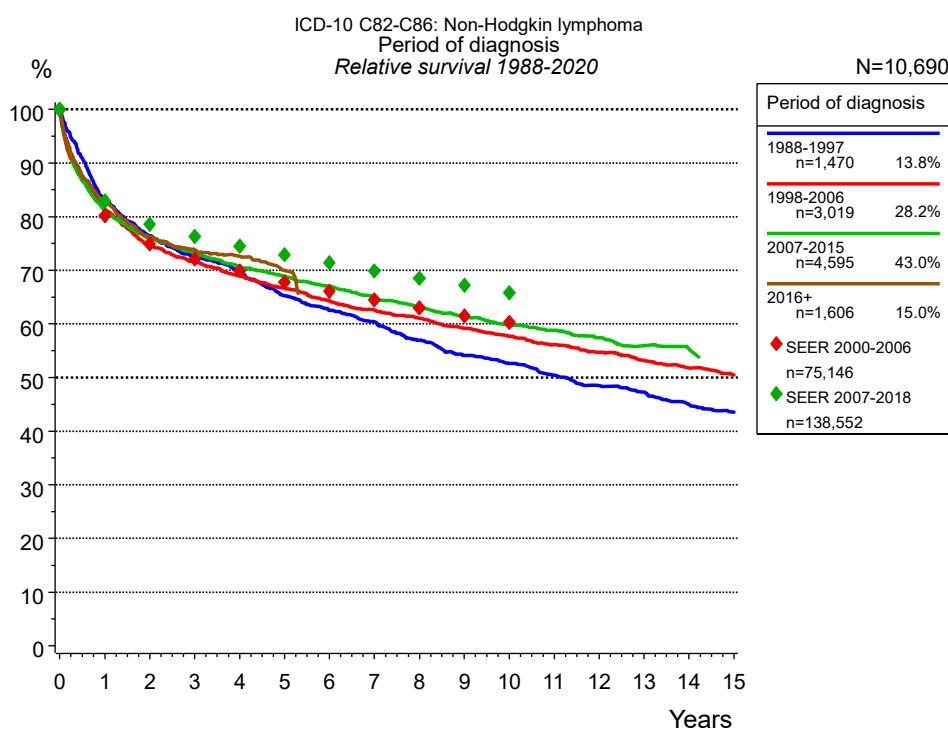Period of diagnosis
Relative survival 1988-2020 N=10,690

Figure 1a. Relative survival of patients with NHL by period of diagnosis. Included in the evaluation are 10,690 cases diagnosed between 1988 and 2020.

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 2000 to 2018, and are represented by colored 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.

| | Period of diagnosis | | | | | | | |
| | 1988-1997 n=1,470 | | 1998-2006 n=3,019 | | 2007-2015 n=4,595 | | 2016+ n=1,606 | |
Years	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
1	81.1	83.1	79.3	81.4	78.8	81.0	80.5	82.8
2	73.0	76.5	71.1	74.6	72.1	75.9	72.4	76.2
3	67.6	72.3	66.9	71.6	68.0	73.3	68.7	73.9
4	63.9	69.7	63.1	68.9	64.1	70.7	66.0	72.6
5	58.5	65.3	59.8	66.6	61.0	68.9	62.2	69.9
6	54.9	62.5	56.6	64.3	58.0	67.0		
7	52.0	60.4	53.9	62.5	54.8	64.8		
8	48.1	57.0	51.6	61.0	52.2	63.2		
9	44.8	54.1	49.0	59.2	49.7	61.5		
10	42.8	52.6	46.8	57.7	47.0	59.7		
11	40.3	50.4	44.6	56.1	45.2	58.8		
12	38.0	48.5	42.5	54.7	43.1	57.4		
13	36.4	47.2	40.4	53.1	41.1	55.9		
14	34.0	45.0	38.5	51.8	39.9	55.3		
15	32.4	43.6	36.7	50.5				
Median	7.4		8.5		8.8			

Table 1b. Observed (obs.) and relative (rel.) survival of patients with NHL by period of diagnosis for period 1988-2020 (N=10,690).

ICD-10 C82-C86: Non-Hodgkin lymphoma
Sex
Survival 1998-2020
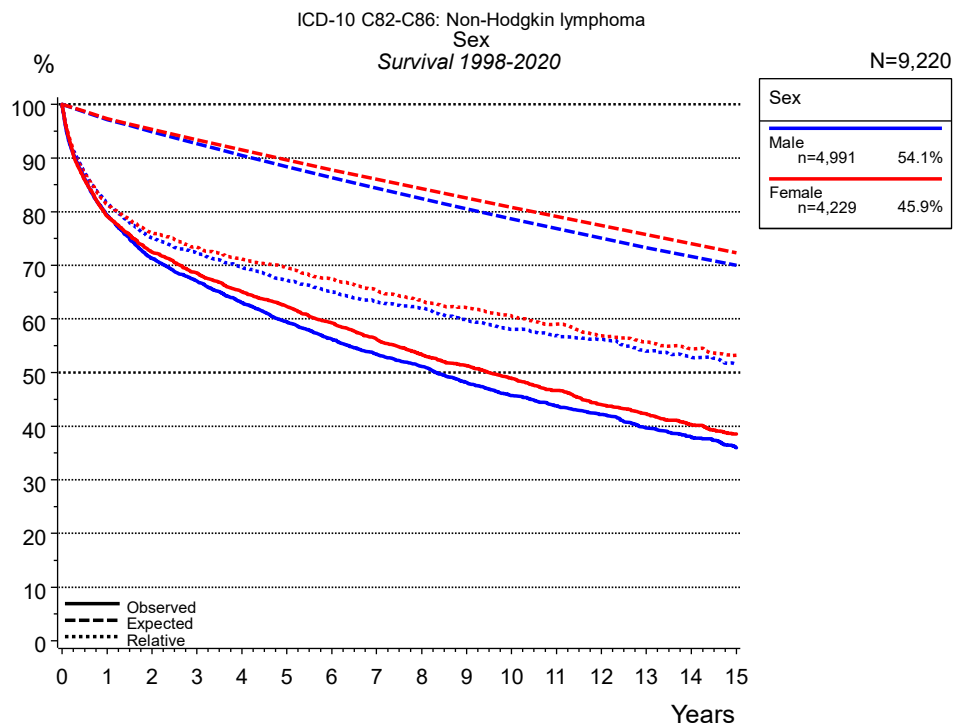
Figure 2a. Survival of patients with NHL by sex. Included in the evaluation are 9,220 cases diagnosed between 1998 and 2020.

	Sex			
	Male n=4,991		Female n=4,229	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	79.3	81.5	79.2	81.3
2	71.3	75.1	72.5	76.0
3	67.1	72.4	68.6	73.4
4	63.1	69.7	65.1	71.1
5	59.4	67.2	62.3	69.5
6	56.2	65.1	59.2	67.4
7	53.3	63.2	56.2	65.3
8	51.1	62.0	53.4	63.3
9	48.1	59.8	51.3	62.1
10	45.7	58.0	48.9	60.4
11	43.8	56.9	46.7	59.0
12	42.2	56.2	44.0	56.9
13	39.6	54.1	42.3	55.8
14	38.0	52.9	40.3	54.4
15	35.9	51.3	38.5	53.2
Median	8.3		9.5	

Table 2b. Observed (obs.) and relative (rel.) survival of patients with NHL by sex for period 1998-2020 (N=9,220).

ICD-10 C82-C86: Non-Hodgkin lymphoma
Sex
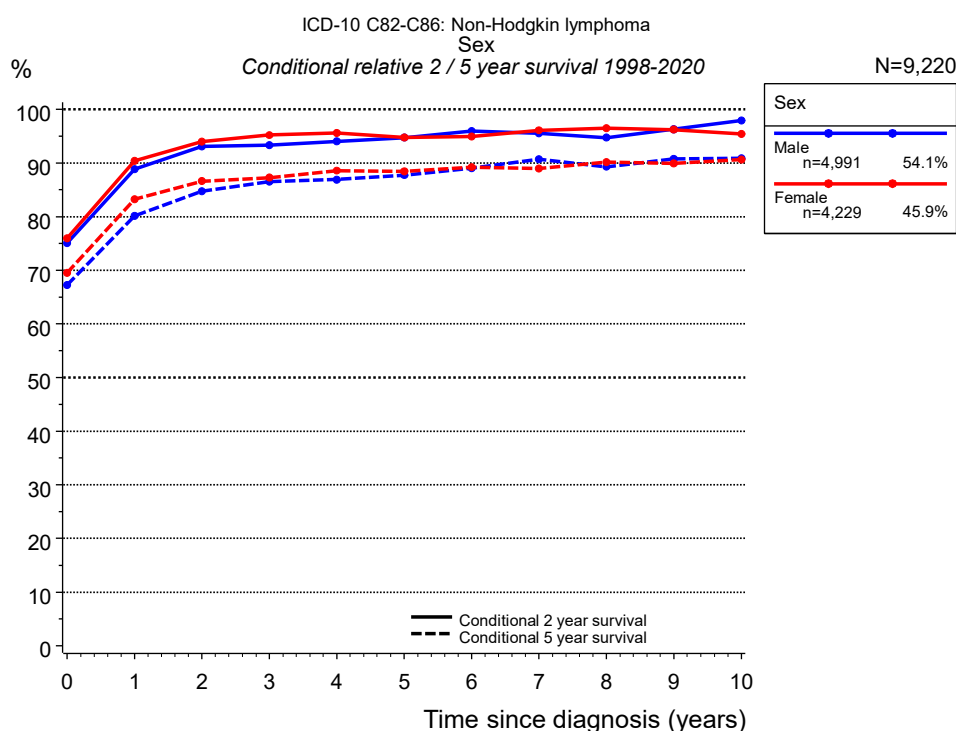*Conditional relative 2 / 5 year survival 1998-2020*

Figure 2c. Conditional relative 2 / 5-year survival of patients with NHL by sex. For 9,220 of 9,220 cases diagnosed between 1998 and 2020 valid data could be obtained for this item.

	Sex					
	Male			Female		
		Cond. surv. %			Cond. surv. %	
Years	n	2 yrs	5 yrs	n	2 yrs	5 yrs
0	4,991	75.1	67.2	4,229	76.0	69.5
1	3,821	88.9	80.1	3,263	90.4	83.3
2	3,314	93.1	84.8	2,887	94.0	86.6
3	2,995	93.3	86.5	2,643	95.2	87.3
4	2,660	94.0	86.9	2,405	95.6	88.6
5	2,342	94.7	87.7	2,195	94.8	88.5
6	2,053	96.0	89.0	1,972	94.9	89.2
7	1,805	95.5	90.7	1,743	96.1	89.0
8	1,586	94.7	89.3	1,530	96.5	90.2
9	1,357	96.3	90.8	1,340	96.2	90.0
10	1,156	97.9	90.9	1,164	95.4	90.6

Table 2d. Conditional relative 2 / 5-year survival of patients with NHL by sex for period 1998-2020 (N=9,220).

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 sex="Male", who are alive at least 3 years after cancer diagnosis, the conditional relative 2-year survival rate is 93.3% (n=2,995).

ICD-10 C82-C86: Non-Hodgkin lymphoma
Age category
Observed survival 1998-2020

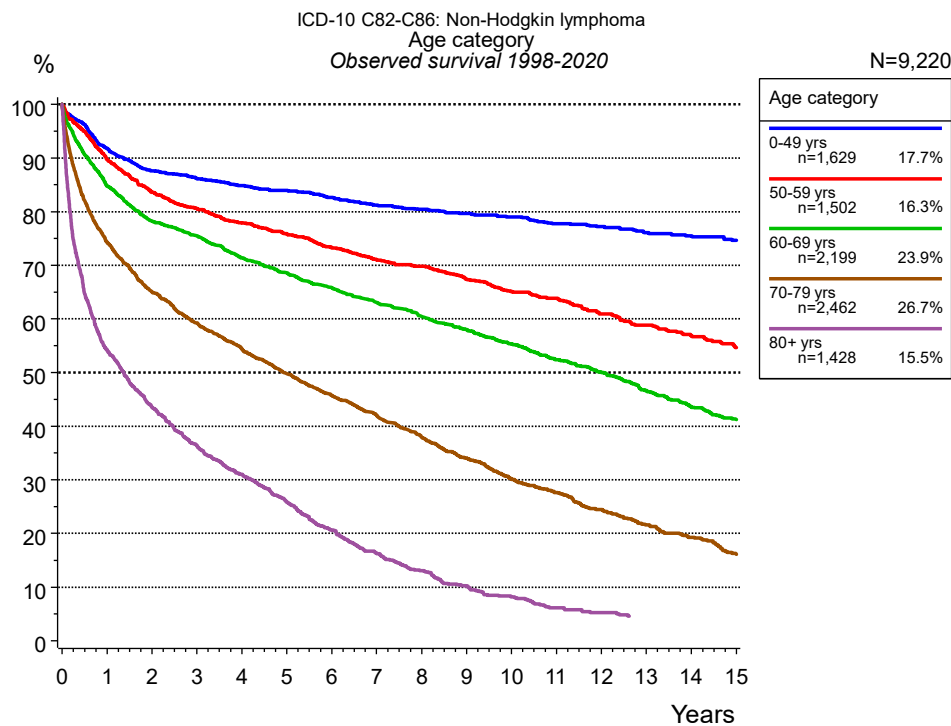**Figure 3a.** Observed survival of patients with NHL by age category. Included in the evaluation are 9,220 cases diagnosed between 1998 and 2020.

ICD-10 C82-C86: Non-Hodgkin lymphoma
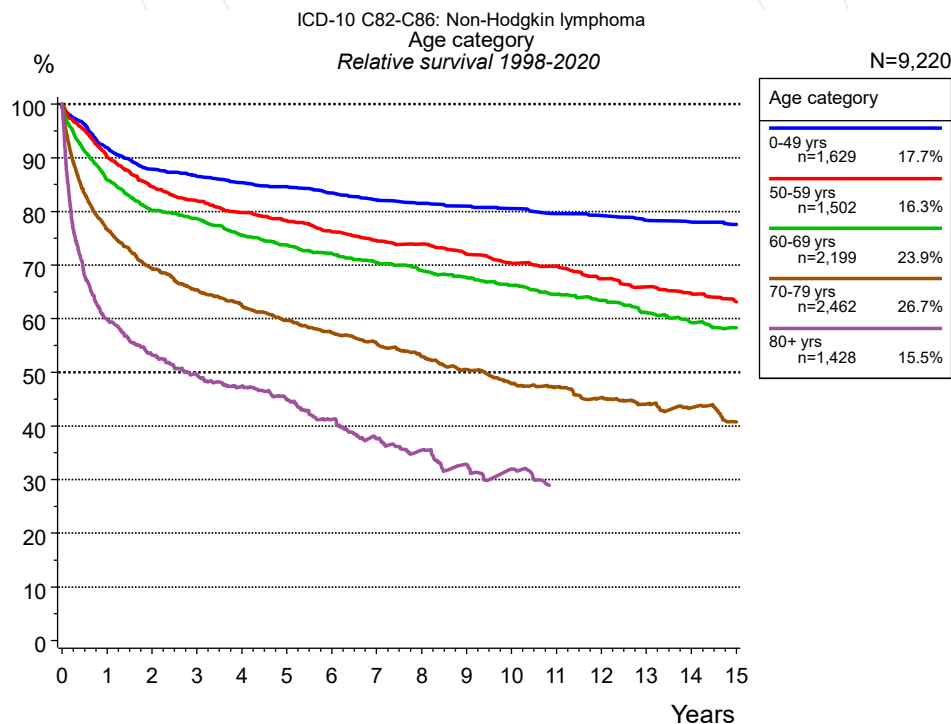Age category
Relative survival 1998-2020

Figure 3b. Relative survival of patients with NHL by age category. Included in the evaluation are 9,220 cases diagnosed between 1998 and 2020.

	Age category									
	0-49 yrs n=1,629		50-59 yrs n=1,502		60-69 yrs n=2,199		70-79 yrs n=2,462		80+ yrs n=1,428	
Years	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	91.9	91.9	89.7	90.2	84.8	85.8	74.3	76.6	54.2	59.9
2	87.6	87.8	83.6	84.6	78.2	80.3	65.1	69.3	43.5	53.2
3	86.2	86.5	80.6	82.0	75.5	78.7	59.2	65.4	36.5	49.6
4	84.9	85.4	77.9	79.8	71.4	75.5	54.5	62.5	31.0	47.4
5	84.0	84.6	75.9	78.3	68.5	73.8	49.8	59.7	25.8	44.8
6	82.7	83.5	73.2	76.2	65.8	72.2	45.7	57.4	20.7	41.2
7	81.2	82.2	71.1	74.5	63.0	70.5	42.0	55.4	16.2	37.6
8	80.4	81.5	69.9	73.9	60.4	69.0	37.9	53.0	13.1	35.5
9	79.6	81.0	67.4	72.0	58.0	67.7	34.0	50.5	10.1	32.8
10	79.0	80.6	65.1	70.4	55.3	66.2	30.1	47.9	8.2	32.0
11	77.7	79.6	63.9	69.8	52.5	64.6	27.6	47.3	6.2	29.5
12	77.2	79.2	60.9	67.4	50.0	63.4	24.4	45.3	5.2	31.7
13	76.0	78.3	58.9	65.9	46.7	61.1	21.6	44.1		
14	75.5	78.0	56.9	64.7	43.7	59.3	19.3	43.4		
15	74.6	77.6	54.7	63.1	41.2	58.3	16.1	40.8		
Median			19.3		12.0		4.9		1.4	

Table 3c. Observed (obs.) and relative (rel.) survival of patients with NHL by age category for period 1998-2020 (N=9,220).

ICD-10 C82-C86: Non-Hodgkin lymphoma
Ann Arbor staging
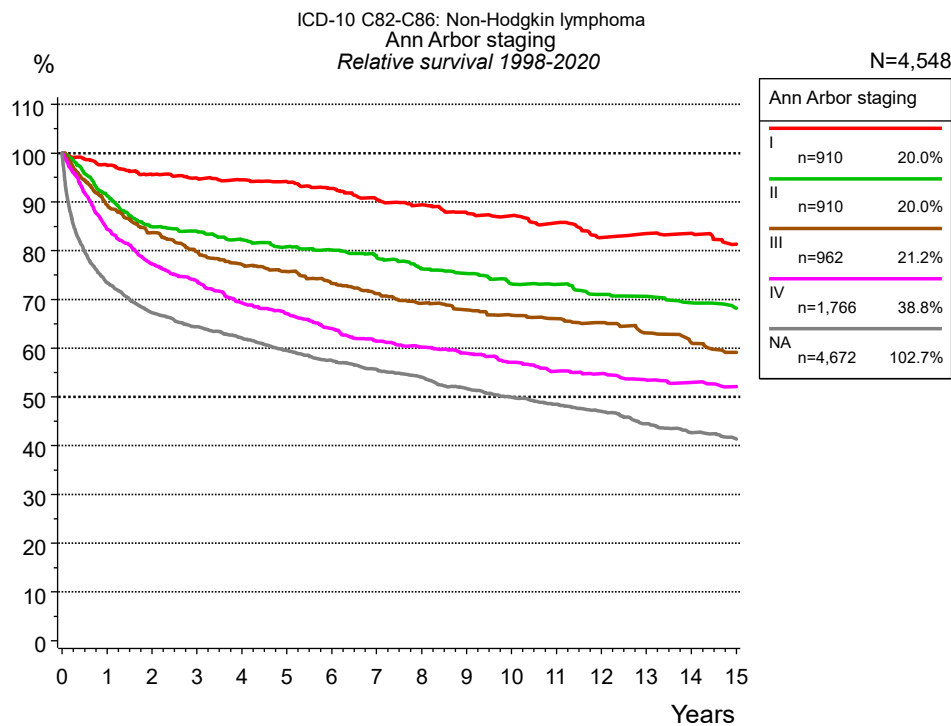*Relative survival 1998-2020*

Figure 4a. Relative survival of patients with NHL by Ann Arbor staging. For 4,556 of 9,220 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 4,548 cases an evaluable classification was established. The grey line represents the subgroup of 4,672 patients with missing values regarding Ann Arbor staging (50.7 % of 9,220 patients, the percent values of all other categories are related to n=4,548).

	Ann Arbor staging									
	I		II		III		IV		NA	
	n=910		n=910		n=962		n=1,766		n=4,672	
Years	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	97.5	89.2	91.2	87.4	89.4	82.6	84.4	71.1	73.5
2	91.9	95.6	81.4	84.9	80.2	83.7	74.2	77.3	63.3	67.2
3	89.5	94.8	79.0	84.0	74.9	79.8	69.5	73.8	59.2	64.4
4	87.6	94.5	75.9	82.2	70.9	77.2	64.0	69.3	55.7	62.1
5	85.5	94.2	73.1	80.8	68.1	75.7	60.8	67.1	52.0	59.5
6	82.6	92.8	71.0	80.1	64.6	73.3	56.9	64.0	49.0	57.5
7	79.0	90.4	68.2	78.6	61.4	71.2	53.5	61.5	46.3	55.6
8	76.6	89.4	64.8	76.2	58.3	69.2	51.4	60.2	43.9	54.1
9	73.7	87.8	63.0	75.3	55.9	67.8	49.4	59.0	41.1	51.8
10	71.8	87.2	59.9	73.2	53.7	66.8	46.8	57.2	38.6	49.9
11	69.2	85.7	58.6	73.1	51.9	66.0	44.3	55.3	36.7	48.5
12	65.2	82.7	55.8	71.0	50.2	65.2	43.0	54.8	34.7	47.0
13	64.4	83.5	54.7	70.6	47.3	63.2	41.1	53.5	32.1	44.5
14	63.3	83.6	52.6	69.3	44.8	61.2	39.7	53.0	30.1	42.7
15	60.0	81.3	50.6	68.2	42.3	59.1	38.3	52.2	28.5	41.4
Median	19.0		15.7		12.1		8.8		5.6	

Table 4b. Observed (obs.) and relative (rel.) survival of patients with NHL by Ann Arbor staging for period 1998-2020 (N=4,548).

ICD-10 C82-C86: Non-Hodgkin lymphoma
Progressionsform
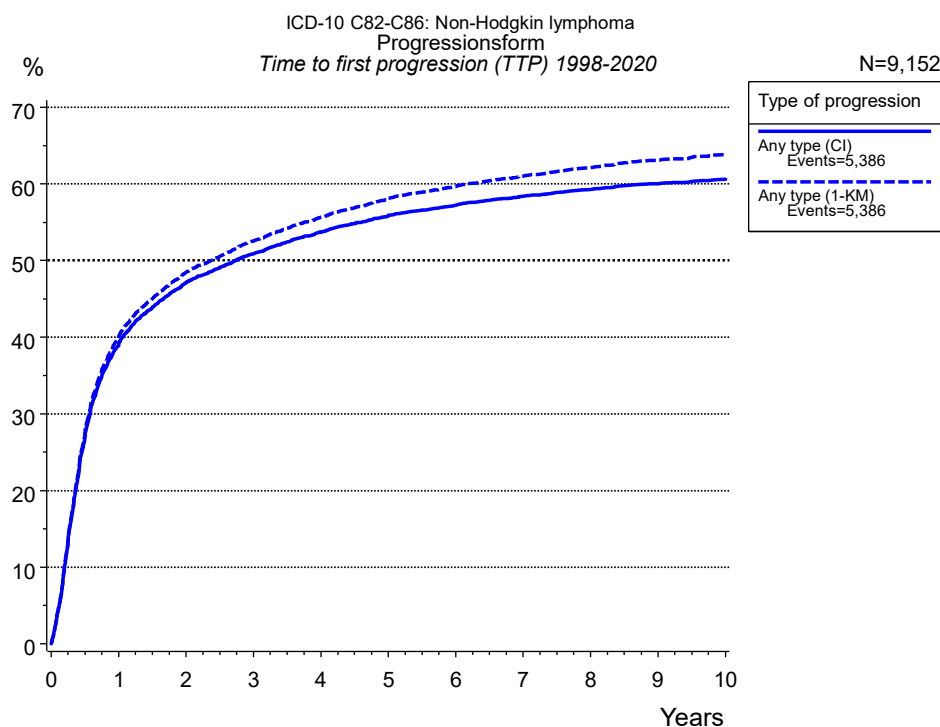*Time to first progression (TTP) 1998-2020*

Figure 5a. Time to first progression of 9,152 patients with NHL diagnosed between 1998 and 2020 (in solid cancers M0 only) 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.

	Type of progression	
	Any type (CI)	Any type (1-KM)
N	9,152	9,152
Events	5,286	5,286
compet.	966	
Years	%	%
0	0.0	0.0
1	39.1	40.0
2	47.1	48.5
3	50.9	52.6
4	53.7	55.6
5	55.9	58.1
6	57.3	59.7
7	58.4	61.1
8	59.3	62.1
9	60.0	63.1
10	60.6	63.9

Table 5b. Time to first progression of patients with NHL for period 1998-2020 (N=9,152), also showing the total of progression events (Events) and of deaths as competing risk (compet.).
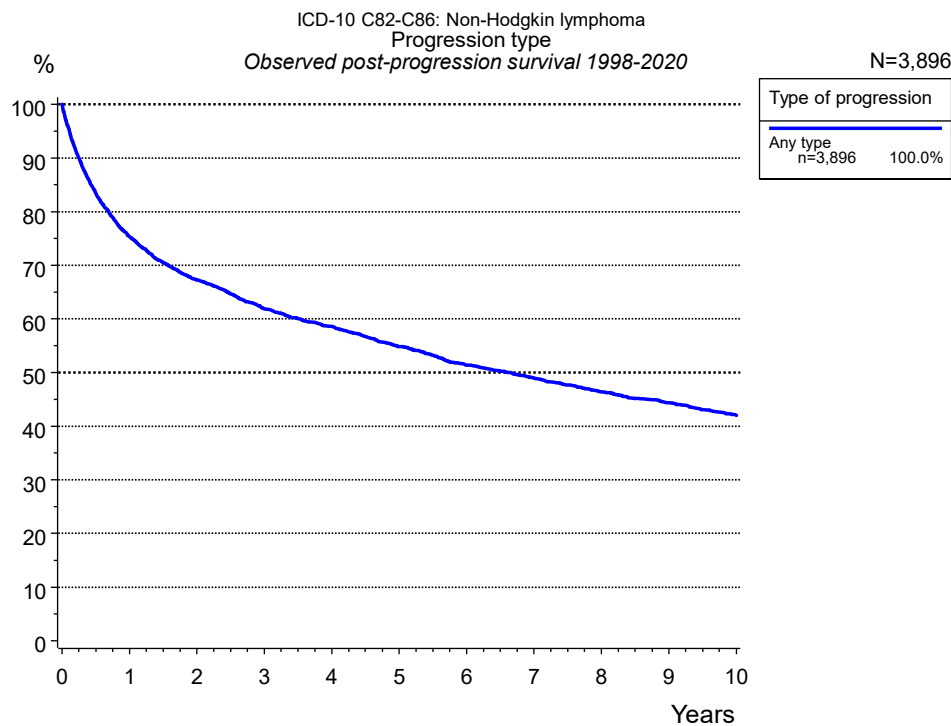
ICD-10 C82-C86: Non-Hodgkin lymphoma
Progression type
Observed post-progression survival 1998-2020

N=3,896

Figure 5c. Observed post-progression survival of 3,896 patients with NHL diagnosed between 1998 and 2020. These 3,896 patients with documented progression events during their course of disease represent 42.6 % of the totally 9,156 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=1,494, 16.3 %).

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 potientially considered in more than one subgroup.

	Type of progression
	Any type n=3,896
Years	%
0	100.0
1	75.3
2	67.3
3	61.9
4	58.6
5	54.9
6	51.3
7	48.9
8	46.4
9	44.3
10	42.0

Table 5d. Observed post-progression survival of patients with NHL for period 1998-2020 (N=3,896).
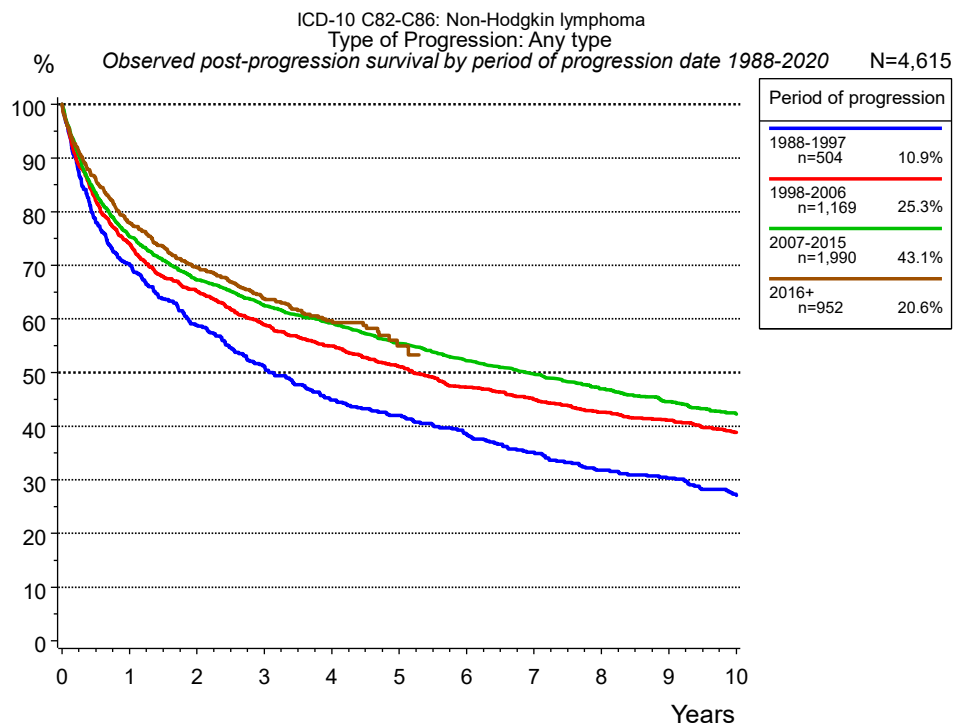
ICD-10 C82-C86: Non-Hodgkin lymphoma
Type of Progression: Any type
Observed post-progression survival by period of progression date 1988-2020   N=4,615

Figure 5e. Observed post-progression (any type) survival of 4,615 patients with NHL diagnosed between 1988 and 2020 by period of progression.

	Period of progression			
	1988-1997 n=504	1998-2006 n=1,169	2007-2015 n=1,990	2016+ n=952
Years	%	%	%	%
0	100.0	100.0	100.0	100.0
1	70.3	74.0	75.3	77.9
2	58.8	65.2	67.3	69.7
3	51.2	58.9	62.5	63.8
4	44.9	55.0	59.3	59.6
5	42.0	51.1	55.4	55.0
6	38.4	47.3	52.1	
7	35.1	45.0	49.6	
8	31.8	42.6	47.0	
9	30.3	41.1	44.5	
10	27.1	38.9	42.2	

Table 5f. Observed post-progression (any type) survival of patients with NHL for period 1988-2020 by period of progression (N=4,615).

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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