

# Munich Cancer Registry



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## ICD-10 C81-C96: Systemic neoplasms

### Survival

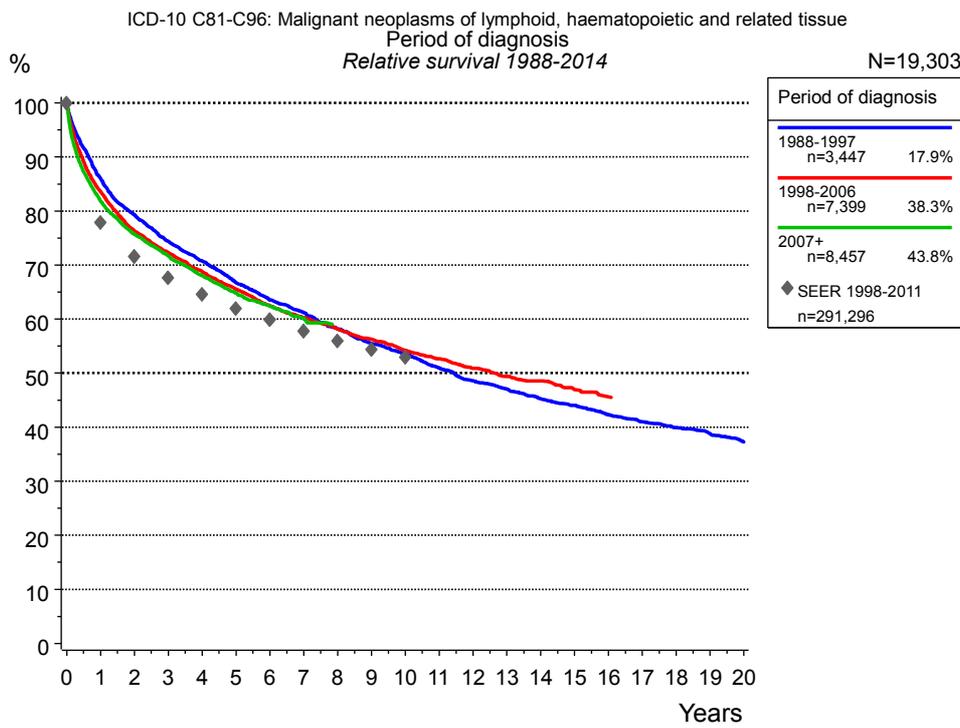
Year of diagnosis	1988-1997	1998-2014
Patients	3,843	23,999
Diseases	3,870	24,414
Cases evaluated	3,457	16,166
Creation date	04/11/2016	
Export date	12/23/2015	
Population	4.64 m	



Munich Cancer Registry at Munich Cancer Center  
Marchioninstr. 15  
Munich, 81377  
Germany

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

<http://www.tumorregister-muenchen.de/en/facts/surv/sC8196E-ICD-10-C81-C96-Systemic-neoplasms-survival.pdf>



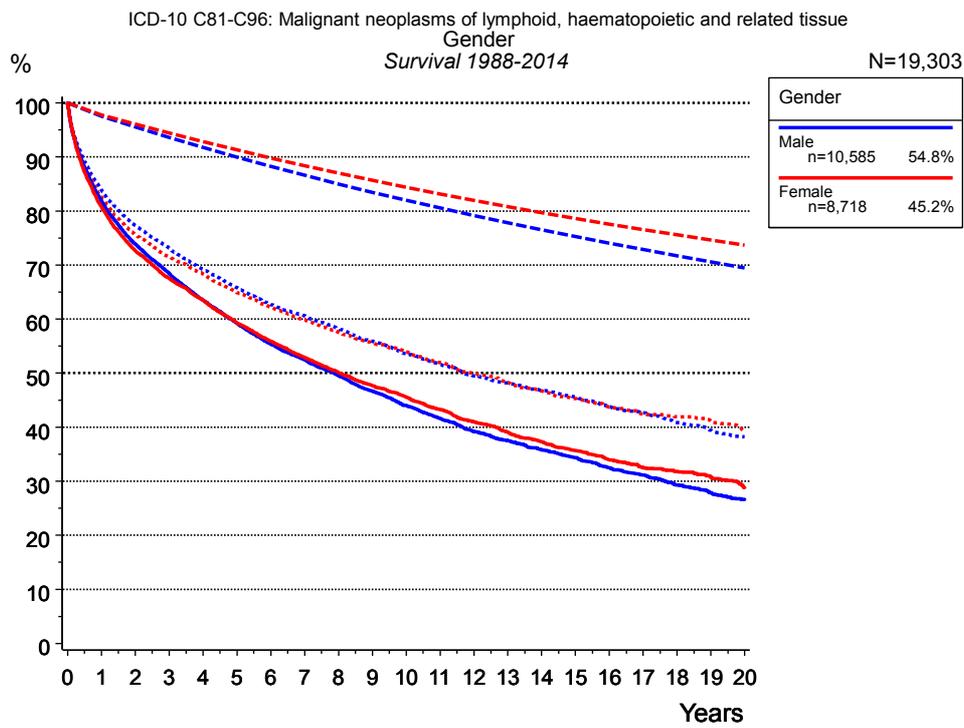
**Figure 1a.** Relative survival of patients with systemic neoplasms by period of diagnosis. Included in the evaluation are 19,303 cases diagnosed between 1988 and 2014.

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=3,447		1998-2006 n=7,399		2007+ n=8,457	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	84.2	86.0	81.7	83.6	79.9	81.9
2	76.3	79.3	73.1	76.3	72.3	75.7
3	70.3	74.4	68.0	72.3	67.2	71.7
4	65.7	70.8	63.6	68.8	62.5	68.0
5	60.8	66.7	59.5	65.5	58.4	64.8
6	57.0	63.5	55.7	62.5	55.1	62.4
7	54.0	61.2	52.9	60.3	52.1	60.1
8	50.5	58.2	50.1	58.2		
9	47.4	55.5	47.7	56.3		
10	45.1	53.6	45.1	54.2		
11	42.3	51.0	43.1	52.7		
12	39.7	48.6	40.9	50.9		
13	37.9	47.1	39.1	49.4		
14	35.9	45.3	37.8	48.5		
15	34.5	44.0	35.9	47.0		
16	32.6	42.3	34.4	45.6		
17	31.2	41.0				
18	29.9	39.9				
19	28.7	38.8				
20	27.2	37.3				

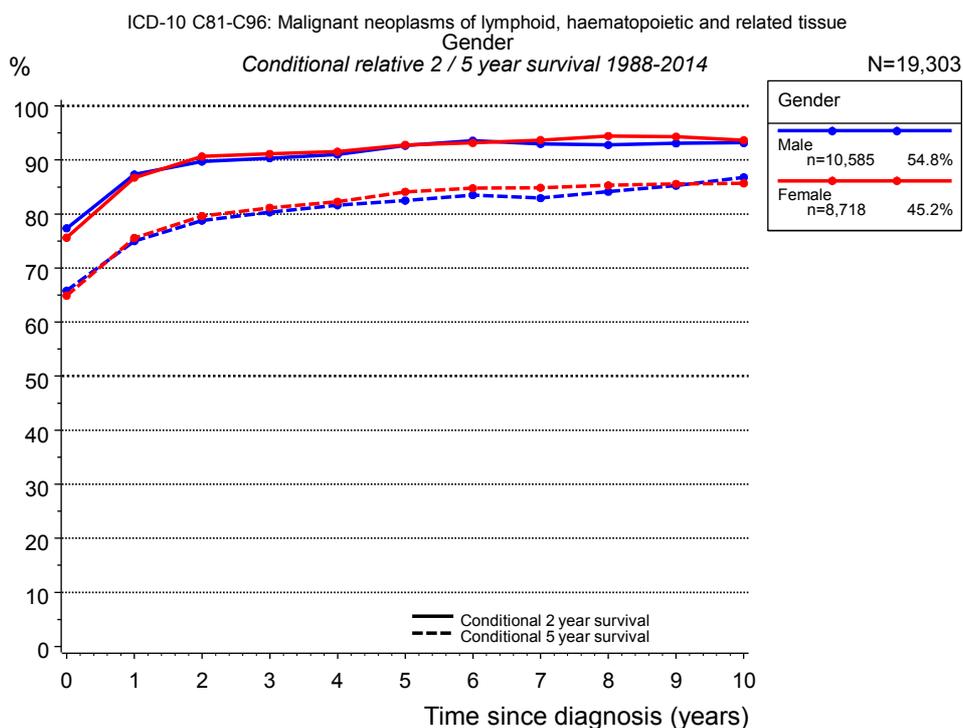
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with systemic neoplasms by period of diagnosis for period 1988-2014 (N=19,303).



**Figure 2a.** Survival of patients with systemic neoplasms by gender. Included in the evaluation are 19,303 cases diagnosed between 1988 and 2014.

Years	Gender			
	Male n=10,585		Female n=8,718	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	81.8	83.9	80.8	82.6
2	73.9	77.4	72.7	75.6
3	68.4	73.1	67.6	71.5
4	63.5	69.2	63.5	68.4
5	59.2	65.8	59.3	64.9
6	55.3	62.7	55.9	62.2
7	52.5	60.6	52.9	59.9
8	49.5	58.3	50.1	57.6
9	46.7	55.9	47.7	55.7
10	44.0	53.6	45.5	53.9
11	41.6	51.6	43.3	52.0
12	39.2	49.5	41.0	50.0
13	37.5	48.2	39.0	48.3
14	35.8	46.8	37.3	46.8
15	34.3	45.6	35.7	45.3
16	32.5	43.8	33.9	43.7
17	31.1	42.6	32.5	42.4
18	29.3	40.8	31.8	42.0
19	27.9	39.4	30.8	41.1
20	26.6	38.3	28.8	39.1

**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with systemic neoplasms by gender for period 1988-2014 (N=19,303).

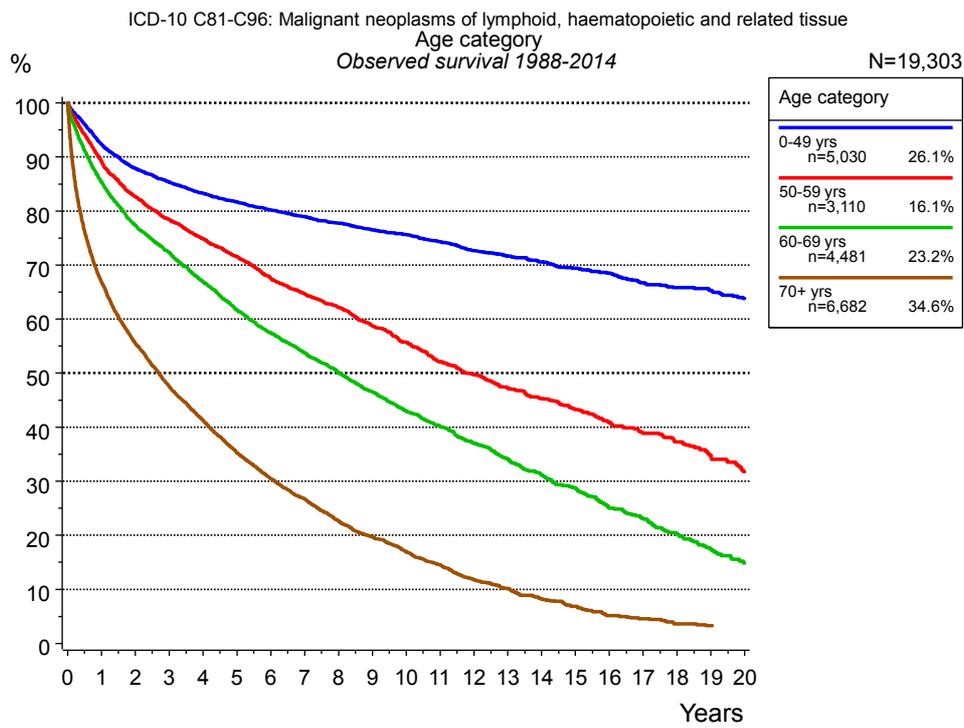


**Figure 2c.** Conditional relative 2 / 5-year survival of patients with systemic neoplasms by gender. For 19,303 of 19,303 cases diagnosed between 1988 and 2014 valid data could be obtained for this item.

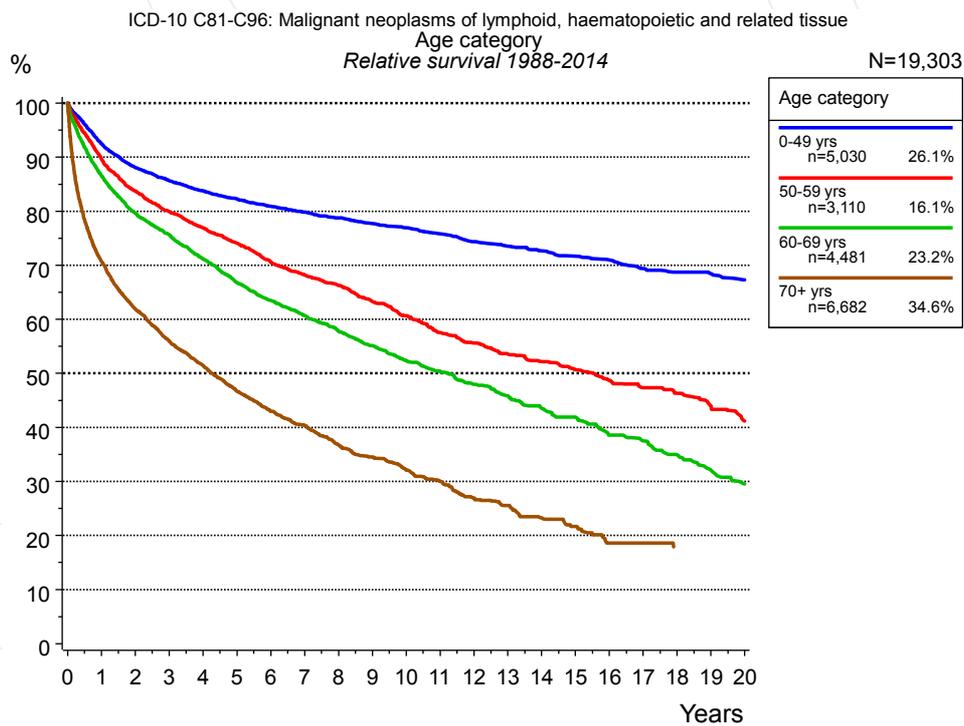
Years	Gender					
	n	Male		Female		n
		Cond. surv. % 2 yrs	Cond. surv. % 5 yrs	Cond. surv. % 2 yrs	Cond. surv. % 5 yrs	
0	10,585	77.4	65.8	8,718	75.6	64.9
1	8,303	87.3	75.0	6,793	86.7	75.6
2	7,112	89.7	78.8	5,796	90.7	79.6
3	6,157	90.3	80.3	5,053	91.1	81.2
4	5,272	91.0	81.6	4,418	91.5	82.3
5	4,516	92.7	82.5	3,769	92.8	84.1
6	3,825	93.5	83.5	3,229	93.2	84.8
7	3,244	92.9	82.9	2,748	93.7	84.8
8	2,706	92.8	84.1	2,329	94.4	85.3
9	2,266	93.1	85.2	2,006	94.3	85.6
10	1,899	93.2	86.8	1,705	93.6	85.7

**Table 2d.** Conditional relative 2 / 5-year survival of patients with systemic neoplasms by gender for period 1988-2014 (N=19,303).

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 90.3% (n=6,157).



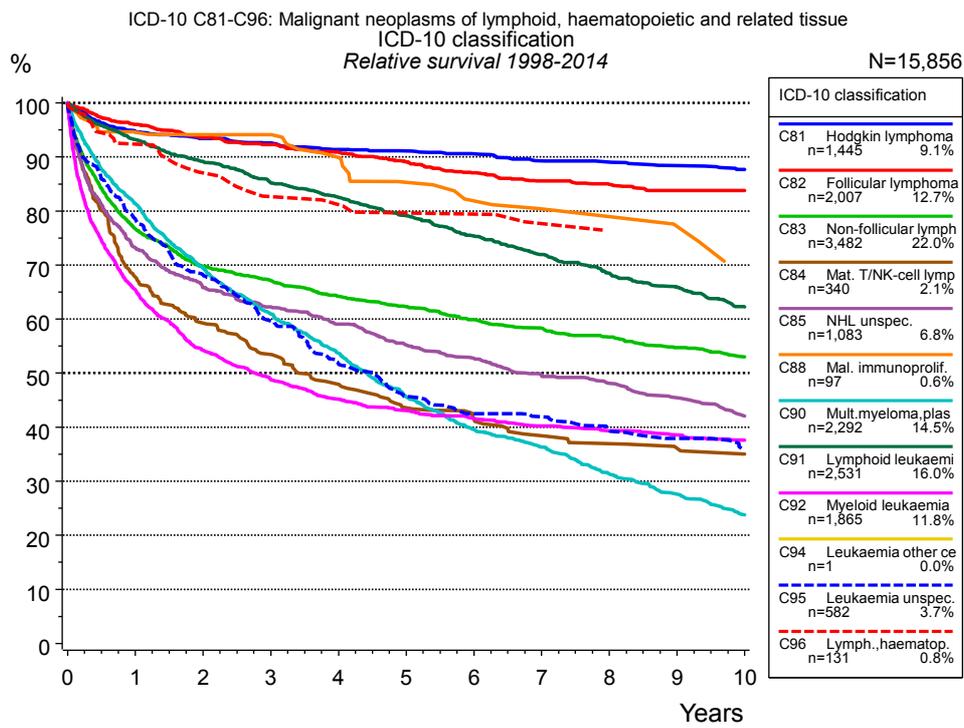
**Figure 3a.** Observed survival of patients with systemic neoplasms by age category. Included in the evaluation are 19,303 cases diagnosed between 1988 and 2014.



**Figure 3b.** Relative survival of patients with systemic neoplasms by age category. Included in the evaluation are 19,303 cases diagnosed between 1988 and 2014.

Years	Age category							
	0-49 yrs n=5,030		50-59 yrs n=3,110		60-69 yrs n=4,481		70+ yrs n=6,682	
	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	92.4	92.5	89.1	89.7	85.3	86.5	66.9	70.7
2	87.9	88.1	82.7	83.7	77.4	79.7	55.5	61.9
3	85.3	85.6	78.5	79.9	72.3	75.6	47.6	56.0
4	83.3	83.7	74.9	76.9	66.9	71.1	41.3	51.5
5	81.7	82.3	71.5	74.1	61.7	66.8	35.3	46.7
6	80.2	80.9	67.5	70.6	57.5	63.5	30.5	43.0
7	79.0	79.8	64.6	68.2	53.7	60.7	26.7	40.3
8	77.8	78.8	62.2	66.3	50.1	57.8	22.7	36.7
9	76.5	77.7	58.8	63.3	46.5	55.1	19.7	34.5
10	75.6	76.9	55.7	60.7	42.9	52.3	16.9	32.1
11	74.3	75.8	52.1	57.5	40.2	50.4	14.5	30.1
12	72.7	74.3	49.7	55.6	37.0	48.0	11.8	26.9
13	71.6	73.5	47.2	53.5	34.1	45.8	10.1	25.5
14	70.6	72.7	45.3	52.2	31.1	43.6	8.3	23.2
15	69.4	71.7	43.3	50.7	28.7	41.9	6.9	21.7
16	68.5	71.0	40.9	48.8	25.0	38.6	5.1	18.6
17	66.7	69.4	38.9	47.3	23.0	37.5	4.6	18.6
18	65.8	68.7	37.3	46.3	20.3	34.9	3.6	17.9
19	65.3	68.4	34.8	44.0	17.4	32.1		
20	63.8	67.3	31.7	41.2	14.8	29.5		

**Table 3c.** Observed (obs.) and relative (rel.) survival of patients with systemic neoplasms by age category for period 1988-2014 (N=19,303).

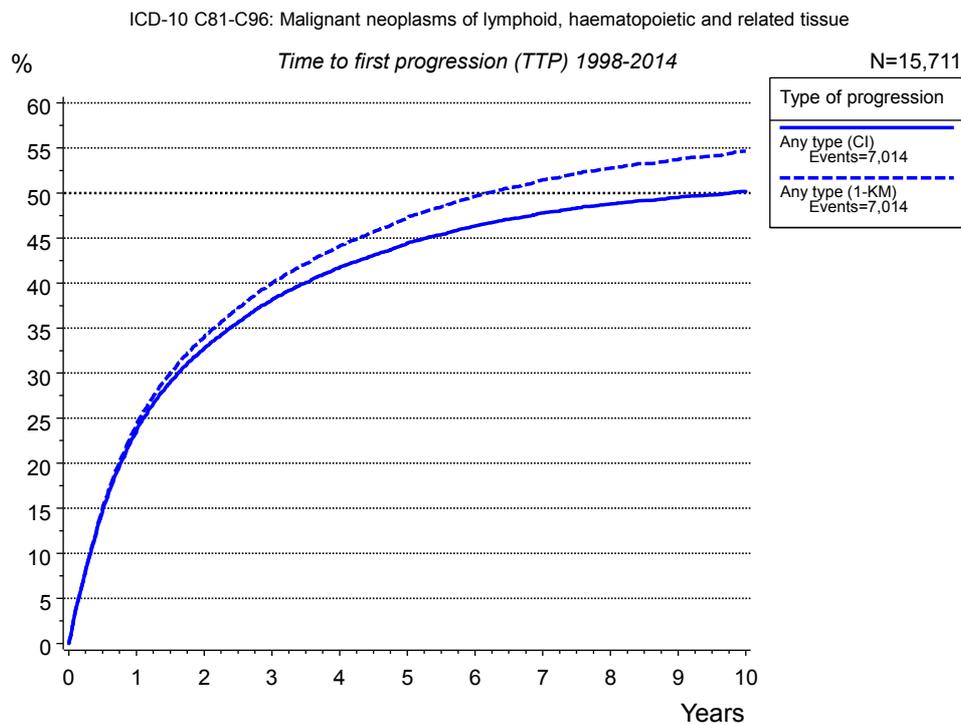


**Figure 4a.** Relative survival of patients with systemic neoplasms by ICD-10 classification. Included in the evaluation are 15,856 cases diagnosed between 1998 and 2014. Subgroups with sample size <15 are dropped from the chart.

Years	ICD-10 classification															
	C81 Hodgkin lymphoma		C82 Follicular lymphoma		C83 Non-follicular lymphoma		C84 Mat. T/NK-cell lymphoma		C85 NHL unspec.		C88 Mal. immunoprolif. dis.		C90 Mult.myeloma, plasma cell			
	n=1,445	n=2,007	n=3,482	n=340	n=1,083	n=97	n=2,292									
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1	94.1	94.8	94.2	96.0	74.4	76.7	66.1	67.8	70.9	73.2	92.5	94.6	79.2	81.4		
2	92.3	93.4	90.2	93.6	66.0	69.7	56.7	59.3	62.0	65.8	90.3	94.2	65.9	69.5		
3	91.0	92.6	87.4	92.3	62.1	67.2	50.3	53.5	57.3	62.2	89.1	94.2	56.5	60.9		
4	89.2	91.4	84.2	90.9	58.0	64.2	44.3	47.9	53.0	59.0	82.7	89.9	48.6	53.7		
5	88.6	91.1	81.1	89.1	55.0	62.3	39.3	43.6	48.5	55.2	75.7	85.3	40.4	45.6		
6	87.6	90.6	77.7	87.1	51.7	59.9	36.7	41.6	45.3	52.7	71.0	81.9	34.2	39.6		
7	85.9	89.3	74.9	85.6	49.1	58.3	33.7	38.5	41.9	49.6	67.5	80.4	30.7	36.3		
8	85.3	89.0	72.9	84.9	46.8	56.7	31.9	37.0	39.5	48.1	65.1	78.9	25.9	31.3		
9	84.2	88.4	70.5	83.8	44.2	54.7	30.5	36.1	36.7	45.4	62.0	77.1	22.5	27.6		
10	83.0	87.7	69.4	83.8	41.9	53.0	29.8	35.1	33.1	42.0	55.5	69.5	18.8	23.8		

<i>cont'd</i>	ICD-10 classification									
	C91 Lymphoid leukaemia n=2,531		C92 Myeloid leukaemia n=1,865		C94 Leukaemia other cells n=1		C95 Leukaemia unspec. n=582		C96 Lymph.,haem atop. unspec. n=131	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
Years										
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	91.2	93.2	64.0	65.4			76.3	78.5	91.8	92.3
2	85.5	89.2	52.3	54.2			64.6	68.1	85.5	87.0
3	80.0	85.2	46.5	48.8			55.1	59.6	80.5	82.7
4	75.9	82.5	42.5	45.2			47.0	51.7	79.4	81.2
5	71.4	79.2	40.1	43.1			40.4	45.7	77.0	79.6
6	66.6	75.4	38.3	41.6			36.8	42.5	77.0	79.4
7	62.3	71.9	36.6	40.2			35.6	41.9	74.2	77.6
8	58.1	68.5	35.4	39.3			32.7	39.4		
9	54.8	65.9	34.4	38.6			30.6	37.9		
10	50.8	62.3	33.2	37.6			28.1	35.8		

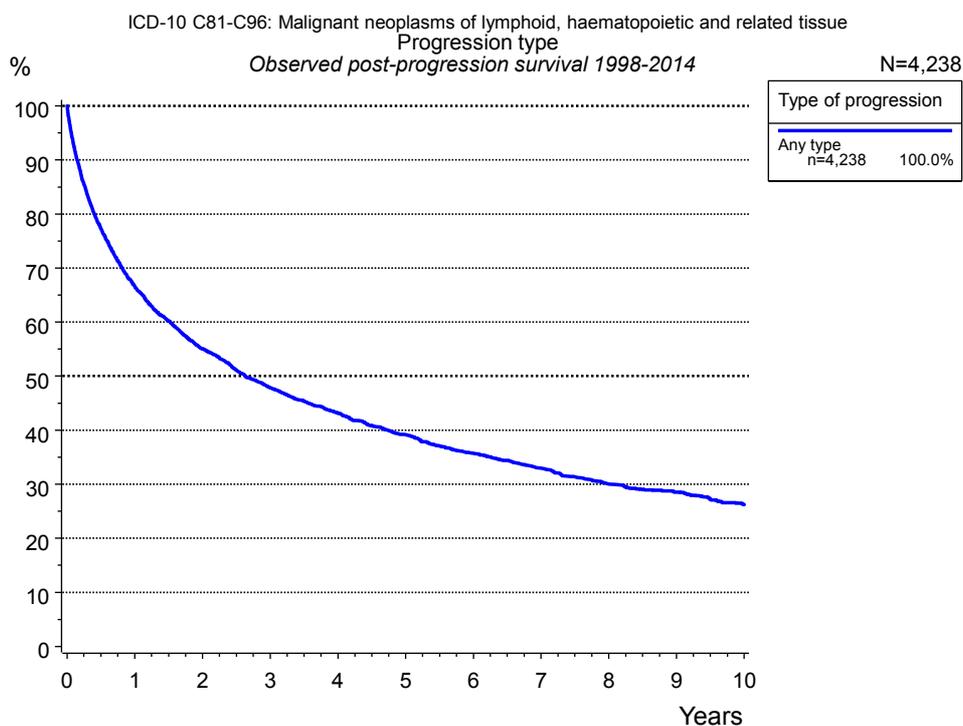
**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with systemic neoplasms by ICD-10 classification for period 1998-2014 (N=15,856).



**Figure 5a.** Time to first progression of 15,711 patients with systemic neoplasms 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=15,711	n=15,711
	%	%
0	0.0	0.0
1	23.6	24.2
2	32.7	34.0
3	38.1	40.0
4	41.7	44.1
5	44.4	47.3
6	46.4	49.6
7	47.8	51.5
8	48.8	52.7
9	49.5	53.7
10	50.2	54.6

**Table 5b.** Time to first progression of patients with systemic neoplasms for period 1998-2014 (N=15,711).

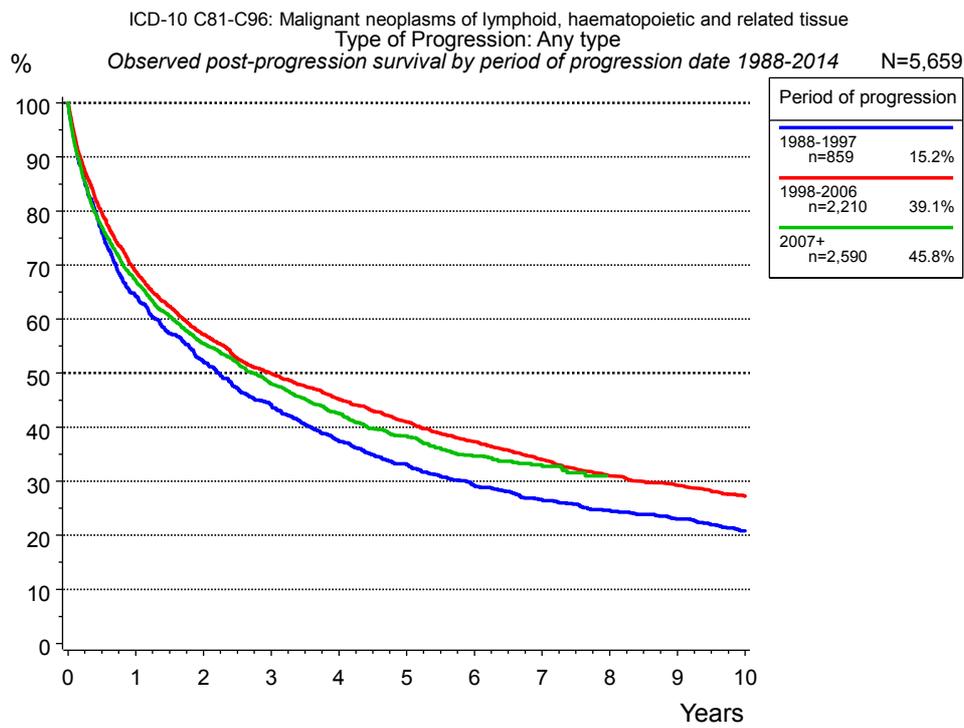


**Figure 5c.** Observed post-progression survival of 4,238 patients with systemic neoplasms diagnosed between 1998 and 2014. These 4,238 patients with documented progression events during their course of disease represent 27.0 % of the totally 15,715 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=2,780, 17.7 %).

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=4,238	
Years	%
0	100.0
1	66.6
2	55.1
3	47.8
4	43.2
5	39.2
6	35.7
7	32.9
8	30.0
9	28.5
10	26.2

**Table 5d.** Observed post-progression survival of patients with systemic neoplasms for period 1998-2014 (N=4,238).



**Figure 5e.** Observed post-progression (any type) survival of 5,659 patients with systemic neoplasms diagnosed between 1988 and 2014 by period of progression.

Years	Period of progression		
	1988-1997 n=859 %	1998-2006 n=2,210 %	2007+ n=2,590 %
0	100.0	100.0	100.0
1	64.2	68.8	67.0
2	52.2	57.2	55.5
3	44.2	49.9	48.0
4	37.4	45.2	42.5
5	33.1	41.0	38.4
6	29.1	37.3	34.7
7	26.5	34.0	32.8
8	24.7	31.0	31.0
9	23.0	29.2	
10	20.8	27.2	

**Table 5f.** Observed post-progression (any type) survival of patients with systemic neoplasms for period 1988-2014 by period of progression (N=5,659).

## 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 C81-C96: Systemic neoplasms [Internet]. 2016 [updated 2016 Apr 11; cited 2016 Jun 1]. Available from: <http://www.tumorregister-muenchen.de/en/facts/surv/sC8196E-ICD-10-C81-C96-Systemic-neoplasms-survival.pdf>

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