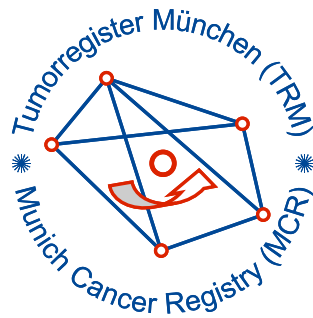


Munich Cancer Registry



- ▶ Incidence and Mortality
- ▶ Selection Matrix
- ▶ Homepage
- ▶ *Deutsch*

ICD-10 C91-C95: Leukaemias

Survival

Year of diagnosis	1988-1997	1998-2014
Patients	1,256	9,084
Diseases	1,259	9,174
Cases evaluated	1,109	5,137
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/sC9195E-ICD-10-C91-C95-Leukaemias-survival.pdf>

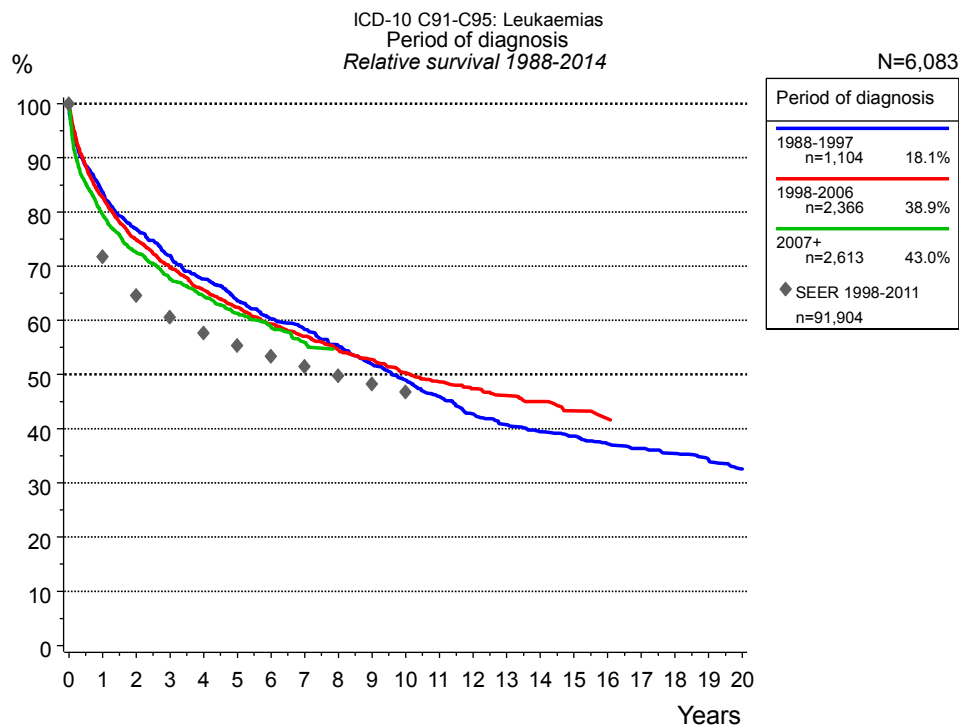


Figure 1a. Relative survival of patients with leukaemias by period of diagnosis. Included in the evaluation are 6,083 cases diagnosed between 1988 and 2014.

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=1,104		1998-2006 n=2,366		2007+ n=2,613	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	82.0	83.7	81.0	82.8	77.7	79.5
2	74.1	76.9	71.8	74.9	69.5	72.6
3	68.1	72.0	65.6	69.7	63.6	67.7
4	62.9	67.6	60.7	65.6	59.6	64.5
5	58.0	63.6	56.7	62.4	55.5	61.3
6	54.0	60.3	52.9	59.3	52.4	58.9
7	51.4	58.4	50.0	57.1	48.9	56.0
8	47.9	55.3	47.0	54.5		
9	44.2	51.9	44.6	52.8		
10	41.0	49.0	41.8	50.3		
11	37.9	46.0	39.8	48.7		
12	34.6	42.7	38.1	47.4		
13	32.5	40.7	36.4	46.1		
14	31.0	39.4	35.2	45.0		
15	30.0	38.6	33.2	43.3		
16	28.4	37.3	32.0	41.8		
17	27.4	36.3				
18	26.2	35.4				
19	25.1	34.3				
20	23.4	32.6				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with leukaemias by period of diagnosis for period 1988-2014 (N=6,083).

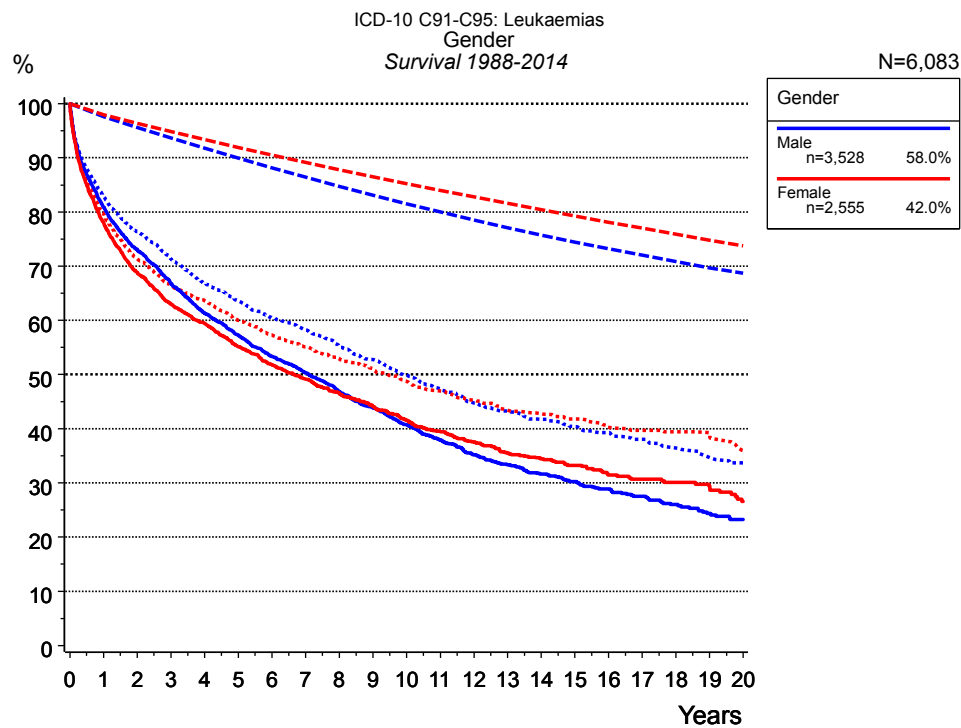


Figure 2a. Survival of patients with leukaemias by gender. Included in the evaluation are 6,083 cases diagnosed between 1988 and 2014.

Years	Gender			
	Male n=3,528		Female n=2,555	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	80.9	82.9	78.2	79.7
2	73.0	76.4	68.8	71.4
3	66.8	71.3	63.0	66.4
4	61.4	66.8	59.4	63.6
5	57.2	63.6	55.1	60.0
6	53.3	60.5	51.9	57.3
7	50.3	58.2	49.2	55.1
8	46.9	55.3	46.6	53.0
9	43.8	52.7	44.2	51.0
10	40.7	49.9	41.5	48.7
11	37.9	47.3	39.6	47.0
12	35.2	44.8	37.6	45.3
13	33.4	43.2	35.5	43.4
14	31.6	41.7	34.5	42.8
15	30.2	40.4	33.2	41.8
16	28.9	39.3	31.5	40.3
17	27.5	38.0	30.7	39.7
18	26.0	36.5	30.1	39.5
19	24.3	34.7	29.4	38.9
20	23.3	33.7	26.6	36.0

Table 2b. Observed (obs.) and relative (rel.) survival of patients with leukaemias by gender for period 1988-2014 (N=6,083).

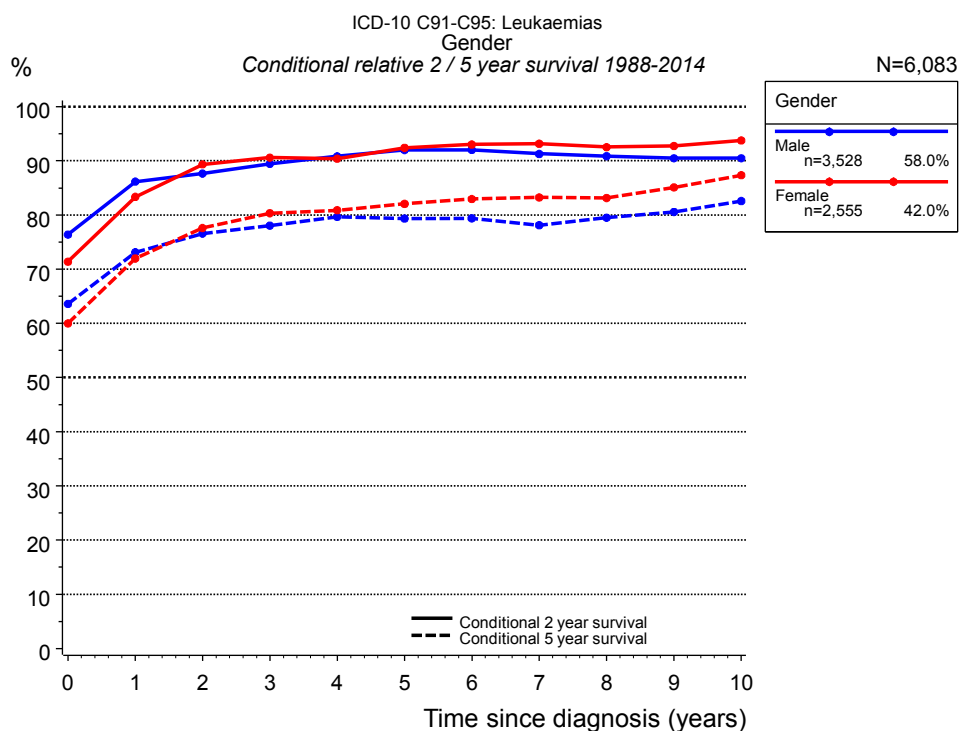


Figure 2c. Conditional relative 2 / 5-year survival of patients with leukaemias by gender. For 6,083 of 6,083 cases diagnosed between 1988 and 2014 valid data could be obtained for this item.

Years	Gender					
	Male			Female		
	n	Cond. surv. % 2 yrs	Cond. surv. % 5 yrs	n	Cond. surv. % 2 yrs	Cond. surv. % 5 yrs
0	3,528	76.4	63.6	2,555	71.4	60.0
1	2,734	86.2	73.1	1,932	83.4	72.0
2	2,369	87.7	76.6	1,620	89.3	77.6
3	2,039	89.4	78.1	1,393	90.6	80.3
4	1,735	90.8	79.7	1,230	90.4	80.9
5	1,501	92.0	79.4	1,032	92.4	82.1
6	1,273	92.0	79.4	885	93.0	83.0
7	1,086	91.3	78.1	758	93.2	83.2
8	883	90.9	79.5	648	92.5	83.1
9	751	90.5	80.6	551	92.7	85.1
10	624	90.5	82.6	472	93.8	87.3

Table 2d. Conditional relative 2 / 5-year survival of patients with leukaemias by gender for period 1988-2014 (N=6,083).

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 89.4% (n=2,039).

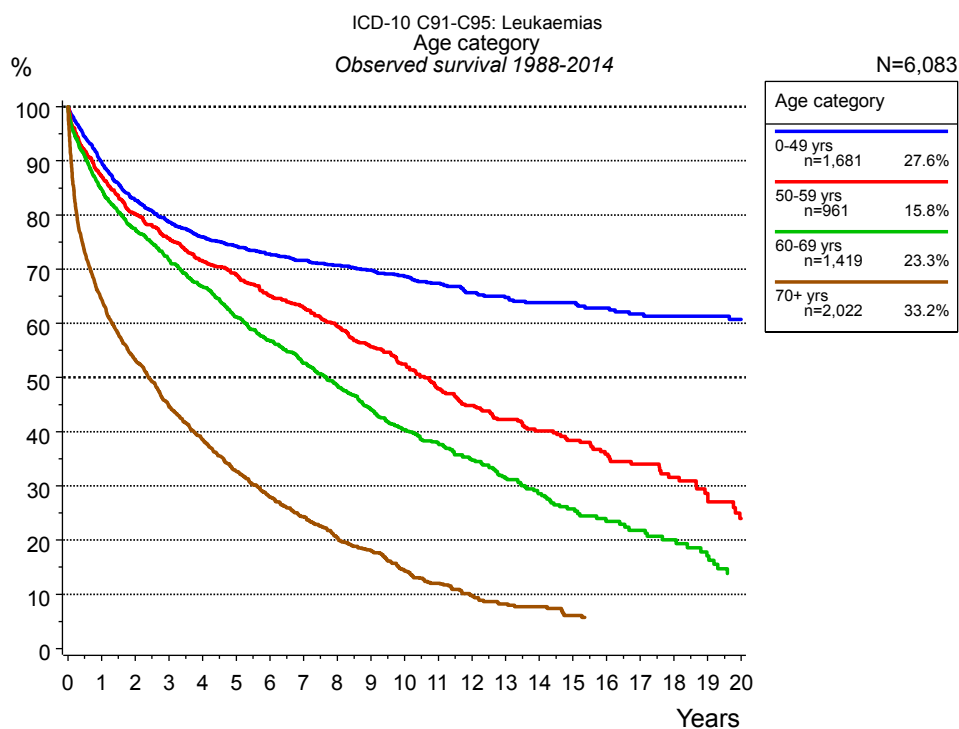


Figure 3a. Observed survival of patients with leukaemias by age category. Included in the evaluation are 6,083 cases diagnosed between 1988 and 2014.

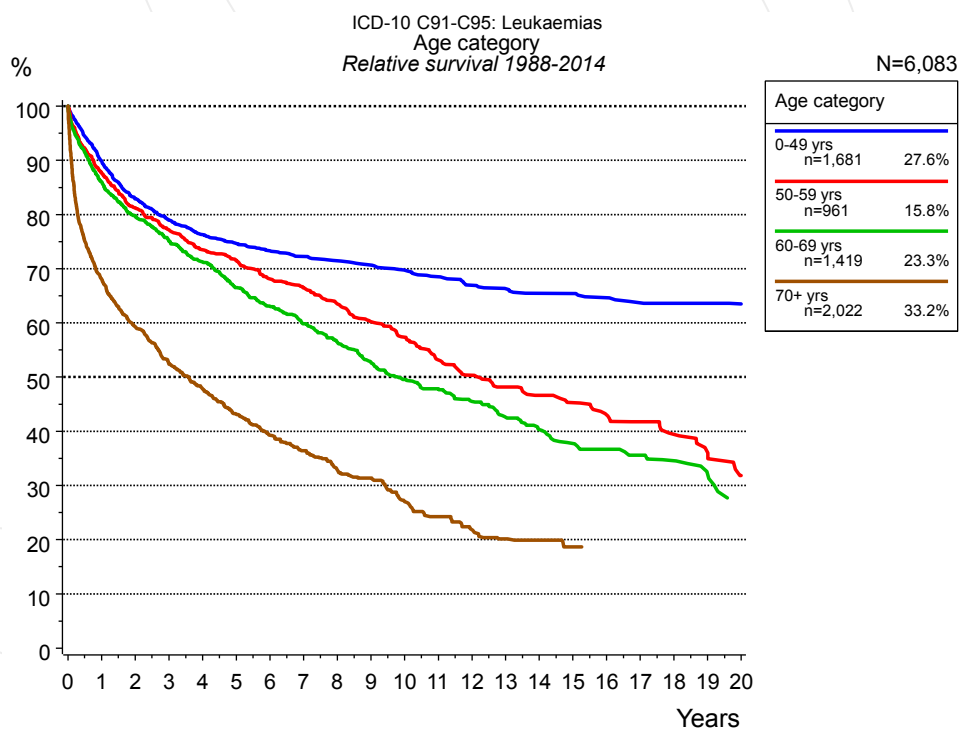


Figure 3b. Relative survival of patients with leukaemias by age category. Included in the evaluation are 6,083 cases diagnosed between 1988 and 2014.

Years	Age category							
	0-49 yrs n=1,681		50-59 yrs n=961		60-69 yrs n=1,419		70+ yrs n=2,022	
	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	89.8	89.9	87.2	87.7	84.8	86.0	64.5	68.1
2	82.7	82.9	80.3	81.2	77.5	79.8	53.2	59.3
3	78.7	79.0	75.7	77.2	71.6	75.1	44.8	52.6
4	76.0	76.3	71.5	73.5	66.7	71.2	38.6	47.8
5	74.3	74.7	68.9	71.5	61.2	66.5	32.7	43.1
6	72.7	73.3	65.2	68.1	56.8	63.1	28.0	39.3
7	71.6	72.2	62.9	66.5	52.7	59.8	24.3	36.4
8	70.7	71.5	59.5	63.5	48.6	56.4	20.5	32.9
9	69.8	70.7	55.7	60.2	44.2	52.7	18.1	31.3
10	68.7	69.7	52.5	57.4	40.4	49.5	14.3	27.0
11	67.4	68.5	47.9	53.1	38.0	47.9	12.0	24.2
12	65.7	66.9	44.9	50.3	34.8	45.5	9.8	21.8
13	64.8	66.3	42.3	48.1	31.4	42.6	8.2	20.1
14	63.8	65.5	40.2	46.6	28.6	40.3	7.7	19.9
15	63.8	65.4	38.4	45.3	25.8	37.8	6.1	18.7
16	62.8	64.6	35.9	43.0	23.5	36.7		
17	61.7	63.7	34.0	41.7	21.9	35.6		
18	61.3	63.6	31.6	39.4	20.1	34.6		
19	61.3	63.6	28.7	36.0	17.1	32.1		
20	60.7	63.5	24.0	31.8				

Table 3c. Observed (obs.) and relative (rel.) survival of patients with leukaemias by age category for period 1988-2014 (N=6,083).

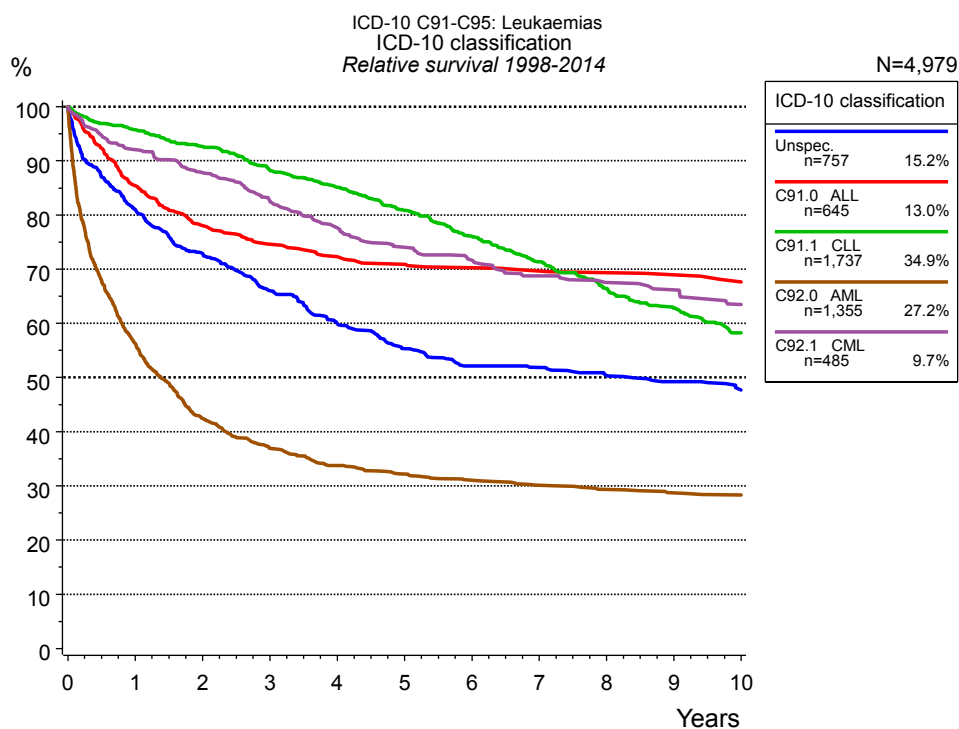


Figure 4a. Relative survival of patients with leukaemias by ICD-10 classification. Included in the evaluation are 4,979 cases diagnosed between 1998 and 2014.

ICD-10 classification										
Years	Unspec. n=757		C91.0 ALL n=645		C91.1 CLL n=1,737		C92.0 AML n=1,355		C92.1 CML n=485	
	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	78.8	81.0	85.0	85.4	93.0	95.7	55.1	56.3	90.5	92.1
2	69.2	72.8	77.6	78.0	87.6	92.6	40.9	42.4	84.9	87.8
3	61.4	66.1	74.0	74.6	81.2	88.2	35.3	37.0	78.7	82.5
4	54.9	60.0	71.8	72.3	76.3	85.1	31.9	33.8	73.0	77.6
5	49.4	55.4	70.4	70.9	70.6	80.9	30.2	32.2	68.5	74.0
6	45.6	52.2	69.6	70.2	64.6	76.1	28.8	31.0	65.6	71.6
7	44.5	51.9	68.9	69.7	59.0	71.3	27.7	30.1	62.1	68.8
8	42.3	50.4	68.5	69.3	53.5	66.4	26.9	29.4	60.0	67.5
9	40.4	49.2	68.1	69.0	49.2	62.8	26.0	28.7	58.4	66.2
10	38.2	47.7	66.8	67.6	44.4	58.3	25.6	28.4	55.2	63.5

Table 4b. Observed (obs.) and relative (rel.) survival of patients with leukaemias by ICD-10 classification for period 1998-2014 (N=4,979).

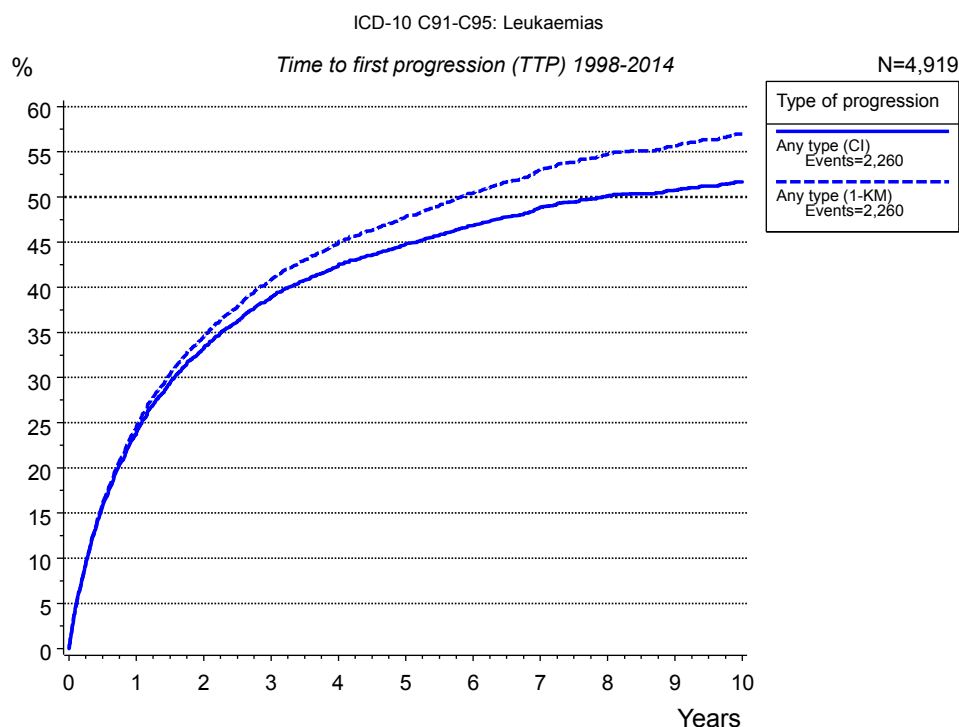


Figure 5a. Time to first progression of 4,919 patients with leukaemias diagnosed between 1998 and 2014 (M0 only in solid cancers) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Years	Type of progression	
	Any type (CI) n=4,919	Any type (1-KM) n=4,919
	%	%
0	0.0	0.0
1	23.8	24.5
2	33.2	34.5
3	38.8	40.8
4	42.3	44.8
5	44.8	47.8
6	46.9	50.4
7	48.9	53.1
8	50.1	54.7
9	50.7	55.7
10	51.6	57.0

Table 5b. Time to first progression of patients with leukaemias for period 1998-2014 (N=4,919).

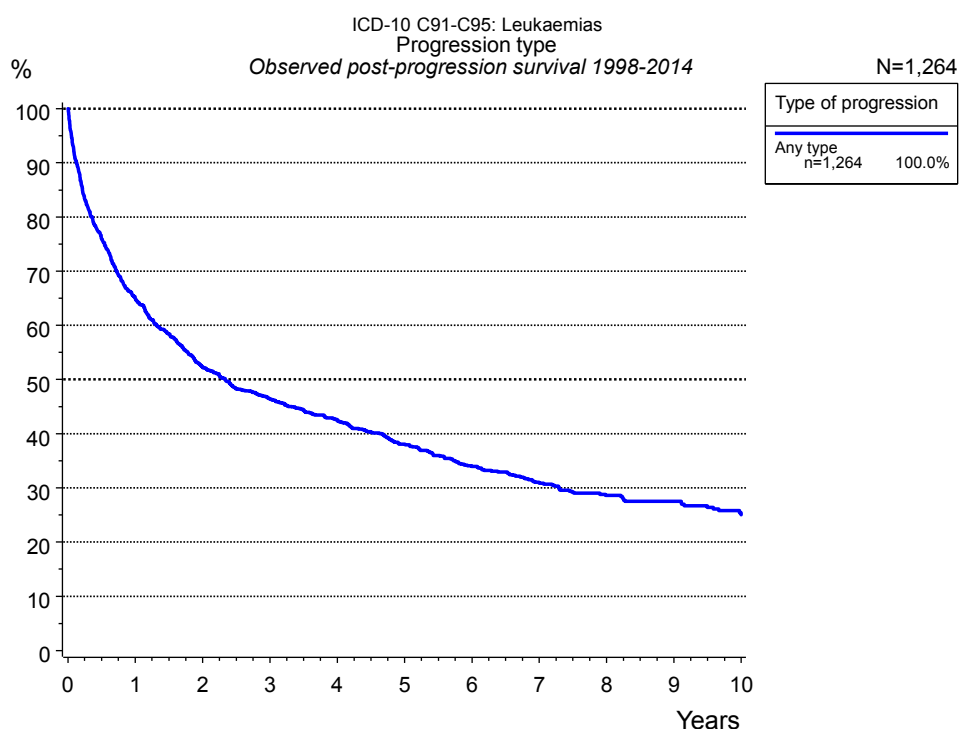


Figure 5c. Observed post-progression survival of 1,264 patients with leukaemias diagnosed between 1998 and 2014. These 1,264 patients with documented progression events during their course of disease represent 25.7 % of the totally 4,919 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=996, 20.2 %).

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=1,264	
Years	%
0	100.0
1	65.0
2	52.3
3	46.5
4	42.6
5	38.1
6	34.0
7	30.9
8	28.6
9	27.5
10	25.1

Table 5d. Observed post-progression survival of patients with leukaemias for period 1998-2014 (N=1,264).

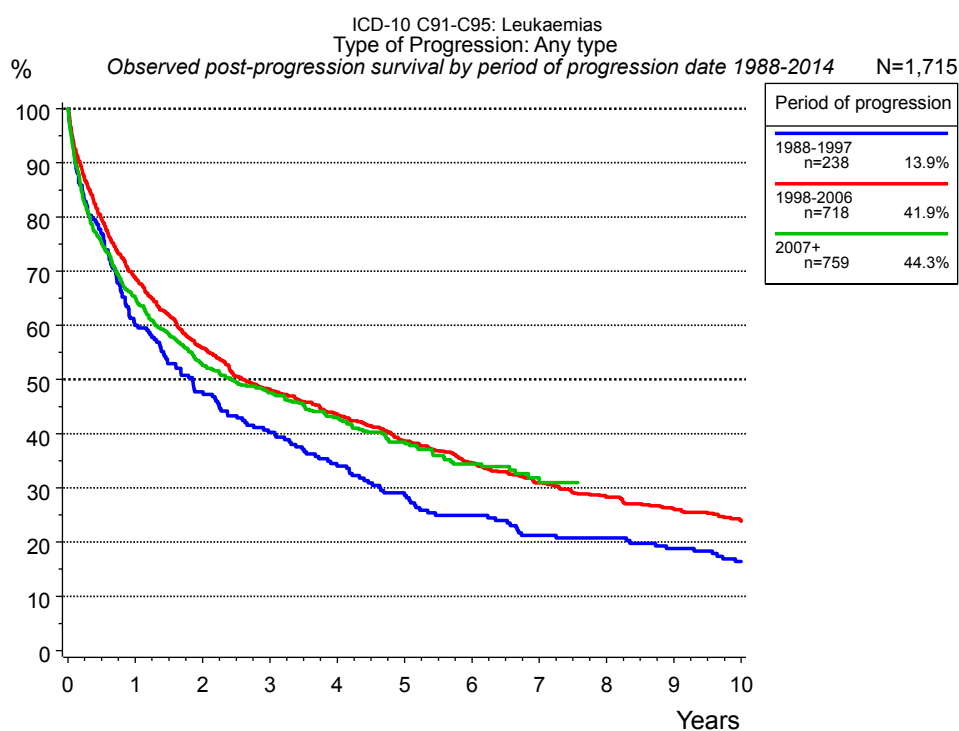


Figure 5e. Observed post-progression (any type) survival of 1,715 patients with leukaemias diagnosed between 1988 and 2014 by period of progression.

Years	Period of progression		
	1988-1997 n=238 %	1998-2006 n=718 %	2007+ n=759 %
0	100.0	100.0	100.0
1	60.0	68.8	65.0
2	47.7	55.9	52.7
3	40.3	48.3	47.6
4	34.1	43.7	43.0
5	28.6	38.6	38.5
6	24.9	34.6	34.4
7	21.3	31.0	31.0
8	20.8	28.3	31.0
9	18.8	26.2	
10	16.4	23.9	

Table 5f. Observed post-progression (any type) survival of patients with leukaemias for period 1988-2014 by period of progression (N=1,715).

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

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Index of figures and tables

Fig./Tbl.	Page
1a Relative survival by period of diagnosis (chart)	2
1b Survival by period of diagnosis (table)	3
2a Survival by gender (chart)	4
2b Survival by gender (table)	4
2c Conditional survival by gender (chart)	5
2d Conditional survival by gender (table)	5
3a Observed survival by age category (chart)	6
3b Relative survival by age category (chart)	6
3c Survival by age category (table)	7
4a Relative survival by ICD-10 classification (chart)	8
4b Survival by ICD-10 classification (table)	8
5a Time to first progression (chart)	9
5b Time to first progression (table)	9
5c Observed post-progression survival (chart)	10
5d Observed post-progression survival (table)	10
5e Observed post-progression survival by period of progression (chart)	11
5f Observed post-progression survival by period of progression (table)	11