Munich Cancer Registry

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ICD-10 C91.0, C92.0-C94.4: Acute leukaemias

Survival

Year of diagnosis	1988-1997	1998-2020
Patients	470	4,712
Diseases	470	4,718
Cases evaluated	433	2,798

Creation date	04/15/2022
Database export	12/20/2021
Population	4.92 m

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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/surv/sC914aE-ICD-10-C91.0-C92.0-C94.4-Acute-leukaemias-survival.pdf

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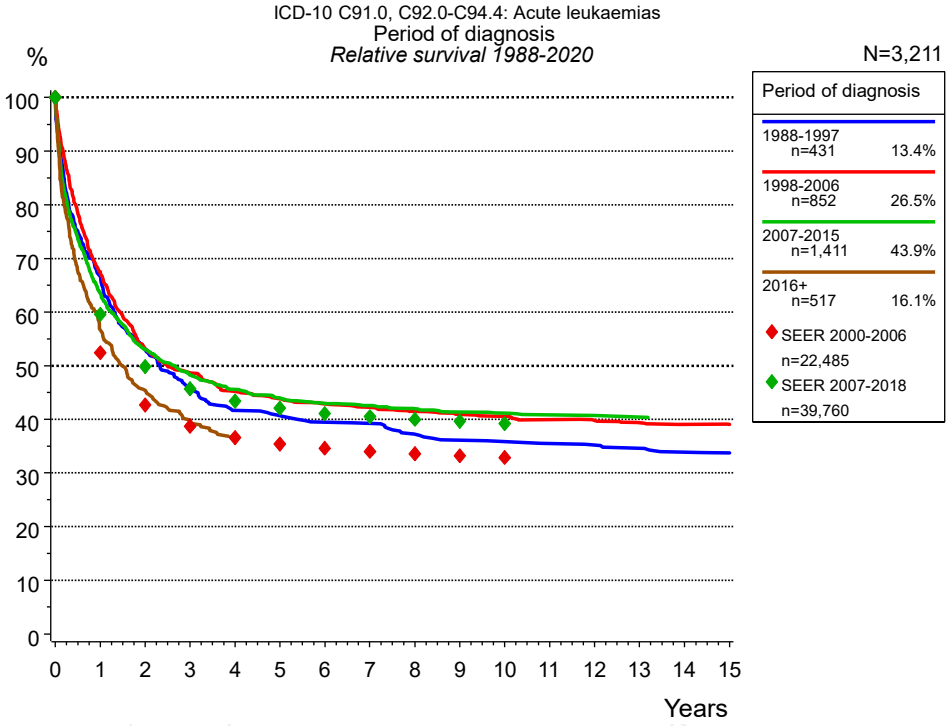

Figure 1a. Relative survival of patients with acute leukaemias by period of diagnosis. Included in the evaluation are 3,211 cases diagnosed between 1988 and 2020.

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=431		1998-2006 n=852		2007-2015 n=1,411		2016+ n=517	
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	65.7	66.6	66.4	67.4	62.2	63.5	55.4	56.6
2	52.3	53.1	52.0	53.1	51.5	53.0	44.0	45.4
3	45.1	46.0	47.2	48.6	46.5	48.2	38.0	39.6
4	40.5	41.7	43.8	45.2	43.6	45.6		
5	39.5	40.6	42.2	43.8	41.9	44.0		
6	38.2	39.4	41.0	42.8	40.6	43.0		
7	37.9	39.2	40.2	42.2	40.0	42.6		
8	35.7	37.2	39.3	41.4	39.2	41.9		
9	34.6	36.1	38.6	40.9	38.4	41.3		
10	34.4	35.9	38.1	40.5	38.0	41.1		
11	33.8	35.5	37.3	39.9	37.4	40.8		
12	33.5	35.2	37.1	39.8	37.1	40.7		
13	32.9	34.6	36.4	39.4	37.1	40.4		
14	32.0	33.9	35.8	39.0				
15	31.7	33.7	35.7	39.0				
Median	2.3		2.3		2.2		1.4	

Table 1b. Observed (obs.) and relative (rel.) survival of patients with acute leukaemias by period of diagnosis for period 1988-2020 (N=3,211).

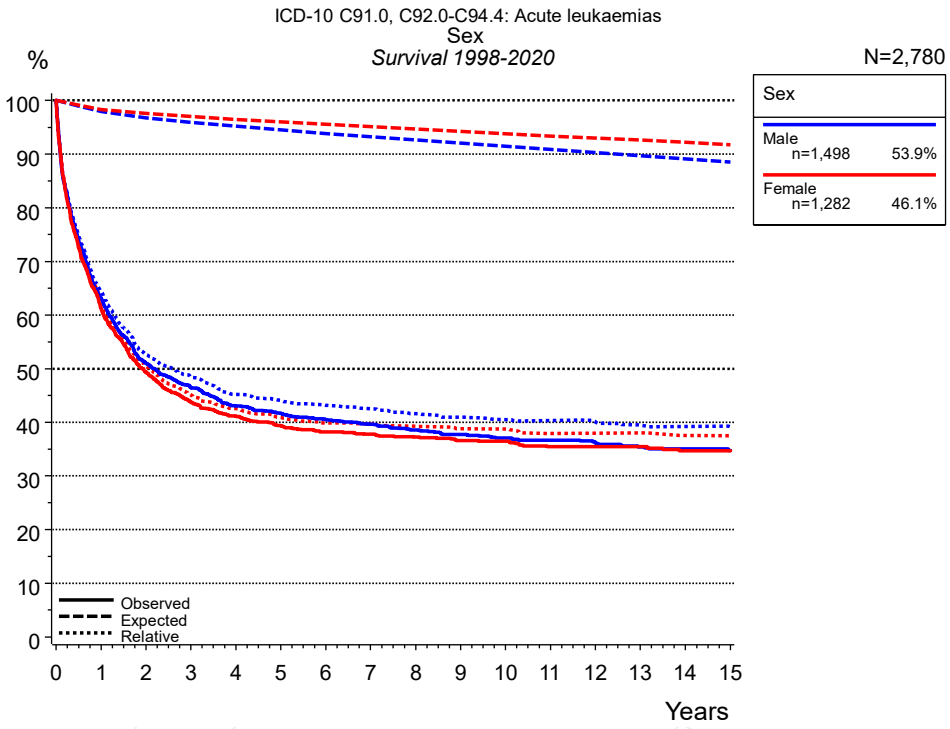

Figure 2a. Survival of patients with acute leukaemias by sex. Included in the evaluation are 2,780 cases diagnosed between 1998 and 2020.

	Sex			
	Male n=1,498		Female n=1,282	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	63.0	64.4	61.3	62.4
2	51.1	52.7	49.3	50.5
3	46.5	48.4	43.8	45.1
4	43.0	45.2	41.2	42.6
5	41.8	44.1	39.4	40.9
6	40.5	43.2	38.2	39.9
7	39.7	42.5	37.8	39.6
8	38.6	41.6	37.2	39.3
9	37.8	41.0	36.6	38.8
10	37.1	40.5	36.5	38.7
11	36.7	40.3	35.4	37.9
12	36.2	40.1	35.4	38.0
13	35.4	39.4	35.4	38.0
14	35.0	39.2	34.7	37.6
15	34.8	39.2	34.7	37.5
Median	2.2		1.9	

Table 2b. Observed (obs.) and relative (rel.) survival of patients with acute leukaemias by sex for period 1998-2020 (N=2,780).

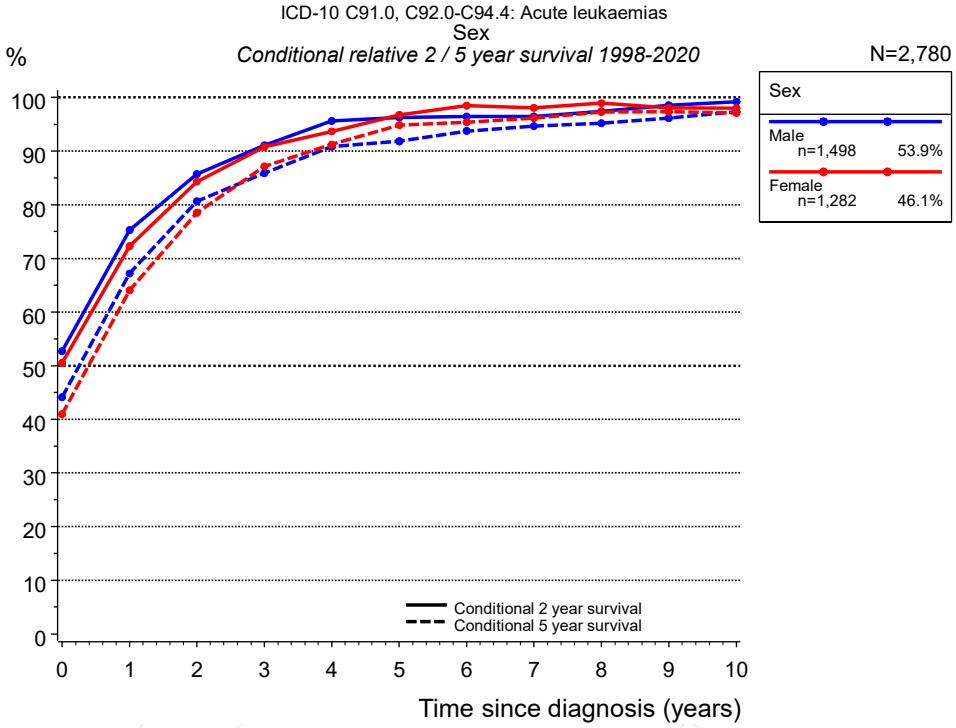

Figure 2c. Conditional relative 2 / 5-year survival of patients with acute leukaemias by sex. For 2,780 of 2,780 cases diagnosed between 1998 and 2020 valid data could be obtained for this item.

	Sex					
	Male			Female		
		Cond. surv. %			Cond. surv. %	
Years	n	2 yrs	5 yrs	n	2 yrs	5 yrs
0	1,498	52.7	44.1	1,282	50.5	40.9
1	898	75.2	67.2	753	72.3	64.1
2	704	85.7	80.6	579	84.3	78.5
3	624	91.1	85.9	491	90.8	87.2
4	562	95.6	90.8	447	93.7	91.2
5	512	96.3	91.9	407	96.8	94.8
6	473	96.4	93.7	375	98.5	95.4
7	443	96.5	94.7	356	98.1	96.2
8	400	97.4	95.2	331	99.0	97.3
9	351	98.5	96.2	292	98.1	97.3
10	306	99.2	97.4	255	98.0	97.1

Table 2d. Conditional relative 2 / 5-year survival of patients with acute leukaemias by sex for period 1998-2020 (N=2,780).

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 91.1% (n=624).

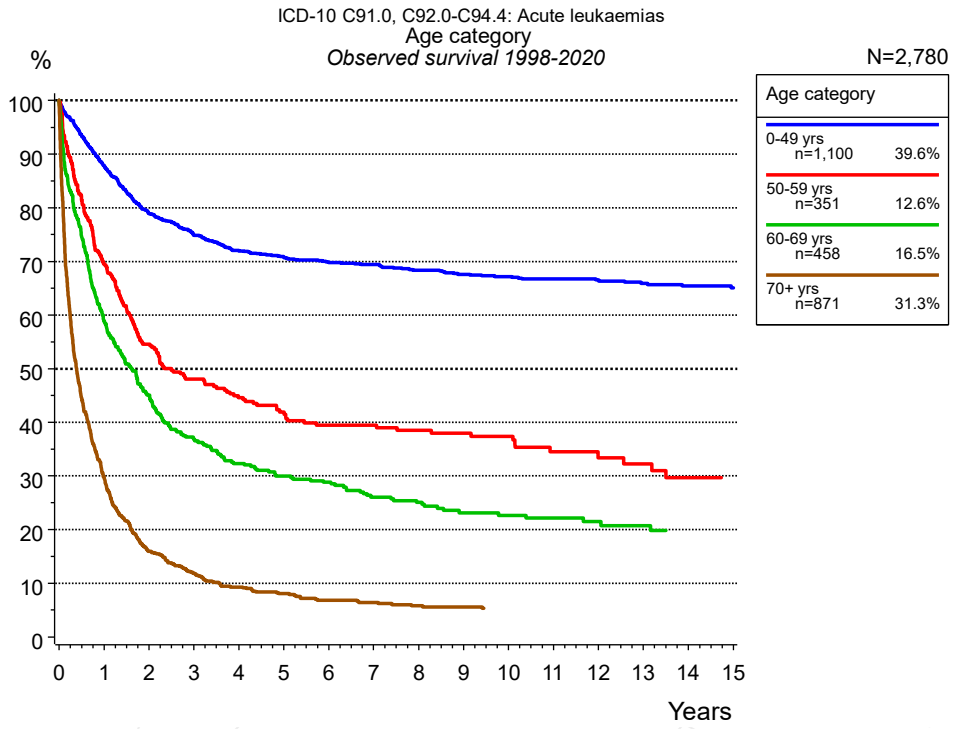

Figure 3a. Observed survival of patients with acute leukaemias by age category. Included in the evaluation are 2,780 cases diagnosed between 1998 and 2020.

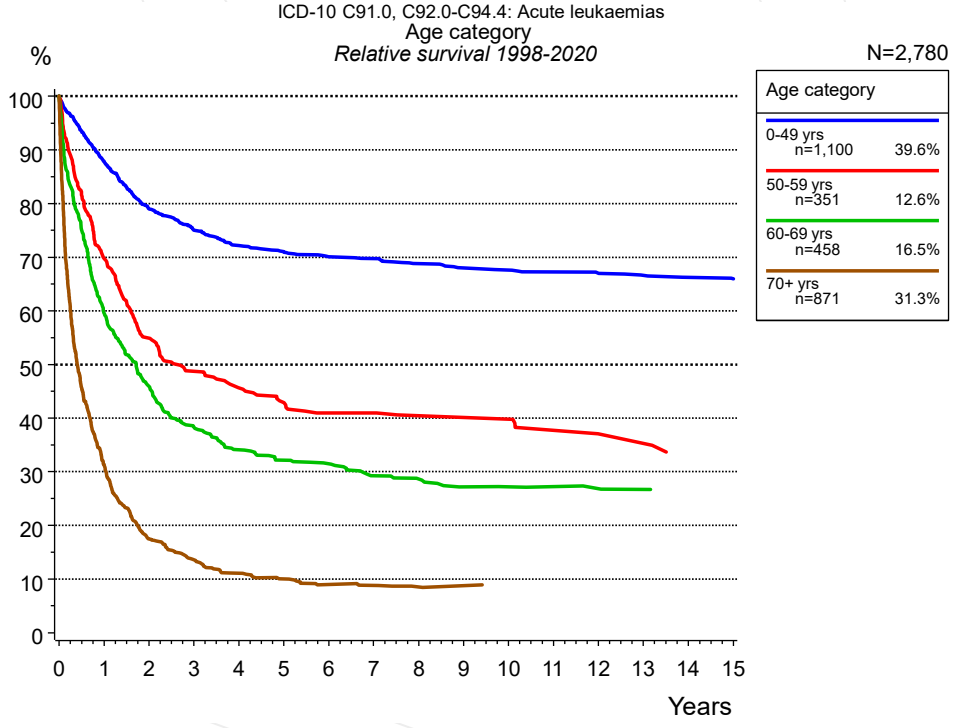

Figure 3b. Relative survival of patients with acute leukaemias by age category. Included in the evaluation are 2,780 cases diagnosed between 1998 and 2020.

	Age category							
	0-49 yrs n=1,100		50-59 yrs n=351		60-69 yrs n=458		70+ yrs n=871	
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	87.8	87.9	69.4	69.7	58.9	59.6	29.7	31.3
2	79.0	79.0	54.6	54.9	45.1	45.9	15.9	17.5
3	74.9	75.0	48.0	48.7	36.8	38.3	11.9	13.6
4	72.1	72.2	44.6	45.6	32.3	34.1	9.3	11.1
5	70.9	71.1	42.0	42.9	29.9	32.2	8.0	10.0
6	69.8	70.1	39.4	40.9	28.8	31.5	6.8	9.0
7	69.5	69.8	39.4	40.9	26.1	29.2	6.4	8.8
8	68.4	68.8	38.5	40.4	25.1	28.6	5.8	8.5
9	67.6	68.0	38.0	40.1	23.1	27.2	5.5	8.8
10	67.2	67.6	37.4	39.8	22.6	27.2		
11	66.7	67.3	34.5	37.7	22.1	27.2		
12	66.5	67.1	33.4	37.0	21.5	26.9		
13	65.9	66.6	32.3	35.3	20.7	26.7		
14	65.4	66.2	29.7	33.6				
15	65.1	66.0	29.7	33.4				
Median			2.5		1.6		0.4	

Table 3c. Observed (obs.) and relative (rel.) survival of patients with acute leukaemias by age category for period 1998-2020 (N=2,780).

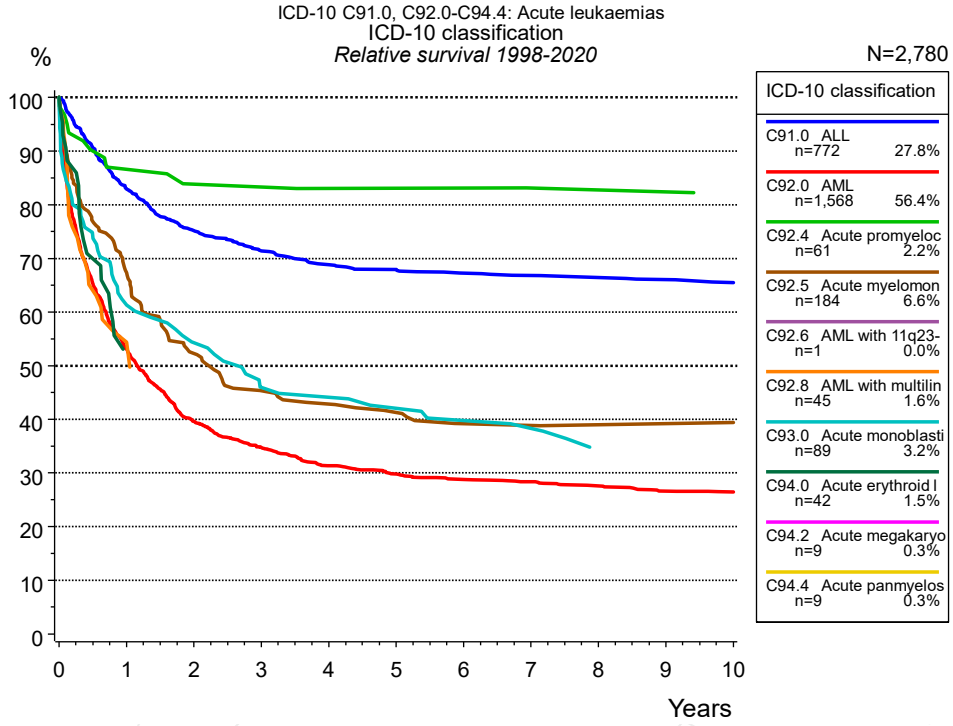

Figure 4a. Relative survival of patients with acute leukaemias by ICD-10 classification. Included in the evaluation are 2,780 cases diagnosed between 1998 and 2020. Subgroups with sample size <20 are omitted from the chart.

	ICD-10 classification													
	C91.0 ALL n=772		C92.0 AML n=1,568		C92.4 Acute promyelocytic leukaemia n=61		C92.5 Acute myelomonocytic leukaemia n=184		C92.8 AML with multilineage dysplasia n=45		C93.0 Acute monoblastic/monocytic leuk n=89		C94.0 Acute erythroid leukaemia n=42	
Years	obs. %	rel. %	obs. %	rel. %	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	100.0	100.0	100.0	100.0
1	82.5	82.9	51.8	53.1	86.4	86.6	66.6	67.4	53.1	54.3	60.2	61.3	52.1	52.1
2	74.8	75.2	38.0	39.6	82.6	83.9	51.0	52.3			53.0	54.3		
3	70.9	71.4	33.0	34.7	82.6	83.4	43.5	45.3			44.5	46.0		
4	68.2	68.9	29.4	31.4	80.6	83.1	41.2	42.8			43.3	44.1		
5	67.2	67.9	27.7	29.8	80.6	83.1	39.3	41.3			40.8	42.1		
6	66.2	67.3	26.4	28.8	80.6	83.1	36.7	39.2			38.3	39.8		
7	65.8	66.8	25.8	28.4	77.9	83.1	36.7	38.9			37.0	38.3		
8	65.3	66.5	24.8	27.6	77.9	82.8	36.0	39.0			32.7	34.7		
9	64.8	66.0	23.7	26.6	77.9	82.4	36.0	39.2						
10	64.1	65.5	23.4	26.4			36.0	39.4						
Median			1.1				2.1		1.0		2.4		1.1	

Table 4b. Observed (obs.) and relative (rel.) survival of patients with acute leukaemias by ICD-10 classification for period 1998-2020 (N=2,780).

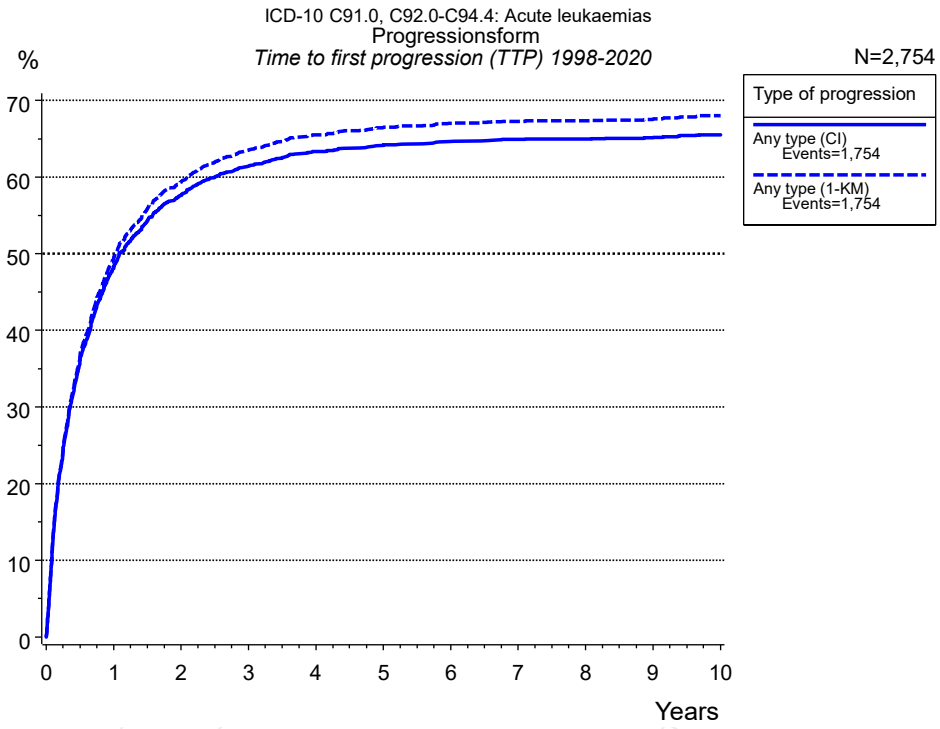

Figure 5a. Time to first progression of 2,754 patients with acute leukaemias diagnosed between 1998 and 2020 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

	Type of progression	
	Any type (CI)	Any type (1-KM)
N	2,754	2,754
Events	1,747	1,747
compet.	162	
Years	%	%
0	0.0	0.0
1	48.3	49.4
2	57.6	59.4
3	61.4	63.5
4	63.3	65.6
5	64.2	66.5
6	64.7	67.0
7	64.9	67.3
8	64.9	67.3
9	65.1	67.5
10	65.5	68.0

Table 5b. Time to first progression of patients with acute leukaemias for period 1998-2020 (N=2,754), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

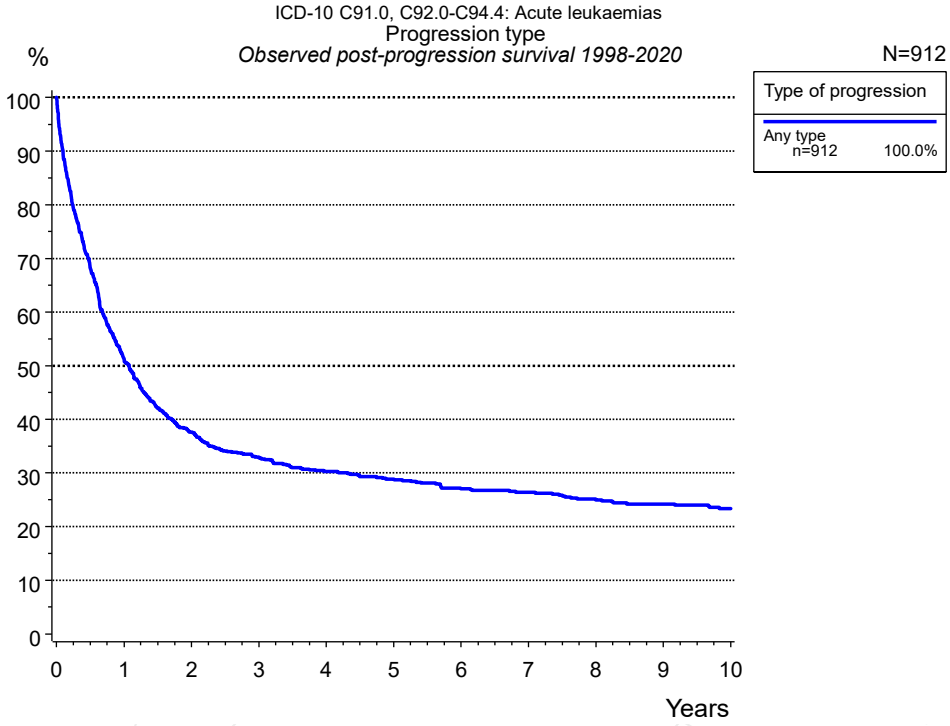

Figure 5c. Observed post-progression survival of 912 patients with acute leukaemias diagnosed between 1998 and 2020. These 912 patients with documented progression events during their course of disease represent 33.1 % of the totally 2,755 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=843, 30.6 %).

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 potientially considered in more than one subgroup.

	Type of progression
	Any type n=912
Years	%
0	100.0
1	51.2
2	37.6
3	33.0
4	30.3
5	28.9
6	27.1
7	26.4
8	25.0
9	24.2
10	23.4

Table 5d. Observed post-progression survival of patients with acute leukaemias for period 1998-2020 (N=912).

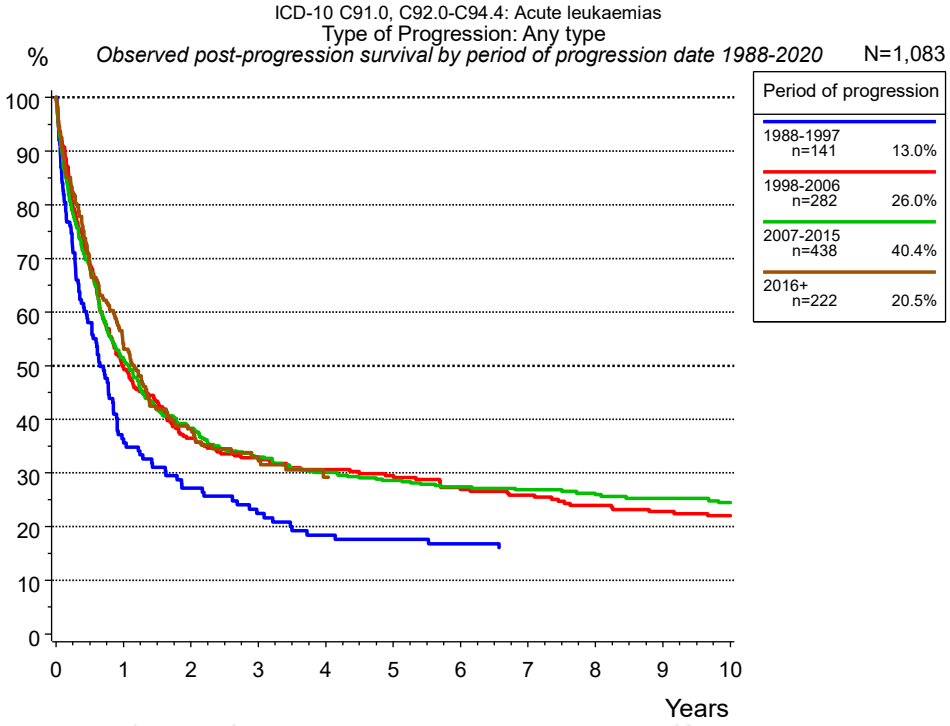

Figure 5e. Observed post-progression (any type) survival of 1,083 patients with acute leukaemias diagnosed between 1988 and 2020 by period of progression.

	Period of progression			
	1988-1997 n=141	1998-2006 n=282	2007-2015 n=438	2016+ n=222
Years	%	%	%	%
0	100.0	100.0	100.0	100.0
1	36.4	49.6	51.1	54.1
2	27.2	36.5	38.3	38.2
3	22.4	32.8	32.9	33.1
4	18.4	30.6	30.1	29.2
5	17.6	29.5	28.6	
6	16.8	26.9	27.4	
7	16.0	25.8	26.9	
8	16.0	23.9	25.9	
9		22.8	25.2	
10		22.0	24.4	

Table 5f. Observed post-progression (any type) survival of patients with acute leukaemias for period 1988-2020 by period of progression (N=1,083).

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 C91.0, C92.0-C94.4: Acute leukaemias [Internet]. 2022 [updated 2022 Apr 15; cited 2022 Jun 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/surv/sC914aE-ICD-10-C91.0-C92.0-C94.4-Acute-leukaemias-survival.pdf

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