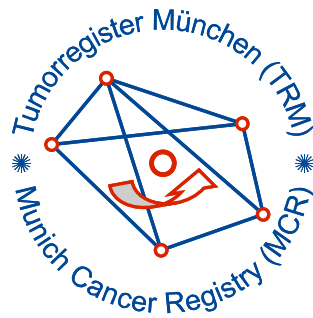


Munich Cancer Registry



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

Sarcoma (morphological classification)

Survival

Year of diagnosis	1988-1997	1998-2020
Patients	695	4,357
Diseases	695	4,382
Cases evaluated	639	3,379
Creation date	04/27/2022	
Database export	12/20/2021	
Population	4.92 m	



Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninstr. 15
Munich, 81377
Germany

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

https://www.tumorregister-muenchen.de/en/facts/surv/shST__E-Sarcoma-morphological-classification-survival.pdf

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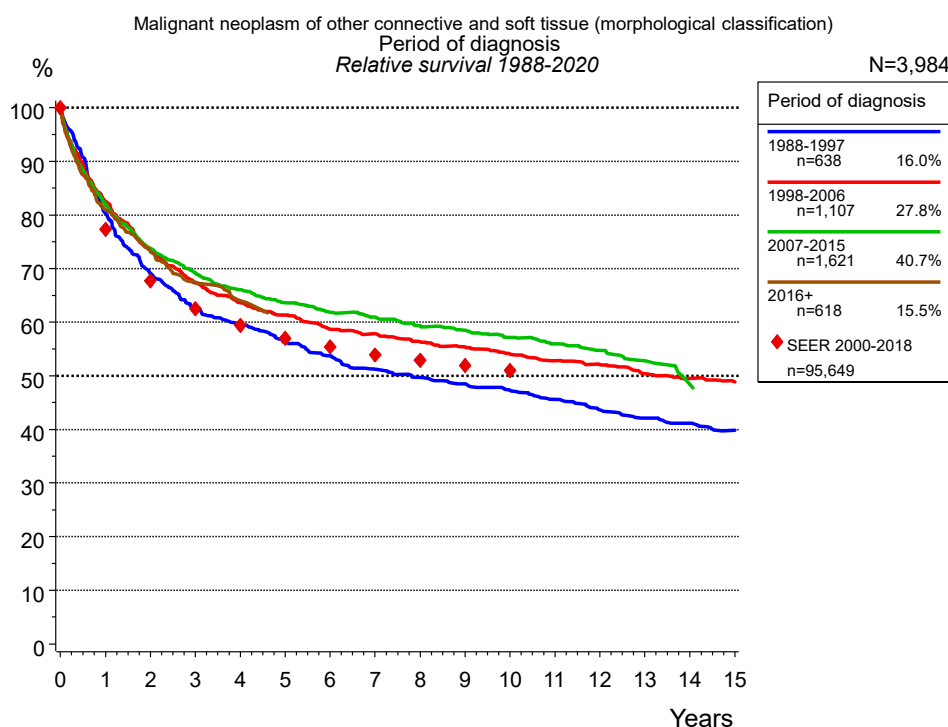


Figure 1a. Relative survival of patients with sarcoma (morphological classification) by period of diagnosis. Included in the evaluation are 3,984 cases diagnosed between 1988 and 2020.

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.

Years	Period of diagnosis							
	1988-1997 n=638		1998-2006 n=1,107		2007-2015 n=1,621		2016+ n=618	
	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	78.7	80.3	81.0	82.5	80.4	82.0	79.3	80.9
2	66.8	69.1	70.9	73.5	71.0	73.8	70.7	73.1
3	59.4	62.6	64.0	67.3	65.5	69.2	64.1	67.5
4	55.6	59.6	59.5	63.6	61.4	66.1	59.9	64.0
5	51.6	56.2	56.4	61.3	58.2	63.7	57.1	59.9
6	48.6	53.7	53.2	58.7	55.6	61.8		
7	45.7	51.2	51.7	57.9	53.9	60.9		
8	43.7	49.7	49.5	56.4	51.6	59.3		
9	41.9	48.5	47.9	55.4	50.0	58.5		
10	40.2	47.2	46.0	54.0	48.0	57.2		
11	38.2	45.6	44.2	52.8	46.3	56.0		
12	36.0	43.6	42.9	52.1	44.4	54.7		
13	34.2	42.1	40.8	50.4	42.2	52.8		
14	33.1	41.2	39.5	49.5	38.7	48.4		
15	31.4	39.8	38.4	48.9				
Median	5.5		7.8		9.0			

Table 1b. Observed (obs.) and relative (rel.) survival of patients with sarcoma (morphological classification) by period of diagnosis for period 1988-2020 (N=3,984).

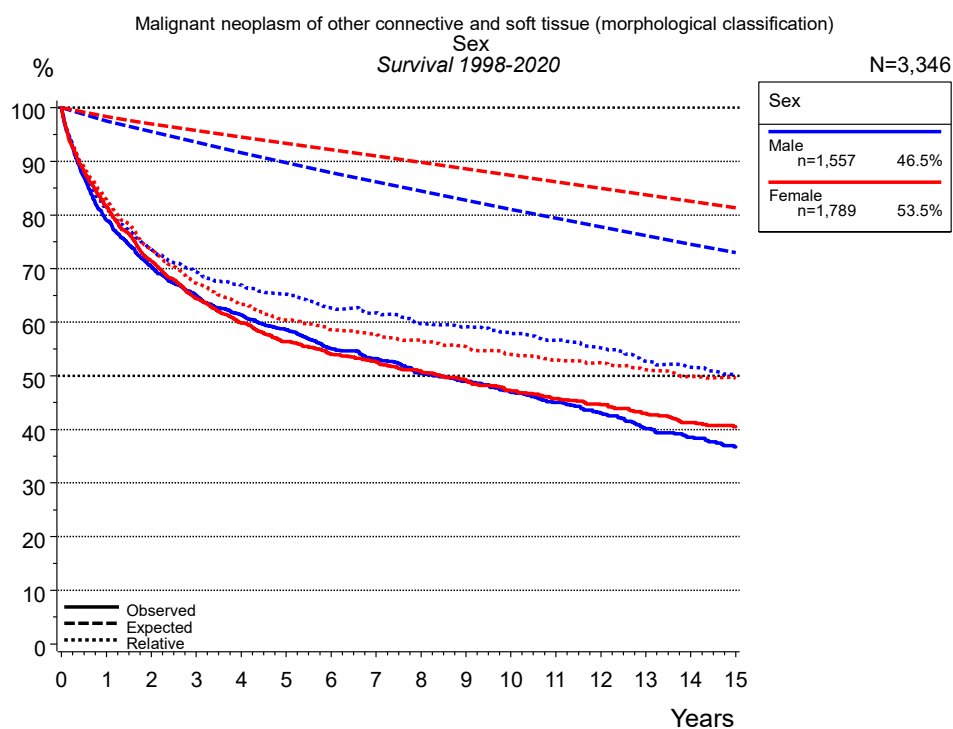


Figure 2a. Survival of patients with sarcoma (morphological classification) by sex. Included in the evaluation are 3,346 cases diagnosed between 1998 and 2020.

Years	Sex			
	Male n=1,557		Female n=1,789	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	79.1	81.0	81.5	82.9
2	70.3	73.6	71.4	73.6
3	65.0	69.4	64.4	67.3
4	61.3	66.9	59.9	63.3
5	58.6	65.2	56.4	60.4
6	55.1	62.6	54.0	58.6
7	53.2	61.7	52.6	57.7
8	50.4	59.7	51.0	56.6
9	49.0	59.1	49.2	55.5
10	47.0	57.9	47.2	54.0
11	45.0	56.6	45.7	52.9
12	43.0	55.2	44.6	52.4
13	40.1	52.7	43.0	51.2
14	38.6	51.6	41.3	49.9
15	36.7	50.2	40.5	49.5
Median	8.4		8.4	

Table 2b. Observed (obs.) and relative (rel.) survival of patients with sarcoma (morphological classification) by sex for period 1998-2020 (N=3,346).

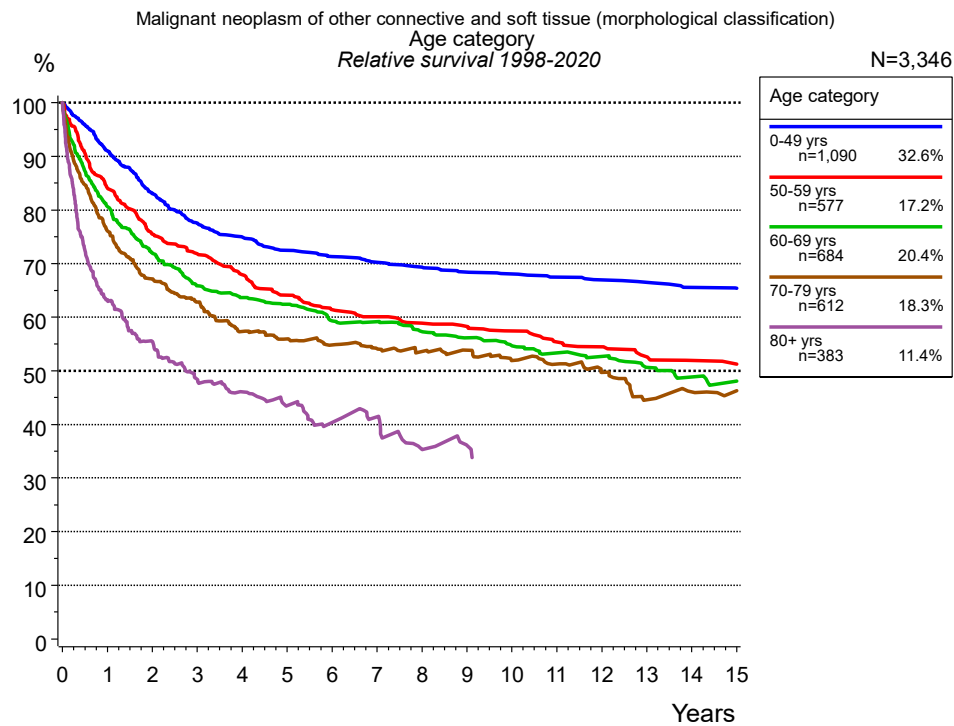


Figure 3a. Relative survival of patients with sarcoma (morphological classification) by age category. Included in the evaluation are 3,346 cases diagnosed between 1998 and 2020.

Years	Age category									
	0-49 yrs n=1,090		50-59 yrs n=577		60-69 yrs n=684		70-79 yrs n=612		80+ yrs n=383	
	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	91.0	91.0	83.8	84.1	79.7	80.7	74.0	76.1	57.3	63.2
2	82.9	83.1	74.8	75.5	70.2	72.0	63.3	67.2	45.2	55.4
3	77.3	77.5	70.8	71.9	63.4	65.9	57.1	62.8	35.2	48.4
4	74.7	74.9	66.5	67.9	60.4	63.7	50.2	57.4	29.5	46.1
5	72.1	72.5	62.4	64.1	58.3	62.4	46.9	56.0	24.2	43.5
6	70.8	71.3	59.3	61.4	54.4	59.3	43.8	54.8	19.6	40.3
7	69.7	70.2	57.6	60.1	53.3	59.2	41.0	54.1	17.5	41.4
8	68.7	69.3	55.8	58.9	50.6	57.3	38.3	53.6	12.8	35.3
9	67.6	68.4	55.0	58.3	48.4	56.2	36.3	53.8	10.5	36.1
10	67.1	68.0	53.5	57.4	46.1	54.7	32.4	51.9		
11	66.4	67.5	51.0	55.4	43.8	53.4	29.8	51.3		
12	65.7	66.9	49.9	54.5	42.0	52.7	26.3	49.7		
13	65.2	66.5	47.6	52.6	39.0	50.6	21.5	44.6		
14	64.0	65.6	46.0	51.9	36.5	48.9	20.1	46.0		
15	63.6	65.4	45.3	51.2	34.7	48.1	17.9	46.3		
Median			11.5		8.3		4.1		1.5	

Table 3b. Observed (obs.) and relative (rel.) survival of patients with sarcoma (morphological classification) by age category for period 1998-2020 (N=3,346).

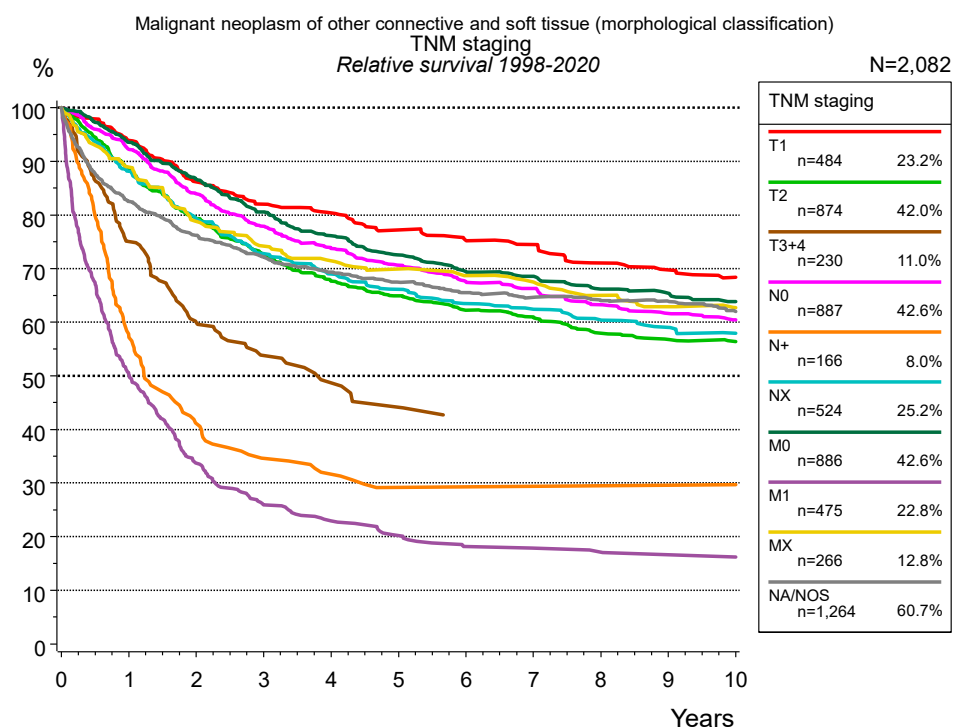


Figure 4a. Relative survival of patients with sarcoma (morphological classification) by TNM staging. For 2,083 of 3,346 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 2,082 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 1,264 patients with missing values regarding TNM staging (37.8 % of 3,346 patients, the percent values of all other categories are related to n=2,082).

TNM staging														
Years	T1 n=484		T2 n=874		T3+4 n=230		N0 n=887		N+ n=166		NX n=524		M0 n=886	
	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	92.5	93.9	87.0	88.5	73.7	75.0	90.9	92.3	56.5	57.2	86.4	88.1	92.2	93.5
2	83.9	86.2	76.7	79.4	57.9	60.0	81.5	83.9	40.4	41.1	76.5	79.3	84.3	86.6
3	78.8	82.0	69.1	72.6	51.0	53.8	74.6	77.8	33.7	34.6	68.9	72.8	77.3	80.6
4	76.1	80.4	63.5	67.7	45.9	48.7	69.7	73.8	30.9	31.7	64.3	69.0	71.9	76.1
5	72.2	77.2	59.9	64.9	41.8	44.1	65.7	70.6	27.9	29.2	60.7	66.1	67.6	72.5
6	69.4	75.2	56.5	62.3	38.7	42.6	62.0	67.5	27.9	29.3	57.3	63.5	63.9	69.4
7	67.8	74.5	54.5	61.0	38.7	42.4	60.1	66.3	27.9	29.4	55.6	62.4	62.4	68.5
8	63.6	71.0	51.0	57.9			56.5	63.2	27.9	29.5	52.9	60.4	59.5	66.2
9	61.6	69.7	49.2	56.8			54.2	61.6	27.9	29.6	50.9	59.0	58.0	65.4
10	59.3	68.4	48.2	56.4			52.3	60.4	27.9	29.7	49.0	58.0	55.7	63.8
Median	15.6		8.5		3.3		12.0		1.2		9.1		13.1	

<i>cont'd</i>	TNM staging					
	M1 n=475		MX n=266		NA/NOS n=1,264	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
Years						
0	100.0	100.0	100.0	100.0	100.0	100.0
1	49.4	50.3	87.3	89.0	80.7	82.5
2	32.7	33.7	76.0	78.8	73.0	76.2
3	25.0	25.9	70.5	74.2	67.8	72.2
4	22.2	22.9	66.9	71.5	63.9	69.3
5	19.3	20.2	64.5	69.9	61.0	67.5
6	17.0	18.2	61.9	68.7	58.2	65.5
7	16.7	17.9	60.2	67.5	56.4	64.6
8	16.2	17.1	56.8	65.0	54.9	64.0
9	15.3	16.6	54.1	62.9	53.8	63.9
10	15.3	16.1	52.7	62.8	51.2	62.0
Median	1.0		11.6		10.6	

Table 4b. Observed (obs.) and relative (rel.) survival of patients with sarcoma (morphological classification) by TNM staging for period 1998-2020 (N=2,082).

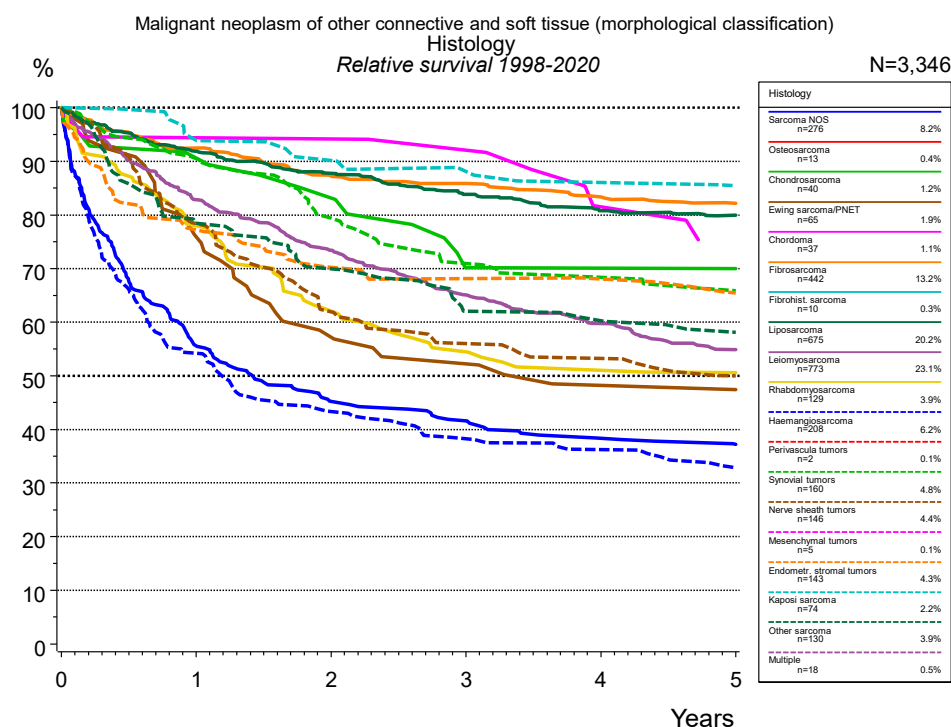


Figure 4e. Relative survival of patients with sarcoma (morphological classification) by histology. For 3,346 of 3,346 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. Subgroups with sample size <20 are omitted from the chart.

		Histology													
		Sarcoma NOS		Chondrosarcoma		Ewing sarcoma/PNET		Chordoma		Fibrosarcoma		Liposarcoma		Leiomyosarcoma	
		n=276		n=40		n=65		n=37		n=442		n=675		n=773	
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		54.1	55.6	89.7	90.6	76.0	75.9	94.4	94.4	90.6	92.5	90.0	91.9	81.3	82.8
2		42.8	45.2	81.6	83.1	58.1	57.2	94.4	94.2	83.8	87.2	84.3	87.7	70.8	73.4
3		38.8	41.6	65.3	70.2	53.1	52.2	91.2	92.1	81.0	85.9	79.0	83.8	61.7	65.1
4		34.7	38.4	65.3	70.1	47.9	48.2	77.2	81.5	77.3	83.4	74.7	80.8	55.8	59.7
5		32.9	37.2	65.3	69.9	47.9	47.4	70.2	75.1	74.8	82.2	72.6	79.9	50.4	54.9
Median		1.2				3.3						13.8		5.2	

		Histology													
		Rhabdomyosarcoma		Haemangiosarcoma		Synovial tumors		Nerve sheath tumors		Endometr. stromal tumors		Kaposi sarcoma		Other sarcoma	
		n=129		n=208		n=160		n=146		n=143		n=74		n=130	
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		77.8	78.0	52.9	54.3	90.6	90.5	77.2	78.4	76.7	77.2	92.5	93.9	77.4	78.4
2		61.8	62.1	40.9	43.3	78.7	79.4	60.5	61.9	68.8	70.2	86.4	90.2	68.6	69.9
3		54.6	54.4	35.4	38.3	70.4	70.9	53.8	56.0	66.3	68.1	81.6	88.1	59.6	62.0
4		51.0	51.0	32.5	36.2	67.4	68.3	50.6	53.2	65.3	68.1	78.4	86.0	57.8	60.3
5		50.0	50.6	28.8	32.9	65.1	65.9	46.4	50.0	62.2	65.5	75.0	85.5	55.0	58.1
Median		4.3		1.1		12.7		4.2		15.9				7.5	

Table 4f. Observed (obs.) and relative (rel.) survival of patients with sarcoma (morphological classification) by histology for period 1998-2020 (N=3,346).

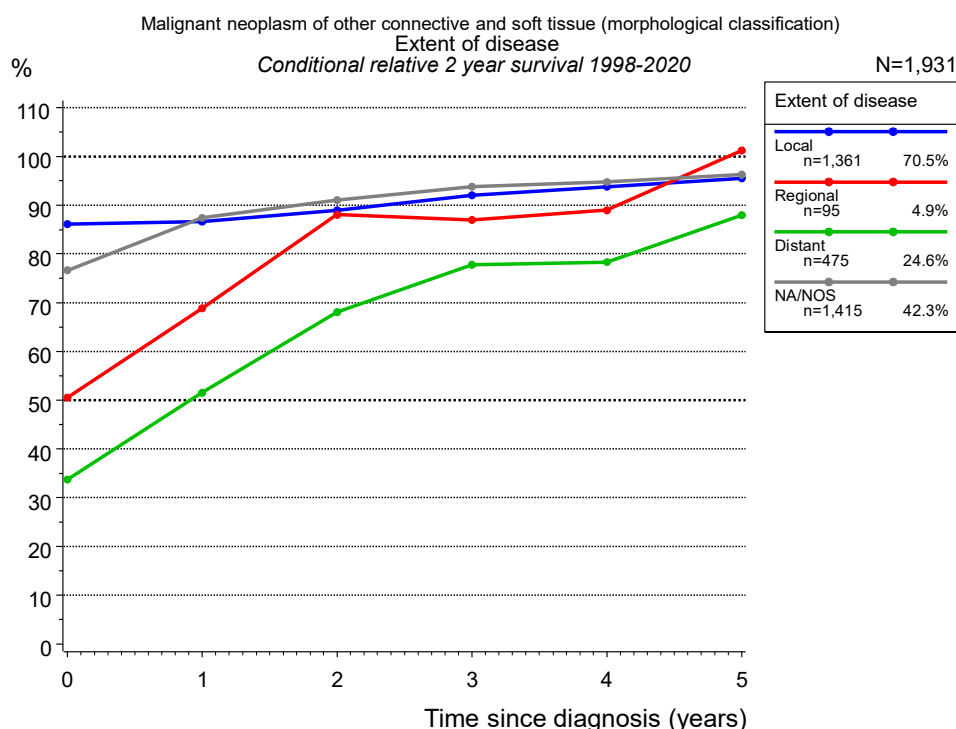


Figure 4g. Conditional relative 2-year survival of patients with sarcoma (morphological classification) by extent of disease. For 2,083 of 3,346 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 1,931 cases an evaluable classification was established. The grey line represents the subgroup of 1,415 patients with missing values regarding extent of disease (42.3 % of 3,346 patients, the percent values of all other categories are related to n=1,931).

Extent of disease								
Years	Local		Regional		Distant		NA/NOS	
	n	Cond. surv. % 2 yrs	n	Cond. surv. % 2 yrs	n	Cond. surv. % 2 yrs	n	Cond. surv. % 2 yrs
0	1,361	86.1	95	50.5	475	33.7	1,415	76.7
1	1,195	86.6	62	68.8	227	51.6	1,103	87.4
2	1,023	89.0	43	88.0	146	68.0	978	91.0
3	871	92.1	38	86.9	106	77.8	878	93.8
4	757	93.8	33	88.9	82	78.3	800	94.8
5	688	95.5	26	101.2	63	88.0	732	96.3

Table 4h. Conditional relative 2-year survival of patients with sarcoma (morphological classification) by extent of disease for period 1998-2020 (N=1,931).

Conditional relative survival rates refer to the relative survival probability, in this case for 2 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 4e). 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 extent of disease="Local", who are alive at least 3 years after cancer diagnosis, the conditional relative 2-year survival rate is 92.1% (n=871).

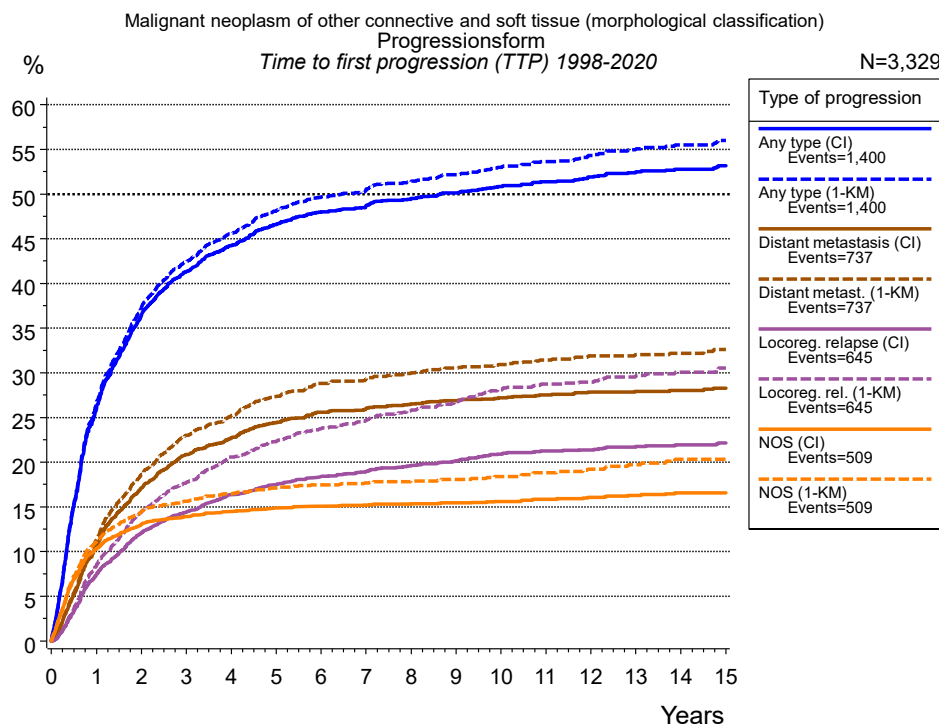


Figure 5a. Time to first progression of 3,329 patients with sarcoma (morphological classification) diagnosed between 1998 and 2020 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

		Type of progression					
	Any type (CI)	Any type (1-KM)	Distant metastasis (CI)	Distant metast. (1- KM)	Locoreg. relapse (CI)	Locoreg. rel. (1-KM)	NOS (CI)
N	2,873	2,873	2,873	2,873	3,329	3,329	3,329
Events	1,391	1,391	729	729	641	641	507
compet.	314		694		1,281		1,314
Years	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	26.1	26.5	10.7	11.4	7.4	8.4	10.4
2	36.4	37.3	17.1	18.6	12.0	14.4	13.0
3	41.3	42.4	20.9	23.0	14.4	17.7	13.9
4	44.3	45.6	22.7	25.2	16.4	20.6	14.5
5	46.6	48.1	24.4	27.3	17.5	22.3	14.9
6	48.0	49.7	25.6	28.8	18.4	23.8	15.1
7	48.7	50.5	26.0	29.3	18.9	24.6	15.2
8	49.4	51.3	26.5	30.0	19.6	25.7	15.3
9	50.1	52.1	26.9	30.5	20.1	26.7	15.4
10	50.8	53.0	27.2	30.9	20.9	28.1	15.6
11	51.4	53.6	27.5	31.4	21.2	28.7	15.8
12	51.9	54.3	27.8	31.9	21.4	29.0	16.1
13	52.5	55.1	27.9	32.0	21.7	29.7	16.3
14	52.8	55.5	28.0	32.2	21.9	30.1	16.6
15	53.1	56.0	28.3	32.6	22.1	30.5	16.6

Type of progression	
<i>cont'd</i>	NOS (1-KM)
N	3,329
Events	507
compet.	
Years	%
0	0.0
1	11.2
2	14.5
3	15.6
4	16.5
5	17.1
6	17.4
7	17.7
8	17.8
9	18.1
10	18.4
11	18.8
12	19.2
13	19.7
14	20.3
15	20.3

Table 5b. Time to first progression of patients with sarcoma (morphological classification) for period 1998-2020 (N=3,329), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

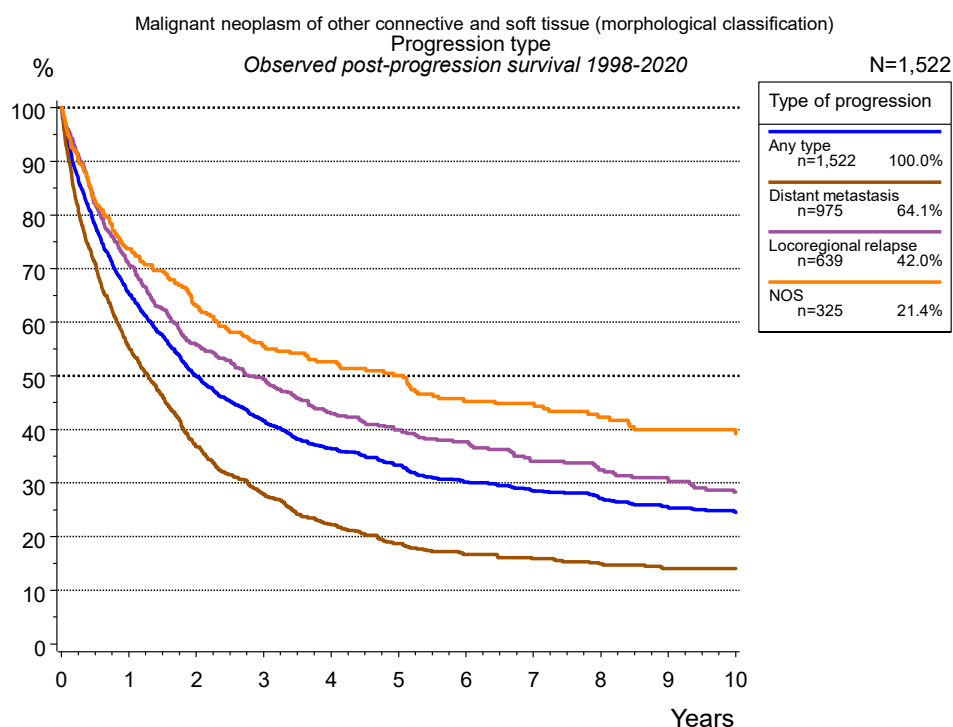


Figure 5c. Observed post-progression survival of 1,522 patients with sarcoma (morphological classification) diagnosed between 1998 and 2020. These 1,522 patients with documented progression events during their course of disease represent 45.7 % of the totally 3,329 evaluated cases (incl. M1, n=456, 13.7 %). Patients with cancer relapse documented via death certificates only were excluded (n=334, 10.0 %). Multiple progression types on different sites are included in the evaluation even when not occurring synchronously. The NOS (not otherwise specified) class is included under the condition, that it is the one and only progression type during the course of disease.

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.

Years	Type of progression			
	Any type n=1,522 %	Distant metastasis n=975 %	Locoregional relapse n=639 %	NOS n=325 %
0	100.0	100.0	100.0	100.0
1	65.4	55.2	70.9	73.7
2	49.9	36.7	55.7	63.3
3	41.6	27.9	49.3	55.4
4	36.5	22.3	43.0	52.6
5	33.3	18.7	39.9	50.1
6	30.2	16.7	37.7	45.3
7	28.6	15.9	34.1	44.8
8	27.1	14.9	32.4	42.3
9	25.5	14.0	30.6	40.0
10	24.5	14.0	28.3	39.2

Table 5d. Observed post-progression survival of patients with sarcoma (morphological classification) for period 1998-2020 (N=1,522).

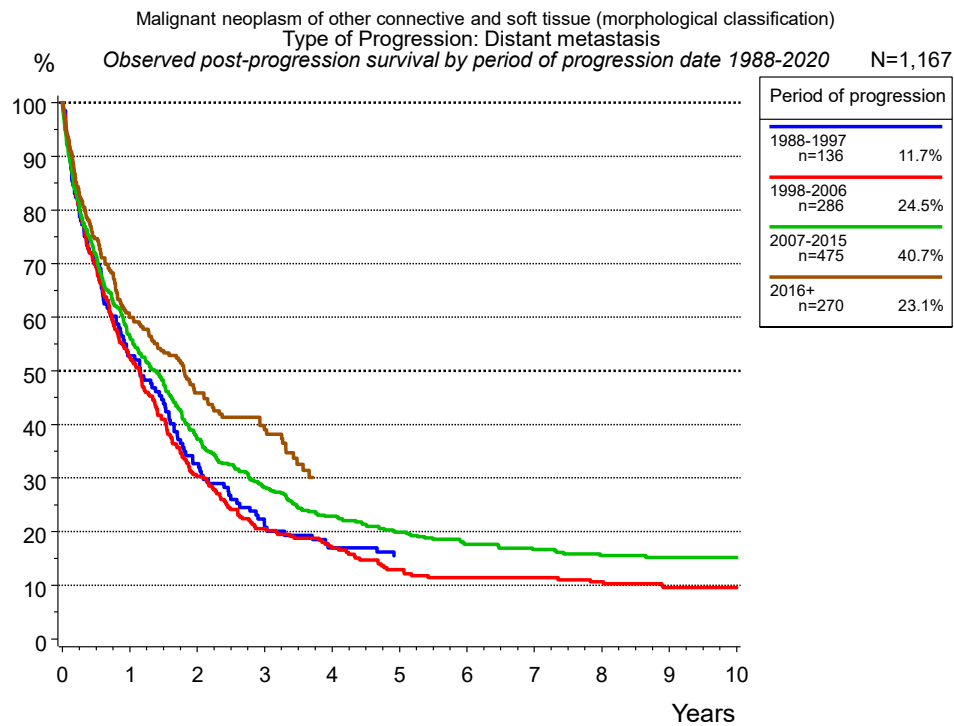


Figure 5e. Observed post-progression (distant metastasis) survival of 1,167 patients with sarcoma (morphological classification) diagnosed between 1988 and 2020 by period of progression.

Years	Period of progression			
	1988-1997 n=136 %	1998-2006 n=286 %	2007-2015 n=475 %	2016+ n=270 %
0	100.0	100.0	100.0	100.0
1	52.8	52.4	56.4	60.0
2	32.7	30.3	37.2	45.9
3	21.6	20.6	28.2	39.0
4	17.0	17.3	22.9	
5		12.9	19.9	
6		11.4	17.7	
7		11.4	16.7	
8		10.7	15.6	
9		9.6	15.2	
10		9.6	15.2	

Table 5f. Observed post-progression (distant metastasis) survival of patients with sarcoma (morphological classification) for period 1988-2020 by period of progression (N=1,167).

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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