

Munich Cancer Registry



- ▶ Incidence and Mortality
- ▶ Selection Matrix
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Sarcoma (morphological classification)

Survival

Year of diagnosis	1988-1997	1998-2019
Patients	693	4,051
Diseases	693	4,076
Cases evaluated	637	3,143
Creation date	01/28/2021	
Database export	01/07/2021	
Population	4.92 m	



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

Index of figures and tables

Fig./Tbl.		Page
1a	Relative survival by period of diagnosis (chart)	3
1b	Survival by period of diagnosis (table)	3
2a	Survival by sex (chart)	4
2b	Survival by sex (table)	4
3a	Relative survival by age category (chart)	5
3b	Survival by age category (table)	5
4a	Relative survival by TNM staging (chart)	6
4b	Survival by TNM staging (table)	6
4g	Conditional survival by extent of disease (chart)	8
4h	Conditional survival by extent of disease (table)	8
5a	Time to first progression (chart)	9
5b	Time to first progression (table)	9
5c	Observed post-progression survival (chart)	11
5d	Observed post-progression survival (table)	11
5e	Observed post-progression survival by period of progression (chart)	12
5f	Observed post-progression survival by period of progression (table)	12

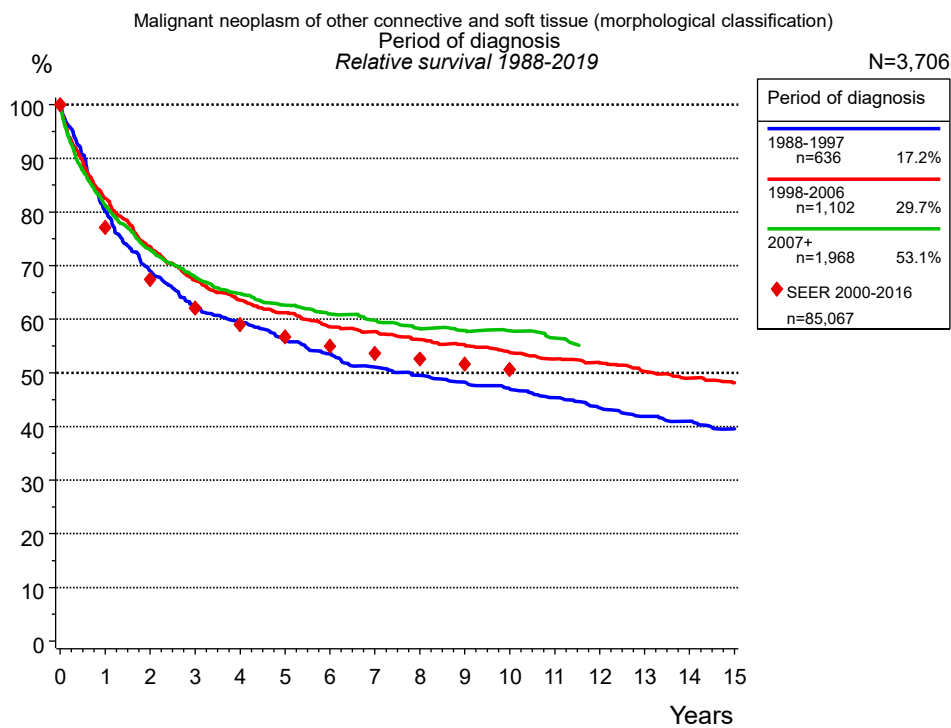


Figure 1a. Relative survival of patients with sarcoma (morphological classification) by period of diagnosis. Included in the evaluation are 3,706 cases diagnosed between 1988 and 2019.

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 2016, 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=636		1998-2006 n=1,102		2007+ n=1,968	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	78.7	80.2	81.0	82.6	79.6	81.2
2	66.7	69.0	70.9	73.5	70.2	73.0
3	59.3	62.5	63.9	67.3	64.3	67.9
4	55.5	59.5	59.4	63.5	60.3	64.8
5	51.5	56.1	56.3	61.2	57.3	62.6
6	48.4	53.5	53.1	58.6	54.9	61.0
7	45.5	51.1	51.6	57.7	52.9	59.8
8	43.5	49.6	49.4	56.2	50.8	58.3
9	41.7	48.3	47.7	55.2	49.6	57.9
10	40.0	47.1	45.8	53.8	48.6	57.8
11	38.0	45.4	44.0	52.6	46.7	56.5
12	35.8	43.4	42.7	51.8		
13	34.0	41.9	40.7	50.3		
14	32.9	41.0	39.0	49.0		
15	31.2	39.5	37.7	48.1		
Median	5.5		7.8		8.8	

Table 1b. Observed (obs.) and relative (rel.) survival of patients with sarcoma (morphological classification) by period of diagnosis for period 1988-2019 (N=3,706).

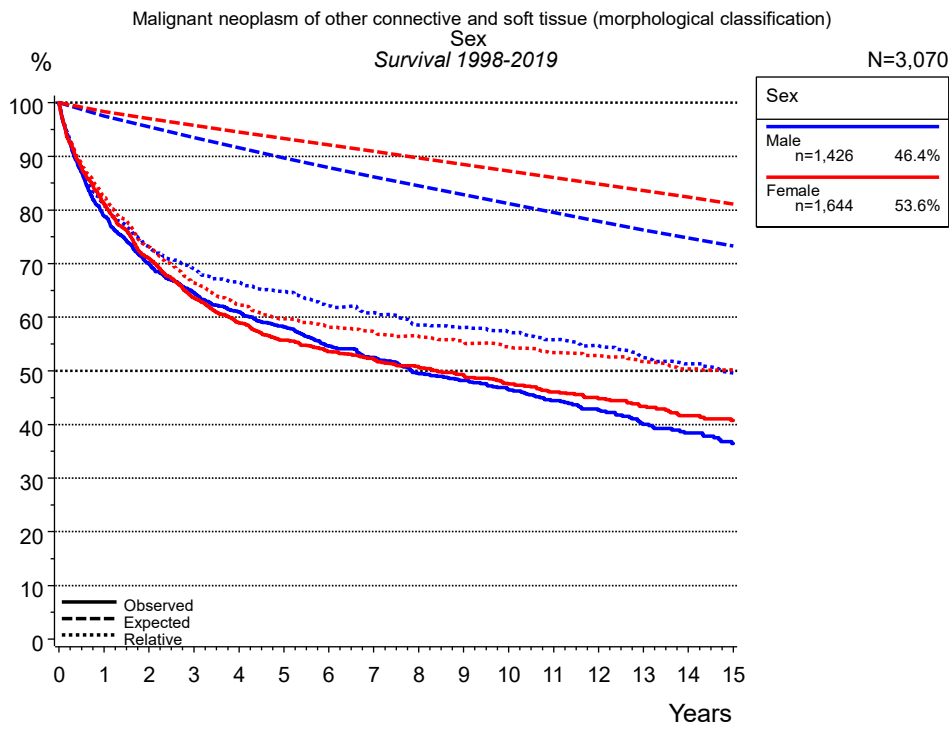


Figure 2a. Survival of patients with sarcoma (morphological classification) by sex. Included in the evaluation are 3,070 cases diagnosed between 1998 and 2019.

Years	Sex			
	Male n=1,426		Female n=1,644	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	78.9	80.8	81.1	82.5
2	69.9	73.2	70.9	73.1
3	64.6	69.0	63.7	66.5
4	60.9	66.5	59.0	62.3
5	58.2	64.8	55.7	59.7
6	54.6	62.1	53.6	58.1
7	52.5	60.9	52.2	57.3
8	49.4	58.5	50.8	56.5
9	48.2	58.1	49.2	55.6
10	46.6	57.2	47.6	54.5
11	44.4	55.8	46.1	53.4
12	42.7	54.7	44.9	52.8
13	40.0	52.5	43.4	51.7
14	38.4	51.3	41.6	50.4
15	36.4	49.6	40.7	50.2
Median	7.9		8.4	

Table 2b. Observed (obs.) and relative (rel.) survival of patients with sarcoma (morphological classification) by sex for period 1998-2019 (N=3,070).

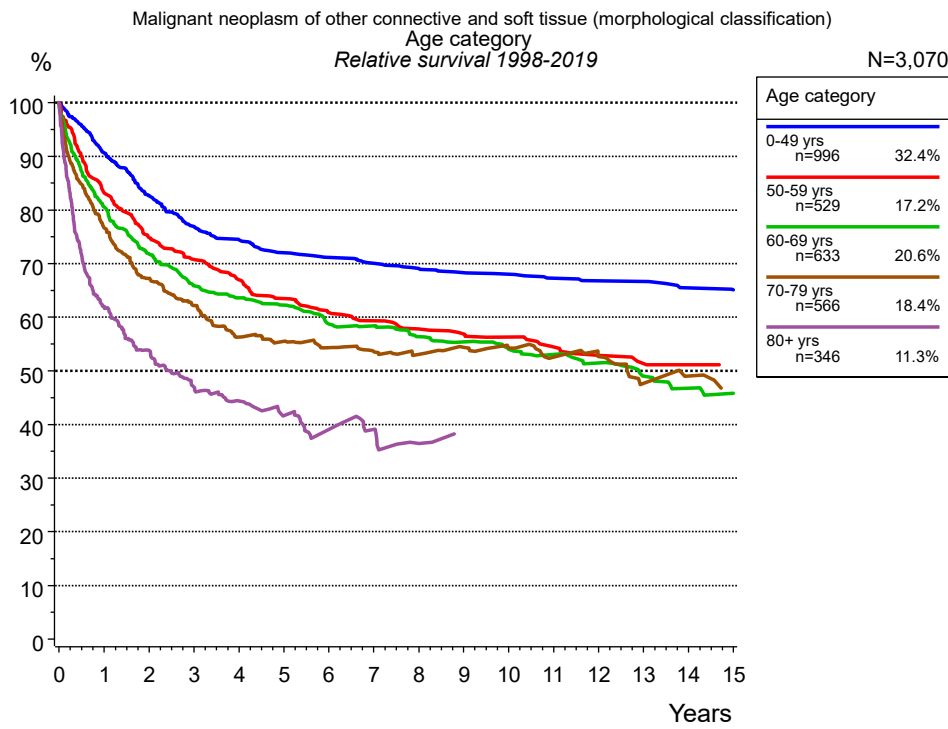


Figure 3a. Relative survival of patients with sarcoma (morphological classification) by age category. Included in the evaluation are 3,070 cases diagnosed between 1998 and 2019.

Years	Age category									
	0-49 yrs n=996		50-59 yrs n=529		60-69 yrs n=633		70-79 yrs n=566		80+ yrs n=346	
	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	90.6	90.7	82.9	83.3	79.6	80.6	74.6	76.7	56.1	62.0
2	82.4	82.6	74.1	74.8	70.1	71.8	63.3	67.2	43.6	53.7
3	76.7	76.9	69.8	70.8	63.3	65.8	56.5	62.2	34.0	46.9
4	74.2	74.4	65.6	67.0	60.2	63.6	49.2	56.3	28.3	44.3
5	71.6	72.0	61.8	63.5	58.1	62.3	46.5	55.5	23.1	41.7
6	70.6	71.1	58.8	60.9	53.9	58.7	43.3	54.4	19.0	39.1
7	69.5	70.0	56.9	59.3	52.6	58.4	40.7	53.6	16.5	39.1
8	68.5	69.1	54.8	57.8	49.6	56.4	38.0	53.1	13.2	36.4
9	67.6	68.3	53.7	56.9	47.8	55.4	36.6	54.4		
10	67.1	68.0	52.6	56.3	45.6	54.0	33.7	54.3		
11	66.1	67.3	50.2	54.5	43.6	53.0	30.3	52.6		
12	65.5	66.8	48.7	52.9	41.2	51.5	27.7	52.7		
13	65.5	66.7	46.6	51.4	37.8	49.0	22.7	47.7		
14	63.9	65.5	45.8	51.2	35.1	46.8	21.2	49.1		
15	63.4	65.1	44.8	51.1	33.3	45.8				
Median			11.1		7.9		3.9		1.4	

Table 3b. Observed (obs.) and relative (rel.) survival of patients with sarcoma (morphological classification) by age category for period 1998-2019 (N=3,070).

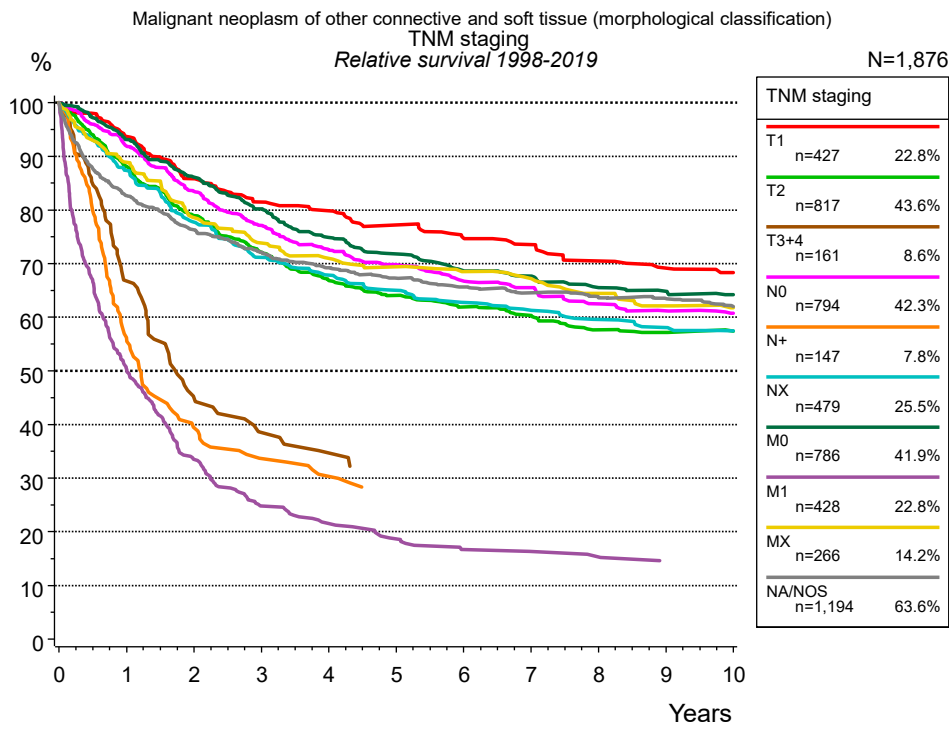


Figure 4a. Relative survival of patients with sarcoma (morphological classification) by TNM staging. For 1,878 of 3,070 cases diagnosed between 1998 and 2019 valid data could be obtained for this item. For a total of 1,876 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 1,194 patients with missing values regarding TNM staging (38.9 % of 3,070 patients, the percent values of all other categories are related to n=1,876).

Years	TNM staging													
	T1 n=427		T2 n=817		T3+4 n=161		N0 n=794		N+ n=147		NX n=479		M0 n=786	
	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	92.3	93.7	86.5	88.0	65.8	66.8	90.5	91.9	54.8	55.5	85.7	87.3	91.8	93.1
2	83.5	85.8	76.3	78.9	43.9	45.0	81.1	83.5	38.8	39.4	75.0	77.7	83.7	86.1
3	78.2	81.5	68.7	72.1	37.0	38.5	73.9	77.1	32.8	33.6	67.6	71.1	77.0	80.2
4	75.6	79.8	62.7	66.8	33.2	34.7	68.7	72.5	29.7	30.3	63.4	67.8	70.8	74.9
5	72.1	77.2	59.2	64.1	30.2	31.1	65.1	69.8	27.2	28.4	59.8	65.0	67.1	71.8
6	68.9	74.7	56.3	61.9			61.4	66.7	27.2	28.4	56.6	62.7	63.4	68.6
7	66.9	73.6	54.1	60.3			59.5	65.5	27.2	28.5	54.6	61.2	61.8	67.7
8	63.0	70.5	50.8	57.7			56.0	62.5	27.2	28.5	52.0	59.6	59.1	65.5
9	60.9	69.1	49.8	57.2			54.1	61.2	27.2	28.6	50.3	58.0	57.8	64.9
10	59.1	68.3	49.3	57.4			52.8	60.8	27.2	28.6	48.7	57.4	56.3	64.2
Median	14.7		8.6		1.7		12.2		1.2		9.0		12.9	

<i>cont'd</i>	TNM staging					
	M1 n=428		MX n=266		NA/NOS n=1,194	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
Years						
0	100.0	100.0	100.0	100.0	100.0	100.0
1	49.5	50.4	87.2	88.9	80.8	82.7
2	32.5	33.5	75.7	78.5	73.0	76.3
3	23.9	24.8	70.1	73.8	67.7	72.1
4	20.9	21.5	66.4	71.0	63.7	69.2
5	17.9	18.7	63.9	69.4	60.8	67.3
6	15.7	16.7	61.8	68.5	58.2	65.6
7	15.2	16.3	59.9	67.2	56.3	64.5
8	14.7	15.3	56.2	64.5	54.5	63.7
9	13.5	14.6	53.3	62.1	53.3	63.5
10			51.7	61.7	51.1	62.0
Median	1.0		11.1		10.5	

Table 4b. Observed (obs.) and relative (rel.) survival of patients with sarcoma (morphological classification) by TNM staging for period 1998-2019 (N=1,876).

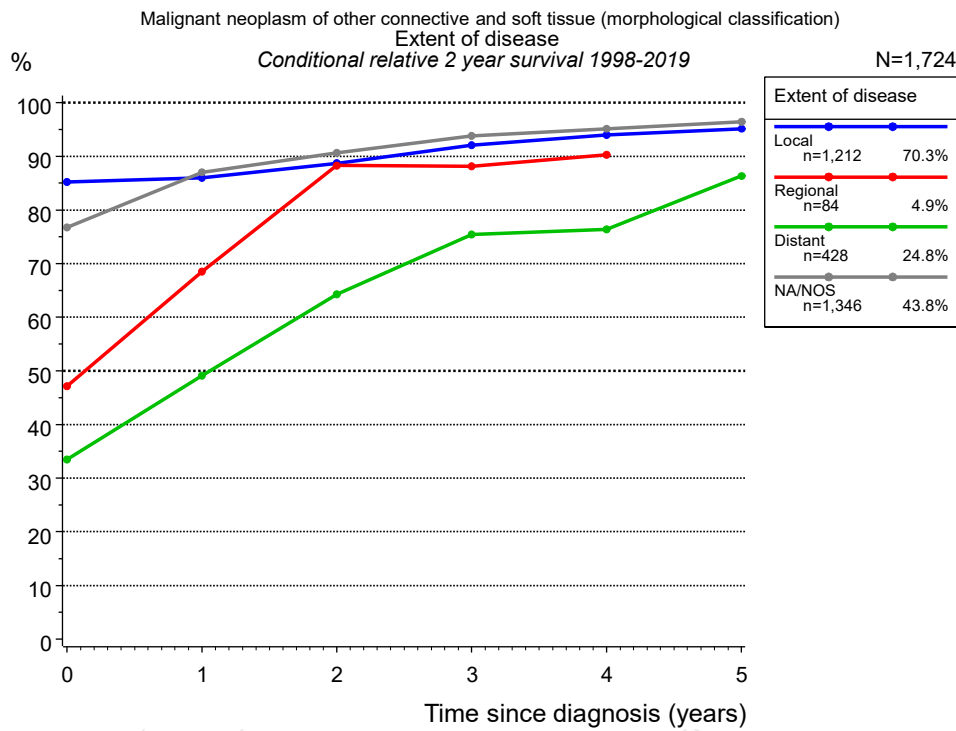


Figure 4g. Conditional relative 2-year survival of patients with sarcoma (morphological classification) by extent of disease. For 1,878 of 3,070 cases diagnosed between 1998 and 2019 valid data could be obtained for this item. For a total of 1,724 cases an evaluable classification was established. The grey line represents the subgroup of 1,346 patients with missing values regarding extent of disease (43.8 % of 3,070 patients, the percent values of all other categories are related to n=1,724).

Years	Extent of disease							
	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	1,212	85.2	84	47.2	428	33.5	1,346	76.7
1	1,019	86.0	50	68.5	203	49.1	1,034	87.1
2	873	88.7	36	88.3	124	64.3	905	90.7
3	774	92.1	31	88.1	84	75.4	805	93.8
4	680	94.0	29	90.3	66	76.4	735	95.2
5	594	95.1			51	86.4	671	96.4

Table 4h. Conditional relative 2-year survival of patients with sarcoma (morphological classification) by extent of disease for period 1998-2019 (N=1,724).

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=774).

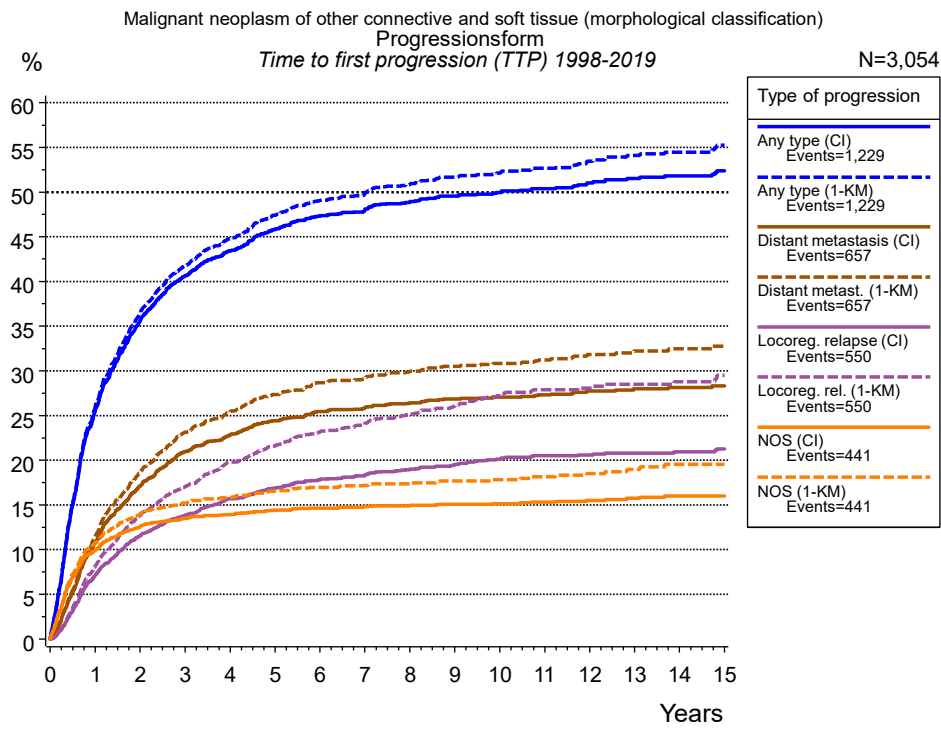


Figure 5a. Time to first progression of 3,054 patients with sarcoma (morphological classification) diagnosed between 1998 and 2019 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, 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)	NOS (1-KM)
N	2,644	2,644	2,644	2,644	3,054	3,054	3,054	3,054
Events	1,225	1,225	653	653	547	547	440	440
compet.	269		600		1,146		1,158	
Years	%	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	25.5	25.9	10.8	11.5	7.1	8.1	10.0	10.0
2	35.5	36.4	17.1	18.6	11.5	13.8	12.6	12.6
3	40.6	41.7	21.0	23.1	13.8	17.0	13.5	13.5
4	43.4	44.8	22.9	25.4	15.7	19.8	13.9	13.9
5	45.8	47.4	24.4	27.4	16.8	21.6	14.4	14.4
6	47.3	49.1	25.4	28.7	17.8	23.2	14.7	14.7
7	48.1	49.9	25.9	29.2	18.4	24.1	14.8	14.8
8	48.8	50.8	26.4	30.0	18.9	25.1	14.9	14.9
9	49.6	51.7	26.8	30.5	19.5	26.0	15.1	15.1
10	49.9	52.1	27.1	30.8	20.1	27.2	15.2	15.2
11	50.4	52.6	27.3	31.2	20.5	27.9	15.3	15.3
12	51.0	53.5	27.7	31.8	20.6	28.1	15.5	15.5
13	51.5	54.1	28.0	32.2	20.8	28.5	15.7	15.7
14	51.8	54.5	28.2	32.5	20.9	28.8	16.0	16.0
15	52.4	55.3	28.3	32.8	21.3	29.5	16.0	16.0

Type of progression	
<i>cont'd</i>	NOS (1-KM)
N	3,054
Events	440
compet.	
Years	%
0	0.0
1	10.7
2	14.0
3	15.2
4	15.8
5	16.5
6	16.9
7	17.2
8	17.4
9	17.7
10	17.8
11	18.1
12	18.5
13	19.0
14	19.5
15	19.5

Table 5b. Time to first progression of patients with sarcoma (morphological classification) for period 1998-2019 (N=3,054), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

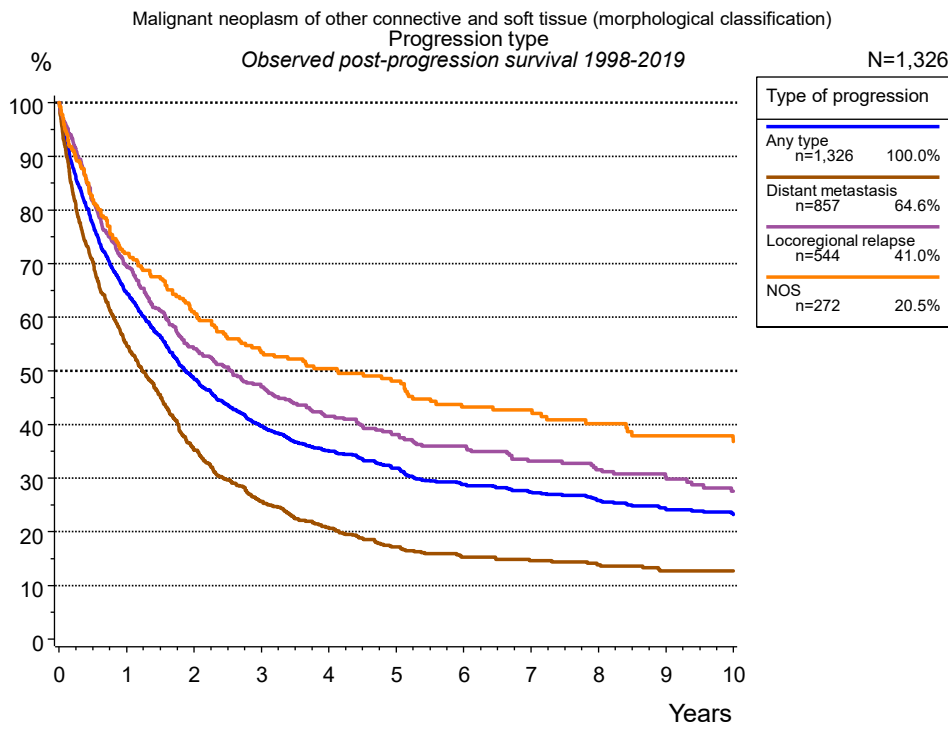


Figure 5c. Observed post-progression survival of 1,326 patients with sarcoma (morphological classification) diagnosed between 1998 and 2019. These 1,326 patients with documented progression events during their course of disease represent 43.4 % of the totally 3,054 evaluated cases (incl. M1, n=410, 13.4 %). Patients with cancer relapse documented via death certificates only were excluded (n=313, 10.2 %). 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=1,326 %	Distant metastasis n=857 %	Locoregional relapse n=544 %	NOS n=272 %
0	100.0	100.0	100.0	100.0
1	64.6	54.9	69.7	71.9
2	48.5	35.2	54.1	61.0
3	39.7	25.6	47.0	53.5
4	35.1	20.8	41.5	50.4
5	31.8	17.1	38.1	48.1
6	28.8	15.3	35.9	43.3
7	27.4	14.6	33.2	42.7
8	25.8	13.9	31.6	40.2
9	24.3	12.7	30.3	37.9
10	23.2	12.7	27.6	36.9

Table 5d. Observed post-progression survival of patients with sarcoma (morphological classification) for period 1998-2019 (N=1,326).

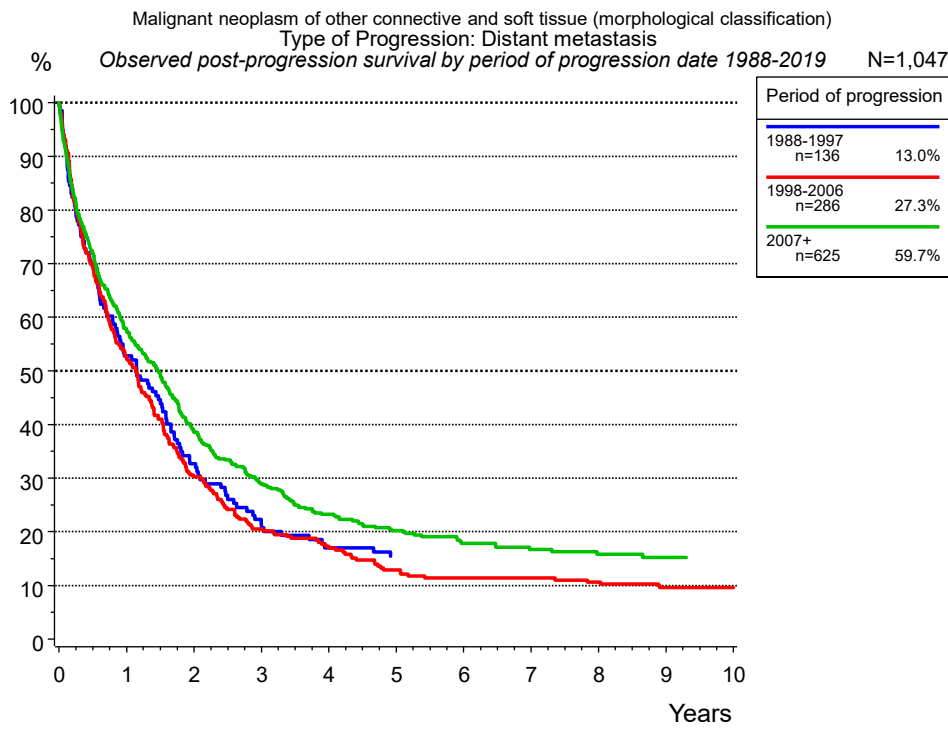


Figure 5e. Observed post-progression (distant metastasis) survival of 1,047 patients with sarcoma (morphological classification) diagnosed between 1988 and 2019 by period of progression.

Years	Period of progression		
	1988-1997 n=136 %	1998-2006 n=286 %	2007+ n=625 %
0	100.0	100.0	100.0
1	52.8	52.4	57.6
2	32.7	30.3	38.6
3	21.6	20.6	29.0
4	17.0	17.3	23.3
5		12.9	20.2
6		11.4	17.8
7		11.4	16.7
8		10.7	15.8
9		9.6	15.2
10		9.6	

Table 5f. Observed post-progression (distant metastasis) survival of patients with sarcoma (morphological classification) for period 1988-2019 by period of progression (N=1,047).

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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