

Munich Cancer Registry



- ▶ Incidence and Mortality
- ▶ Selection Matrix
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GIST: Gastroint. stromal tumor

Survival

Year of diagnosis	1998-2019
Patients	1,495
Diseases	1,498
Cases evaluated	1,058
Creation date	01/28/2021
Database export	01/07/2021
Population	4.92 m



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

<https://www.tumorregister-muenchen.de/en/facts/surv/shGISTE-GIST-Gastroint.-stromal-tumor-survival.pdf>

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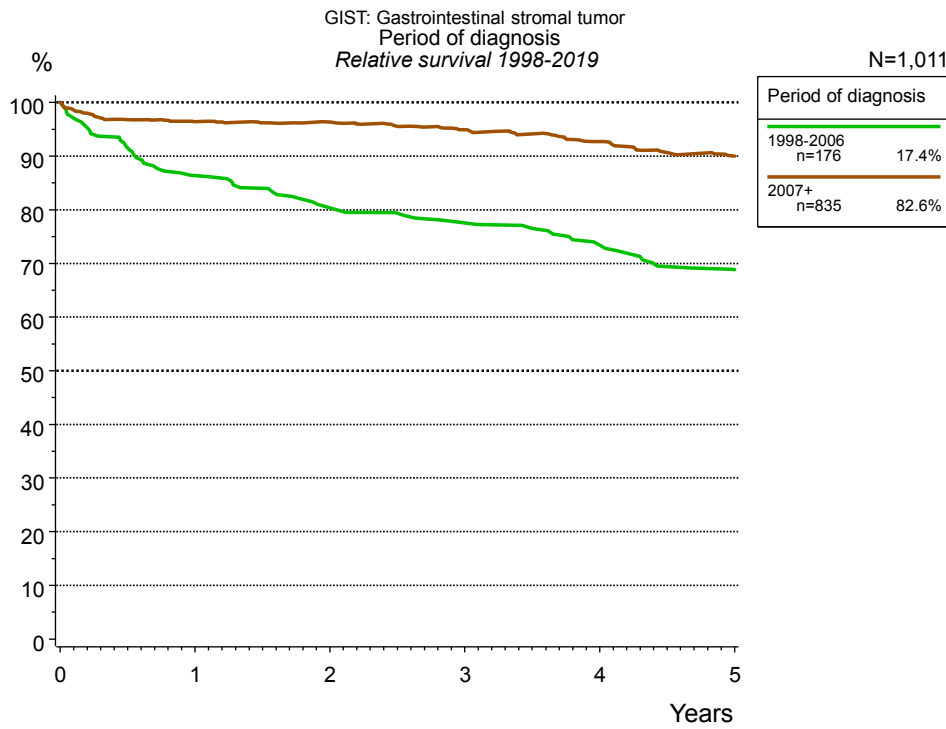


Figure 1a. Relative survival of patients with gastroint. stromal tumor by period of diagnosis. Included in the evaluation are 1,011 cases diagnosed between 1998 and 2019.

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			
	1998-2006 n=176		2007+ n=835	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	84.4	86.4	94.0	96.4
2	77.5	80.3	91.9	96.4
3	72.8	77.5	88.2	94.9
4	68.1	73.4	84.0	92.7
5	62.2	68.9	79.5	90.0
Median	10.2			

Table 1b. Observed (obs.) and relative (rel.) survival of patients with gastroint. stromal tumor by period of diagnosis for period 1998-2019 (N=1,011).

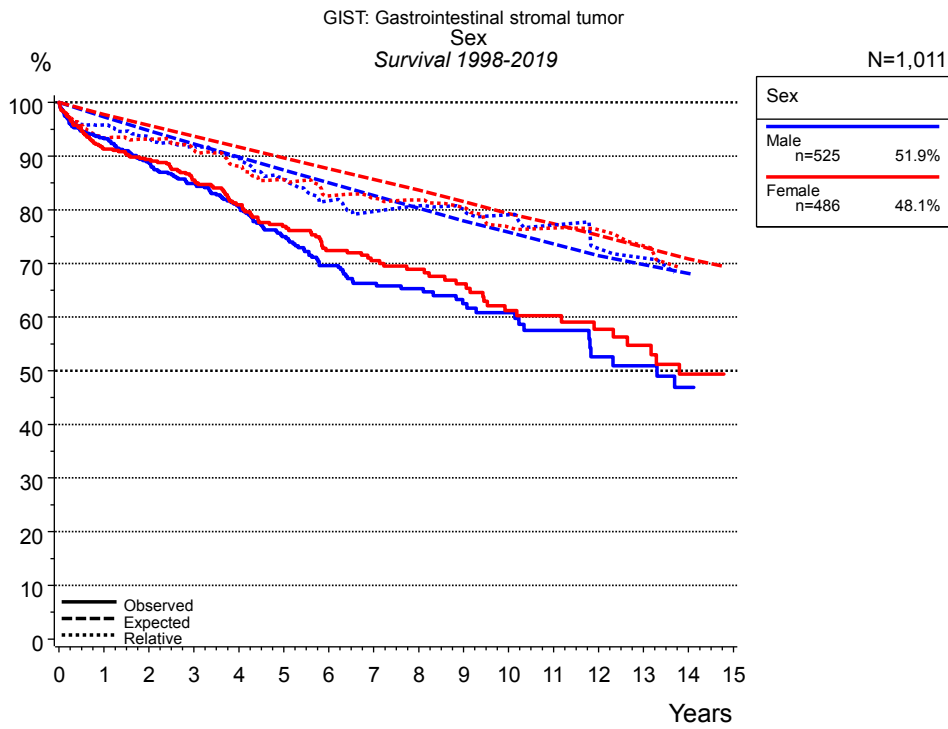


Figure 2a. Survival of patients with gastroint. stromal tumor by sex. Included in the evaluation are 1,011 cases diagnosed between 1998 and 2019.

Years	Sex			
	Male n=525		Female n=486	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	93.2	95.8	91.3	93.3
2	88.9	93.6	89.3	93.1
3	84.9	91.8	85.6	91.1
4	80.8	89.6	80.9	88.1
5	75.0	85.6	76.9	85.6
6	69.6	81.7	72.4	82.6
7	66.3	79.7	70.5	82.1
8	65.3	80.8	68.9	81.8
9	62.5	80.0	66.2	80.4
10	60.9	79.1	61.2	76.8
11	57.6	77.2	60.2	76.6
12	52.6	72.8	57.7	76.3
13	50.9	71.0	54.7	73.3
14	46.9	67.6	49.4	68.9
Median	13.3		13.8	

Table 2b. Observed (obs.) and relative (rel.) survival of patients with gastroint. stromal tumor by sex for period 1998-2019 (N=1,011).

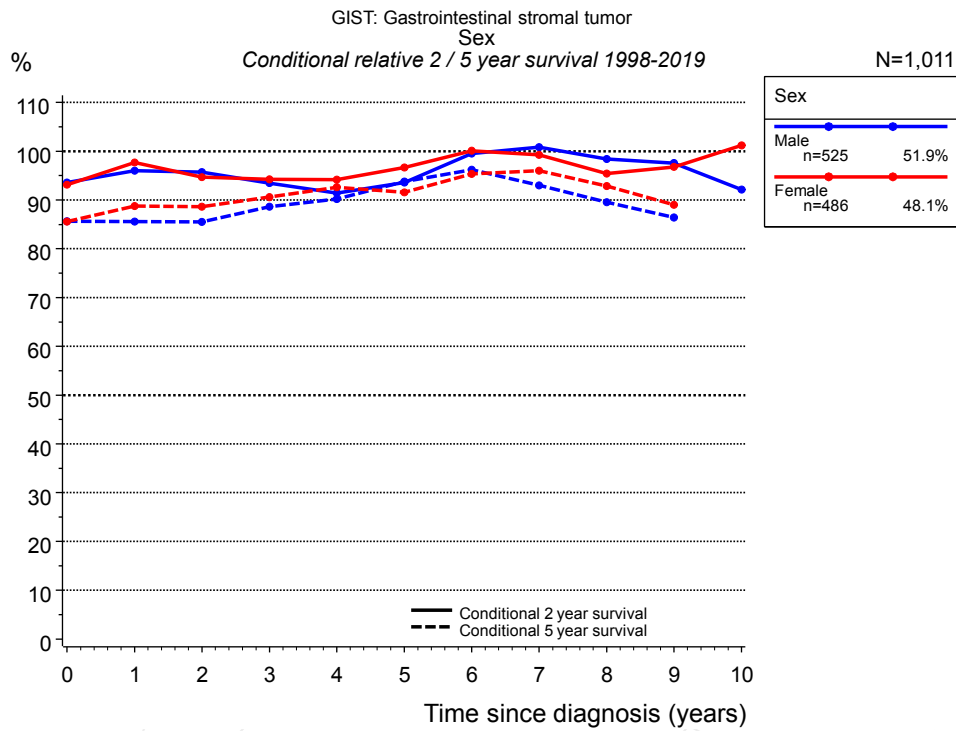


Figure 2c. Conditional relative 2 / 5-year survival of patients with gastroint. stromal tumor by sex. For 1,011 of 1,011 cases diagnosed between 1998 and 2019 valid data could be obtained for this item.

Years	Sex					
	n	Male		Female		n
		Cond. surv. % 2 yrs	5 yrs	Cond. surv. % 2 yrs	5 yrs	
0	525	93.6	85.6	486	93.1	85.6
1	436	96.0	85.6	400	97.7	88.8
2	370	95.7	85.5	350	94.7	88.7
3	317	93.4	88.6	305	94.2	90.6
4	278	91.4	90.2	249	94.2	92.6
5	226	93.6	93.8	211	96.6	91.6
6	179	99.5	96.2	169	100.1	95.3
7	142	100.8	93.0	143	99.3	96.0
8	113	98.4	89.5	110	95.4	92.9
9	81	97.6	86.4	84	96.8	89.0
10	60	92.2		67	101.2	

Table 2d. Conditional relative 2 / 5-year survival of patients with gastroint. stromal tumor by sex for period 1998-2019 (N=1,011).

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 93.4% (n=317).

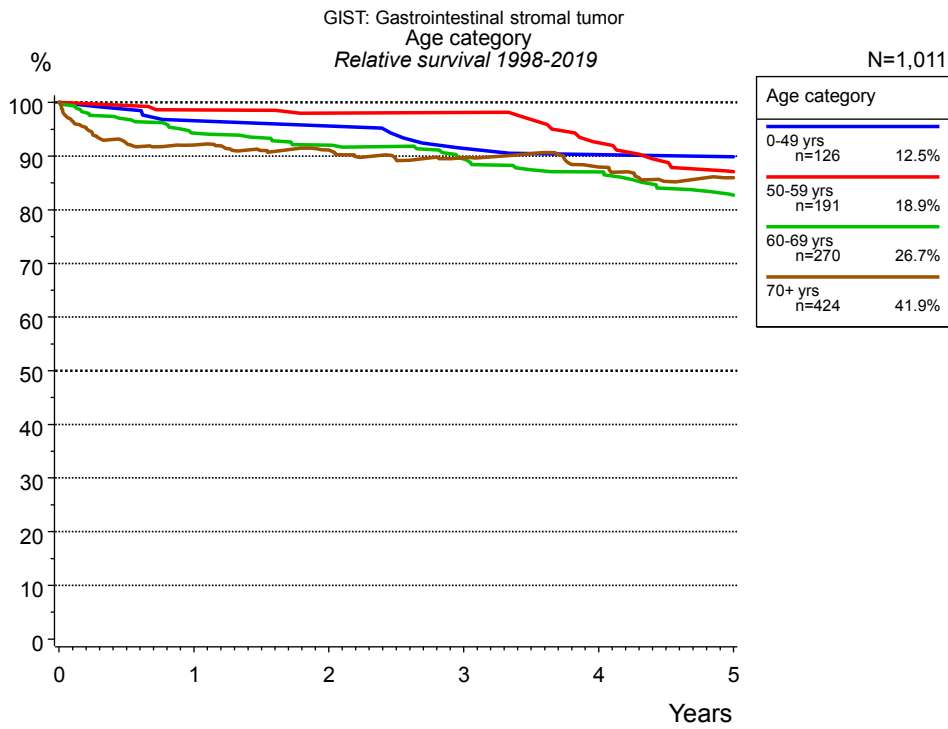


Figure 3a. Relative survival of patients with gastroint. stromal tumor by age category. Included in the evaluation are 1,011 cases diagnosed between 1998 and 2019.

Years	Age category							
	0-49 yrs n=126		50-59 yrs n=191		60-69 yrs n=270		70+ yrs n=424	
	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	96.7	96.6	98.3	98.6	93.2	94.3	87.7	92.1
2	95.8	95.6	97.0	98.0	90.2	92.0	82.8	91.1
3	91.1	91.4	97.0	98.1	86.4	89.5	77.3	89.7
4	90.1	90.3	90.5	92.5	83.0	87.1	72.0	88.0
5	90.1	89.9	84.4	87.1	77.4	82.7	66.2	86.0
Median			18.0		14.8		8.6	

Table 3b. Observed (obs.) and relative (rel.) survival of patients with gastroint. stromal tumor by age category for period 1998-2019 (N=1,011).

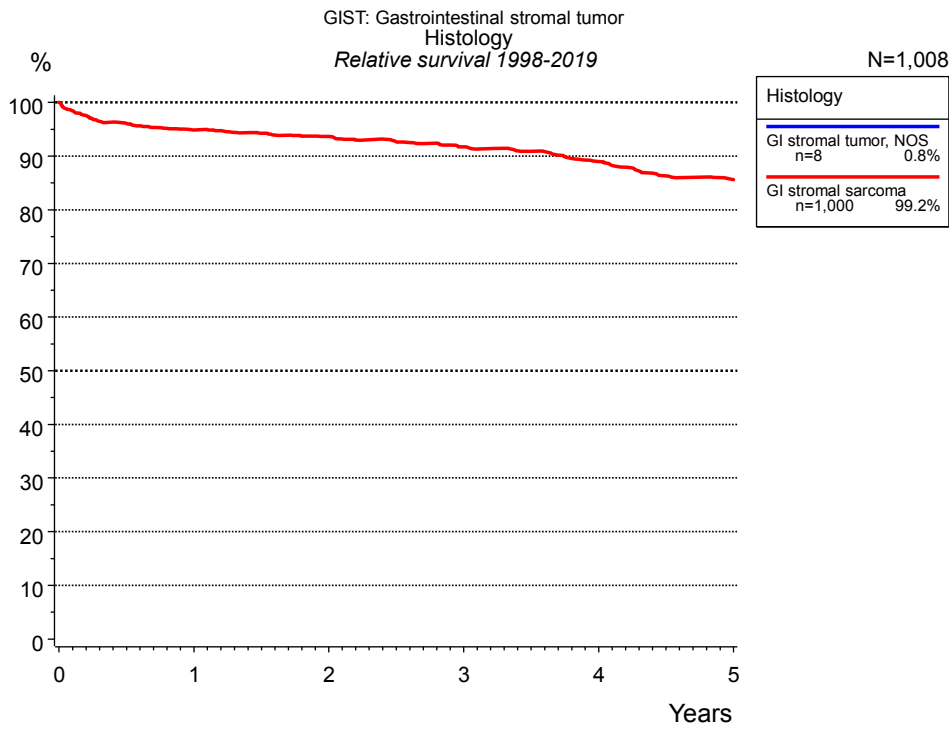


Figure 4a. Relative survival of patients with gastroint. stromal tumor by histology. For 1,008 of 1,011 cases diagnosed between 1998 and 2019 valid data could be obtained for this item. Subgroups with sample size <20 are omitted from the chart.

Histology		
GI stromal sarcoma n=1,000		
Years	obs. %	rel. %
0	100.0	100.0
1	92.5	94.8
2	89.3	93.7
3	85.4	91.7
4	81.0	89.0
5	75.9	85.6
Median	13.3	

Table 4b. Observed (obs.) and relative (rel.) survival of patients with gastroint. stromal tumor by histology for period 1998-2019 (N=1,008).

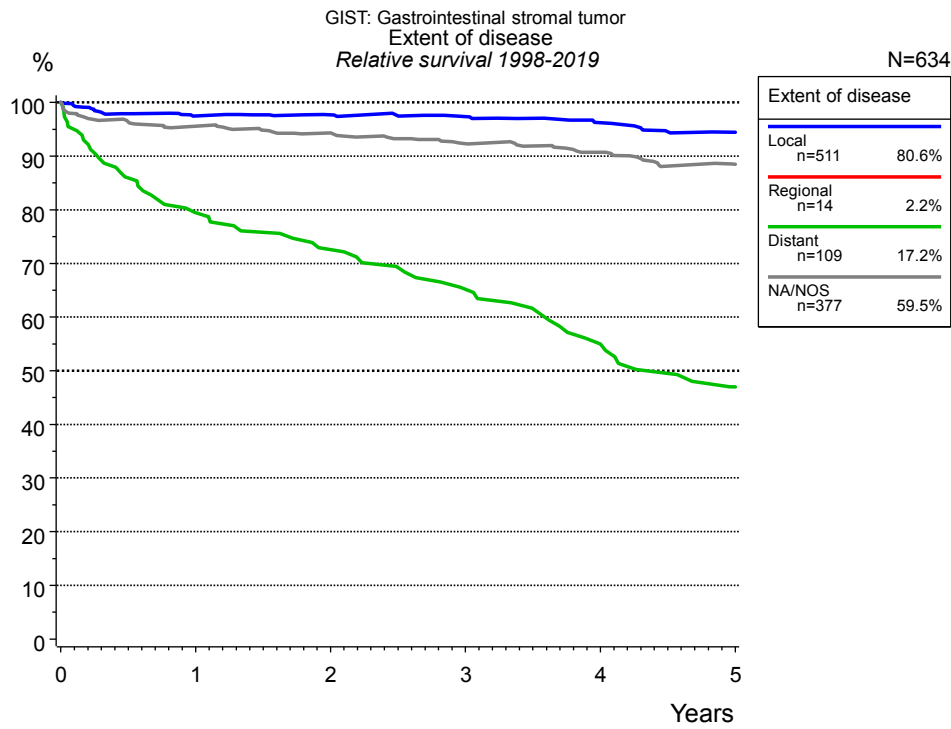


Figure 4c. Relative survival of patients with gastroint. stromal tumor by extent of disease. For 660 of 1,011 cases diagnosed between 1998 and 2019 valid data could be obtained for this item. For a total of 634 cases an evaluable classification was established. The grey line represents the subgroup of 377 patients with missing values regarding extent of disease (37.3 % of 1,011 patients, the percent values of all other categories are related to n=634). Subgroups with sample size <20 are omitted from the chart.

Years	Extent of disease					
	Local n=511		Distant n=109		NA/NOS n=377	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	95.3	97.5	77.4	79.4	93.2	95.6
2	93.5	97.7	69.4	72.6	89.8	94.4
3	91.1	97.4	61.0	65.2	85.7	92.3
4	87.8	96.2	51.1	55.0	82.2	90.7
5	84.4	94.5	41.8	47.0	77.9	88.5
Median			4.0		13.8	

Table 4d. Observed (obs.) and relative (rel.) survival of patients with gastroint. stromal tumor by extent of disease for period 1998-2019 (N=634).

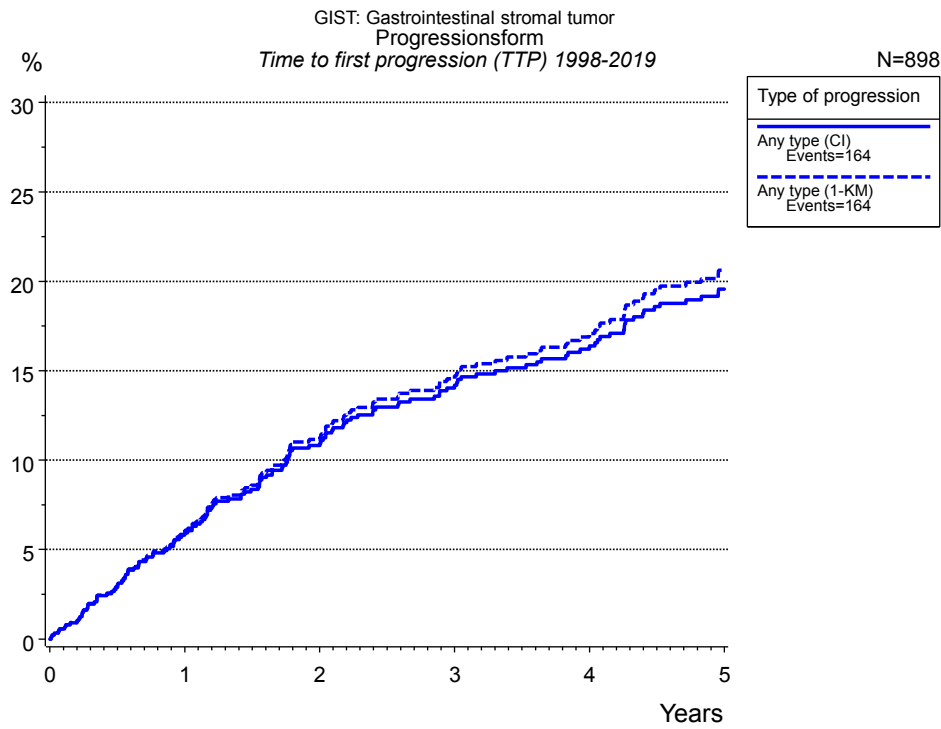


Figure 5a. Time to first progression of 898 patients with gastroint. stromal tumor diagnosed between 1998 and 2019 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

	Type of progression	
	Any type (CI)	Any type (1-KM)
N	898	898
Events	140	140
compet.	69	
Years	%	%
0	0.0	0.0
1	5.9	6.1
2	10.8	11.2
3	14.0	14.6
4	16.2	16.9
5	19.6	20.6

Table 5b. Time to first progression of patients with gastroint. stromal tumor for period 1998-2019 (N=898), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

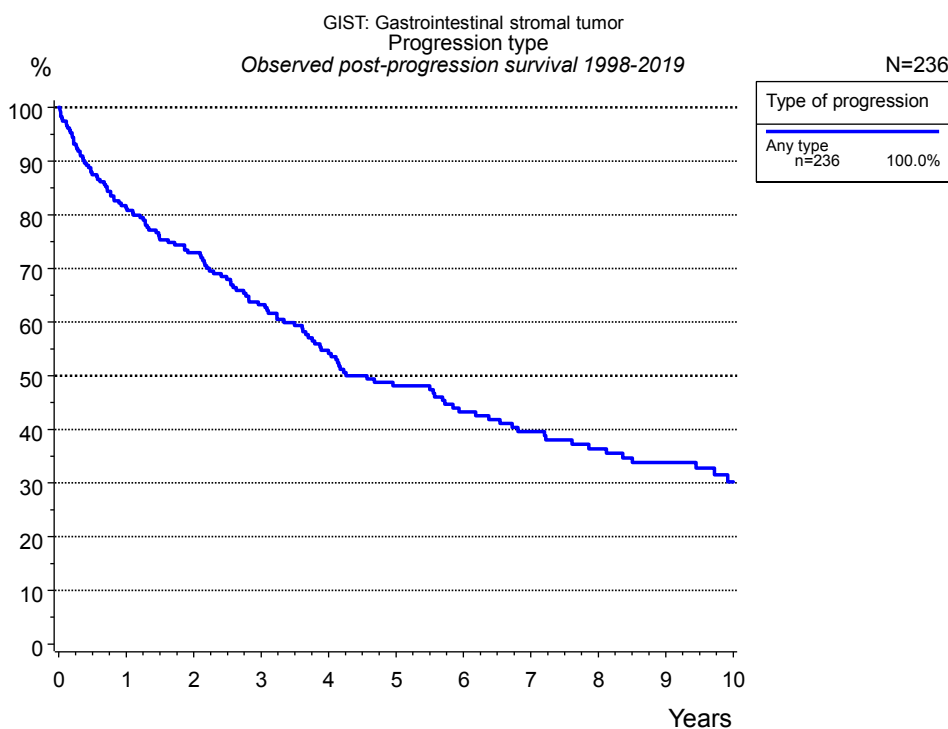


Figure 5c. Observed post-progression survival of 236 patients with gastroint. stromal tumor diagnosed between 1998 and 2019. These 236 patients with documented progression events during their course of disease represent 23.5 % of the totally 1,006 evaluated cases (incl. M1, n=108, 10.7 %). Patients with cancer relapse documented via death certificates only were excluded (n=36, 3.6 %).

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 potentially considered in more than one subgroup.

Type of progression	
Years	Any type n=236 %
0	100.0
1	81.3
2	72.9
3	63.2
4	54.7
5	48.1
6	43.3
7	39.6
8	36.4
9	33.8
10	30.2

Table 5d. Observed post-progression survival of patients with gastroint. stromal tumor for period 1998-2019 (N=236).

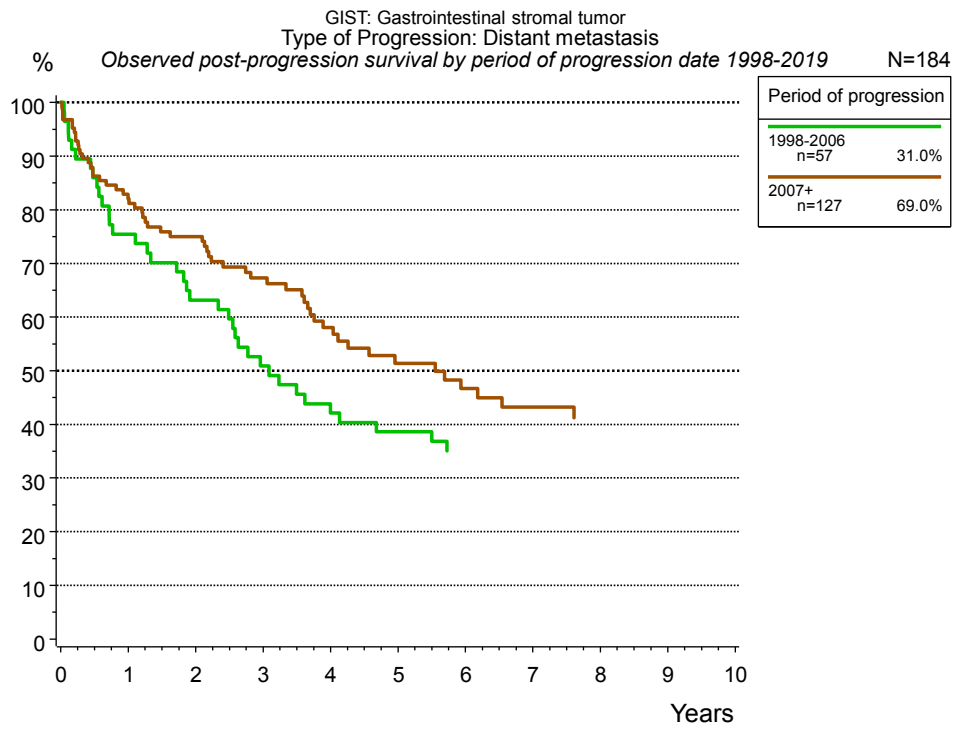


Figure 5e. Observed post-progression (distant metastasis) survival of 184 patients with gastroint. stromal tumor diagnosed between 1998 and 2019 by period of progression.

Years	Period of progression	
	1998-2006 n=57 %	2007+ n=127 %
0	100.0	100.0
1	75.4	82.0
2	63.2	75.0
3	50.9	67.3
4	43.9	58.1
5	38.6	51.4
6		46.7
7		43.3

Table 5f. Observed post-progression (distant metastasis) survival of patients with gastroint. stromal tumor for period 1998-2019 by period of progression (N=184).

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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