Munich Cancer Registry

- Incidence and Mortality
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ICD-10 C25: Pancreas cancer

Survival

Year of diagnosis	1988-1997	1998-2016
Patients	868	13,862
Diseases	868	13,866
Cases evaluated	775	8,075

Creation date	08/22/2018
Export date	08/09/2018
Population	4.81 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
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Marchioninistr. 15
Munich, 81377
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/surv/sC25__E-ICD-10-C25-Pancreas-cancer-survival.pdf

Index of figures and tables

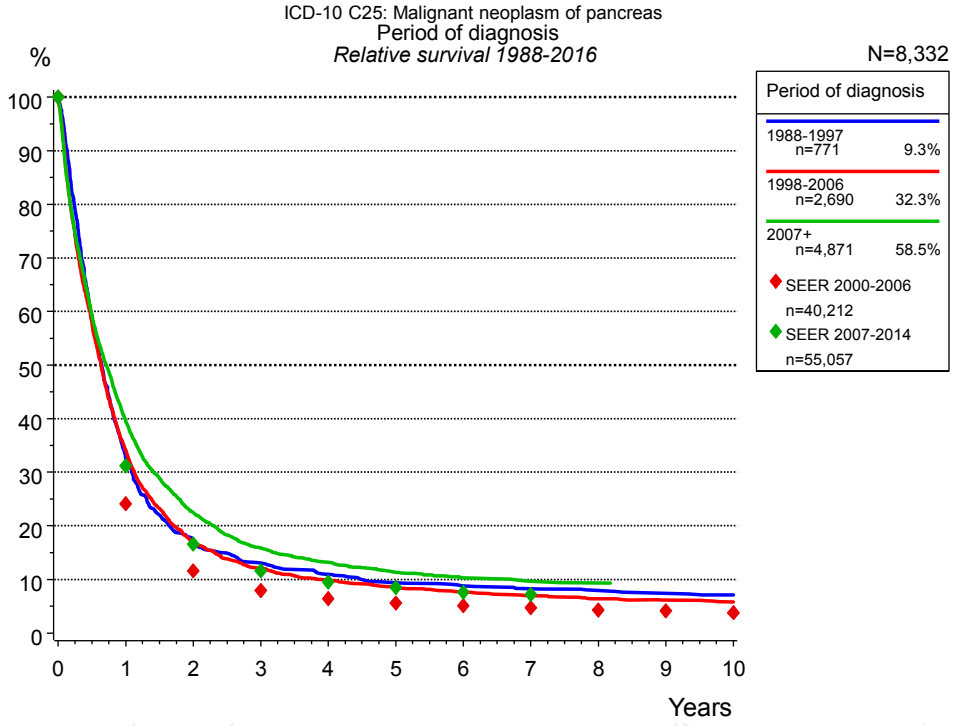

Figure 1a. Relative survival of patients with pancreas cancer by period of diagnosis. Included in the evaluation are 8,332 cases diagnosed between 1988 and 2016.

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 2014, 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=771		1998-2006 n=2,690		2007+ n=4,871	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	31.7	32.6	33.3	34.2	38.5	39.6
2	16.6	17.4	16.2	17.1	21.4	22.5
3	12.3	13.1	11.3	12.1	14.7	15.8
4	10.1	10.9	8.9	9.8	12.0	13.1
5	8.4	9.4	7.6	8.5	10.1	11.3
6	7.7	8.8	6.7	7.7	9.0	10.3
7	7.1	8.3	5.9	7.0	8.2	9.6
8	6.7	7.9	5.3	6.4	8.0	9.3
9	6.0	7.4	5.0	6.1		
10	5.7	7.1	4.6	5.8		

Table 1b. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by period of diagnosis for period 1988-2016 (N=8,332).

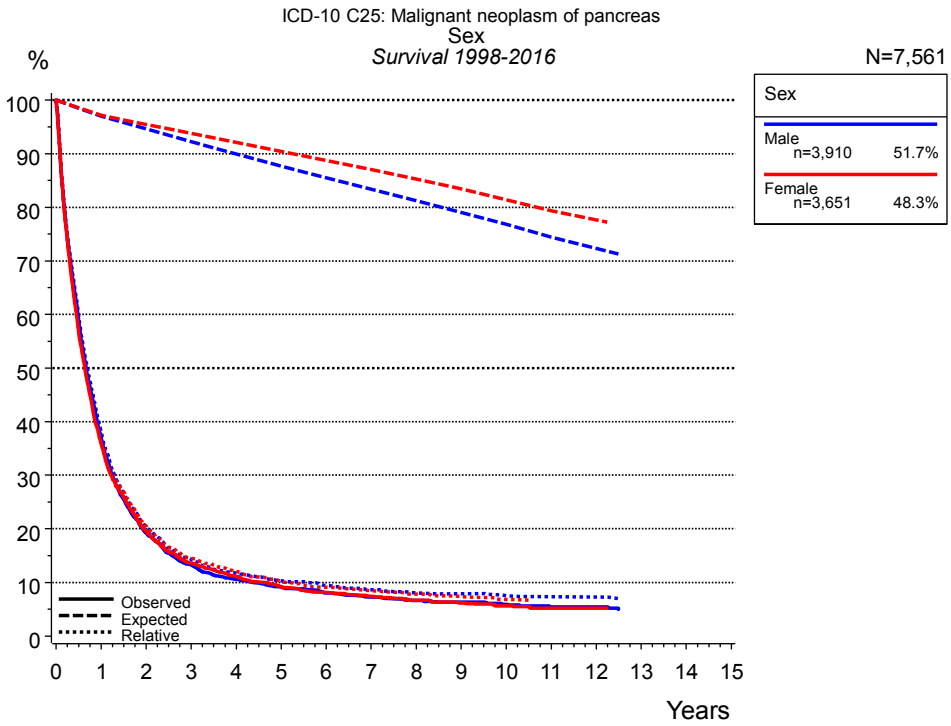

Figure 2a. Survival of patients with pancreas cancer by sex. Included in the evaluation are 7,561 cases diagnosed between 1998 and 2016.

	Sex			
	Male n=3,910		Female n=3,651	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	37.2	38.2	35.9	36.9
2	19.3	20.4	19.6	20.5
3	13.2	14.3	13.6	14.5
4	10.6	11.7	11.0	12.0
5	9.1	10.3	9.2	10.1
6	8.1	9.4	8.1	9.1
7	7.2	8.6	7.4	8.4
8	6.6	8.1	6.7	7.8
9	6.3	7.9	6.1	7.3
10	5.9	7.5	5.6	6.8
11	5.4	7.3	5.2	6.5
12	5.4	7.2	5.2	6.5

Table 2b. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by sex for period 1998-2016 (N=7,561).

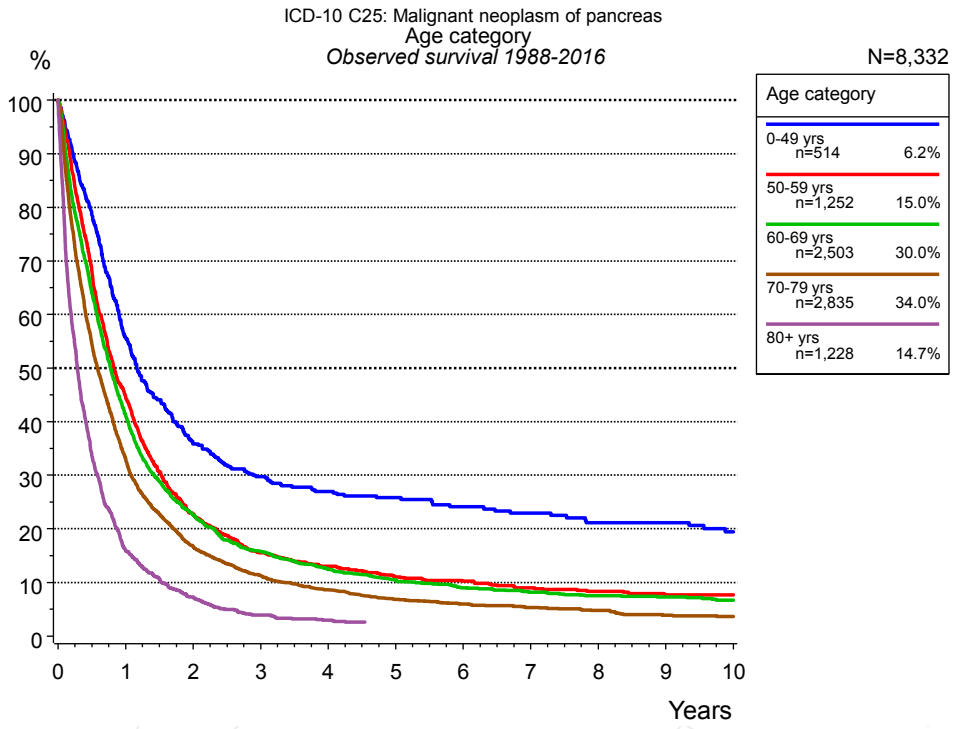

Figure 3a. Observed survival of patients with pancreas cancer by age category. Included in the evaluation are 8,332 cases diagnosed between 1988 and 2016.

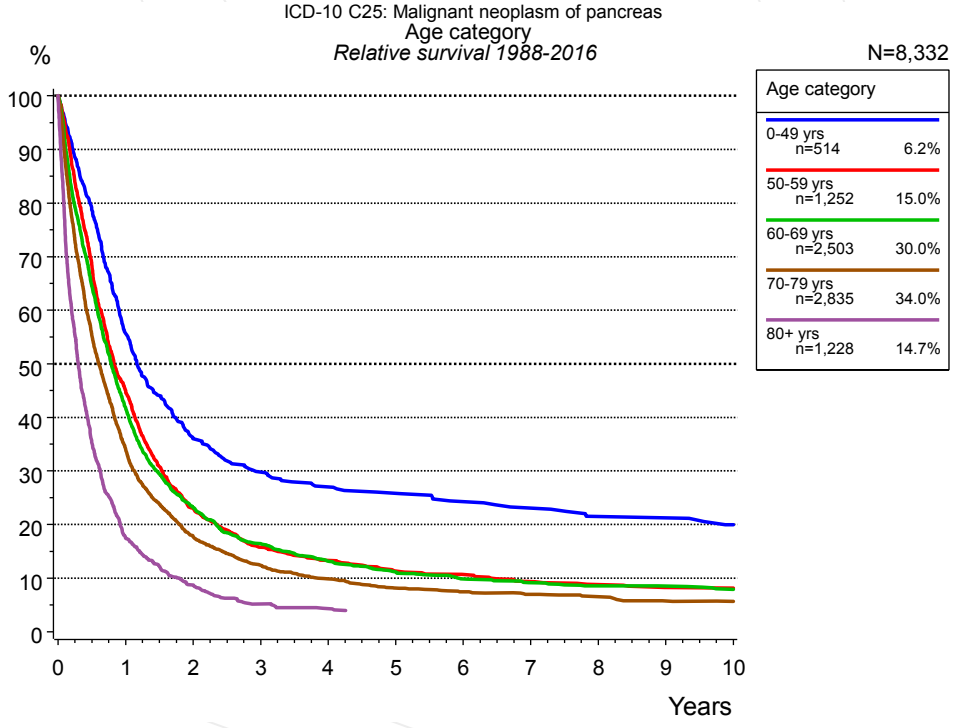

Figure 3b. Relative survival of patients with pancreas cancer by age category. Included in the evaluation are 8,332 cases diagnosed between 1988 and 2016.

	Age category									
	0-49 yrs n=514		50-59 yrs n=1,252		60-69 yrs n=2,503		70-79 yrs n=2,835		80+ yrs n=1,228	
Years	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	55.5	55.6	44.7	44.9	41.2	41.7	33.1	34.0	15.8	17.4
2	35.8	36.0	22.8	23.0	22.6	23.2	16.7	17.7	7.3	8.7
3	29.7	29.8	15.5	15.8	15.8	16.5	11.3	12.4	3.9	5.2
4	27.0	27.0	13.0	13.3	12.4	13.2	8.6	9.8	2.9	4.3
5	25.8	25.8	11.0	11.3	10.5	11.2	6.8	8.1		
6	24.1	24.3	10.2	10.7	9.0	9.8	6.0	7.5		
7	22.9	23.1	9.0	9.3	8.2	9.2	5.3	7.0		
8	21.1	21.5	8.3	8.8	7.5	8.6	4.8	6.5		
9	21.1	21.2	7.7	8.3	7.3	8.5	3.9	5.8		
10	19.4	20.0	7.7	8.1	6.7	7.9	3.7	5.7		

Table 3c. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by age category for period 1988-2016 (N=8,332).

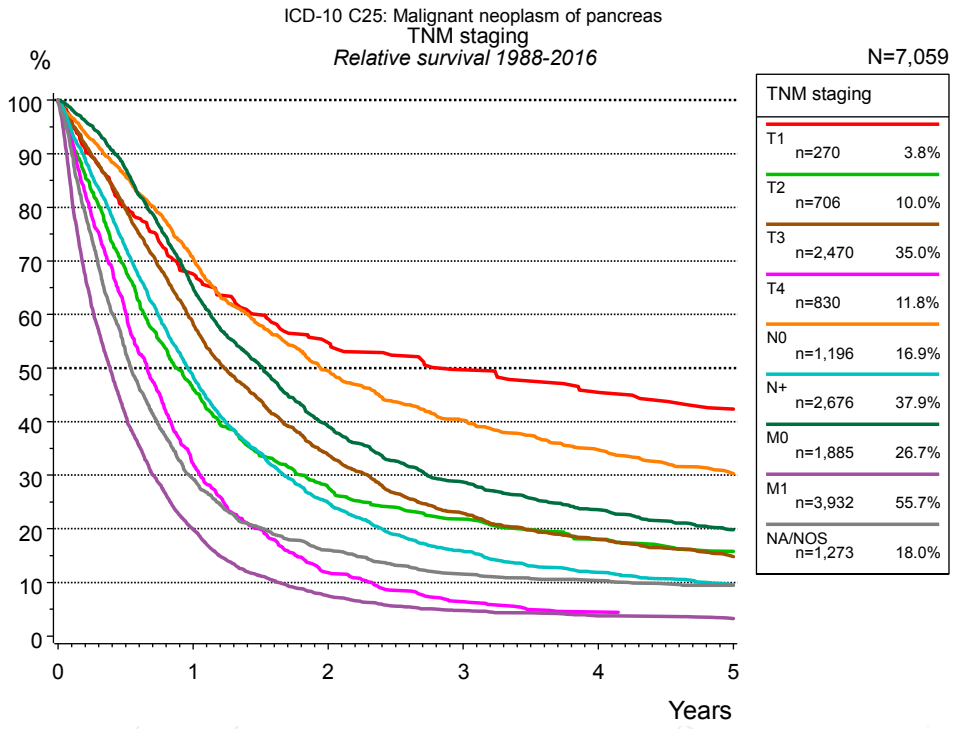

Figure 4a. Relative survival of patients with pancreas cancer by TNM staging. For 7,078 of 8,332 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 7,059 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potientially considered in more than one subgroup. The grey line represents the subgroup of 1,273 patients with missing values regarding TNM staging (15.3 % of 8,332 patients, the percent values of all other categories are related to n=7,059).

	TNM staging													
	T1 n=270		T2 n=706		T3 n=2,470		T4 n=830		N0 n=1,196		N+ n=2,676		M0 n=1,885	
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	66.2	67.5	45.1	46.2	57.2	58.3	31.4	32.1	69.0	70.5	47.4	48.4	63.6	64.9
2	53.3	54.7	26.7	27.7	32.5	33.8	11.4	11.8	47.4	49.5	23.9	24.9	37.6	39.1
3	47.0	49.7	20.7	21.8	21.5	22.9	6.2	6.4	37.9	40.3	14.9	15.8	27.0	28.7
4	42.5	45.5	16.9	18.1	16.5	18.0	4.2	4.5	31.9	34.7	10.9	11.9	21.6	23.6
5	38.6	42.4	14.4	15.8	13.4	14.8			27.4	30.3	8.7	9.5	17.9	19.8

	TNM staging			
cont'd	M1 n=3,932		NA/NOS n=1,273	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	19.4	19.9	28.1	29.3
2	7.1	7.5	14.8	16.0
3	4.4	4.7	10.5	11.5
4	3.5	3.8	9.1	10.4
5	3.0	3.3	8.2	9.5

Table 4b. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by TNM staging for period 1988-2016 (N=7,059).

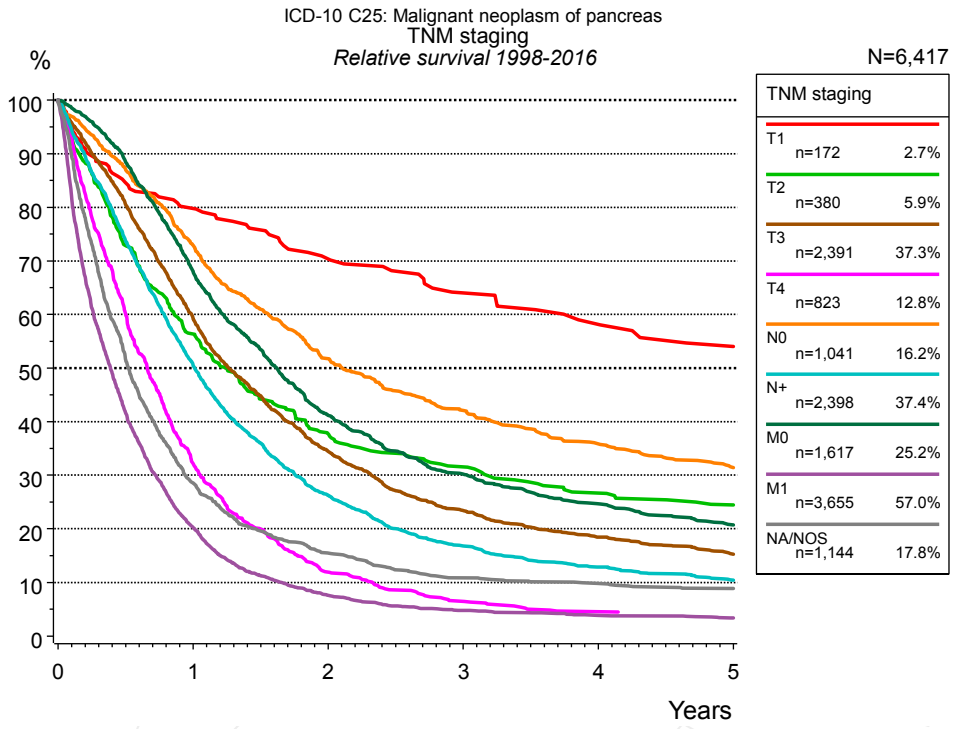

Figure 4c. Relative survival of patients with pancreas cancer by TNM staging. For 6,433 of 7,561 cases diagnosed between 1998 and 2016 valid data could be obtained for this item. For a total of 6,417 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potientially considered in more than one subgroup. The grey line represents the subgroup of 1,144 patients with missing values regarding TNM staging (15.1 % of 7,561 patients, the percent values of all other categories are related to n=6,417).

	TNM staging													
	T1 n=172		T2 n=380		T3 n=2,391		T4 n=823		N0 n=1,041		N+ n=2,398		M0 n=1,617	
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	78.8	79.8	55.3	56.4	58.2	59.2	31.4	32.1	71.4	72.9	49.6	50.7	66.6	68.0
2	68.4	70.4	36.3	37.7	33.1	34.5	11.5	11.9	49.6	51.7	25.2	26.2	39.5	41.2
3	60.8	64.0	30.0	31.6	22.0	23.4	6.2	6.5	39.6	42.1	15.8	16.8	28.4	30.2
4	54.9	58.1	25.0	26.7	16.9	18.5	4.3	4.5	33.0	35.8	11.8	12.9	22.7	24.7
5	50.0	54.0	22.5	24.5	13.8	15.3			28.4	31.4	9.4	10.4	18.7	20.7

	TNM staging			
cont'd	M1 n=3,655		NA/NOS n=1,144	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	19.7	20.2	27.3	28.5
2	7.3	7.6	14.3	15.5
3	4.5	4.8	9.8	10.9
4	3.5	3.8	8.6	9.8
5	3.0	3.3	7.7	8.9

Table 4d. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by TNM staging for period 1998-2016 (N=6,417).

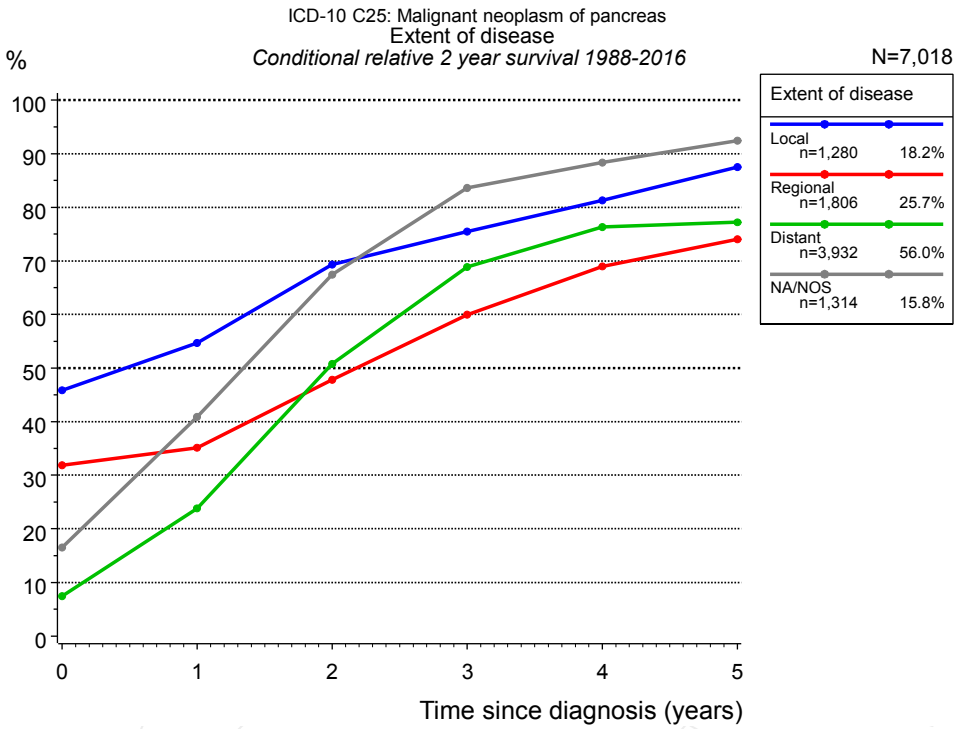

Figure 4e. Conditional relative 2-year survival of patients with pancreas cancer by extent of disease. For 7,078 of 8,332 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 7,018 cases an evaluable classification was established. The grey line represents the subgroup of 1,314 patients with missing values regarding extent of disease (15.8 % of 8,332 patients, the percent values of all other categories are related to n=7,018).

	Extent of disease							
	Local		Regional		Distant		NA/NOS	
Years	n	Cond. surv. % 2 yrs	n	Cond. surv. % 2 yrs	n	Cond. surv. % 2 yrs	n	Cond. surv. % 2 yrs
0	1,280	45.8	1,806	31.8	3,932	7.5	1,314	16.5
1	778	54.7	955	35.1	699	23.8	353	40.8
2	473	69.3	461	47.8	231	50.8	178	67.4
3	331	75.5	264	60.0	124	68.8	119	83.6
4	248	81.3	173	69.0	86	76.3	100	88.4
5	189	87.5	113	74.0	63	77.2	86	92.4

Table 4f. Conditional relative 2-year survival of patients with pancreas cancer by extent of disease for period 1988-2016 (N=7,018).

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 4c). 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 75.5% (n=331).

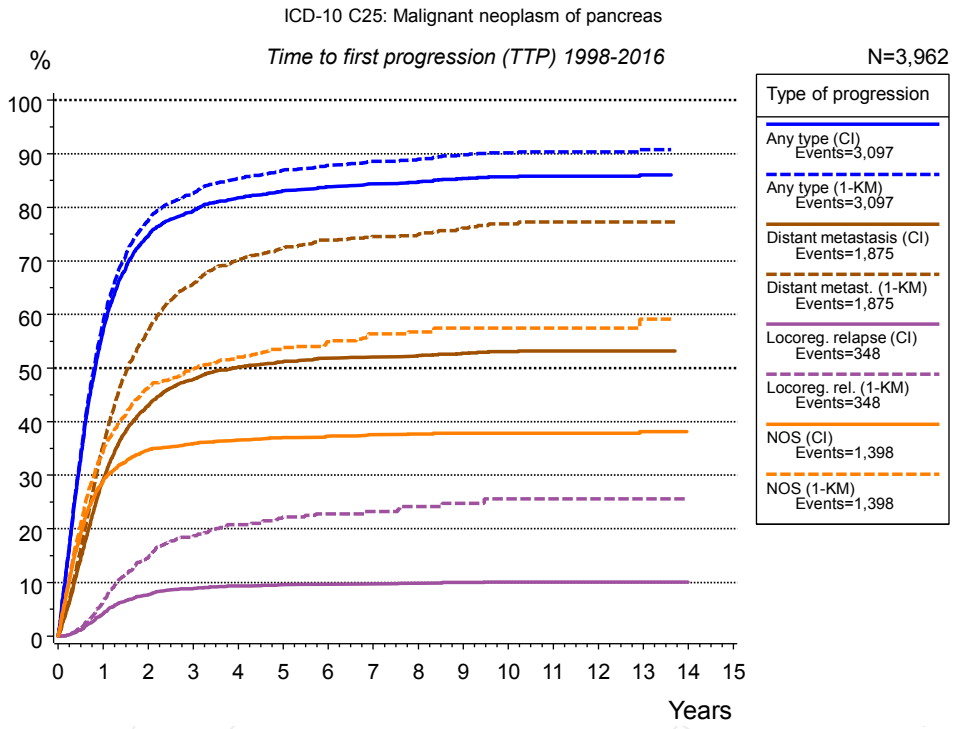

Figure 5a. Time to first progression of 3,962 patients with pancreas cancer diagnosed between 1998 and 2016 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency 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=3,962	n=3,962	n=3,962	n=3,962	n=3,962	n=3,962	n=3,962
Years	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	57.0	58.6	29.2	35.7	4.2	6.4	28.9
2	74.6	77.5	43.0	56.9	7.7	14.7	34.7
3	79.3	82.6	47.9	65.6	8.9	18.6	35.9
4	81.8	85.4	50.2	70.3	9.4	20.8	36.6
5	83.1	87.0	51.2	72.3	9.6	22.2	37.0
6	83.9	87.9	51.9	73.9	9.7	22.8	37.3
7	84.4	88.6	52.2	74.5	9.8	23.2	37.6
8	84.7	88.9	52.3	74.9	9.9	24.2	37.7
9	85.4	89.8	52.8	76.1	10.0	24.8	37.8
10	85.7	90.2	53.1	76.9	10.1	25.6	37.8
11	85.8	90.3	53.2	77.3	10.1	25.6	37.8
12	85.8	90.3	53.2	77.3	10.1	25.6	37.8
13	86.1	90.7	53.2	77.3	10.1	25.6	38.1
14					10.1	25.6	

Type of progression	
cont'd	NOS (1-KM) n=3,962
Years	%
0	0.0
1	34.5
2	46.3
3	49.8
4	52.1
5	53.8
6	54.9
7	56.4
8	56.7
9	57.4
10	57.4
11	57.4
12	57.4
13	59.1
14	

Table 5b. Time to first progression of patients with pancreas cancer for period 1998-2016 (N=3,962).

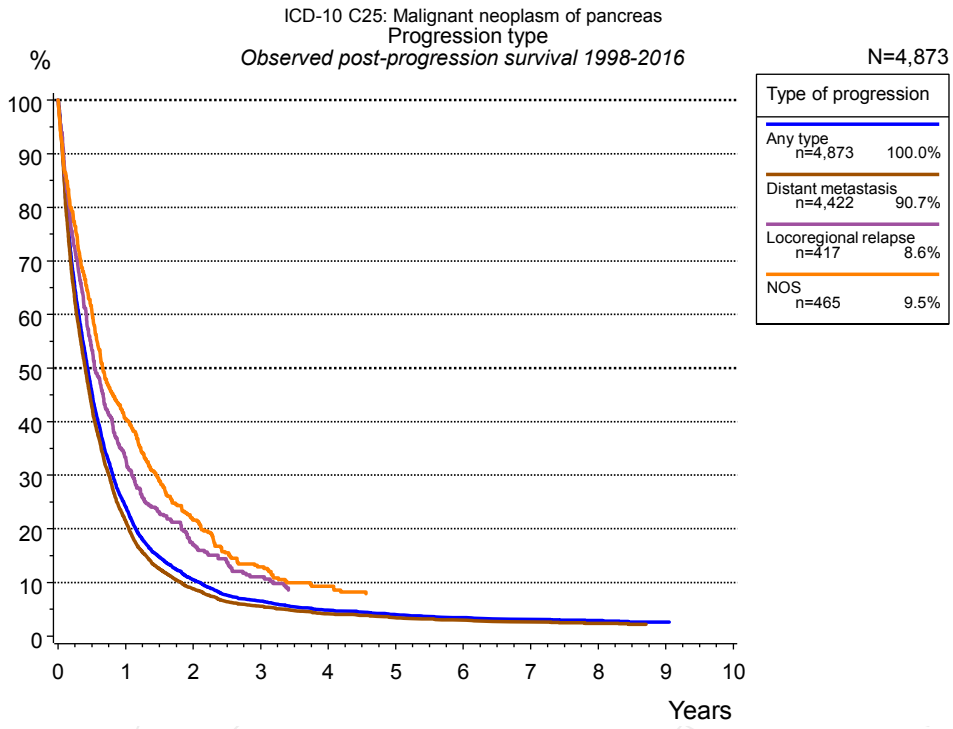

Figure 5c. Observed post-progression survival of 4,873 patients with pancreas cancer diagnosed between 1998 and 2016. These 4,873 patients with documented progression events during their course of disease represent 64.7 % of the totally 7,530 evaluated cases (incl. M1, n=3,568, 47.4 %). Patients with cancer relapse documented via death certificates only were excluded (n=1,792, 23.8 %). Multiple progression types on different sites are included in the evaluation even when not occuring 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 potientially considered in more than one subgroup.

	Type of progression			
	Any type	Distant metastasis	Locoregional relapse	NOS
	n=4,873	n=4,422	n=417	n=465
Years	%	%	%	%
0	100.0	100.0	100.0	100.0
1	24.1	21.4	33.3	40.5
2	10.5	8.8	16.9	21.6
3	6.5	5.5	11.0	12.9
4	4.8	4.1		9.3
5	3.9	3.4		
6	3.4	2.9		
7	3.1	2.6		
8	2.9	2.4		
9	2.6			

Table 5d. Observed post-progression survival of patients with pancreas cancer for period 1998-2016 (N=4,873).

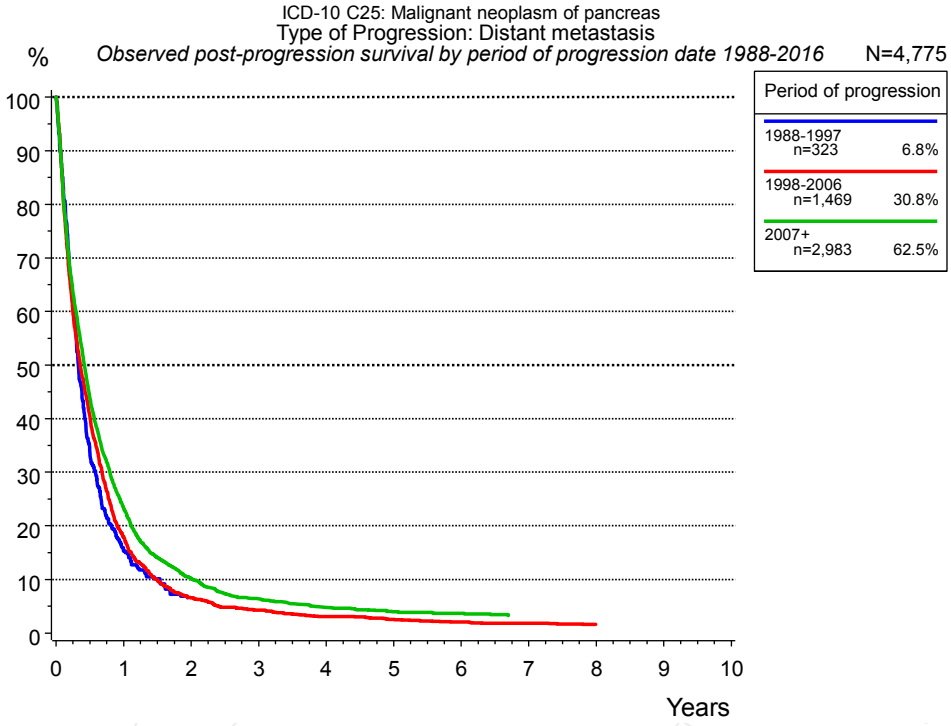

Figure 5e. Observed post-progression (distant metastasis) survival of 4,775 patients with pancreas cancer diagnosed between 1988 and 2016 by period of progression.

	Period of progression		
	1988-1997 n=323	1998-2006 n=1,469	2007+ n=2,983
Years	%	%	%
0	100.0	100.0	100.0
1	15.3	17.9	23.3
2		6.5	10.2
3		4.2	6.3
4		3.1	4.7
5		2.5	3.9
6		2.0	3.7
7		1.8	
8		1.6	

Table 5f. Observed post-progression (distant metastasis) survival of patients with pancreas cancer for period 1988-2016 by period of progression (N=4,775).

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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