Munich Cancer Registry

ICD-10 C25: Pancreas cancer

Survival

Year of diagnosis	1988-1997	1998-2014
Patients	867	11,685
Diseases	867	11,687
Cases evaluated	774	6,775
Creation date	03/02/2016	
Export date	12/23/2015	
Population	4.64 m	

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

ICD-10 C25: Malignant neoplasm of pancreas
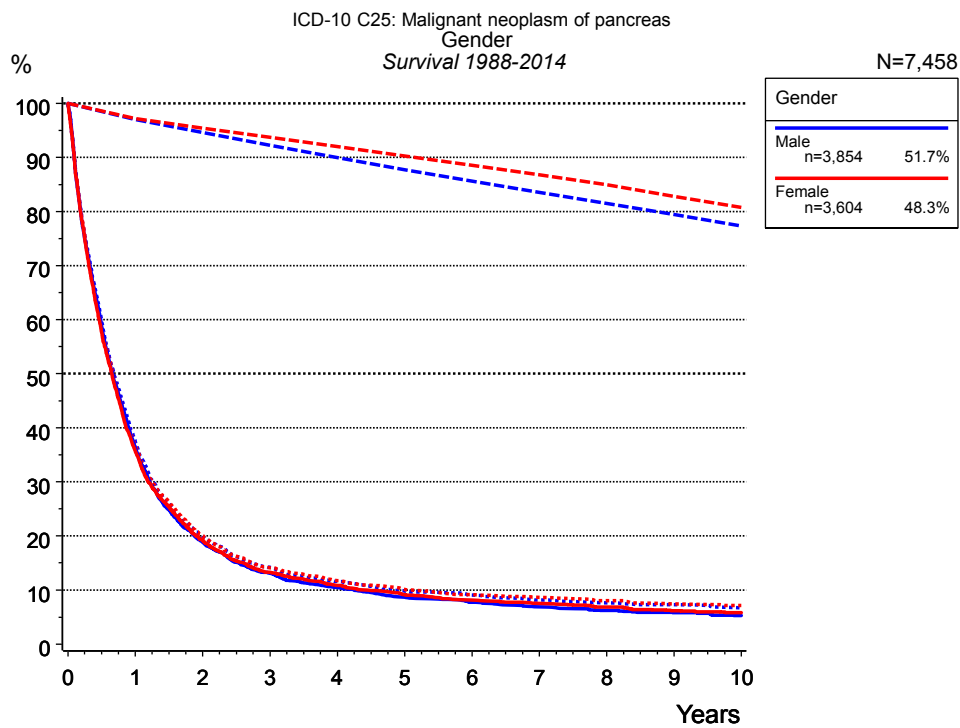Period of diagnosis
Relative survival 1988-2014
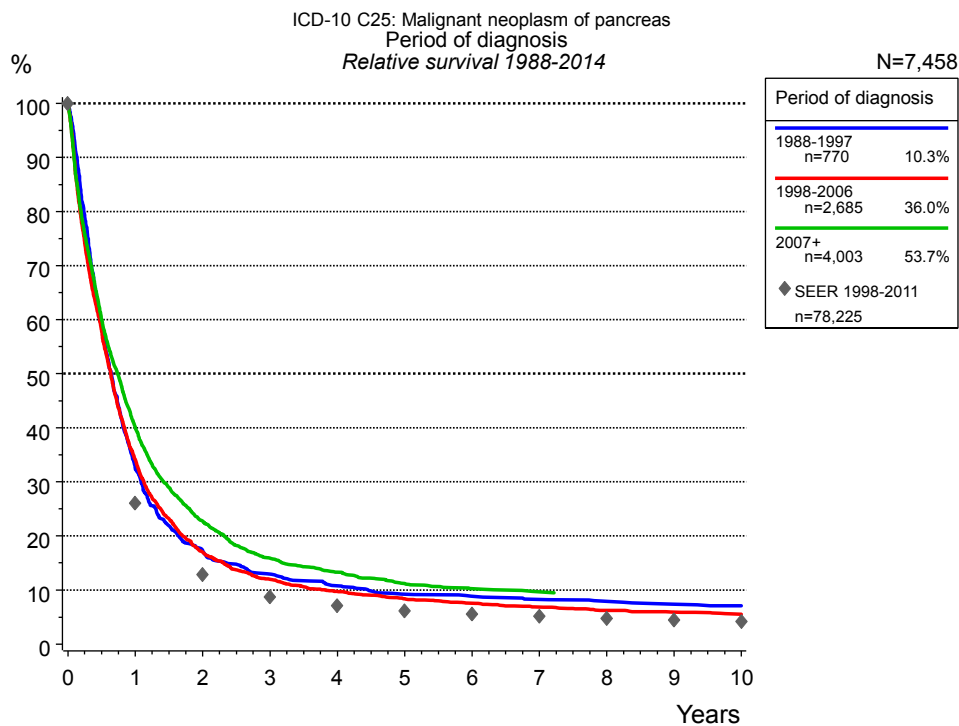
Figure 1a. Relative survival of patients with pancreas cancer by period of diagnosis. Included in the evaluation are 7,458 cases diagnosed between 1988 and 2014.

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 1998 to 2011, and are represented by gray 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=770		1998-2006 n=2,685		2007+ n=4,003	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	31.6	32.4	33.2	34.1	39.0	40.1
2	16.5	17.3	16.1	17.0	21.7	22.7
3	12.2	12.9	11.2	12.0	14.8	15.9
4	10.0	10.8	8.8	9.7	12.1	13.3
5	8.3	9.2	7.5	8.4	10.0	11.2
6	7.7	8.8	6.6	7.5	8.9	10.2
7	7.2	8.3	5.8	6.8	8.3	9.7
8	6.7	7.9	5.2	6.2		
9	6.0	7.4	4.8	5.9		
10	5.7	7.1	4.4	5.5		

Table 1b. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by period of diagnosis for period 1988-2014 (N=7,458).
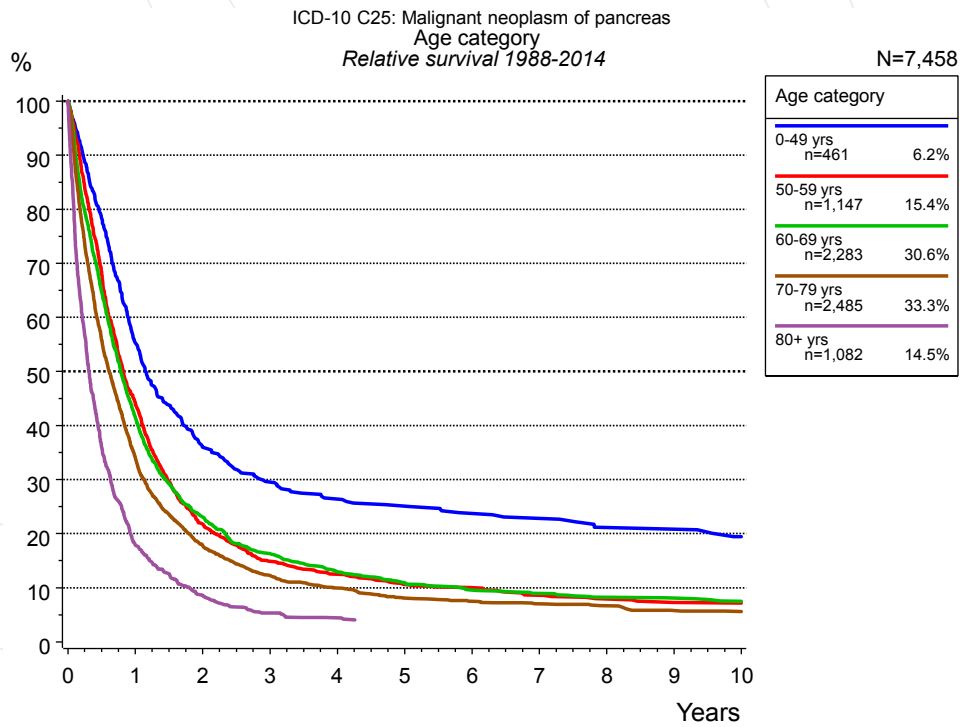
ICD-10 C25: Malignant neoplasm of pancreas
Gender
Survival 1988-2014

Figure 2a. Survival of patients with pancreas cancer by gender. Included in the evaluation are 7,458 cases diagnosed between 1988 and 2014.

	Gender			
	Male n=3,854		Female n=3,604	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	36.5	37.5	35.7	36.6
2	18.8	19.9	19.2	20.1
3	13.1	14.2	13.3	14.1
4	10.4	11.6	10.8	11.8
5	8.7	9.8	9.2	10.1
6	7.8	9.0	8.1	9.1
7	6.8	8.2	7.5	8.6
8	6.2	7.6	6.8	8.0
9	5.8	7.3	6.2	7.4
10	5.2	6.7	5.8	7.2

Table 2b. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by gender for period 1988-2014 (N=7,458).

ICD-10 C25: Malignant neoplasm of pancreas
Age category
Observed survival 1988-2014   N=7,458
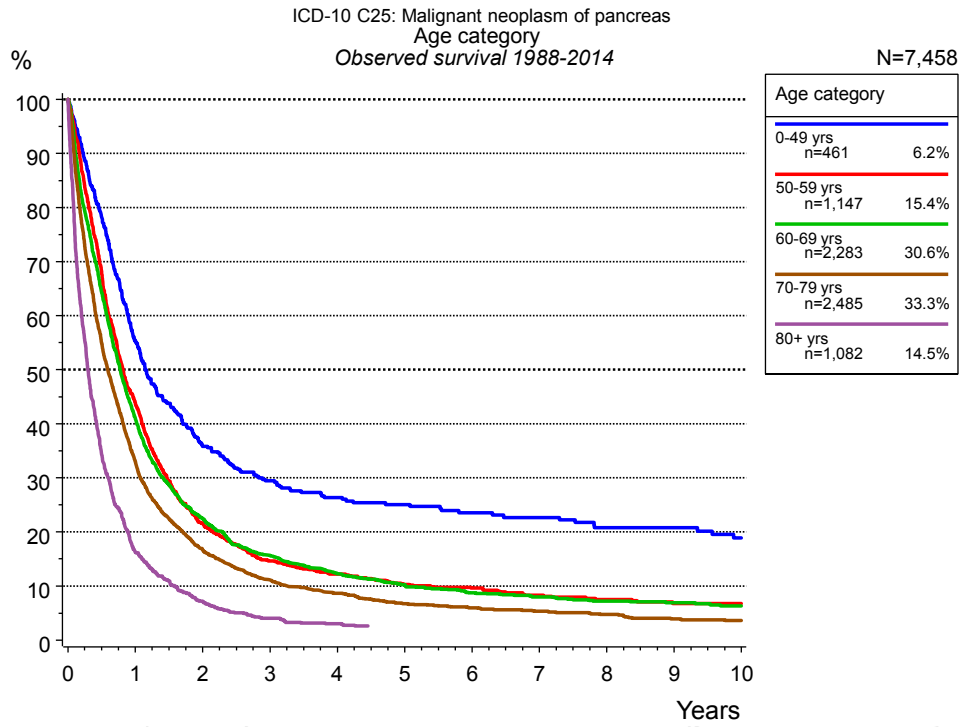
Figure 3a. Observed survival of patients with pancreas cancer by age category. Included in the evaluation are 7,458 cases diagnosed between 1988 and 2014.

ICD-10 C25: Malignant neoplasm of pancreas
Age category
Relative survival 1988-2014   N=7,458

Figure 3b. Relative survival of patients with pancreas cancer by age category. Included in the evaluation are 7,458 cases diagnosed between 1988 and 2014.

	Age category									
	0-49 yrs n=461		50-59 yrs n=1,147		60-69 yrs n=2,283		70-79 yrs n=2,485		80+ yrs n=1,082	
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	55.1	55.3	43.9	44.1	41.0	41.5	33.1	34.0	16.2	17.8
2	35.8	36.0	21.6	21.8	22.5	23.1	16.7	17.8	7.2	8.6
3	29.5	29.5	14.6	14.9	15.7	16.3	11.1	12.3	4.0	5.3
4	26.4	26.4	12.2	12.5	12.2	13.0	8.7	9.9	3.0	4.4
5	25.1	25.1	10.3	10.6	10.2	10.9	6.7	8.1		
6	23.5	23.7	9.6	10.0	8.7	9.6	6.0	7.5		
7	22.7	22.8	8.3	8.6	8.0	8.9	5.3	7.0		
8	20.8	21.1	7.5	7.9	7.2	8.3	4.8	6.7		
9	20.8	20.8	6.8	7.3	6.9	8.1	3.9	5.8		
10	18.9	19.4	6.8	7.1	6.3	7.5	3.6	5.5		

Table 3c. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by age category for period 1988-2014 (N=7,458).

ICD-10 C25: Malignant neoplasm of pancreas
TNM staging
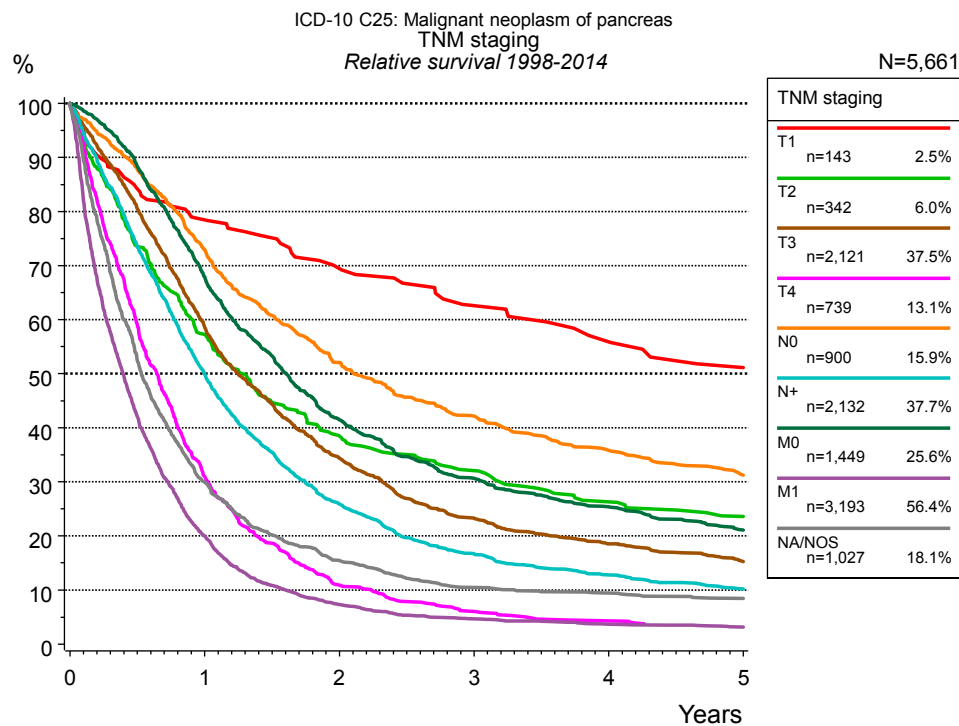*Relative survival 1988-2014*   N=6,303
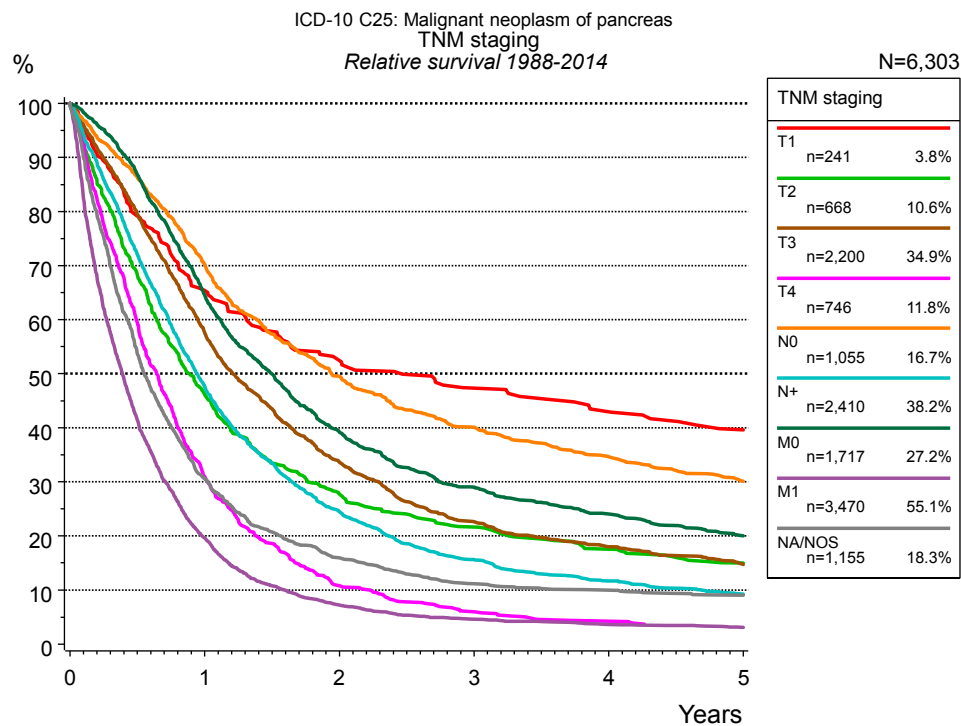
Figure 4a. Relative survival of patients with pancreas cancer by TNM staging. For 6,323 of 7,458 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 6,303 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potientially considered in more than one subgroup. The grey line represents the subgroup of 1,155 patients with missing values regarding TNM staging (15.5 % of 7,458 patients, the percent values of all other categories are related to n=6,303).

	TNM staging												
	T1		T2		T3		T4		N0		N+		M0	
	n=241		n=668		n=2,200		n=746		n=1,055		n=2,410		n=1,717	
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	64.1	65.4	45.1	46.1	56.5	57.6	30.2	31.0	68.6	70.2	46.7	47.6	63.1	64.5
2	51.1	52.4	26.7	27.7	32.3	33.6	10.4	10.8	47.4	49.5	23.5	24.5	37.7	39.2
3	44.7	47.3	20.5	21.6	21.2	22.7	5.8	6.0	37.7	40.1	14.7	15.6	27.2	29.0
4	40.1	43.0	16.4	17.5	16.5	18.0	4.1	4.3	31.8	34.6	10.8	11.7	22.1	24.1
5	35.9	39.6	13.7	15.0	13.3	14.7			27.1	30.1	8.4	9.3	18.1	20.0

	TNM staging			
cont'd	M1		NA/NOS	
	n=3,470		n=1,155	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	19.1	19.6	29.3	30.6
2	6.9	7.2	14.8	15.9
3	4.3	4.6	10.1	11.2
4	3.3	3.6	8.8	10.0
5	2.8	3.1	7.8	9.0

Table 4b. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by TNM staging for period 1988-2014 (N=12,507).

ICD-10 C25: Malignant neoplasm of pancreas
TNM staging
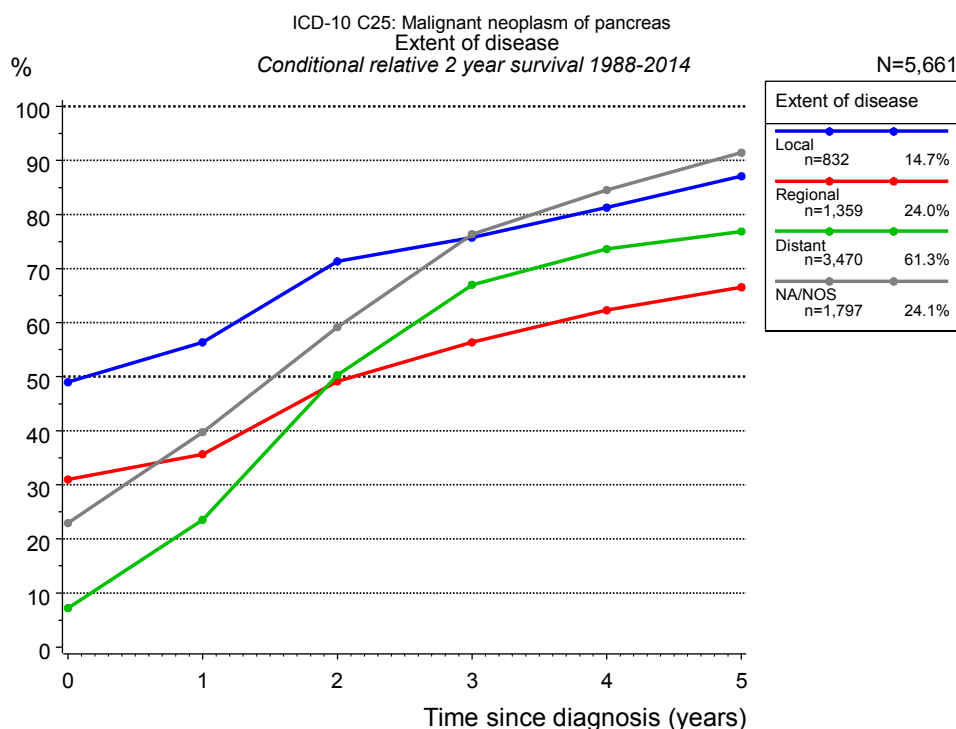*Relative survival 1998-2014*

Figure 4c. Relative survival of patients with pancreas cancer by TNM staging. For 5,678 of 6,688 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 5,661 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 1,027 patients with missing values regarding TNM staging (15.4 % of 6,688 patients, the percent values of all other categories are related to n=5,661).

	TNM staging												
	T1		T2		T3		T4		N0		N+		M0	
	n=143		n=342		n=2,121		n=739		n=900		n=2,132		n=1,449	
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	77.5	78.5	56.2	57.3	57.6	58.6	30.2	31.0	71.4	72.9	49.0	50.0	66.5	67.9
2	67.5	69.5	37.0	38.5	33.0	34.4	10.5	10.9	49.9	52.1	24.9	25.9	39.8	41.5
3	59.4	62.6	30.5	32.0	21.8	23.3	5.9	6.1	39.6	42.1	15.7	16.7	28.8	30.7
4	52.9	55.9	24.7	26.3	17.0	18.6	4.1	4.3	32.9	35.8	11.8	12.8	23.3	25.4
5	47.2	51.1	21.7	23.6	13.8	15.2			28.2	31.2	9.3	10.2	19.0	21.1

cont'd	TNM staging			
	M1		NA/NOS	
	n=3,193		n=1,027	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	19.4	20.0	28.7	30.0
2	7.0	7.3	14.3	15.4
3	4.4	4.7	9.5	10.5
4	3.4	3.7	8.3	9.4
5	2.9	3.2	7.3	8.4

Table 4d. Observed (obs.) and relative (rel.) survival of patients with pancreas cancer by TNM staging for period 1998-2014 (N=11,019).

ICD-10 C25: Malignant neoplasm of pancreas
Extent of disease
*Conditional relative 2 year survival 1988-2014*

Figure 4e. Conditional relative 2-year survival of patients with pancreas cancer by extent of disease. For 6,323 of 7,458 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 5,661 cases an evaluable classification was established. The grey line represents the subgroup of 1,797 patients with missing values regarding extent of disease (24.1% of 7,458 patients, the percent values of all other categories are related to n=5,661).

	Extent of disease							
	Local		Regional		Distant		NA/NOS	
		Cond. surv. %		Cond. surv. %		Cond. surv. %		Cond. surv. %
Years	n	2 yrs	n	2 yrs	n	2 yrs	n	2 yrs
0	832	49.0	1,359	31.0	3,470	7.2	1,797	22.9
1	528	56.4	704	35.7	624	23.5	676	39.8
2	315	71.3	323	49.2	197	50.3	364	59.2
3	216	75.7	184	56.4	111	67.0	234	76.4
4	161	81.3	107	62.3	75	73.6	185	84.5
5	121	87.1	65	66.5	55	76.9	149	91.4

Table 4f. Conditional relative 2-year survival of patients with pancreas cancer by extent of disease for period 1988-2014 (N=5,661).

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 75.7% (n=216).

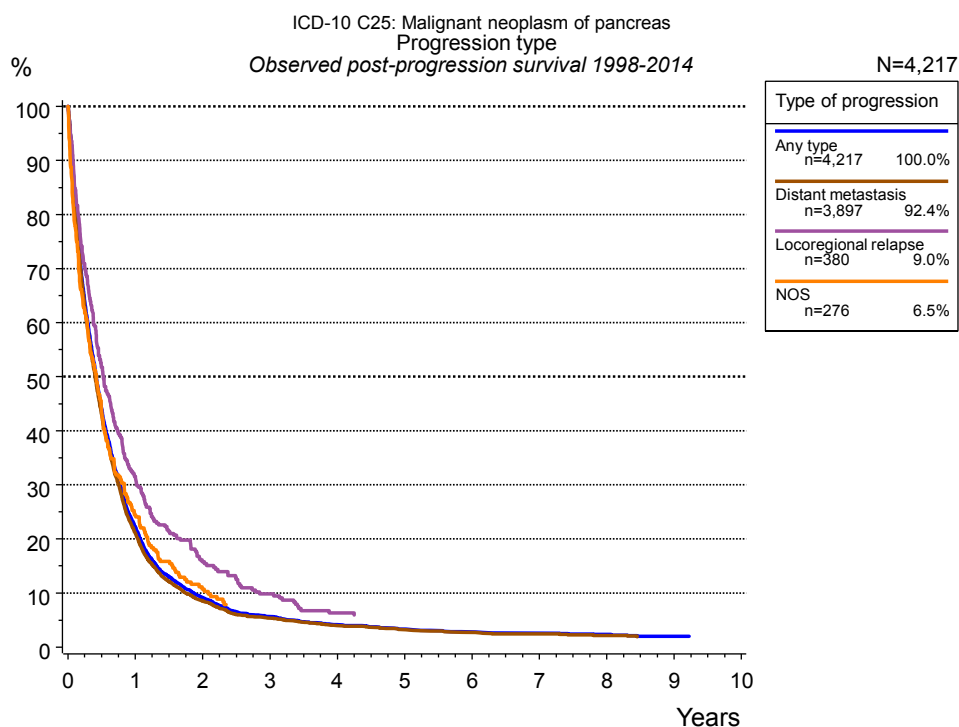ICD-10 C25: Malignant neoplasm of pancreas
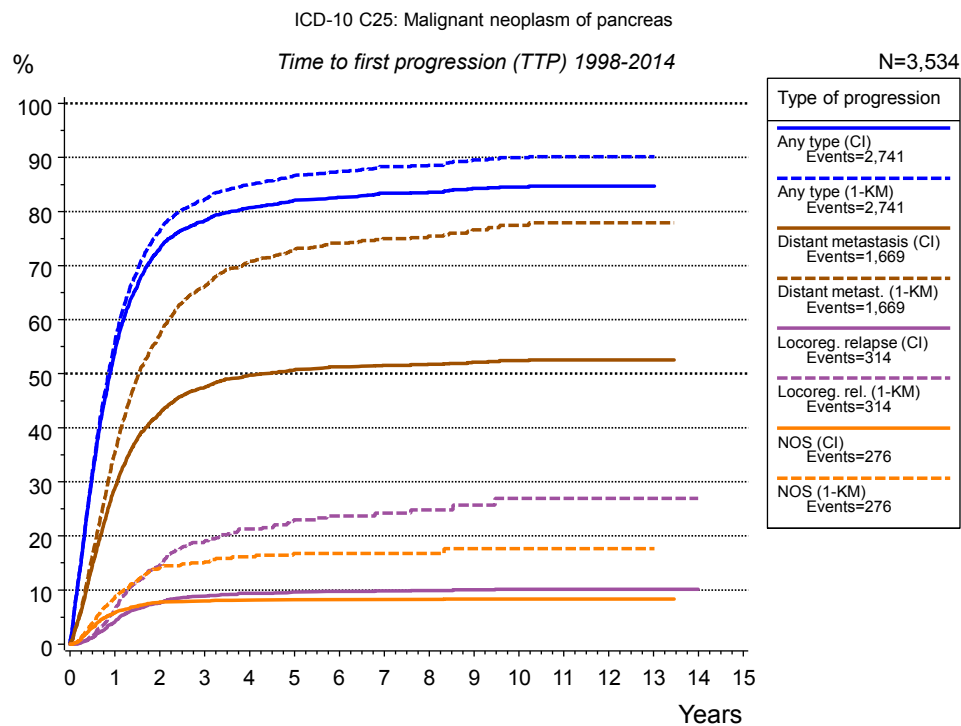
Figure 5a. Time to first progression of 3,534 patients with pancreas cancer diagnosed between 1998 and 2014 (M0 only in solid cancers) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency 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=3,534	n=3,534	n=3,534	n=3,534	n=3,534	n=3,534	n=3,534
Years	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	54.0	55.7	28.9	35.5	4.2	6.4	5.8
2	73.0	76.3	42.6	57.1	7.7	14.6	7.7
3	78.2	82.2	47.4	66.0	8.9	19.0	8.0
4	80.7	85.1	49.8	70.8	9.4	21.3	8.2
5	82.1	86.7	50.7	72.8	9.7	23.0	8.2
6	82.6	87.4	51.2	74.1	9.8	23.7	8.2
7	83.4	88.3	51.6	75.0	9.8	24.2	8.2
8	83.5	88.5	51.7	75.4	9.9	24.9	8.2
9	84.2	89.6	52.1	76.7	10.0	25.7	8.3
10	84.5	89.9	52.4	77.5	10.2	27.0	8.3
11	84.7	90.2	52.6	78.0	10.2	27.0	8.3
12	84.7	90.2	52.6	78.0	10.2	27.0	8.3
13	84.7	90.2	52.6	78.0	10.2	27.0	8.3
14	84.7	90.2	52.6	78.0	10.2	27.0	8.3
15	84.7	90.2	52.6	78.0			8.3

	Type of progression
cont'd	NOS (1-KM) n=3,534
Years	%
0	0.0
1	8.6
2	14.1
3	15.2
4	16.1
5	16.8
6	16.8
7	16.8
8	16.8
9	17.7
10	17.7
11	17.7
12	17.7
13	17.7
14	17.7
15	17.7

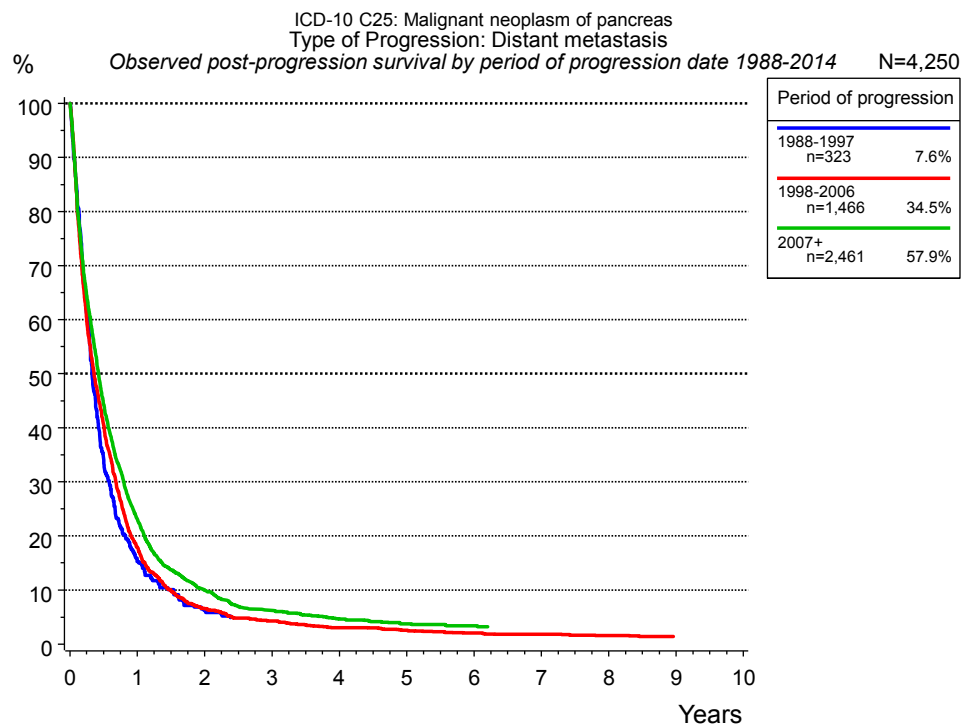**Table 5b.** Time to first progression of patients with pancreas cancer for period 1998-2014 (N=3,534).

ICD-10 C25: Malignant neoplasm of pancreas
Progression type
Observed post-progression survival 1998-2014   N=4,217

Figure 5c. Observed post-progression survival of 4,217 patients with pancreas cancer diagnosed between 1998 and 2014. These 4,217 patients with documented progression events during their course of disease represent 63.3 % of the totally 6,657 evaluated cases (incl. M1, n=3,123, 46.9 %). Patients with cancer relapse documented via death certificates only were excluded (n=1,647, 24.7 %). 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=4,217	n=3,897	n=380	n=276
Years	%	%	%	%
0	100.0	100.0	100.0	100.0
1	22.3	21.1	31.6	24.4
2	9.1	8.5	15.8	10.7
3	5.6	5.4	9.8	
4	4.1	3.9	6.3	
5	3.3	3.2		
6	2.8	2.7		
7	2.6	2.4		
8	2.3	2.2		
9	2.0	1.9		
10	2.0	1.9		

Table 5d. Observed post-progression survival of patients with pancreas cancer for period 1998-2014 (N=4,217).

ICD-10 C25: Malignant neoplasm of pancreas
Type of Progression: Distant metastasis
Observed post-progression survival by period of progression date 1988-2014 N=4,250

Figure 5e. Observed post-progression (distant metastasis) survival of 4,250 patients with pancreas cancer diagnosed between 1988 and 2014 by period of progression.

	Period of progression		
	1988-1997 n=323	1998-2006 n=1,466	2007+ n=2,461
Years	%	%	%
0	100.0	100.0	100.0
1	15.3	18.0	23.1
2	6.2	6.6	10.0
3		4.3	6.2
4		3.1	4.6
5		2.5	3.8
6		2.0	3.4
7		1.8	3.2
8		1.6	3.2
9		1.4	
10		1.4	

Table 5f. Observed post-progression (distant metastasis) survival of patients with pancreas cancer for period 1988-2014 by period of progression (N=4,250).

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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