Munich Cancer Registry

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

ICD-10 C21: Anal cancer

Survival

Year of diagnosis	1988-1997	1998-2014
Patients	241	1,292
Diseases	241	1,292
Cases evaluated	225	1,010

Creation date	04/11/2016
Export date	12/23/2015
Population	4.64 m

Munich Cancer Registry at Munich Cancer Center
Marchioninistr. 15
Munich, 81377
Germany

http://www.tumorregister-muenchen.de/en

http://www.tumorregister-muenchen.de/en/facts/surv/sC21__E-ICD-10-C21-Anal-cancer-survival.pdf

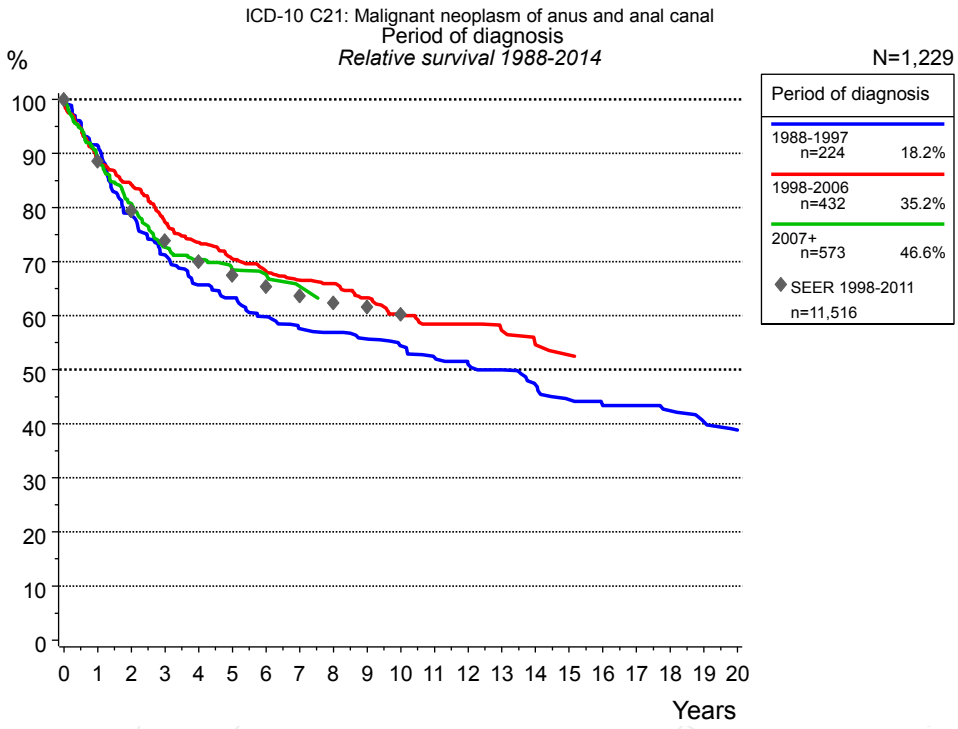

Figure 1a. Relative survival of patients with anal cancer by period of diagnosis. Included in the evaluation are 1,229 cases diagnosed between 1988 and 2014.

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=224		1998-2006 n=432		2007+ n=573	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	88.7	91.5	86.8	89.0	86.7	88.9
2	73.7	78.4	80.1	84.2	77.1	80.7
3	65.5	71.2	71.9	77.3	68.1	72.6
4	58.6	65.7	67.0	73.5	64.8	70.4
5	55.4	63.3	62.9	70.5	61.7	68.5
6	51.2	59.8	59.7	68.2	59.7	67.6
7	47.9	57.6	57.0	66.6	57.1	65.4
8	46.5	56.9	55.5	66.0		
9	44.5	55.7	52.0	63.3		
10	42.1	54.4	48.7	60.3		
11	39.7	52.2	46.1	58.4		
12	37.7	51.0	45.1	58.4		
13	36.7	50.0	43.1	57.2		
14	33.6	47.2	40.2	54.6		
15	31.0	44.5	39.0	52.7		
16	29.4	43.4				
17	28.9	43.4				
18	27.7	42.4				
19	25.7	40.4				
20	24.1	38.8				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with anal cancer by period of diagnosis for period 1988-2014 (N=1,229).

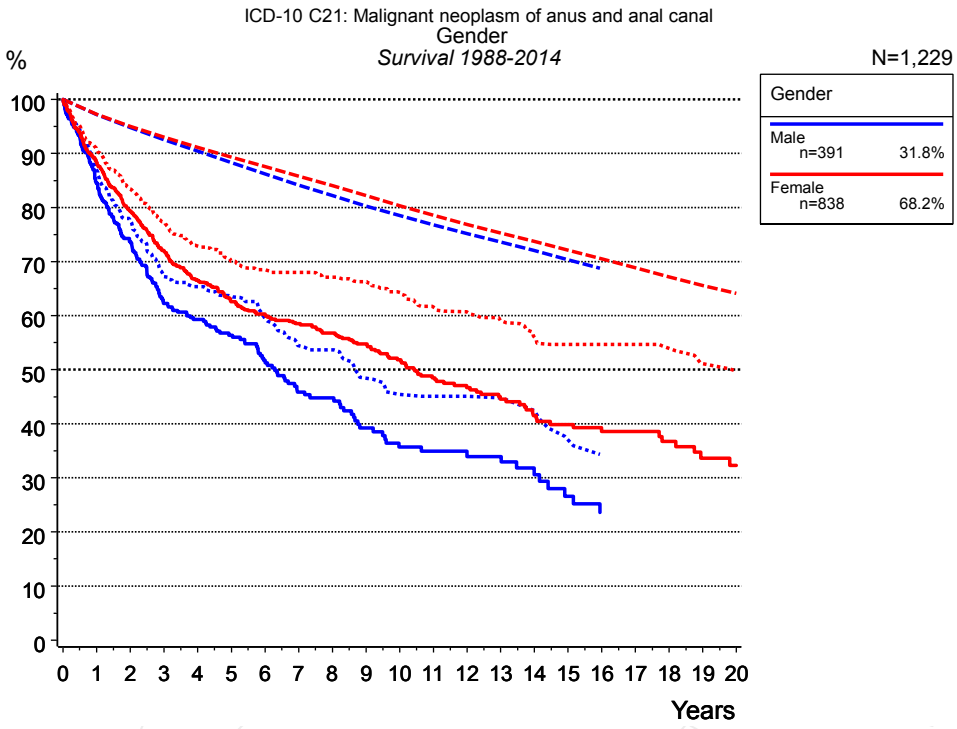

Figure 2a. Survival of patients with anal cancer by gender. Included in the evaluation are 1,229 cases diagnosed between 1988 and 2014.

	Gender			
	Male n=391		Female n=838	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	84.6	86.9	88.3	90.7
2	73.7	77.5	79.3	83.4
3	62.2	67.2	72.1	77.3
4	59.3	65.4	66.5	72.9
5	56.4	63.5	62.6	70.1
6	51.3	59.4	60.3	68.5
7	45.9	54.4	58.5	68.0
8	44.8	53.7	56.8	67.1
9	39.2	48.4	54.8	66.3
10	35.7	45.4	51.9	64.3
11	34.9	45.1	48.5	61.6
12	34.0	45.1	46.7	60.7
13	34.0	44.8	44.6	59.1
14	30.6	42.4	41.5	56.0
15	26.6	37.0	39.9	54.7
16	23.6	34.2	38.6	54.7
17			38.6	54.7
18			36.7	54.0
19			33.6	51.1
20			32.3	49.7

Table 2b. Observed (obs.) and relative (rel.) survival of patients with anal cancer by gender for period 1988-2014 (N=1,229).

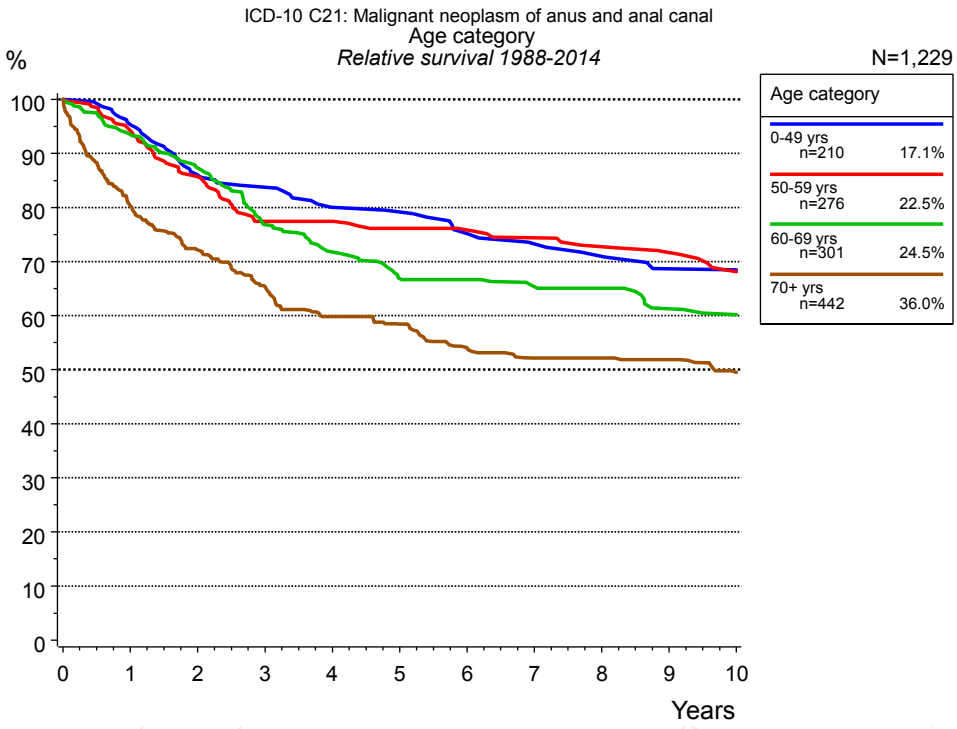

Figure 3a. Relative survival of patients with anal cancer by age category. Included in the evaluation are 1,229 cases diagnosed between 1988 and 2014.

	Age category							
	0-49 yrs n=210		50-59 yrs n=276		60-69 yrs n=301		70+ yrs n=442	
Years	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	95.6	95.4	94.0	94.2	92.6	93.5	75.1	80.3
2	85.8	86.0	85.1	85.7	85.5	87.3	63.5	72.2
3	83.6	83.7	76.3	77.4	74.1	76.8	54.0	65.3
4	79.4	80.0	76.3	77.4	68.5	71.8	46.8	59.8
5	78.7	79.2	74.2	76.2	62.9	66.9	42.5	58.4
6	75.0	75.2	73.5	75.9	61.9	66.6	36.7	54.1
7	72.4	73.3	71.6	74.4	59.6	65.3	33.0	52.1
8	70.5	70.9	69.4	72.8	59.0	65.1	31.4	52.1
9	67.2	68.7	67.7	71.7	54.0	61.3	29.2	51.8
10	67.2	68.5	63.4	68.1	52.4	60.2	24.9	49.5

Table 3b. Observed (obs.) and relative (rel.) survival of patients with anal cancer by age category for period 1988-2014 (N=1,229).

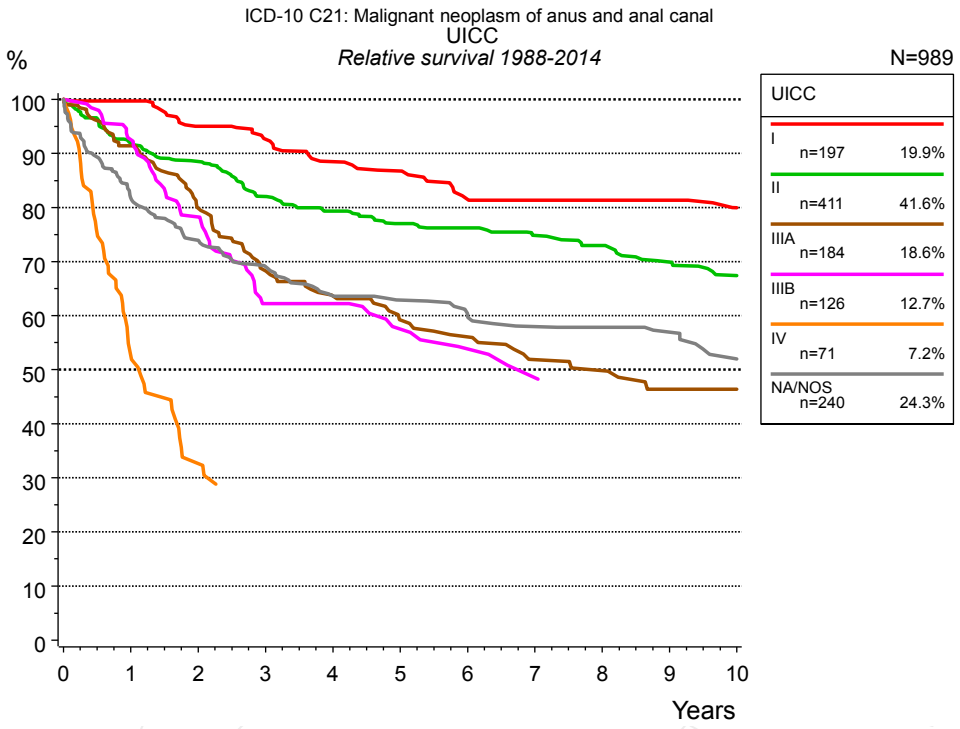

Figure 4a. Relative survival of patients with anal cancer by UICC. For 1,038 of 1,229 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 989 cases an evaluable classification was established. The grey line represents the subgroup of 240 patients with missing values regarding UICC (19.5% of 1,229 patients, the percent values of all other categories are related to n=989).

	UICC											
	I n=197		II n=411		IIIA n=184		IIIB n=126		IV n=71		NA/NOS n=240	
Years	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
1	99.5	99.7	89.9	92.0	89.3	91.4	90.9	92.5	52.9	52.6	78.7	81.7
2	91.4	95.0	84.5	88.5	75.7	79.8	75.6	78.2	32.1	32.6	69.5	73.9
3	87.6	92.6	76.9	82.1	63.4	68.3	58.2	62.3			63.0	69.1
4	82.4	88.5	72.8	79.3	57.2	63.6	58.2	62.3			57.2	63.7
5	79.6	86.7	69.3	77.0	51.5	59.2	51.7	57.5			55.0	62.9
6	73.3	81.5	67.6	76.2	48.0	56.1	47.3	53.9			51.8	60.1
7	72.5	81.3	64.7	74.9	42.6	51.8	43.4	48.5			49.1	57.9
8	72.5	81.3	62.1	73.0	40.6	49.8	40.7	46.4			48.4	57.8
9	70.2	81.3	58.3	69.9	36.2	46.4					46.7	56.9
10	65.5	79.9	55.1	67.4	36.2	46.4					41.3	52.0

Table 4b. Observed (obs.) and relative (rel.) survival of patients with anal cancer by UICC for period 1988-2014 (N=989).

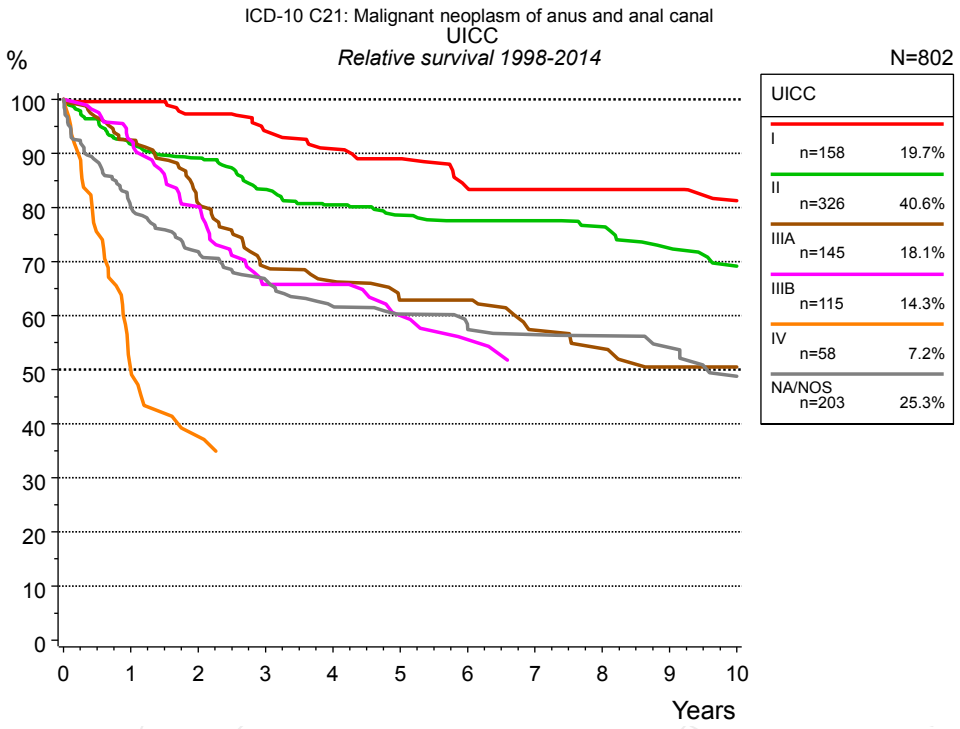

Figure 4c. Relative survival of patients with anal cancer by UICC. For 842 of 1,005 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 802 cases an evaluable classification was established. The grey line represents the subgroup of 203 patients with missing values regarding UICC (20.2% of 1,005 patients, the percent values of all other categories are related to n=802).

	UICC											
	I n=158		II n=326		IIIA n=145		IIIB n=115		IV n=58		NA/NOS n=203	
Years	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
1	99.4	99.6	89.7	91.7	90.7	92.5	91.0	92.4	50.8	49.9	77.4	80.1
2	93.9	97.3	85.5	89.2	77.1	80.8	77.7	80.2	37.2	37.7	67.9	71.8
3	89.0	94.1	78.4	83.3	64.4	69.0	61.8	65.8			61.3	66.7
4	84.6	90.8	74.2	80.5	60.7	66.4	61.8	65.8			56.0	61.7
5	81.9	89.0	71.1	78.6	55.2	62.9	54.4	60.0			53.3	60.3
6	75.3	83.5	69.1	77.6	55.2	62.9	49.3	55.6			50.7	58.0
7	74.1	83.4	67.9	77.6	47.4	57.3	44.7	48.7			49.0	56.5
8	74.1	83.4	65.9	76.4	44.6	53.9					47.9	56.3
9	72.4	83.4	61.4	72.5	39.7	50.5					45.5	54.1
10	66.6	81.3	57.7	69.2	39.7	50.5					40.4	48.8

Table 4d. Observed (obs.) and relative (rel.) survival of patients with anal cancer by UICC for period 1998-2014 (N=802).

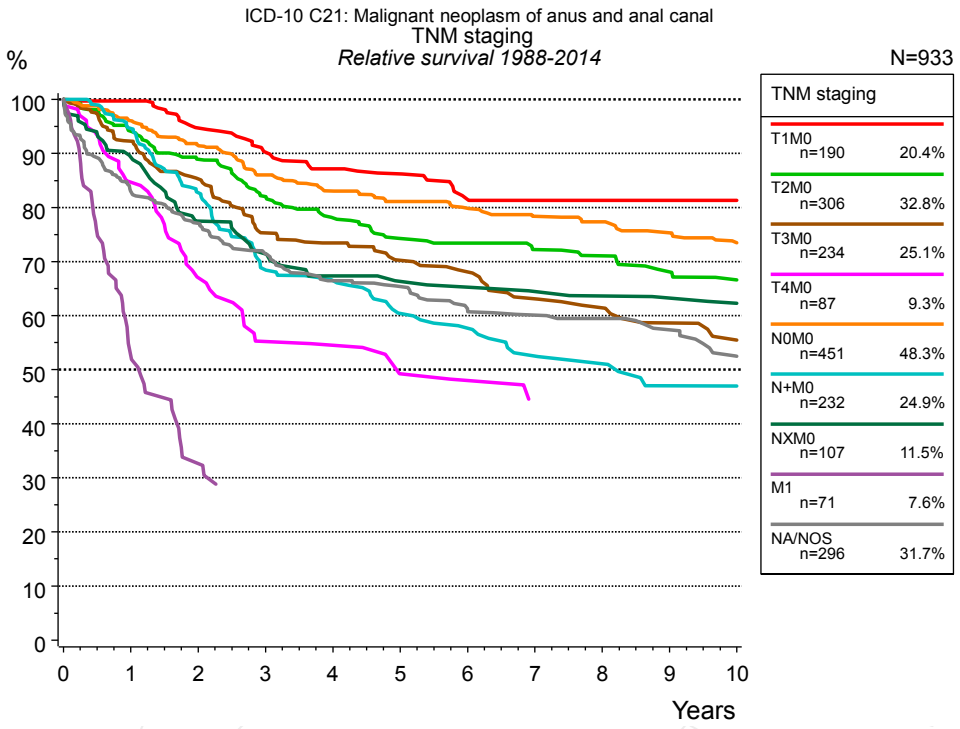

Figure 4e. Relative survival of patients with anal cancer by TNM staging. For 1,038 of 1,229 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 933 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potientially considered in more than one subgroup. The grey line represents the subgroup of 296 patients with missing values regarding TNM staging (24.1 % of 1,229 patients, the percent values of all other categories are related to n=933).

	TNM staging													
	T1M0 n=190		T2M0 n=306		T3M0 n=234		T4M0 n=87		N0M0 n=451		N+M0 n=232		NXM0 n=107	
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	99.5	99.7	92.3	94.1	90.1	92.3	83.0	84.7	94.1	96.1	92.7	94.6	86.8	89.3
2	90.9	94.7	85.4	88.9	81.0	85.3	64.2	67.0	87.8	91.5	79.3	82.7	73.1	77.5
3	85.0	90.2	77.5	82.0	69.7	75.3	51.9	55.2	81.0	86.0	64.4	68.5	66.7	71.4
4	80.8	87.1	72.2	78.1	66.4	73.5	50.5	54.6	76.7	83.1	60.9	66.5	61.2	67.4
5	78.6	86.2	67.3	74.2	62.0	70.2	43.7	49.3	73.5	81.1	54.0	60.4	58.8	66.4
6	72.8	81.5	65.9	73.4	59.1	68.1	41.8	48.0	70.8	79.8	50.9	57.6	57.5	65.3
7	71.9	81.3	63.0	72.2	53.7	63.1	37.2	44.2	67.8	78.4	45.6	52.5	54.8	64.5
8	71.9	81.3	61.1	71.0	51.2	61.4			65.8	77.3	43.5	51.1	53.3	63.6
9	69.6	81.3	57.6	68.1	47.4	58.7			62.6	75.3	38.5	47.0	51.7	63.3
10	65.9	81.3	55.3	66.6	44.3	55.5			59.5	73.5	38.5	46.9	50.1	62.3

TNM staging				
cont'd	M1		NA/NOS	
	n=71		n=296	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	52.9	52.6	80.0	82.9
2	32.1	32.6	72.5	77.1
3			65.4	71.5
4			59.4	66.5
5			57.3	65.4
6			52.5	61.1
7			50.9	60.1
8			49.7	59.5
9			46.9	57.4
10			41.7	52.5

Table 4f. Observed (obs.) and relative (rel.) survival of patients with anal cancer by TNM staging for period 1988-2014 (N=933).

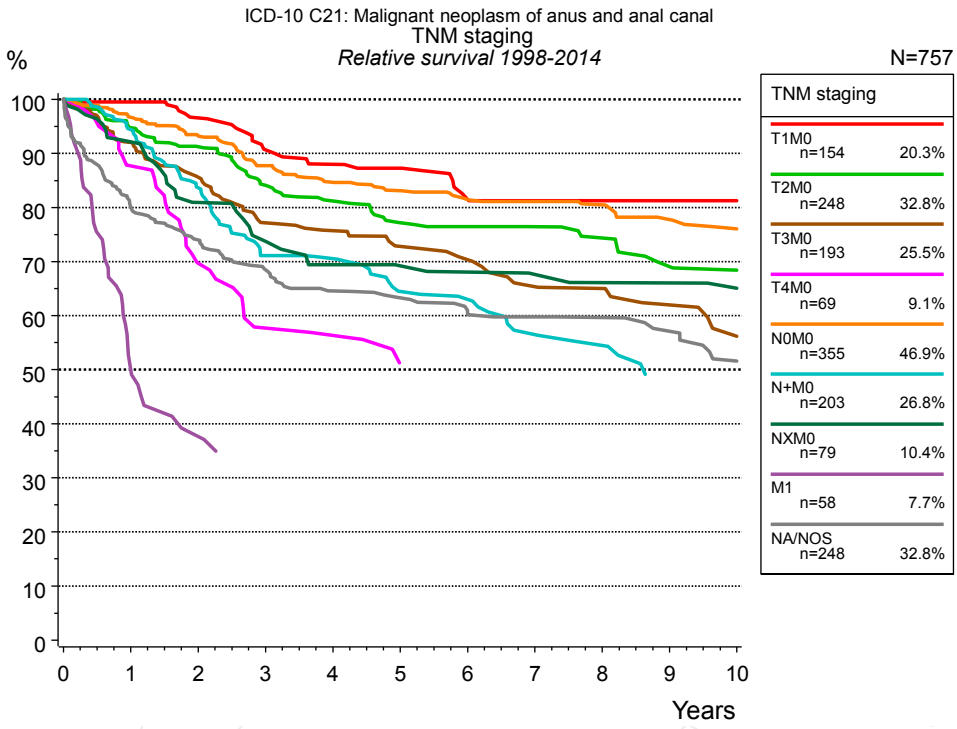

Figure 4g. Relative survival of patients with anal cancer by TNM staging. For 842 of 1,005 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 757 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potientially considered in more than one subgroup. The grey line represents the subgroup of 248 patients with missing values regarding TNM staging (24.7 % of 1,005 patients, the percent values of all other categories are related to n=757).

	TNM staging													
	T1M0 n=154		T2M0 n=248		T3M0 n=193		T4M0 n=69		N0M0 n=355		N+M0 n=203		NXM0 n=79	
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	99.4	99.6	92.9	94.7	90.1	92.0	86.1	87.7	94.8	96.7	92.7	94.4	89.8	92.1
2	92.9	96.6	87.7	91.2	81.7	85.6	67.0	69.7	89.7	93.3	80.5	83.7	76.4	81.0
3	85.2	90.7	79.6	84.1	72.0	77.2	54.7	57.7	82.8	87.7	66.8	71.1	69.0	73.7
4	81.6	88.0	75.4	81.2	69.2	75.7	52.7	56.4	78.5	84.6	65.4	70.6	62.7	69.4
5	79.6	87.3	70.1	77.2	65.0	72.8	45.7	51.2	75.7	83.1	57.9	64.5	61.0	69.2
6	72.8	81.5	68.9	76.4	61.9	70.4	45.7	50.5	72.8	81.5	55.9	63.0	59.1	68.1
7	71.5	81.3	67.2	76.4	56.6	65.4			71.1	81.1	49.3	56.5	56.9	67.6
8	71.5	81.3	64.5	74.4	55.5	65.0			69.2	80.5	46.6	54.5	54.6	66.1
9	69.8	81.3	59.1	69.0	51.3	62.0			65.5	77.7	40.2	48.9	54.6	66.0
10	65.9	81.3	57.8	68.4	46.3	56.2			62.9	76.0	40.2	48.4	52.0	65.0

TNM staging				
cont'd	M1 n=58		NA/NOS n=248	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	50.8	49.9	77.4	80.0
2	37.2	37.7	70.0	74.0
3			63.2	68.5
4			58.4	64.6
5			56.2	63.3
6			53.0	60.6
7			51.6	59.8
8			50.8	59.7
9			47.8	57.1
10			42.5	51.6

Table 4h. Observed (obs.) and relative (rel.) survival of patients with anal cancer by TNM staging for period 1998-2014 (N=757).

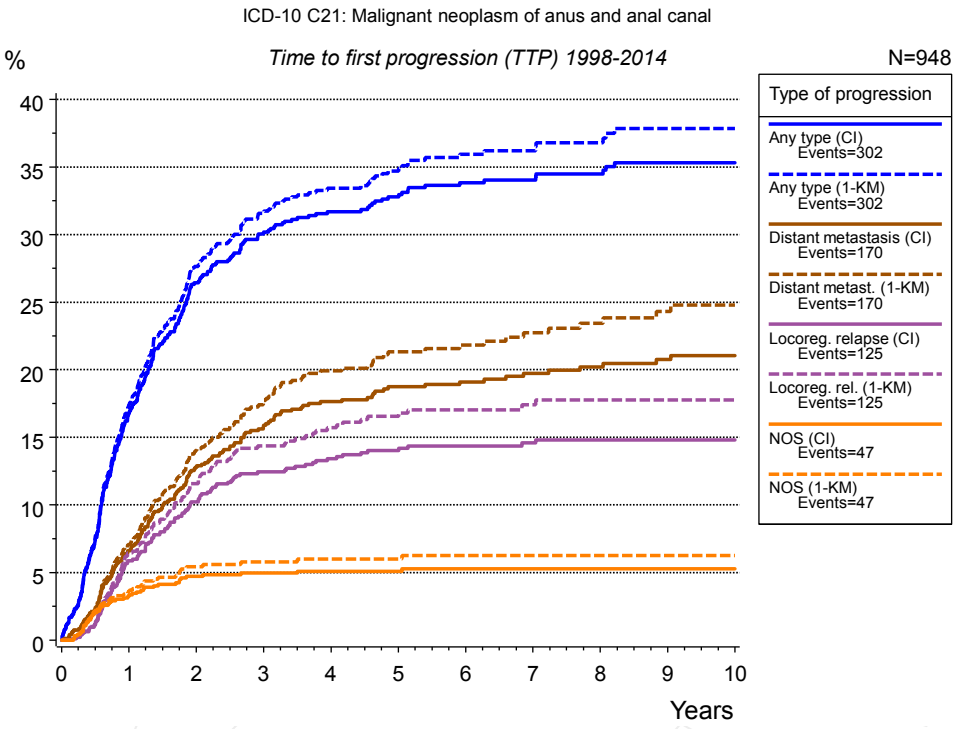

Figure 5a. Time to first progression of 948 patients with anal cancer diagnosed between 1998 and 2014 (M0 only in solid cancers) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of 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=948	n=948	n=948	n=948	n=948	n=948	n=948
Years	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	16.8	17.4	6.6	7.1	5.9	6.5	3.2
2	26.4	27.7	12.8	14.0	10.2	11.6	4.7
3	30.1	31.6	15.8	17.6	12.4	14.4	5.0
4	31.7	33.4	17.6	19.9	13.4	15.7	5.1
5	32.8	34.7	18.7	21.3	14.0	16.6	5.1
6	33.8	35.9	19.1	21.8	14.4	17.0	5.3
7	34.0	36.2	19.7	22.7	14.6	17.4	5.3
8	34.5	36.8	20.2	23.4	14.8	17.8	5.3
9	35.3	37.8	20.8	24.3	14.8	17.8	5.3
10	35.3	37.8	21.1	24.8	14.8	17.8	5.3

Type of progression	
cont'd	NOS (1-KM) n=948
Years	%
0	0.0
1	3.5
2	5.4
3	5.8
4	6.0
5	6.0
6	6.2
7	6.2
8	6.2
9	6.2
10	6.2

Table 5b. Time to first progression of patients with anal cancer for period 1998-2014 (N=948).

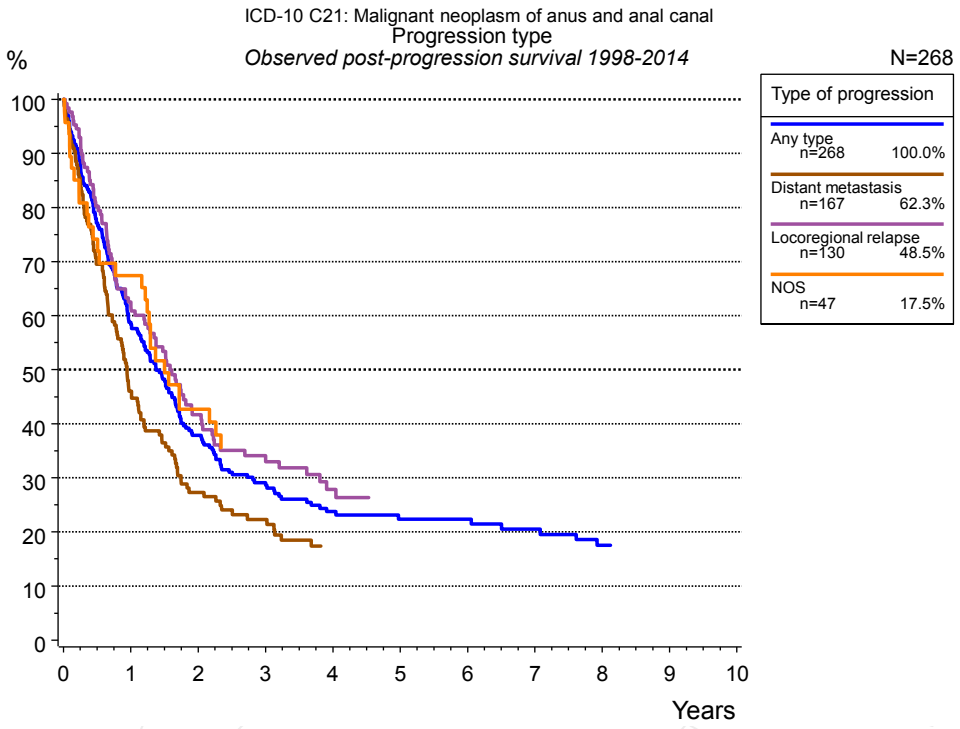

Figure 5c. Observed post-progression survival of 268 patients with anal cancer diagnosed between 1998 and 2014. These 268 patients with documented progression events during their course of disease represent 26.7 % of the totally 1,005 evaluated cases (incl. M1, n=57, 5.7 %). Patients with cancer relapse documented via death certificates only were excluded (n=91, 9.1 %). 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 n=268	Distant metastasis n=167	Locoregional relapse n=130	NOS n=47
Years	%	%	%	%
0	100.0	100.0	100.0	100.0
1	58.4	46.1	61.7	67.4
2	37.9	27.3	41.7	42.7
3	29.1	22.3	34.1	
4	23.8	17.4	27.9	
5	22.3		26.4	
6	22.3		26.4	
7	20.6			
8	17.6			

Table 5d. Observed post-progression survival of patients with anal cancer for period 1998-2014 (N=268).

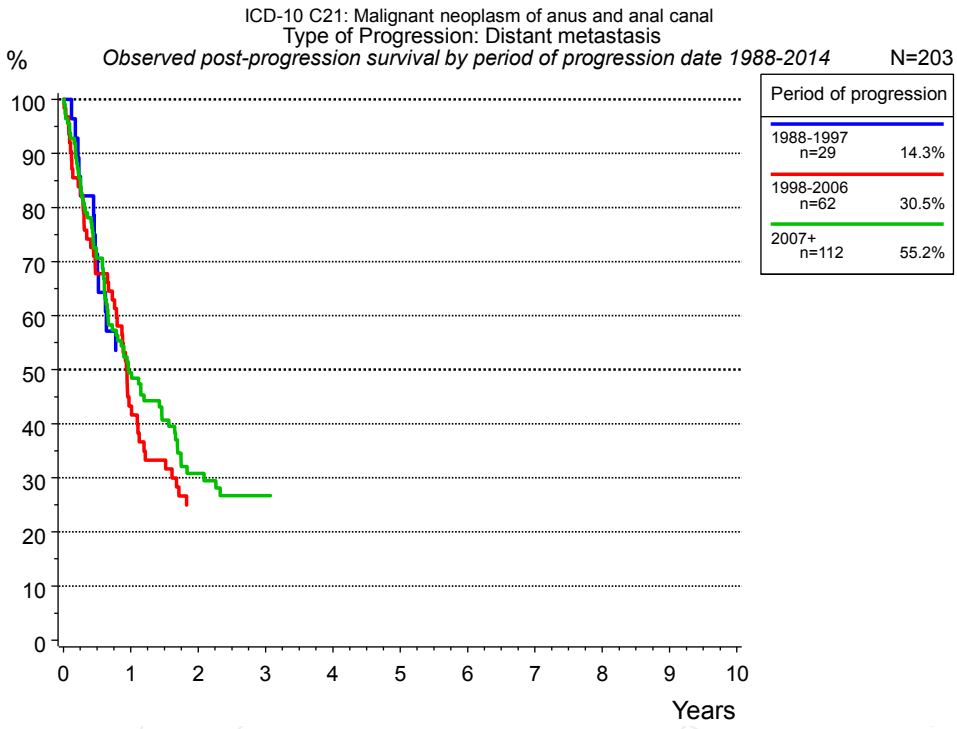

Figure 5e. Observed post-progression (distant metastasis) survival of 203 patients with anal cancer diagnosed between 1988 and 2014 by period of progression.

	Period of progression		
	1988-1997 n=29	1998-2006 n=62	2007+ n=112
Years	%	%	%
0	100.0	100.0	100.0
1		43.3	49.4
2			30.8
3			26.7

Table 5f. Observed post-progression (distant metastasis) survival of patients with anal cancer for period 1988-2014 by period of progression (N=203).

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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