Munich Cancer Registry

Tumorregister München (TRM)
Munich Cancer Registry (MCR)

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

ICD-10 C18-C21: Colorectal cancer

Survival

Year of diagnosis	1988-1997	1998-2014
Patients	10,329	46,354
Diseases	10,501	47,569
Cases evaluated	9,249	36,179
Creation date	03/02/2016	
Export date	12/23/2015	
Population	4.64 m	

BERLIN

GERMANY

BAVARIA

MUNICH

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

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

ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
Period of diagnosis
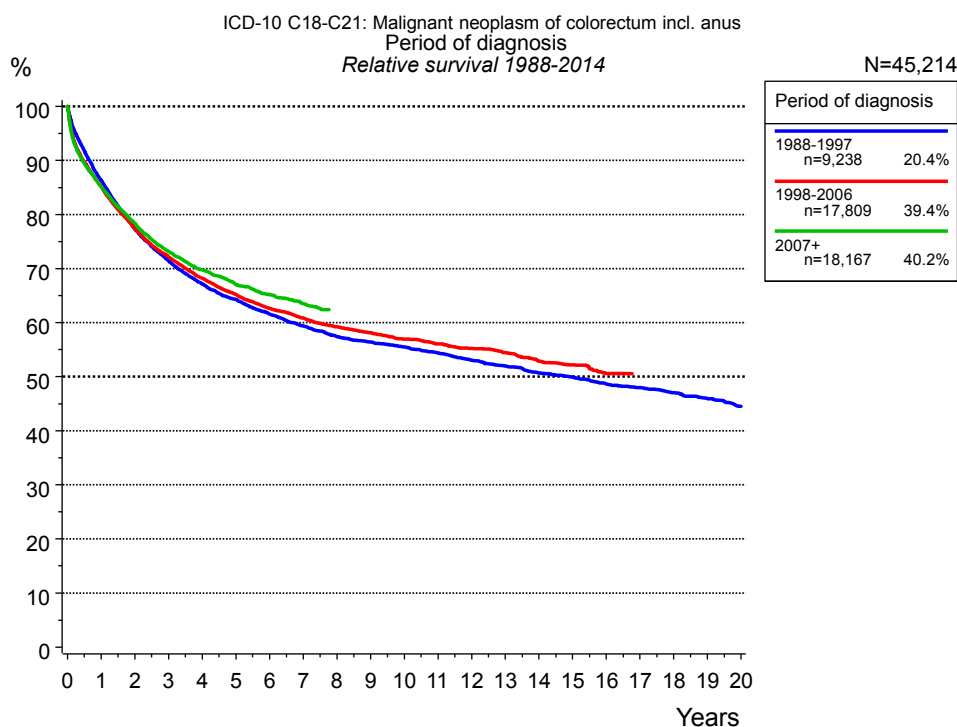*Relative survival 1988-2014*

Figure 1a. Relative survival of patients with colorectal cancer by period of diagnosis. Included in the evaluation are 45,214 cases diagnosed between 1988 and 2014.

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=9,238		1998-2006 n=17,809		2007+ n=18,167	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	83.2	86.3	82.0	85.2	82.2	85.2
2	72.0	77.3	72.1	77.4	73.3	78.4
3	64.3	71.5	65.1	72.1	66.2	73.2
4	58.4	67.2	59.5	68.2	61.1	69.8
5	54.0	64.3	55.1	65.2	56.8	67.1
6	50.0	61.6	51.2	62.7	53.3	65.1
7	46.5	59.3	48.1	60.9	50.2	63.5
8	43.5	57.4	45.2	59.2		
9	41.2	56.4	42.9	58.1		
10	39.1	55.5	40.6	56.9		
11	37.0	54.4	38.6	56.1		
12	34.8	53.0	36.6	55.2		
13	32.9	52.0	34.7	54.4		
14	31.0	50.7	32.4	52.9		
15	29.4	49.9	30.8	52.2		
16	27.6	48.7	28.7	50.6		
17	26.2	48.0				
18	24.7	47.0				
19	23.2	46.0				
20	21.6	44.5				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by period of diagnosis for period 1988-2014 (N=45,214).

ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
Year of diagnosis
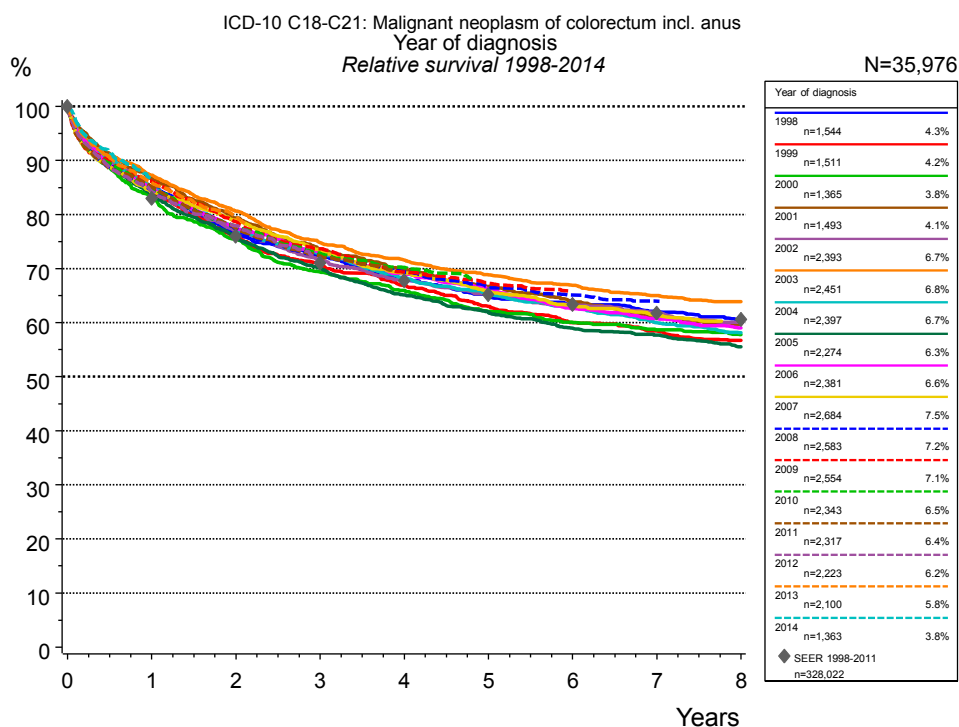*Relative survival 1998-2014*

Figure 1c. Relative survival of patients with colorectal cancer by year of diagnosis. Included in the evaluation are 35,976 cases diagnosed between 1998 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.

	1998 n=1,544		1999 n=1,511		2000 n=1,365		2001 n=1,493		2002 n=2,393		2003 n=2,451		2004 n=2,397	
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	81.9	85.2	81.0	84.3	79.9	83.2	83.5	86.7	81.9	85.1	84.2	87.3	81.9	85.0
2	71.0	76.5	70.4	75.8	70.1	75.4	74.0	79.4	71.5	77.0	75.3	80.6	72.0	77.3
3	64.8	72.2	63.2	70.5	62.4	69.4	66.4	73.6	64.3	71.6	67.7	74.8	65.5	72.7
4	59.0	68.1	57.8	66.9	57.4	66.0	61.1	70.0	59.1	67.9	62.7	71.5	59.6	68.3
5	54.7	65.3	52.6	63.0	52.3	62.1	56.5	66.7	54.9	65.3	58.3	68.8	55.3	65.5
6	51.3	63.3	48.5	60.0	48.9	60.0	52.5	63.9	51.5	63.3	54.8	66.9	51.5	63.0
7	48.6	62.0	45.7	58.5	46.3	58.7	48.9	61.3	48.5	61.8	51.5	65.0	47.3	60.0
8	45.8	60.5	42.9	56.7	44.1	57.8	46.2	59.7	45.5	60.1	48.9	63.9	44.4	58.1

Year of diagnosis

cont'd	2005 n=2,274		2006 n=2,381		2007 n=2,684		2008 n=2,583		2009 n=2,554		2010 n=2,343		2011 n=2,317	
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	80.9	83.9	82.2	85.0	81.3	84.2	81.6	84.7	83.1	86.1	82.1	85.2	82.1	85.1
2	70.7	75.8	72.7	77.5	73.9	78.9	72.2	77.4	73.5	78.7	72.6	77.8	72.3	77.4
3	63.4	70.0	66.4	73.0	66.4	73.2	65.4	72.5	66.6	73.6	65.7	72.8	65.4	72.3
4	57.1	65.1	60.8	69.0	60.8	69.2	60.7	69.4	60.7	69.4	61.2	70.2		
5	52.6	62.0	56.6	66.2	55.9	65.7	56.2	66.5	57.0	67.3				
6	48.4	59.0	51.8	62.6	52.0	63.2	53.2	65.1						
7	45.8	57.7	48.7	60.7	48.8	61.3	50.7	64.0						
8	42.6	55.6	45.7	59.0										

| cont'd | Year of diagnosis | | | | | |
| | 2012 n=2,223 | | 2013 n=2,100 | | 2014 n=1,363 | |
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	81.4	84.3	83.0	85.9		
2	72.9	77.9	75.2	79.6		

Table 1d. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by year of diagnosis for period 1998-2014 (N=35,976).
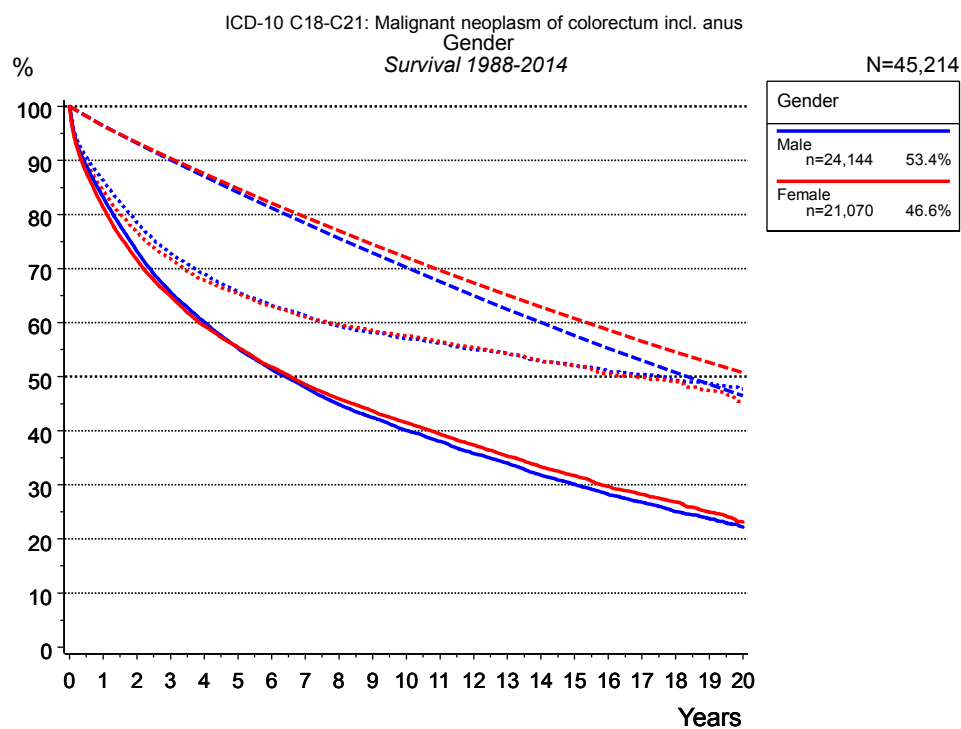
ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
Gender
Survival 1988-2014

N=45,214

Gender	
Male	n=24,144 53.4%
Female	n=21,070 46.6%

Figure 2a. Survival of patients with colorectal cancer by gender. Included in the evaluation are 45,214 cases diagnosed between 1988 and 2014.

	Gender			
	Male n=24,144		Female n=21,070	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	83.2	86.3	81.3	84.4
2	73.2	78.6	71.7	76.8
3	65.7	72.9	64.9	71.8
4	60.2	69.1	59.4	67.9
5	55.3	65.8	55.5	65.4
6	51.3	63.2	51.8	63.1
7	48.1	61.3	48.6	61.1
8	44.9	59.4	45.9	59.6
9	42.4	58.2	43.7	58.6
10	40.1	57.1	41.5	57.6
11	38.1	56.2	39.4	56.5
12	35.8	55.0	37.4	55.4
13	34.1	54.4	35.3	54.2
14	31.8	52.9	33.3	52.9
15	30.1	52.2	31.7	52.1
16	28.2	51.0	29.7	50.6
17	26.8	50.4	28.2	49.9
18	25.1	49.3	26.8	49.1
19	23.8	48.8	25.0	47.4
20	22.2	47.7	23.1	45.5

Table 2b. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by gender for period 1988-2014 (N=45,214).

ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
Age category
Observed survival 1988-2014

N=45,214

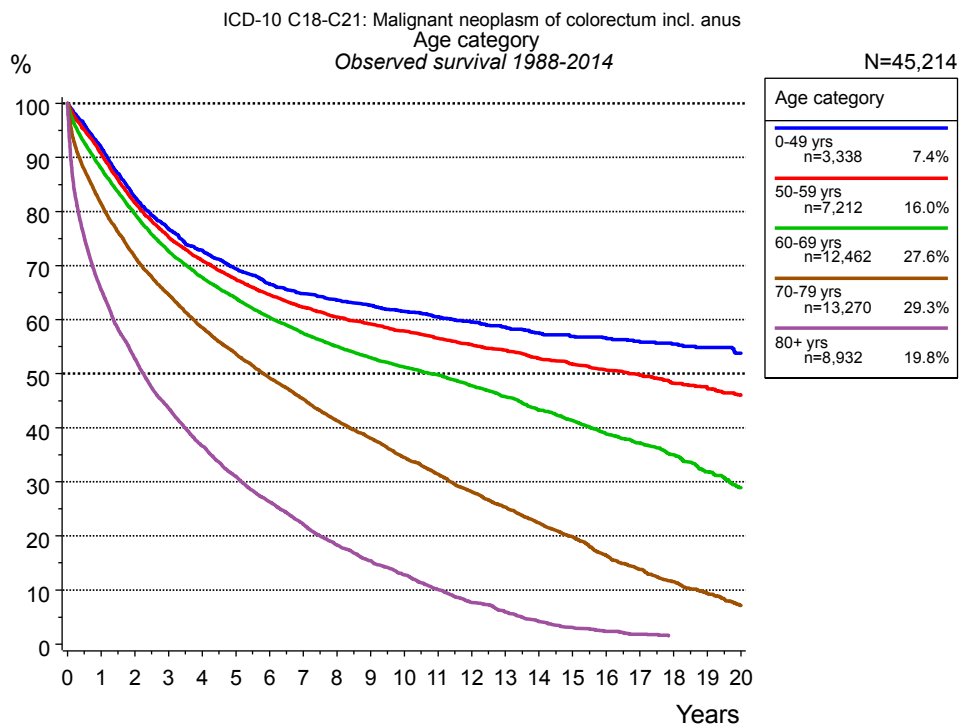| Age category		
0-49 yrs	n=3,338	7.4%
50-59 yrs	n=7,212	16.0%
60-69 yrs	n=12,462	27.6%
70-79 yrs	n=13,270	29.3%
80+ yrs	n=8,932	19.8%

Figure 3a. Observed survival of patients with colorectal cancer by age category. Included in the evaluation are 45,214 cases diagnosed between 1988 and 2014.
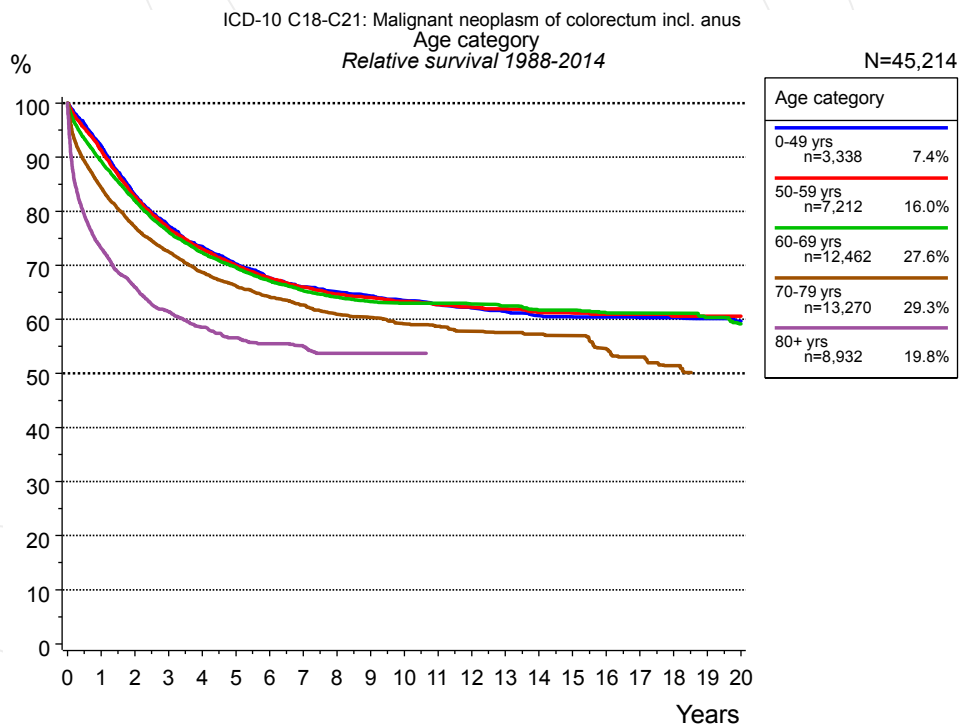
ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
Age category
Relative survival 1988-2014

N=45,214

Age category		
0-49 yrs	n=3,338	7.4%
50-59 yrs	n=7,212	16.0%
60-69 yrs	n=12,462	27.6%
70-79 yrs	n=13,270	29.3%
80+ yrs	n=8,932	19.8%

Figure 3b. Relative survival of patients with colorectal cancer by age category. Included in the evaluation are 45,214 cases diagnosed between 1988 and 2014.

	Age category									
	0-49 yrs n=3,338		50-59 yrs n=7,212		60-69 yrs n=12,462		70-79 yrs n=13,270		80+ yrs n=8,932	
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	91.9	92.1	90.7	91.3	88.0	89.3	81.4	84.3	65.5	73.2
2	82.6	83.0	81.6	82.7	79.5	82.0	71.6	77.1	52.8	66.0
3	76.8	77.3	75.3	76.8	72.7	76.2	64.7	72.5	43.6	61.4
4	72.8	73.5	71.0	73.0	67.8	72.3	58.6	68.7	36.7	58.6
5	69.4	70.2	67.4	70.0	64.0	69.6	53.7	66.2	31.0	56.6
6	66.6	67.6	64.6	67.6	60.5	67.2	49.2	64.1	26.3	55.5
7	64.7	66.0	62.3	65.9	57.5	65.3	45.3	62.6	22.2	55.0
8	63.6	65.1	60.5	64.7	55.1	64.1	41.3	60.9	18.4	53.7
9	62.6	64.3	59.2	64.0	52.9	63.3	38.1	60.3	15.4	53.7
10	61.5	63.5	57.8	63.3	51.3	63.0	34.5	59.2	12.8	53.7
11	60.5	62.7	56.5	62.7	49.8	63.0	31.4	58.7		
12	59.6	62.1	55.4	62.3	47.8	62.8	28.2	57.8		
13	58.7	61.5	54.3	62.0	45.8	62.5	25.3	57.5		
14	57.5	60.7	52.8	61.3	43.3	61.7	22.4	57.3		
15	56.9	60.4	51.7	61.1	41.3	61.7	19.8	57.0		
16	56.5	60.4	50.7	60.9	38.9	61.2	16.4	54.6		
17	55.8	60.3	49.7	60.9	37.2	61.1	13.8	53.0		
18	55.5	60.3	48.3	60.6	35.0	61.1	11.5	51.5		
19	54.8	60.2	47.4	60.6	31.9	60.4				
20	53.8	59.7	46.0	60.6	29.0	59.2				

Table 3c. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by age category for period 1988-2014 (N=45,214).

ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
UICC
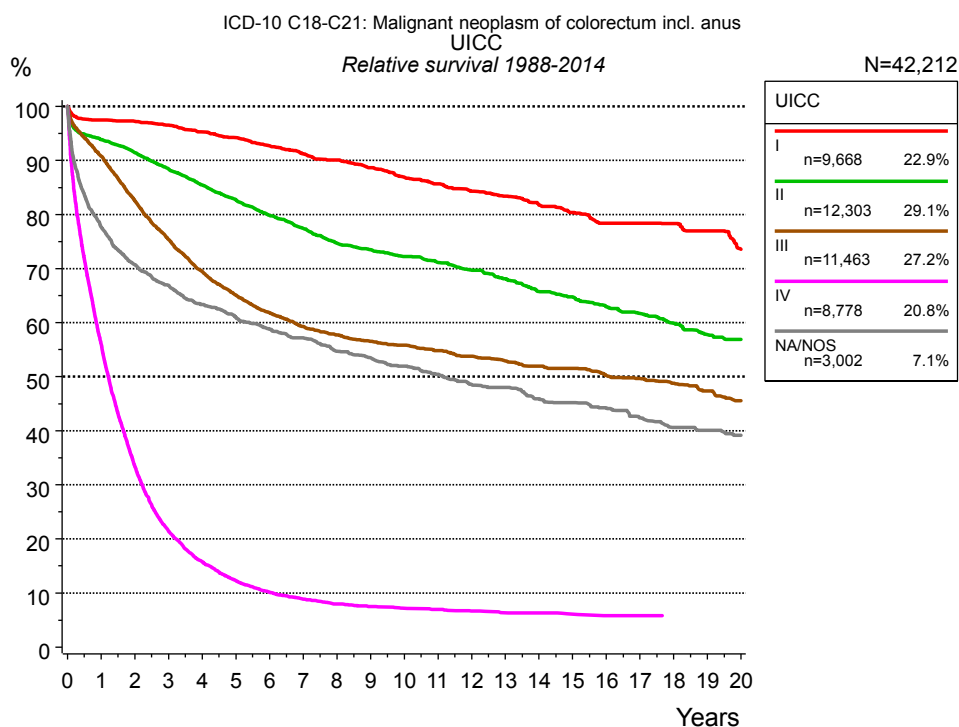*Relative survival 1988-2014*

Figure 4a. Relative survival of patients with colorectal cancer by UICC. For 42,591 of 45,214 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 42,212 cases an evaluable classification was established. The grey line represents the subgroup of 3,002 patients with missing values regarding UICC (6.6% of 45,214 patients, the percent values of all other categories are related to n=42,212).

	I		II		III		IV		NA/NOS	
	n=9,668		n=12,303		n=11,463		n=8,778		n=3,002	
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	94.5	97.5	90.1	93.9	87.7	90.8	54.1	55.9	74.0	77.7
2	91.3	97.2	84.5	91.4	77.2	82.5	31.5	33.5	64.9	70.7
3	87.8	96.5	78.7	88.4	68.3	75.4	19.7	21.4	59.4	66.9
4	83.9	95.3	73.3	85.5	61.0	69.5	14.2	15.8	54.7	63.4
5	80.2	94.2	68.3	82.7	55.4	65.1	10.8	12.3	51.1	61.0
6	76.4	92.7	63.5	79.8	51.0	61.8	8.7	10.2	47.8	58.8
7	72.6	91.2	59.3	77.4	47.4	59.3	7.4	8.9	45.2	57.2
8	69.3	90.1	55.1	74.7	44.7	57.7	6.6	8.0	42.0	54.8
9	65.9	88.7	52.2	73.5	42.4	56.6	6.0	7.5	39.8	53.5
10	62.3	86.9	49.4	72.2	40.5	55.8	5.6	7.2	37.5	52.0
11	59.3	85.6	46.8	71.1	38.5	54.8	5.3	7.0	35.3	50.5
12	56.2	84.3	44.1	69.7	36.5	53.8	4.9	6.7	32.8	48.5
13	53.6	83.4	41.5	68.1	34.7	52.9	4.5	6.4	31.5	48.0
14	50.6	81.8	38.5	65.7	33.0	52.0	4.4	6.3	29.0	45.9
15	47.9	80.4	36.5	64.7	31.5	51.5	4.1	6.1	27.7	45.2
16	45.1	78.4	34.0	62.9	29.6	50.3	3.7	5.8	26.1	44.3
17	43.4	78.4	32.0	61.6	28.2	49.6	3.7	5.8	24.1	42.4
18	41.7	78.3	29.8	59.9	26.7	48.8	3.5	5.8	22.2	40.6
19	39.7	77.0	27.6	57.8	24.9	47.4	3.5	5.8	21.2	40.1
20	36.2	73.6	26.1	56.9	23.1	45.5			20.0	39.1

Table 4b. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by UICC for period 1988-2014 (N=42,212).

ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
UICC
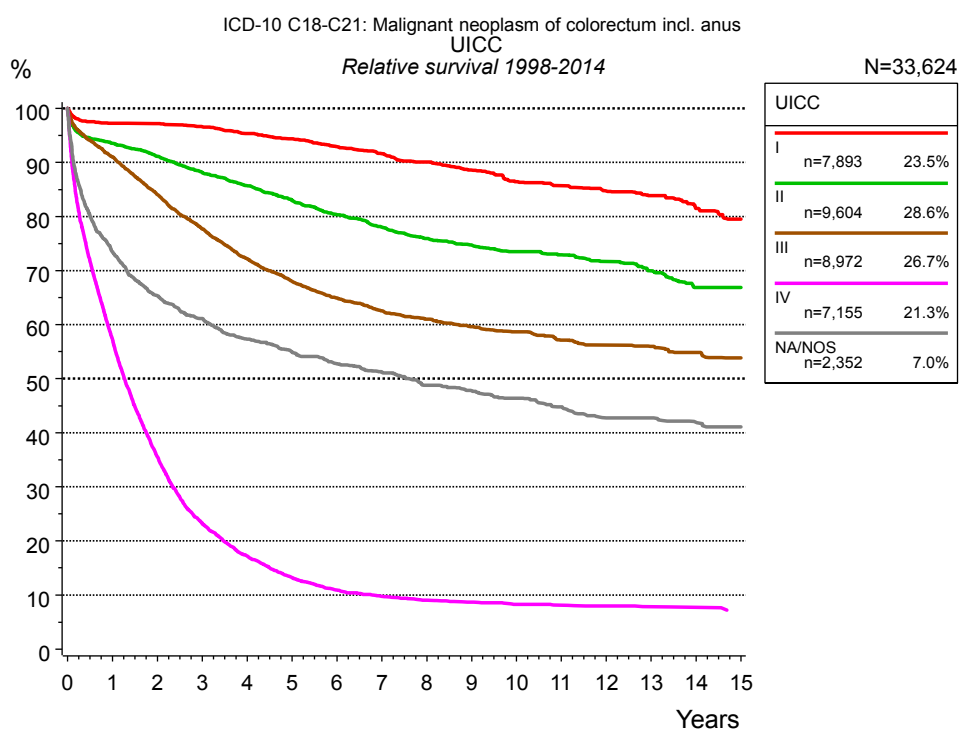*Relative survival 1998-2014*   N=33,624

Figure 4c. Relative survival of patients with colorectal cancer by UICC. For 33,944 of 35,976 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 33,624 cases an evaluable classification was established. The grey line represents the subgroup of 2,352 patients with missing values regarding UICC (6.5% of 35,976 patients, the percent values of all other categories are related to n=33,624).

	UICC									
	I n=7,893		II n=9,604		III n=8,972		IV n=7,155		NA/NOS n=2,352	
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	94.3	97.3	89.8	93.5	88.0	91.0	55.4	57.3	69.9	73.5
2	91.3	97.2	84.2	91.1	78.7	84.1	33.5	35.5	59.9	65.3
3	87.9	96.6	78.5	88.1	70.5	77.7	21.4	23.2	54.3	61.1
4	84.0	95.3	73.5	85.7	63.5	72.2	15.5	17.2	49.5	57.3
5	80.4	94.4	68.6	83.0	58.0	68.0	11.6	13.2	46.1	55.0
6	76.6	92.9	64.0	80.4	53.6	64.9	9.4	10.9	43.2	52.8
7	73.0	91.6	59.8	78.0	50.1	62.6	8.2	9.7	40.9	51.2
8	69.3	90.1	56.1	75.9	47.4	61.0	7.4	9.0	37.9	48.8
9	65.8	88.6	53.1	74.7	44.8	59.6	7.0	8.7	36.2	47.8
10	61.9	86.4	50.3	73.5	42.7	58.7	6.5	8.3	34.4	46.4
11	59.3	85.7	48.0	72.9	40.2	57.2	6.2	8.1	32.2	44.8
12	56.3	84.7	45.4	71.6	38.4	56.2	5.9	8.0	29.8	42.8
13	53.7	83.9	42.5	70.0	36.7	55.9	5.6	7.9	29.1	42.8
14	50.0	81.5	39.1	66.9	34.8	54.8	5.4	7.7	27.7	41.9
15	47.0	79.5	37.6	66.9	33.1	53.9	4.8	7.0	26.5	41.1

Table 4d. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by UICC for period 1998-2014 (N=33,624).

ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
UICC
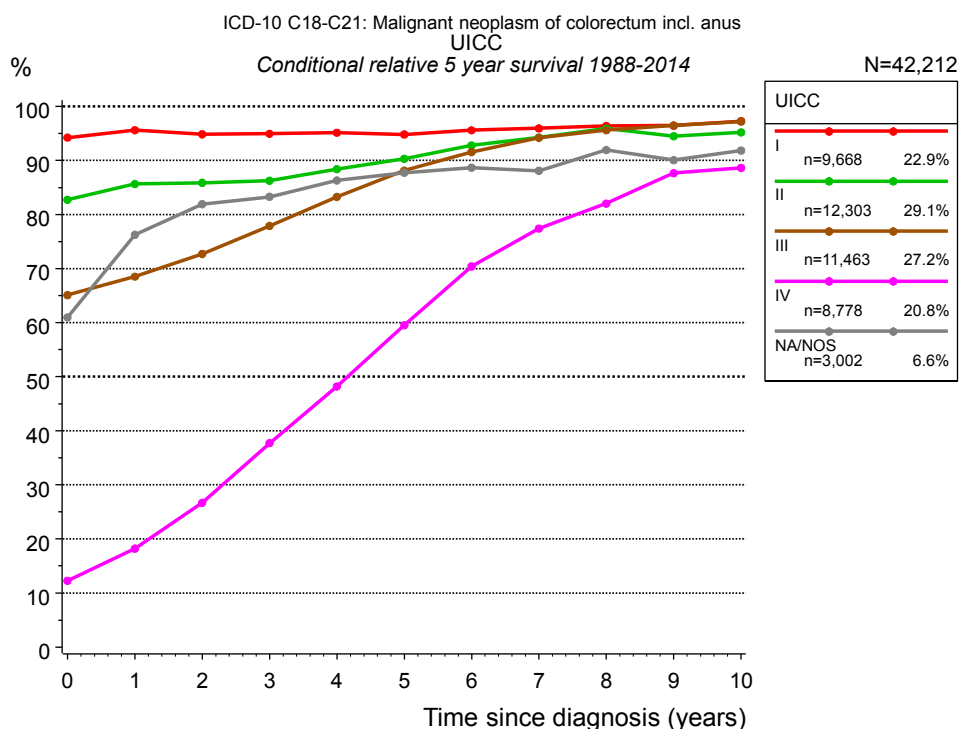*Conditional relative 5 year survival 1988-2014*

Figure 4e. Conditional relative 5-year survival of patients with colorectal cancer by UICC. For 42,591 of 45,214 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 42,212 cases an evaluable classification was established. The grey line represents the subgroup of 3,002 patients with missing values regarding UICC (6.6% of 45,214 patients, the percent values of all other categories are related to n=42,212).

	UICC									
	I		II		III		IV		NA/NOS	
		Cond. surv. %		Cond. surv. %		Cond. surv. %		Cond. surv. %		Cond. surv. %
Years	n	5 yrs	n	5 yrs	n	5 yrs	n	5 yrs	n	5 yrs
0	9,668	94.2	12,303	82.7	11,463	65.1	8,778	12.3	3,002	61.0
1	8,685	95.6	10,558	85.7	9,603	68.5	4,533	18.2	2,139	76.3
2	7,968	94.8	9,420	85.9	7,970	72.7	2,476	26.7	1,813	81.9
3	7,212	94.9	8,297	86.3	6,573	77.9	1,419	37.7	1,602	83.3
4	6,474	95.1	7,267	88.4	5,445	83.3	928	48.2	1,410	86.3
5	5,754	94.8	6,315	90.3	4,554	88.1	619	59.5	1,252	87.7
6	5,024	95.6	5,416	92.8	3,800	91.5	442	70.4	1,108	88.7
7	4,346	95.9	4,665	94.2	3,122	94.2	330	77.4	994	88.1
8	3,742	96.4	3,939	95.9	2,602	95.6	244	82.0	866	91.9
9	3,200	96.5	3,382	94.5	2,213	96.5	193	87.7	761	90.1
10	2,760	97.3	2,910	95.2	1,908	97.2	151	88.6	677	91.9

Table 4f. Conditional relative 5-year survival of patients with colorectal cancer by UICC for period 1988-2014 (N=42,212).

Conditional relative survival rates refer to the relative survival probability, in this case for 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 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 UICC="I", who are alive at least 3 years after cancer diagnosis, the conditional relative 5-year survival rate is 94.9% (n=7,212).
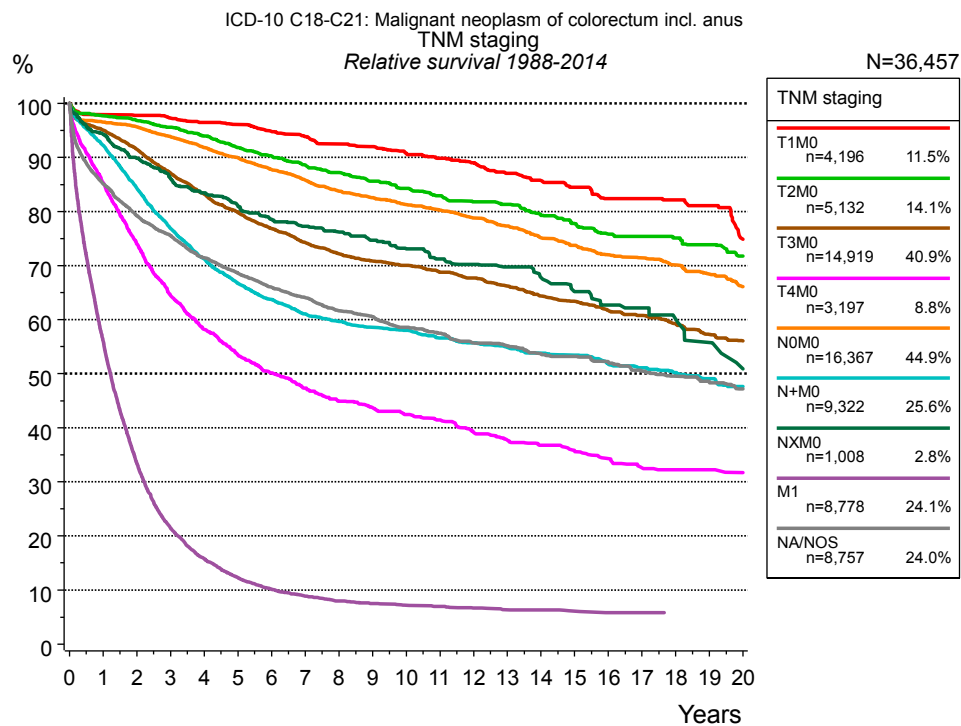
ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
TNM staging
Relative survival 1988-2014   N=36,457

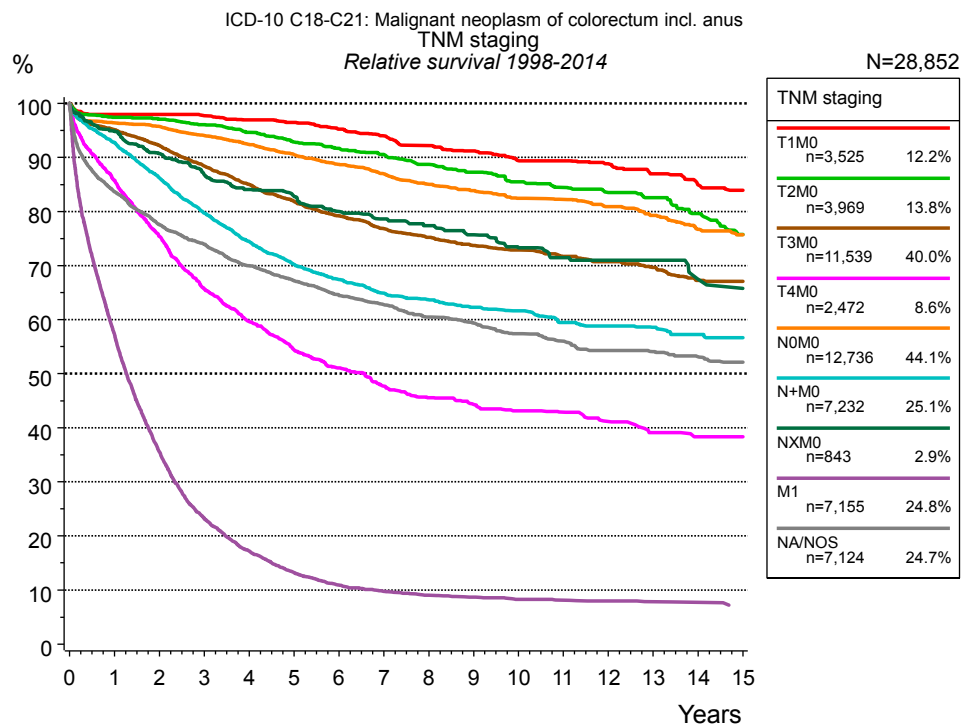| TNM staging		
T1M0 n=4,196	11.5%
T2M0 n=5,132	14.1%
T3M0 n=14,919	40.9%
T4M0 n=3,197	8.8%
N0M0 n=16,367	44.9%
N+M0 n=9,322	25.6%
NXM0 n=1,008	2.8%
M1 n=8,778	24.1%
NA/NOS n=8,757	24.0%

Figure 4g. Relative survival of patients with colorectal cancer by TNM staging. For 42,591 of 45,214 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 36,457 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 8,757 patients with missing values regarding TNM staging (19.4 % of 45,214 patients, the percent values of all other categories are related to n=36,457).

	TNM staging													
	T1M0 n=4,196		T2M0 n=5,132		T3M0 n=14,919		T4M0 n=3,197		N0M0 n=16,367		N+M0 n=9,322		NXM0 n=1,008	
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	95.4	97.9	94.6	97.7	91.7	95.1	81.8	85.3	93.2	96.6	89.2	92.3	91.4	94.3
2	92.6	97.8	90.8	96.8	85.3	91.5	68.3	74.0	89.2	95.7	79.0	84.3	84.5	89.9
3	89.5	97.3	86.9	95.6	78.4	87.1	57.6	64.5	84.6	93.9	69.9	76.9	78.7	86.1
4	86.3	96.5	82.7	94.0	72.4	83.2	50.1	58.2	80.0	91.8	62.9	71.2	74.3	83.5
5	83.5	96.1	78.2	91.8	67.2	79.9	44.6	53.5	75.6	90.0	57.2	66.8	69.8	80.9
6	79.7	94.8	74.4	90.3	62.4	76.9	40.4	50.1	71.3	87.8	53.0	63.7	65.9	78.6
7	76.5	93.9	70.6	88.6	58.2	74.2	36.9	47.3	67.2	85.8	49.2	61.1	63.2	77.3
8	73.4	92.5	67.2	87.2	54.7	72.2	33.8	44.9	63.4	83.8	46.7	59.7	60.4	76.2
9	70.3	92.0	63.8	85.6	51.8	70.8	31.8	43.7	60.2	82.6	44.4	58.5	57.4	74.7
10	67.0	90.8	60.7	84.2	49.3	70.0	29.9	42.5	57.2	81.3	42.6	58.0	54.3	73.1
11	64.1	89.9	57.8	82.9	46.7	68.8	28.3	41.5	54.5	80.3	40.2	56.6	51.5	71.2
12	61.3	89.0	54.9	81.8	44.3	67.7	25.8	39.1	51.5	78.8	38.4	55.7	49.6	70.2
13	57.8	87.1	52.8	81.3	41.8	66.3	24.1	37.7	48.7	77.3	36.4	54.8	47.1	69.8
14	54.8	85.8	49.4	79.3	39.1	64.4	22.7	36.7	45.5	75.1	34.6	53.8	44.3	67.8
15	52.3	84.5	46.7	77.8	37.0	63.4	21.3	35.7	43.0	73.8	33.1	53.4	41.0	65.2
16	49.2	82.4	43.8	75.8	34.7	61.7	19.8	34.3	40.4	72.0	31.0	51.8	38.4	62.7
17	47.7	82.4	42.2	75.4	32.9	60.8	18.2	32.6	38.6	71.4	29.5	51.1	37.1	62.2
18	45.8	82.1	40.3	75.1	30.8	59.3	17.6	32.2	36.4	70.1	27.9	50.2	34.4	60.1
19	43.2	81.1	38.3	73.9	28.5	57.3	17.1	32.2	34.1	68.4	26.2	49.1	31.3	55.8
20	38.5	74.9	35.4	71.7	26.9	56.1	16.1	31.7	31.6	66.1	24.6	47.6	27.2	50.9

cont'd	**TNM staging**			
	M1 n=8,778		NA/NOS n=8,757	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	54.1	55.9	81.4	85.1
2	31.5	33.5	72.8	79.2
3	19.7	21.4	66.9	75.5
4	14.2	15.8	61.1	71.5
5	10.8	12.3	56.6	68.6
6	8.7	10.2	52.5	66.0
7	7.4	8.9	49.2	64.1
8	6.6	8.0	45.6	61.7
9	6.0	7.5	43.2	60.5
10	5.6	7.2	40.3	58.6
11	5.3	7.0	38.1	57.5
12	4.9	6.7	35.6	55.7
13	4.5	6.4	33.9	55.1
14	4.4	6.3	31.8	53.7
15	4.1	6.1	30.4	53.2
16	3.7	5.8	28.5	52.1
17	3.7	5.8	26.5	50.5
18	3.5	5.8	25.0	49.5
19	3.5	5.8	23.5	48.5
20			22.0	47.2

Table 4h. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by TNM staging for period 1988-2014 (N=62,919).
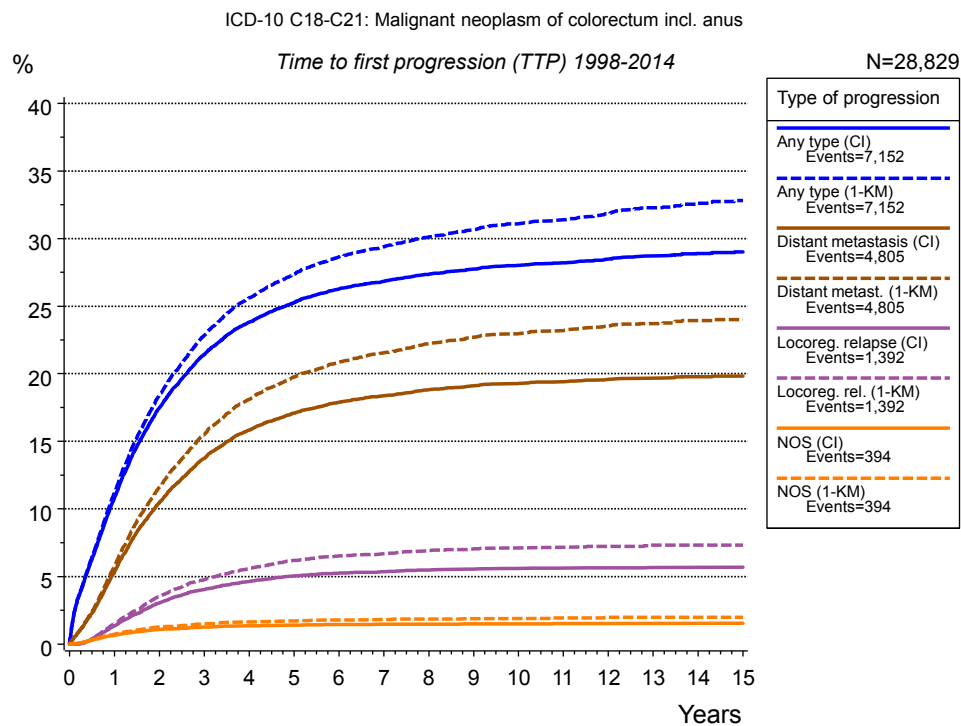
ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
TNM staging
Relative survival 1998-2014

N=28,852

Figure 4i. Relative survival of patients with colorectal cancer by TNM staging. For 33,944 of 35,976 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 28,852 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 7,124 patients with missing values regarding TNM staging (19.8% of 35,976 patients, the percent values of all other categories are related to n=28,852).

	TNM staging													
	T1M0 n=3,525		T2M0 n=3,969		T3M0 n=11,539		T4M0 n=2,472		N0M0 n=12,736		N+M0 n=7,232		NXM0 n=843	
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	95.4	97.9	94.4	97.4	91.8	95.1	82.4	85.8	93.0	96.4	89.8	92.8	92.1	94.9
2	92.9	97.9	91.1	97.1	86.0	92.2	69.8	75.4	89.3	95.7	80.9	86.2	85.5	90.7
3	89.9	97.7	87.4	96.1	79.7	88.4	58.9	65.7	84.8	94.1	72.7	79.7	79.6	86.8
4	86.8	97.0	83.3	94.6	74.0	85.0	51.7	59.7	80.5	92.4	65.8	74.5	75.2	84.1
5	83.8	96.5	79.1	92.9	68.9	81.9	45.6	54.4	76.2	90.6	60.2	70.2	71.8	82.8
6	80.1	95.2	75.6	91.7	64.3	79.2	41.5	51.1	72.1	88.7	56.2	67.4	67.6	80.0
7	76.6	93.9	72.2	90.5	60.2	76.8	37.6	47.7	68.2	87.0	52.4	64.9	64.6	78.6
8	73.0	92.2	68.4	88.7	57.0	75.2	34.7	45.6	64.4	85.1	49.9	63.7	61.9	77.4
9	69.7	91.2	65.0	87.2	53.9	73.7	32.7	44.3	61.2	83.9	47.3	62.3	58.8	75.7
10	66.0	89.4	61.7	85.5	51.3	72.9	31.0	43.2	58.0	82.4	45.3	61.7	55.0	73.3
11	63.8	89.4	58.8	84.4	48.6	71.7	29.8	42.9	55.7	82.2	42.3	59.5	52.4	71.4
12	61.0	88.8	55.9	83.5	46.2	70.7	27.7	41.2	52.8	80.9	40.6	58.8	51.0	71.0
13	57.4	87.0	53.6	82.6	43.7	69.6	25.4	39.1	49.7	79.3	38.9	58.6	49.4	71.0
14	53.8	84.9	49.4	79.6	40.6	67.2	24.2	38.3	46.1	76.7	36.9	57.2	44.8	67.5
15	51.6	83.9	45.3	75.8	38.9	67.1	23.5	38.3	43.8	75.7	35.3	56.6	42.2	65.7

	TNM staging			
cont'd	M1		NA/NOS	
	n=7,155		n=7,124	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	55.4	57.3	79.9	83.7
2	33.5	35.5	71.3	77.6
3	21.4	23.2	65.5	73.9
4	15.5	17.2	59.9	70.0
5	11.6	13.2	55.5	67.2
6	9.4	10.9	51.4	64.5
7	8.2	9.7	48.3	62.8
8	7.4	9.0	44.9	60.5
9	7.0	8.7	42.6	59.3
10	6.5	8.3	39.8	57.4
11	6.2	8.1	37.5	56.0
12	5.9	8.0	35.0	54.3
13	5.6	7.9	33.7	54.1
14	5.4	7.7	31.9	53.1
15	4.8	7.0	30.4	52.1

Table 4j. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by TNM staging for period 1998-2014 (N=49,471).

ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus

Figure 5a. Time to first progression of 28,829 patients with colorectal 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=28,829	n=28,829	n=28,829	n=28,829	n=28,829	n=28,829	n=28,829
Years	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	10.8	11.2	5.3	5.8	1.4	1.5	0.7
2	17.5	18.4	10.5	11.6	3.1	3.5	1.1
3	21.4	22.8	13.7	15.5	4.0	4.8	1.3
4	23.8	25.6	15.8	18.1	4.6	5.6	1.4
5	25.3	27.4	17.1	19.8	5.0	6.2	1.4
6	26.3	28.7	17.9	20.9	5.3	6.5	1.4
7	26.8	29.4	18.4	21.6	5.4	6.7	1.5
8	27.3	30.1	18.8	22.2	5.5	6.9	1.5
9	27.7	30.7	19.1	22.7	5.5	7.0	1.5
10	28.0	31.1	19.3	23.0	5.6	7.1	1.5
11	28.2	31.4	19.4	23.2	5.6	7.2	1.5
12	28.5	31.9	19.6	23.5	5.6	7.2	1.5
13	28.7	32.3	19.7	23.7	5.7	7.3	1.5
14	28.9	32.6	19.8	23.9	5.7	7.3	1.5
15	29.0	32.8	19.8	24.0	5.7	7.3	1.5

cont'd Years	Type of progression NOS (1-KM) n=28,829 %
0	0.0
1	0.7
2	1.3
3	1.5
4	1.6
5	1.7
6	1.8
7	1.8
8	1.9
9	1.9
10	1.9
11	1.9
12	2.0
13	2.0
14	2.0
15	2.0

Table 5b. Time to first progression of patients with colorectal cancer for period 1998-2014 (N=28,829).
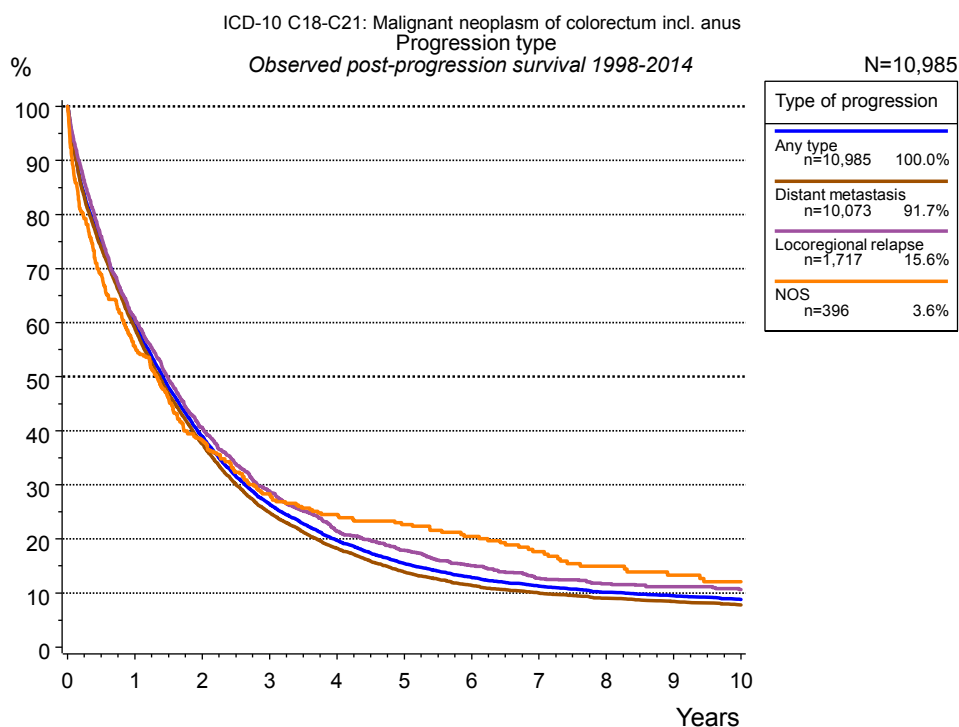
ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
Progression type
Observed post-progression survival 1998-2014

Figure 5c. Observed post-progression survival of 10,985 patients with colorectal cancer diagnosed between 1998 and 2014. These 10,985 patients with documented progression events during their course of disease represent 30.6 % of the totally 35,849 evaluated cases (incl. M1, n=7,020, 19.6 %). Patients with cancer relapse documented via death certificates only were excluded (n=3,187, 8.9 %). 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=10,985 | Distant metastasis n=10,073 | Locoregional relapse n=1,717 | NOS n=396 |
Years	%	%	%	%
0	100.0	100.0	100.0	100.0
1	60.0	59.0	60.7	55.7
2	38.9	37.6	40.5	38.1
3	26.5	24.8	28.9	28.3
4	19.7	18.2	21.4	24.5
5	15.5	13.9	17.9	22.7
6	12.9	11.4	15.0	20.5
7	11.3	10.0	12.7	17.6
8	10.2	9.0	11.7	14.9
9	9.5	8.4	11.2	13.3
10	8.8	7.8	10.6	12.1

Table 5d. Observed post-progression survival of patients with colorectal cancer for period 1998-2014 (N=10,985).

ICD-10 C18-C21: Malignant neoplasm of colorectum incl. anus
Type of Progression: Distant metastasis
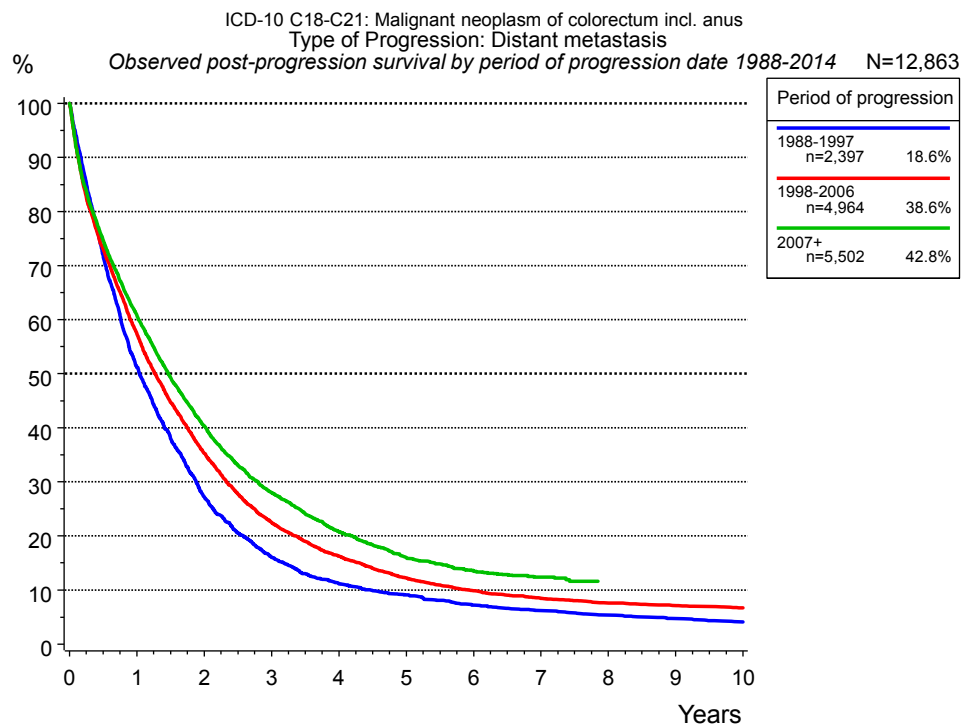*Observed post-progression survival by period of progression date 1988-2014*   N=12,863

Figure 5e. Observed post-progression (distant metastasis) survival of 12,863 patients with colorectal cancer diagnosed between 1988 and 2014 by period of progression.

	Period of progression		
	1988-1997 n=2,397	1998-2006 n=4,964	2007+ n=5,502
Years	%	%	%
0	100.0	100.0	100.0
1	51.2	57.5	60.8
2	27.2	35.3	40.3
3	16.1	22.5	28.0
4	11.2	16.2	20.8
5	9.1	12.2	16.0
6	7.2	9.8	13.5
7	6.1	8.4	12.4
8	5.3	7.6	11.6
9	4.7	7.1	
10	4.1	6.7	

Table 5f. Observed post-progression (distant metastasis) survival of patients with colorectal cancer for period 1988-2014 by period of progression (N=12,863).

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

Munich Cancer Registry. Survival ICD-10 C18-C21: Colorectal cancer [Internet]. 2016 [updated 2016 Mar 2; cited 2016 May 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/surv/sC1821E-ICD-10-C18-C21-Colorectal-cancer-survival.pdf

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