

Munich Cancer Registry



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



Munich Cancer Registry at Munich Cancer Center
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Munich, 81377
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<http://www.tumorregister-muenchen.de/en>

<http://www.tumorregister-muenchen.de/en/facts/surv/sC1821E-ICD-10-C18-C21-Colorectal-cancer-survival.pdf>

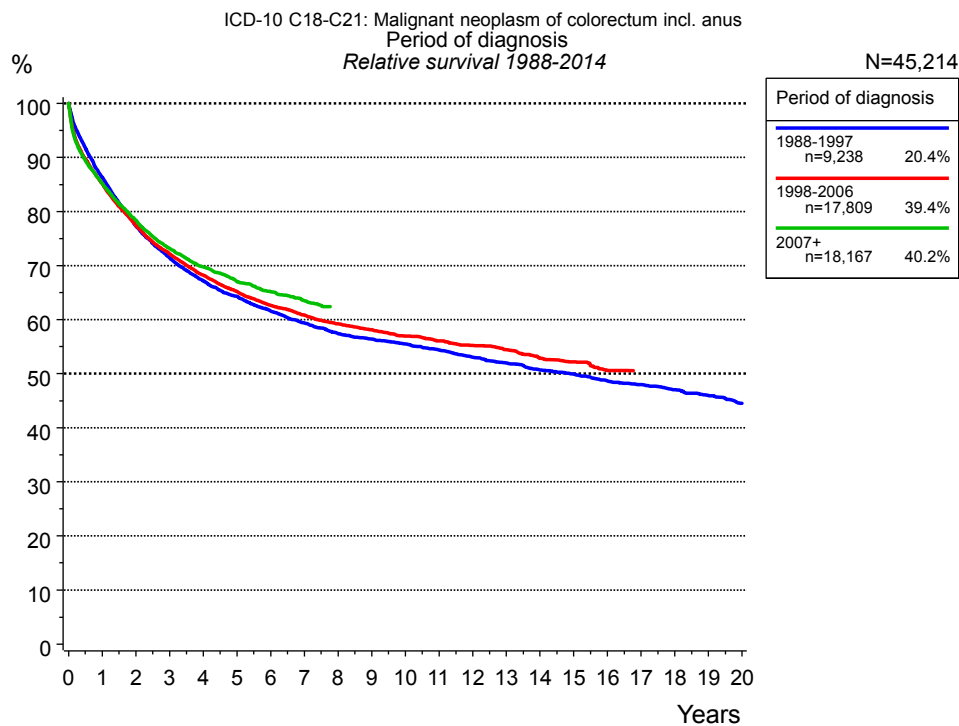


Figure 1a. Relative survival of patients with colorectal cancer by period of diagnosis. Included in the evaluation are 45,214 cases diagnosed between 1988 and 2014.

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.

Years	Period of diagnosis					
	1988-1997 n=9,238		1998-2006 n=17,809		2007+ n=18,167	
	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).

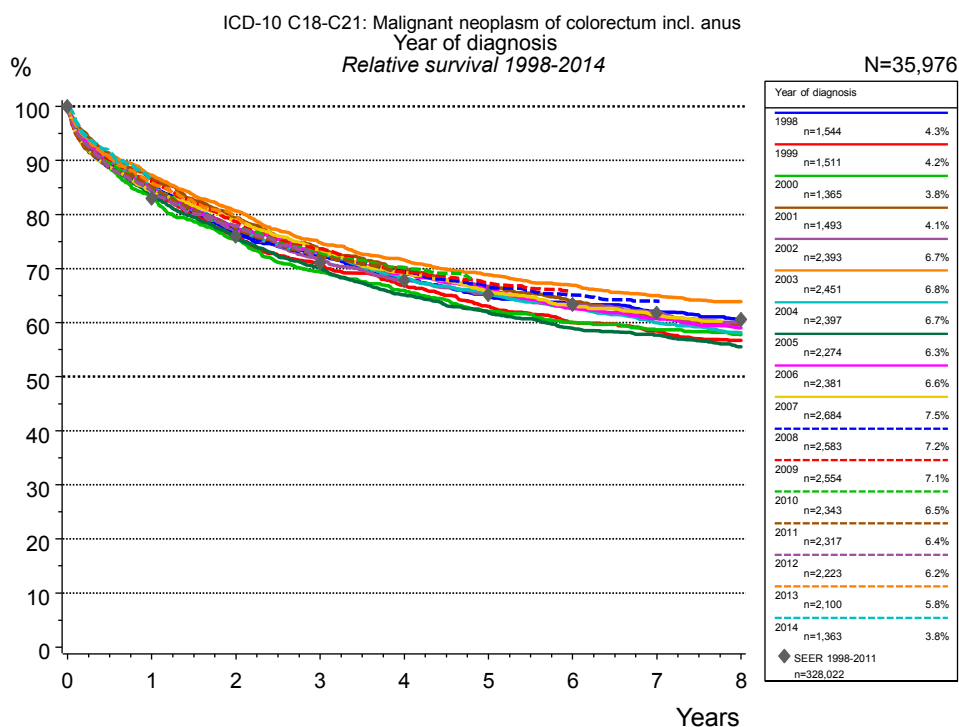


Figure 1c. Relative survival of patients with colorectal cancer by year of diagnosis. Included in the evaluation are 35,976 cases diagnosed between 1998 and 2014.

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.

Years	Year of diagnosis													
	1998		1999		2000		2001		2002		2003		2004	
	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

cont'd Years	Year of diagnosis													
	2005		2006		2007		2008		2009		2010		2011	
	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										

<i>cont'd</i>	Year of diagnosis					
	2012		2013		2014	
	n=2,223		n=2,100		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).

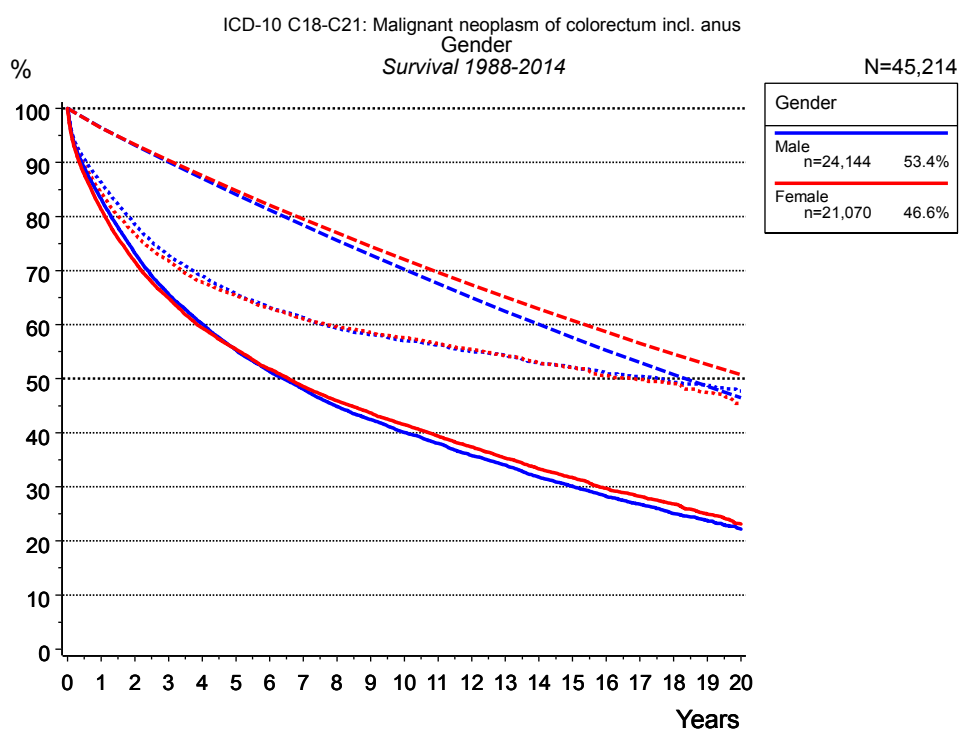


Figure 2a. Survival of patients with colorectal cancer by gender. Included in the evaluation are 45,214 cases diagnosed between 1988 and 2014.

Years	Gender			
	Male n=24,144		Female n=21,070	
	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).

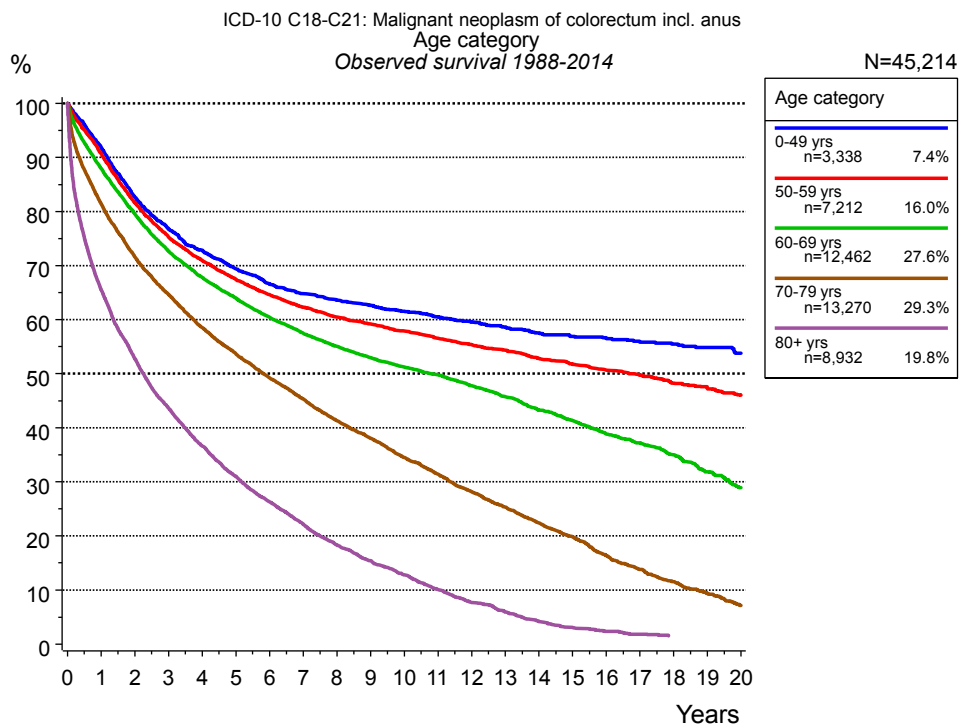


Figure 3a. Observed survival of patients with colorectal cancer by age category. Included in the evaluation are 45,214 cases diagnosed between 1988 and 2014.

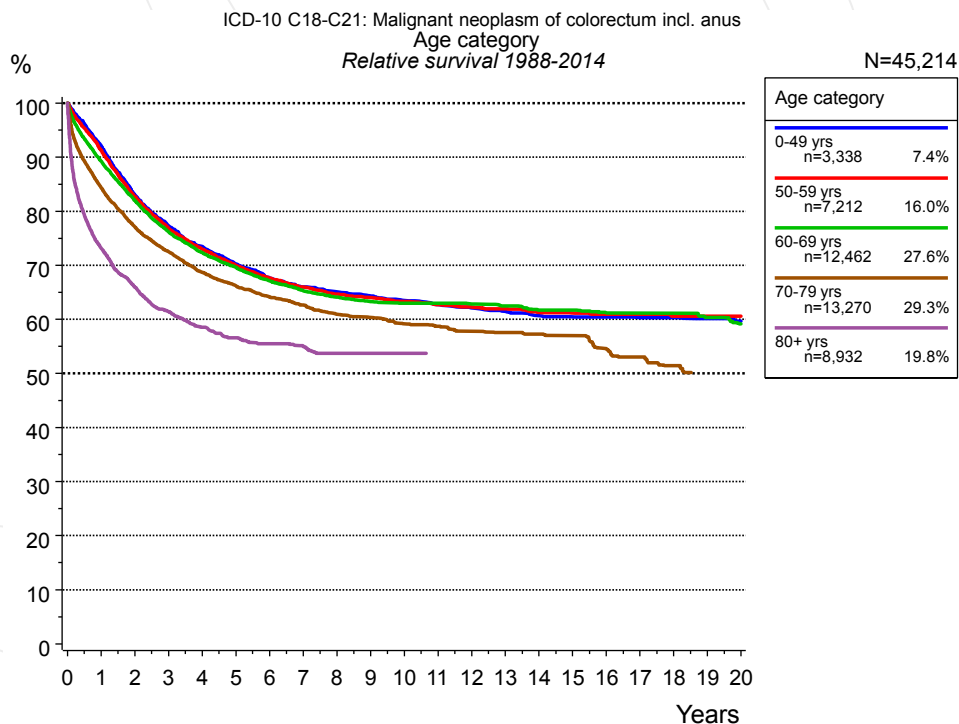


Figure 3b. Relative survival of patients with colorectal cancer by age category. Included in the evaluation are 45,214 cases diagnosed between 1988 and 2014.

Years	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	
	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).

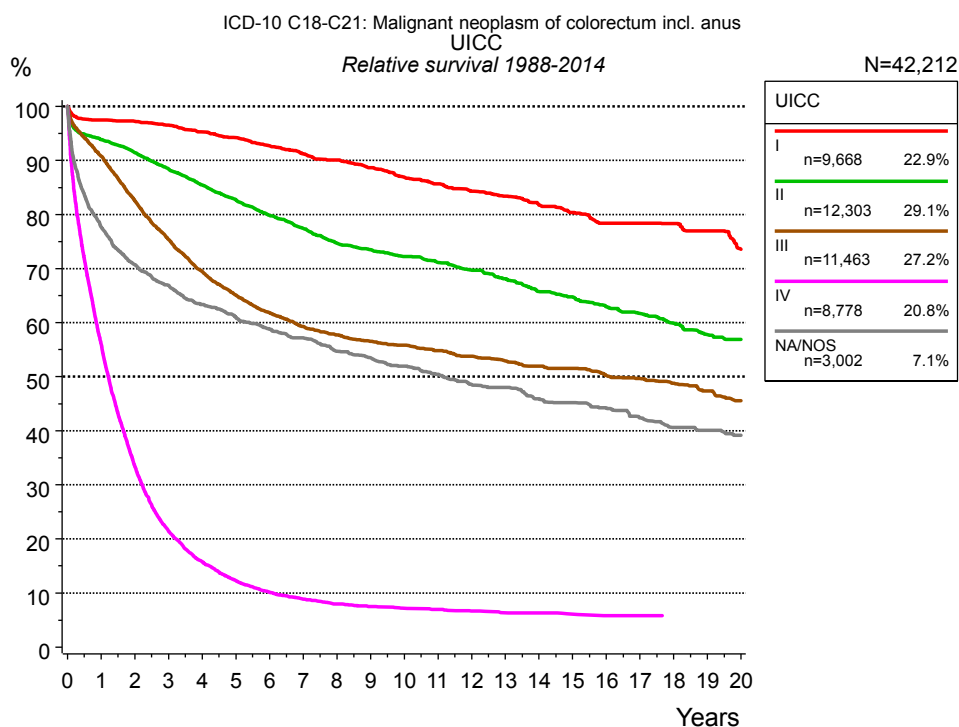


Figure 4a. Relative survival of patients with colorectal cancer by UICC. For 42,591 of 45,214 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 42,212 cases an evaluable classification was established. The grey line represents the subgroup of 3,002 patients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

Years	UICC									
	I n=9,668		II n=12,303		III n=11,463		IV n=8,778		NA/NOS n=3,002	
	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).

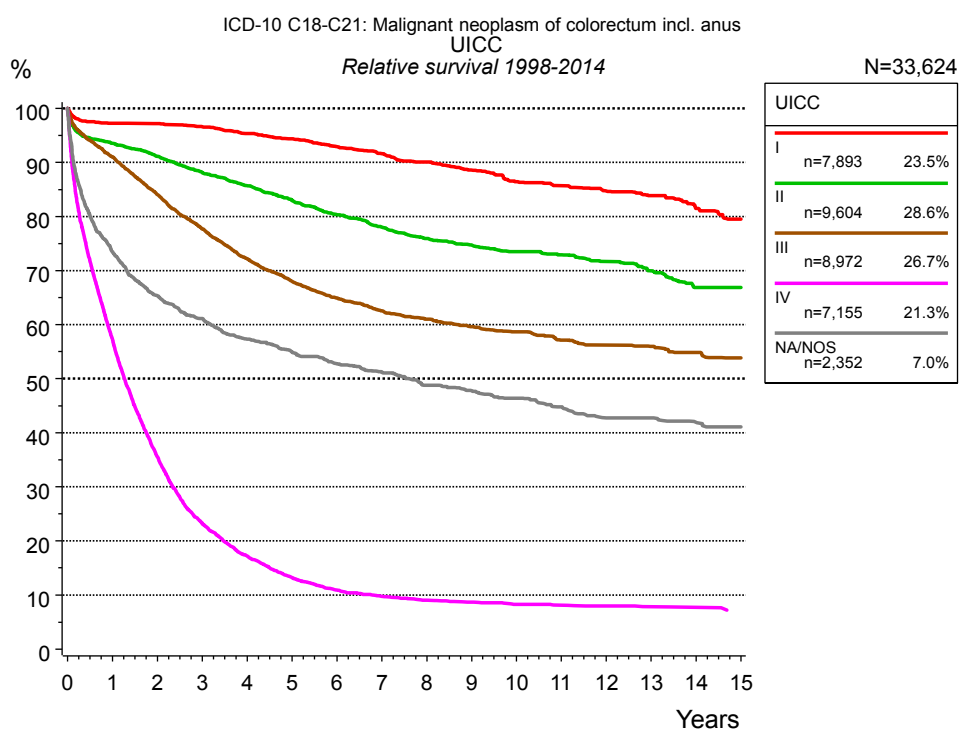


Figure 4c. Relative survival of patients with colorectal cancer by UICC. For 33,944 of 35,976 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 33,624 cases an evaluable classification was established. The grey line represents the subgroup of 2,352 patients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

Years	UICC									
	I n=7,893		II n=9,604		III n=8,972		IV n=7,155		NA/NOS n=2,352	
	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).

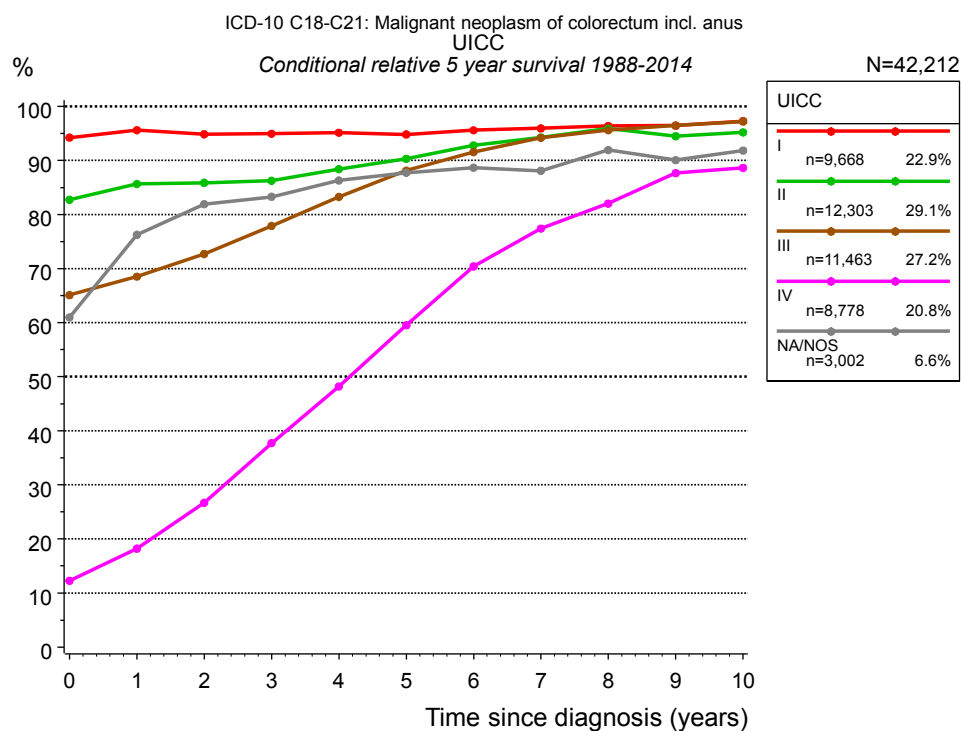


Figure 4e. Conditional relative 5-year survival of patients with colorectal cancer by UICC. For 42,591 of 45,214 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 42,212 cases an evaluable classification was established. The grey line represents the subgroup 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).

Years	UICC									
	I		II		III		IV		NA/NOS	
	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 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).

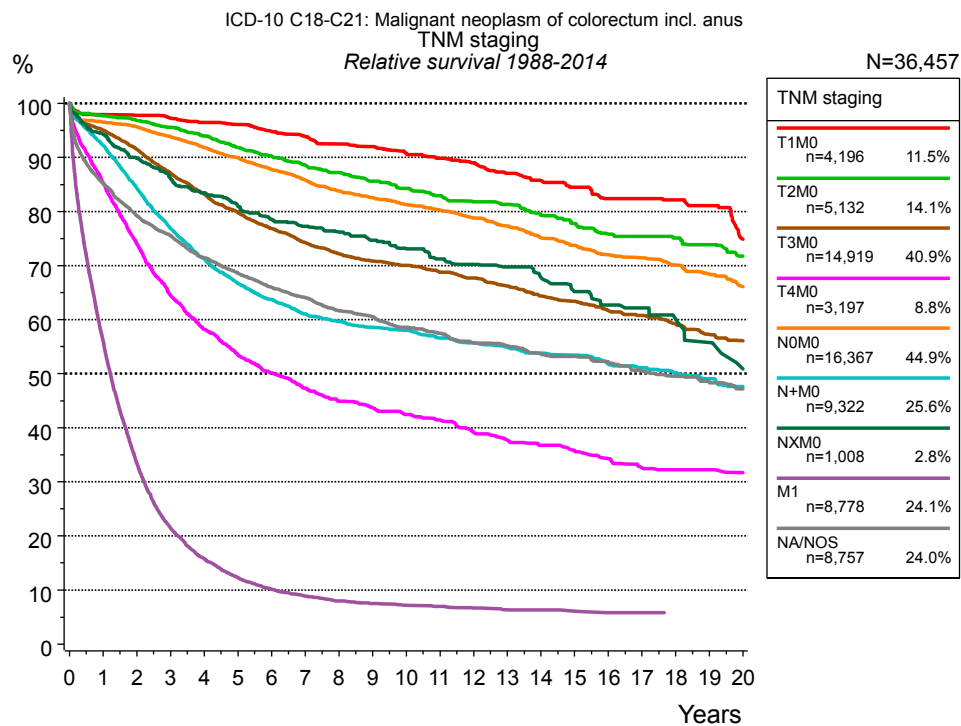


Figure 4g. Relative survival of patients with colorectal cancer by TNM staging. For 42,591 of 45,214 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 36,457 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potentially 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														
Years	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	
	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

<i>cont'd</i>	TNM staging			
	M1		NA/NOS	
	n=8,778		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=36,457).

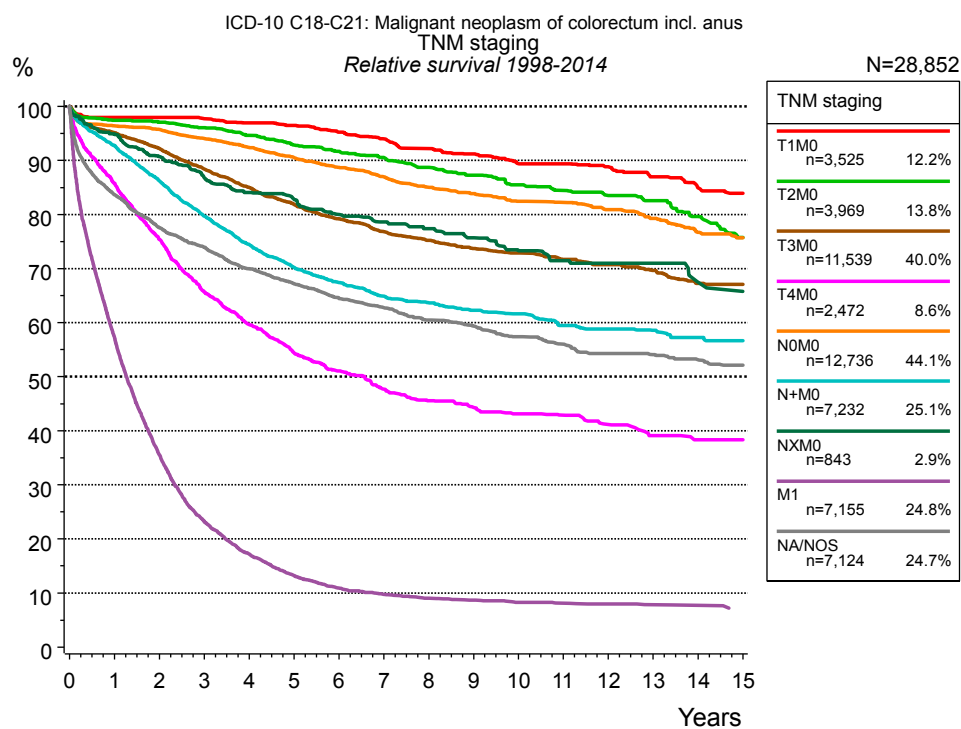


Figure 4i. Relative survival of patients with colorectal cancer by TNM staging. For 33,944 of 35,976 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 28,852 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potentially 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														
Years	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	
	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

<i>cont'd</i>	TNM staging			
	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=28,852).

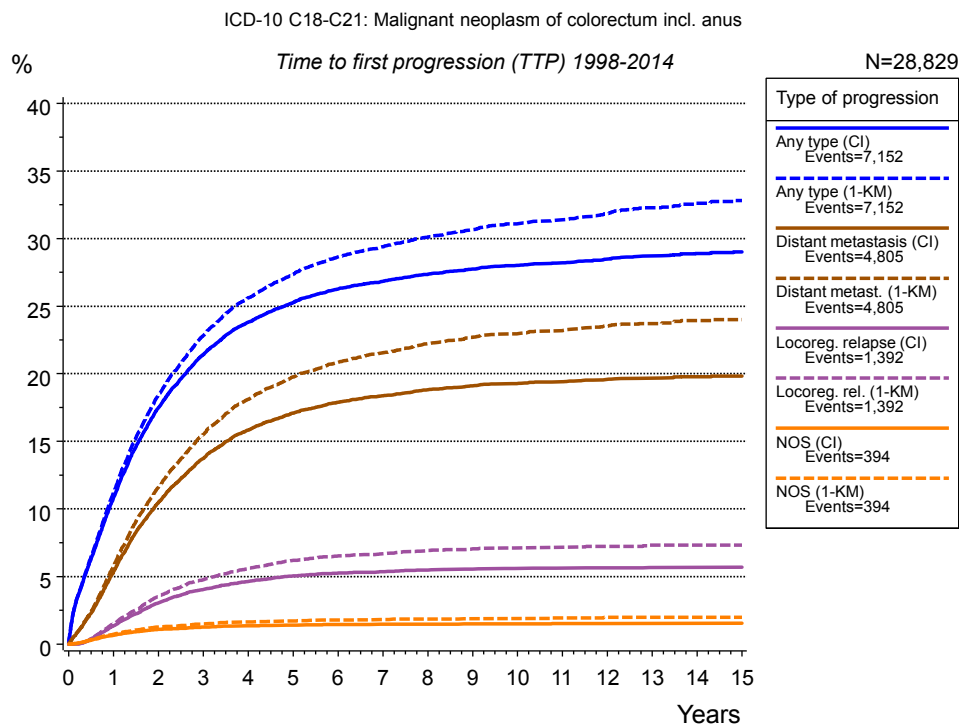


Figure 5a. Time to first progression of 28,829 patients with colorectal cancer diagnosed between 1998 and 2014 (M0 only in solid cancers) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Years	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 %
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

Type of progression	
<i>cont'd</i>	NOS (1-KM) n=28,829
Years	%
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).

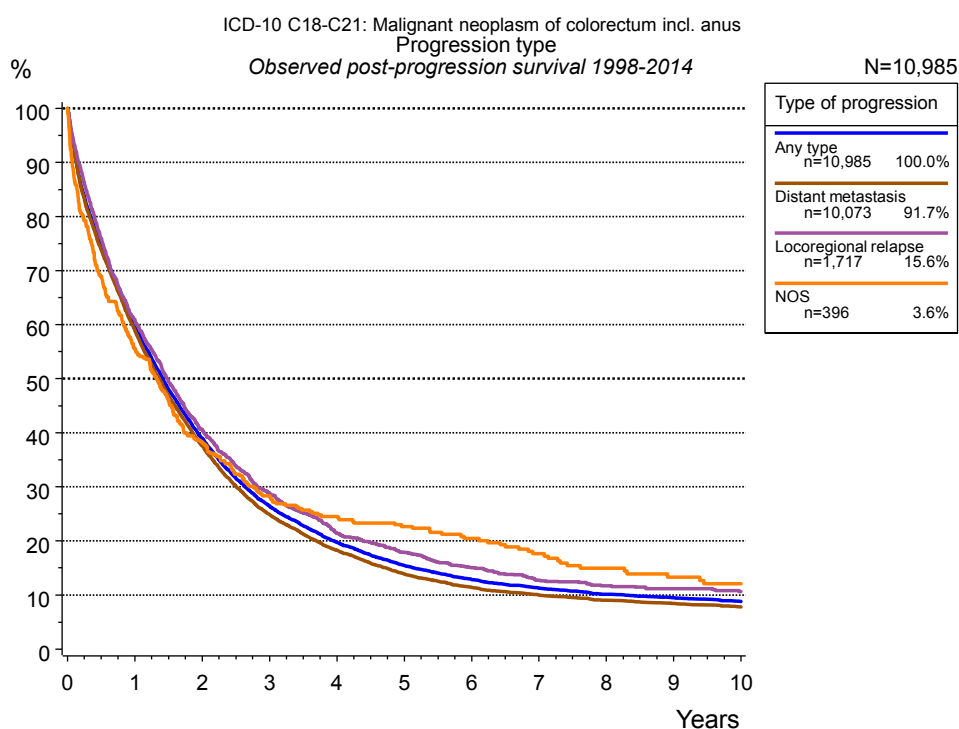


Figure 5c. Observed post-progression survival of 10,985 patients with colorectal cancer diagnosed between 1998 and 2014. These 10,985 patients with documented progression events during their course of disease represent 30.6 % of the totally 35,849 evaluated cases (incl. M1, n=7,020, 19.6 %). Patients 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 occurring 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 potentially considered in more than one subgroup.

Years	Type of progression			
	Any type n=10,985 %	Distant metastasis n=10,073 %	Locoregional relapse n=1,717 %	NOS n=396 %
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).

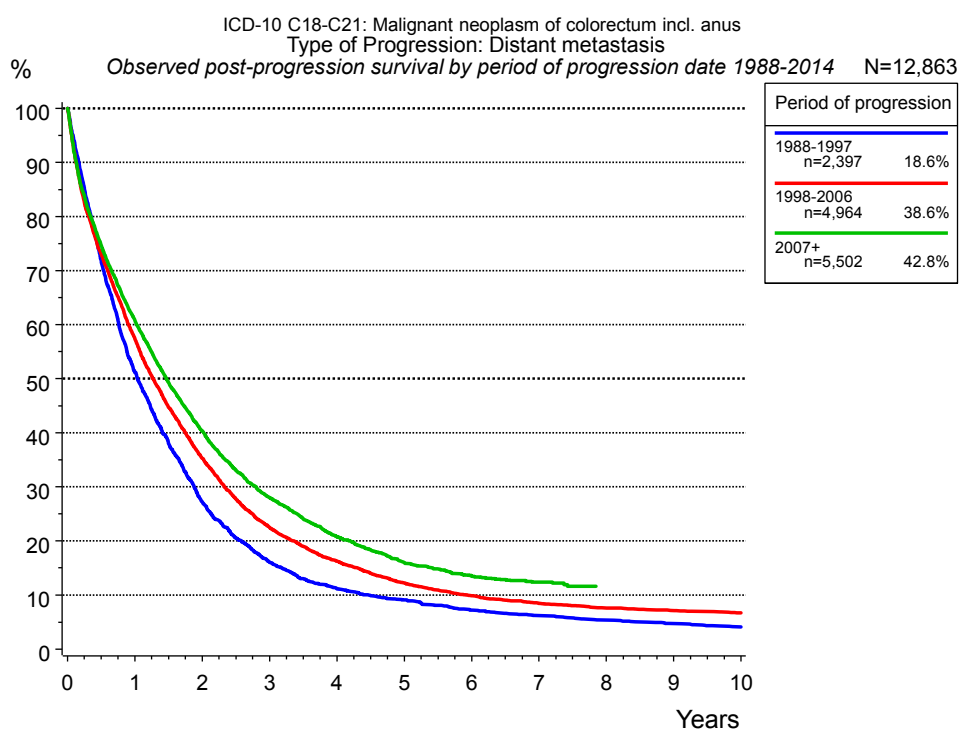


Figure 5e. Observed post-progression (distant metastasis) survival of 12,863 patients with colorectal cancer diagnosed between 1988 and 2014 by period of progression.

Years	Period of progression		
	1988-1997 n=2,397	1998-2006 n=4,964	2007+ n=5,502
	%	%	%
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

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