

Munich Cancer Registry



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ICD-10 C18-C20: Colorectal cancer

Survival

Year of diagnosis	1988-1997	1998-2016
Patients	10,120	50,596
Diseases	10,290	51,980
Cases evaluated	9,049	39,360
Creation date	08/22/2018	
Export date	08/09/2018	
Population	4.81 m	



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<https://www.tumorregister-muenchen.de/en>

<https://www.tumorregister-muenchen.de/en/facts/surv/sC1820E-ICD-10-C18-C20-Colorectal-cancer-survival.pdf>

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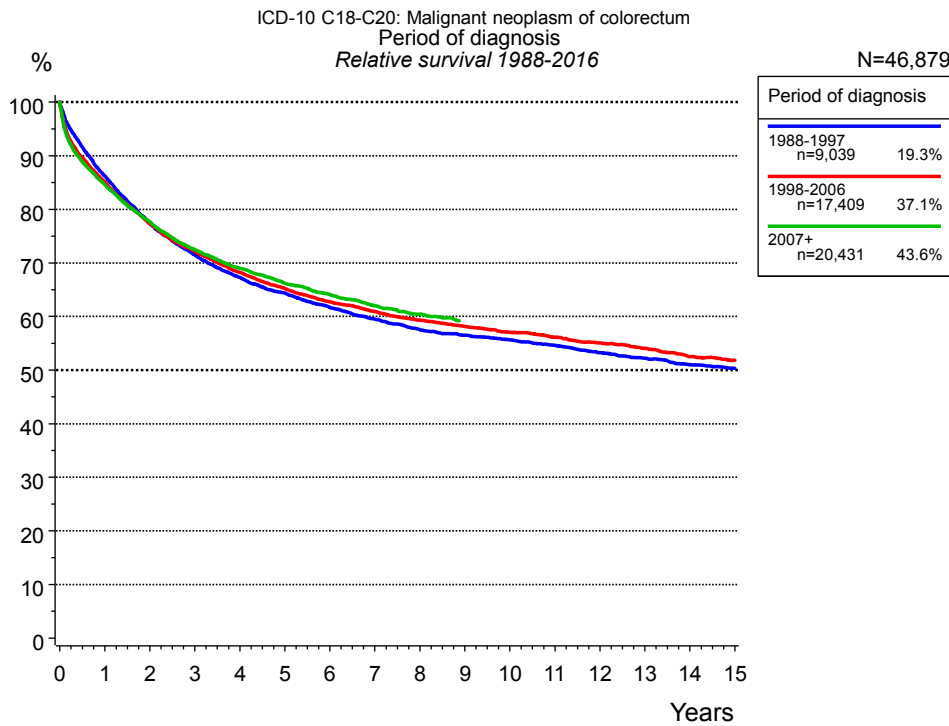


Figure 1a. Relative survival of patients with colorectal cancer by period of diagnosis. Included in the evaluation are 46,879 cases diagnosed between 1988 and 2016.

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=9,039		1998-2006 n=17,409		2007+ n=20,431	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	83.0	86.2	82.0	85.1	81.6	84.6
2	72.0	77.3	72.0	77.3	72.6	77.7
3	64.3	71.5	65.0	72.1	65.6	72.5
4	58.5	67.3	59.5	68.2	60.4	69.0
5	54.1	64.4	55.0	65.3	56.1	66.2
6	50.0	61.7	51.2	62.8	52.5	64.1
7	46.5	59.5	48.0	61.0	49.1	62.0
8	43.5	57.5	45.2	59.3	46.3	60.4
9	41.2	56.5	42.8	58.2		
10	39.1	55.6	40.5	57.1		
11	37.1	54.6	38.4	56.1		
12	34.9	53.3	36.4	55.1		
13	33.0	52.2	34.4	54.1		
14	31.1	51.0	32.1	52.5		
15	29.5	50.3	30.5	51.8		

Table 1b. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by period of diagnosis for period 1988-2016 (N=46,879).

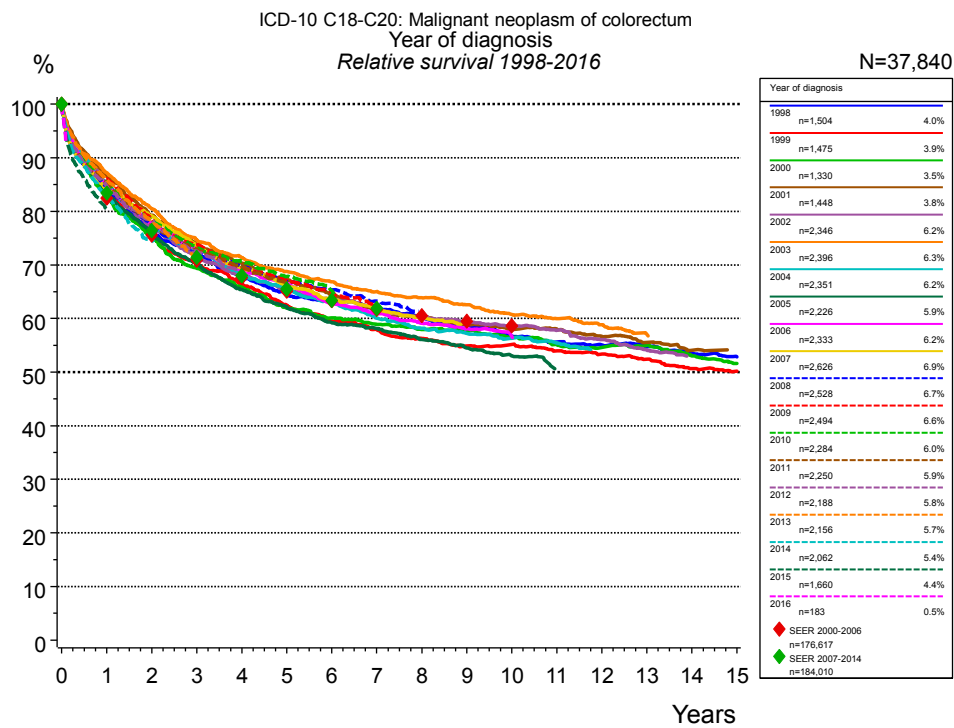


Figure 1c. Relative survival of patients with colorectal cancer by year of diagnosis. Included in the evaluation are 37,840 cases diagnosed between 1998 and 2016.

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.

Years	Year of diagnosis													
	1998		1999		2000		2001		2002		2003		2004	
	n=1,504		n=1,475		n=1,330		n=1,448		n=2,346		n=2,396		n=2,351	
	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	81.7	85.0	80.7	84.0	79.9	83.2	83.4	86.7	81.9	85.1	84.1	87.2	81.9	85.0
2	70.6	76.2	70.0	75.4	70.0	75.3	73.8	79.3	71.5	77.0	75.1	80.5	72.1	77.4
3	64.5	71.9	62.8	70.0	62.3	69.4	66.5	73.8	64.3	71.7	67.5	74.7	65.5	72.8
4	58.7	67.8	57.5	66.4	57.2	65.9	61.4	70.3	59.2	68.2	62.4	71.4	59.5	68.3
5	54.3	64.9	52.2	62.5	52.0	61.9	56.8	67.2	55.0	65.5	58.1	68.7	55.3	65.6
6	50.9	62.9	48.1	59.6	48.9	60.2	52.7	64.4	51.6	63.5	54.6	66.8	51.5	63.2
7	48.3	61.8	45.2	57.9	46.3	58.9	49.1	61.9	48.6	62.1	51.4	65.0	47.3	60.0
8	45.5	60.2	42.5	56.3	44.1	57.9	46.3	60.3	45.7	60.4	48.8	63.9	44.3	58.2
9	42.9	58.8	40.0	54.9	42.4	57.7	43.8	59.0	43.3	59.4	46.1	62.6	42.0	57.2
10	39.9	56.7	38.8	55.2	40.0	56.4	41.7	57.9	41.2	58.6	43.2	60.8	39.9	56.3
11	37.8	55.6	36.7	54.0	37.8	55.1	40.4	58.0	39.1	57.8	41.0	60.0	37.9	55.4
12	36.1	55.1	34.9	53.4	36.0	54.6	38.1	56.6	36.5	56.1	38.8	58.8		
13	34.5	54.7	33.0	52.4	35.0	55.0	36.1	55.5	33.9	54.1	36.4	57.0		
14	32.5	53.5	30.7	50.6	32.4	53.0	33.9	54.1						
15	30.8	52.9	29.2	50.2	30.3	51.6								

<i>cont'd</i>	Year of diagnosis													
	2005		2006		2007		2008		2009		2010		2011	
	n=2,226		n=2,333		n=2,626		n=2,528		n=2,494		n=2,284		n=2,250	
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	82.3	85.1	81.2	84.1	81.6	84.7	82.9	86.0	82.4	85.5	82.1	85.1
2	70.7	75.7	72.7	77.5	74.1	79.1	72.3	77.5	73.4	78.6	73.1	78.4	72.4	77.6
3	63.5	70.2	66.4	73.0	66.6	73.5	65.6	72.7	66.6	73.7	66.1	73.4	65.8	72.9
4	57.2	65.4	60.8	69.1	61.1	69.5	60.9	69.7	60.6	69.4	61.6	70.7	60.9	69.7
5	52.6	62.2	56.8	66.5	56.2	66.2	56.5	66.9	56.7	67.1	57.2	67.8	56.5	66.6
6	48.5	59.2	51.9	62.9	52.3	63.6	53.4	65.3	53.0	64.9	53.4	65.2		
7	46.0	58.1	48.8	61.0	49.2	61.7	50.0	63.3						
8	42.9	56.1	45.7	59.2	46.4	60.2								
9	40.3	54.5	43.4	58.1										
10	37.8	53.0	41.1	56.6										

<i>cont'd</i>	Year of diagnosis									
	2012		2013		2014		2015		2016	
	n=2,188		n=2,156		n=2,062		n=1,660		n=183	
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	81.7	84.6	83.0	85.9	80.1	82.9	77.5	80.4		
2	73.3	78.3	73.3	78.2	70.3	74.7				
3	65.9	72.6	64.5	71.0						

Table 1d. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by year of diagnosis for period 1998-2016 (N=37,840).

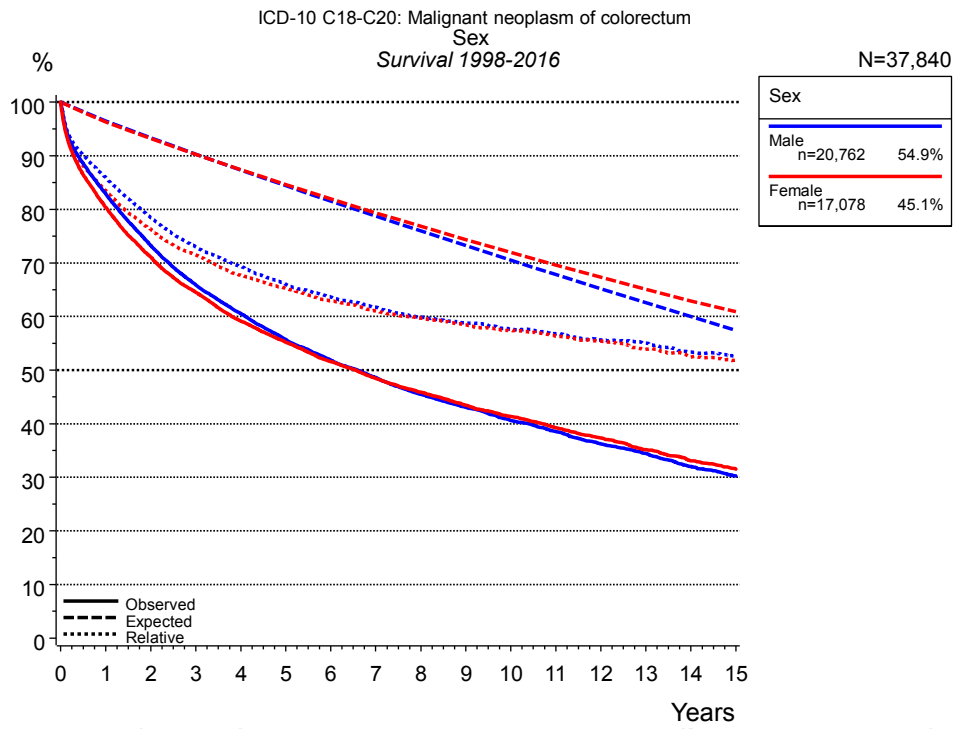


Figure 2a. Survival of patients with colorectal cancer by sex. Included in the evaluation are 37,840 cases diagnosed between 1998 and 2016.

Years	Sex			
	Male n=20,762		Female n=17,078	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	82.9	86.0	80.4	83.5
2	73.3	78.5	71.1	76.3
3	65.9	73.0	64.5	71.4
4	60.6	69.3	59.1	67.7
5	55.7	66.0	55.2	65.2
6	51.9	63.6	51.6	62.9
7	48.6	61.7	48.4	61.0
8	45.5	59.9	45.9	59.7
9	43.1	58.8	43.4	58.4
10	40.6	57.6	41.3	57.4
11	38.5	56.8	39.2	56.3
12	36.3	55.6	37.3	55.4
13	34.5	55.0	35.1	53.9
14	32.0	53.4	33.0	52.5
15	30.3	52.7	31.5	51.7

Table 2b. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by sex for period 1998-2016 (N=37,840).

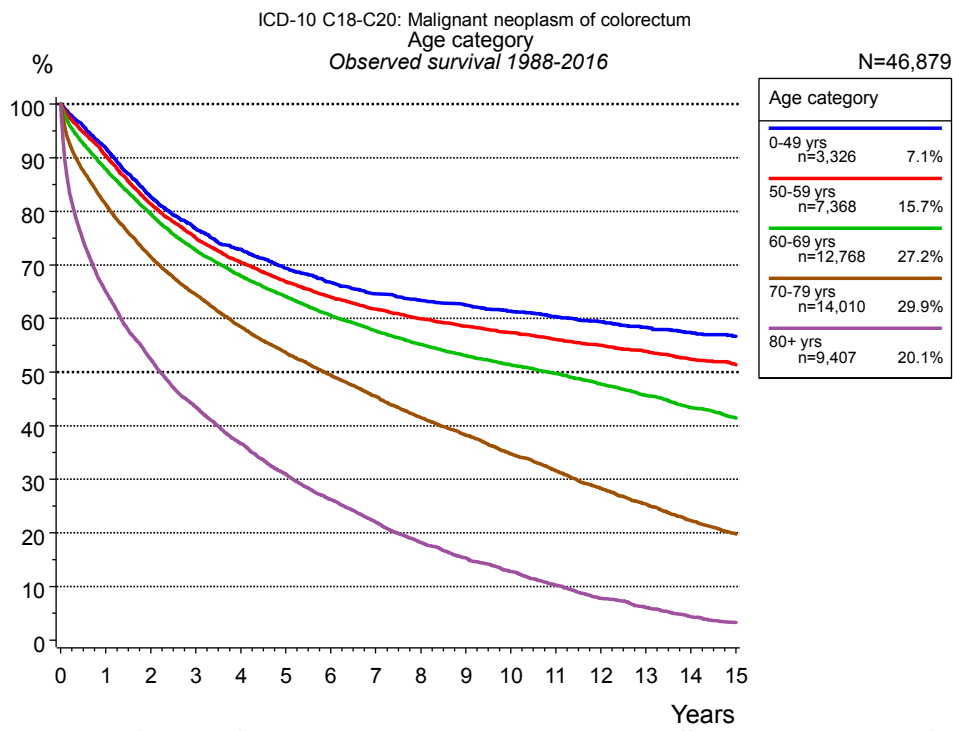


Figure 3a. Observed survival of patients with colorectal cancer by age category. Included in the evaluation are 46,879 cases diagnosed between 1988 and 2016.

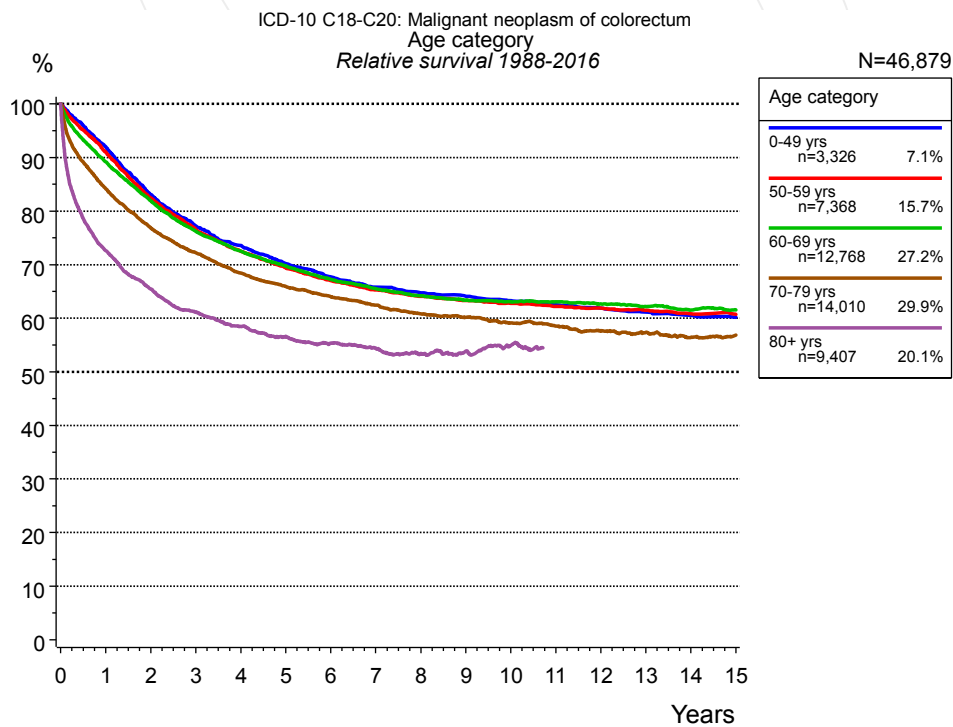


Figure 3b. Relative survival of patients with colorectal cancer by age category. Included in the evaluation are 46,879 cases diagnosed between 1988 and 2016.

Years	Age category									
	0-49 yrs n=3,326		50-59 yrs n=7,368		60-69 yrs n=12,768		70-79 yrs n=14,010		80+ yrs n=9,407	
	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	91.8	92.0	90.4	91.0	87.9	89.2	81.3	84.2	65.1	72.6
2	82.7	83.1	81.4	82.4	79.5	81.9	71.5	76.9	52.4	65.5
3	76.7	77.2	75.1	76.6	72.8	76.2	64.5	72.2	43.5	61.1
4	72.9	73.6	70.5	72.5	68.0	72.5	58.5	68.4	36.7	58.4
5	69.4	70.2	66.9	69.4	64.1	69.8	53.6	65.9	31.0	56.6
6	66.7	67.7	64.0	67.0	60.6	67.3	49.4	64.0	26.2	55.3
7	64.6	65.8	61.7	65.3	57.7	65.5	45.5	62.5	22.0	54.4
8	63.3	64.8	59.9	64.1	55.2	64.2	41.5	60.8	18.2	53.4
9	62.5	64.1	58.6	63.3	53.1	63.4	38.2	60.2	15.3	53.9
10	61.4	63.3	57.3	62.8	51.3	63.1	34.7	59.1	12.8	54.9
11	60.4	62.5	56.1	62.2	49.7	63.1	31.6	58.6	10.2	54.7
12	59.4	61.9	55.0	61.9	47.8	62.7	28.3	57.6	7.8	52.7
13	58.4	61.2	53.9	61.5	45.7	62.2	25.4	57.4	6.1	53.4
14	57.4	60.5	52.4	60.9	43.4	61.5	22.3	56.4	4.3	50.5
15	56.7	60.2	51.4	60.7	41.4	61.5	19.8	56.9	3.3	51.6

Table 3c. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by age category for period 1988-2016 (N=46,879).

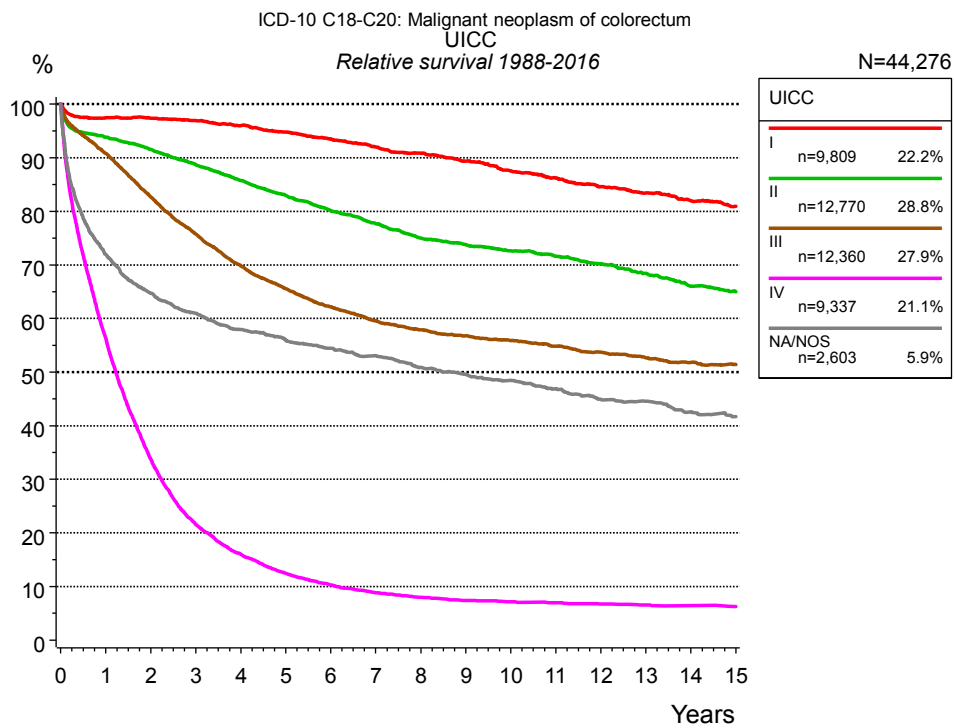


Figure 4a. Relative survival of patients with colorectal cancer by UICC. For 44,515 of 46,879 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 44,276 cases an evaluable classification was established. The grey line represents the subgroup of 2,603 patients with missing values regarding UICC (5.6 % of 46,879 patients, the percent values of all other categories are related to n=44,276).

Years	UICC									
	I n=9,809		II n=12,770		III n=12,360		IV n=9,337		NA/NOS n=2,603	
	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	97.4	90.1	93.8	87.7	90.8	54.4	56.3	68.1	72.0
2	91.4	97.4	84.6	91.5	77.4	82.7	31.9	33.8	58.7	64.7
3	88.0	96.9	79.0	88.7	68.8	75.8	19.9	21.5	53.4	61.0
4	84.3	96.0	73.6	85.8	61.5	69.9	14.4	16.0	49.1	57.9
5	80.5	94.8	68.5	83.0	56.0	65.6	10.9	12.4	46.0	56.0
6	76.7	93.5	63.7	80.1	51.5	62.2	8.8	10.3	43.3	54.5
7	73.0	92.0	59.5	77.7	47.8	59.6	7.4	8.8	40.9	53.1
8	69.6	90.9	55.3	75.0	45.0	57.9	6.5	8.0	38.0	50.9
9	66.0	89.4	52.4	73.8	42.8	56.8	5.9	7.4	35.8	49.6
10	62.4	87.6	49.6	72.6	40.8	55.9	5.5	7.1	33.9	48.4
11	59.3	86.2	47.1	71.6	38.7	54.8	5.3	7.0	31.7	46.9
12	56.1	84.6	44.4	70.2	36.7	53.7	4.9	6.8	29.3	44.9
13	53.3	83.4	41.7	68.4	34.8	52.7	4.7	6.5	28.1	44.5
14	50.4	81.9	38.6	66.0	33.0	51.8	4.5	6.5	26.0	42.6
15	47.9	80.9	36.5	65.0	31.6	51.4	4.2	6.3	24.5	41.7

Table 4b. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by UICC for period 1988-2016 (N=44,276).

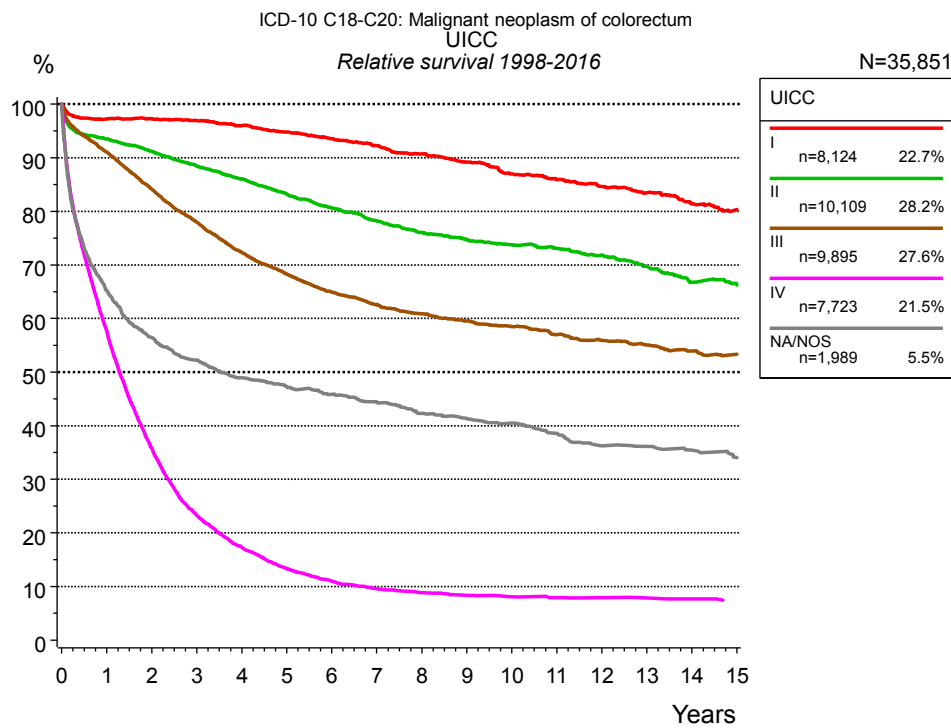


Figure 4c. Relative survival of patients with colorectal cancer by UICC. For 36,048 of 37,840 cases diagnosed between 1998 and 2016 valid data could be obtained for this item. For a total of 35,851 cases an evaluable classification was established. The grey line represents the subgroup of 1,989 patients with missing values regarding UICC (5.3 % of 37,840 patients, the percent values of all other categories are related to n=35,851).

Years	UICC									
	I n=8,124		II n=10,109		III n=9,895		IV n=7,723		NA/NOS n=1,989	
	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	94.1	97.2	89.7	93.5	88.0	91.1	55.7	57.6	61.5	65.3
2	91.3	97.3	84.3	91.2	78.8	84.1	33.8	35.8	50.9	56.4
3	88.1	96.9	78.7	88.4	70.9	78.0	21.4	23.2	45.4	52.2
4	84.4	96.0	73.8	86.0	63.8	72.3	15.6	17.3	41.2	48.9
5	80.6	94.8	68.7	83.2	58.4	68.3	11.7	13.3	38.7	47.3
6	76.9	93.6	64.2	80.6	53.9	64.9	9.5	11.0	36.4	45.9
7	73.2	92.2	59.9	78.2	50.4	62.6	8.1	9.6	34.3	44.4
8	69.5	90.7	56.2	76.1	47.5	60.9	7.3	8.8	31.7	42.3
9	65.9	89.1	53.1	74.7	45.0	59.5	6.7	8.4	30.2	41.4
10	62.0	87.0	50.4	73.8	42.8	58.4	6.3	8.1	28.8	40.5
11	59.1	85.9	48.0	73.1	40.4	57.0	6.0	7.9	26.6	38.6
12	56.0	84.6	45.4	71.9	38.3	55.9	5.9	7.9	24.2	36.3
13	53.2	83.5	42.4	69.7	36.5	55.0	5.7	7.9	23.5	36.1
14	49.8	81.4	38.9	66.8	34.6	53.9	5.4	7.7	22.5	35.4
15	47.2	80.3	37.1	66.3	33.0	53.3	5.0	7.3	20.9	34.1

Table 4d. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by UICC for period 1998-2016 (N=35,851).

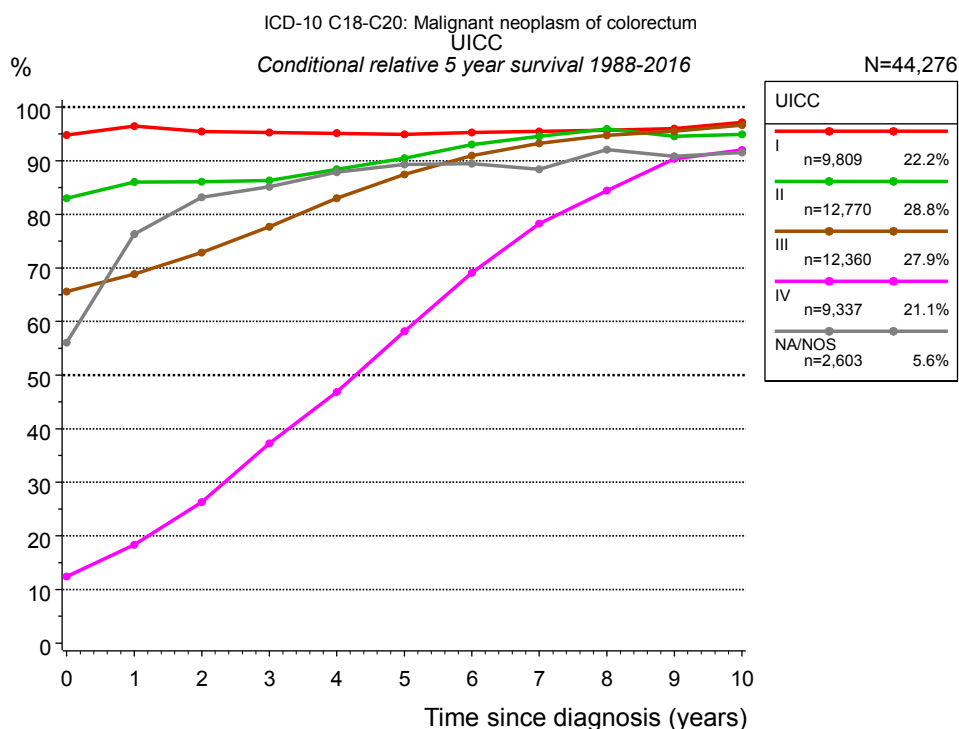


Figure 4e. Conditional relative 5-year survival of patients with colorectal cancer by UICC. For 44,515 of 46,879 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 44,276 cases an evaluable classification was established. The grey line represents the subgroup of 2,603 patients with missing values regarding UICC (5.6 % of 46,879 patients, the percent values of all other categories are related to n=44,276).

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	9,809	94.8	12,770	83.0	12,360	65.6	9,337	12.4	2,603	56.0
1	8,815	96.4	10,917	86.0	10,255	68.9	4,806	18.4	1,689	76.3
2	8,120	95.5	9,776	86.1	8,597	72.9	2,642	26.3	1,424	83.2
3	7,402	95.3	8,644	86.3	7,182	77.6	1,531	37.2	1,255	85.2
4	6,681	95.2	7,618	88.4	5,968	83.0	1,012	46.9	1,121	87.9
5	5,982	94.9	6,695	90.5	5,026	87.4	693	58.2	1,006	89.3
6	5,312	95.3	5,780	93.0	4,263	90.9	493	69.1	914	89.5
7	4,642	95.5	4,983	94.6	3,588	93.3	364	78.3	829	88.4
8	4,034	95.7	4,276	95.9	3,003	94.7	283	84.5	732	92.1
9	3,452	96.0	3,685	94.6	2,523	95.5	219	90.4	646	90.8
10	2,943	97.2	3,168	94.9	2,145	96.6	177	92.0	573	91.6

Table 4f. Conditional relative 5-year survival of patients with colorectal cancer by UICC for period 1988-2016 (N=44,276).

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 95.3% (n=7,402).

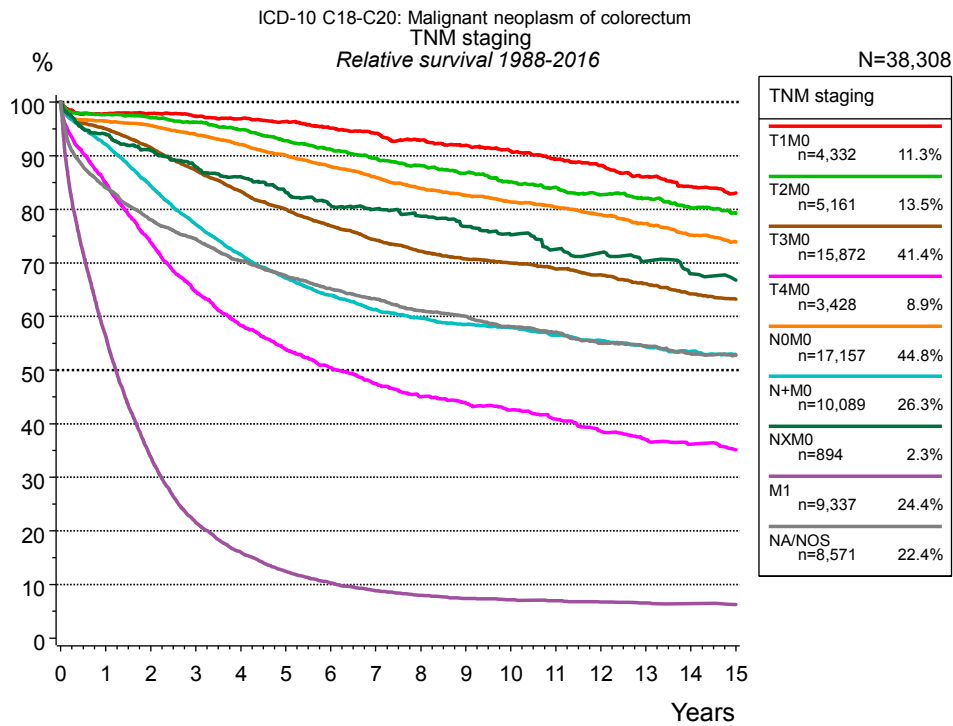


Figure 4g. Relative survival of patients with colorectal cancer by TNM staging. For 44,515 of 46,879 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 38,308 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 8,571 patients with missing values regarding TNM staging (18.3 % of 46,879 patients, the percent values of all other categories are related to n=38,308).

Years	TNM staging													
	T1M0 n=4,332		T2M0 n=5,161		T3M0 n=15,872		T4M0 n=3,428		N0M0 n=17,157		N+M0 n=10,089		NXM0 n=894	
	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	95.1	97.8	94.5	97.7	91.7	95.0	81.4	84.9	93.0	96.4	89.1	92.1	91.1	94.0
2	92.6	97.9	90.9	97.1	85.3	91.5	68.2	73.8	89.2	95.7	79.2	84.4	85.6	91.0
3	89.6	97.4	87.3	96.3	78.7	87.3	57.7	64.7	84.7	94.0	70.3	77.2	80.3	87.9
4	86.5	96.9	83.2	94.8	72.6	83.4	50.3	58.3	80.1	92.0	63.3	71.6	76.4	86.1
5	83.5	96.4	78.7	92.8	67.4	80.0	45.0	53.9	75.7	90.1	57.7	67.2	71.5	83.1
6	79.9	95.1	74.8	91.2	62.5	76.9	40.8	50.5	71.4	88.0	53.3	64.0	67.4	80.7
7	76.6	94.2	71.1	89.6	58.3	74.3	37.1	47.5	67.3	85.9	49.6	61.3	64.9	80.1
8	73.2	92.9	67.5	88.2	54.7	72.2	34.0	45.1	63.4	83.9	46.8	59.7	61.9	78.7
9	70.1	91.9	64.2	86.8	51.8	70.7	32.0	43.8	60.2	82.6	44.5	58.5	58.6	76.8
10	67.0	90.9	60.8	85.1	49.4	70.0	30.1	42.6	57.2	81.4	42.7	57.9	55.4	75.2
11	63.5	89.3	58.1	84.1	46.9	68.9	28.0	40.9	54.5	80.4	40.4	56.5	51.7	72.6
12	60.6	88.2	55.1	82.7	44.5	67.8	25.6	38.6	51.5	79.0	38.4	55.5	49.6	71.9
13	57.0	86.1	52.7	82.1	41.8	66.1	23.8	37.1	48.6	77.3	36.4	54.3	46.7	70.3
14	53.7	84.2	49.7	80.3	39.1	64.2	22.4	36.2	45.5	75.2	34.6	53.5	43.6	68.0
15	51.1	83.1	47.3	79.3	37.0	63.2	21.1	35.1	43.0	73.9	33.0	52.9	41.3	66.8

<i>cont'd</i>	TNM staging			
	M1		NA/NOS	
	n=9,337		n=8,571	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	54.4	56.3	80.3	84.1
2	31.9	33.8	71.6	78.0
3	19.9	21.5	65.7	74.4
4	14.4	16.0	59.9	70.4
5	10.9	12.4	55.5	67.6
6	8.8	10.3	51.5	65.2
7	7.4	8.8	48.2	63.2
8	6.5	8.0	44.9	61.1
9	5.9	7.4	42.4	60.0
10	5.5	7.1	39.6	58.1
11	5.3	7.0	37.4	57.1
12	4.9	6.8	34.7	55.0
13	4.7	6.5	33.1	54.5
14	4.5	6.5	31.0	53.1
15	4.2	6.3	29.7	52.8

Table 4h. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by TNM staging for period 1988-2016 (N=38,308).

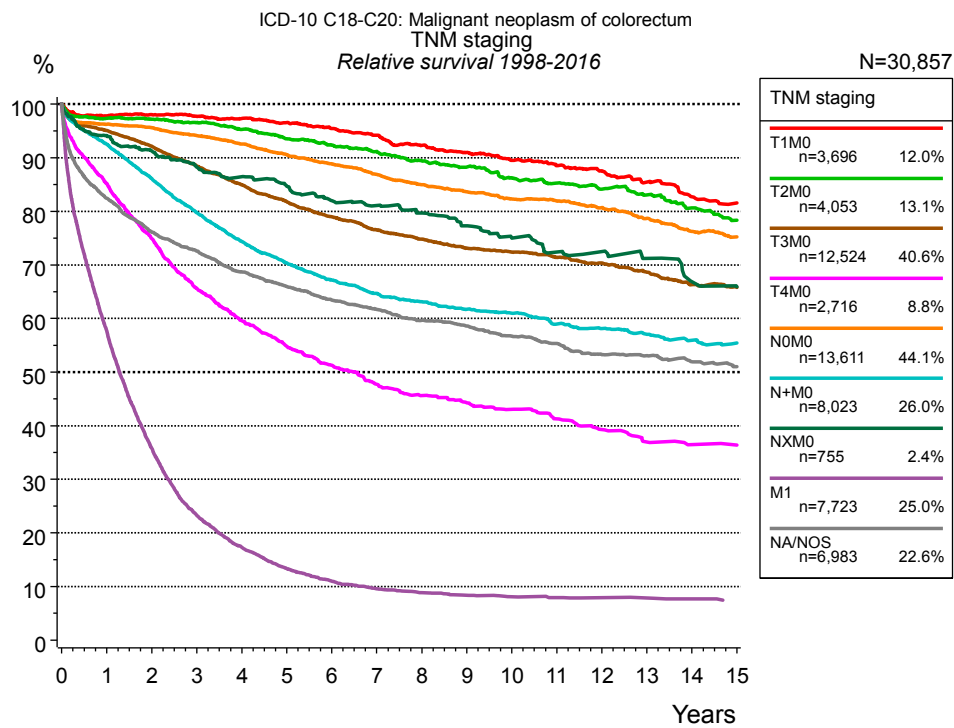


Figure 4i. Relative survival of patients with colorectal cancer by TNM staging. For 36,048 of 37,840 cases diagnosed between 1998 and 2016 valid data could be obtained for this item. For a total of 30,857 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 6,983 patients with missing values regarding TNM staging (18.5 % of 37,840 patients, the percent values of all other categories are related to n=30,857).

Years	TNM staging													
	T1M0 n=3,696		T2M0 n=4,053		T3M0 n=12,524		T4M0 n=2,716		N0M0 n=13,611		N+M0 n=8,023		NXM0 n=755	
	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	95.2	97.8	94.1	97.3	91.7	95.1	81.8	85.2	92.9	96.2	89.6	92.6	91.3	94.1
2	92.8	98.1	91.0	97.1	86.0	92.2	69.4	75.0	89.2	95.6	80.9	86.1	86.0	91.3
3	90.0	97.7	87.5	96.6	79.8	88.5	58.7	65.6	84.8	94.1	72.8	79.8	80.9	88.2
4	87.0	97.3	83.5	95.3	74.1	85.0	51.7	59.6	80.6	92.5	65.9	74.4	77.1	86.5
5	83.7	96.5	79.3	93.6	68.9	81.8	46.0	54.8	76.1	90.6	60.5	70.4	73.3	84.6
6	80.3	95.4	75.8	92.4	64.3	79.0	41.7	51.3	72.1	88.8	56.1	67.2	69.1	82.0
7	76.8	94.2	72.3	91.2	60.1	76.5	37.7	47.7	68.1	86.9	52.5	64.7	66.3	81.1
8	72.8	92.3	68.4	89.4	56.8	74.8	34.9	45.6	64.3	85.0	49.7	63.1	63.3	79.7
9	69.5	91.0	65.3	88.3	53.6	73.2	32.8	44.3	61.0	83.7	47.1	61.7	59.6	77.3
10	66.1	89.5	61.6	86.2	51.1	72.4	31.0	43.0	57.8	82.3	45.1	61.0	55.8	75.0
11	63.0	88.5	58.8	85.3	48.6	71.4	28.7	41.2	55.4	81.9	42.3	59.0	52.4	72.4
12	60.1	87.6	55.9	84.1	46.1	70.4	26.5	39.3	52.6	80.7	40.3	58.1	50.8	72.5
13	56.5	85.5	53.3	83.1	43.3	68.7	24.2	36.9	49.3	78.7	38.3	57.1	48.0	71.2
14	52.5	82.7	49.7	80.6	40.2	66.3	23.1	36.5	45.9	76.2	36.3	56.0	43.6	66.9
15	49.9	81.6	46.7	78.4	38.4	65.8	22.3	36.4	43.5	75.2	34.7	55.5	41.5	65.9

<i>cont'd</i>	TNM staging			
	M1		NA/NOS	
	n=7,723		n=6,983	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	55.7	57.6	78.6	82.4
2	33.8	35.8	69.8	76.1
3	21.4	23.2	64.0	72.6
4	15.6	17.3	58.4	68.7
5	11.7	13.3	54.1	66.0
6	9.5	11.0	50.1	63.4
7	8.1	9.6	47.1	61.7
8	7.3	8.8	43.9	59.7
9	6.7	8.4	41.6	58.6
10	6.3	8.1	38.8	56.7
11	6.0	7.9	36.5	55.3
12	5.9	7.9	33.8	53.2
13	5.7	7.9	32.6	53.1
14	5.4	7.7	30.7	51.9
15	5.0	7.3	29.0	51.0

Table 4j. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by TNM staging for period 1998-2016 (N=30,857).

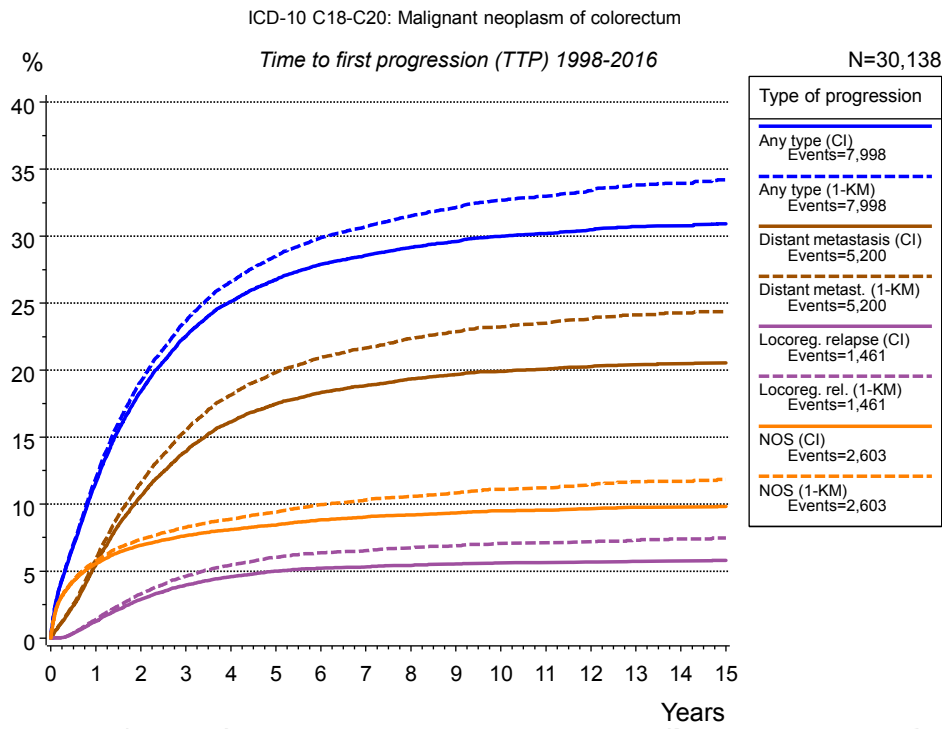


Figure 5a. Time to first progression of 30,138 patients with colorectal cancer diagnosed between 1998 and 2016 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

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=30,138 %	n=30,138 %	n=30,138 %	n=30,138 %	n=30,138 %	n=30,138 %	n=30,138 %
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	11.6	11.9	5.5	5.9	1.2	1.4	5.6
2	18.4	19.1	10.6	11.6	2.9	3.3	6.9
3	22.5	23.6	13.9	15.5	3.9	4.6	7.6
4	25.1	26.6	16.1	18.1	4.6	5.5	8.1
5	26.8	28.5	17.5	19.8	5.0	6.0	8.4
6	27.9	29.9	18.3	21.0	5.2	6.4	8.8
7	28.6	30.7	18.9	21.7	5.3	6.5	9.0
8	29.2	31.5	19.3	22.4	5.4	6.7	9.2
9	29.6	32.1	19.7	22.9	5.5	6.9	9.3
10	30.0	32.7	19.9	23.2	5.6	7.1	9.5
11	30.2	33.0	20.1	23.5	5.7	7.1	9.6
12	30.5	33.4	20.3	23.9	5.7	7.2	9.7
13	30.7	33.8	20.4	24.1	5.7	7.3	9.8
14	30.8	33.9	20.5	24.3	5.8	7.4	9.8
15	30.9	34.2	20.5	24.4	5.8	7.5	9.8

Type of progression	
<i>cont'd</i>	NOS (1-KM) n=30,138
Years	%
0	0.0
1	5.8
2	7.4
3	8.3
4	8.9
5	9.4
6	10.0
7	10.3
8	10.6
9	10.8
10	11.1
11	11.2
12	11.5
13	11.7
14	11.7
15	11.8

Table 5b. Time to first progression of patients with colorectal cancer for period 1998-2016 (N=30,138).

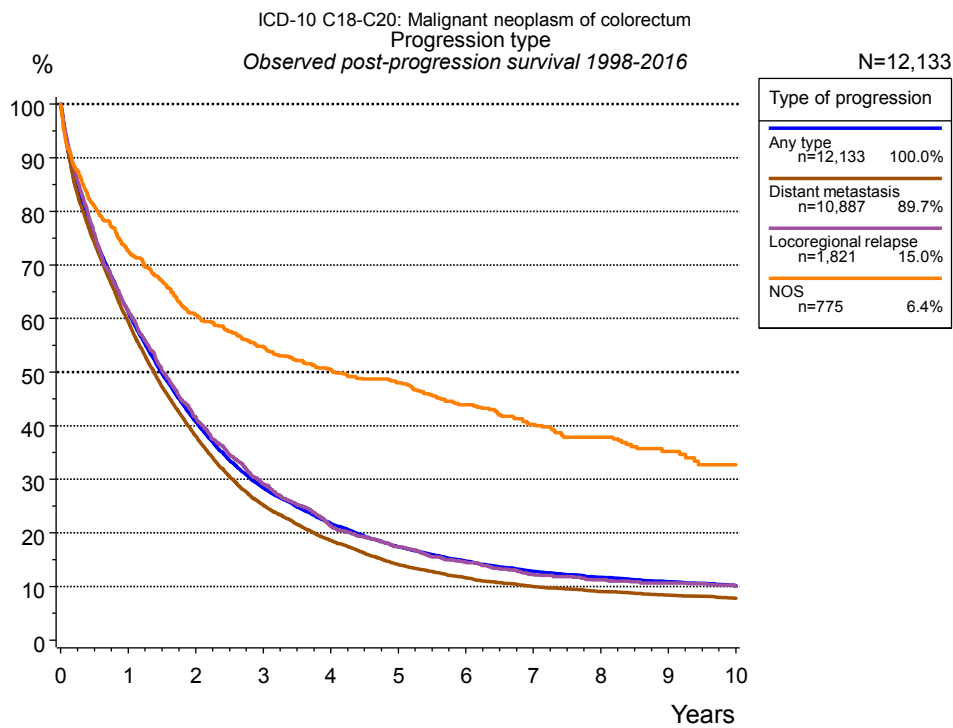


Figure 5c. Observed post-progression survival of 12,133 patients with colorectal cancer diagnosed between 1998 and 2016. These 12,133 patients with documented progression events during their course of disease represent 32.2 % of the totally 37,707 evaluated cases (incl. M1, n=7,569, 20.1 %). Patients with cancer relapse documented via death certificates only were excluded (n=3,434, 9.1 %). 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=12,133 %	Distant metastasis n=10,887 %	Locoregional relapse n=1,821 %	NOS n=775 %
0	100.0	100.0	100.0	100.0
1	61.3	59.4	61.3	72.8
2	40.7	38.1	41.6	60.6
3	28.5	25.2	29.2	54.8
4	21.7	18.6	21.2	50.4
5	17.4	14.1	17.4	48.0
6	14.7	11.6	14.5	43.9
7	12.8	10.0	12.2	40.2
8	11.7	9.0	11.2	37.8
9	10.9	8.4	10.6	35.2
10	10.2	7.8	10.1	32.7

Table 5d. Observed post-progression survival of patients with colorectal cancer for period 1998-2016 (N=12,133).

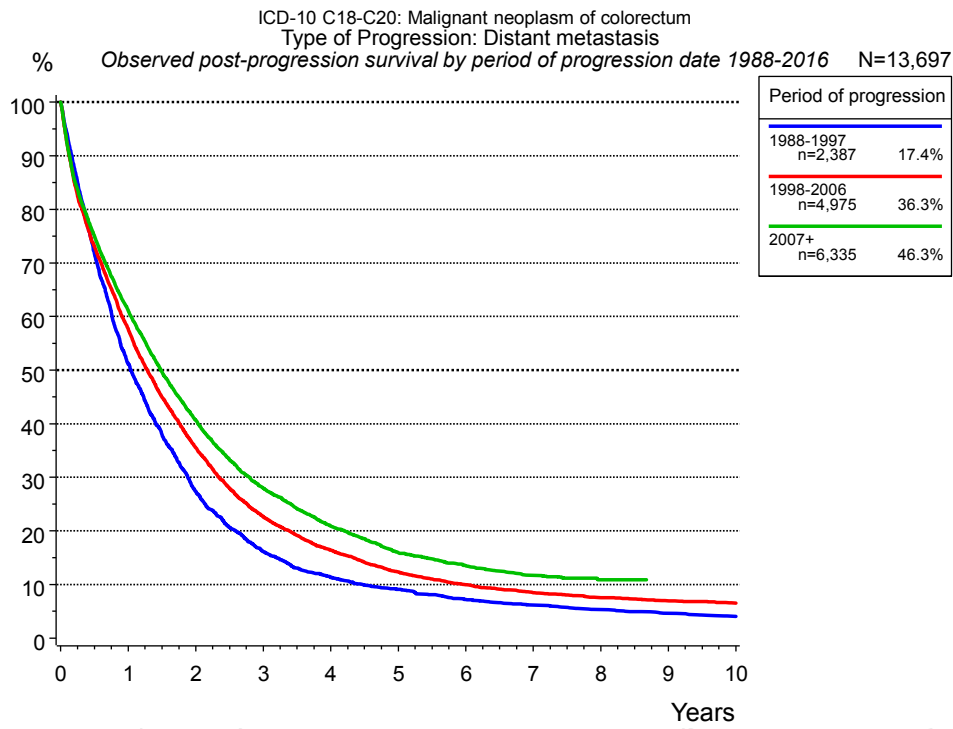


Figure 5e. Observed post-progression (distant metastasis) survival of 13,697 patients with colorectal cancer diagnosed between 1988 and 2016 by period of progression.

Years	Period of progression		
	1988-1997 n=2,387 %	1998-2006 n=4,975 %	2007+ n=6,335 %
0	100.0	100.0	100.0
1	51.2	57.7	61.1
2	27.4	35.5	40.7
3	16.1	22.6	28.0
4	11.3	16.4	20.9
5	9.1	12.3	15.9
6	7.2	9.9	13.5
7	6.1	8.5	11.7
8	5.3	7.5	10.9
9	4.6	6.9	
10	4.1	6.5	

Table 5f. Observed post-progression (distant metastasis) survival of patients with colorectal cancer for period 1988-2016 by period of progression (N=13,697).

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-C20: Colorectal cancer [Internet]. 2018 [updated 2018 Aug 22; cited 2018 Oct 1]. Available from: <https://www.tumorregister-muenchen.de/en/facts/surv/sC1820E-ICD-10-C18-C20-Colorectal-cancer-survival.pdf>

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