Munich Cancer Registry

ICD-10 C18-C20: Colorectal cancer

Survival

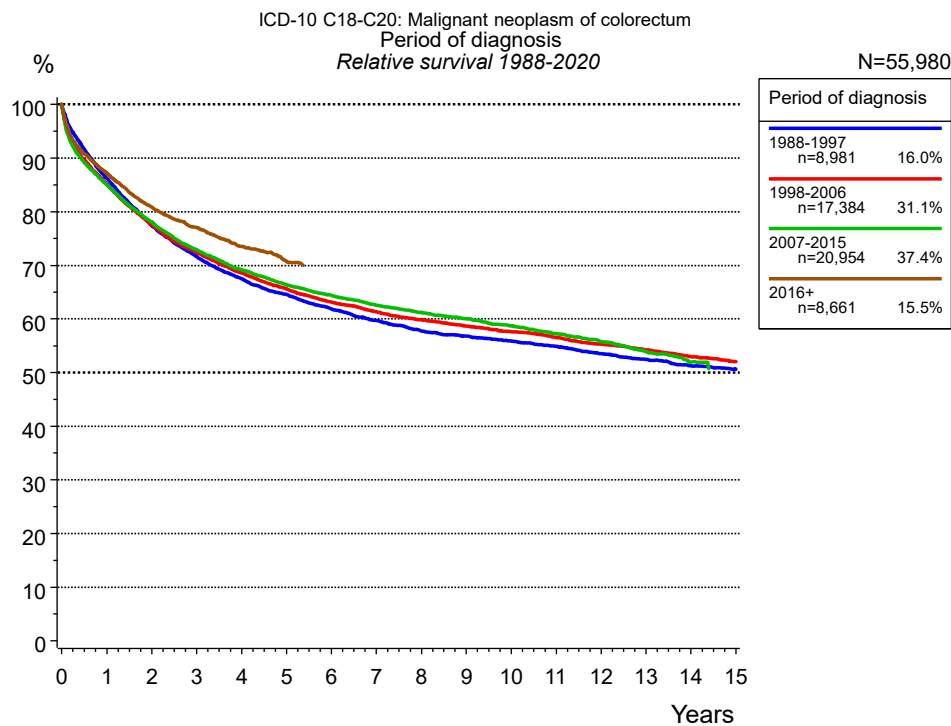| Year of diagnosis	1988-1997	1998-2020
Patients	10,070	60,701
Diseases	10,237	62,495
Cases evaluated	8,992	47,155
Creation date	04/15/2022	
Database export	12/20/2021	
Population	4.92 m	

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninistr. 15
Munich, 81377
Germany

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

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

Index of figures and tables

ICD-10 C18-C20: Malignant neoplasm of colorectum
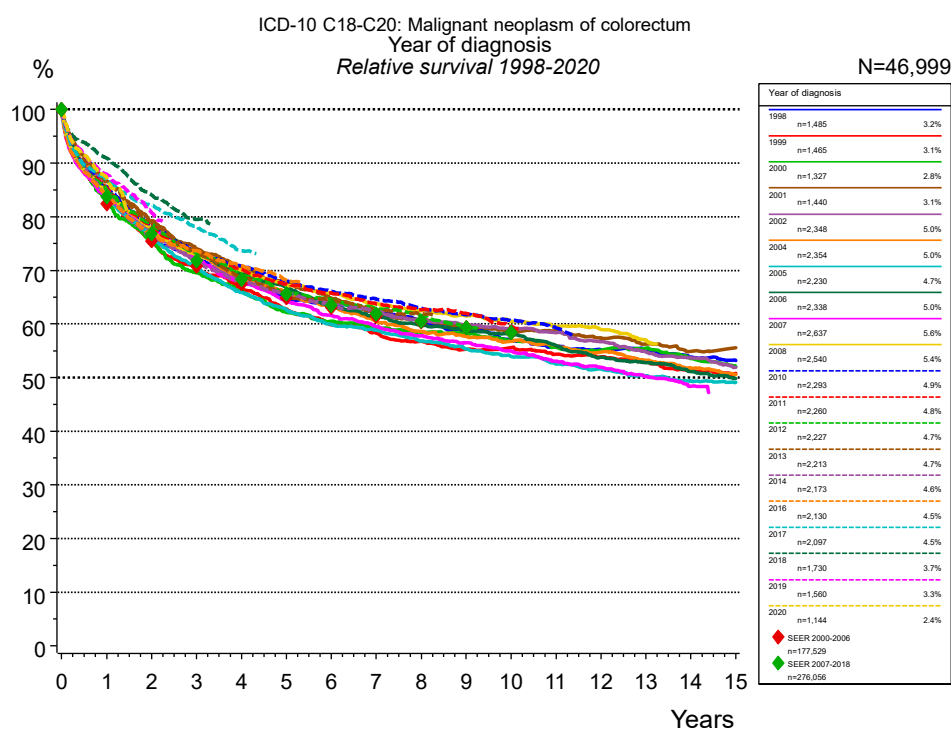Period of diagnosis
Relative survival 1988-2020

Figure 1a. Relative survival of patients with colorectal cancer by period of diagnosis. Included in the evaluation are 55,980 cases diagnosed between 1988 and 2020.

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=8,981		1998-2006 n=17,384		2007-2015 n=20,954		2016+ n=8,661	
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	83.1	86.2	82.0	85.2	82.0	85.0	84.4	87.2
2	72.0	77.4	72.2	77.5	73.0	78.1	75.8	80.8
3	64.5	71.6	65.2	72.4	65.9	72.9	70.1	77.0
4	58.7	67.5	59.8	68.6	60.6	69.2	64.8	73.5
5	54.2	64.6	55.3	65.6	56.3	66.4	60.3	70.7
6	50.2	61.9	51.5	63.2	52.8	64.4		
7	46.7	59.7	48.4	61.4	49.6	62.6		
8	43.7	57.8	45.6	59.8	46.9	61.2		
9	41.4	56.8	43.2	58.7	44.4	60.1		
10	39.3	55.9	40.9	57.6	41.9	58.7		
11	37.3	54.9	38.7	56.5	39.3	57.3		
12	35.1	53.6	36.5	55.3	36.9	55.8		
13	33.2	52.5	34.5	54.3	34.3	54.0		
14	31.3	51.3	32.4	53.0	31.8	52.0		
15	29.7	50.6	30.5	52.0				
Median	6.0		6.5		6.9			

Table 1b. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by period of diagnosis for period 1988-2020 (N=55,980).

ICD-10 C18-C20: Malignant neoplasm of colorectum
Year of diagnosis
Relative survival 1998-2020

Figure 1c. Relative survival of patients with colorectal cancer by year of diagnosis. Included in the evaluation are 46,999 cases diagnosed between 1998 and 2020.

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 2018, and are represented by colored diamonds in order to facilitate comparisons between MCR and SEER.

	Year of diagnosis												
	1998 n=1,485		1999 n=1,465		2000 n=1,327		2001 n=1,440		2002 n=2,348		2004 n=2,354		2005 n=2,230	
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	81.6	84.9	80.6	83.9	80.0	83.3	83.5	86.7	82.0	85.2	82.0	85.1	81.1	84.1
2	70.6	76.1	70.0	75.4	70.1	75.5	73.8	79.3	71.7	77.2	72.3	77.6	71.0	76.1
3	64.7	72.1	62.9	70.1	62.4	69.5	66.7	74.0	64.6	72.0	65.8	73.0	63.9	70.7
4	59.0	68.0	57.7	66.6	57.4	66.1	61.7	70.7	59.6	68.6	59.8	68.6	57.7	65.9
5	54.7	65.2	52.4	62.8	52.2	62.2	57.1	67.6	55.4	65.9	55.6	65.9	53.1	62.7
6	51.3	63.4	48.4	59.9	49.1	60.5	53.1	64.8	52.0	64.0	51.8	63.5	49.0	59.9
7	48.6	62.2	45.6	58.4	46.6	59.2	49.5	62.4	49.0	62.5	47.6	60.4	46.6	58.8
8	45.8	60.6	42.8	56.7	44.4	58.4	46.6	60.7	46.1	60.9	44.6	58.6	43.4	56.8
9	43.1	59.0	40.3	55.3	42.7	58.1	44.2	59.4	43.7	59.9	42.3	57.6	40.9	55.3
10	40.1	56.9	39.1	55.6	40.4	56.9	42.0	58.4	41.6	59.1	40.2	56.8	38.4	54.0
11	37.9	55.8	36.9	54.4	38.2	55.7	40.7	58.7	39.5	58.4	38.3	56.0	36.0	52.5
12	36.2	55.2	35.2	53.9	36.5	55.1	38.5	57.3	37.0	56.7	36.1	54.8	34.1	51.6
13	34.7	54.9	33.3	52.9	35.4	55.5	36.5	56.3	34.5	54.8	33.8	53.2	32.1	50.3
14	32.7	53.8	31.0	51.2	32.8	53.6	34.3	54.9	32.5	53.7	31.5	51.7	30.2	49.3
15	31.0	53.1	29.5	50.7	30.7	52.0	33.5	55.6	30.2	52.0	29.6	50.5	28.9	49.1
Median	6.6		5.7		5.7		6.8		6.7		6.4		5.8	

cont'd	2006 n=2,338		2007 n=2,637		2008 n=2,540		2010 n=2,293		2011 n=2,260		2012 n=2,227		2013 n=2,213	
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	82.4	85.2	80.5	83.4	81.7	84.8	82.5	85.6	82.2	85.3	82.1	85.0	83.5	86.4
2	72.9	77.7	73.1	78.1	72.5	77.7	73.2	78.5	72.6	77.8	73.8	78.8	74.1	79.1
3	66.6	73.3	65.2	72.1	65.8	73.0	66.2	73.5	66.1	73.2	66.6	73.3	67.0	73.7
4	61.1	69.4	59.4	67.9	61.2	70.0	61.7	70.8	61.3	70.2	60.8	69.1	60.5	68.6
5	57.1	66.9	54.4	64.3	56.8	67.2	57.2	67.9	57.0	67.4	56.1	65.8	56.1	65.6
6	52.2	63.2	50.3	61.6	53.7	65.8	53.8	66.1	53.8	65.8	53.4	64.6	53.3	64.4
7	49.0	61.4	47.0	59.5	50.4	63.8	50.8	64.6	50.3	63.7	50.3	62.9	50.1	62.6
8	46.1	59.7	44.2	57.8	47.7	62.5	47.7	62.9	47.8	62.7	47.6	61.6	48.0	62.0
9	43.7	58.7	41.7	56.5	45.4	61.5	45.1	61.7	45.7	62.0	44.3	59.4		
10	41.7	58.1	39.2	55.0	43.0	60.5	42.6	60.6	42.4	59.5				
11	38.7	56.0	36.5	53.1	40.8	59.6	40.0	59.3						
12	35.9	53.8	34.4	51.9	38.9	59.0								
13	33.8	52.7	32.0	50.2	36.1	57.0								
14	31.5	51.1	29.7	48.4										
15	29.5	49.8												
Median	6.7		6.1		7.1		7.3		7.1		7.1		7.1	

| cont'd	2014 n=2,173		2016 n=2,130		2017 n=2,097		2018 n=1,730		2019 n=1,560		2020 n=1,144	
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	81.2	84.0	81.1	84.0	83.9	86.8	88.2	90.9	85.1	87.9	84.4	87.2
2	71.8	76.8	71.9	76.8	77.1	82.1	79.0	84.0	75.7	80.7		
3	64.9	71.6	66.8	73.6	71.1	78.2	72.6	79.5				
4	59.8	68.0	62.2	70.8	65.0	73.7						
5	56.0	65.8	57.8	68.1								
6	52.3	63.3										
7	50.1	62.5										
Median	7.0											

Table 1d. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by year of diagnosis for period 1998-2020 (N=46,999).
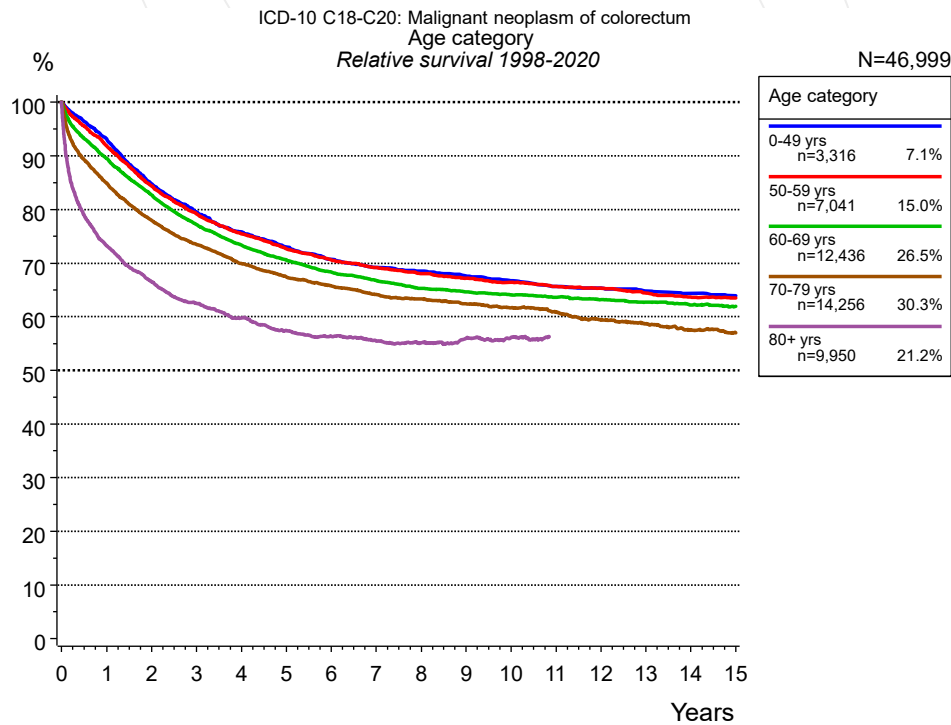
ICD-10 C18-C20: Malignant neoplasm of colorectum
Sex
Survival 1998-2020
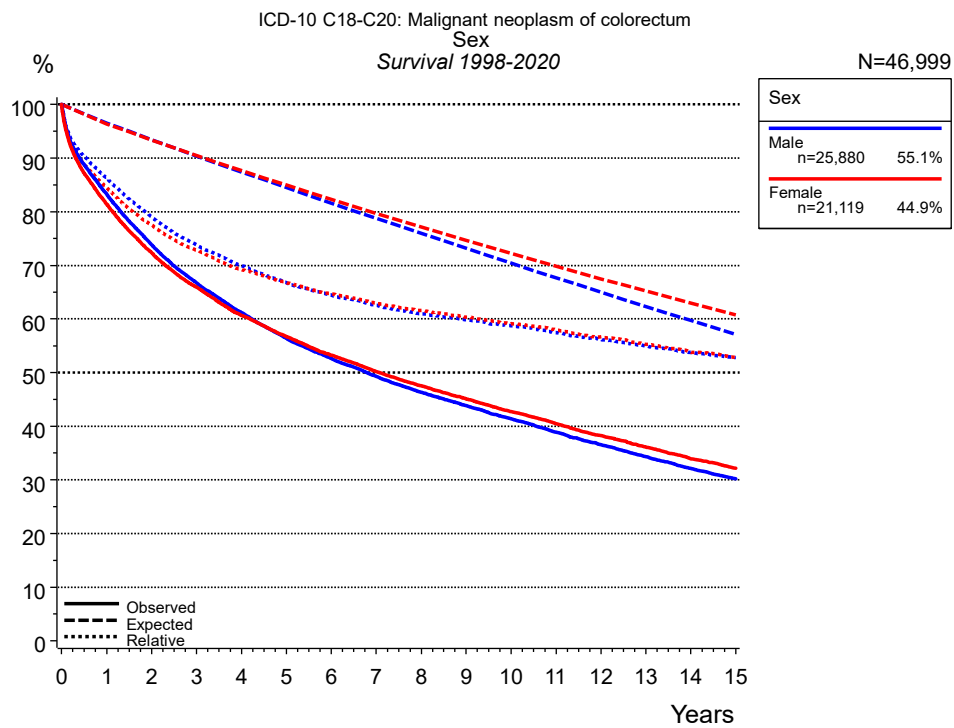
Figure 2a. Survival of patients with colorectal cancer by sex. Included in the evaluation are 46,999 cases diagnosed between 1998 and 2020.

	Sex			
	Male n=25,880		Female n=21,119	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	83.3	86.3	81.4	84.5
2	73.8	79.0	72.4	77.5
3	66.7	73.8	65.9	72.8
4	61.2	70.0	60.7	69.2
5	56.4	66.8	56.7	66.8
6	52.6	64.5	53.2	64.7
7	49.3	62.6	50.2	62.9
8	46.3	61.0	47.5	61.6
9	43.8	59.9	45.1	60.4
10	41.4	58.7	42.7	59.1
11	38.9	57.4	40.5	57.9
12	36.5	56.2	38.3	56.7
13	34.3	55.0	36.1	55.3
14	32.1	53.7	33.9	53.8
15	30.2	52.8	32.1	52.8
Median	6.8		7.1	

Table 2b. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by sex for period 1998-2020 (N=46,999).

ICD-10 C18-C20: Malignant neoplasm of colorectum
Age category
Observed survival 1998-2020
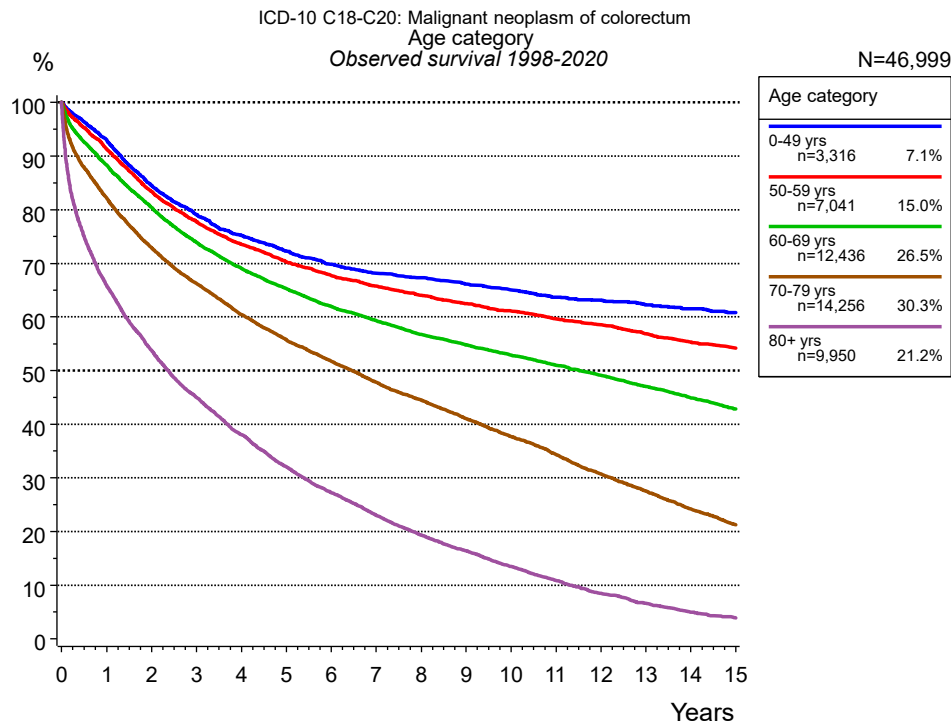
Figure 3a. Observed survival of patients with colorectal cancer by age category. Included in the evaluation are 46,999 cases diagnosed between 1998 and 2020.

ICD-10 C18-C20: Malignant neoplasm of colorectum
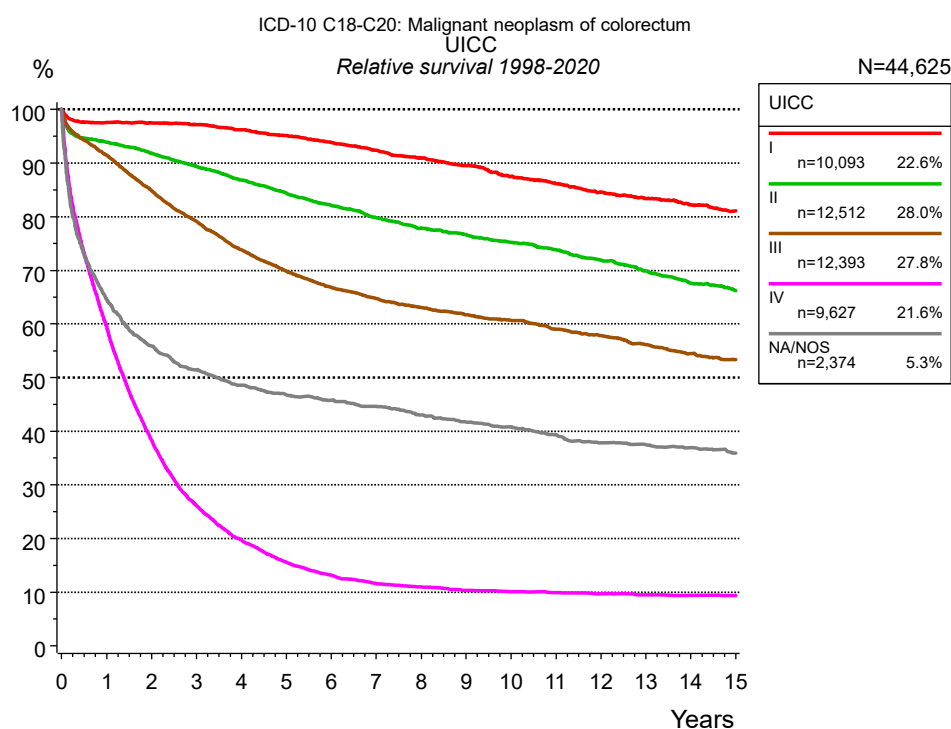Age category
Relative survival 1998-2020

Figure 3b. Relative survival of patients with colorectal cancer by age category. Included in the evaluation are 46,999 cases diagnosed between 1998 and 2020.

	Age category									
	0-49 yrs n=3,316		50-59 yrs n=7,041		60-69 yrs n=12,436		70-79 yrs n=14,256		80+ yrs n=9,950	
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	93.0	93.1	91.3	91.9	88.3	89.5	82.2	84.9	65.9	73.2
2	84.5	84.7	83.4	84.4	80.4	82.7	72.9	77.9	53.8	66.6
3	79.1	79.5	77.7	79.2	73.9	77.2	66.2	73.5	45.0	62.5
4	75.2	75.8	73.5	75.4	69.1	73.3	60.4	69.9	38.1	59.8
5	72.3	73.0	70.2	72.7	65.3	70.6	55.7	67.4	32.1	57.5
6	69.8	70.7	67.7	70.6	62.0	68.3	51.7	65.7	27.3	56.4
7	68.2	69.2	65.7	69.2	59.3	66.7	47.8	64.1	23.0	55.5
8	67.3	68.5	64.0	68.1	56.7	65.3	44.5	63.3	19.4	55.1
9	66.1	67.6	62.5	67.2	54.8	64.6	41.1	62.4	16.4	56.0
10	65.0	66.7	61.0	66.4	52.9	64.1	37.7	61.6	13.5	56.2
11	63.7	65.6	59.7	65.7	51.0	63.6	34.3	60.8	10.9	56.3
12	63.2	65.3	58.5	65.3	49.1	63.2	30.7	59.4	8.4	55.4
13	62.3	64.8	56.9	64.4	47.0	62.7	27.5	58.7	6.6	56.1
14	61.5	64.4	55.3	63.7	44.9	62.2	24.2	57.5	4.9	55.7
15	60.8	63.9	54.2	63.5	42.9	61.9	21.2	57.0	3.9	59.4
Median			18.7		11.5		6.5		2.4	

Table 3c. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by age category for period 1998-2020 (N=46,999).

ICD-10 C18-C20: Malignant neoplasm of colorectum
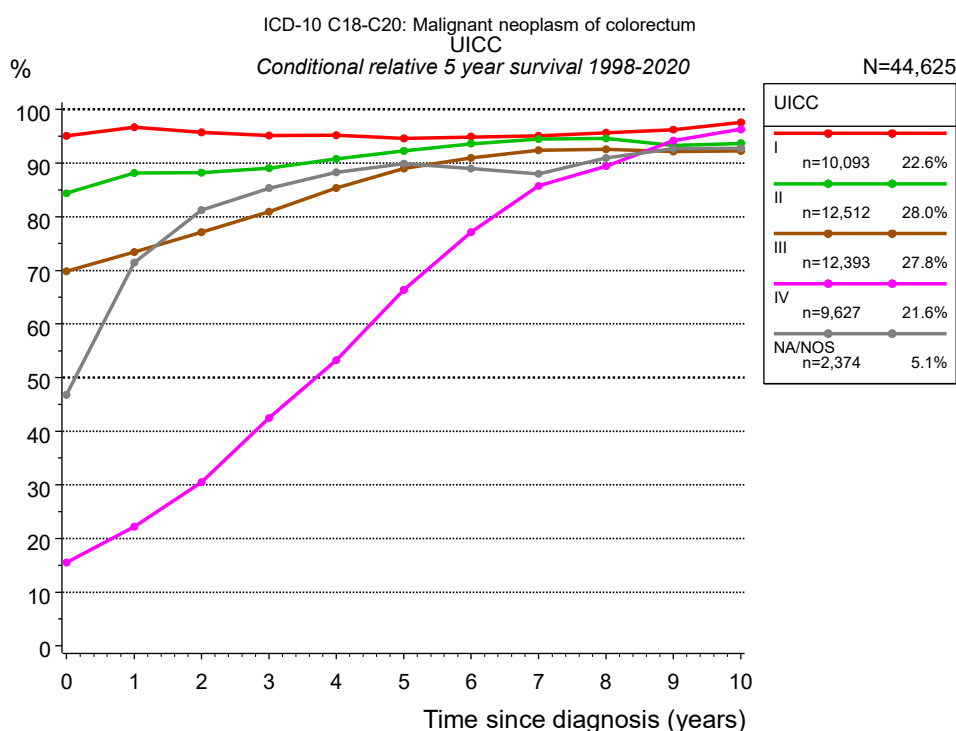UICC
Relative survival 1998-2020

Figure 4a. Relative survival of patients with colorectal cancer by UICC. For 44,865 of 46,999 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 44,625 cases an evaluable classification was established. The grey line represents the subgroup of 2,374 patients with missing values regarding UICC (5.1 % of 46,999 patients, the percent values of all other categories are related to n=44,625).

	UICC									
	I n=10,093		II n=12,512		III n=12,393		IV n=9,627		NA/NOS n=2,374	
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	97.6	90.1	93.9	88.5	91.5	57.6	59.5	60.9	64.7
2	91.6	97.5	84.9	91.8	79.6	84.9	36.2	38.3	50.4	55.9
3	88.4	97.2	79.6	89.3	72.1	79.1	24.1	26.1	44.7	51.5
4	84.6	96.2	74.5	86.9	65.3	73.8	17.8	19.7	40.9	48.6
5	80.9	95.1	69.7	84.4	60.0	69.9	13.7	15.5	38.2	46.8
6	77.2	93.8	65.3	82.1	55.7	66.8	11.4	13.2	36.3	45.7
7	73.4	92.4	61.1	79.8	52.3	64.7	9.8	11.6	34.5	44.6
8	69.8	91.0	57.4	77.9	49.4	63.1	9.1	11.0	32.3	43.0
9	66.2	89.5	54.3	76.7	46.9	61.8	8.3	10.4	30.5	41.7
10	62.4	87.5	51.1	75.2	44.6	60.7	7.9	10.1	29.0	40.8
11	59.2	86.1	48.2	73.8	41.9	59.0	7.6	9.9	27.2	39.3
12	55.9	84.6	45.1	72.0	39.7	57.8	7.1	9.7	25.4	37.8
13	53.0	83.4	42.1	69.9	37.3	56.2	6.8	9.5	24.5	37.5
14	50.1	82.2	38.9	67.5	34.9	54.5	6.5	9.4	23.5	36.9
15	47.4	81.1	36.5	66.2	33.0	53.4	6.3	9.4	22.2	35.9
Median	14.0		10.4		7.8		1.3		2.1	

Table 4b. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by UICC for period 1998-2020 (N=44,625).

ICD-10 C18-C20: Malignant neoplasm of colorectum
UICC
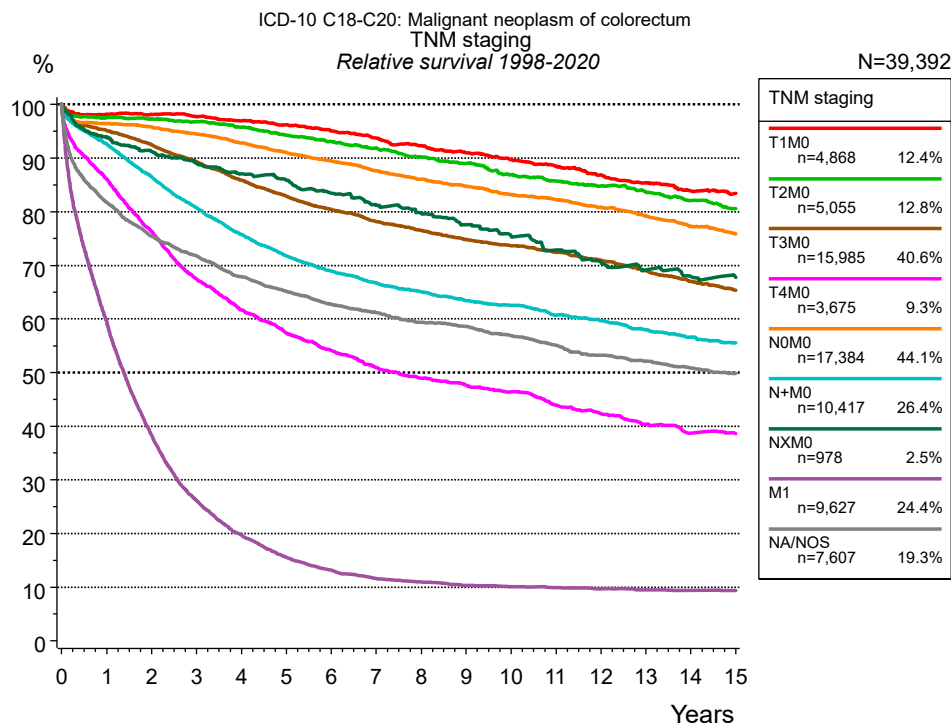*Conditional relative 5 year survival 1998-2020*   N=44,625

Figure 4c. Conditional relative 5-year survival of patients with colorectal cancer by UICC. For 44,865 of 46,999 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 44,625 cases an evaluable classification was established. The grey line represents the subgroup of 2,374 patients with missing values regarding UICC (5.1 % of 46,999 patients, the percent values of all other categories are related to n=44,625).

	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	10,093	95.1	12,512	84.4	12,393	69.9	9,627	15.5	2,374	46.8
1	9,233	96.7	10,993	88.1	10,698	73.4	5,426	22.2	1,396	71.4
2	8,665	95.8	9,992	88.2	9,268	77.1	3,262	30.5	1,139	81.2
3	8,007	95.2	8,960	89.0	8,027	80.9	2,042	42.5	976	85.3
4	7,278	95.2	7,983	90.8	6,840	85.3	1,392	53.2	863	88.3
5	6,564	94.6	7,034	92.3	5,866	89.0	975	66.3	772	89.9
6	5,932	94.9	6,188	93.6	5,090	90.9	740	77.1	706	89.0
7	5,302	95.1	5,433	94.5	4,482	92.4	575	85.7	649	88.0
8	4,737	95.7	4,733	94.6	3,909	92.6	486	89.4	583	90.9
9	4,160	96.2	4,150	93.3	3,404	92.1	400	94.1	525	92.7
10	3,615	97.6	3,617	93.7	2,936	92.2	341	96.3	474	92.7

Table 4d. Conditional relative 5-year survival of patients with colorectal cancer by UICC for period 1998-2020 (N=44,625).

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 4a). 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 95.2% (n=8,007).

ICD-10 C18-C20: Malignant neoplasm of colorectum
TNM staging
Relative survival 1998-2020   N=39,392

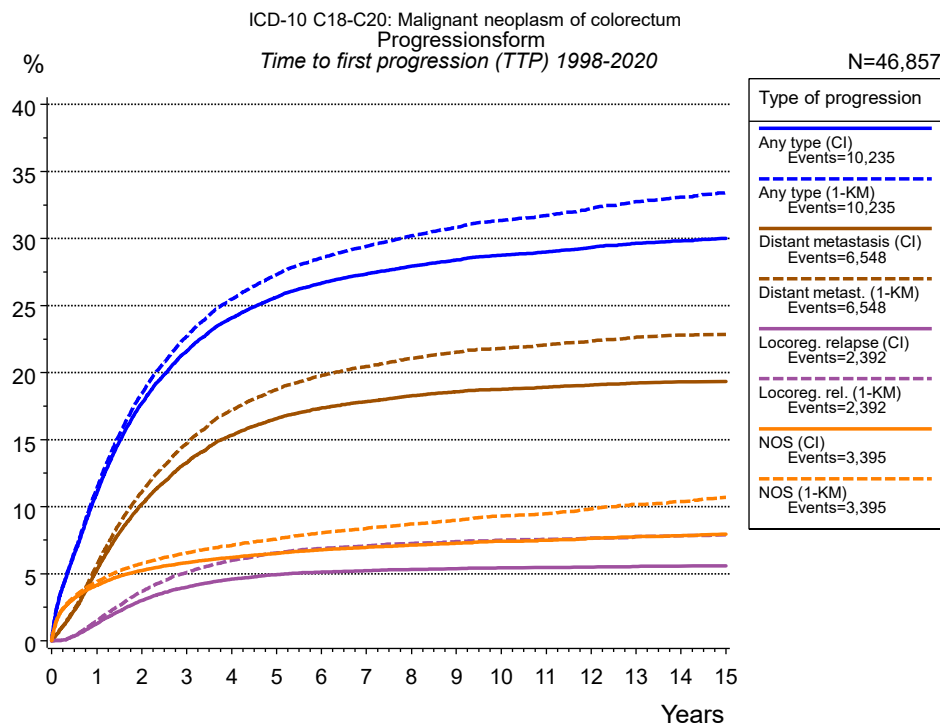| TNM staging		
T1M0	n=4,868	12.4%
T2M0	n=5,055	12.8%
T3M0	n=15,985	40.6%
T4M0	n=3,675	9.3%
N0M0	n=17,384	44.1%
N+M0	n=10,417	26.4%
NXM0	n=978	2.5%
M1	n=9,627	24.4%
NA/NOS	n=7,607	19.3%

Figure 4g. Relative survival of patients with colorectal cancer by TNM staging. For 44,865 of 46,999 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 39,392 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 7,607 patients with missing values regarding TNM staging (16.2 % of 46,999 patients, the percent values of all other categories are related to n=39,392).

	TNM staging													
	T1M0 n=4,868		T2M0 n=5,055		T3M0 n=15,985		T4M0 n=3,675		N0M0 n=17,384		N+M0 n=10,417		NXM0 n=978	
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	95.6	98.2	94.4	97.5	91.8	95.2	82.8	86.2	93.1	96.4	89.7	92.6	91.3	93.9
2	93.0	98.1	91.1	97.3	86.3	92.5	70.9	76.3	89.3	95.8	81.3	86.5	86.3	91.2
3	90.1	97.8	87.7	96.8	80.6	89.3	60.6	67.4	85.1	94.5	73.8	80.7	82.1	89.0
4	86.8	96.9	83.8	95.7	74.9	85.9	53.7	61.7	80.7	92.8	67.2	75.7	78.3	87.1
5	83.7	96.2	79.7	94.2	69.9	82.9	48.4	57.4	76.4	91.1	61.9	71.8	75.1	85.8
6	80.3	95.1	76.0	93.1	65.5	80.4	44.3	54.2	72.5	89.5	57.7	68.9	71.2	83.4
7	76.7	93.7	72.5	91.9	61.5	78.2	40.4	51.0	68.4	87.6	54.3	66.7	67.3	81.2
8	73.2	92.3	68.6	90.2	58.1	76.5	37.5	48.9	64.8	86.0	51.3	65.1	64.4	79.8
9	69.8	91.0	65.3	89.0	54.8	74.8	35.3	47.7	61.4	84.8	48.5	63.5	61.0	77.6
10	66.5	89.7	61.4	86.9	51.9	73.6	33.2	46.4	58.0	83.2	46.3	62.6	57.4	75.4
11	63.3	88.5	58.3	85.7	49.2	72.4	30.4	43.9	55.2	82.2	43.5	60.7	53.9	72.9
12	60.0	86.9	55.6	84.8	46.4	70.9	28.4	42.4	52.1	80.9	41.4	59.7	50.5	70.7
13	56.7	85.4	52.8	83.6	43.4	69.0	26.2	40.4	49.1	79.2	38.9	58.0	47.4	69.2
14	53.6	83.9	49.7	82.0	40.4	67.0	24.3	38.7	45.9	77.2	36.6	56.6	44.9	67.9
15	51.2	83.4	46.9	80.6	37.8	65.3	23.4	38.6	43.2	75.8	34.7	55.5	43.1	67.8
Median	15.5		13.9		10.7		4.8		12.7		8.4		12.0	

| | **TNM staging** | | | |
| cont'd | M1 n=9,627 | | NA/NOS n=7,607 | |
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	57.6	59.5	77.9	81.7
2	36.2	38.3	69.1	75.4
3	24.1	26.1	63.3	71.7
4	17.8	19.7	57.7	67.9
5	13.7	15.5	53.5	65.2
6	11.4	13.2	49.6	62.7
7	9.8	11.6	46.7	61.2
8	9.1	11.0	43.7	59.4
9	8.3	10.4	41.5	58.6
10	7.9	10.1	38.9	56.9
11	7.6	9.9	36.3	55.1
12	7.1	9.7	33.7	53.2
13	6.8	9.5	31.8	52.1
14	6.5	9.4	29.8	50.9
15	6.3	9.4	28.1	49.8
Median	1.3		5.9	

Table 4h. Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by TNM staging for period 1998-2020 (N=39,392).

ICD-10 C18-C20: Malignant neoplasm of colorectum
Progressionsform
Time to first progression (TTP) 1998-2020   N=46,857
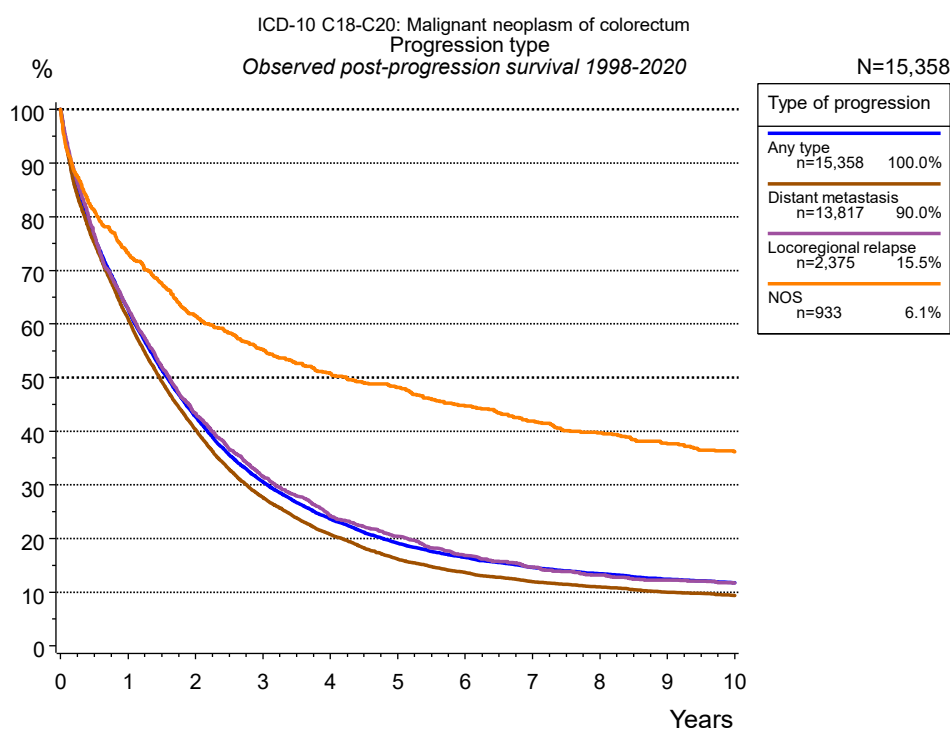

Figure 5a. Time to first progression of 46,857 patients with colorectal cancer diagnosed between 1998 and 2020 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

	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	37,395	37,395	37,398	37,398	46,857	46,857	46,854
Events	10,159	10,159	6,527	6,527	2,376	2,376	3,349
compet.	9,315		12,370		24,226		23,136
Years	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	11.0	11.3	5.3	5.6	1.3	1.5	4.2
2	17.7	18.4	10.2	11.1	3.0	3.7	5.2
3	21.6	22.7	13.3	14.7	4.0	5.1	5.8
4	24.1	25.5	15.3	17.2	4.6	6.0	6.2
5	25.6	27.3	16.6	18.7	4.9	6.6	6.5
6	26.7	28.6	17.4	19.8	5.1	6.9	6.8
7	27.4	29.4	17.9	20.5	5.2	7.1	7.0
8	27.9	30.2	18.3	21.1	5.3	7.2	7.1
9	28.4	30.8	18.6	21.5	5.4	7.4	7.3
10	28.8	31.3	18.8	21.8	5.4	7.5	7.4
11	29.0	31.7	18.9	22.1	5.5	7.6	7.5
12	29.3	32.2	19.1	22.4	5.5	7.7	7.6
13	29.6	32.8	19.2	22.6	5.5	7.8	7.8
14	29.8	33.1	19.3	22.8	5.6	7.9	7.9
15	30.0	33.4	19.3	22.8	5.6	7.9	8.0

	Type of progression
cont'd	NOS (1-KM)
N	46,854
Events	3,349
compet.	
Years	%
0	0.0
1	4.4
2	5.7
3	6.5
4	7.1
5	7.6
6	8.1
7	8.4
8	8.7
9	9.0
10	9.3
11	9.5
12	9.8
13	10.2
14	10.4
15	10.7

Table 5b. Time to first progression of patients with colorectal cancer for period 1998-2020 (N=46,857), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

ICD-10 C18-C20: Malignant neoplasm of colorectum
Progression type
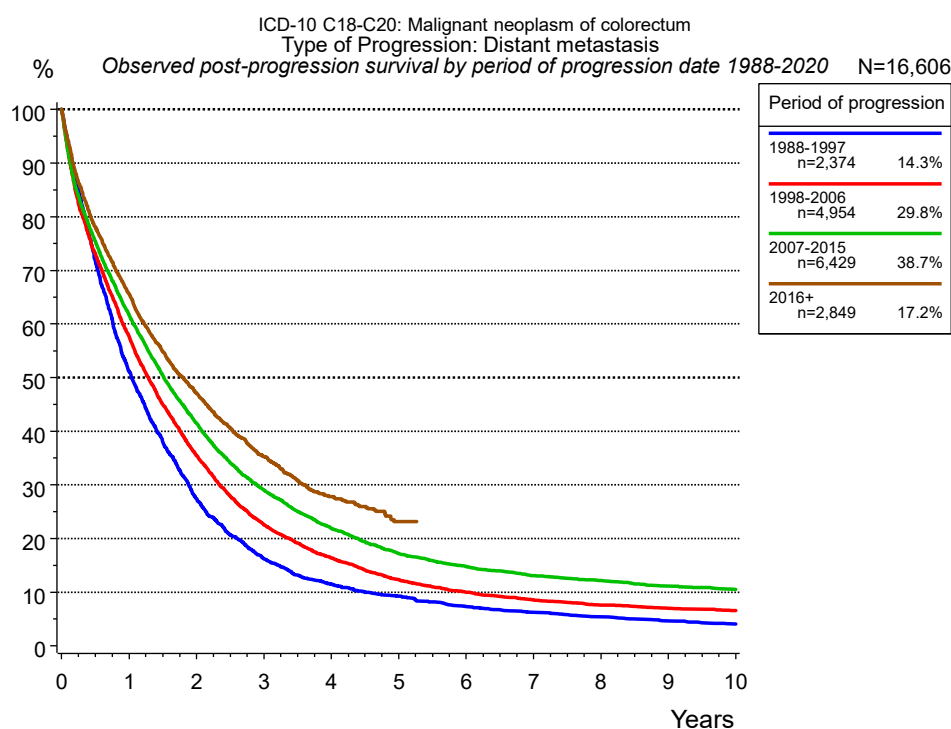*Observed post-progression survival 1998-2020*

N=15,358

Figure 5c. Observed post-progression survival of 15,358 patients with colorectal cancer diagnosed between 1998 and 2020. These 15,358 patients with documented progression events during their course of disease represent 32.8 % of the totally 46,857 evaluated cases (incl. M1, n=9,462, 20.2 %). Patients with cancer relapse documented via death certificates only were excluded (n=4,339, 9.3 %). Multiple progression types on different sites are included in the evaluation even when not occuring synchronously. The NOS (not otherwise specified) class is included under the condition, that it is the one and only progression type during the course of disease.

Medical record documentation often lacks the linguistic severity to distinguish between local relapse, regional lymph node metastasis and distant spread in solid cancers. Frequently, the statement "not specified" is the only information in registries regarding relapse of the disease. The category "Any type" denotes all cases who suffered from at least one relapse during the course of disease (incl. primary M1-status). Although, the real number of relapsed patients is likely to be much higher. The accumulated percentage of patients with local relapse or distant metastasis exceeds the 100 % value because patients are potientially considered in more than one subgroup.

	Type of progression			
	Any type	Distant metastasis	Locoregional relapse	NOS
Years	n=15,358 %	n=13,817 %	n=2,375 %	n=933 %
0	100.0	100.0	100.0	100.0
1	62.7	61.0	62.8	73.3
2	42.7	40.3	43.3	61.4
3	30.6	27.7	31.7	55.3
4	23.6	20.8	24.2	50.7
5	19.2	16.1	20.4	48.2
6	16.5	13.7	16.8	44.7
7	14.6	11.9	14.7	41.9
8	13.4	11.0	13.2	39.7
9	12.4	10.0	12.3	37.7
10	11.8	9.4	11.7	36.2

Table 5d. Observed post-progression survival of patients with colorectal cancer for period 1998-2020 (N=15,358).

ICD-10 C18-C20: Malignant neoplasm of colorectum
Type of Progression: Distant metastasis
Observed post-progression survival by period of progression date 1988-2020   N=16,606

Period of progression				
1988-1997 n=2,374	14.3%			
1998-2006 n=4,954	29.8%			
2007-2015 n=6,429	38.7%			
2016+ n=2,849	17.2%			

Figure 5e. Observed post-progression (distant metastasis) survival of 16,606 patients with colorectal cancer diagnosed between 1988 and 2020 by period of progression.

	Period of progression			
	1988-1997 n=2,374 %	1998-2006 n=4,954 %	2007-2015 n=6,429 %	2016+ n=2,849 %
Years				
0	100.0	100.0	100.0	100.0
1	51.1	57.6	61.6	65.6
2	27.3	35.5	41.5	47.0
3	16.2	22.6	29.1	35.3
4	11.4	16.4	21.9	27.8
5	9.2	12.3	17.2	23.1
6	7.3	10.0	14.8	
7	6.2	8.5	13.1	
8	5.4	7.6	12.2	
9	4.6	7.0	11.1	
10	4.1	6.6	10.5	

Table 5f. Observed post-progression (distant metastasis) survival of patients with colorectal cancer for period 1988-2020 by period of progression (N=16,606).

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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