

# Munich Cancer Registry



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

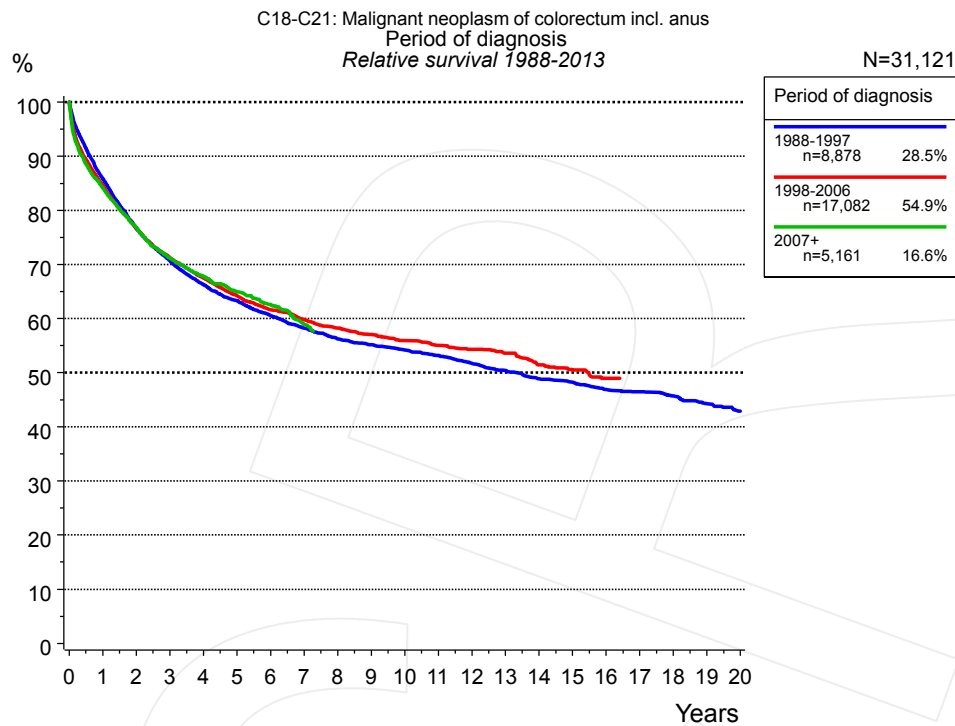
## Cancer statistics: Survival

### C18-C21: Colorectal cancer

|                   |            |
|-------------------|------------|
| Year of diagnosis | 1988-2013  |
| Patients          | 53,864     |
| Diseases          | 55,312     |
| Cases evaluated   | 31,121     |
| Creation date     | 05/13/2015 |
| Export date       | 12/30/2014 |
| Population        | 4.64 m     |



[http://www.tumorregister-muenchen.de/en/facts/surv/surv\\_C1821E.pdf](http://www.tumorregister-muenchen.de/en/facts/surv/surv_C1821E.pdf)

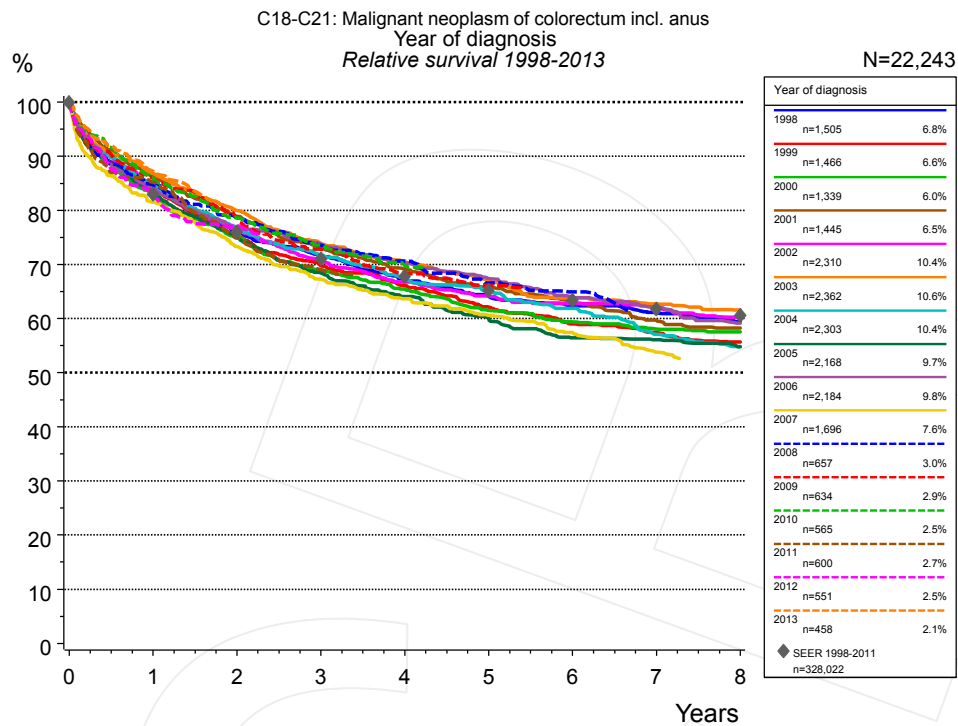


**Figure 1a.** Relative survival of patients with colorectal cancer by period of diagnosis. Included in the evaluation are 31,121 cases diagnosed between 1988 and 2013.

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 1988, 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<br>n=8,878 |        | 1998-2006<br>n=17,082 |        | 2007+<br>n=5,161 |        |
|       | obs. %               | rel. % | obs. %                | rel. % | obs. %           | rel. % |
| 0     | 100.0                | 100.0  | 100.0                 | 100.0  | 100.0            | 100.0  |
| 1     | 82.8                 | 85.9   | 81.5                  | 84.7   | 81.1             | 84.2   |
| 2     | 71.4                 | 76.7   | 71.4                  | 76.7   | 71.7             | 76.9   |
| 3     | 63.6                 | 70.7   | 64.2                  | 71.3   | 64.3             | 71.2   |
| 4     | 57.6                 | 66.3   | 58.8                  | 67.5   | 59.2             | 67.9   |
| 5     | 53.2                 | 63.4   | 54.1                  | 64.3   | 54.7             | 65.0   |
| 6     | 49.1                 | 60.6   | 50.2                  | 61.6   | 51.0             | 62.7   |
| 7     | 45.6                 | 58.3   | 47.1                  | 59.8   | 46.3             | 58.9   |
| 8     | 42.5                 | 56.3   | 44.3                  | 58.3   |                  |        |
| 9     | 40.2                 | 55.2   | 41.9                  | 57.0   |                  |        |
| 10    | 38.1                 | 54.2   | 39.6                  | 55.9   |                  |        |
| 11    | 36.1                 | 53.2   | 37.6                  | 55.0   |                  |        |
| 12    | 33.9                 | 51.7   | 35.7                  | 54.3   |                  |        |
| 13    | 31.9                 | 50.4   | 33.8                  | 53.6   |                  |        |
| 14    | 29.8                 | 48.9   | 31.2                  | 51.4   |                  |        |
| 15    | 28.4                 | 48.3   | 29.4                  | 50.5   |                  |        |
| 16    | 26.6                 | 46.9   | 27.5                  | 48.9   |                  |        |
| 17    | 25.5                 | 46.5   |                       |        |                  |        |
| 18    | 24.0                 | 45.7   |                       |        |                  |        |
| 19    | 22.4                 | 44.3   |                       |        |                  |        |
| 20    | 20.9                 | 42.9   |                       |        |                  |        |

**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by period of diagnosis for period 1988-2013 (N=31,121).



**Figure 1c.** Relative survival of patients with colorectal cancer by year of diagnosis. Included in the evaluation are 22,243 cases diagnosed between 1998 and 2013.

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.

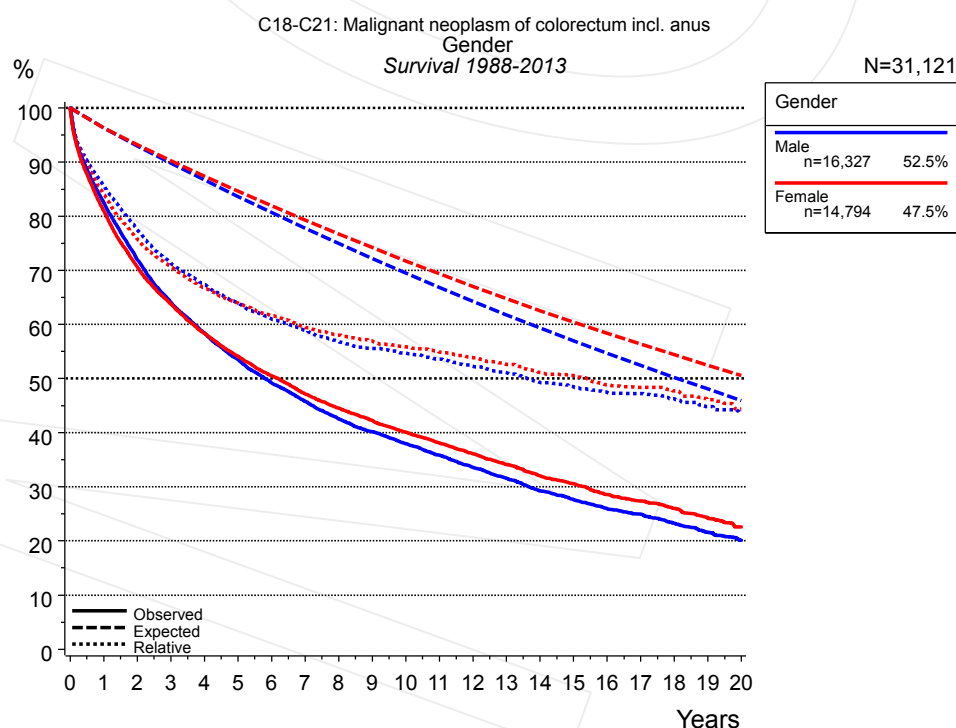
|       |  | Year of diagnosis |        |                 |        |                 |        |                 |        |                 |        |                 |        |                 |        |
|-------|--|-------------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|
|       |  | 1998<br>n=1,505   |        | 1999<br>n=1,466 |        | 2000<br>n=1,339 |        | 2001<br>n=1,445 |        | 2002<br>n=2,310 |        | 2003<br>n=2,362 |        | 2004<br>n=2,303 |        |
| 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     |  | 81.5              | 84.8   | 80.6            | 83.9   | 79.7            | 83.0   | 83.1            | 86.3   | 81.4            | 84.6   | 83.7            | 86.8   | 81.4            | 84.5   |
| 2     |  | 70.4              | 76.0   | 69.8            | 75.2   | 69.8            | 75.1   | 73.4            | 78.9   | 70.7            | 76.2   | 74.6            | 79.9   | 71.3            | 76.5   |
| 3     |  | 64.1              | 71.5   | 62.4            | 69.8   | 61.9            | 69.0   | 65.7            | 72.9   | 63.3            | 70.6   | 66.8            | 73.9   | 64.6            | 71.7   |
| 4     |  | 58.2              | 67.2   | 57.0            | 66.1   | 56.9            | 65.5   | 60.4            | 69.2   | 57.9            | 66.8   | 61.6            | 70.4   | 58.7            | 67.4   |
| 5     |  | 53.8              | 64.4   | 51.7            | 62.1   | 51.7            | 61.5   | 55.7            | 65.8   | 53.7            | 64.1   | 56.9            | 67.2   | 54.9            | 65.3   |
| 6     |  | 50.4              | 62.4   | 47.5            | 59.0   | 48.4            | 59.4   | 51.7            | 63.0   | 51.0            | 62.8   | 52.2            | 63.8   | 50.4            | 61.9   |
| 7     |  | 47.6              | 61.0   | 44.7            | 57.4   | 45.7            | 58.0   | 47.5            | 59.7   | 48.5            | 61.9   | 49.5            | 62.7   | 44.6            | 57.1   |
| 8     |  | 44.8              | 59.4   | 42.0            | 55.6   | 44.1            | 57.6   | 45.1            | 58.2   | 45.5            | 60.2   | 46.9            | 61.6   | 41.2            | 54.8   |

|       |  | Year of diagnosis |        |                 |        |                 |        |               |        |               |        |               |        |               |        |
|-------|--|-------------------|--------|-----------------|--------|-----------------|--------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|
|       |  | 2005<br>n=2,168   |        | 2006<br>n=2,184 |        | 2007<br>n=1,696 |        | 2008<br>n=657 |        | 2009<br>n=634 |        | 2010<br>n=565 |        | 2011<br>n=600 |        |
| 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     |  | 80.3              | 83.3   | 81.3            | 84.1   | 78.4            | 81.5   | 81.4          | 84.8   | 83.0          | 85.9   | 83.0          | 86.0   | 82.2          | 85.2   |
| 2     |  | 70.0              | 75.0   | 71.8            | 76.5   | 68.3            | 73.3   | 73.1          | 78.7   | 73.8          | 78.9   | 73.3          | 78.6   | 70.0          | 74.9   |
| 3     |  | 61.9              | 68.4   | 67.1            | 73.7   | 60.6            | 67.3   | 66.1          | 73.5   | 65.8          | 72.8   | 66.2          | 73.5   | 62.5          | 69.1   |
| 4     |  | 56.1              | 64.1   | 61.9            | 70.2   | 55.4            | 63.7   | 61.5          | 70.7   | 59.9          | 68.5   | 60.8          | 69.8   |               |        |
| 5     |  | 51.0              | 60.0   | 57.7            | 67.4   | 51.0            | 60.6   | 55.9          | 66.6   | 56.0          | 66.2   |               |        |               |        |
| 6     |  | 46.1              | 56.4   | 53.1            | 64.1   | 46.7            | 57.4   | 52.6          | 64.9   |               |        |               |        |               |        |
| 7     |  | 44.4              | 56.1   | 49.7            | 62.1   | 42.3            | 53.8   |               |        |               |        |               |        |               |        |
| 8     |  | 41.9              | 54.8   | 45.7            | 59.2   |                 |        |               |        |               |        |               |        |               |        |

| cont'd | Year of diagnosis |        |               |        |
|--------|-------------------|--------|---------------|--------|
|        | 2012<br>n=551     |        | 2013<br>n=458 |        |
|        | obs. %            | rel. % | obs. %        | rel. % |
| Years  |                   |        |               |        |
| 0      | 100.0             | 100.0  | 100.0         | 100.0  |
| 1      | 79.7              | 82.4   | 84.2          | 87.2   |
| 2      | 72.6              | 77.1   |               |        |

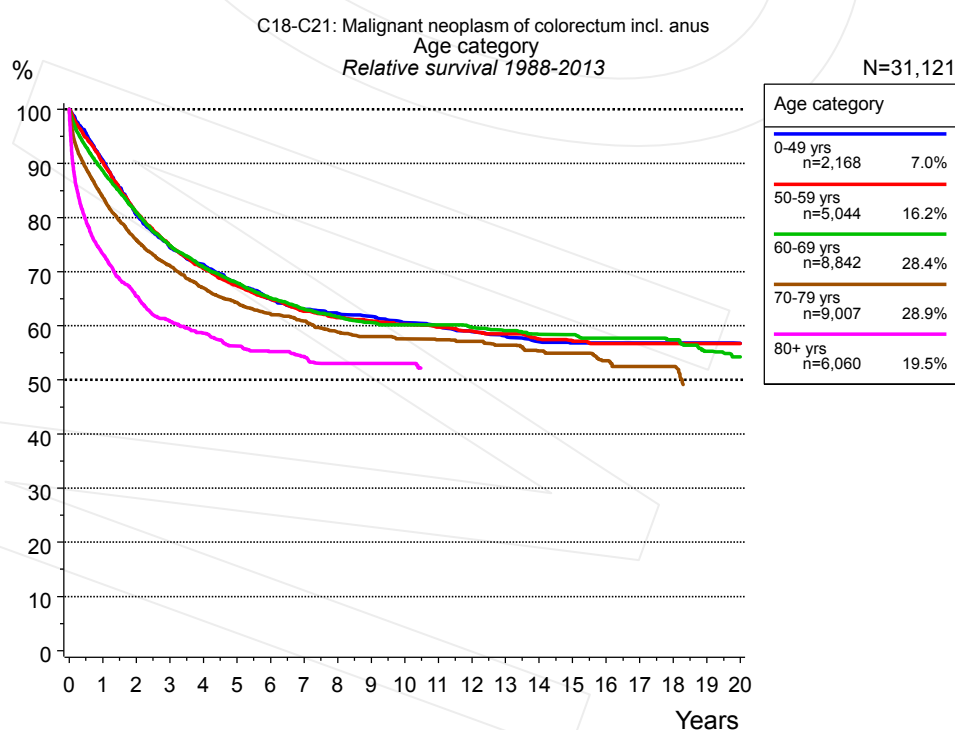
**Table 1d.** Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by year of diagnosis for period 1998-2013 (N=22,243).



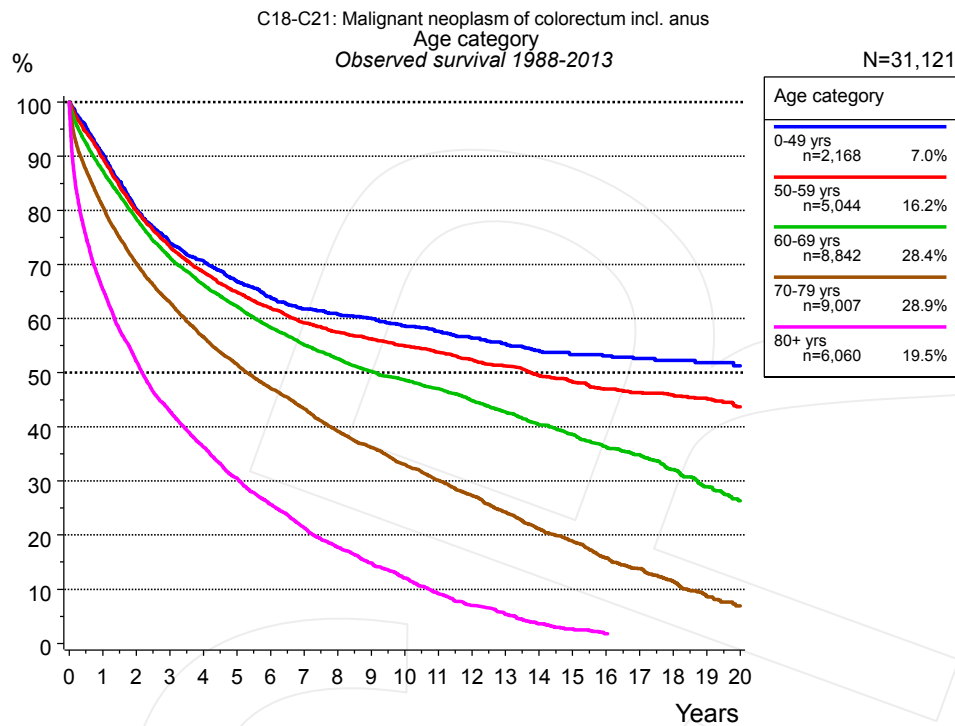
**Figure 2a.** Survival of patients with colorectal cancer by gender. Included in the evaluation are 31,121 cases diagnosed between 1988 and 2013.

| Years | Gender   |        |          |        |
|-------|----------|--------|----------|--------|
|       | Male     |        | Female   |        |
|       | n=16,327 |        | n=14,794 |        |
|       | obs. %   | rel. % | obs. %   | rel. % |
| 0     | 100.0    | 100.0  | 100.0    | 100.0  |
| 1     | 82.5     | 85.7   | 81.0     | 84.1   |
| 2     | 72.0     | 77.4   | 70.7     | 75.8   |
| 3     | 64.1     | 71.4   | 63.8     | 70.6   |
| 4     | 58.4     | 67.4   | 58.3     | 66.7   |
| 5     | 53.6     | 64.0   | 54.1     | 64.0   |
| 6     | 49.2     | 61.0   | 50.5     | 61.7   |
| 7     | 45.8     | 58.9   | 47.2     | 59.5   |
| 8     | 42.6     | 56.8   | 44.5     | 58.0   |
| 9     | 40.1     | 55.6   | 42.3     | 56.9   |
| 10    | 38.0     | 54.6   | 40.1     | 55.9   |
| 11    | 35.8     | 53.6   | 38.1     | 54.9   |
| 12    | 33.6     | 52.3   | 36.1     | 53.9   |
| 13    | 31.6     | 51.1   | 34.1     | 52.6   |
| 14    | 29.3     | 49.3   | 32.0     | 51.1   |
| 15    | 27.6     | 48.4   | 30.6     | 50.5   |
| 16    | 26.0     | 47.5   | 28.6     | 48.9   |
| 17    | 25.0     | 47.2   | 27.4     | 48.4   |
| 18    | 23.2     | 46.2   | 26.0     | 47.8   |
| 19    | 21.6     | 44.8   | 24.2     | 46.1   |
| 20    | 20.2     | 43.8   | 22.6     | 44.4   |

**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by gender for period 1988-2013 (N=31,121).



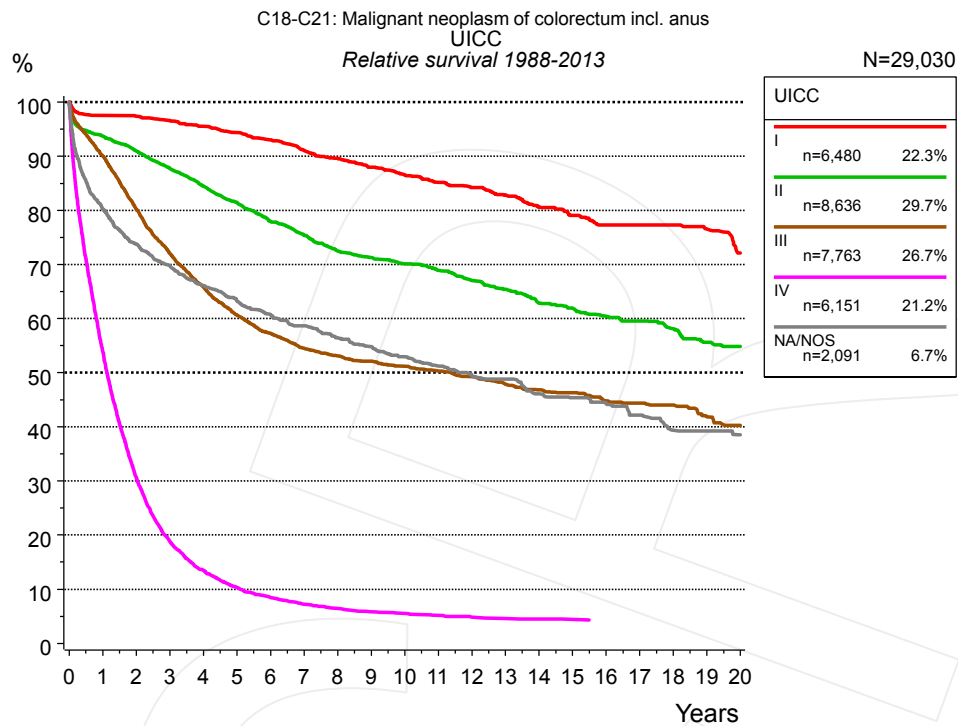
**Figure 3a.** Relative survival of patients with colorectal cancer by age category. Included in the evaluation are 31,121 cases diagnosed between 1988 and 2013.



**Figure 3b.** Observed survival of patients with colorectal cancer by age category. Included in the evaluation are 31,121 cases diagnosed between 1988 and 2013.

| Years | Age category        |        |                      |        |                      |        |                      |        |                    |        |
|-------|---------------------|--------|----------------------|--------|----------------------|--------|----------------------|--------|--------------------|--------|
|       | 0-49 yrs<br>n=2,168 |        | 50-59 yrs<br>n=5,044 |        | 60-69 yrs<br>n=8,842 |        | 70-79 yrs<br>n=9,007 |        | 80+ yrs<br>n=6,060 |        |
|       | 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     | 90.5                | 90.6   | 89.7                 | 90.3   | 87.3                 | 88.7   | 80.7                 | 83.8   | 65.5               | 73.3   |
| 2     | 80.2                | 80.6   | 79.9                 | 81.0   | 78.5                 | 81.0   | 70.2                 | 75.9   | 52.2               | 65.6   |
| 3     | 74.0                | 74.5   | 73.3                 | 74.9   | 71.3                 | 74.8   | 63.0                 | 71.1   | 42.9               | 60.9   |
| 4     | 70.7                | 71.4   | 68.6                 | 70.7   | 66.2                 | 70.9   | 56.6                 | 67.0   | 36.3               | 58.6   |
| 5     | 66.8                | 67.7   | 64.9                 | 67.4   | 62.3                 | 68.0   | 51.6                 | 64.3   | 30.6               | 56.3   |
| 6     | 63.9                | 65.0   | 61.9                 | 65.0   | 58.4                 | 65.2   | 47.1                 | 62.2   | 25.7               | 55.2   |
| 7     | 61.8                | 63.1   | 59.2                 | 62.7   | 55.2                 | 63.1   | 43.4                 | 60.9   | 21.4               | 54.4   |
| 8     | 60.8                | 62.3   | 57.4                 | 61.6   | 52.6                 | 61.7   | 39.2                 | 58.8   | 17.8               | 53.1   |
| 9     | 60.1                | 61.8   | 56.2                 | 60.9   | 50.3                 | 60.6   | 36.2                 | 58.0   | 14.8               | 53.1   |
| 10    | 58.6                | 60.6   | 54.9                 | 60.3   | 48.7                 | 60.2   | 33.0                 | 57.6   | 12.0               | 53.1   |
| 11    | 57.7                | 59.9   | 53.8                 | 59.8   | 47.1                 | 60.2   | 30.1                 | 57.4   |                    |        |
| 12    | 56.4                | 59.0   | 52.4                 | 59.1   | 44.9                 | 59.8   | 27.3                 | 57.1   |                    |        |
| 13    | 55.4                | 58.1   | 51.2                 | 58.5   | 42.8                 | 59.2   | 24.2                 | 56.4   |                    |        |
| 14    | 54.1                | 57.1   | 49.5                 | 57.6   | 40.4                 | 58.4   | 21.1                 | 55.4   |                    |        |
| 15    | 53.3                | 56.8   | 48.2                 | 57.2   | 38.6                 | 58.4   | 18.9                 | 54.9   |                    |        |
| 16    | 53.1                | 56.8   | 47.0                 | 56.7   | 36.3                 | 57.7   | 15.8                 | 53.6   |                    |        |
| 17    | 52.6                | 56.8   | 46.4                 | 56.7   | 34.9                 | 57.7   | 13.8                 | 52.5   |                    |        |
| 18    | 52.3                | 56.8   | 45.8                 | 56.7   | 32.1                 | 57.4   | 11.5                 | 52.5   |                    |        |
| 19    | 51.9                | 56.8   | 45.3                 | 56.7   | 28.9                 | 55.3   |                      |        |                    |        |
| 20    | 51.3                | 56.8   | 43.7                 | 56.7   | 26.4                 | 54.3   |                      |        |                    |        |

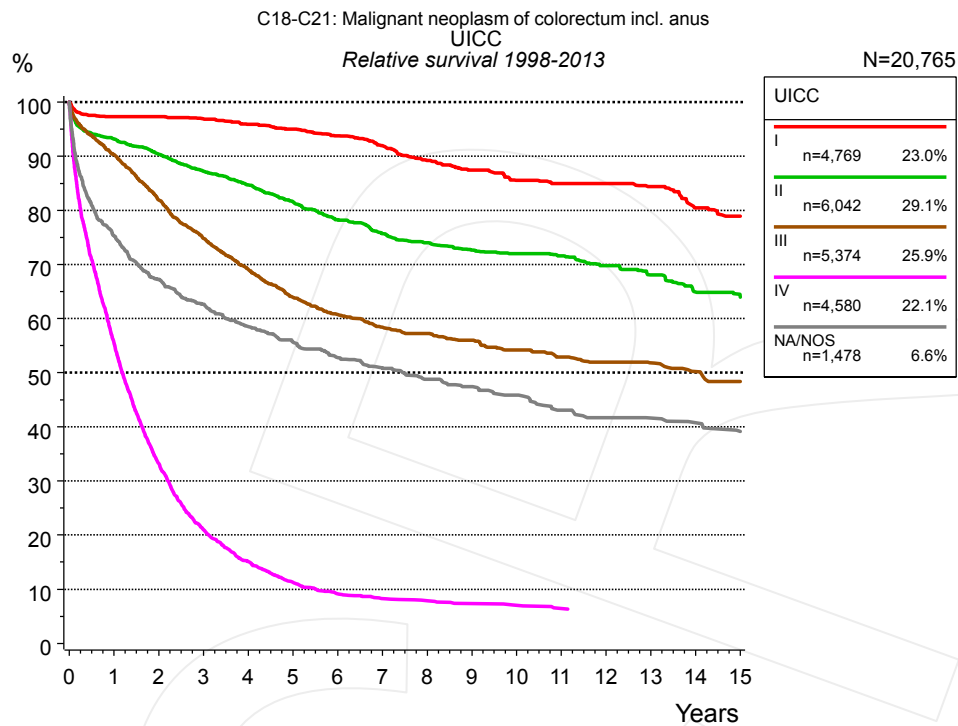
**Table 3c.** Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by age category for period 1988-2013 (N=31,121).



**Figure 4a.** Relative survival of patients with colorectal cancer by UICC. For 29,307 of 31,121 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 29,030 cases an evaluable classification was established. The grey line represents the subgroup of 2,091 patients with missing values regarding UICC (6.7% of 31,121 patients, the percent values of all other categories are related to n=29,030).

| Years | UICC         |        |               |        |                |        |               |        |                   |        |
|-------|--------------|--------|---------------|--------|----------------|--------|---------------|--------|-------------------|--------|
|       | I<br>n=6,480 |        | II<br>n=8,636 |        | III<br>n=7,763 |        | IV<br>n=6,151 |        | NA/NOS<br>n=2,091 |        |
|       | 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   | 89.9          | 93.7   | 86.8           | 90.1   | 52.2          | 54.0   | 76.5              | 80.2   |
| 2     | 91.3         | 97.4   | 83.9          | 90.9   | 74.8           | 80.2   | 28.9          | 30.7   | 67.6              | 73.8   |
| 3     | 87.6         | 96.6   | 78.1          | 87.8   | 65.0           | 72.0   | 17.3          | 18.8   | 61.9              | 69.8   |
| 4     | 83.8         | 95.5   | 72.3          | 84.4   | 57.5           | 65.8   | 12.1          | 13.5   | 56.8              | 66.1   |
| 5     | 80.2         | 94.4   | 67.2          | 81.5   | 51.4           | 60.7   | 9.1           | 10.3   | 52.8              | 63.3   |
| 6     | 76.2         | 93.0   | 61.9          | 78.0   | 47.0           | 57.3   | 7.2           | 8.5    | 49.1              | 60.7   |
| 7     | 72.1         | 91.1   | 57.6          | 75.4   | 43.4           | 54.5   | 6.1           | 7.3    | 46.2              | 58.6   |
| 8     | 68.5         | 89.6   | 53.4          | 72.5   | 40.9           | 53.1   | 5.3           | 6.4    | 42.9              | 56.4   |
| 9     | 65.0         | 88.0   | 50.5          | 71.2   | 38.8           | 52.1   | 4.6           | 5.8    | 40.3              | 54.8   |
| 10    | 61.6         | 86.6   | 47.8          | 70.1   | 36.9           | 51.2   | 4.3           | 5.5    | 37.6              | 53.0   |
| 11    | 58.7         | 85.2   | 45.2          | 68.9   | 35.1           | 50.3   | 3.9           | 5.2    | 35.1              | 51.2   |
| 12    | 55.9         | 84.2   | 42.3          | 67.0   | 33.3           | 49.3   | 3.5           | 4.9    | 32.7              | 49.5   |
| 13    | 52.9         | 82.8   | 39.7          | 65.4   | 31.2           | 47.9   | 3.3           | 4.6    | 31.3              | 48.8   |
| 14    | 49.7         | 80.6   | 36.7          | 62.9   | 29.5           | 46.8   | 3.2           | 4.5    | 28.4              | 46.1   |
| 15    | 46.9         | 79.0   | 34.8          | 62.0   | 28.3           | 46.3   | 3.0           | 4.4    | 26.9              | 45.4   |
| 16    | 44.2         | 77.3   | 32.6          | 60.4   | 26.3           | 44.8   |               |        | 25.5              | 44.4   |
| 17    | 43.1         | 77.3   | 31.1          | 59.5   | 25.3           | 44.4   |               |        | 23.4              | 42.1   |
| 18    | 41.4         | 77.3   | 28.9          | 58.1   | 24.2           | 44.1   |               |        | 20.9              | 39.4   |
| 19    | 39.0         | 76.5   | 26.6          | 55.6   | 22.1           | 41.9   |               |        | 20.4              | 39.2   |
| 20    | 35.3         | 72.1   | 25.4          | 54.8   | 20.7           | 40.3   |               |        | 19.0              | 38.5   |

**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by UICC for period 1988-2013 (N=29,030).

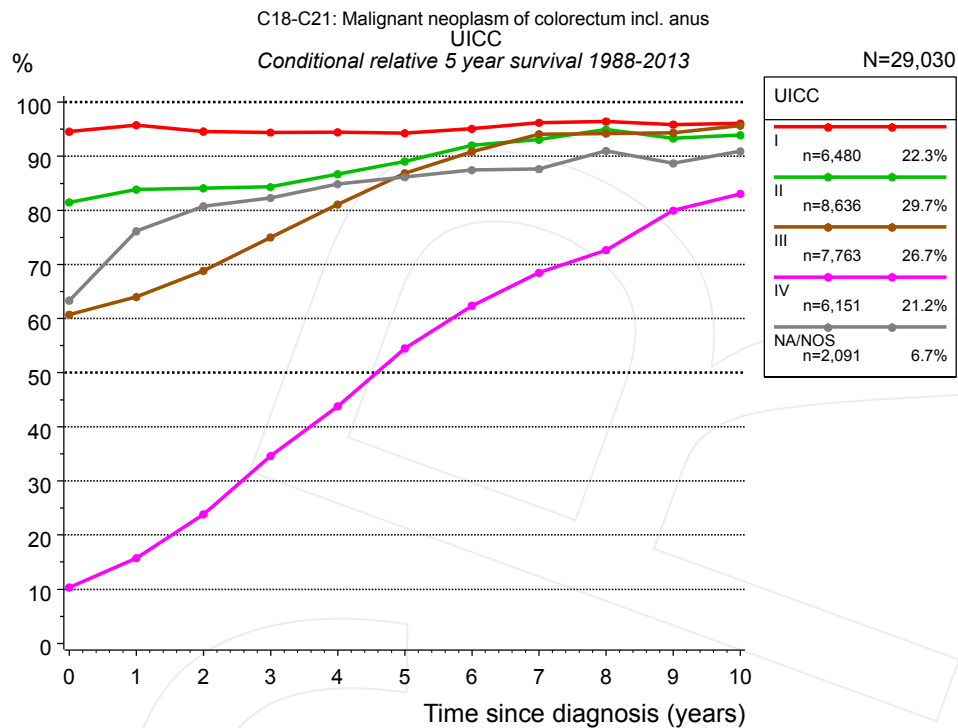


**Figure 4c.** Relative survival of patients with colorectal cancer by UICC. For 20,984 of 22,243 cases diagnosed between 1998 and 2013 valid data could be obtained for this item. For a total of 20,765 cases an evaluable classification was established. The grey line represents the subgroup of 1,478 patients with missing values regarding UICC (6.6% of 22,243 patients, the percent values of all other categories are related to n=20,765).

| Years | UICC         |        |               |        |                |        |               |        |                   |        |
|-------|--------------|--------|---------------|--------|----------------|--------|---------------|--------|-------------------|--------|
|       | I<br>n=4,769 |        | II<br>n=6,042 |        | III<br>n=5,374 |        | IV<br>n=4,580 |        | NA/NOS<br>n=1,478 |        |
|       | 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     | 94.4         | 97.3   | 89.3          | 93.2   | 87.1           | 90.3   | 53.7          | 55.6   | 71.5              | 75.3   |
| 2     | 91.4         | 97.3   | 83.3          | 90.3   | 76.4           | 81.9   | 31.3          | 33.3   | 61.5              | 67.2   |
| 3     | 87.9         | 96.9   | 77.5          | 87.2   | 67.6           | 74.8   | 19.3          | 21.0   | 55.6              | 62.7   |
| 4     | 84.2         | 95.9   | 72.5          | 84.7   | 60.5           | 69.1   | 13.6          | 15.1   | 50.4              | 58.5   |
| 5     | 80.8         | 95.0   | 67.3          | 81.6   | 54.2           | 63.9   | 9.9           | 11.3   | 46.7              | 55.7   |
| 6     | 76.9         | 93.8   | 62.2          | 78.3   | 49.9           | 60.8   | 7.9           | 9.2    | 43.2              | 52.8   |
| 7     | 72.8         | 92.0   | 57.9          | 75.6   | 46.5           | 58.4   | 7.0           | 8.3    | 40.6              | 50.9   |
| 8     | 68.1         | 89.2   | 54.6          | 74.0   | 44.2           | 57.2   | 6.5           | 7.9    | 37.9              | 48.8   |
| 9     | 64.4         | 87.4   | 51.5          | 72.6   | 41.8           | 56.0   | 6.0           | 7.4    | 36.0              | 47.4   |
| 10    | 60.7         | 85.6   | 49.1          | 72.0   | 39.3           | 54.2   | 5.6           | 7.0    | 33.9              | 45.9   |
| 11    | 58.4         | 85.0   | 46.8          | 71.6   | 36.8           | 52.9   | 5.0           | 6.4    | 30.8              | 43.1   |
| 12    | 56.2         | 85.0   | 44.0          | 69.8   | 35.2           | 52.0   | 4.8           | 6.3    | 28.9              | 41.7   |
| 13    | 53.4         | 84.4   | 41.0          | 68.1   | 33.6           | 51.8   | 4.8           | 6.3    | 28.1              | 41.6   |
| 14    | 48.7         | 80.4   | 37.5          | 64.9   | 31.5           | 50.2   |               |        | 26.8              | 40.7   |
| 15    | 46.1         | 78.9   | 35.3          | 64.0   | 29.8           | 48.4   |               |        | 24.9              | 39.2   |

**Table 4d.** Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by UICC for period 1998-2013 (N=20,765).



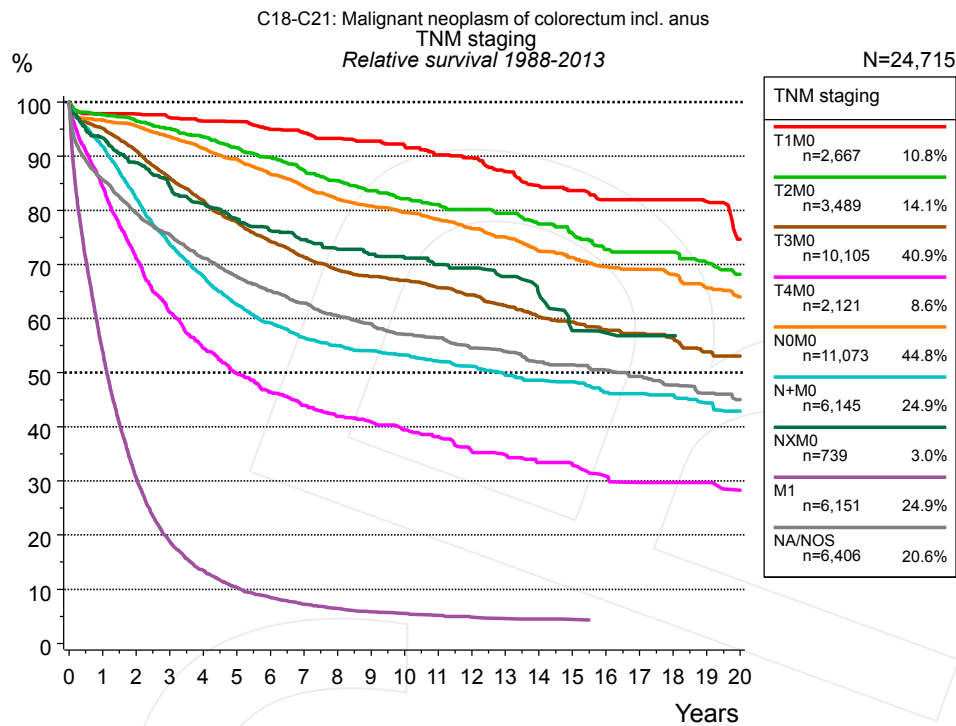


**Figure 4e.** Conditional relative 5-year survival of patients with colorectal cancer by UICC. For 29,307 of 31,121 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 29,030 cases an evaluable classification was established. The grey line represents the subgroup of 2,091 patients with missing values regarding UICC (6.7% of 31,121 patients, the percent values of all other categories are related to n=29,030).

| 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     | 6,480 | 94.6                | 8,636 | 81.5                | 7,763 | 60.7                | 6,151 | 10.3                | 2,091  | 63.3                |
| 1     | 5,855 | 95.7                | 7,391 | 83.9                | 6,428 | 64.0                | 2,993 | 15.7                | 1,532  | 76.2                |
| 2     | 5,240 | 94.6                | 6,477 | 84.1                | 5,144 | 68.8                | 1,517 | 23.8                | 1,293  | 80.8                |
| 3     | 4,597 | 94.4                | 5,589 | 84.3                | 4,097 | 75.0                | 802   | 34.6                | 1,134  | 82.3                |
| 4     | 4,006 | 94.4                | 4,722 | 86.7                | 3,253 | 81.1                | 490   | 43.8                | 979    | 84.8                |
| 5     | 3,429 | 94.2                | 3,966 | 89.0                | 2,578 | 86.8                | 316   | 54.5                | 852    | 86.1                |
| 6     | 2,895 | 95.1                | 3,295 | 92.0                | 2,098 | 90.9                | 220   | 62.4                | 740    | 87.4                |
| 7     | 2,507 | 96.2                | 2,849 | 93.1                | 1,754 | 94.1                | 159   | 68.5                | 644    | 87.6                |
| 8     | 2,211 | 96.4                | 2,446 | 94.9                | 1,499 | 94.2                | 114   | 72.7                | 550    | 91.0                |
| 9     | 1,893 | 95.9                | 2,103 | 93.3                | 1,297 | 94.3                | 89    | 80.0                | 470    | 88.7                |
| 10    | 1,627 | 96.1                | 1,807 | 93.9                | 1,104 | 95.7                | 70    | 83.1                | 405    | 90.9                |

**Table 4f.** Conditional relative 5-year survival of patients with colorectal cancer by UICC for period 1988-2013 (N=29,030).

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 94.4% (n=4,597).

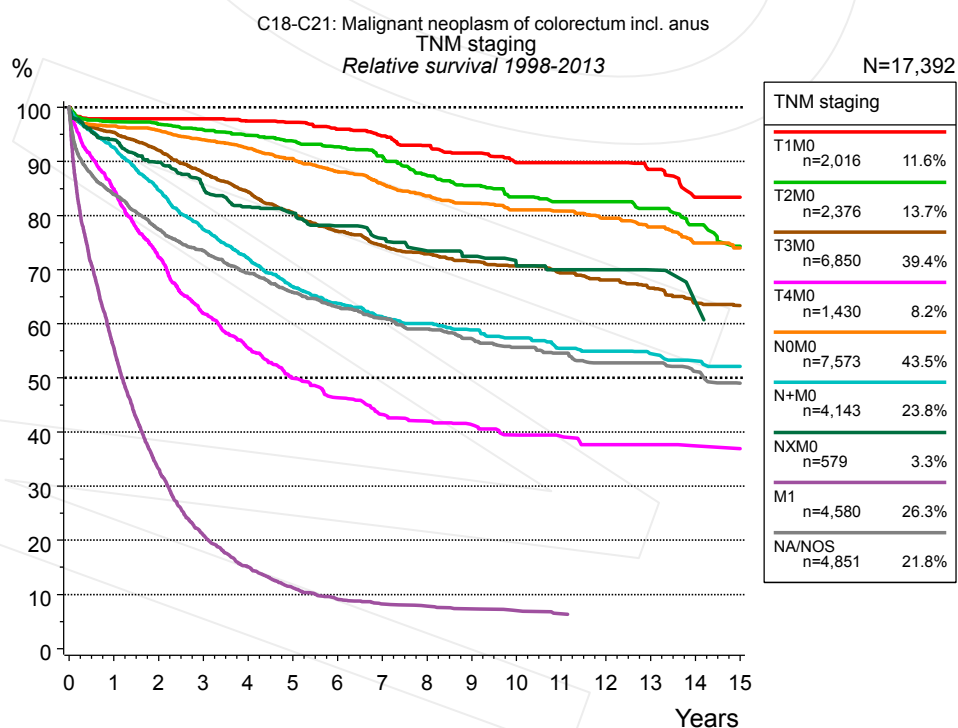


**Figure 4g.** Relative survival of patients with colorectal cancer by TNM staging. For 29,307 of 31,121 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 24,715 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 6,406 patients with missing values regarding TNM staging (20.6% of 31,121 patients, the percent values of all other categories are related to n=24,715).

| TNM staging |                 |        |                 |        |                  |        |                 |        |                  |        |                 |        |               |        |  |
|-------------|-----------------|--------|-----------------|--------|------------------|--------|-----------------|--------|------------------|--------|-----------------|--------|---------------|--------|--|
| Years       | T1M0<br>n=2,667 |        | T2M0<br>n=3,489 |        | T3M0<br>n=10,105 |        | T4M0<br>n=2,121 |        | N0M0<br>n=11,073 |        | N+M0<br>n=6,145 |        | NXM0<br>n=739 |        |  |
|             | 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           | 95.3            | 97.8   | 94.6            | 97.7   | 91.7             | 95.2   | 80.8            | 84.4   | 93.3             | 96.7   | 88.7            | 91.9   | 90.3          | 93.4   |  |
| 2           | 92.4            | 97.8   | 90.5            | 96.5   | 84.7             | 91.0   | 65.5            | 71.1   | 89.1             | 95.6   | 76.9            | 82.2   | 83.2          | 88.8   |  |
| 3           | 89.1            | 97.2   | 86.4            | 95.1   | 77.3             | 86.0   | 54.4            | 61.2   | 84.3             | 93.6   | 66.8            | 73.7   | 76.9          | 84.5   |  |
| 4           | 86.0            | 96.5   | 82.3            | 93.5   | 71.0             | 81.8   | 46.8            | 54.5   | 79.5             | 91.4   | 59.6            | 67.9   | 72.1          | 81.3   |  |
| 5           | 83.5            | 96.4   | 77.9            | 91.6   | 65.3             | 77.9   | 41.4            | 49.9   | 75.2             | 89.5   | 53.4            | 62.6   | 67.4          | 78.4   |  |
| 6           | 79.4            | 94.9   | 73.9            | 89.8   | 60.1             | 74.3   | 37.2            | 46.4   | 70.3             | 86.7   | 49.0            | 59.2   | 63.7          | 76.2   |  |
| 7           | 76.4            | 94.3   | 69.6            | 87.5   | 55.7             | 71.3   | 34.2            | 44.0   | 66.0             | 84.3   | 45.3            | 56.5   | 60.8          | 74.6   |  |
| 8           | 73.4            | 93.3   | 65.7            | 85.4   | 52.0             | 69.0   | 31.5            | 41.9   | 62.0             | 82.1   | 42.8            | 55.0   | 57.6          | 72.9   |  |
| 9           | 70.5            | 92.8   | 62.3            | 83.6   | 49.3             | 67.8   | 29.7            | 40.9   | 58.8             | 80.8   | 40.8            | 54.0   | 55.0          | 71.9   |  |
| 10          | 67.3            | 92.0   | 59.0            | 82.1   | 47.0             | 67.0   | 27.7            | 39.4   | 55.9             | 79.6   | 39.0            | 53.3   | 52.6          | 71.2   |  |
| 11          | 64.0            | 90.3   | 56.5            | 81.1   | 44.4             | 65.7   | 25.9            | 38.2   | 53.0             | 78.3   | 36.9            | 52.1   | 50.2          | 70.0   |  |
| 12          | 61.4            | 89.7   | 53.8            | 80.2   | 42.0             | 64.4   | 23.3            | 35.4   | 49.9             | 76.6   | 35.2            | 51.2   | 48.9          | 69.4   |  |
| 13          | 57.5            | 87.2   | 51.5            | 79.4   | 39.1             | 62.4   | 22.1            | 34.8   | 47.1             | 75.0   | 32.8            | 49.6   | 45.2          | 67.8   |  |
| 14          | 53.8            | 84.5   | 48.2            | 77.5   | 36.5             | 60.3   | 20.6            | 33.4   | 43.8             | 72.4   | 31.2            | 48.6   | 41.7          | 64.6   |  |
| 15          | 51.5            | 83.7   | 45.4            | 75.7   | 34.6             | 59.4   | 19.7            | 33.1   | 41.6             | 71.3   | 29.9            | 48.3   | 35.8          | 57.8   |  |
| 16          | 48.7            | 82.0   | 42.0            | 72.7   | 32.6             | 57.9   | 17.9            | 30.9   | 39.0             | 69.6   | 27.7            | 46.4   | 34.8          | 57.3   |  |
| 17          | 48.4            | 82.0   | 40.6            | 72.3   | 31.1             | 57.3   | 16.8            | 29.7   | 37.6             | 69.1   | 26.8            | 46.2   | 33.6          | 56.8   |  |
| 18          | 46.3            | 82.0   | 38.8            | 72.3   | 29.3             | 56.4   | 16.5            | 29.7   | 35.4             | 68.2   | 25.6            | 45.9   | 33.6          | 56.8   |  |
| 19          | 43.2            | 81.6   | 36.4            | 70.4   | 26.9             | 53.8   | 16.1            | 29.7   | 32.8             | 65.7   | 23.7            | 44.5   | 31.5          | 53.9   |  |
| 20          | 37.9            | 74.7   | 33.9            | 68.2   | 25.7             | 53.1   | 14.6            | 28.3   | 30.8             | 64.0   | 22.4            | 42.9   |               |        |  |

| cont'd<br>Years | TNM staging   |        |                   |        |
|-----------------|---------------|--------|-------------------|--------|
|                 | M1<br>n=6,151 |        | NA/NOS<br>n=6,406 |        |
|                 | obs. %        | rel. % | obs. %            | rel. % |
| 0               | 100.0         | 100.0  | 100.0             | 100.0  |
| 1               | 52.2          | 54.0   | 81.8              | 85.6   |
| 2               | 28.9          | 30.7   | 72.9              | 79.5   |
| 3               | 17.3          | 18.8   | 66.7              | 75.5   |
| 4               | 12.1          | 13.5   | 60.5              | 71.2   |
| 5               | 9.1           | 10.3   | 55.6              | 67.8   |
| 6               | 7.2           | 8.5    | 51.5              | 65.2   |
| 7               | 6.1           | 7.3    | 47.8              | 62.8   |
| 8               | 5.3           | 6.4    | 44.3              | 60.5   |
| 9               | 4.6           | 5.8    | 41.6              | 59.0   |
| 10              | 4.3           | 5.5    | 38.7              | 57.1   |
| 11              | 3.9           | 5.2    | 36.8              | 56.4   |
| 12              | 3.5           | 4.9    | 34.3              | 54.6   |
| 13              | 3.3           | 4.6    | 32.6              | 53.9   |
| 14              | 3.2           | 4.5    | 30.2              | 52.0   |
| 15              | 3.0           | 4.4    | 28.7              | 51.4   |
| 16              |               |        | 27.2              | 50.5   |
| 17              |               |        | 25.5              | 49.3   |
| 18              |               |        | 23.6              | 47.7   |
| 19              |               |        | 22.0              | 46.2   |
| 20              |               |        | 20.4              | 45.0   |

**Table 4h.** Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by TNM staging for period 1988-2013 (N=42,490).



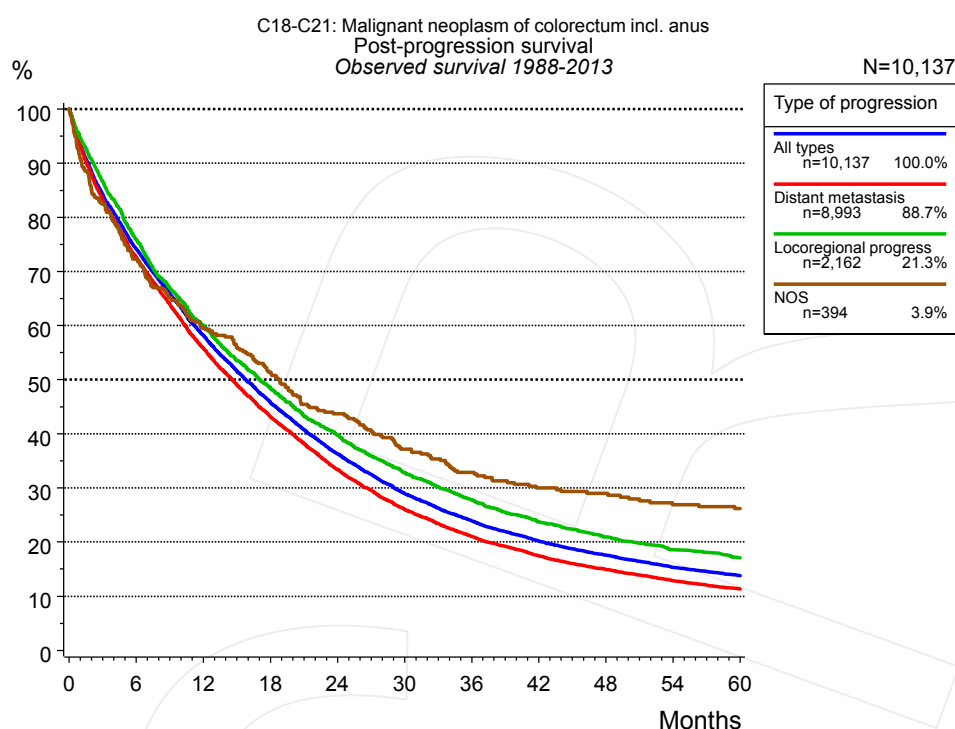
**Figure 4i.** Relative survival of patients with colorectal cancer by TNM staging. For 20,984 of 22,243 cases diagnosed between 1998 and 2013 valid data could be obtained for this item. For a total of 17,392 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 4,851 patients with missing values regarding TNM

staging (21.8% of 22,243 patients, the percent values of all other categories are related to n=17,392).

| Years | TNM staging     |        |                 |        |                 |        |                 |        |                 |        |                 |        |               |        |
|-------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|---------------|--------|
|       | T1M0<br>n=2,016 |        | T2M0<br>n=2,376 |        | T3M0<br>n=6,850 |        | T4M0<br>n=1,430 |        | N0M0<br>n=7,573 |        | N+M0<br>n=4,143 |        | NXM0<br>n=579 |        |
|       | 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   | 94.3            | 97.3   | 91.9            | 95.4   | 81.5            | 84.9   | 93.1            | 96.5   | 89.5            | 92.6   | 91.0          | 94.0   |
| 2     | 92.9            | 97.9   | 90.9            | 96.9   | 85.6            | 92.1   | 66.9            | 72.3   | 89.2            | 95.7   | 79.3            | 84.7   | 84.4          | 89.8   |
| 3     | 89.9            | 97.9   | 87.1            | 95.9   | 79.0            | 87.9   | 55.4            | 61.9   | 84.7            | 94.0   | 70.3            | 77.4   | 77.9          | 85.2   |
| 4     | 86.9            | 97.5   | 83.4            | 94.8   | 73.2            | 84.4   | 48.1            | 55.6   | 80.4            | 92.4   | 63.5            | 72.1   | 72.8          | 81.7   |
| 5     | 84.2            | 97.2   | 79.9            | 93.8   | 67.5            | 80.6   | 41.9            | 49.9   | 76.1            | 90.5   | 57.1            | 66.9   | 69.8          | 80.5   |
| 6     | 80.2            | 96.0   | 76.4            | 92.7   | 62.4            | 77.1   | 37.7            | 46.4   | 71.5            | 88.1   | 52.9            | 63.8   | 66.0          | 78.1   |
| 7     | 76.6            | 94.7   | 72.4            | 91.0   | 58.1            | 74.4   | 34.3            | 43.3   | 67.2            | 85.8   | 49.3            | 61.3   | 62.4          | 75.8   |
| 8     | 72.7            | 93.0   | 67.2            | 87.4   | 55.0            | 72.9   | 32.3            | 42.0   | 63.1            | 83.6   | 47.0            | 60.1   | 59.0          | 73.5   |
| 9     | 69.4            | 91.6   | 63.8            | 85.6   | 51.9            | 71.5   | 30.9            | 41.4   | 59.9            | 82.3   | 44.5            | 58.9   | 56.5          | 72.5   |
| 10    | 65.3            | 89.8   | 60.2            | 83.5   | 49.6            | 70.7   | 28.8            | 39.5   | 56.9            | 81.1   | 42.3            | 57.4   | 53.0          | 70.7   |
| 11    | 63.5            | 89.8   | 57.4            | 82.6   | 46.6            | 69.4   | 27.7            | 39.2   | 54.4            | 80.8   | 39.2            | 55.5   | 51.4          | 70.0   |
| 12    | 61.8            | 89.8   | 55.0            | 82.6   | 44.2            | 68.1   | 26.0            | 37.7   | 51.5            | 79.5   | 37.9            | 55.0   | 51.4          | 70.0   |
| 13    | 57.5            | 88.6   | 52.6            | 81.3   | 41.3            | 66.6   | 25.4            | 37.7   | 48.5            | 77.9   | 35.9            | 54.5   | 48.7          | 70.0   |
| 14    | 51.9            | 83.4   | 48.4            | 78.3   | 38.0            | 63.8   | 24.0            | 37.5   | 44.7            | 74.9   | 33.8            | 53.2   | 42.2          | 63.9   |
| 15    | 51.1            | 83.4   | 44.0            | 74.3   | 36.1            | 63.4   | 22.7            | 36.9   | 42.3            | 74.0   | 32.6            | 52.1   |               |        |

| Years | TNM staging   |        |                   |        |
|-------|---------------|--------|-------------------|--------|
|       | M1<br>n=4,580 |        | NA/NOS<br>n=4,851 |        |
|       | obs. %        | rel. % | obs. %            | rel. % |
| 0     | 100.0         | 100.0  | 100.0             | 100.0  |
| 1     | 53.7          | 55.6   | 80.1              | 83.9   |
| 2     | 31.3          | 33.3   | 71.0              | 77.4   |
| 3     | 19.3          | 21.0   | 64.8              | 73.5   |
| 4     | 13.6          | 15.1   | 59.0              | 69.4   |
| 5     | 9.9           | 11.3   | 54.0              | 65.9   |
| 6     | 7.9           | 9.2    | 49.9              | 63.1   |
| 7     | 7.0           | 8.3    | 46.6              | 61.0   |
| 8     | 6.5           | 7.9    | 43.5              | 59.1   |
| 9     | 6.0           | 7.4    | 40.6              | 57.2   |
| 10    | 5.6           | 7.0    | 38.1              | 55.6   |
| 11    | 5.0           | 6.4    | 36.1              | 54.6   |
| 12    | 4.8           | 6.3    | 33.7              | 52.8   |
| 13    | 4.8           | 6.3    | 32.4              | 52.8   |
| 14    |               |        | 30.2              | 51.2   |
| 15    |               |        | 27.8              | 49.1   |

**Table 4j.** Observed (obs.) and relative (rel.) survival of patients with colorectal cancer by TNM staging for period 1998-2013 (N=29,547).



**Figure 5a.** Observed post-progression survival of 10,137 patients with colorectal cancer diagnosed between 1988 and 2013 (incl. M1). These 10,137 patients with documented progression events during their course of disease represent 32.6% of the totally 31,121 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=2,344, 7.5%). 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 “All types” 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.

| Months | Type of progression   |                               |                                  |              |
|--------|-----------------------|-------------------------------|----------------------------------|--------------|
|        | All types<br>n=10,137 | Distant metastasis<br>n=8,993 | Locoregional progress<br>n=2,162 | NOS<br>n=394 |
|        | %                     | %                             | %                                | %            |
| 0      | 100.0                 | 100.0                         | 100.0                            | 100.0        |
| 12     | 58.2                  | 55.8                          | 59.9                             | 59.6         |
| 24     | 36.3                  | 33.4                          | 39.8                             | 43.7         |
| 36     | 23.9                  | 21.0                          | 27.8                             | 32.9         |
| 48     | 17.6                  | 14.9                          | 20.9                             | 29.0         |
| 60     | 13.8                  | 11.4                          | 17.1                             | 26.2         |

**Table 5b.** Observed post-progression survival of patients with colorectal cancer for period 1988-2013 (N=10,137).

## Shortcuts

|             |   |
|-------------|---|
| MCR         | Munich Cancer Registry, Germany (Tumorregister München)   |
| NCI         | National Cancer Institute, USA  |
| SEER        | Surveillance, Epidemiology, and End Results, USA  |
| UICC        | Union for International Cancer Control, Geneva  |
| DCO         | Death certificate only. The death certificate provides the only notification to the registry.   |
| NA          | Not available   |
| NOS         | Not otherwise specified   |
| OS          | Observed/overall survival (Kaplan-Meier estimate)   |
| RS          | Relative survival, compared to the general population, ratio of observed to expected survival (Ederer II method), reflecting excess mortality among cancer patients |
| AS          | Assembled survival chart (observed, expected, relative)   |
| PPS         | Post-progression survival, survival since first relapse (Kaplan-Meier estimate)   |
| progression | Date of entry: Date of first locoregional recurrence, distant metastasis, unspecified   |
|             | Event: Death of all causes  |
| CS          | Conditional survival, survival probability under the condition of surviving a given period of time  |

## Recommended Citation

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