

# Munich Cancer Registry



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## ICD-10 C70-C72: Brain/nerves cancer

### Survival

Year of diagnosis	1988-1997	1998-2019
Patients	749	6,651
Diseases	752	6,658
Cases evaluated	679	4,956
Creation date	01/27/2021	
Database export	01/07/2021	
Population	4.92 m	



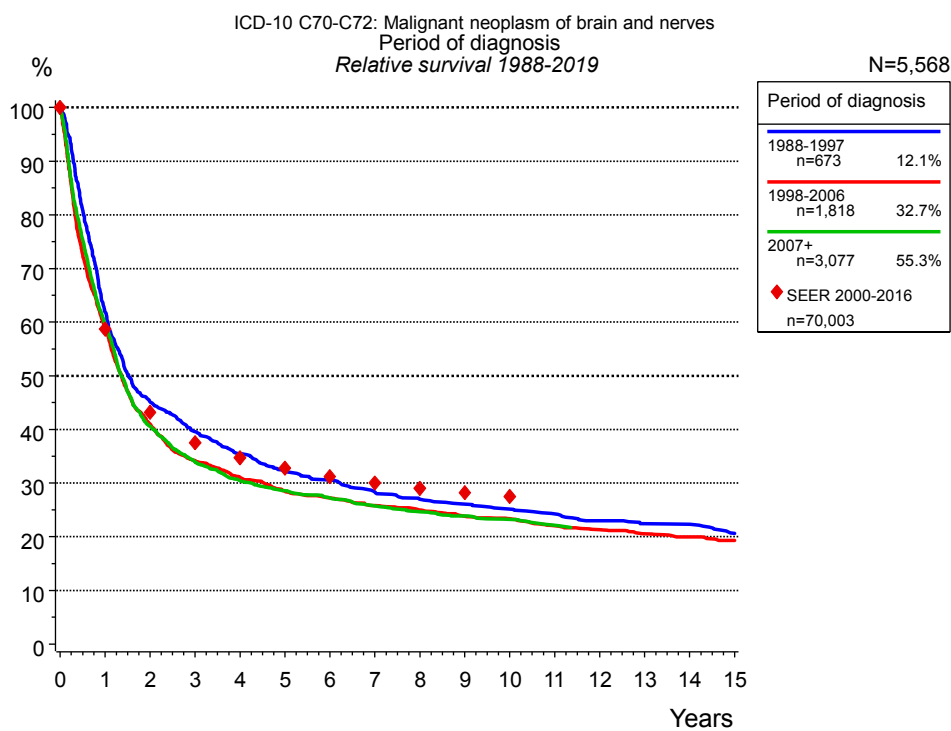
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<https://www.tumorregister-muenchen.de/en>

<https://www.tumorregister-muenchen.de/en/facts/surv/sC7072E-ICD-10-C70-C72-Brain-nerves-cancer-survival.pdf>

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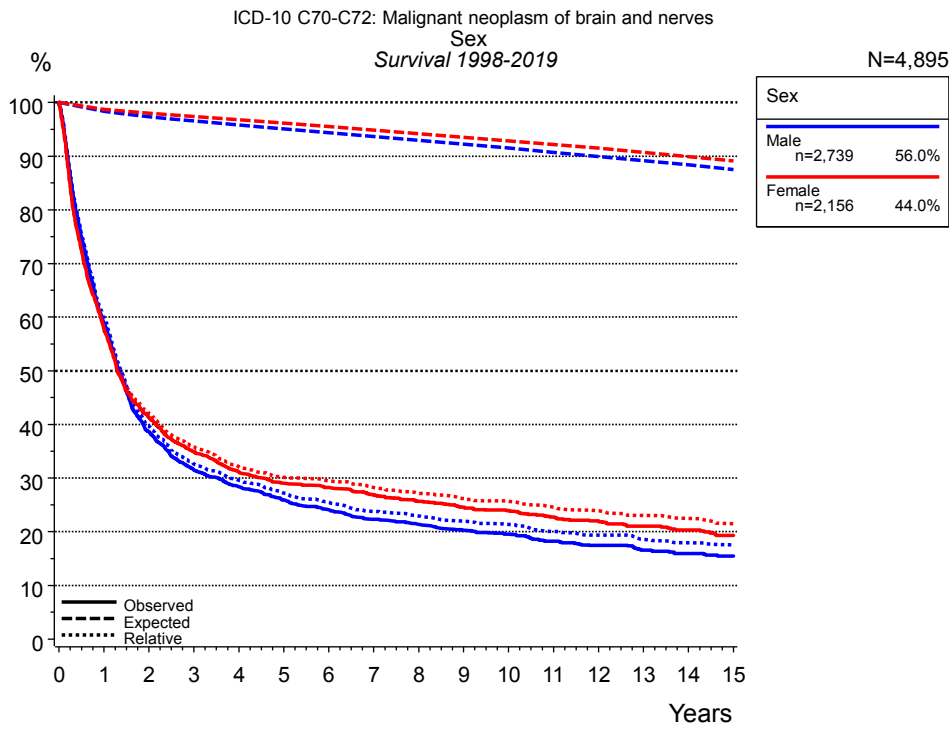
**Figure 1a.** Relative survival of patients with brain/nerves cancer by period of diagnosis. Included in the evaluation are 5,568 cases diagnosed between 1988 and 2019.

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 2016, and are represented by colored diamonds in order to facilitate comparisons between MCR and SEER.

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		1998-2006		2007+	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	61.2	61.9	57.7	58.6	58.7	59.6
2	44.4	45.1	40.1	41.0	39.6	40.6
3	38.7	39.6	33.1	34.2	32.9	33.9
4	34.5	35.5	29.9	31.1	29.3	30.5
5	31.4	32.4	27.3	28.5	27.3	28.5
6	29.4	30.5	25.9	27.2	25.8	27.2
7	27.2	28.3	24.4	25.8	24.2	25.7
8	25.6	27.0	23.4	25.0	23.1	24.6
9	24.6	26.1	22.2	23.8	22.2	23.9
10	23.6	25.1	21.6	23.3	21.4	23.2
11	22.5	24.3	20.2	22.0	20.4	22.2
12	21.1	23.0	19.4	21.3		
13	20.5	22.4	18.5	20.5		
14	20.3	22.3	17.8	19.9		
15	18.5	20.6	17.1	19.3		
Median	1.5		1.3		1.3	

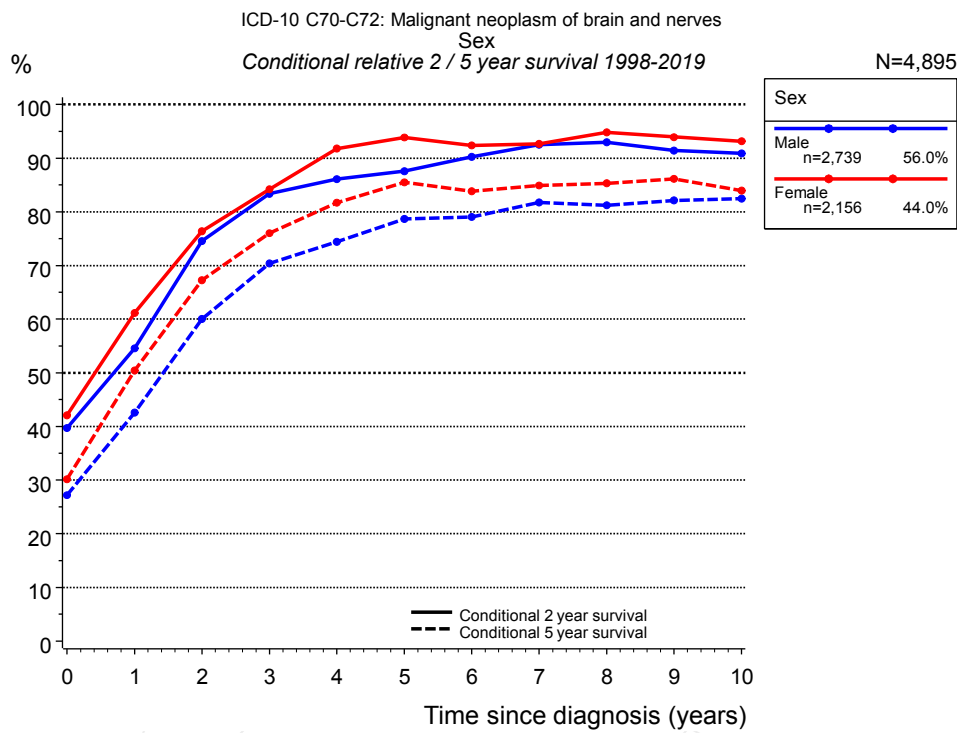
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with brain/nerves cancer by period of diagnosis for period 1988-2019 (N=5,568).



**Figure 2a.** Survival of patients with brain/nerves cancer by sex. Included in the evaluation are 4,895 cases diagnosed between 1998 and 2019.

Years	Sex			
	Male n=2,739		Female n=2,156	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	58.8	59.8	57.8	58.5
2	38.6	39.7	41.3	42.1
3	31.5	32.6	34.9	35.8
4	28.4	29.6	31.1	32.1
5	25.9	27.2	29.0	30.1
6	24.0	25.4	28.2	29.5
7	22.3	23.8	26.9	28.3
8	21.4	22.9	25.6	27.2
9	20.3	21.9	24.6	26.2
10	19.6	21.3	23.9	25.7
11	18.2	20.0	22.8	24.6
12	17.4	19.4	22.0	23.9
13	16.6	18.6	21.0	23.1
14	15.9	17.9	20.3	22.5
15	15.5	17.5	19.3	21.5
Median	1.3		1.3	

**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with brain/nerves cancer by sex for period 1998-2019 (N=4,895).

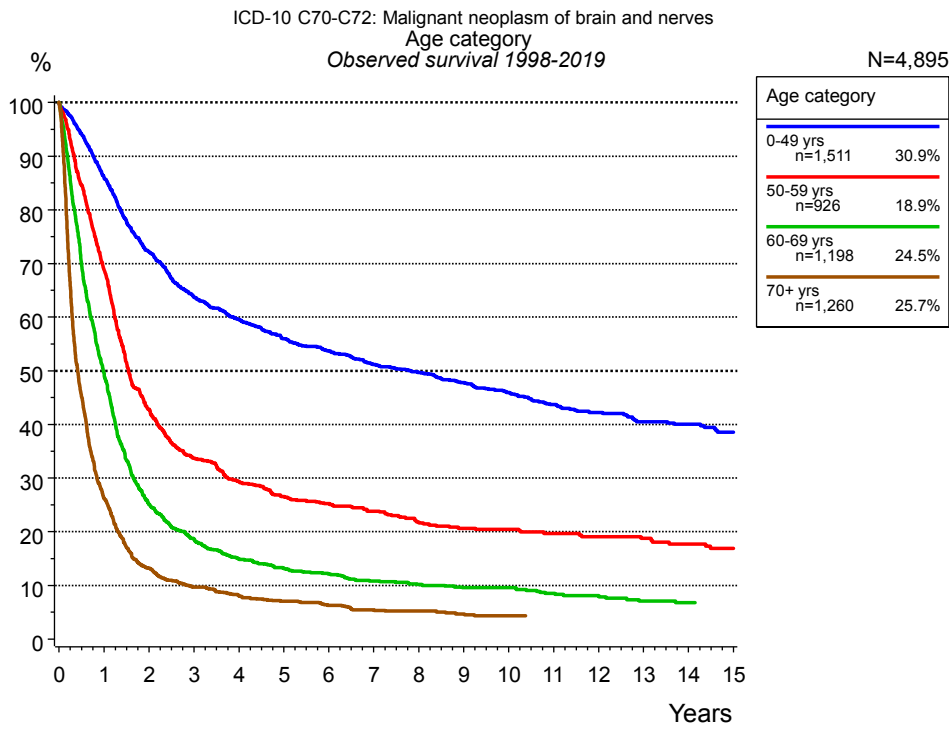


**Figure 2c.** Conditional relative 2 / 5-year survival of patients with brain/nerves cancer by sex. For 4,895 of 4,895 cases diagnosed between 1998 and 2019 valid data could be obtained for this item.

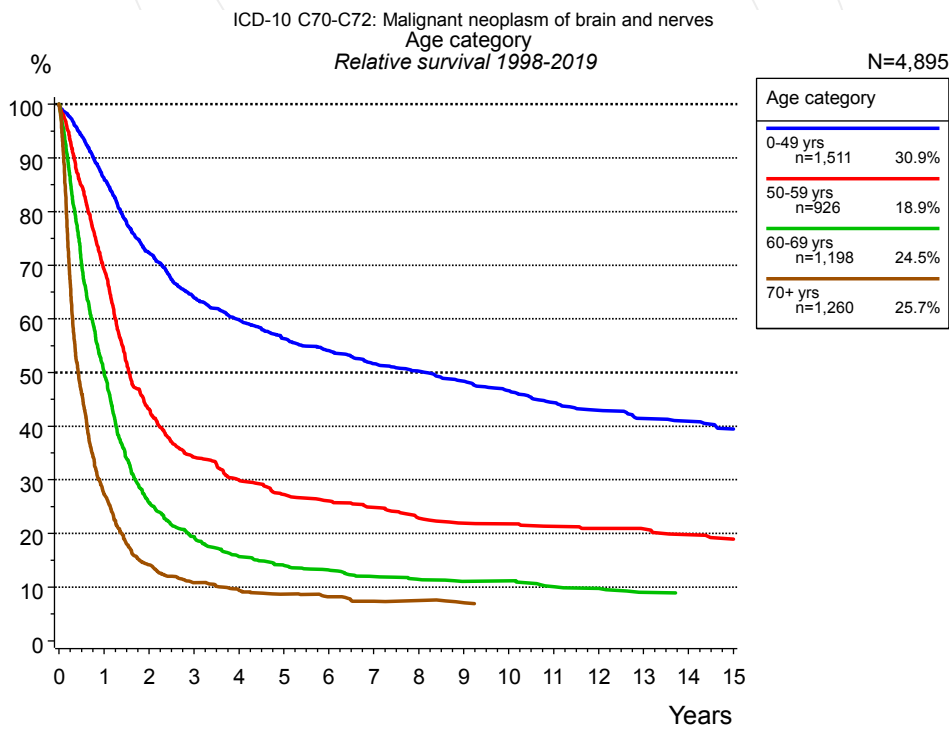
Years	Sex					
	n	Male		n	Female	
		Cond. surv. % 2 yrs	Cond. surv. % 5 yrs		Cond. surv. % 2 yrs	Cond. surv. % 5 yrs
0	2,739	39.7	27.2	2,156	42.1	30.1
1	1,552	54.6	42.6	1,196	61.2	50.4
2	987	74.6	60.0	829	76.3	67.2
3	770	83.4	70.4	667	84.2	76.0
4	656	86.1	74.4	563	91.8	81.7
5	568	87.6	78.7	489	93.9	85.5
6	486	90.2	79.1	443	92.4	83.8
7	413	92.5	81.8	379	92.7	84.9
8	348	93.0	81.2	320	94.8	85.3
9	299	91.4	82.1	275	93.9	86.1
10	251	90.9	82.5	240	93.2	84.0

**Table 2d.** Conditional relative 2 / 5-year survival of patients with brain/nerves cancer by sex for period 1998-2019 (N=4,895).

Conditional relative survival rates refer to the relative survival probability, in this case for 2 and 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 2a). 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 sex="Male", who are alive at least 3 years after cancer diagnosis, the conditional relative 2-year survival rate is 83.4% (n=770).



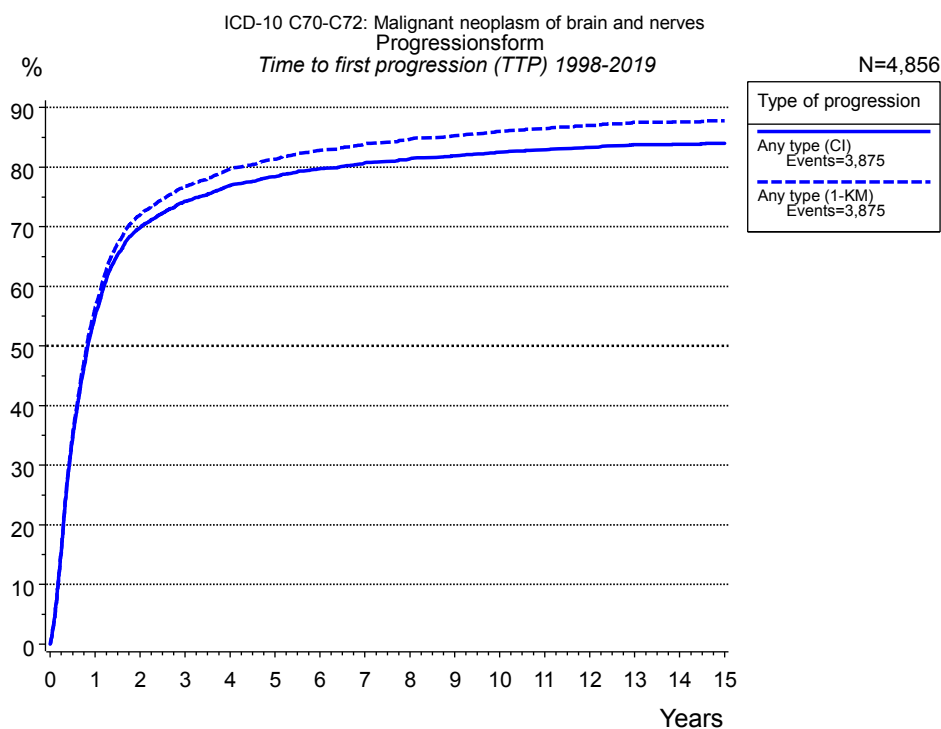
**Figure 3a.** Observed survival of patients with brain/nerves cancer by age category. Included in the evaluation are 4,895 cases diagnosed between 1998 and 2019.



**Figure 3b.** Relative survival of patients with brain/nerves cancer by age category. Included in the evaluation are 4,895 cases diagnosed between 1998 and 2019.

Years	Age category							
	0-49 yrs n=1,511		50-59 yrs n=926		60-69 yrs n=1,198		70+ yrs n=1,260	
	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	86.0	86.1	68.9	69.3	49.5	50.1	26.2	27.3
2	72.1	72.3	42.8	43.2	25.2	25.7	13.2	14.2
3	63.7	63.9	33.7	34.2	18.7	19.4	9.6	10.8
4	59.6	59.8	29.4	30.0	15.0	15.7	8.0	9.4
5	56.0	56.3	26.5	27.3	13.2	14.1	7.0	8.7
6	53.6	54.1	25.2	26.1	12.1	13.2	6.3	8.2
7	51.2	51.6	23.8	24.9	10.8	12.0	5.5	7.4
8	49.7	50.2	21.8	22.8	10.2	11.4	5.2	7.5
9	47.8	48.4	20.6	21.9	9.6	11.1	4.7	7.1
10	46.0	46.6	20.4	21.8	9.6	11.1	4.3	7.1
11	43.7	44.4	19.7	21.4	8.5	10.1		
12	42.3	43.0	19.1	21.0	8.1	9.8		
13	40.5	41.4	18.7	20.8	7.1	9.0		
14	40.0	40.9	17.7	19.8	6.8	8.8		
15	38.6	39.5	16.9	18.9				
Median	7.8		1.5		1.0		0.4	

**Table 3c.** Observed (obs.) and relative (rel.) survival of patients with brain/nerves cancer by age category for period 1998-2019 (N=4,895).

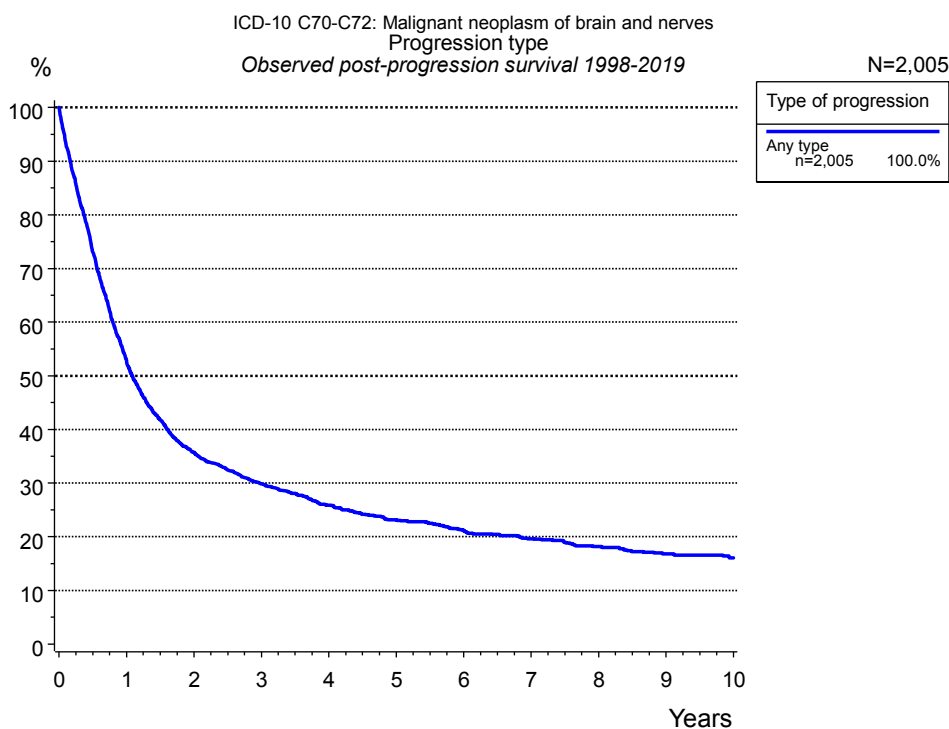


**Figure 5a.** Time to first progression of 4,856 patients with brain/nerves cancer diagnosed between 1998 and 2019 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

	Type of progression	
	Any type (CI)	Any type (1-KM)
N	4,856	4,856
Events	3,871	3,871
compet.	265	
Years	%	%
0	0.0	0.0
1	55.2	56.5
2	69.9	72.0
3	74.3	76.8
4	76.9	79.6
5	78.4	81.3
6	79.8	82.8
7	80.7	83.9
8	81.4	84.7
9	82.0	85.3
10	82.6	86.0
11	82.9	86.4
12	83.4	87.0
13	83.8	87.5
14	83.9	87.6
15	84.0	87.8

**Table 5b.** Time to first progression of patients with brain/nerves cancer for period 1998-2019 (N=4,856), also showing the total of progression events (Events) and of deaths as competing risk (compet.).



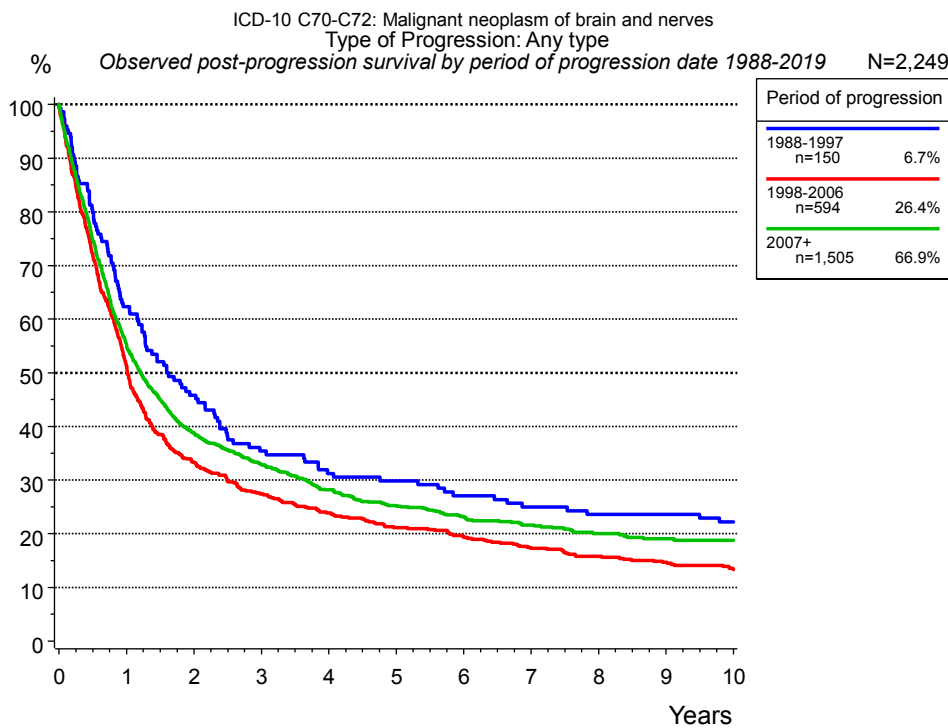


**Figure 5c.** Observed post-progression survival of 2,005 patients with brain/nerves cancer diagnosed between 1998 and 2019. These 2,005 patients with documented progression events during their course of disease represent 41.1 % of the totally 4,876 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=1,890, 38.8 %).

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.

Type of progression	
Years	Any type n=2,005 %
0	100.0
1	52.8
2	35.6
3	29.8
4	25.9
5	23.1
6	21.1
7	19.6
8	18.1
9	16.8
10	16.0

**Table 5d.** Observed post-progression survival of patients with brain/nerves cancer for period 1998-2019 (N=2,005).



**Figure 5e.** Observed post-progression (any type) survival of 2,249 patients with brain/nerves cancer diagnosed between 1988 and 2019 by period of progression.

Years	Period of progression		
	1988-1997 n=150 %	1998-2006 n=594 %	2007+ n=1,505 %
0	100.0	100.0	100.0
1	62.3	51.3	55.2
2	45.8	33.2	38.7
3	35.4	27.4	32.9
4	31.2	23.8	28.2
5	29.9	21.1	25.2
6	27.1	19.5	23.1
7	25.0	17.3	21.6
8	23.6	15.8	20.0
9	23.6	14.7	19.0
10	22.2	13.3	18.7

**Table 5f.** Observed post-progression (any type) survival of patients with brain/nerves cancer for period 1988-2019 by period of progression (N=2,249).

## 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

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