

Munich Cancer Registry



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ICD-10 C70-C72: Brain/nerves cancer

Survival

Year of diagnosis	1988-1997	1998-2014
Patients	737	5,338
Diseases	740	5,346
Cases evaluated	673	3,961
Creation date	03/02/2016	
Export date	12/23/2015	
Population	4.64 m	



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

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

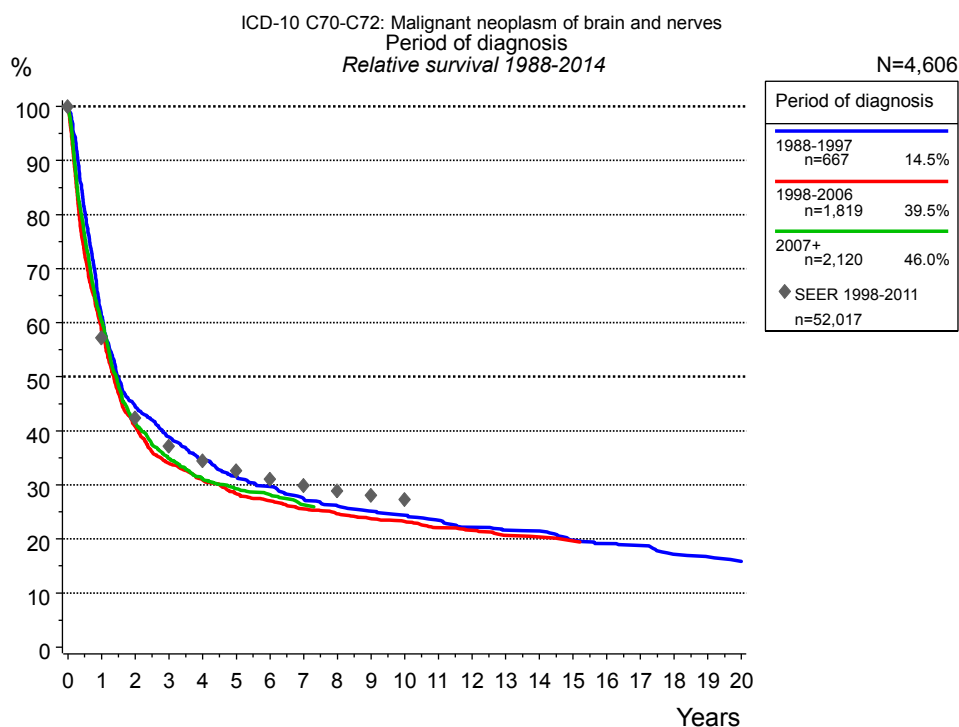


Figure 1a. Relative survival of patients with brain/nerves cancer by period of diagnosis. Included in the evaluation are 4,606 cases diagnosed between 1988 and 2014.

The presented survival curves are derived from clinical records with valid follow-up informations, which means that death certificate cases (DCO) cases are omitted from the analysis. With this one restriction, the MCR has provided population-based statistics since 1998, collecting data on all cancer cases in the region of southern Bavaria. Historical data of previous time periods can be heavily selected, therefore, univariate survival comparisons of the presented time periods must be carefully considered. Nonetheless, all calculable survival curves are depicted to facilitate the comparison of long time follow-up analyses of relative survival between particular cancers.

Years	Period of diagnosis					
	1988-1997 n=667		1998-2006 n=1,819		2007+ n=2,120	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	60.6	61.2	57.7	58.5	59.4	60.3
2	43.7	44.5	39.9	40.8	40.4	41.4
3	38.0	38.9	33.0	34.0	33.8	34.8
4	33.8	34.7	29.8	30.9	30.0	31.1
5	30.6	31.6	27.1	28.3	28.1	29.3
6	28.6	29.7	25.7	27.0	26.9	28.2
7	26.3	27.5	24.2	25.5	24.9	26.3
8	24.7	26.1	23.1	24.6		
9	23.7	25.2	22.1	23.7		
10	22.8	24.4	21.5	23.2		
11	21.8	23.5	20.2	22.1		
12	20.4	22.2	19.7	21.6		
13	19.7	21.6	18.6	20.7		
14	19.5	21.5	18.3	20.3		
15	17.8	19.8	17.9	19.6		
16	17.0	19.2				
17	16.5	18.8				
18	14.9	17.2				
19	14.4	16.7				
20	13.8	15.8				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with brain/nerves cancer by period of diagnosis for period 1988-2014 (N=4,606).

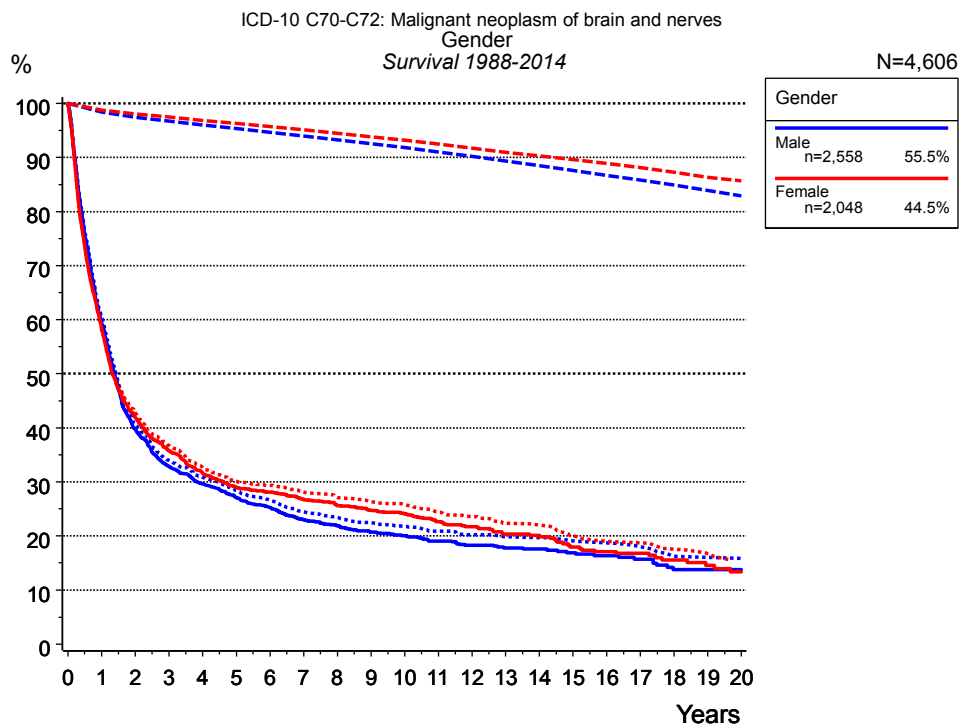


Figure 2a. Survival of patients with brain/nerves cancer by gender. Included in the evaluation are 4,606 cases diagnosed between 1988 and 2014.

Years	Gender			
	Male n=2,558		Female n=2,048	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	59.4	60.3	58.3	59.0
2	39.7	40.8	41.9	42.7
3	32.8	34.0	35.8	36.7
4	29.7	30.8	31.7	32.6
5	27.1	28.4	29.1	30.1
6	25.2	26.6	28.1	29.3
7	23.1	24.5	26.8	28.1
8	21.9	23.4	25.6	27.1
9	20.7	22.4	24.8	26.3
10	20.1	21.8	24.1	25.8
11	19.1	20.9	22.7	24.4
12	18.3	20.2	21.7	23.6
13	17.8	19.9	20.4	22.3
14	17.6	19.7	20.1	22.0
15	16.9	19.1	18.0	20.0
16	16.4	18.7	17.1	19.0
17	15.7	18.0	16.8	18.7
18	13.8	16.2	15.6	17.6
19	13.8	16.0	14.5	16.7
20	13.8	15.9		

Table 2b. Observed (obs.) and relative (rel.) survival of patients with brain/nerves cancer by gender for period 1988-2014 (N=4,606).

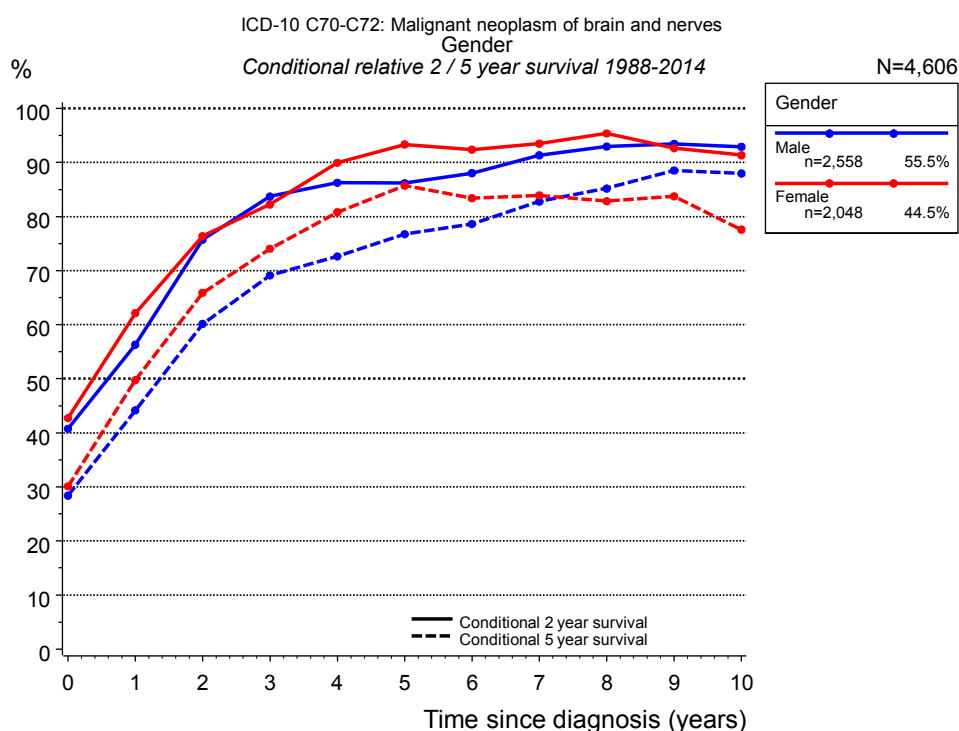


Figure 2c. Conditional relative 2 / 5-year survival of patients with brain/nerves cancer by gender. For 4,606 of 4,606 cases diagnosed between 1988 and 2014 valid data could be obtained for this item.

Years	Gender					
	Male			Female		
	n	Cond. surv. % 2 yrs	5 yrs	n	Cond. surv. % 2 yrs	5 yrs
0	2,558	40.8	28.4	2,048	42.7	30.1
1	1,473	56.3	44.2	1,147	62.1	49.8
2	924	75.7	60.2	771	76.4	65.9
3	694	83.7	69.1	601	82.2	74.1
4	570	86.3	72.6	483	90.0	80.8
5	484	86.2	76.7	414	93.3	85.7
6	392	88.0	78.6	370	92.4	83.4
7	315	91.3	82.8	308	93.5	83.9
8	260	92.9	85.2	262	95.4	82.8
9	225	93.4	88.5	234	92.7	83.8
10	198	92.9	88.0	196	91.3	77.6

Table 2d. Conditional relative 2 / 5-year survival of patients with brain/nerves cancer by gender for period 1988-2014 (N=4,606).

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 gender="Male", who are alive at least 3 years after cancer diagnosis, the conditional relative 2-year survival rate is 83.7% (n=694).

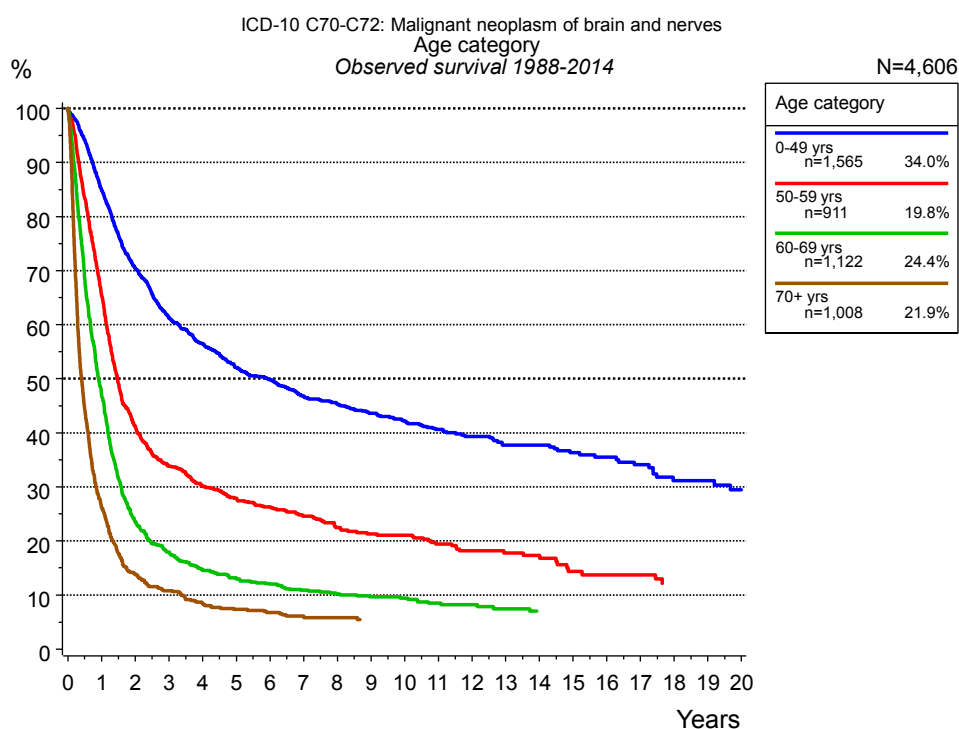


Figure 3a. Observed survival of patients with brain/nerves cancer by age category. Included in the evaluation are 4,606 cases diagnosed between 1988 and 2014.

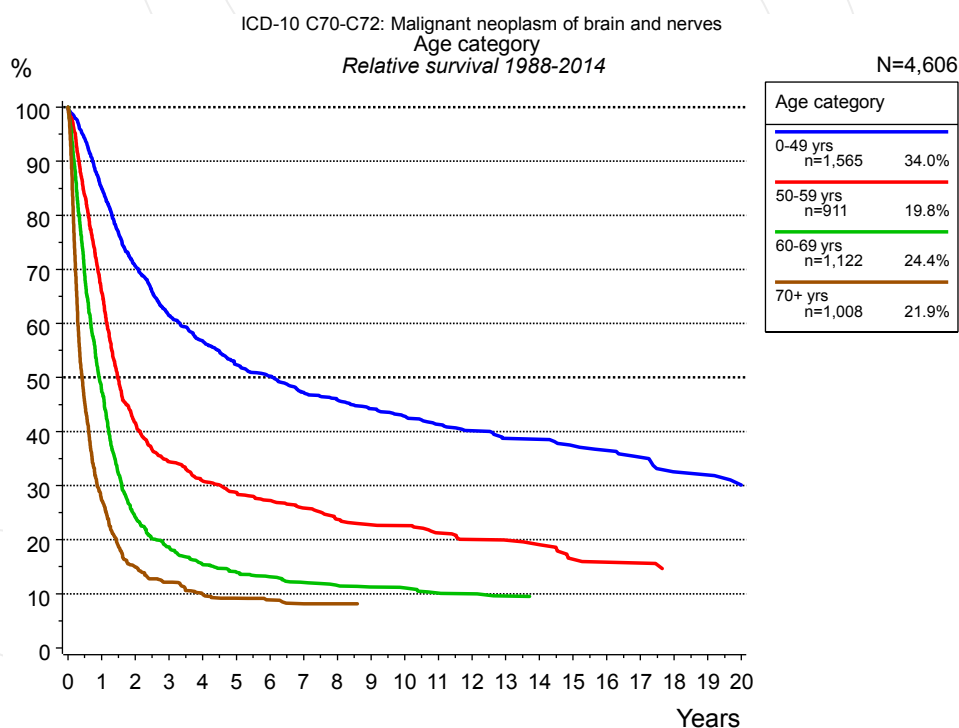


Figure 3b. Relative survival of patients with brain/nerves cancer by age category. Included in the evaluation are 4,606 cases diagnosed between 1988 and 2014.

Years	Age category							
	0-49 yrs n=1,565		50-59 yrs n=911		60-69 yrs n=1,122		70+ yrs n=1,008	
	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	84.9	85.0	65.4	65.8	47.2	47.8	26.1	27.3
2	70.4	70.6	41.3	41.7	23.6	24.1	13.8	15.0
3	61.2	61.5	33.8	34.4	18.0	18.7	10.8	12.2
4	56.5	56.8	30.2	30.9	14.6	15.4	8.4	9.9
5	52.1	52.4	27.9	28.7	13.1	14.0	7.4	9.2
6	49.9	50.3	26.3	27.2	12.0	13.1	6.8	8.9
7	46.9	47.2	24.6	25.9	10.9	12.1	6.1	8.1
8	45.3	45.8	22.5	23.8	10.2	11.6	5.8	8.1
9	43.6	44.2	21.3	22.8	9.7	11.3	5.5	8.0
10	42.2	42.8	21.1	22.6	9.5	11.1		
11	40.6	41.4	19.5	21.3	8.5	10.1		
12	39.4	40.2	18.2	20.1	8.2	10.0		
13	37.8	38.7	17.8	19.9	7.5	9.6		
14	37.8	38.6	17.3	19.1	7.0	9.2		
15	36.3	37.4	14.4	16.4				
16	35.5	36.5	13.8	15.9				
17	34.1	35.2	13.8	15.7				
18	31.2	32.5						
19	31.2	32.0						
20	29.5	30.1						

Table 3c. Observed (obs.) and relative (rel.) survival of patients with brain/nerves cancer by age category for period 1988-2014 (N=4,606).

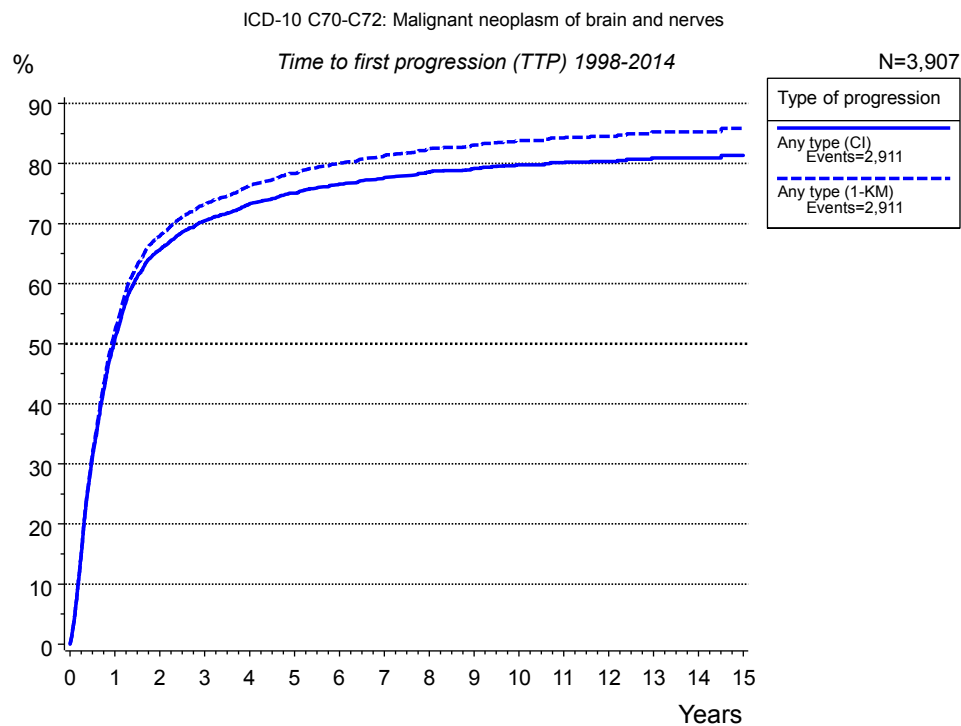


Figure 5a. Time to first progression of 3,907 patients with brain/nerves cancer diagnosed between 1998 and 2014 (M0 only in solid cancers) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Years	Type of progression	
	Any type (CI)	Any type (1-KM)
	n=3,907 %	n=3,907 %
0	0.0	0.0
1	50.9	52.3
2	65.6	68.0
3	70.5	73.2
4	73.2	76.3
5	75.0	78.3
6	76.6	80.1
7	77.6	81.3
8	78.5	82.4
9	79.2	83.1
10	79.8	83.8
11	80.1	84.2
12	80.4	84.5
13	80.9	85.2
14	80.9	85.2
15	81.3	85.8

Table 5b. Time to first progression of patients with brain/nerves cancer for period 1998-2014 (N=3,907).

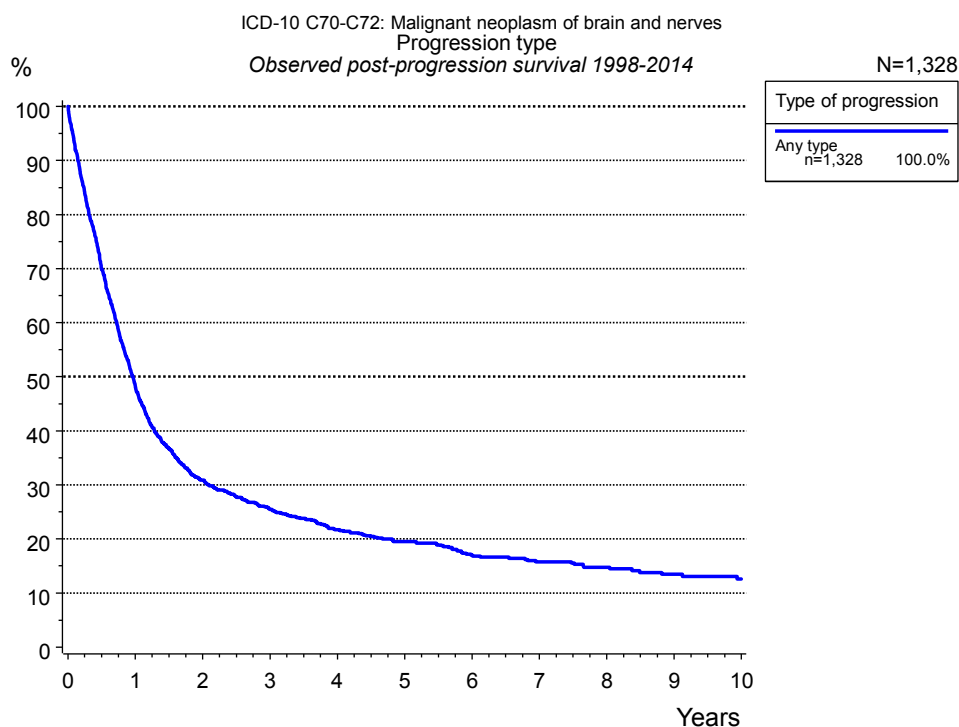


Figure 5c. Observed post-progression survival of 1,328 patients with brain/nerves cancer diagnosed between 1998 and 2014. These 1,328 patients with documented progression events during their course of disease represent 33.9 % of the totally 3,922 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=1,598, 40.7 %).

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	
Any type n=1,328	
Years	%
0	100.0
1	48.2
2	30.9
3	25.5
4	21.7
5	19.6
6	17.0
7	15.8
8	14.8
9	13.5
10	12.6

Table 5d. Observed post-progression survival of patients with brain/nerves cancer for period 1998-2014 (N=1,328).

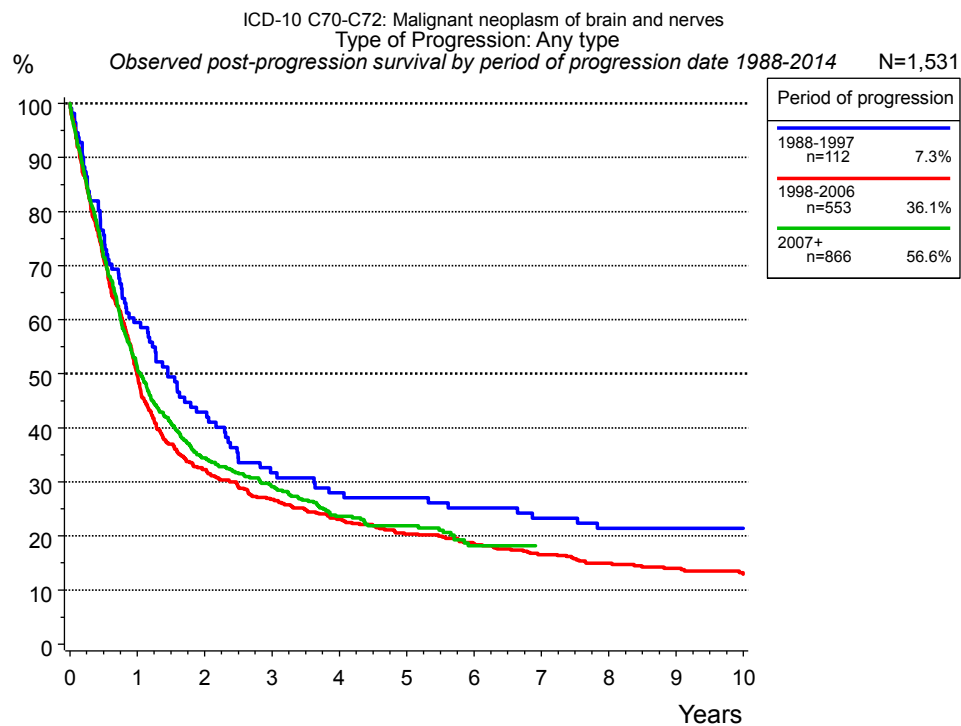


Figure 5e. Observed post-progression (any type) survival of 1,531 patients with brain/nerves cancer diagnosed between 1988 and 2014 by period of progression.

Years	Period of progression		
	1988-1997 n=112	1998-2006 n=553	2007+ n=866
	%	%	%
0	100.0	100.0	100.0
1	59.5	49.7	51.1
2	42.9	32.3	34.4
3	31.7	26.7	29.1
4	28.0	23.1	23.6
5	27.0	20.4	21.9
6	25.2	18.6	18.2
7	23.3	16.6	18.2
8	21.4	15.0	
9	21.4	14.0	
10	21.4	12.9	

Table 5f. Observed post-progression (any type) survival of patients with brain/nerves cancer for period 1988-2014 by period of progression (N=1,531).

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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