

# Munich Cancer Registry



- ▶ Baseline statistics
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Munich Cancer Registry at Munich Cancer Center  
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Germany

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

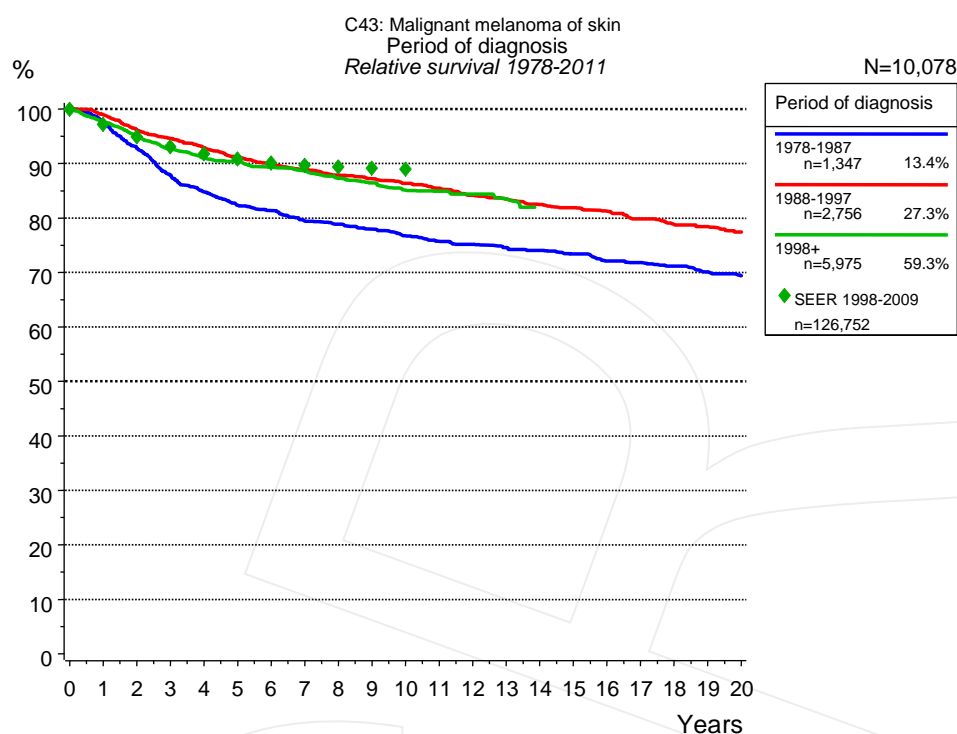
## Cancer statistics: Survival

### C43: Malignant melanoma

Year of diagnosis	1978-1987	1988-1997	1998-2011
Patients	1,488	3,134	11,489
Diseases	1,515	3,198	11,948
Creation date	04/01/2013		
Export date	01/03/2013		
Population	4.5 m		



[http://www.tumorregister-muenchen.de/en/facts/surv/surv\\_C43\\_\\_E.pdf](http://www.tumorregister-muenchen.de/en/facts/surv/surv_C43__E.pdf)



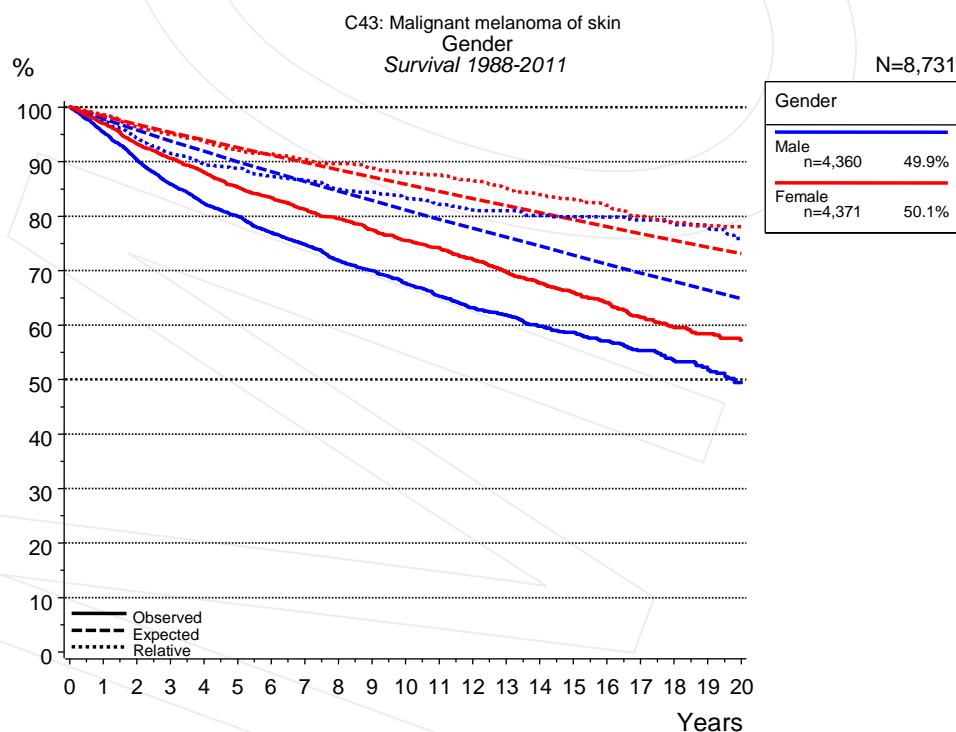
**Figure 1a.** Relative survival of patients with malignant melanoma by period of diagnosis. Included in the evaluation are 10,078 cases diagnosed between 1978 and 2011.

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 2009, and are represented by green 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					
	1978-1987		1988-1997		1998+	
	n=1,347		n=2,756		n=5,975	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	96.1	97.7	97.1	98.9	95.8	97.6
2	89.9	92.8	92.6	96.1	91.4	94.9
3	83.8	87.9	89.5	94.6	87.6	92.6
4	79.5	84.8	86.2	92.8	84.7	91.0
5	76.1	82.3	83.2	91.2	82.6	90.3
6	74.0	81.3	80.5	89.9	80.2	89.3
7	71.0	79.4	78.2	88.9	78.2	88.6
8	69.3	78.9	75.9	87.8	75.8	87.3
9	67.3	77.9	74.0	87.2	73.7	86.4
10	65.1	76.7	72.0	86.3	71.4	85.1
11	63.2	75.7	69.9	85.5	70.1	84.9
12	61.6	75.2	67.6	84.1	68.9	84.4
13	60.0	74.6	65.8	83.5	66.5	83.5
14	58.6	74.1	63.8	82.4		
15	57.0	73.4	62.4	81.9		
16	55.0	72.1	60.6	81.2		
17	53.8	71.8	58.4	79.8		
18	52.4	71.2	56.5	78.7		
19	50.6	70.1	55.1	78.4		
20	49.1	69.4	53.4	77.4		

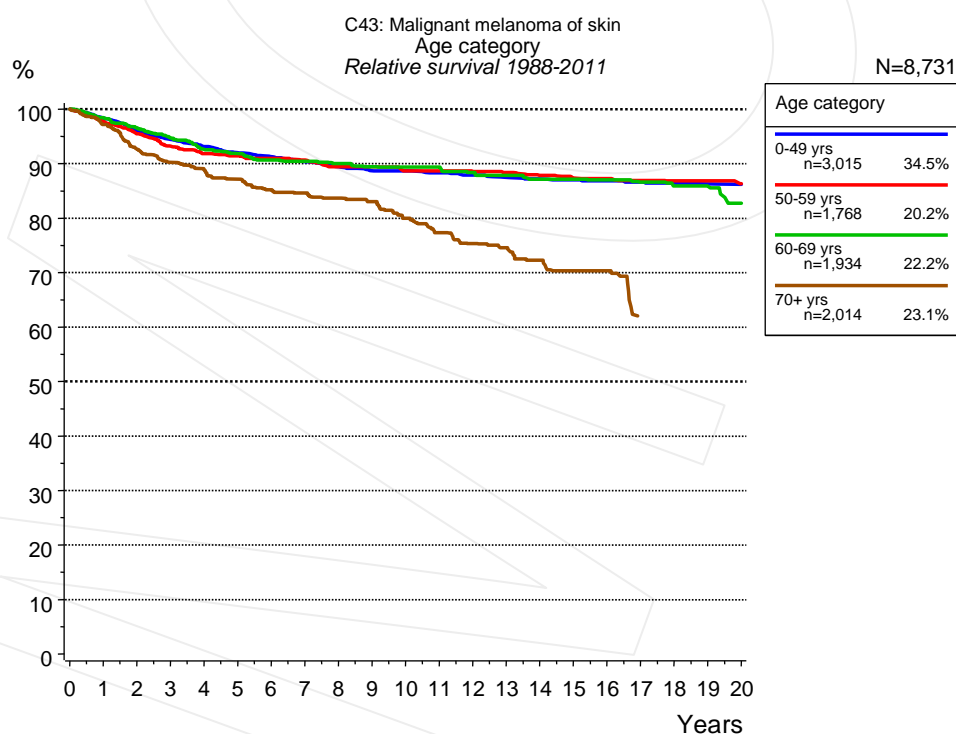
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by period of diagnosis for period 1978-2011 (N=10,078).



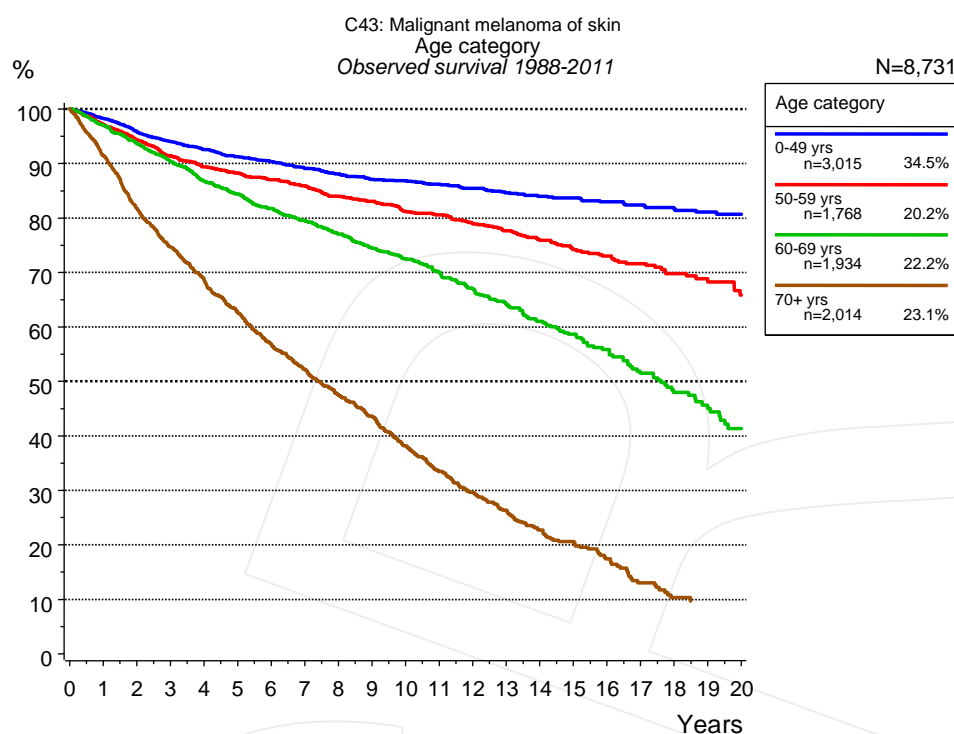
**Figure 2a.** Survival of patients with malignant melanoma by gender. Included in the evaluation are 8,731 cases diagnosed between 1988 and 2011.

Years	Gender			
	Male n=4,360		Female n=4,371	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	95.4	97.5	97.0	98.6
2	90.3	94.3	93.3	96.3
3	85.9	91.5	90.6	95.0
4	82.3	89.6	88.0	93.7
5	80.0	88.8	85.4	92.2
6	76.9	87.3	83.4	91.4
7	74.8	86.6	81.2	90.4
8	71.9	84.9	79.5	89.6
9	70.0	84.4	77.5	88.8
10	67.7	83.4	75.5	87.9
11	65.3	82.2	74.2	87.5
12	63.2	81.1	72.1	86.6
13	61.8	81.0	69.8	85.1
14	59.8	80.1	67.7	83.9
15	58.7	79.9	66.0	83.1
16	57.1	79.8	64.1	82.0
17	55.3	79.3	61.4	80.0
18	53.5	78.5	59.5	78.8
19	51.7	77.9	58.4	78.2
20	49.4	75.9	57.3	78.0

**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by gender for period 1988-2011 (N=8,731).



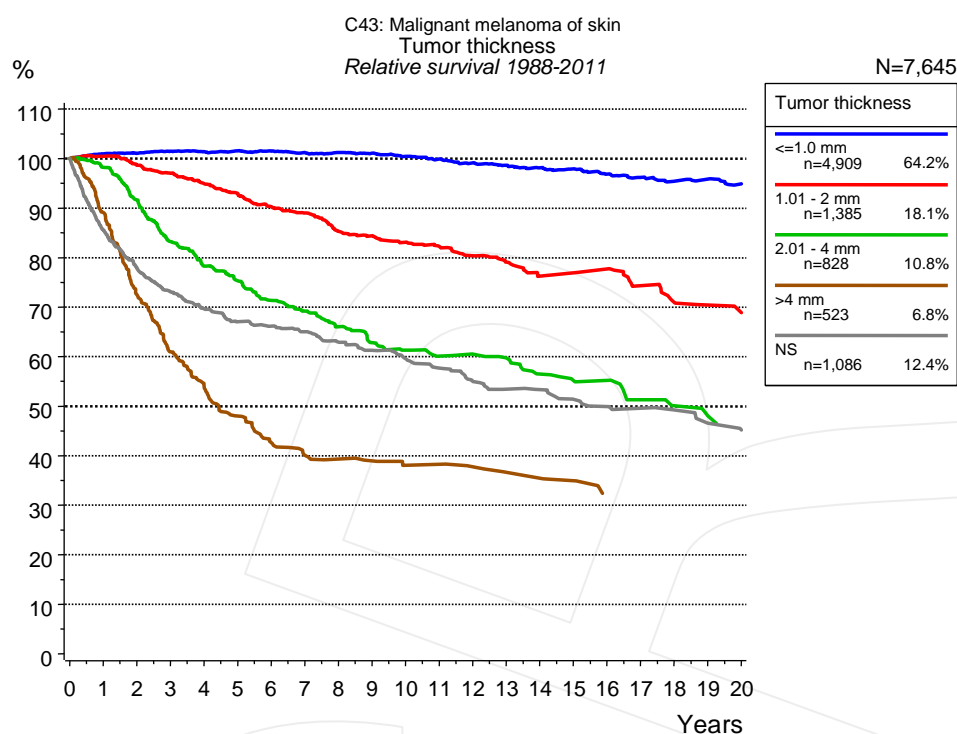
**Figure 3a.** Relative survival of patients with malignant melanoma by age category. Included in the evaluation are 8,731 cases diagnosed between 1988 and 2011.



**Figure 3b.** Observed survival of patients with malignant melanoma by age category. Included in the evaluation are 8,731 cases diagnosed between 1988 and 2011.

Years	Age category							
	0-49 yrs n=3,015		50-59 yrs n=1,768		60-69 yrs n=1,934		70+ yrs n=2,014	
	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	98.2	98.4	97.1	97.7	97.0	98.4	91.5	97.2
2	95.8	96.1	94.3	95.5	93.7	96.6	81.7	92.6
3	94.0	94.5	91.4	93.2	90.4	94.7	74.7	90.2
4	92.5	93.2	89.4	91.8	86.7	92.6	68.7	89.0
5	91.2	92.0	88.3	91.4	84.5	91.8	62.7	87.2
6	90.3	91.3	87.0	91.0	81.8	90.7	56.8	85.2
7	89.1	90.3	85.9	90.7	79.6	90.4	52.1	84.6
8	88.1	89.5	84.0	89.4	77.0	90.0	47.6	83.7
9	87.1	88.7	83.0	89.4	74.5	89.4	43.6	83.0
10	86.8	88.7	81.2	88.7	72.5	89.3	38.1	80.0
11	86.2	88.3	80.6	88.7	70.1	89.3	33.5	77.3
12	85.5	87.9	78.9	88.6	66.9	88.4	29.7	75.3
13	84.6	87.5	77.6	88.4	64.1	87.8	26.3	74.5
14	84.0	87.2	75.9	87.9	61.0	87.2	22.7	72.3
15	83.7	87.1	74.2	87.4	58.6	87.2	20.6	70.4
16	83.0	86.9	73.0	87.3	55.9	87.1	17.4	70.4
17	82.4	86.6	71.6	86.9	51.5	86.6	13.0	62.1
18	81.7	86.4	69.8	86.9	48.0	85.9		
19	81.1	86.3	68.2	86.9	45.0	85.8		
20	80.7	86.2	65.8	86.3	41.3	82.7		

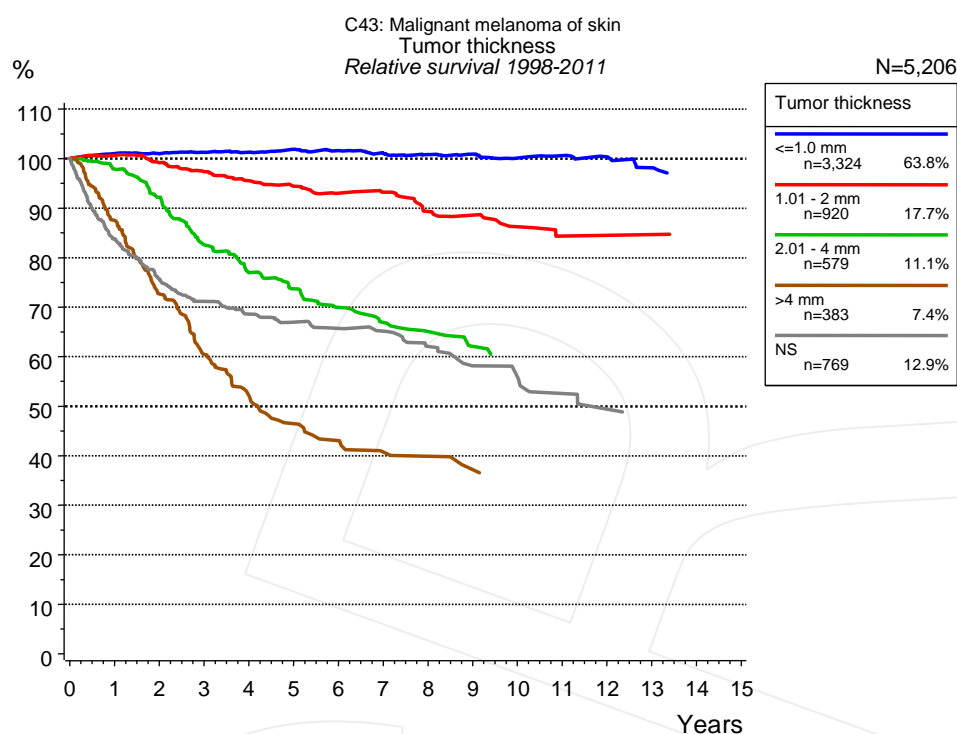
**Table 3c.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by age category for period 1988-2011 (N=8,731).



**Figure 4a.** Relative survival of patients with malignant melanoma by tumor thickness. For 8,336 of 8,731 cases diagnosed between 1988 and 2011 valid data could be obtained for this item. For a total of 7,645 cases an evaluable classification was established. The grey line represents the subgroup of 1,086 patients with missing values regarding tumor thickness (12.4% of 8,731 patients, the percent values of all other categories are related to n=7,645).

Years	Tumor thickness									
	≤1.0 mm		1.01 - 2 mm		2.01 - 4 mm		>4 mm		NS	
	n=4,909		n=1,385		n=828		n=523		n=1,086	
	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	99.5	101.0	98.7	100.4	95.8	98.2	85.5	89.0	83.5	85.6
2	98.1	101.0	95.2	98.6	87.2	91.7	67.0	72.4	74.2	77.9
3	97.0	101.5	92.1	97.0	77.1	83.2	54.4	61.0	68.1	73.1
4	95.4	101.4	88.6	94.9	70.8	78.3	46.8	53.9	63.7	69.7
5	94.1	101.6	85.3	92.9	66.6	75.3	40.3	48.0	60.0	67.0
6	92.5	101.5	81.3	90.3	61.6	71.3	34.8	42.6	58.1	66.2
7	90.8	101.2	78.6	89.0	58.3	69.2	31.6	40.1	56.0	65.1
8	89.3	101.2	74.1	85.3	54.3	66.1	30.4	39.3	53.1	62.9
9	87.8	101.1	72.0	84.4	50.5	62.8	29.5	38.9	50.6	61.3
10	85.7	100.4	69.6	83.1	48.3	61.3	27.9	38.1	48.4	59.6
11	83.8	99.9	67.6	82.3	46.3	60.1	27.9	38.3	45.9	57.7
12	81.8	99.2	64.9	80.4	45.6	60.5	26.5	37.7	42.8	54.9
13	79.9	98.7	62.6	79.1	43.9	59.7	25.0	36.6	40.9	53.4
14	78.0	98.1	59.2	76.3	40.7	56.5	24.2	35.4	40.2	53.4
15	76.5	97.9	58.9	76.9	39.1	55.1	23.3	34.9	37.9	51.4
16	74.3	96.9	58.5	77.7	38.5	55.2	20.2	32.2	36.6	50.0
17	72.3	96.2	54.6	74.3	34.7	51.3			35.6	49.6
18	70.4	95.4	51.5	70.9	33.0	50.1			34.4	49.3
19	69.6	95.9	49.9	70.4	30.9	48.0			31.9	46.5
20	67.5	94.9	48.3	68.9	29.7	45.9			30.7	45.2

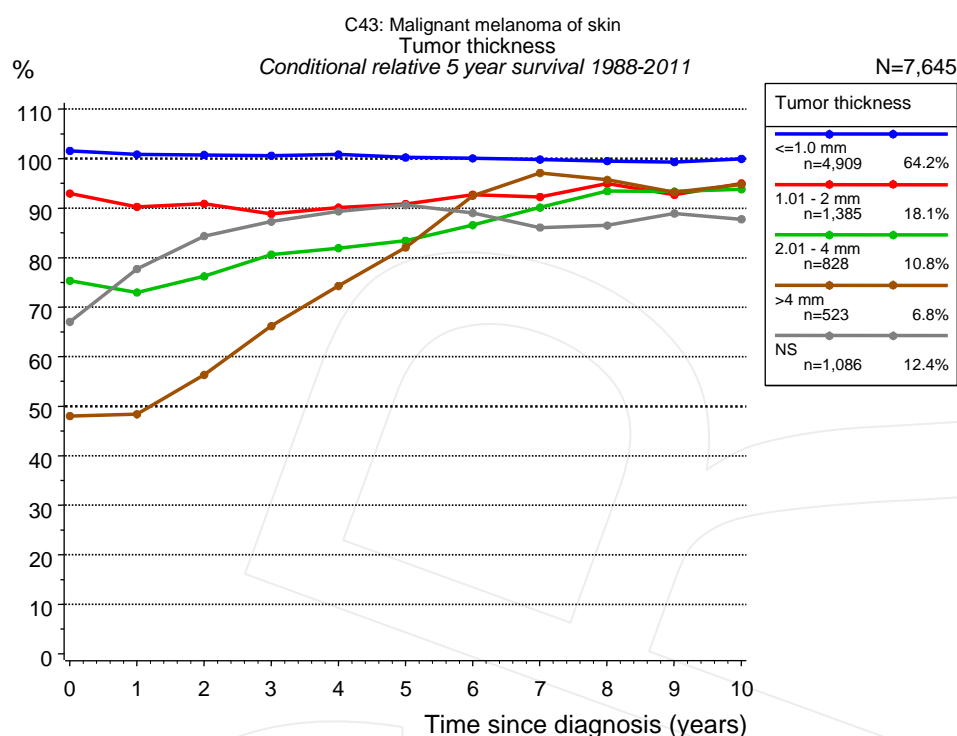
**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by tumor thickness for period 1988-2011 (N=7,645).



**Figure 4c.** Relative survival of patients with malignant melanoma by tumor thickness. For 5,699 of 5,975 cases diagnosed between 1998 and 2011 valid data could be obtained for this item. For a total of 5,206 cases an evaluable classification was established. The grey line represents the subgroup of 769 patients with missing values regarding tumor thickness (12.9% of 5,975 patients, the percent values of all other categories are related to n=5,206).

		Tumor thickness									
		≤1.0 mm n=3,324		1.01 - 2 mm n=920		2.01 - 4 mm n=579		>4 mm n=383		NS n=769	
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		99.6	101.0	98.9	100.6	95.4	97.8	84.1	87.5	81.6	83.8
2		98.2	101.0	95.8	99.2	87.4	92.2	67.2	72.7	72.0	75.7
3		97.0	101.3	92.5	97.4	76.3	82.6	54.1	60.5	66.1	71.2
4		95.7	101.3	89.2	95.5	69.3	77.0	45.9	52.1	62.5	68.6
5		94.8	101.8	86.7	94.5	64.9	73.7	39.3	46.5	59.6	67.0
6		93.0	101.6	83.8	93.0	60.0	69.9	35.6	43.1	57.3	65.7
7		91.2	101.1	82.5	93.2	56.2	66.9	32.3	40.7	55.7	65.2
8		89.5	100.7	77.8	89.3	53.4	65.0	31.4	39.9	51.6	62.1
9		88.4	100.9	75.9	88.6	49.8	62.1	28.7	37.2	47.0	58.1
10		86.3	100.1	72.4	86.2	48.0	60.0			44.8	55.8
11		85.4	100.5	69.3	84.3	48.0	59.3			41.4	52.5
12		83.9	100.3	69.3	84.5	48.0	58.6			38.5	49.4
13		80.8	98.2	69.3	84.6	48.0	57.9				

**Table 4d.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by tumor thickness for period 1998-2011 (N=5,206).



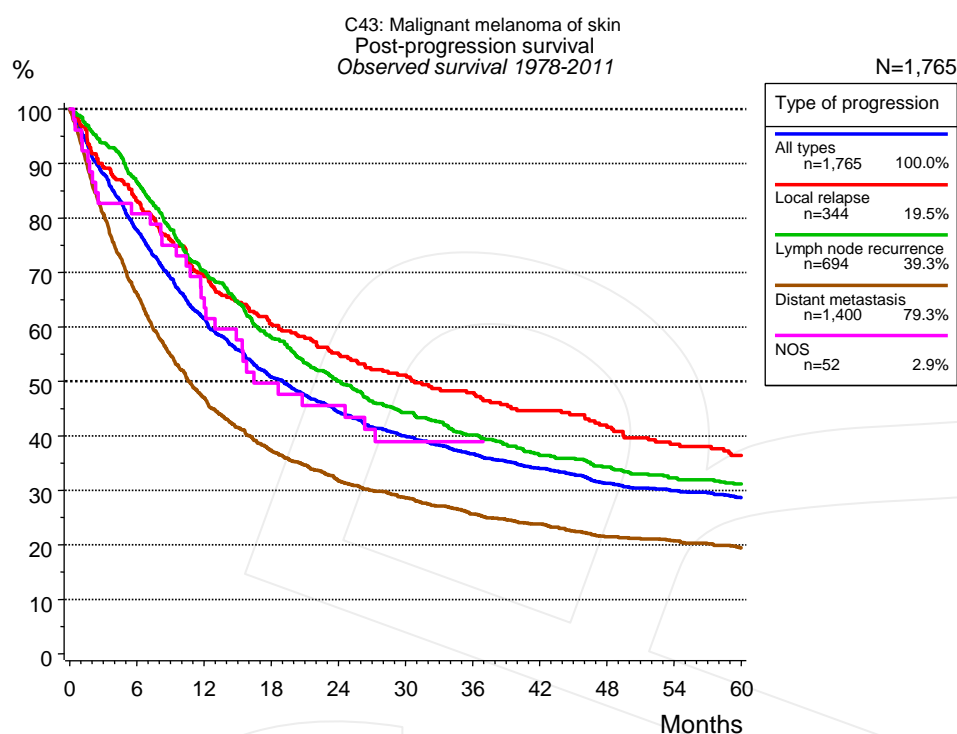
**Figure 4e.** Conditional relative 5-year survival of patients with malignant melanoma by tumor thickness. For 8,336 of 8,731 cases diagnosed between 1988 and 2011 valid data could be obtained for this item. For a total of 7,645 cases an evaluable classification was established. The grey line represents the subgroup of 1,086 patients with missing values regarding tumor thickness (12.4% of 8,731 patients, the percent values of all other categories are related to n=7,645).

Years	Tumor thickness									
	≤1.0 mm		1.01 - 2 mm		2.01 - 4 mm		>4 mm		NS	
	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	4,909	101.6	1,385	92.9	828	75.3	523	48.0	1,086	67.0
1	4,670	100.8	1,318	90.2	761	72.9	424	48.4	861	77.7
2	4,229	100.7	1,178	90.9	648	76.2	297	56.3	714	84.3
3	3,804	100.6	1,047	88.8	528	80.6	211	66.2	603	87.3
4	3,399	100.8	907	90.1	447	81.9	163	74.3	500	89.3
5	3,005	100.2	781	90.8	368	83.4	120	82.1	412	90.6
6	2,627	100.0	661	92.7	299	86.6	93	92.5	349	89.0
7	2,358	99.8	583	92.2	263	90.1	78	97.1	314	86.1
8	2,120	99.5	498	94.9	219	93.4	70	95.7	260	86.5
9	1,877	99.3	433	92.7	192	93.3	60	93.2	230	88.9
10	1,666	99.9	374	95.0	160	93.8	50	94.8	198	87.7

**Table 4f.** Conditional relative 5-year survival of patients with malignant melanoma by tumor thickness for period 1988-2011 (N=7,645).

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 tumor thickness="≤1.0 mm", who are alive at least 3 years after cancer diagnosis, the conditional relative 5-year survival rate is 100.6% (n=3,804).





**Figure 5a.** Observed post-progression survival of 1,765 patients with malignant melanoma diagnosed between 1978 and 2011 (incl. M1). These 1,765 patients with documented progression events during their course of disease represent 17.5% of the totally 10,078 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=141, 1.4%). 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 n=1,765 %	Local relapse n=344 %	Lymph node recurrence n=694 %	Distant metastasis n=1,400 %	NOS n=52 %
0	100.0	100.0	100.0	100.0	100.0
12	61.5	69.2	70.1	47.0	63.5
24	44.3	55.2	50.0	31.8	45.5
36	36.7	47.9	40.2	25.7	38.9
48	31.3	41.6	34.3	21.5	
60	28.6	36.4	31.2	19.4	

**Table 5b.** Observed post-progression survival of patients with malignant melanoma for period 1978-2011 (N=1,765).

**Shortcuts**

AS	Assembled survival chart (observed, expected, relative)
CS	Conditional survival
DCO	Death certificate only. The death certificate provides the only notification to the registry.
MCR	Munich Cancer Registry, Germany (Tumorregister München)
NA	Not available
NCI	National Cancer Institute, USA
NOS	Not otherwise specified
OS	Observed/overall survival (Kaplan-Meier estimate)
PPS	Post-progression survival
RS	Relative Survival. Ratio of observed and expected survival (derived from the normal population)
SEER	Surveillance, Epidemiology, and End Results, USA
TTP	Time to progression Date of entry: Date of diagnosis Event (Progression): First local recurrence, lymph node relapse or distant metastasis, unspecified recurrence First all-cause recurrence is illustrated by survival curves (Kaplan-Meier estimate). First local recurrence, lymph node relapse or distant metastasis are depicted cumulatively, where applicable ("reverse" Kaplan-Meier estimate).
UICC	Union for International Cancer Control, Geneva

**Recommended Citation**

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