

# Munich Cancer Registry



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

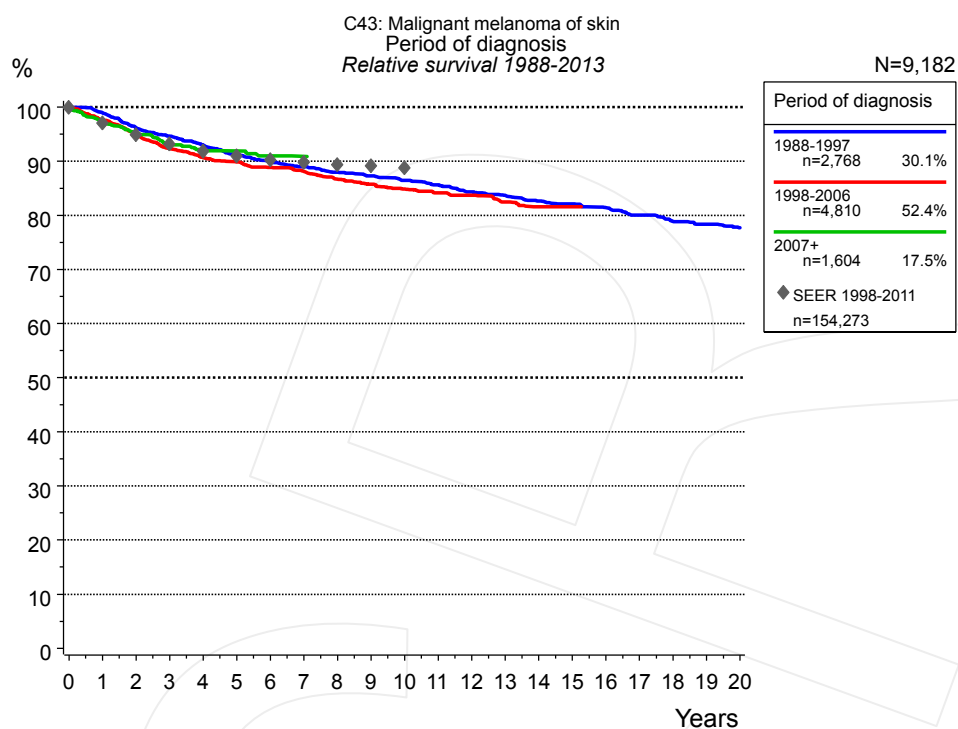
## Cancer statistics: Survival

### C43: Malignant melanoma

Year of diagnosis	1988-2013
Patients	17,214
Diseases	17,982
Cases evaluated	9,182
Creation date	05/13/2015
Export date	12/30/2014
Population	4.64 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)



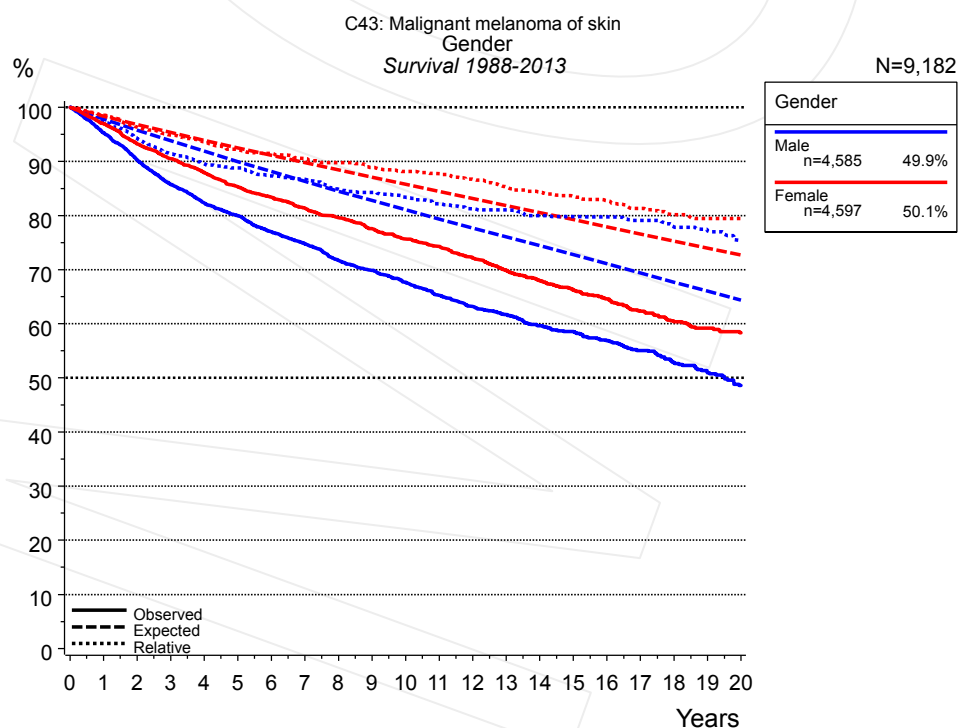
**Figure 1a.** Relative survival of patients with malignant melanoma by period of diagnosis. Included in the evaluation are 9,182 cases diagnosed between 1988 and 2013.

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.

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		1998-2006		2007+	
	n=2,768		n=4,810		n=1,604	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	97.1	98.9	95.8	97.6	95.4	97.3
2	92.6	96.1	91.4	94.8	91.7	95.3
3	89.5	94.6	87.4	92.3	87.9	93.0
4	86.3	92.9	84.5	90.6	85.1	91.9
5	83.3	91.3	82.3	89.9	83.8	91.8
6	80.6	90.0	79.9	88.8	81.2	91.0
7	78.3	89.0	78.0	88.1	80.0	90.9
8	76.0	87.9	75.3	86.6		
9	74.1	87.3	73.2	85.7		
10	72.1	86.4	71.2	84.9		
11	70.0	85.6	69.5	84.2		
12	67.7	84.3	67.9	83.7		
13	66.0	83.6	65.6	82.5		
14	64.0	82.6	63.7	81.5		
15	62.5	82.1	62.7	81.5		
16	60.7	81.4				
17	58.6	80.1				
18	56.5	78.9				
19	55.0	78.3				
20	53.4	77.7				

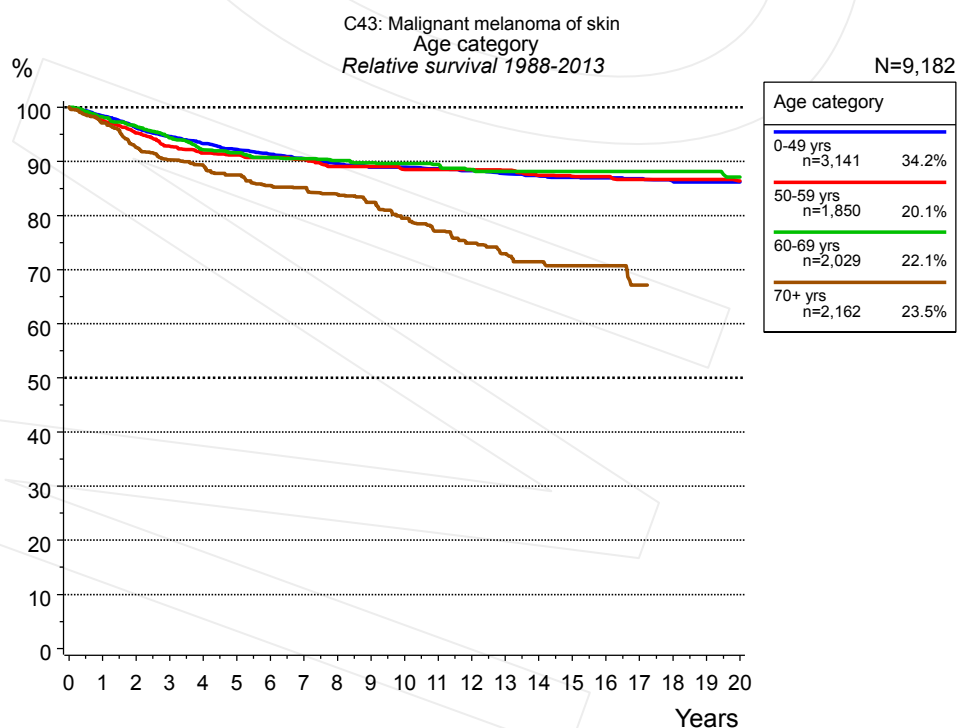
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by period of diagnosis for period 1988-2013 (N=9,182).



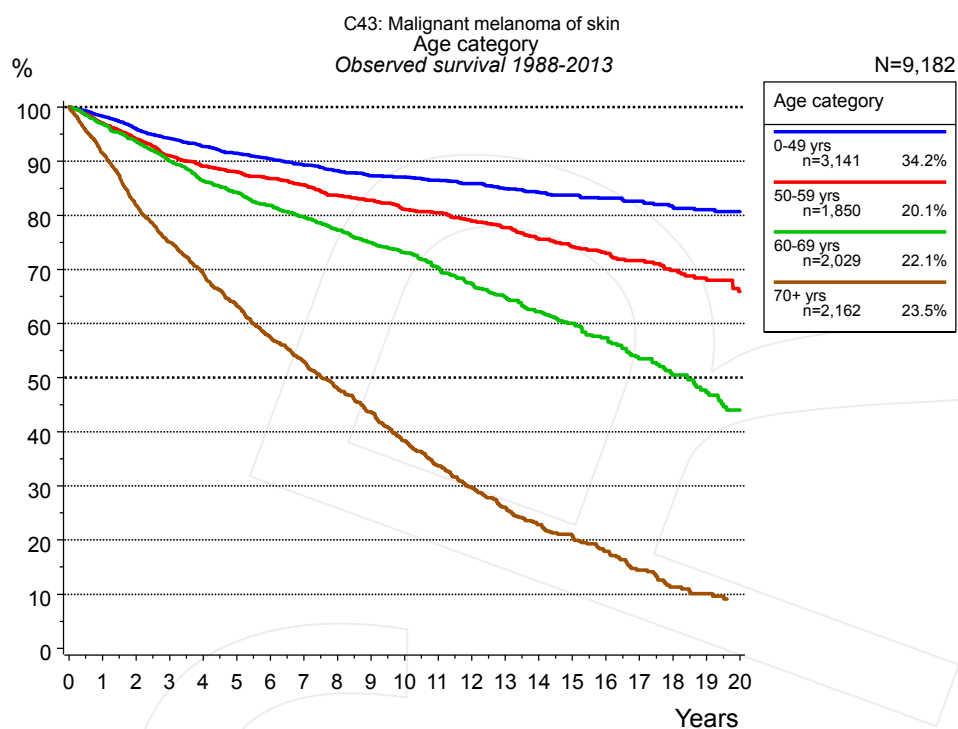
**Figure 2a.** Survival of patients with malignant melanoma by gender. Included in the evaluation are 9,182 cases diagnosed between 1988 and 2013.

Years	Gender			
	Male n=4,585		Female n=4,597	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	95.3	97.4	97.0	98.6
2	90.3	94.2	93.3	96.3
3	85.8	91.4	90.5	94.9
4	82.3	89.6	87.9	93.6
5	80.0	88.8	85.3	92.2
6	77.0	87.3	83.4	91.5
7	74.8	86.7	81.3	90.6
8	71.8	84.9	79.6	89.8
9	69.8	84.3	77.5	88.9
10	67.7	83.4	75.7	88.1
11	65.2	82.1	74.3	87.8
12	63.2	81.2	72.1	86.7
13	61.7	81.0	69.8	85.3
14	59.7	80.0	68.0	84.3
15	58.6	79.8	66.2	83.5
16	56.9	79.7	64.6	82.8
17	55.1	79.1	62.3	81.3
18	52.8	77.9	60.4	80.2
19	51.0	77.2	59.2	79.5
20	48.6	75.4	58.3	79.5

**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by gender for period 1988-2013 (N=9,182).



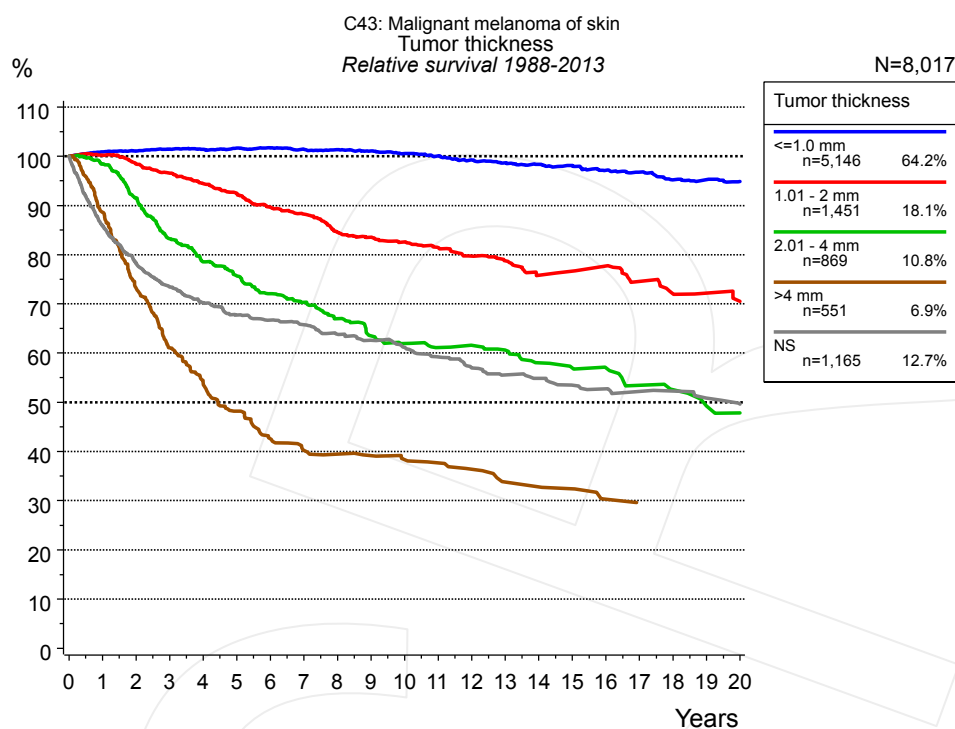
**Figure 3a.** Relative survival of patients with malignant melanoma by age category. Included in the evaluation are 9,182 cases diagnosed between 1988 and 2013.



**Figure 3b.** Observed survival of patients with malignant melanoma by age category. Included in the evaluation are 9,182 cases diagnosed between 1988 and 2013.

Years	Age category							
	0-49 yrs n=3,141		50-59 yrs n=1,850		60-69 yrs n=2,029		70+ yrs n=2,162	
	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	98.3	98.4	97.0	97.6	96.9	98.2	91.5	97.2
2	95.9	96.2	94.0	95.2	93.7	96.5	81.9	92.6
3	94.2	94.6	91.0	92.8	90.0	94.4	75.0	90.3
4	92.7	93.3	89.1	91.5	86.4	92.2	69.3	89.3
5	91.5	92.2	88.1	91.2	84.3	91.6	63.4	87.5
6	90.4	91.4	86.8	90.7	81.9	90.7	57.5	85.6
7	89.3	90.5	85.7	90.4	79.7	90.5	53.0	85.1
8	88.2	89.6	83.7	89.1	77.3	90.1	48.0	83.9
9	87.3	89.0	82.8	89.1	74.9	89.7	43.7	82.4
10	87.1	88.9	81.2	88.5	73.2	89.6	38.4	79.5
11	86.5	88.7	80.4	88.5	70.4	89.4	33.7	77.1
12	85.9	88.3	78.9	88.5	67.4	88.5	29.7	74.9
13	84.9	87.8	77.8	88.4	64.8	88.2	26.1	72.9
14	84.2	87.4	75.6	87.4	62.2	88.1	22.9	71.4
15	83.7	87.1	74.2	87.3	60.1	88.1	20.9	70.7
16	83.1	87.0	73.0	87.2	57.4	88.1	17.9	70.7
17	82.6	86.8	71.6	86.7	53.5	88.1	14.5	67.1
18	81.5	86.3	69.8	86.7	50.5	88.1		
19	81.0	86.2	68.0	86.7	47.3	88.1		
20	80.7	86.2	66.0	86.4	44.0	87.1		

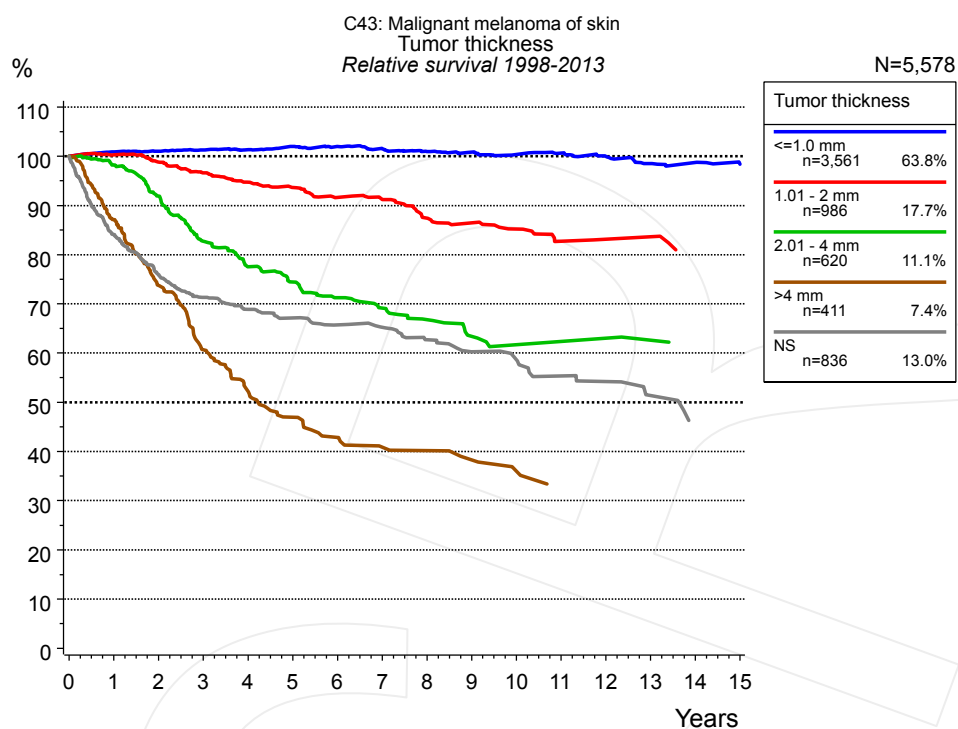
**Table 3c.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by age category for period 1988-2013 (N=9,182).



**Figure 4a.** Relative survival of patients with malignant melanoma by tumor thickness. For 8,749 of 9,182 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 8,017 cases an evaluable classification was established. The grey line represents the subgroup of 1,165 patients with missing values regarding tumor thickness (12.7% of 9,182 patients, the percent values of all other categories are related to n=8,017).

Years	Tumor thickness									
	<=1.0 mm n=5,146		1.01 - 2 mm n=1,451		2.01 - 4 mm n=869		>4 mm n=551		NS n=1,165	
	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	99.4	100.9	98.5	100.2	95.9	98.4	85.1	88.6	83.8	85.9
2	98.1	101.1	95.1	98.4	86.9	91.5	67.8	73.2	74.6	78.2
3	97.0	101.5	91.7	96.6	77.1	83.3	54.6	61.1	68.6	73.4
4	95.4	101.4	88.1	94.4	71.0	78.6	46.8	53.9	64.3	70.2
5	94.2	101.7	84.9	92.5	66.8	75.7	40.4	48.2	60.7	67.7
6	92.6	101.7	80.8	89.7	62.0	72.1	34.8	42.6	58.7	66.7
7	90.9	101.4	78.1	88.3	59.1	70.3	31.8	40.2	56.7	65.7
8	89.3	101.3	73.5	84.6	54.9	67.0	30.6	39.5	54.0	63.8
9	87.7	101.1	71.3	83.6	51.0	63.5	29.8	39.2	51.8	62.6
10	85.7	100.5	69.2	82.6	48.6	62.0	28.4	38.4	49.8	61.1
11	83.9	100.1	66.9	81.5	46.9	61.1	27.4	37.7	47.2	59.2
12	81.7	99.3	64.3	79.8	46.3	61.6	25.7	36.4	44.5	56.9
13	79.9	98.7	62.3	78.8	44.5	60.7	23.2	33.8	42.6	55.5
14	78.2	98.4	58.8	75.9	41.8	58.0	22.5	32.9	41.3	54.9
15	76.6	98.1	58.5	76.6	40.3	57.0	21.8	32.5	39.4	53.5
16	74.4	97.1	58.2	77.7	39.2	57.0	19.2	30.3	38.3	52.7
17	72.7	96.8	54.5	74.6	36.1	53.5	18.2	29.6	37.2	52.2
18	70.1	95.2	51.9	72.1	34.5	52.6	18.2	28.6	36.1	52.2
19	68.9	95.3	50.6	72.2	31.4	49.2			34.4	50.8
20	67.1	94.9	48.7	70.6	30.3	47.8			32.9	49.6

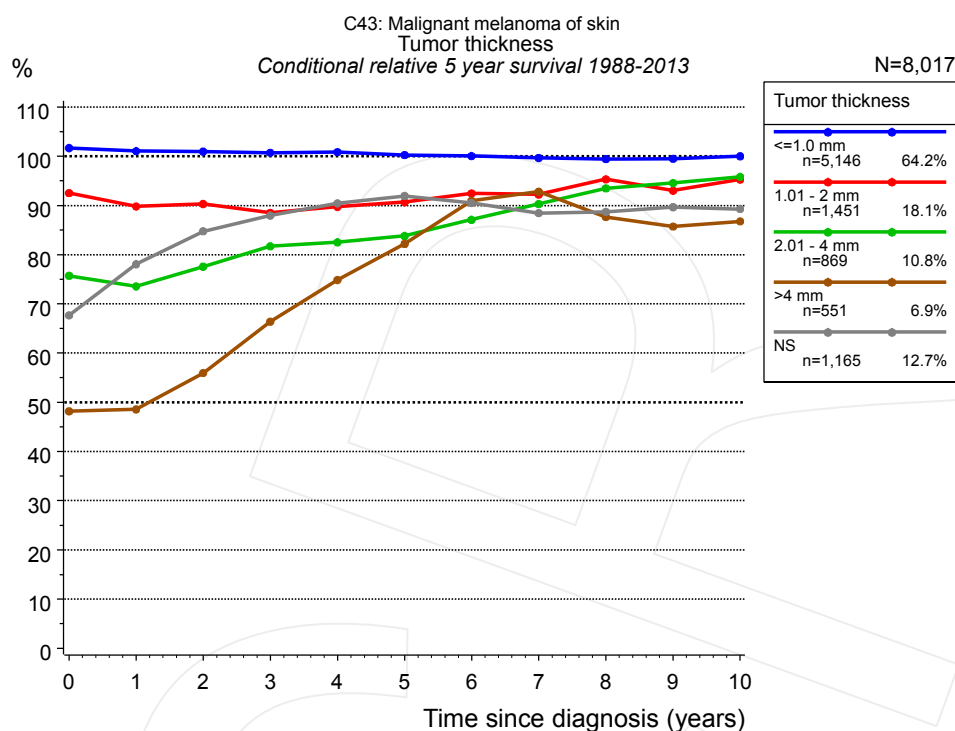
**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by tumor thickness for period 1988-2013 (N=8,017).



**Figure 4c.** Relative survival of patients with malignant melanoma by tumor thickness. For 6,112 of 6,414 cases diagnosed between 1998 and 2013 valid data could be obtained for this item. For a total of 5,578 cases an evaluable classification was established. The grey line represents the subgroup of 836 patients with missing values regarding tumor thickness (13.0% of 6,414 patients, the percent values of all other categories are related to n=5,578).

Years	Tumor thickness									
	≤1.0 mm n=3,561		1.01 - 2 mm n=986		2.01 - 4 mm n=620		>4 mm n=411		NS n=836	
	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	100.9	98.6	100.3	95.5	98.2	83.7	87.1	82.0	84.1
2	98.2	101.0	95.5	98.8	87.0	91.9	68.3	73.7	72.3	76.0
3	97.0	101.3	91.8	96.6	76.3	82.7	54.3	60.7	66.4	71.3
4	95.7	101.4	88.5	94.7	69.7	77.5	45.9	52.2	62.8	68.9
5	94.8	102.0	85.9	93.6	65.4	74.4	39.6	46.9	59.9	67.1
6	93.3	102.0	82.6	91.6	61.0	71.2	35.4	42.8	57.5	65.7
7	91.5	101.5	81.0	91.3	57.9	69.1	32.5	40.9	55.9	65.2
8	89.5	101.0	76.3	87.4	54.5	66.8	31.6	40.2	52.4	62.7
9	88.0	100.8	74.1	86.5	50.7	63.4	29.5	38.3	49.1	60.2
10	86.2	100.4	71.6	85.2	48.4	61.7	27.1	36.0	47.1	58.6
11	85.1	100.7	67.9	82.7	48.4	62.4	24.2	32.2	43.6	55.4
12	83.0	100.0	67.1	83.2	48.4	63.0			41.8	54.2
13	80.6	98.5	67.1	83.7	47.1	62.6			38.1	51.4
14	79.4	98.8								
15	77.7	98.4								

**Table 4d.** Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by tumor thickness for period 1998-2013 (N=5,578).



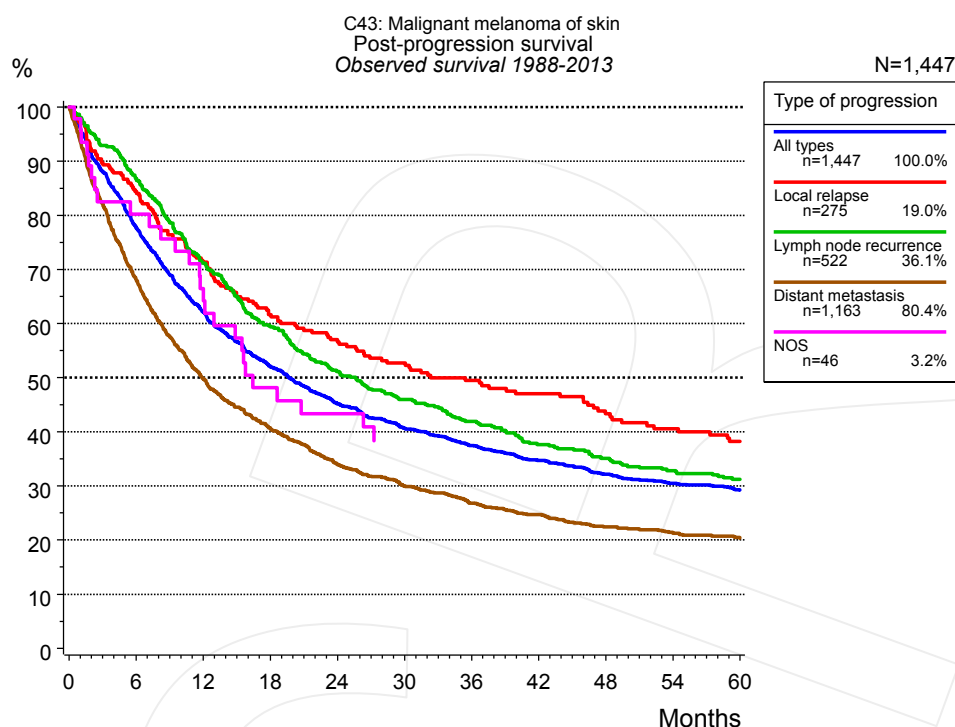
**Figure 4e.** Conditional relative 5-year survival of patients with malignant melanoma by tumor thickness. For 8,749 of 9,182 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 8,017 cases an evaluable classification was established. The grey line represents the subgroup of 1,165 patients with missing values regarding tumor thickness (12.7% of 9,182 patients, the percent values of all other categories are related to n=8,017).

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	5,146	101.7	1,451	92.5	869	75.7	551	48.2	1,165	67.7
1	4,933	101.1	1,384	89.8	804	73.6	448	48.6	926	78.1
2	4,503	101.0	1,262	90.3	684	77.6	329	56.0	775	84.8
3	4,054	100.7	1,124	88.5	558	81.7	234	66.4	655	88.0
4	3,615	100.9	966	89.7	474	82.5	176	74.9	554	90.4
5	3,230	100.3	839	90.7	397	83.8	132	82.2	464	91.9
6	2,831	100.0	715	92.5	331	87.1	102	91.0	396	90.5
7	2,547	99.7	627	92.2	288	90.3	82	92.8	357	88.4
8	2,299	99.4	537	95.3	234	93.5	74	87.7	306	88.7
9	2,050	99.5	479	93.0	202	94.6	67	85.7	276	89.7
10	1,840	100.0	416	95.3	174	95.8	61	86.8	236	89.3

**Table 4f.** Conditional relative 5-year survival of patients with malignant melanoma by tumor thickness for period 1988-2013 (N=8,017).

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 100.7% (n=4,054).





**Figure 5a.** Observed post-progression survival of 1,447 patients with malignant melanoma diagnosed between 1988 and 2013 (incl. M1). These 1,447 patients with documented progression events during their course of disease represent 15.8% of the totally 9,182 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=127, 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=1,447	Local relapse n=275	Lymph node recurrence n=522	Distant metastasis n=1,163	NOS n=46
	%	%	%	%	%
0	100.0	100.0	100.0	100.0	100.0
12	62.1	71.3	71.2	49.9	64.2
24	45.2	57.0	51.2	33.9	43.3
36	37.5	49.5	41.9	26.9	
48	32.2	43.3	35.1	22.4	
60	29.2	38.2	31.2	20.3	

**Table 5b.** Observed post-progression survival of patients with malignant melanoma for period 1988-2013 (N=1,447).

**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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