

Munich Cancer Registry



- ▶ Incidence and Mortality
- ▶ Selection Matrix
- ▶ Homepage
- ▶ *Deutsch*

ICD-10 C43: Malignant melanoma

Survival

Year of diagnosis	1988-1997	1998-2016
Patients	3,164	17,691
Diseases	3,229	18,558
Cases evaluated	2,938	14,090
Creation date	08/22/2018	
Export date	08/09/2018	
Population	4.81 m	



Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninstr. 15
Munich, 81377
Germany

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

https://www.tumorregister-muenchen.de/en/facts/surv/sC43__E-ICD-10-C43-Malignant-melanoma-survival.pdf

Index of figures and tables

Fig./Tbl.		Page
1a	Relative survival by period of diagnosis (chart)	3
1b	Survival by period of diagnosis (table)	3
2a	Survival by sex (chart)	4
2b	Survival by sex (table)	4
3a	Observed survival by age category (chart)	5
3b	Relative survival by age category (chart)	5
3c	Survival by age category (table)	6
4a	Relative survival by tumor thickness (chart)	7
4b	Survival by tumor thickness (table)	7
4c	Relative survival by tumor thickness (chart)	8
4d	Survival by tumor thickness (table)	8
4e	Conditional survival by tumor thickness (chart)	9
4f	Conditional survival by tumor thickness (table)	9
5a	Time to first progression (chart)	10
5b	Time to first progression (table)	10
5c	Observed post-progression survival (chart)	12
5d	Observed post-progression survival (table)	12
5e	Observed post-progression survival by period of progression (chart)	13
5f	Observed post-progression survival by period of progression (table)	13

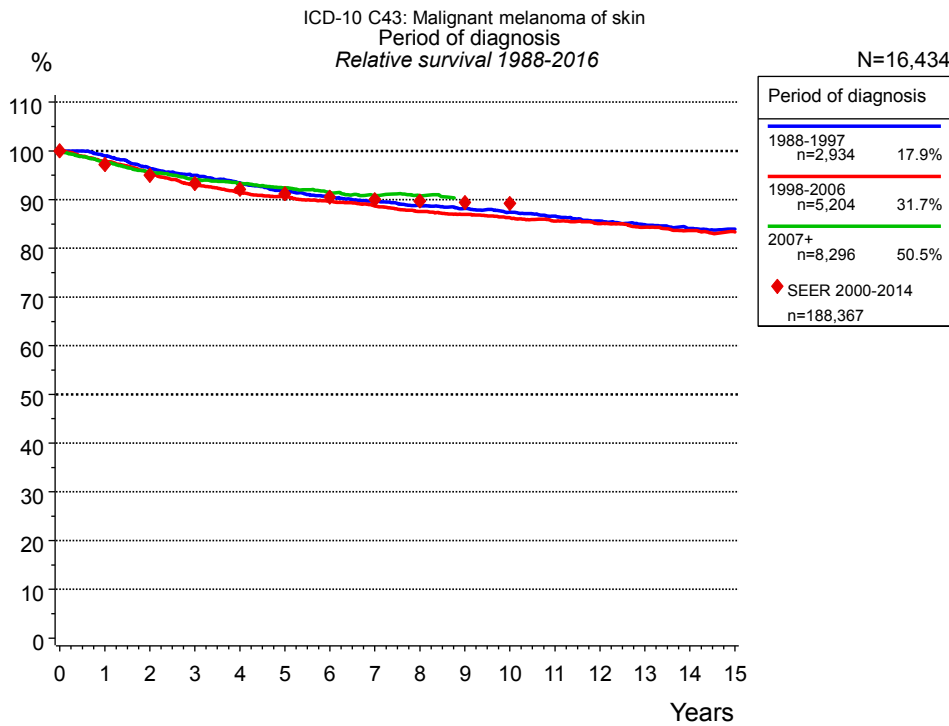


Figure 1a. Relative survival of patients with malignant melanoma by period of diagnosis. Included in the evaluation are 16,434 cases diagnosed between 1988 and 2016.

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 2014, 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 n=2,934		1998-2006 n=5,204		2007+ n=8,296	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	97.2	99.0	96.1	97.8	95.9	97.7
2	92.9	96.4	91.9	95.3	92.3	95.7
3	90.0	95.0	88.1	93.0	89.2	94.1
4	86.9	93.4	85.2	91.4	86.9	93.3
5	84.0	91.9	83.0	90.5	84.6	92.4
6	81.4	90.6	80.8	89.7	82.3	91.5
7	79.2	89.7	78.6	88.7	80.2	90.8
8	77.0	88.8	76.3	87.5	78.7	90.7
9	75.2	88.2	74.5	86.9		
10	73.2	87.4	72.7	86.3		
11	71.3	86.6	70.9	85.6		
12	69.2	85.6	69.3	85.1		
13	67.3	84.8	67.5	84.3		
14	65.6	84.1	65.8	83.6		
15	64.2	83.9	64.5	83.4		

Table 1b. Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by period of diagnosis for period 1988-2016 (N=16,434).

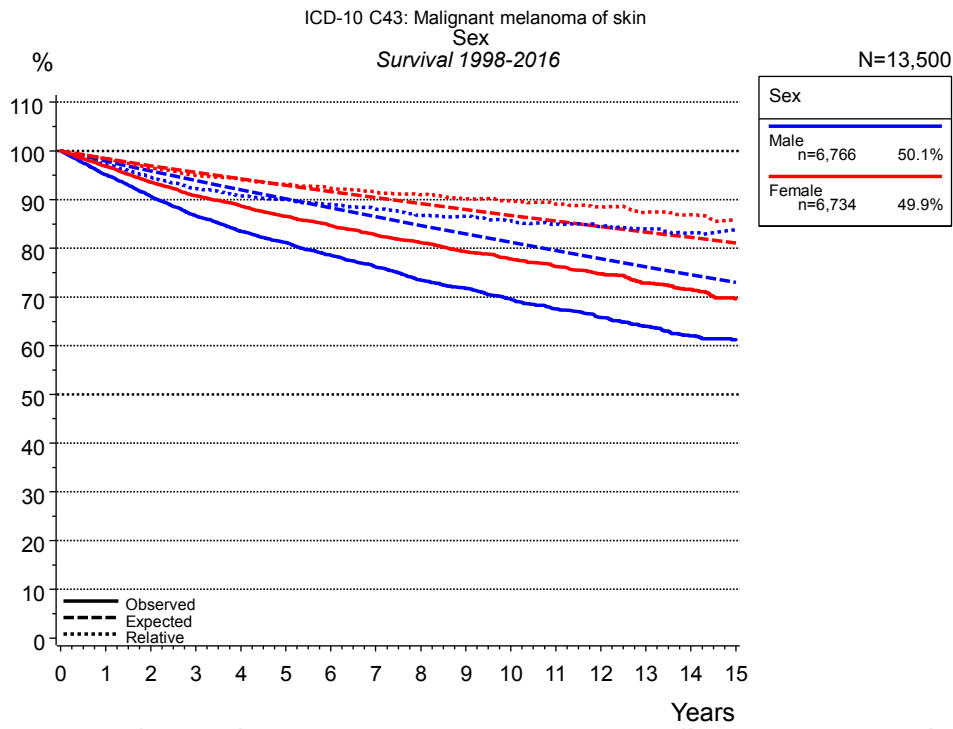


Figure 2a. Survival of patients with malignant melanoma by sex. Included in the evaluation are 13,500 cases diagnosed between 1998 and 2016.

Years	Sex			
	Male n=6,766		Female n=6,734	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	95.1	97.2	96.8	98.4
2	90.7	94.6	93.6	96.5
3	86.7	92.3	90.8	95.0
4	83.5	90.7	88.7	94.1
5	81.2	90.0	86.5	93.1
6	78.6	89.0	84.6	92.3
7	76.2	88.0	82.7	91.5
8	73.5	86.8	81.1	91.0
9	71.8	86.5	79.3	90.2
10	69.6	85.7	77.8	89.7
11	67.5	84.9	76.2	89.1
12	65.7	84.5	74.8	88.5
13	64.0	84.0	72.9	87.4
14	62.0	83.1	71.5	86.9
15	61.3	83.7	69.6	85.8

Table 2b. Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by sex for period 1998-2016 (N=13,500).

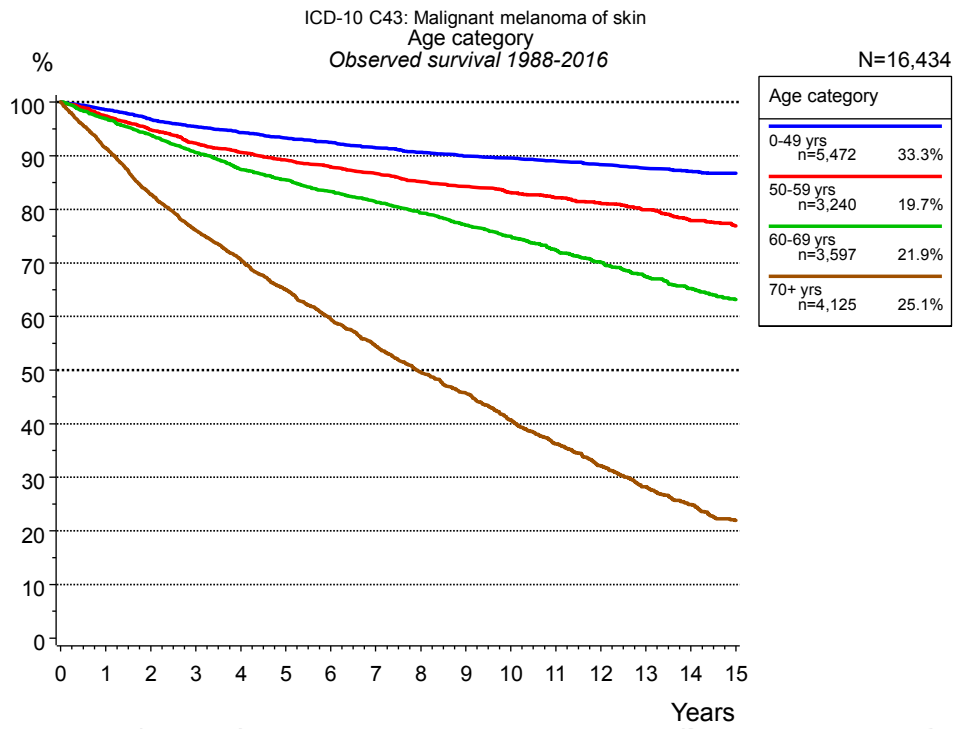


Figure 3a. Observed survival of patients with malignant melanoma by age category. Included in the evaluation are 16,434 cases diagnosed between 1988 and 2016.

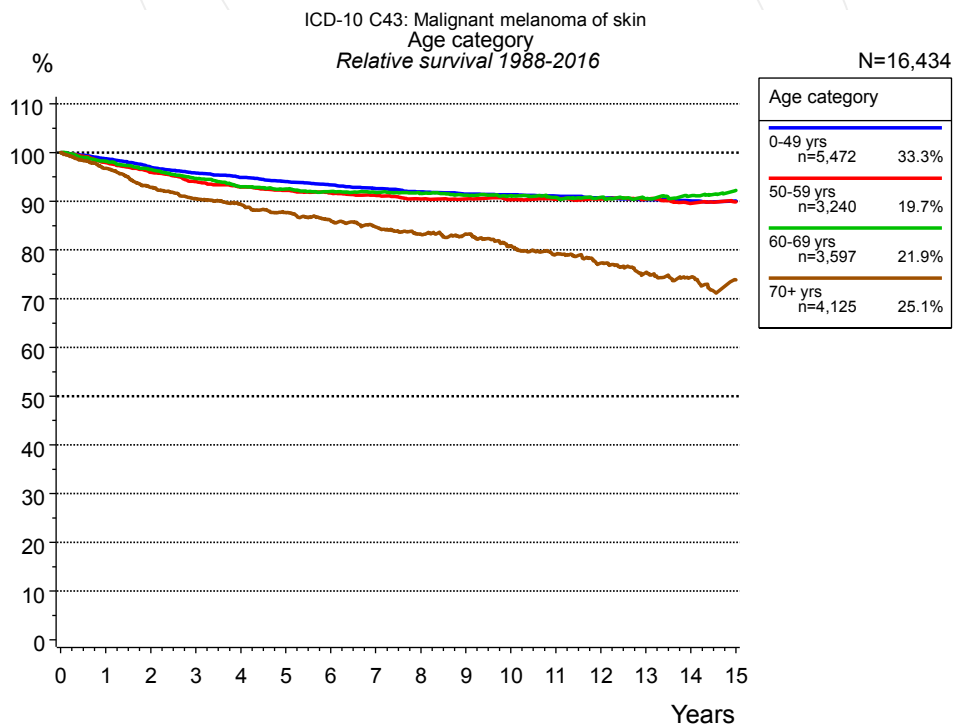


Figure 3b. Relative survival of patients with malignant melanoma by age category. Included in the evaluation are 16,434 cases diagnosed between 1988 and 2016.

Years	Age category							
	0-49 yrs n=5,472		50-59 yrs n=3,240		60-69 yrs n=3,597		70+ yrs n=4,125	
	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	98.6	98.7	97.4	98.0	96.9	98.2	91.5	96.8
2	96.7	97.0	94.8	95.9	93.9	96.5	82.8	92.9
3	95.4	95.8	92.3	94.0	90.6	94.7	76.1	90.5
4	94.3	94.9	90.6	93.0	87.5	93.0	70.7	89.4
5	93.3	94.1	89.2	92.2	85.5	92.6	65.0	87.7
6	92.5	93.4	87.9	91.6	83.3	92.0	59.5	86.0
7	91.4	92.6	86.7	91.2	81.4	91.8	54.5	84.7
8	90.6	92.0	85.1	90.5	79.4	91.6	49.6	83.3
9	89.9	91.5	84.3	90.5	77.0	91.2	45.7	83.2
10	89.6	91.4	83.1	90.3	74.9	91.2	40.7	80.9
11	89.0	91.1	82.2	90.4	72.4	90.8	36.3	79.1
12	88.3	90.7	81.1	90.4	70.1	90.8	32.1	77.3
13	87.6	90.3	79.9	90.4	67.4	90.5	28.3	75.4
14	87.1	90.1	77.9	89.6	65.2	91.1	24.9	74.5
15	86.7	90.1	76.9	89.9	63.1	92.2	22.0	73.9

Table 3c. Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by age category for period 1988-2016 (N=16,434).

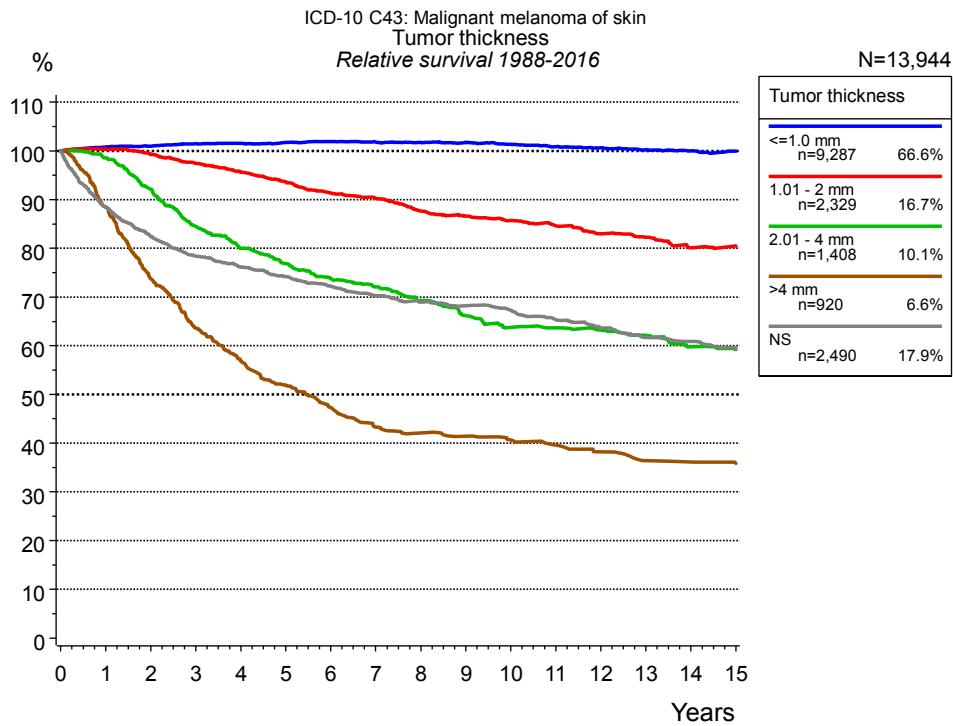


Figure 4a. Relative survival of patients with malignant melanoma by tumor thickness. For 15,621 of 16,434 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 13,944 cases an evaluable classification was established. The grey line represents the subgroup of 2,490 patients with missing values regarding tumor thickness (15.2 % of 16,434 patients, the percent values of all other categories are related to n=13,944).

Years	Tumor thickness									
	<=1.0 mm n=9,287		1.01 - 2 mm n=2,329		2.01 - 4 mm n=1,408		>4 mm n=920		NS n=2,490	
	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	100.8	98.7	100.3	95.9	98.5	84.9	88.5	86.4	88.4
2	98.1	101.0	95.9	99.3	87.3	92.1	68.3	73.7	78.9	82.5
3	97.2	101.5	92.5	97.5	78.0	84.5	57.1	63.7	73.5	78.4
4	95.8	101.6	89.2	95.6	72.1	80.0	49.6	56.9	70.0	76.2
5	94.5	101.7	86.0	93.7	67.6	76.8	44.0	51.9	66.9	74.2
6	93.2	101.9	82.4	91.4	63.4	73.8	39.1	47.3	63.9	72.2
7	91.6	101.7	80.0	90.3	60.4	72.1	34.8	43.3	60.9	70.3
8	90.1	101.7	76.3	87.6	56.7	69.3	33.1	42.1	58.7	69.0
9	88.7	101.7	74.2	86.6	52.9	66.2	31.8	41.4	56.9	68.2
10	87.0	101.4	72.0	85.7	49.8	63.8	30.4	40.6	55.2	67.3
11	85.2	100.9	69.9	84.7	48.6	63.7	29.0	39.6	52.6	65.3
12	83.6	100.6	67.3	83.0	47.1	63.2	27.3	38.2	50.3	63.6
13	81.9	100.2	65.4	82.3	45.3	62.2	25.3	36.4	47.9	61.7
14	80.3	100.0	62.7	80.1	42.7	59.8	24.8	36.1	46.4	60.9
15	78.9	99.9	61.9	80.5	41.5	59.2	23.8	35.9	44.5	59.6

Table 4b. Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by tumor thickness for period 1988-2016 (N=13,944).

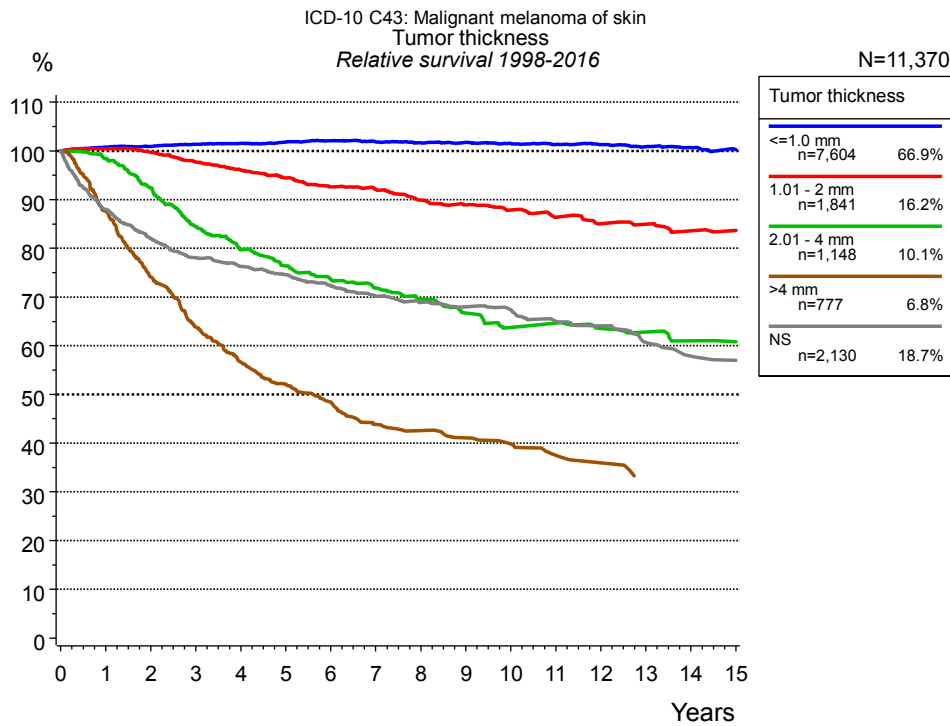


Figure 4c. Relative survival of patients with malignant melanoma by tumor thickness. For 12,841 of 13,500 cases diagnosed between 1998 and 2016 valid data could be obtained for this item. For a total of 11,370 cases an evaluable classification was established. The grey line represents the subgroup of 2,130 patients with missing values regarding tumor thickness (15.8 % of 13,500 patients, the percent values of all other categories are related to n=11,370).

Years	Tumor thickness									
	<=1.0 mm n=7,604		1.01 - 2 mm n=1,841		2.01 - 4 mm n=1,148		>4 mm n=777		NS n=2,130	
	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	100.8	98.8	100.4	95.6	98.4	84.1	87.6	85.9	88.0
2	98.1	100.9	96.3	99.7	87.4	92.4	68.5	74.1	78.4	82.0
3	97.2	101.4	92.8	97.7	77.8	84.5	57.3	63.9	73.0	78.0
4	95.9	101.6	89.6	96.0	71.6	79.7	49.6	56.7	70.0	76.3
5	94.8	101.8	86.7	94.4	67.0	76.4	44.3	52.1	67.1	74.6
6	93.5	102.1	83.6	92.6	63.1	73.6	40.2	48.4	63.8	72.4
7	91.9	101.8	81.8	92.1	60.0	71.8	35.4	43.9	60.6	70.2
8	90.3	101.7	78.4	89.9	56.8	69.6	33.6	42.6	58.3	68.9
9	89.0	101.8	76.2	88.9	53.1	66.7	31.7	41.1	56.4	68.0
10	87.5	101.5	74.0	87.9	49.6	63.7	30.0	39.8	54.8	67.3
11	85.9	101.3	71.4	86.4	49.4	64.6	27.6	37.5	51.9	65.1
12	84.6	101.3	69.0	85.1	47.3	63.6	25.8	36.0	50.2	64.1
13	82.9	100.9	67.8	84.9	45.8	62.8	23.3	33.1	46.6	60.7
14	81.5	100.7	65.7	83.6	43.7	61.0			43.7	57.9
15	79.9	100.3	64.6	83.7	42.9	60.8			42.3	57.0

Table 4d. Observed (obs.) and relative (rel.) survival of patients with malignant melanoma by tumor thickness for period 1998-2016 (N=11,370).

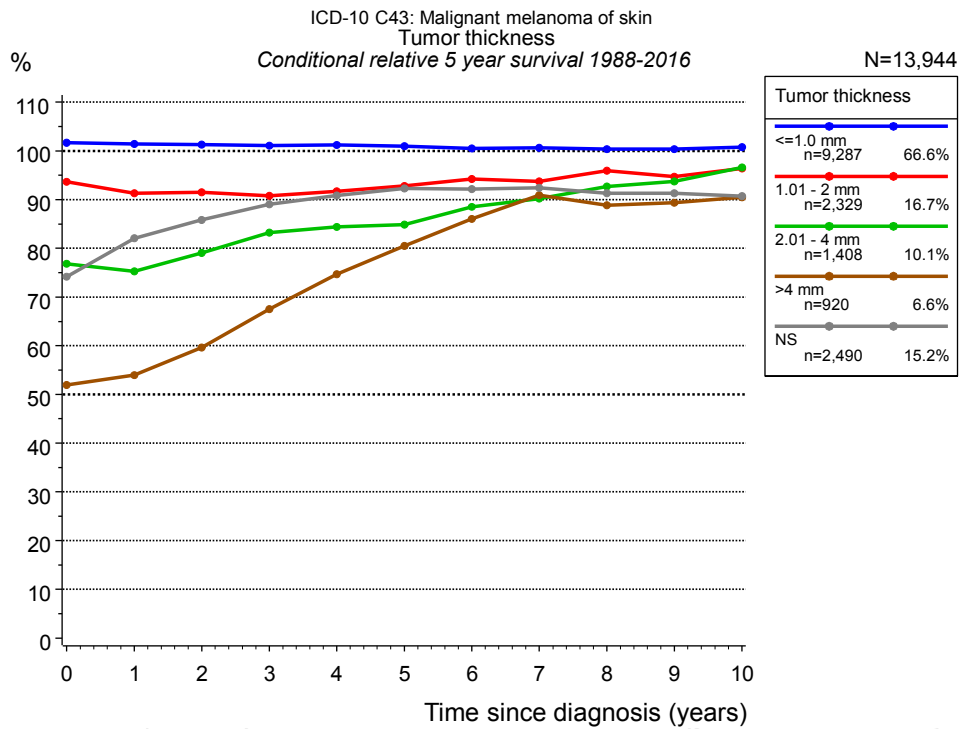


Figure 4e. Conditional relative 5-year survival of patients with malignant melanoma by tumor thickness. For 15,621 of 16,434 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 13,944 cases an evaluable classification was established. The grey line represents the subgroup of 2,490 patients with missing values regarding tumor thickness (15.2 % of 16,434 patients, the percent values of all other categories are related to n=13,944).

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	9,287	101.7	2,329	93.7	1,408	76.8	920	51.9	2,490	74.2
1	8,632	101.4	2,173	91.3	1,272	75.3	740	54.0	2,031	82.1
2	7,987	101.3	1,989	91.5	1,104	79.1	556	59.6	1,782	85.9
3	7,308	101.1	1,808	90.8	919	83.2	441	67.5	1,516	89.0
4	6,616	101.2	1,611	91.7	797	84.4	344	74.7	1,311	90.9
5	5,895	101.0	1,418	92.8	681	84.9	270	80.5	1,120	92.3
6	5,260	100.5	1,260	94.2	584	88.5	209	86.0	959	92.2
7	4,692	100.6	1,127	93.7	508	90.2	169	90.9	794	92.4
8	4,166	100.4	992	96.0	430	92.7	140	88.8	672	91.3
9	3,681	100.4	872	94.7	359	93.7	122	89.4	557	91.3
10	3,271	100.8	780	96.4	310	96.6	109	90.4	493	90.7

Table 4f. Conditional relative 5-year survival of patients with malignant melanoma by tumor thickness for period 1988-2016 (N=13,944).

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 101.1% (n=7,308).

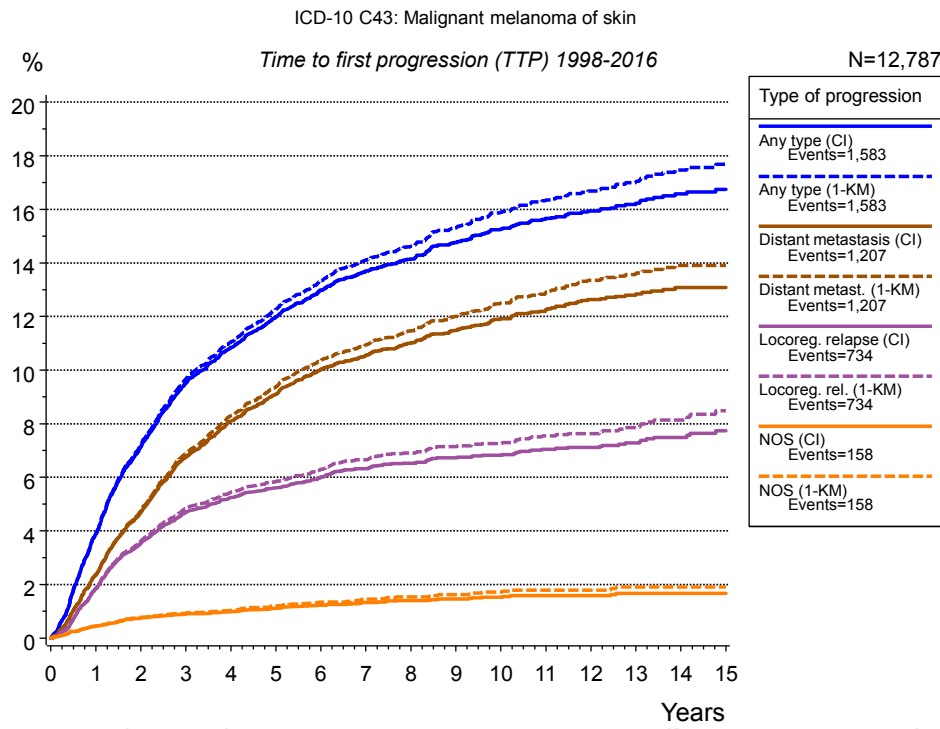


Figure 5a. Time to first progression of 12,787 patients with malignant melanoma diagnosed between 1998 and 2016 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Years	Type of progression							
	Any type (CI)	Any type (1-KM)	Distant metastasis (CI)	Distant metast. (1-KM)	Locoreg. relapse (CI)	Locoreg. rel. (1-KM)	NOS (CI)	
	n=12,787 %	n=12,787 %	n=12,787 %	n=12,787 %	n=12,787 %	n=12,787 %	n=12,787 %	n=12,787 %
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	3.9	3.9	2.3	2.4	1.8	1.9	0.5	
2	7.1	7.2	4.7	4.7	3.6	3.6	0.7	
3	9.5	9.7	6.7	6.9	4.7	4.8	0.9	
4	10.8	11.0	8.1	8.3	5.3	5.4	1.0	
5	12.0	12.3	9.1	9.4	5.6	5.8	1.1	
6	13.0	13.3	10.0	10.4	6.0	6.3	1.2	
7	13.7	14.1	10.5	10.9	6.3	6.7	1.3	
8	14.2	14.6	11.0	11.5	6.5	6.9	1.4	
9	14.8	15.3	11.5	12.0	6.7	7.1	1.5	
10	15.3	15.9	11.9	12.5	6.8	7.3	1.5	
11	15.7	16.4	12.3	12.9	7.0	7.5	1.6	
12	15.9	16.7	12.6	13.4	7.1	7.6	1.6	
13	16.2	17.1	12.8	13.6	7.3	7.9	1.7	
14	16.6	17.5	13.1	13.9	7.5	8.1	1.7	
15	16.7	17.7	13.1	13.9	7.7	8.5	1.7	

Type of progression	
<i>cont'd</i>	NOS (1-KM) n=12,787
Years	%
0	0.0
1	0.5
2	0.8
3	0.9
4	1.0
5	1.2
6	1.3
7	1.4
8	1.5
9	1.6
10	1.7
11	1.8
12	1.8
13	1.9
14	1.9
15	1.9

Table 5b. Time to first progression of patients with malignant melanoma for period 1998-2016 (N=12,787).

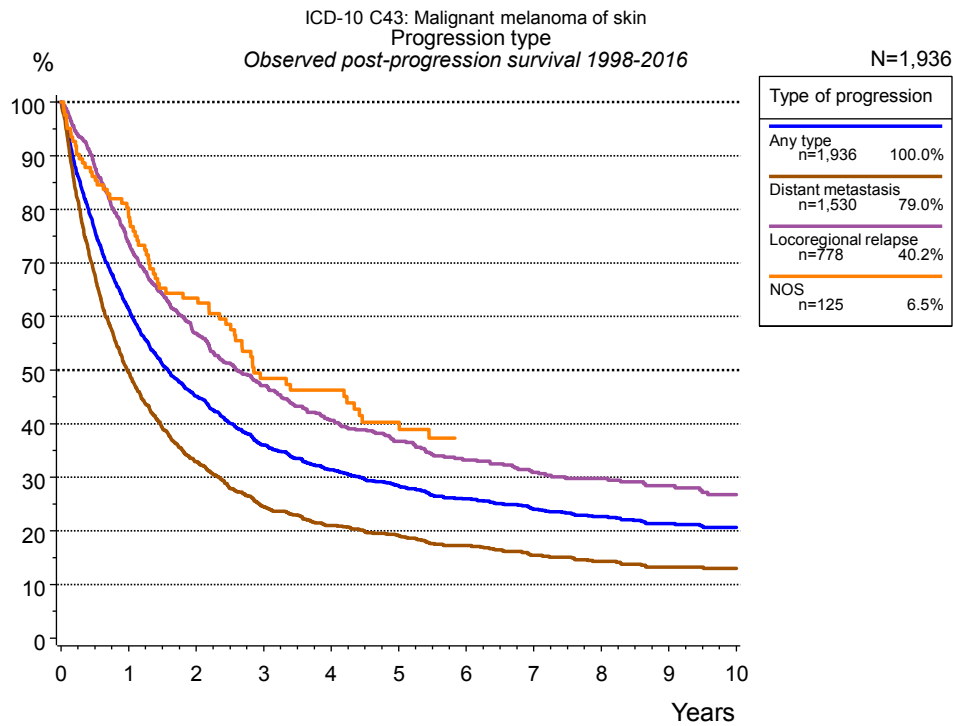


Figure 5c. Observed post-progression survival of 1,936 patients with malignant melanoma diagnosed between 1998 and 2016. These 1,936 patients with documented progression events during their course of disease represent 14.5 % of the totally 13,356 evaluated cases (incl. M1, n=569, 4.3 %). Patients with cancer relapse documented via death certificates only were excluded (n=216, 1.6 %). 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 “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.

Years	Type of progression			
	Any type n=1,936 %	Distant metastasis n=1,530 %	Locoregional relapse n=778 %	NOS n=125 %
0	100.0	100.0	100.0	100.0
1	61.3	49.5	73.7	78.5
2	45.1	32.9	56.8	63.4
3	36.0	24.6	47.1	48.4
4	31.4	21.0	40.6	46.3
5	28.4	19.1	36.7	40.3
6	26.0	17.3	33.3	37.3
7	24.0	15.4	30.9	
8	22.7	14.3	29.8	
9	21.4	13.2	28.4	
10	20.7	13.0	26.7	

Table 5d. Observed post-progression survival of patients with malignant melanoma for period 1998-2016 (N=1,936).

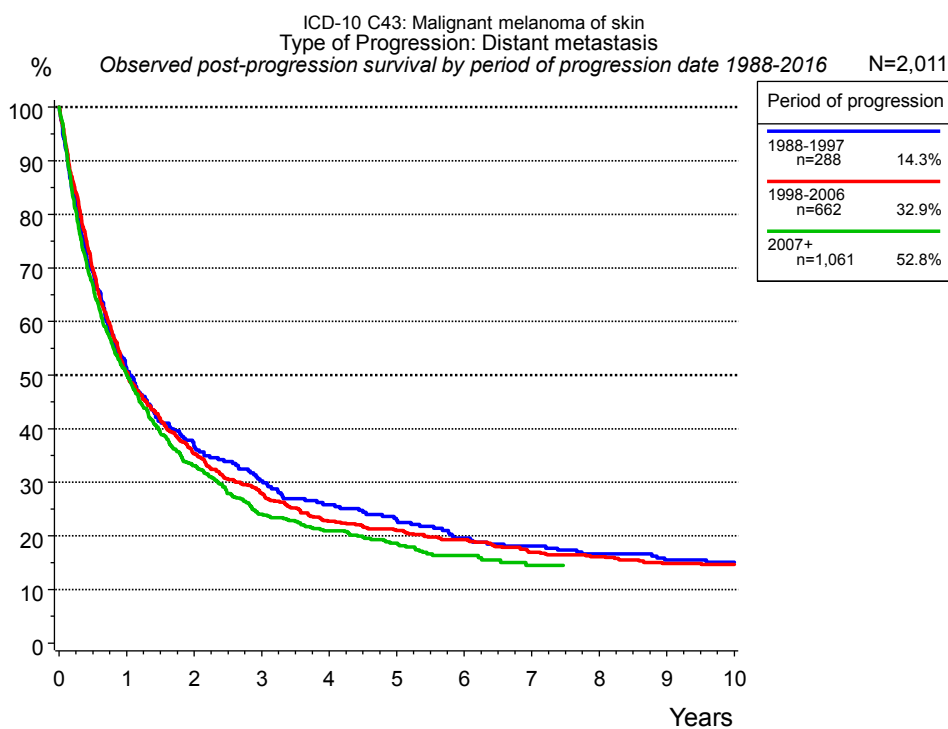


Figure 5e. Observed post-progression (distant metastasis) survival of 2,011 patients with malignant melanoma diagnosed between 1988 and 2016 by period of progression.

Years	Period of progression		
	1988-1997 n=288 %	1998-2006 n=662 %	2007+ n=1,061 %
0	100.0	100.0	100.0
1	51.4	50.6	50.1
2	36.8	35.3	33.1
3	30.3	28.0	24.0
4	25.8	22.7	21.0
5	22.9	21.0	18.6
6	19.6	19.3	16.3
7	18.1	16.9	14.5
8	16.6	16.1	
9	15.5	14.8	
10	15.1	14.7	

Table 5f. Observed post-progression (distant metastasis) survival of patients with malignant melanoma for period 1988-2016 by period of progression (N=2,011).

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

Munich Cancer Registry. Survival ICD-10 C43: Malignant melanoma [Internet]. 2018 [updated 2018 Aug 22; cited 2018 Oct 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/surv/sC43__E-ICD-10-C43-Malignant-melanoma-survival.pdf

Copyright

The content of the public web site provided by the Munich Cancer Registry is available worldwide and free of charge. All documents are free to download, utilize, copy, print-out and distribute, providing that the MCR is referenced.

Disclaimer

The Munich Cancer Registry reserves the right to not be responsible for the topicality, correctness, completeness or quality of the information provided. Liability claims regarding damage caused by the use of any information provided, including any kind of information which is incomplete or incorrect, will therefore be rejected.