

# Munich Cancer Registry



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## ICD-10 C45: Mesothelioma

### Survival

Year of diagnosis	1988-1997	1998-2019
Patients	97	1,672
Diseases	97	1,675
Cases evaluated	89	1,176
Creation date	01/27/2021	
Database export	01/07/2021	
Population	4.92 m	



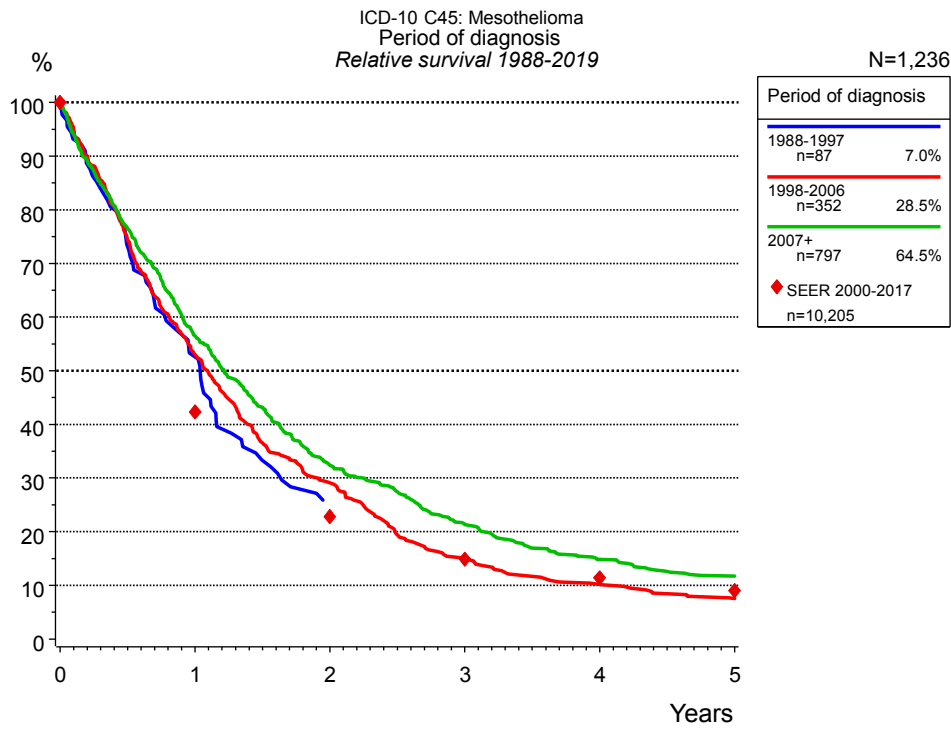
Munich Cancer Registry  
Cancer Registry Bavaria - Upper Bavaria Regional Center  
at Klinikum Grosshadern/IBE  
Marchioninstr. 15  
Munich, 81377  
Germany

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

[https://www.tumorregister-muenchen.de/en/facts/surv/sC45\\_\\_E-ICD-10-C45-Mesothelioma-survival.pdf](https://www.tumorregister-muenchen.de/en/facts/surv/sC45__E-ICD-10-C45-Mesothelioma-survival.pdf)

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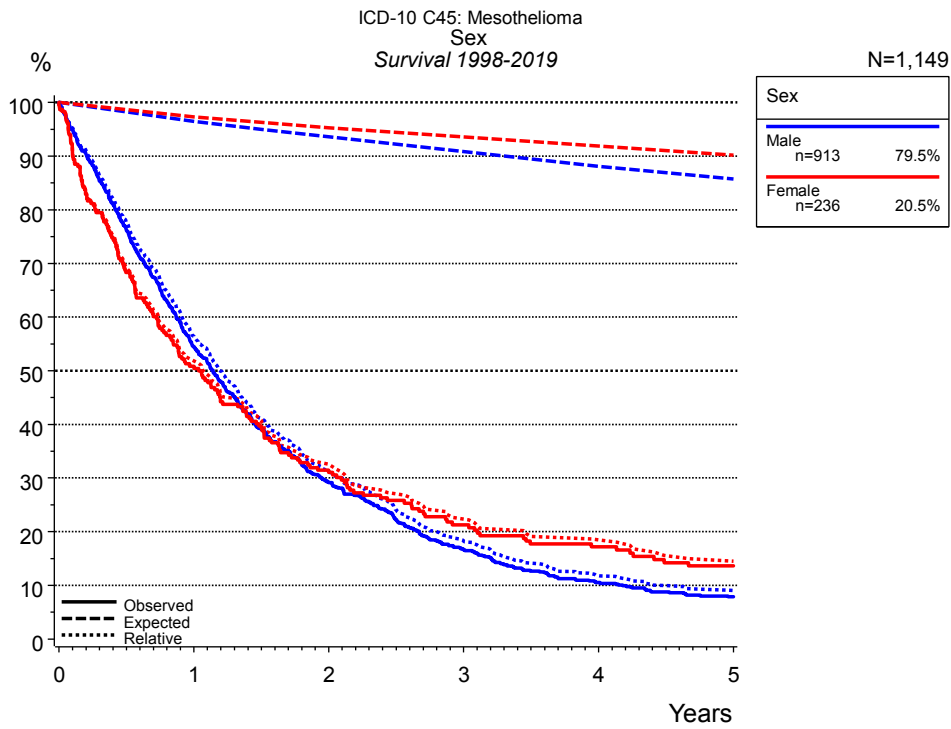
**Figure 1a.** Relative survival of patients with mesothelioma by period of diagnosis. Included in the evaluation are 1,236 cases diagnosed between 1988 and 2019.

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 2017, 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=87		1998-2006 n=352		2007+ n=797	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	52.2	52.5	51.4	53.0	54.7	56.5
2			27.9	29.1	30.3	32.4
3			14.1	14.9	19.5	21.3
4			9.5	10.1	13.1	14.8
5			6.9	7.5	10.2	11.7
Median	1.0		1.1		1.2	

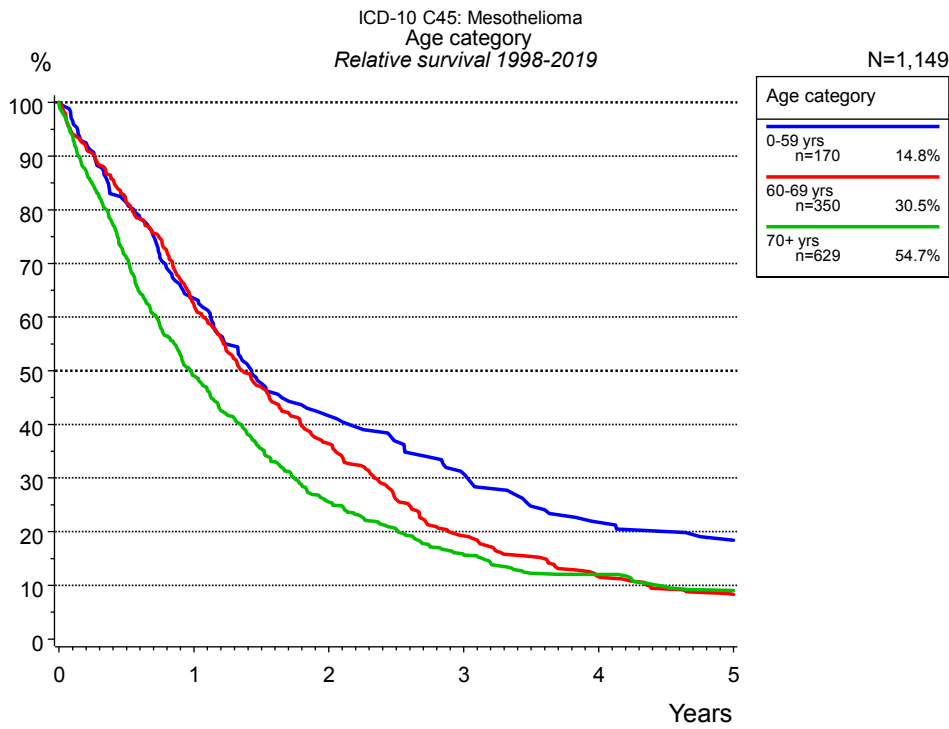
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with mesothelioma by period of diagnosis for period 1988-2019 (N=1,236).



**Figure 2a.** Survival of patients with mesothelioma by sex. Included in the evaluation are 1,149 cases diagnosed between 1998 and 2019.

Years	Sex			
	Male n=913		Female n=236	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	54.4	56.4	50.8	51.8
2	29.1	31.1	31.0	32.5
3	16.7	18.3	21.3	22.3
4	10.5	11.8	17.1	18.5
5	7.8	9.1	13.6	14.5
Median	1.1		1.0	

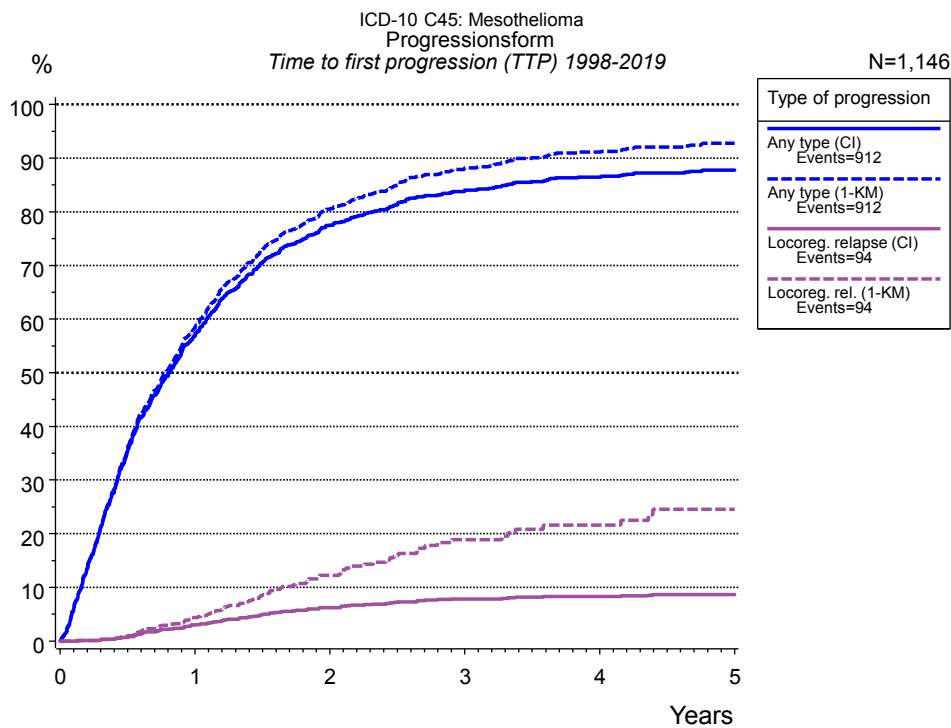
**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with mesothelioma by sex for period 1998-2019 (N=1,149).



**Figure 3a.** Relative survival of patients with mesothelioma by age category. Included in the evaluation are 1,149 cases diagnosed between 1998 and 2019.

Years	Age category					
	0-59 yrs n=170		60-69 yrs n=350		70+ yrs n=629	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	63.4	63.5	61.4	62.3	46.7	49.1
2	41.2	41.6	35.3	36.4	23.1	25.5
3	30.7	30.8	18.5	19.2	13.7	15.7
4	21.4	21.7	11.1	11.6	10.0	12.0
5	18.5	18.4	7.8	8.4	7.3	9.0
Median	1.4		1.3		0.9	

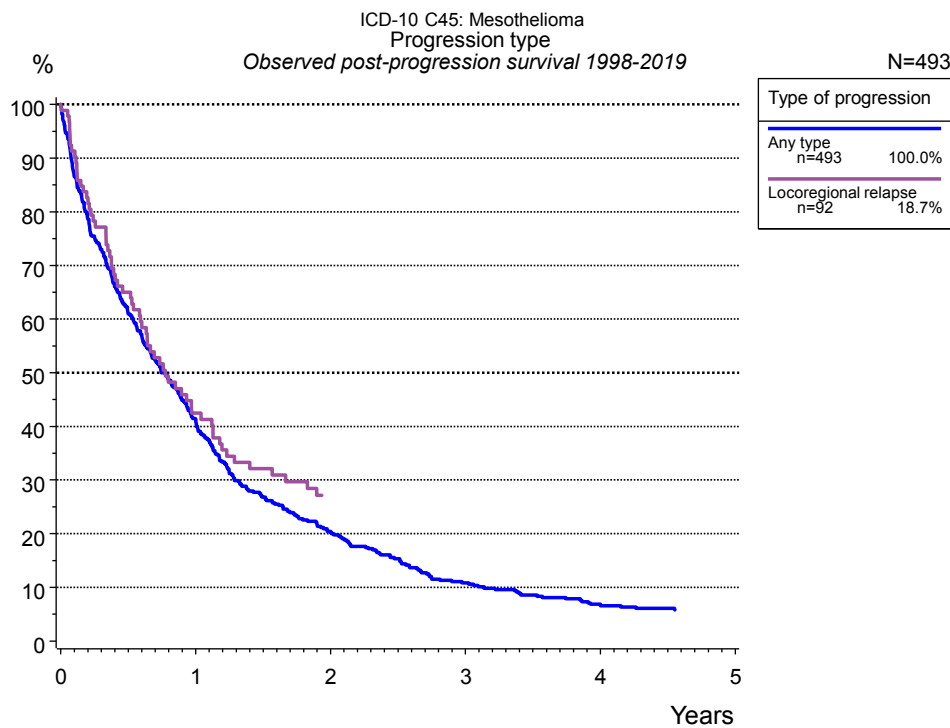
**Table 3b.** Observed (obs.) and relative (rel.) survival of patients with mesothelioma by age category for period 1998-2019 (N=1,149).



**Figure 5a.** Time to first progression of 1,146 patients with mesothelioma 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)	Locoreg. relapse (CI)	Locoreg. rel. (1-KM)
N	1,085	1,085	1,146	1,146
Events	901	901	90	90
compet.	69		890	
Years	%	%	%	%
0	0.0	0.0	0.0	0.0
1	57.2	58.6	3.0	4.4
2	77.5	80.6	6.2	12.2
3	83.9	88.0	7.8	18.9
4	86.5	91.1	8.3	21.6
5	87.8	92.8	8.6	24.6

**Table 5b.** Time to first progression of patients with mesothelioma for period 1998-2019 (N=1,146), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

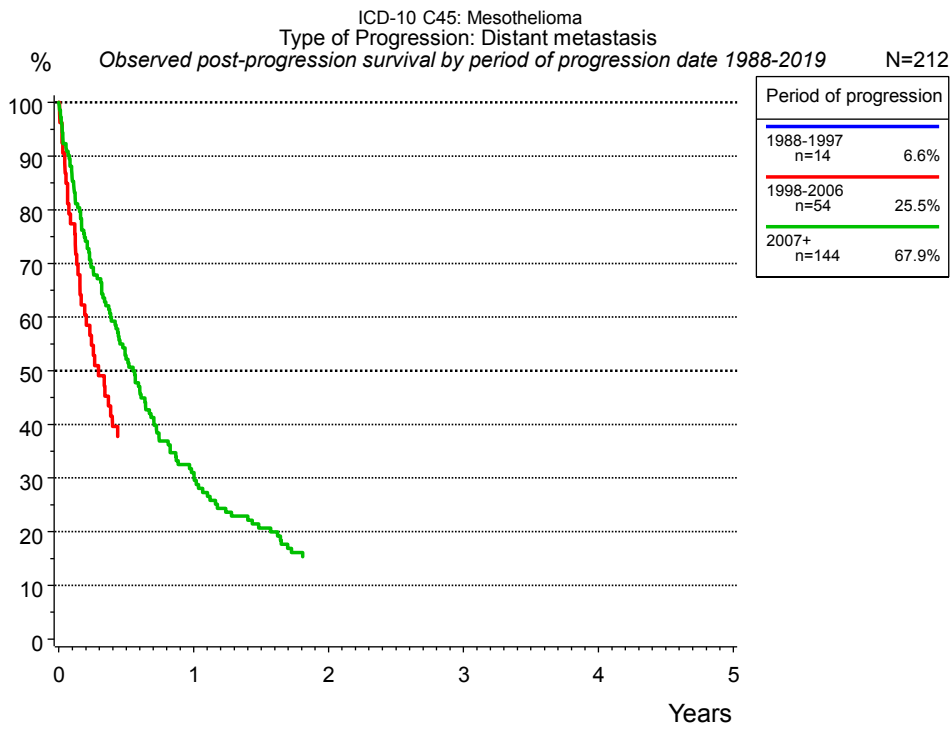


**Figure 5c.** Observed post-progression survival of 493 patients with mesothelioma diagnosed between 1998 and 2019. These 493 patients with documented progression events during their course of disease represent 43.0 % of the totally 1,146 evaluated cases (incl. M1, n=61, 5.3 %). Patients with cancer relapse documented via death certificates only were excluded (n=480, 41.9 %). Multiple progression types on different sites are included in the evaluation even when not occurring synchronously.

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=493 %	Locoregional relapse n=92 %
0	100.0	100.0
1	41.3	42.5
2	20.2	
3	10.8	
4	6.8	
5	5.8	

**Table 5d.** Observed post-progression survival of patients with mesothelioma for period 1998-2019 (N=493).



**Figure 5e.** Observed post-progression (distant metastasis) survival of 212 patients with mesothelioma diagnosed between 1988 and 2019 by period of progression.

Years	Period of progression	
	1998-2006 n=54 %	2007+ n=144 %
0	100.0	100.0
1		31.0

**Table 5f.** Observed post-progression (distant metastasis) survival of patients with mesothelioma for period 1988-2019 by period of progression (N=212).



**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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