

# Munich Cancer Registry



- ▶ Incidence and Mortality
- ▶ Selection Matrix
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## ICD-10 C60: Penile cancer

### Survival

Year of diagnosis	1988-1997	1998-2019
Patients	79	575
Diseases	79	577
Cases evaluated	74	442
Creation date	01/27/2021	
Database export	01/07/2021	
Population (males)	2.43 m	



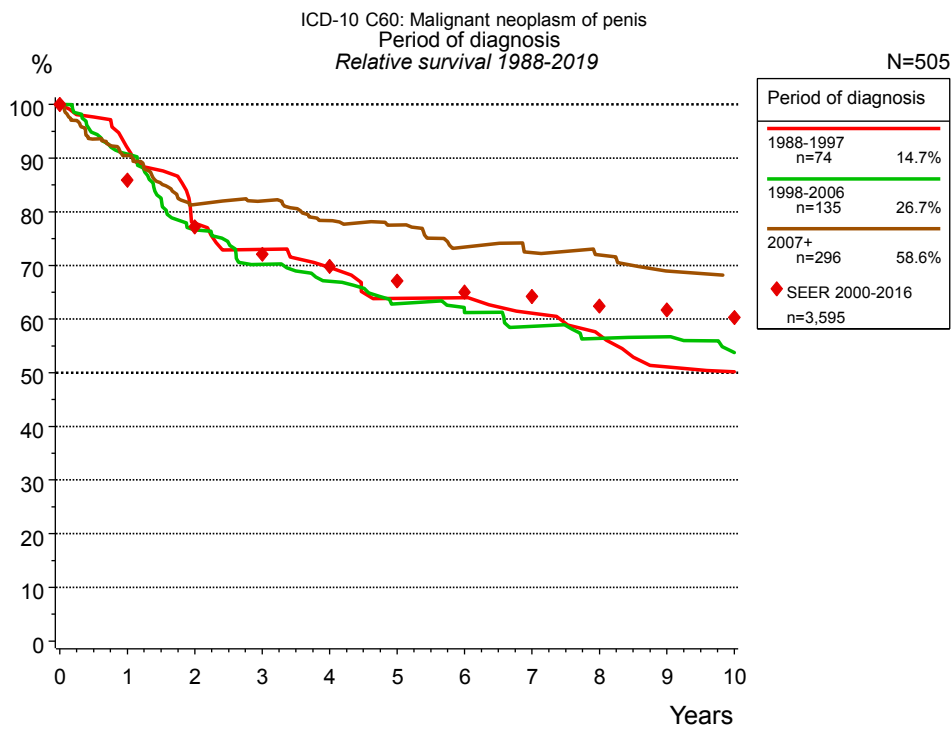
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<https://www.tumorregister-muenchen.de/en>

[https://www.tumorregister-muenchen.de/en/facts/surv/sC60\\_\\_E-ICD-10-C60-Penile-cancer-survival.pdf](https://www.tumorregister-muenchen.de/en/facts/surv/sC60__E-ICD-10-C60-Penile-cancer-survival.pdf)

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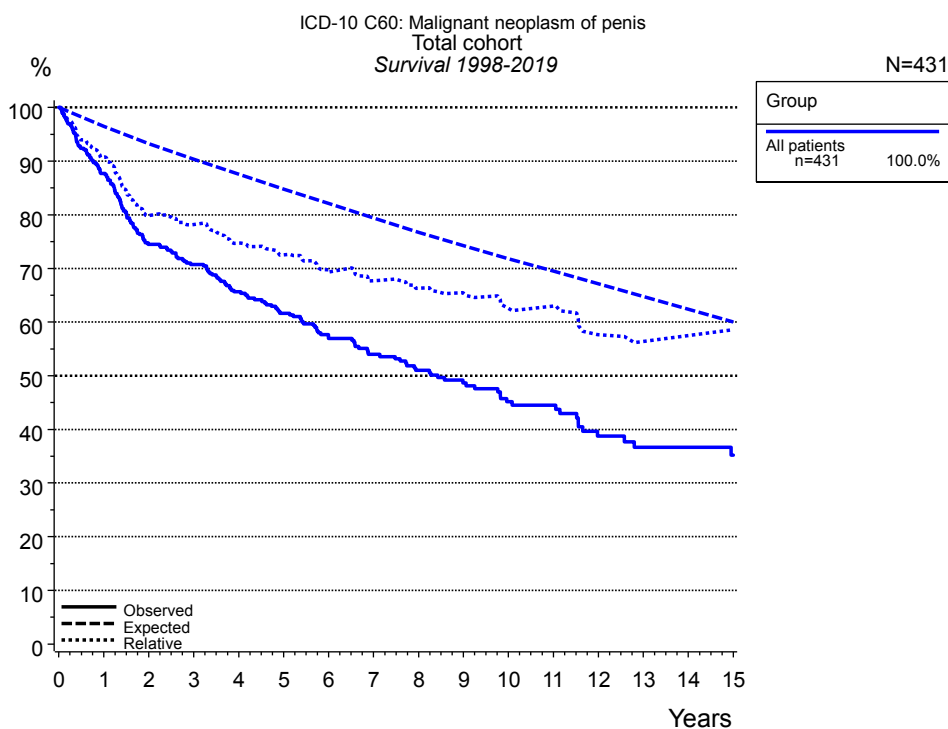
**Figure 1a.** Relative survival of patients with penile cancer by period of diagnosis. Included in the evaluation are 505 cases diagnosed between 1988 and 2019.

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 2016, 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=74		1998-2006 n=135		2007+ n=296	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	88.8	91.9	87.7	90.8	87.7	90.5
2	73.3	77.9	70.7	76.6	76.3	81.4
3	67.7	73.0	62.9	70.2	74.7	82.0
4	63.4	69.6	58.2	67.0	69.4	78.3
5	56.2	63.9	52.6	62.9	66.5	77.6
6	56.2	64.0	49.5	61.2	60.9	73.4
7	51.8	61.1	46.2	58.6	58.2	72.4
8	47.4	57.0	43.0	56.4	55.8	71.9
9	41.5	51.1	42.2	56.7	51.6	69.0
10	39.9	50.2	38.0	53.7	49.9	67.7
Median	7.5		6.0		9.8	

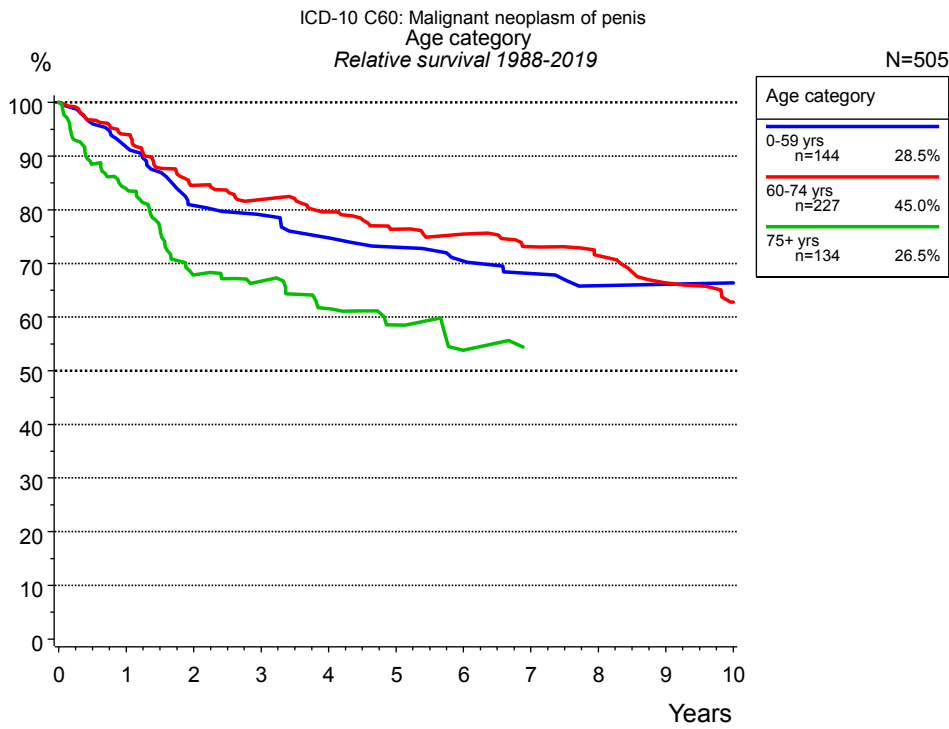
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with penile cancer by period of diagnosis for period 1988-2019 (N=505).



**Figure 2a.** Observed, expected and relative survival of the total cohort with penile cancer. Included in the evaluation are 431 cases diagnosed between 1998 and 2019.

Years	Group	
	obs. %	rel. %
0	100.0	100.0
1	87.7	90.7
2	74.5	79.8
3	70.7	78.2
4	65.6	74.7
5	61.6	72.5
6	56.9	69.3
7	53.9	67.7
8	51.0	66.3
9	48.6	65.4
10	45.1	62.6
11	44.5	63.0
12	38.7	57.6
13	36.7	56.4
14	36.7	57.5
15	35.2	58.5
Median	8.4	

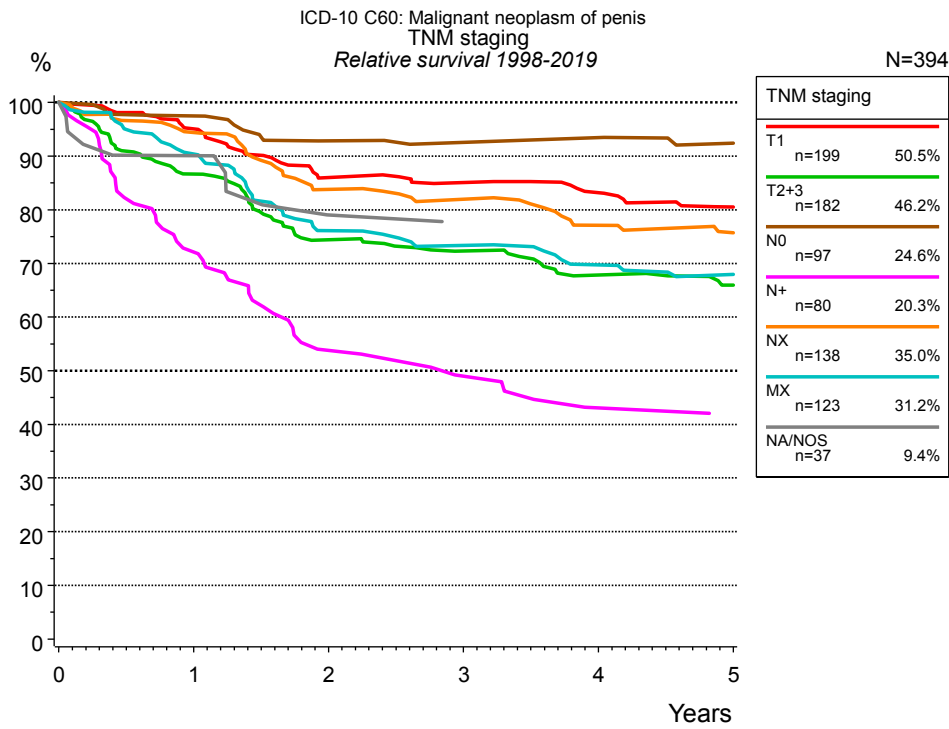
**Table 2b.** Observed (obs.) and relative (rel.) survival of the total cohort with penile cancer for period 1998-2019 (N=431).



**Figure 3a.** Relative survival of patients with penile cancer by age category. Included in the evaluation are 505 cases diagnosed between 1988 and 2019.

Years	Age category					
	0-59 yrs n=144		60-74 yrs n=227		75+ yrs n=134	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	91.3	91.7	92.3	94.0	76.5	83.8
2	80.1	80.8	80.9	84.6	56.3	67.9
3	77.7	79.0	76.5	81.9	50.9	66.7
4	73.5	74.8	72.4	79.6	43.3	61.6
5	71.0	73.0	67.4	76.4	37.0	58.5
6	68.2	70.4	64.5	75.5	30.2	53.8
7	65.2	68.1	60.7	73.1		
8	62.0	65.8	57.1	71.5		
9	62.0	66.1	50.9	66.4		
10	62.0	66.3	46.2	62.8		
Median			9.6		3.2	

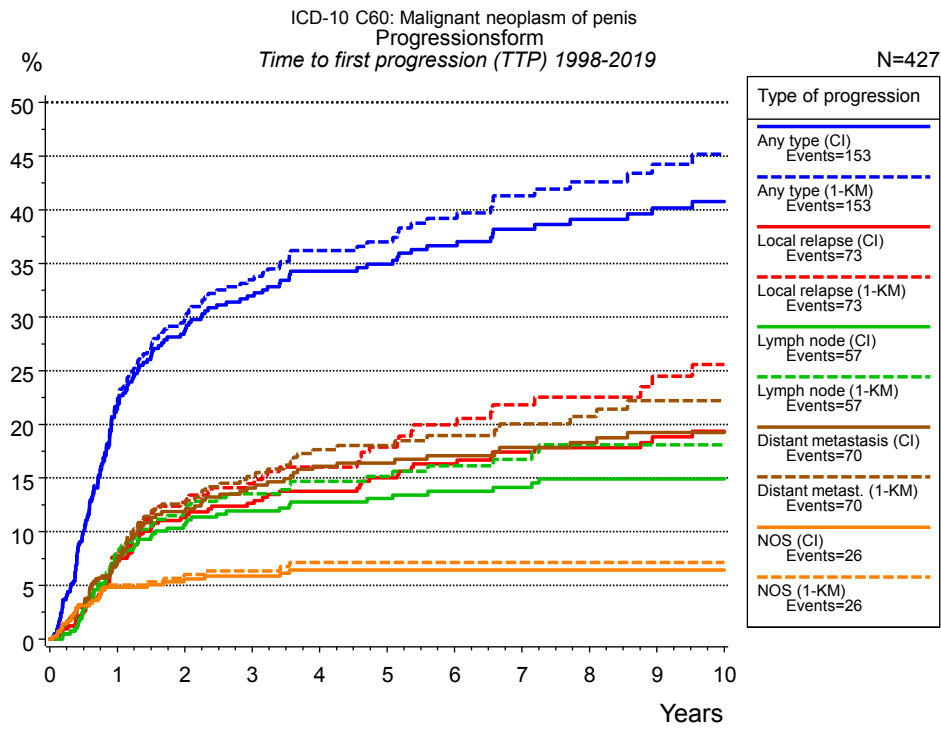
**Table 3b.** Observed (obs.) and relative (rel.) survival of patients with penile cancer by age category for period 1988-2019 (N=505).



**Figure 4a.** Relative survival of patients with penile cancer by TNM staging. For 398 of 431 cases diagnosed between 1998 and 2019 valid data could be obtained for this item. For a total of 394 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 37 patients with missing values regarding TNM staging (8.6 % of 431 patients, the percent values of all other categories are related to n=394).

Years	TNM staging													
	T1 n=199		T2+3 n=182		N0 n=97		N+ n=80		NX n=138		MX n=123		NA/NOS n=37	
	obs. %	rel. %	obs. %	rel. %	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	100.0	100.0	100.0	100.0
1	92.7	95.1	83.5	86.6	95.9	97.5	71.1	72.1	90.7	94.4	87.5	90.4	88.6	90.1
2	81.2	86.0	69.1	74.4	88.3	92.8	51.4	53.8	77.2	83.8	70.8	76.1	72.3	79.0
3	78.3	85.1	64.7	72.3	86.0	92.6	45.4	49.0	73.1	81.9	66.7	73.3	69.0	76.8
4	74.5	83.2	58.7	67.9	84.8	93.5	39.0	43.1	66.5	77.1	61.6	69.7		
5	69.9	80.5	55.0	66.0	81.0	92.4			63.0	75.7	58.3	68.0		
Median	11.1		5.8				2.2		7.6		7.9			

**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with penile cancer by TNM staging for period 1998-2019 (N=394).



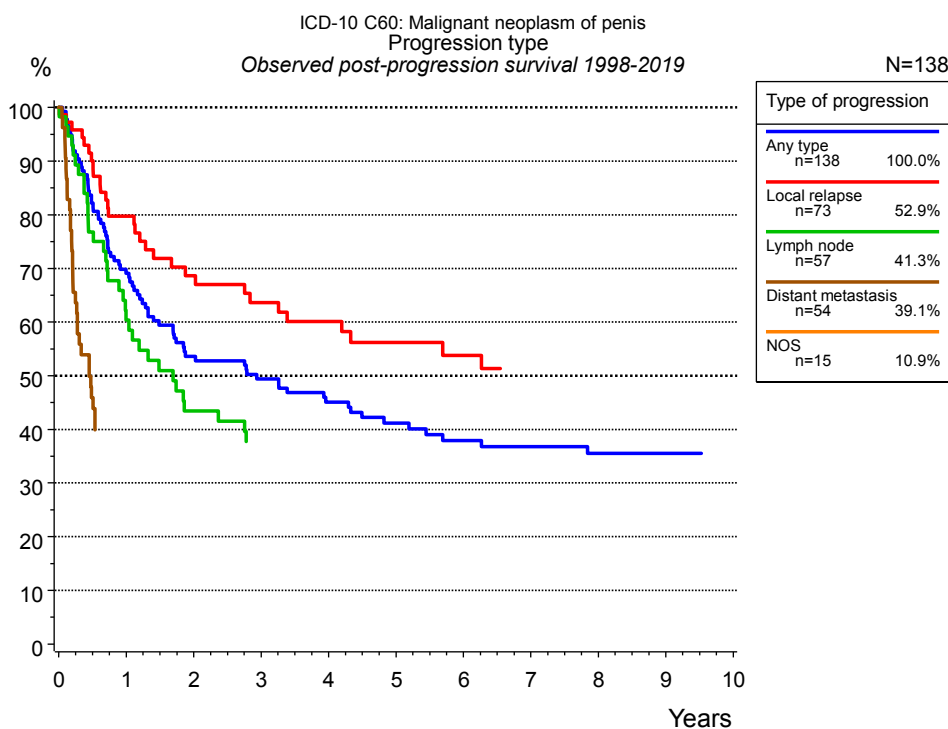
**Figure 5a.** Time to first progression of 427 patients with penile cancer diagnosed between 1998 and 2019 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

	Type of progression							Distant metastasis (CI)
	Any type (CI)	Any type (1-KM)	Local relapse (CI)	Local relapse (1-KM)	Lymph node (CI)	Lymph node (1-KM)		
N	415	415	427	427	427	427	415	
Events	150	150	70	70	57	57	70	
compet.	83		158		147		113	
Years	%	%	%	%	%	%	%	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	21.7	22.2	7.3	7.9	7.5	8.2	7.2	
2	28.7	29.8	11.3	12.7	10.6	11.8	11.9	
3	32.0	33.5	12.6	14.5	11.9	13.5	14.1	
4	34.3	36.2	13.8	16.0	12.8	14.7	16.1	
5	34.9	37.0	15.0	17.9	13.1	15.1	16.4	
6	36.7	39.2	16.3	20.0	13.8	16.1	17.1	
7	38.2	41.3	17.4	21.8	14.1	16.7	17.9	
8	39.1	42.6	17.8	22.5	14.9	18.1	18.3	
9	40.2	44.2	18.8	24.5	14.9	18.1	19.3	
10	40.8	45.2	19.4	25.6	14.9	18.1	19.3	

<i>cont'd</i>	Type of progression		
	Distant metast. (1- KM)	NOS (CI)	NOS (1-KM)
N	415	427	427
Events	70	26	26
compet.		172	
Years	%	%	%
0	0.0	0.0	0.0
1	7.5	4.8	5.0
2	12.6	5.6	6.0
3	15.2	5.8	6.3
4	17.7	6.4	7.1
5	18.0	6.4	7.1
6	18.9	6.4	7.1
7	20.0	6.4	7.1
8	20.7	6.4	7.1
9	22.2	6.4	7.1
10	22.2	6.4	7.1

**Table 5b.** Time to first progression of patients with penile cancer for period 1998-2019 (N=427), also showing the total of progression events (Events) and of deaths as competing risk (compet.).





**Figure 5c.** Observed post-progression survival of 138 patients with penile cancer diagnosed between 1998 and 2019. These 138 patients with documented progression events during their course of disease represent 32.3 % of the totally 427 evaluated cases (incl. M1, n=12, 2.8 %). Patients with cancer relapse documented via death certificates only were excluded (n=27, 6.3 %). 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. Subgroups with sample size <20 are omitted from the chart.

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=138 %	Local relapse n=73 %	Lymph node n=57 %	Distant metastasis n=54 %
0	100.0	100.0	100.0	100.0
1	69.1	79.8	60.4	
2	53.6	68.6	43.4	
3	49.4	63.6		
4	45.1	60.1		
5	41.2	56.2		
6	37.9	53.8		
7	36.8	51.3		
8	35.6			
9	35.6			

**Table 5d.** Observed post-progression survival of patients with penile cancer for period 1998-2019 (N=138).

## 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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