

# Munich Cancer Registry



- ▶ Incidence and Mortality
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## ICD-10 C15: Oesophagus cancer

### Survival

Year of diagnosis	1988-1997	1998-2020
Patients	595	5,623
Diseases	596	5,624
Cases evaluated	517	4,065
Creation date	04/15/2022	
Database export	12/20/2021	
Population	4.92 m	



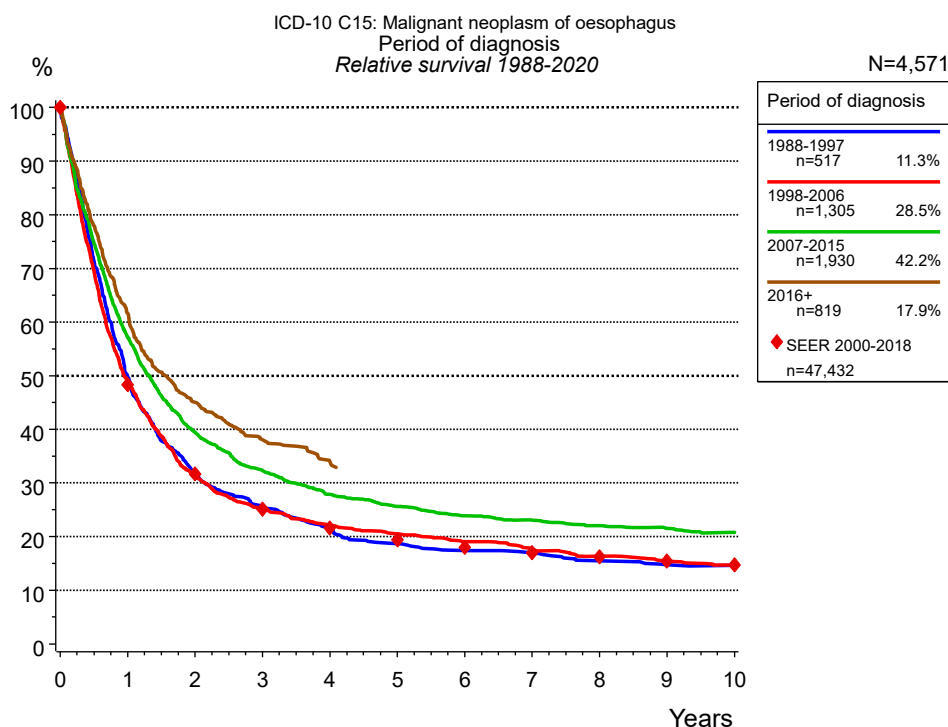
Munich Cancer Registry  
Cancer Registry Bavaria - Upper Bavaria Regional Center  
at Klinikum Grosshadern/IBE  
Marchioninstr. 15  
Munich, 81377  
Germany

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

[https://www.tumorregister-muenchen.de/en/facts/surv/sC15\\_\\_E-ICD-10-C15-Oesophagus-cancer-survival.pdf](https://www.tumorregister-muenchen.de/en/facts/surv/sC15__E-ICD-10-C15-Oesophagus-cancer-survival.pdf)

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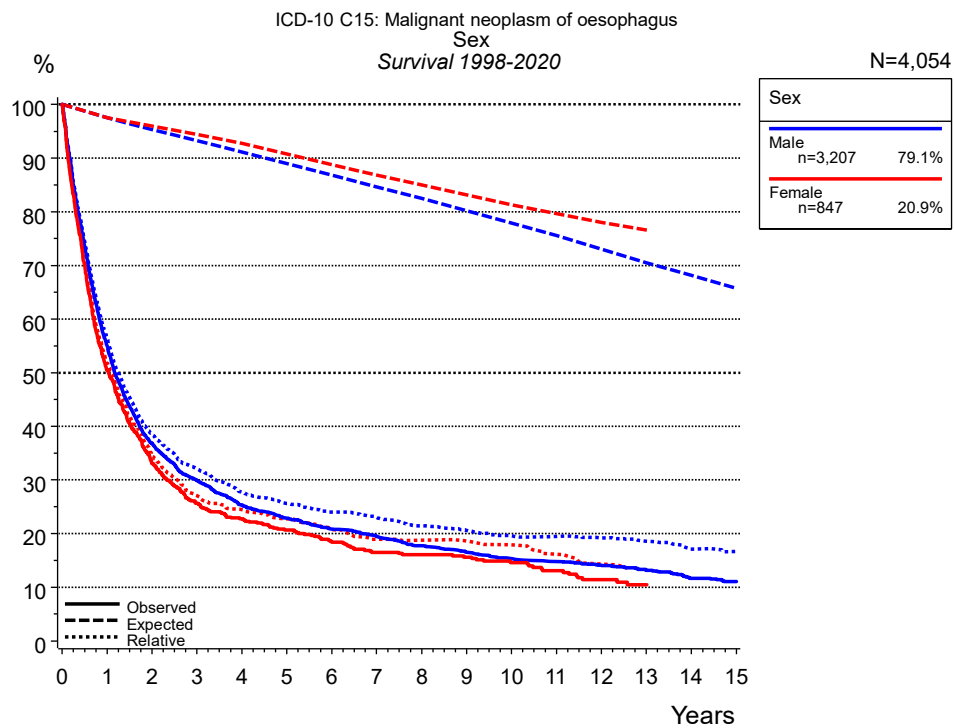
**Figure 1a.** Relative survival of patients with oesophagus cancer by period of diagnosis. Included in the evaluation are 4,571 cases diagnosed between 1988 and 2020.

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 2018, 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=517		1998-2006 n=1,305		2007-2015 n=1,930		2016+ n=819	
	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	48.7	49.8	47.9	49.0	55.7	57.1	60.2	61.6
2	30.6	31.9	29.8	31.1	37.6	39.4	43.2	45.0
3	23.8	25.4	23.7	25.2	30.2	32.3	35.9	38.1
4	19.9	21.6	20.4	22.1	25.4	27.9	31.5	33.9
5	16.8	18.7	18.5	20.5	22.8	25.7		
6	15.4	17.4	16.9	19.1	20.6	23.8		
7	14.6	17.0	15.3	17.7	19.5	23.1		
8	12.9	15.5	13.8	16.4	18.1	22.0		
9	12.0	14.7	12.8	15.5	17.2	21.6		
10	11.6	14.6	11.7	14.5	16.1	20.8		
Median	1.0		0.9		1.2		1.4	

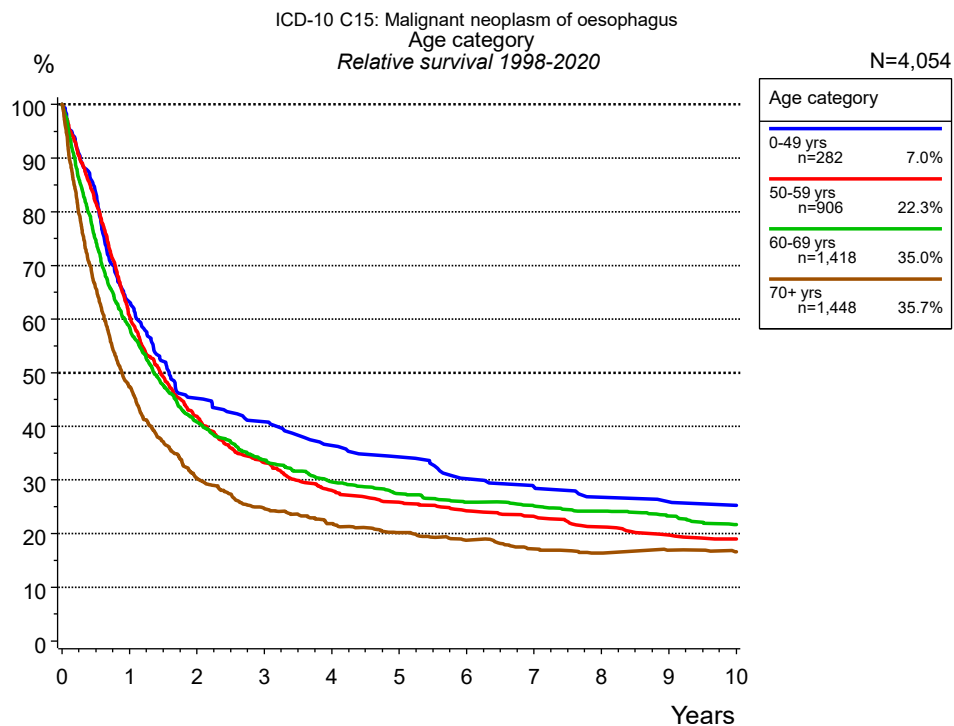
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with oesophagus cancer by period of diagnosis for period 1988-2020 (N=4,571).



**Figure 2a.** Survival of patients with oesophagus cancer by sex. Included in the evaluation are 4,054 cases diagnosed between 1998 and 2020.

Years	Sex			
	Male n=3,207		Female n=847	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	55.0	56.4	50.5	51.7
2	36.8	38.6	33.1	34.4
3	29.9	32.1	25.7	27.1
4	25.3	27.7	22.7	24.4
5	22.8	25.6	20.7	22.7
6	20.8	24.0	18.4	20.7
7	19.5	23.0	16.5	18.9
8	17.7	21.4	16.1	18.8
9	16.5	20.6	15.6	18.6
10	15.3	19.6	14.5	17.9
11	14.8	19.5	13.1	16.1
12	14.1	19.2	11.4	14.3
13	13.1	18.6	10.5	13.1
14	11.7	17.1		
15	11.0	16.7		
Median	1.2		1.0	

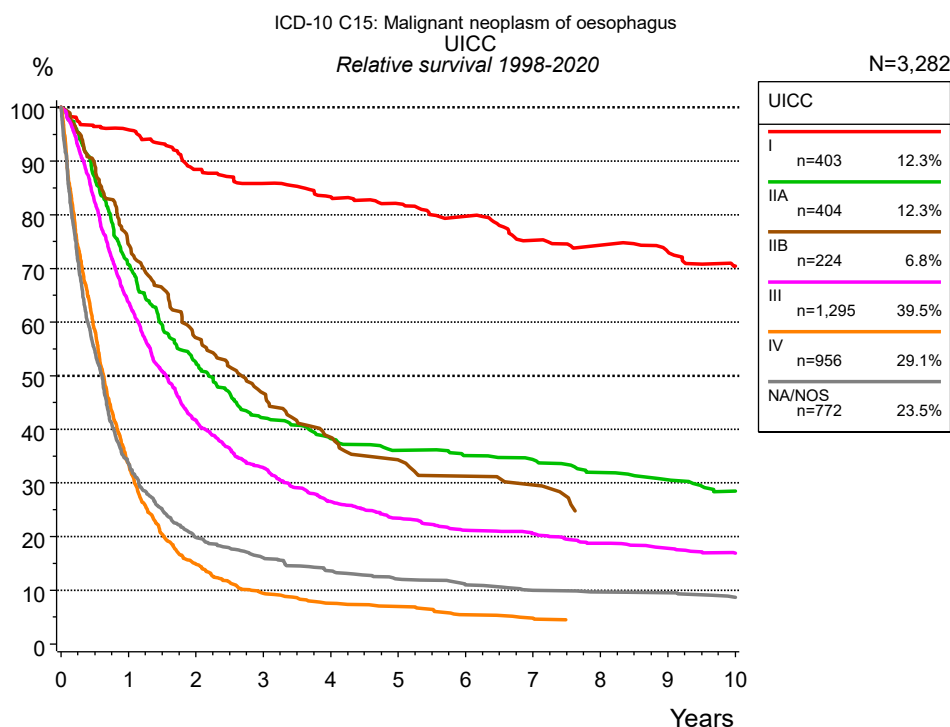
**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with oesophagus cancer by sex for period 1998-2020 (N=4,054).



**Figure 3a.** Relative survival of patients with oesophagus cancer by age category. Included in the evaluation are 4,054 cases diagnosed between 1998 and 2020.

Years	Age category							
	0-49 yrs n=282		50-59 yrs n=906		60-69 yrs n=1,418		70+ yrs n=1,448	
	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	63.6	63.2	60.1	60.5	57.6	58.4	45.0	47.3
2	45.2	45.2	41.4	41.9	39.6	40.8	27.5	30.3
3	40.9	40.9	32.7	33.3	32.3	33.8	21.3	24.7
4	36.3	36.4	27.2	28.1	27.9	29.6	18.0	21.9
5	34.0	34.3	24.9	25.9	25.3	27.5	15.6	20.2
6	29.8	30.2	23.1	24.3	23.4	25.9	13.7	18.8
7	28.4	28.7	21.9	23.2	22.3	25.2	11.7	17.2
8	26.3	26.8	19.9	21.2	20.9	24.2	10.5	16.4
9	25.7	26.0	18.3	19.7	19.6	23.3	9.9	16.9
10	25.1	25.3	17.3	19.0	17.7	21.7	9.0	16.6
Median	1.6		1.4		1.3		0.8	

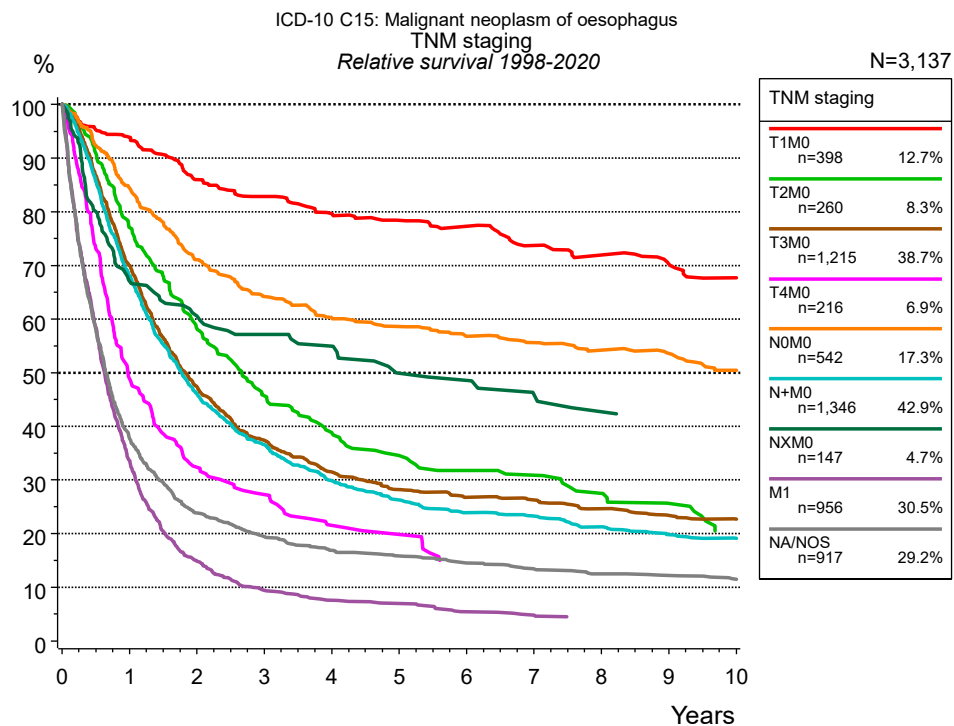
**Table 3b.** Observed (obs.) and relative (rel.) survival of patients with oesophagus cancer by age category for period 1998-2020 (N=4,054).



**Figure 4a.** Relative survival of patients with oesophagus cancer by UICC. For 3,403 of 4,054 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 3,282 cases an evaluable classification was established. The grey line represents the subgroup of 772 patients with missing values regarding UICC (19.0 % of 4,054 patients, the percent values of all other categories are related to n=3,282).

Years	UICC											
	I n=403		IIA n=404		IIB n=224		III n=1,295		IV n=956		NA/NOS n=772	
	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
1	94.2	95.9	69.3	70.7	73.1	74.4	62.4	63.7	33.0	33.6	32.1	33.5
2	84.6	88.5	50.6	52.5	54.8	57.1	40.1	41.7	14.3	14.8	18.5	19.9
3	80.1	85.8	39.8	42.2	44.1	46.7	31.0	32.8	8.9	9.5	14.7	16.0
4	76.2	83.3	35.4	38.3	35.8	38.5	24.5	26.5	7.1	7.6	12.0	13.6
5	73.0	82.1	32.8	36.1	30.9	34.3	21.2	23.4	6.3	6.9	10.4	12.1
6	69.1	79.7	31.2	35.1	28.0	31.3	18.7	21.2	4.8	5.4	9.2	11.0
7	63.4	75.2	30.0	34.4	26.2	29.6	17.8	20.6	4.3	4.8	8.0	10.0
8	61.0	74.3	27.4	32.0	21.0	23.9	15.8	18.8	3.8	4.5	7.7	9.7
9	58.3	73.1	25.7	30.6			14.6	17.8			7.5	9.6
10	54.4	70.4	23.2	28.5			13.5	16.9			6.6	8.6
Median	12.6		2.0		2.5		1.5		0.6		0.6	

**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with oesophagus cancer by UICC for period 1998-2020 (N=3,282).



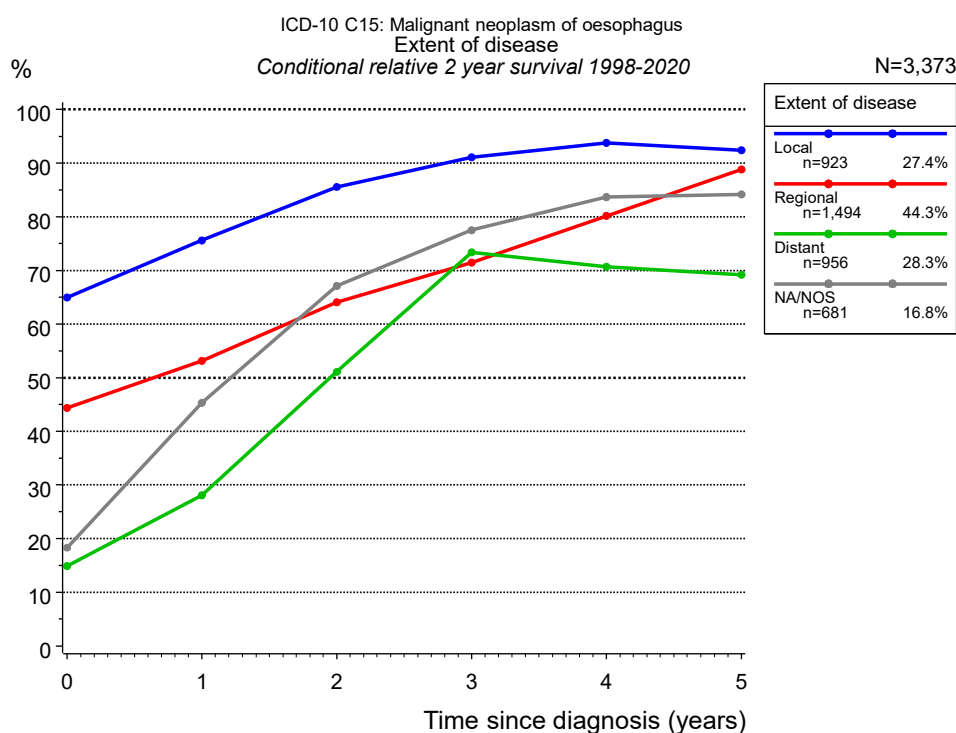
**Figure 4e.** Relative survival of patients with oesophagus cancer by TNM staging. For 3,403 of 4,054 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 3,137 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 917 patients with missing values regarding TNM staging (22.6 % of 4,054 patients, the percent values of all other categories are related to n=3,137).

TNM staging														
Years	T1M0 n=398		T2M0 n=260		T3M0 n=1,215		T4M0 n=216		N0M0 n=542		N+M0 n=1,346		NXM0 n=147	
	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	92.1	93.9	75.6	77.1	68.5	69.9	48.1	48.8	83.0	84.4	66.7	68.1	65.5	67.1
2	82.4	86.0	56.1	58.2	45.7	47.3	31.5	32.4	68.4	71.1	44.3	46.1	58.3	60.6
3	77.6	82.8	43.1	45.7	35.3	37.4	26.3	27.3	60.5	64.2	34.5	36.6	53.7	57.2
4	73.2	79.7	35.7	38.8	29.1	31.4	20.2	21.5	55.6	60.2	27.6	29.8	51.0	54.9
5	70.2	78.4	31.0	34.6	25.5	28.2	18.4	19.8	52.9	58.6	23.7	26.3	44.5	49.9
6	67.6	77.3	28.1	31.7	23.6	26.8			50.1	56.8	21.1	23.9	43.3	48.6
7	62.7	73.7	26.7	30.9	22.7	26.3			48.0	55.6	20.0	23.3	39.2	45.9
8	59.6	71.9	23.3	27.5	20.8	24.6			45.6	54.2	17.9	21.2	36.3	42.7
9	56.7	70.3	20.5	25.6	19.2	23.4			43.9	53.6	16.1	19.8		
10	52.9	67.7			18.2	22.7			40.1	50.4	15.2	19.1		
Median	11.9		2.5		1.7		1.0		6.3		1.7		4.0	

<i>cont'd</i>	TNM staging			
	M1 n=956		NA/NOS n=917	
	obs. %	rel. %	obs. %	rel. %
Years				
0	100.0	100.0	100.0	100.0
1	33.0	33.6	36.2	37.6
2	14.3	14.8	22.4	23.8
3	8.9	9.5	18.0	19.5
4	7.1	7.6	15.1	16.9
5	6.3	6.9	13.7	15.8
6	4.8	5.4	12.2	14.5
7	4.3	4.8	11.0	13.4
8	3.8	4.5	10.0	12.5
9			9.6	12.2
10			8.8	11.5
Median	0.6		0.6	

**Table 4f.** Observed (obs.) and relative (rel.) survival of patients with oesophagus cancer by TNM staging for period 1998-2020 (N=3,137).



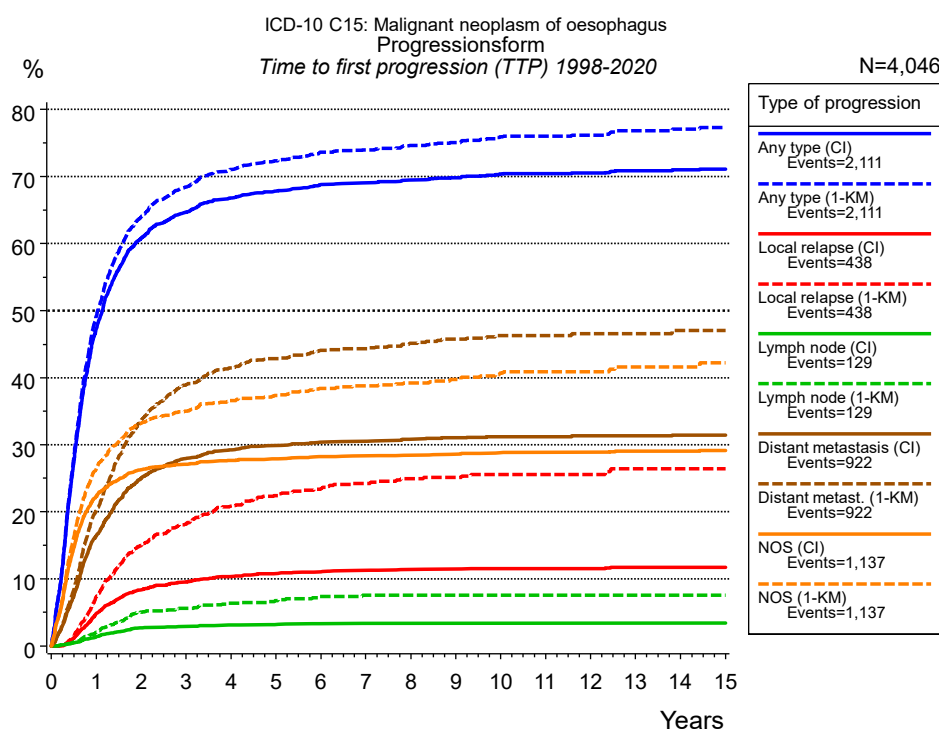


**Figure 4i.** Conditional relative 2-year survival of patients with oesophagus cancer by extent of disease. For 3,403 of 4,054 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 3,373 cases an evaluable classification was established. The grey line represents the subgroup of 681 patients with missing values regarding extent of disease (16.8 % of 4,054 patients, the percent values of all other categories are related to n=3,373).

Years	Extent of disease							
	Local		Regional		Distant		NA/NOS	
	n	Cond. surv. % 2 yrs	n	Cond. surv. % 2 yrs	n	Cond. surv. % 2 yrs	n	Cond. surv. % 2 yrs
0	923	64.9	1,494	44.4	956	14.8	681	18.3
1	682	75.6	931	53.1	308	28.1	203	45.3
2	537	85.6	587	64.1	127	51.0	113	67.1
3	453	91.1	429	71.5	72	73.4	85	77.5
4	390	93.7	313	80.2	49	70.7	68	83.7
5	344	92.4	244	88.8	42	69.2	57	84.2

**Table 4j.** Conditional relative 2-year survival of patients with oesophagus cancer by extent of disease for period 1998-2020 (N=3,373).

Conditional relative survival rates refer to the relative survival probability, in this case for 2 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 4g). 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 extent of disease="Local", who are alive at least 3 years after cancer diagnosis, the conditional relative 2-year survival rate is 91.1% (n=453).

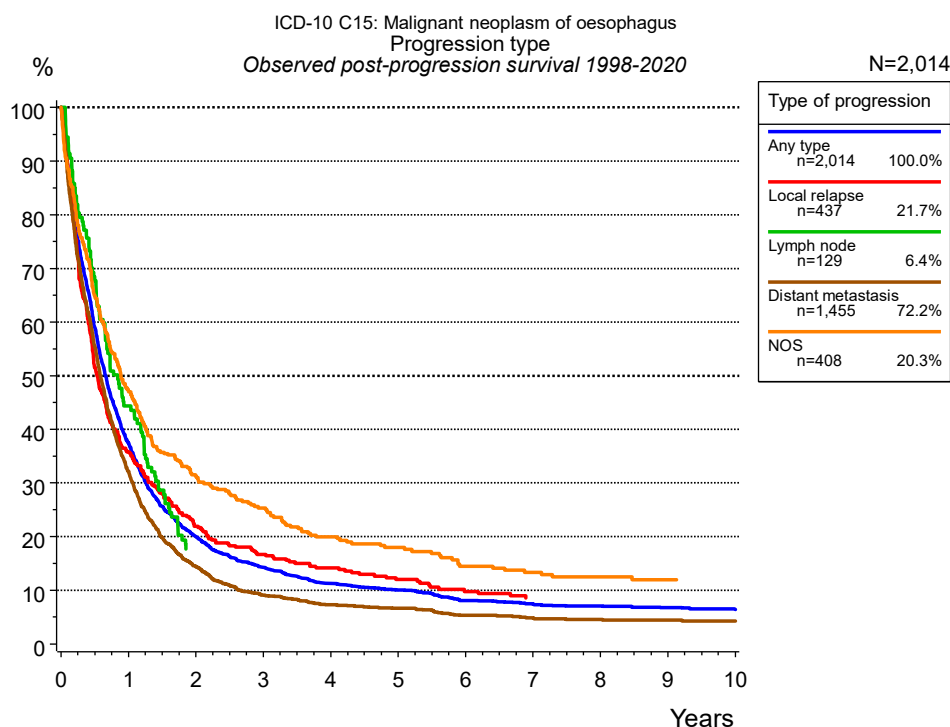


**Figure 5a.** Time to first progression of 4,046 patients with oesophagus cancer diagnosed between 1998 and 2020 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Type of progression							
	Any type (CI)	Any type (1-KM)	Local relapse (CI)	Local relapse (1-KM)	Lymph node (CI)	Lymph node (1-KM)	Distant metastasis (CI)
N	3,110	3,110	4,046	4,046	4,046	4,046	3,110
Events	2,109	2,109	437	437	129	129	922
compet.	434		2,887		3,153		1,516
Years	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	47.3	49.2	4.8	7.4	1.4	2.1	16.4
2	60.8	64.0	8.4	15.0	2.7	5.0	25.0
3	64.7	68.5	9.5	18.1	2.9	5.6	28.0
4	66.9	71.1	10.4	20.8	3.1	6.4	29.3
5	67.9	72.4	10.8	22.4	3.2	6.8	29.9
6	68.8	73.6	11.0	23.3	3.3	7.4	30.4
7	69.1	74.0	11.3	24.2	3.4	7.6	30.5
8	69.6	74.7	11.4	24.9	3.4	7.6	30.8
9	69.8	75.1	11.4	25.1	3.4	7.6	31.0
10	70.4	75.9	11.5	25.6	3.4	7.6	31.2
11	70.4	76.0	11.5	25.6	3.4	7.6	31.2
12	70.5	76.2	11.5	25.6	3.4	7.6	31.3
13	70.9	76.8	11.7	26.4	3.4	7.6	31.3
14	71.0	77.1	11.7	26.4	3.4	7.6	31.4
15	71.1	77.3	11.7	26.4	3.4	7.6	31.4

<i>cont'd</i>	Type of progression		
	Distant metast. (1- KM)	NOS (CI)	NOS (1-KM)
N	3,110	4,046	4,046
Events	922	1,135	1,135
compet.		2,206	
Years	%	%	%
0	0.0	0.0	0.0
1	20.1	22.3	26.4
2	33.5	26.3	33.2
3	38.9	27.1	35.0
4	41.5	27.7	36.6
5	42.9	27.9	37.3
6	44.1	28.3	38.4
7	44.3	28.4	38.8
8	45.1	28.5	39.2
9	45.7	28.6	39.7
10	46.3	28.8	40.7
11	46.3	28.9	40.9
12	46.5	28.9	40.9
13	46.5	29.0	41.6
14	47.0	29.0	41.6
15	47.0	29.1	42.2

**Table 5b.** Time to first progression of patients with oesophagus cancer for period 1998-2020 (N=4,046), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

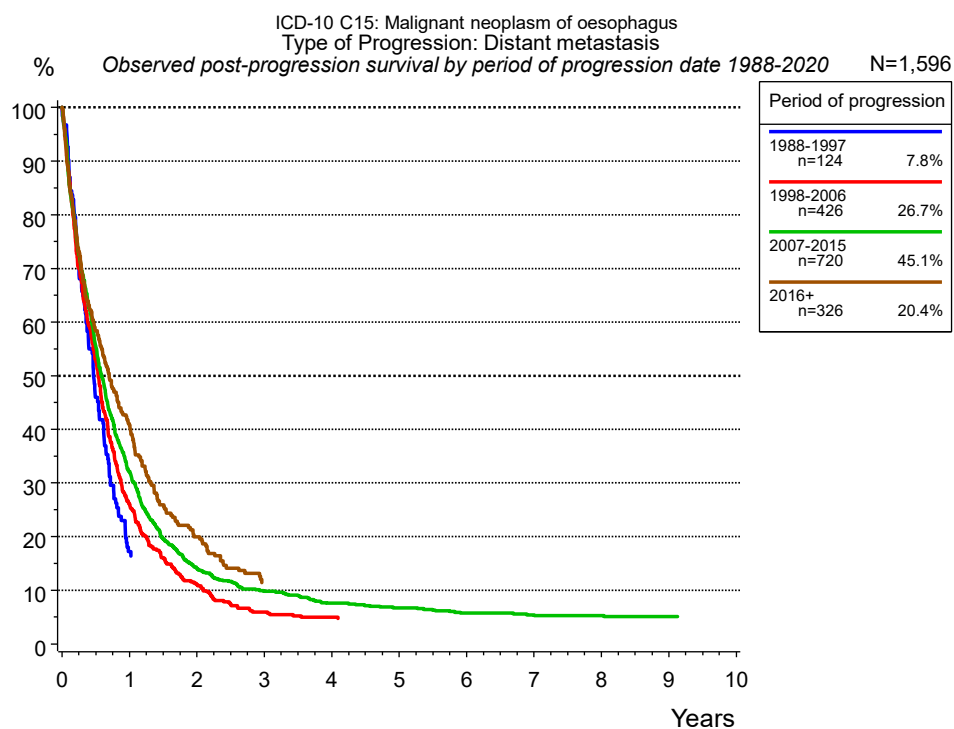


**Figure 5c.** Observed post-progression survival of 2,014 patients with oesophagus cancer diagnosed between 1998 and 2020. These 2,014 patients with documented progression events during their course of disease represent 49.8 % of the totally 4,046 evaluated cases (incl. M1, n=936, 23.1 %). Patients with cancer relapse documented via death certificates only were excluded (n=1,033, 25.5 %). 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=2,014 %	Local relapse n=437 %	Lymph node n=129 %	Distant metastasis n=1,455 %	NOS n=408 %
0	100.0	100.0	100.0	100.0	100.0
1	37.4	35.8	44.3	32.1	47.0
2	20.0	21.9		14.4	31.2
3	14.2	16.7		9.0	25.4
4	11.3	14.1		7.3	20.0
5	10.1	12.0		6.6	18.0
6	8.1	9.8		5.3	14.5
7	7.5	8.5		4.9	13.3
8	7.1			4.5	12.5
9	6.8			4.4	12.0
10	6.4			4.3	

**Table 5d.** Observed post-progression survival of patients with oesophagus cancer for period 1998-2020 (N=2,014).



**Figure 5e.** Observed post-progression (distant metastasis) survival of 1,596 patients with oesophagus cancer diagnosed between 1988 and 2020 by period of progression.

Years	Period of progression			
	1988-1997 n=124 %	1998-2006 n=426 %	2007-2015 n=720 %	2016+ n=326 %
0	100.0	100.0	100.0	100.0
1	17.2	25.9	32.1	40.7
2		11.1	14.0	20.0
3		5.9	9.8	
4		4.9	7.6	
5			6.7	
6			5.7	
7			5.4	
8			5.2	
9			5.0	

**Table 5f.** Observed post-progression (distant metastasis) survival of patients with oesophagus cancer for period 1988-2020 by period of progression (N=1,596).

## 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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