

Munich Cancer Registry



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

ICD-10 C02-C06: Oral cavity cancer

Survival

Year of diagnosis	1988-1997	1998-2014
Patients	905	3,015
Diseases	912	3,038
Cases evaluated	808	2,387
Creation date	03/02/2016	
Export date	12/23/2015	
Population	4.64 m	



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

<http://www.tumorregister-muenchen.de/en/facts/surv/sC0206E-ICD-10-C02-C06-Oral-cavity-cancer-survival.pdf>

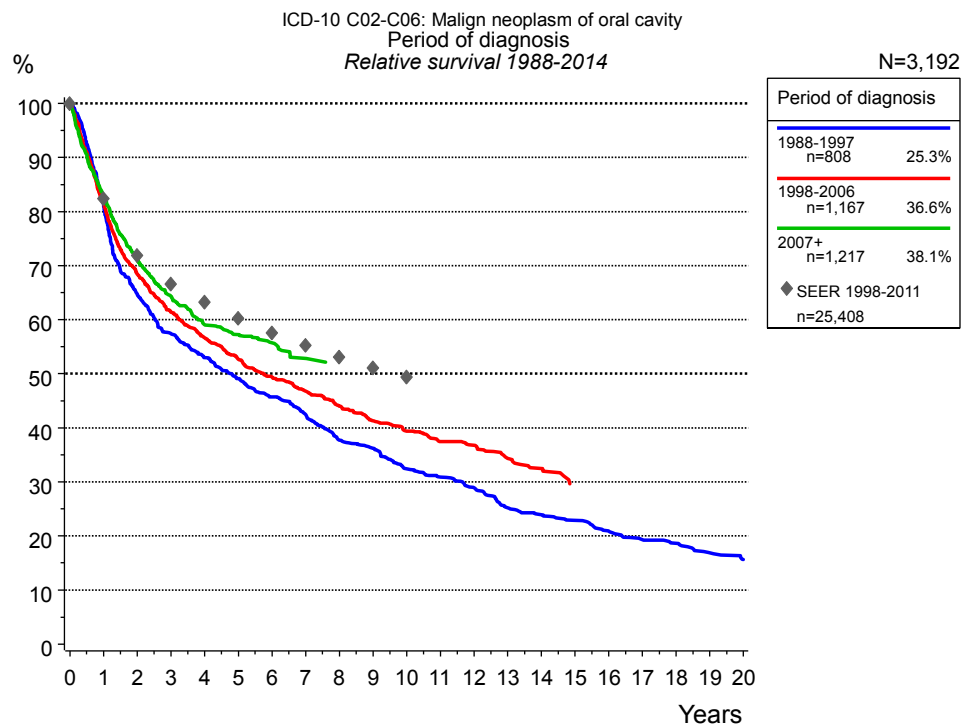


Figure 1a. Relative survival of patients with oral cavity cancer by period of diagnosis. Included in the evaluation are 3,192 cases diagnosed between 1988 and 2014.

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 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=808		1998-2006 n=1,167		2007+ n=1,217	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	79.6	81.0	80.2	81.6	81.5	83.0
2	62.7	64.7	66.2	68.4	68.8	71.2
3	54.7	57.5	58.4	61.4	61.2	64.4
4	49.5	53.0	53.0	56.6	55.3	59.0
5	45.2	49.1	48.5	52.7	52.8	57.3
6	41.3	45.7	44.7	49.4	50.4	55.7
7	37.9	42.5	41.7	46.8	47.4	52.9
8	33.0	37.8	38.5	44.0		
9	31.2	36.2	35.5	41.3		
10	27.5	32.4	33.2	39.4		
11	25.8	30.9	30.9	37.5		
12	23.6	28.9	29.9	36.8		
13	20.2	25.2	27.2	34.4		
14	18.9	24.0	25.5	32.5		
15	17.6	22.9				
16	15.8	20.9				
17	14.4	19.3				
18	13.6	18.7				
19	12.0	16.9				
20	10.9	15.7				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with oral cavity cancer by period of diagnosis for period 1988-2014 (N=3,192).

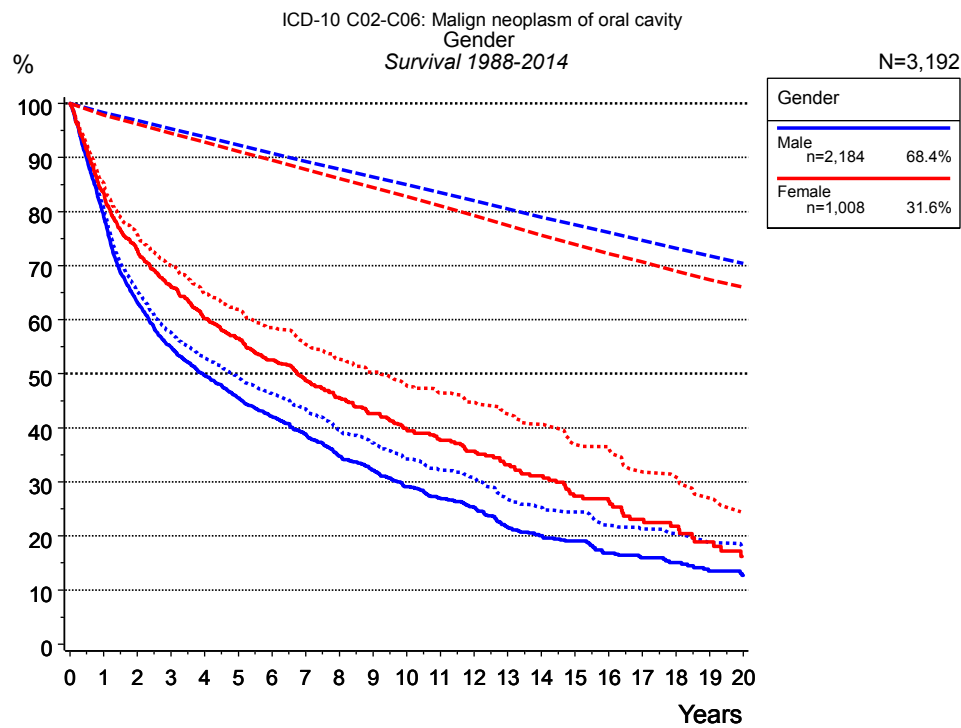


Figure 2a. Survival of patients with oral cavity cancer by gender. Included in the evaluation are 3,192 cases diagnosed between 1988 and 2014.

Years	Gender			
	Male n=2,184		Female n=1,008	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	79.2	80.5	83.4	85.3
2	63.2	65.2	73.0	75.8
3	55.0	57.7	66.0	69.9
4	49.6	52.9	60.2	64.8
5	45.5	49.3	56.5	61.9
6	42.1	46.3	52.5	58.6
7	38.9	43.5	48.8	55.4
8	34.8	39.5	45.4	52.7
9	32.2	37.2	42.6	50.3
10	29.1	34.2	39.7	47.9
11	27.0	32.2	37.7	46.5
12	25.3	30.8	35.7	44.7
13	21.6	26.8	33.2	42.6
14	20.1	25.3	31.1	40.7
15	19.1	24.4	27.4	36.9
16	16.9	22.0	26.4	36.3
17	15.9	21.3	23.1	31.9
18	15.1	20.4	21.8	30.9
19	13.5	18.8	18.9	27.0
20	12.7	17.9	16.2	24.4

Table 2b. Observed (obs.) and relative (rel.) survival of patients with oral cavity cancer by gender for period 1988-2014 (N=3,192).

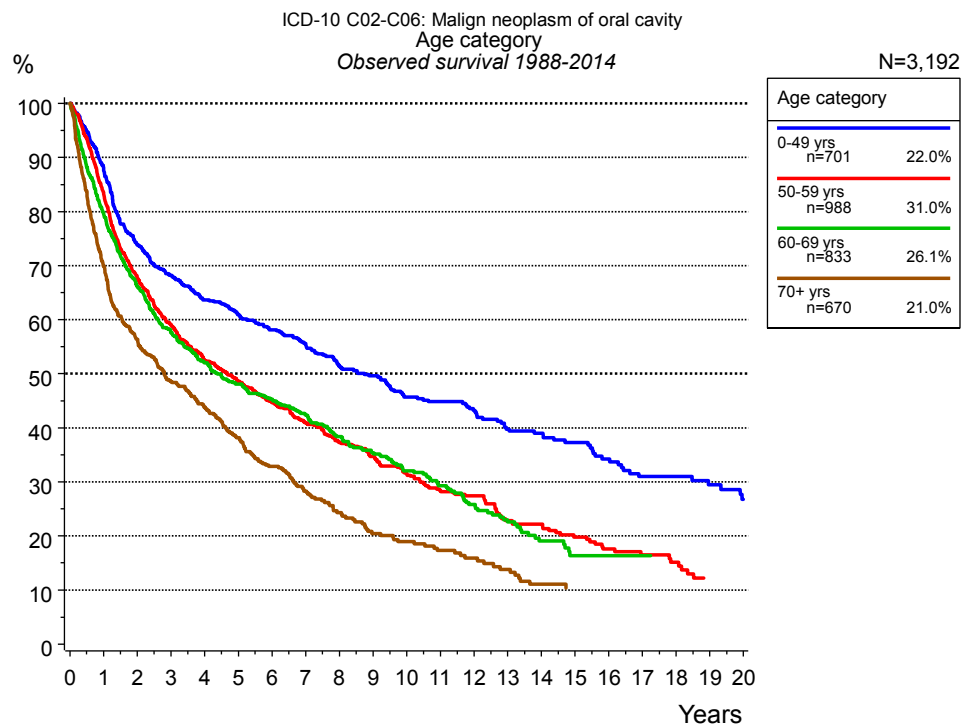


Figure 3a. Observed survival of patients with oral cavity cancer by age category. Included in the evaluation are 3,192 cases diagnosed between 1988 and 2014.

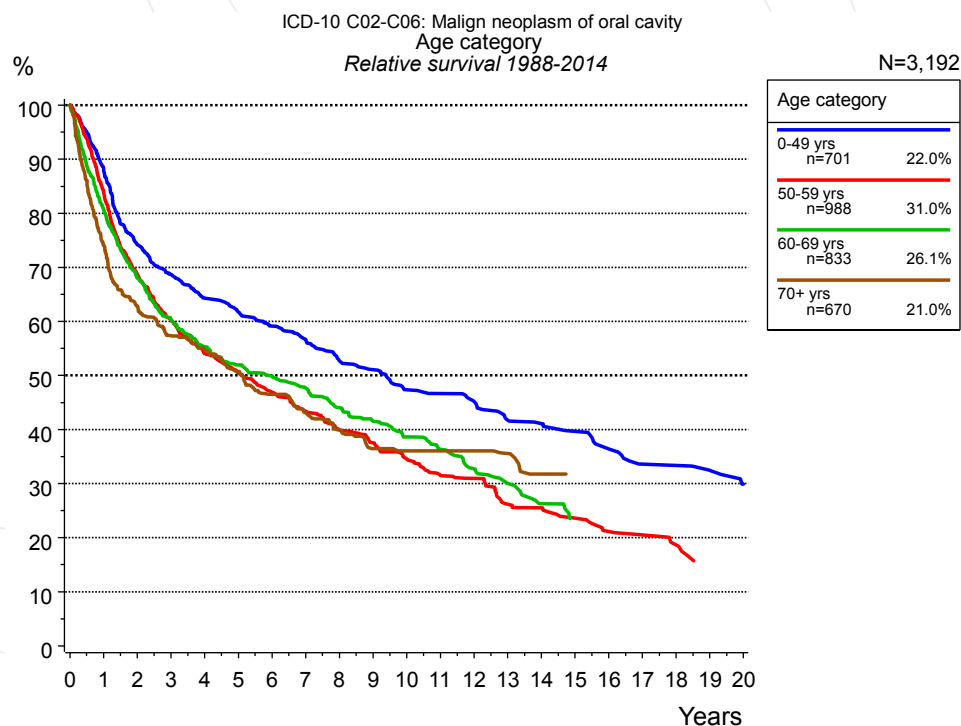


Figure 3b. Relative survival of patients with oral cavity cancer by age category. Included in the evaluation are 3,192 cases diagnosed between 1988 and 2014.

Years	Age category							
	0-49 yrs n=701		50-59 yrs n=988		60-69 yrs n=833		70+ yrs n=670	
	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	87.7	87.9	83.5	84.0	79.8	80.8	69.9	74.1
2	73.8	74.2	67.8	68.7	66.2	68.1	56.4	62.9
3	68.2	68.7	59.1	60.3	57.6	60.2	48.6	57.3
4	63.6	64.3	52.5	54.0	52.1	55.3	43.9	54.8
5	60.9	61.7	48.6	50.4	48.1	51.9	38.2	50.7
6	58.1	59.1	44.8	46.9	45.3	49.9	32.9	46.5
7	55.6	56.7	40.9	43.4	42.5	47.7	28.3	43.1
8	51.3	52.7	37.3	40.0	38.4	44.0	24.3	39.9
9	49.6	51.1	34.7	37.5	35.4	41.6	20.5	36.5
10	45.7	47.3	31.5	34.6	32.0	38.7	18.9	36.1
11	44.8	46.7	28.4	31.5	29.3	36.4	17.3	36.1
12	43.2	45.2	27.4	30.9	25.8	32.8	15.9	36.1
13	39.7	41.8	22.8	26.2	22.6	30.0	13.8	35.6
14	39.0	41.1	22.2	25.6	19.1	26.3	11.1	31.8
15	37.3	39.7	19.8	23.6	16.4	23.5	10.4	31.8
16	34.2	36.4	17.6	21.2	16.4	23.5		
17	31.0	33.6	16.5	20.5	16.4	23.5		
18	31.0	33.4	15.1	18.7				
19	29.5	32.5						
20	26.8	29.9						

Table 3c. Observed (obs.) and relative (rel.) survival of patients with oral cavity cancer by age category for period 1988-2014 (N=3,192).

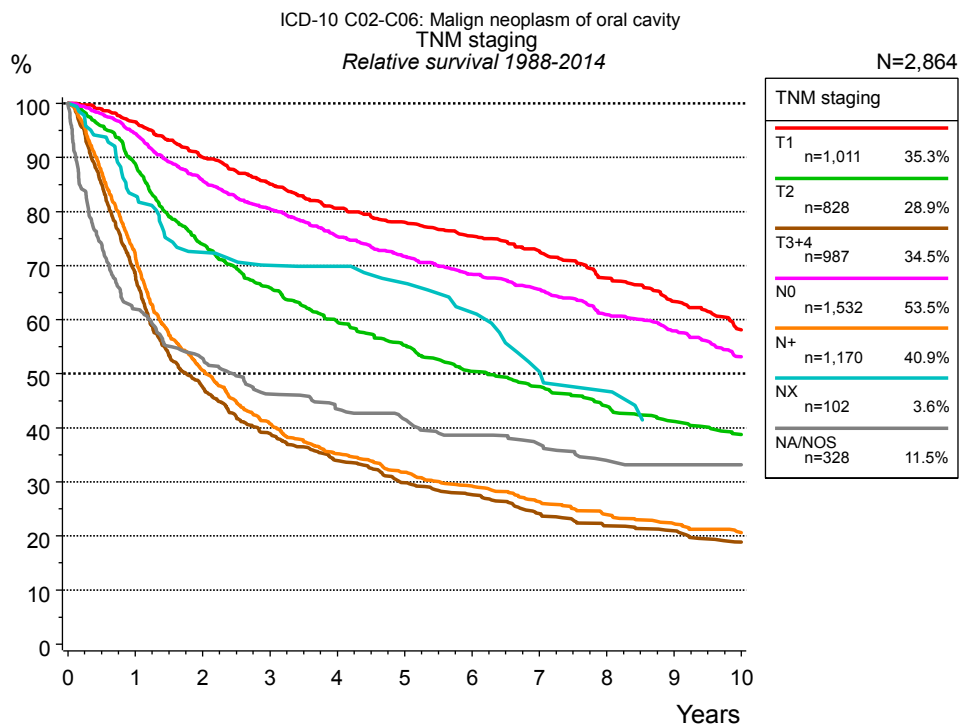


Figure 4a. Relative survival of patients with oral cavity cancer by TNM staging. For 2,881 of 3,192 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 2,864 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 328 patients with missing values regarding TNM staging (10.3 % of 3,192 patients, the percent values of all other categories are related to n=2,864).

TNM staging														
Years	T1 n=1,011		T2 n=828		T3+4 n=987		N0 n=1,532		N+ n=1,170		NX n=102		NA/NOS n=328	
	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	95.2	96.6	87.3	88.8	67.1	68.3	93.0	94.5	70.8	71.8	81.1	82.9	60.1	61.9
2	87.4	90.0	71.5	73.9	46.0	47.5	83.1	85.7	49.2	50.6	68.8	72.5	50.4	52.8
3	81.3	85.1	62.7	65.9	37.1	38.9	76.8	80.5	39.0	40.8	64.5	70.1	43.1	46.2
4	75.8	80.6	55.8	59.6	31.8	33.9	70.7	75.4	33.2	35.2	63.4	69.9	39.7	43.5
5	72.2	78.0	50.9	55.3	27.5	29.8	66.2	71.7	29.6	31.8	59.4	66.7	37.3	41.5
6	68.8	75.5	45.6	50.4	25.1	27.6	62.1	68.4	26.8	29.2	53.3	61.3	34.1	38.6
7	65.1	72.7	42.5	47.6	21.6	24.1	58.6	65.6	23.8	26.3	43.3	50.4	31.7	36.9
8	59.5	67.7	38.5	44.0	19.2	21.9	53.5	60.9	21.2	23.9	39.8	46.7	28.5	33.9
9	54.8	63.4	35.6	41.2	18.2	20.9	50.0	57.9	19.5	22.3			27.6	33.2
10	49.3	58.2	33.0	38.7	16.1	18.9	45.1	53.2	17.7	20.6			26.7	33.2

Table 4b. Observed (obs.) and relative (rel.) survival of patients with oral cavity cancer by TNM staging for period 1988-2014 (N=5,630).

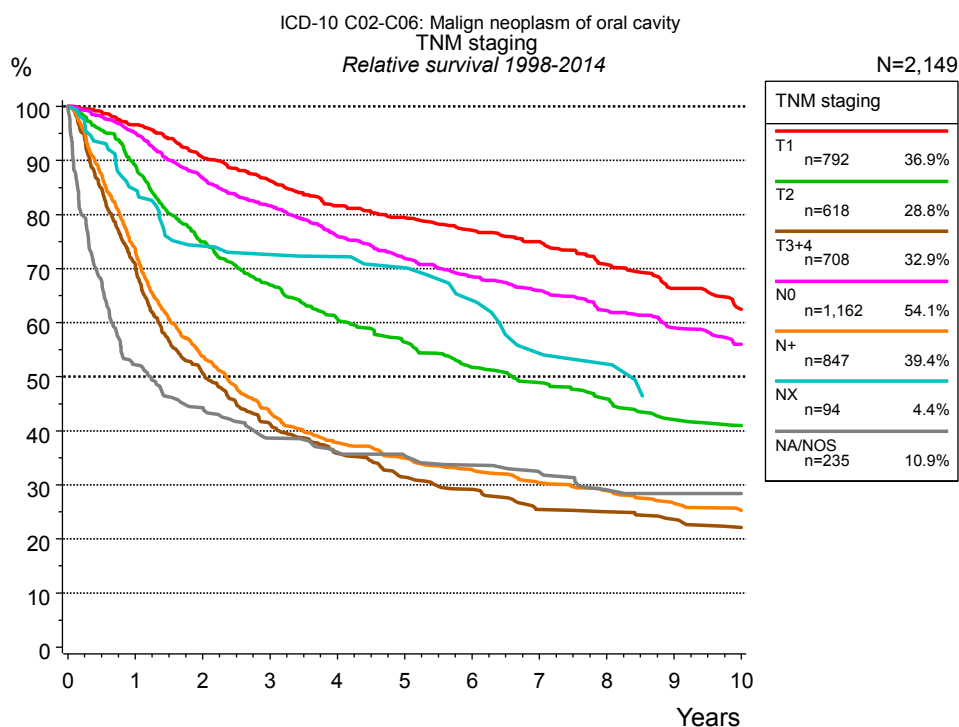


Figure 4c. Relative survival of patients with oral cavity cancer by TNM staging. For 2,164 of 2,384 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 2,149 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 235 patients with missing values regarding TNM staging (9.9 % of 2,384 patients, the percent values of all other categories are related to n=2,149).

TNM staging														
	T1 n=792		T2 n=618		T3+4 n=708		N0 n=1,162		N+ n=847		NX n=94		NA/NOS n=235	
Years	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	95.2	96.6	87.5	89.0	69.6	70.7	93.8	95.1	72.4	73.4	82.7	84.6	50.4	52.2
2	88.0	90.6	72.6	75.0	49.1	50.7	84.1	86.7	52.3	53.8	70.4	74.2	42.2	44.3
3	82.5	86.3	63.7	67.0	39.4	41.3	78.0	81.6	41.6	43.4	66.9	72.6	35.8	38.7
4	76.9	81.6	56.8	60.7	33.6	35.9	71.5	76.0	35.7	37.8	65.7	72.2	32.8	36.0
5	73.7	79.5	52.0	56.4	29.0	31.4	66.5	71.9	32.5	35.0	62.9	70.2	31.8	35.4
6	70.4	77.1	46.8	51.8	26.7	29.2	62.3	68.5	30.2	32.9	56.0	64.1	29.6	33.6
7	67.3	75.0	43.6	48.9	22.7	25.4	59.0	65.9	27.5	30.4	46.7	54.3	27.6	32.4
8	62.2	70.7	40.3	45.9	22.0	25.1	54.7	62.2	25.7	28.9	44.7	52.3	24.1	29.1
9	57.3	66.3	36.5	42.1	20.6	23.6	51.0	59.1	23.4	26.6			23.4	28.4
10	53.0	62.5	34.7	41.0	19.1	22.2	47.5	56.0	21.7	25.3			22.6	28.4

Table 4d. Observed (obs.) and relative (rel.) survival of patients with oral cavity cancer by TNM staging for period 1998-2014 (N=4,221).

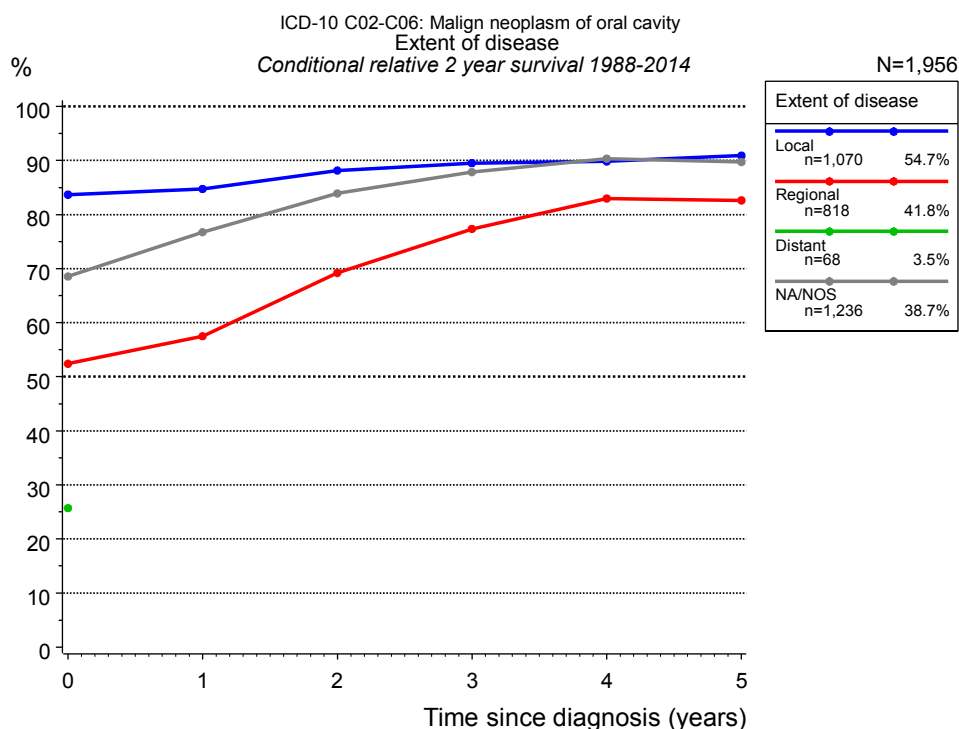


Figure 4e. Conditional relative 2-year survival of patients with oral cavity cancer by extent of disease. For 2,881 of 3,192 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 1,956 cases an evaluable classification was established. The grey line represents the subgroup of 1,236 patients with missing values regarding extent of disease (38.7% of 3,192 patients, the percent values of all other categories are related to n=1,956).

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	1,070	83.7	818	52.4	68	25.7	1,236	68.6
1	942	84.7	581	57.5			963	76.7
2	776	88.2	381	69.2			793	83.9
3	645	89.5	274	77.3			695	87.8
4	538	89.8	207	83.0			614	90.3
5	442	90.9	168	82.6			547	89.7

Table 4f. Conditional relative 2-year survival of patients with oral cavity cancer by extent of disease for period 1988-2014 (N=1,956).

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 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 extent of disease="Local", who are alive at least 3 years after cancer diagnosis, the conditional relative 2-year survival rate is 89.5% (n=645).

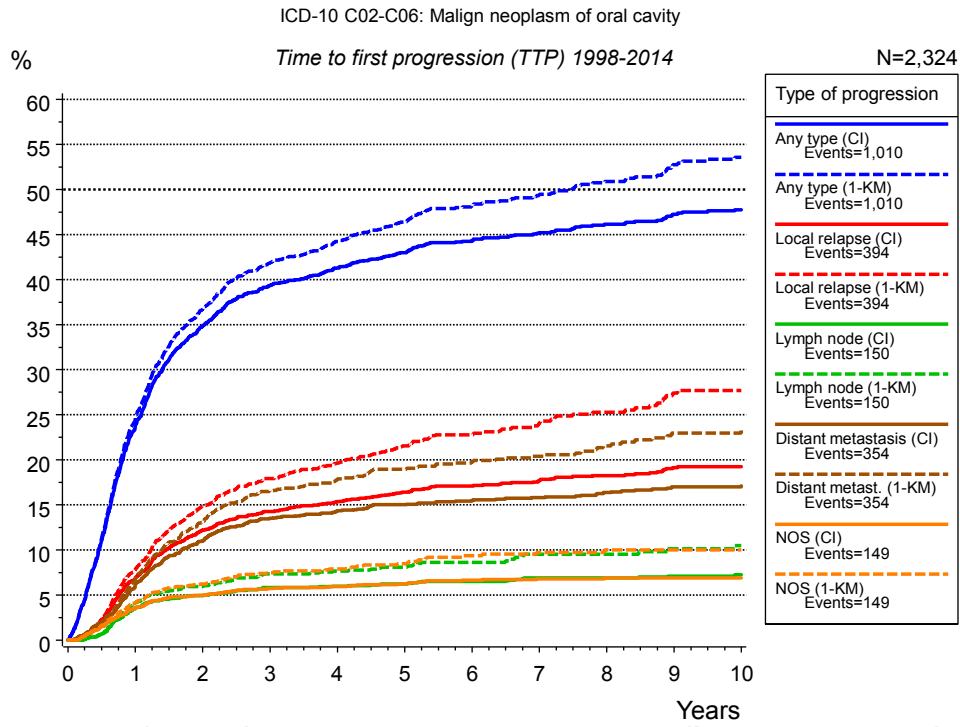


Figure 5a. Time to first progression of 2,324 patients with oral cavity cancer diagnosed between 1998 and 2014 (M0 only in solid cancers) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Type of progression							
Years	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=2,324	n=2,324	n=2,324	n=2,324	n=2,324	n=2,324	n=2,324
	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	23.8	24.6	6.9	7.9	3.6	4.2	6.2
2	34.8	36.7	12.2	14.9	4.9	5.9	11.0
3	39.4	41.9	14.3	17.9	5.8	7.4	13.5
4	41.3	44.2	15.3	19.7	6.0	7.7	14.4
5	43.0	46.4	16.4	21.6	6.2	8.1	15.0
6	44.3	48.2	17.1	22.8	6.5	8.6	15.5
7	45.2	49.5	17.7	24.1	6.9	9.6	15.8
8	46.1	50.9	18.3	25.3	6.9	9.6	16.4
9	47.3	52.7	19.1	27.4	7.1	10.1	17.0
10	47.8	53.6	19.2	27.7	7.2	10.5	17.1

<i>cont'd</i>	Type of progression		
	Distant metast. (1- KM)	NOS (CI)	NOS (1-KM)
	n=2,324	n=2,324	n=2,324
Years	%	%	%
0	0.0	0.0	0.0
1	7.0	3.5	4.1
2	13.1	5.0	6.2
3	16.6	5.7	7.5
4	17.9	5.9	7.9
5	19.0	6.2	8.5
6	19.8	6.6	9.4
7	20.4	6.8	9.7
8	21.6	6.9	10.0
9	23.0	6.9	10.0
10	23.3	6.9	10.0

Table 5b. Time to first progression of patients with oral cavity cancer for period 1998-2014 (N=2,324).

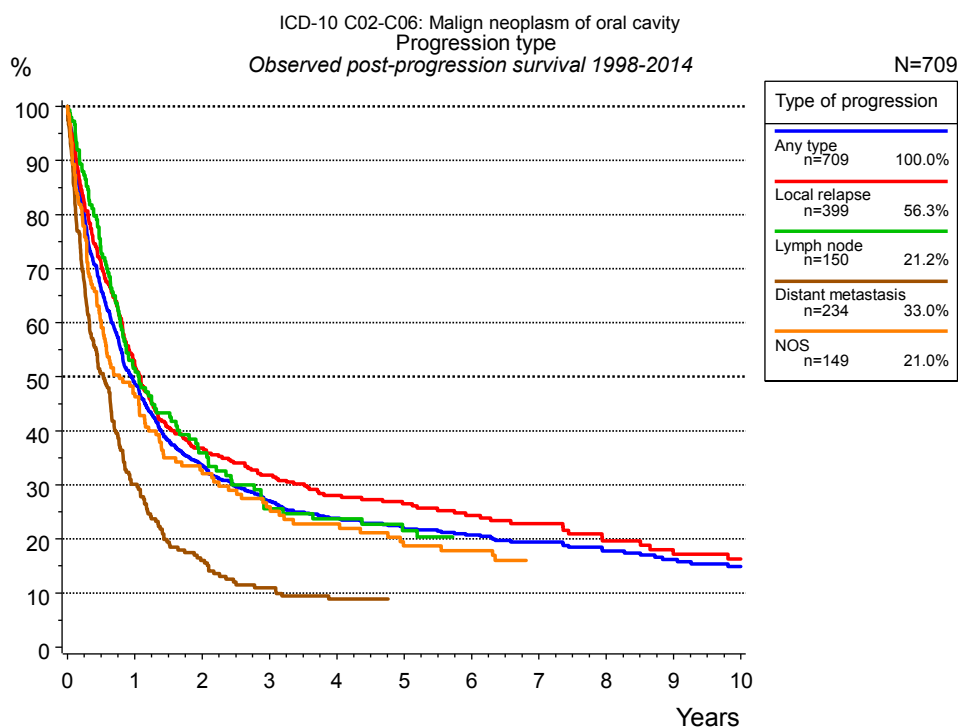


Figure 5c. Observed post-progression survival of 709 patients with oral cavity cancer diagnosed between 1998 and 2014. These 709 patients with documented progression events during their course of disease represent 29.8 % of the totally 2,376 evaluated cases (incl. M1, n=52, 2.2 %). Patients with cancer relapse documented via death certificates only were excluded (n=353, 14.9 %). 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=709 %	Local relapse n=399 %	Lymph node n=150 %	Distant metastasis n=234 %	NOS n=149 %
0	100.0	100.0	100.0	100.0	100.0
1	48.5	52.2	51.6	30.1	46.2
2	33.7	36.8	35.9	16.0	32.8
3	27.1	31.8	25.6	11.0	25.9
4	23.9	28.1	23.7	8.9	22.8
5	21.9	26.5	21.6	8.9	18.7
6	20.7	24.4		8.9	17.9
7	19.4	22.9		8.9	16.0
8	17.8	19.7		8.9	16.0
9	16.2	17.2			
10	14.9	16.3			

Table 5d. Observed post-progression survival of patients with oral cavity cancer for period 1998-2014 (N=709).

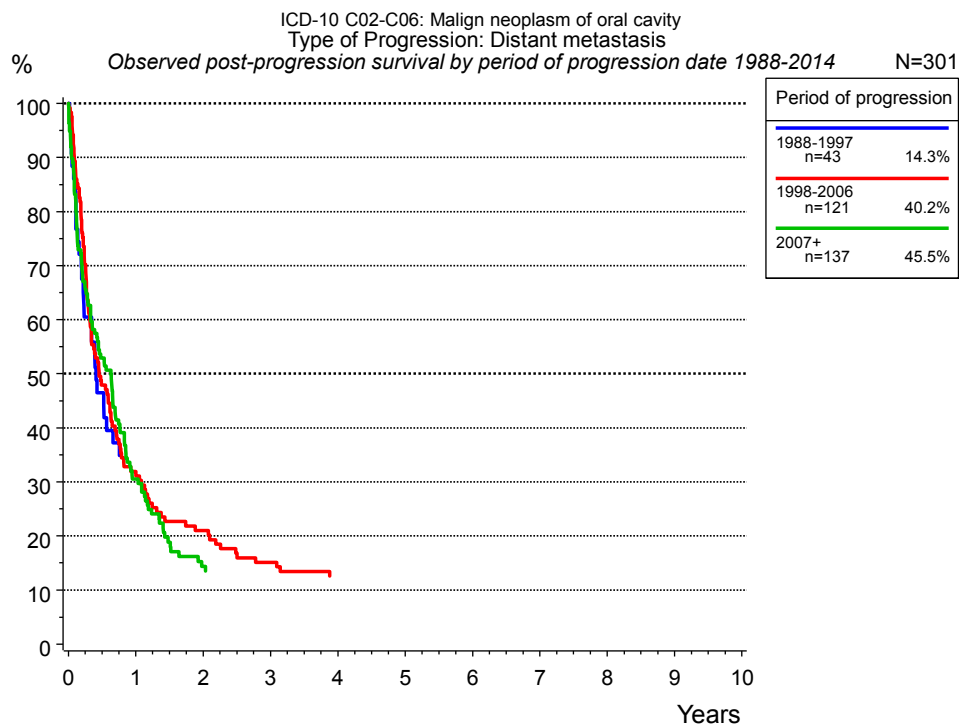


Figure 5e. Observed post-progression (distant metastasis) survival of 301 patients with oral cavity cancer diagnosed between 1988 and 2014 by period of progression.

Years	Period of progression		
	1988-1997 n=43 %	1998-2006 n=121 %	2007+ n=137 %
0	100.0	100.0	100.0
1		32.0	30.5
2		21.0	14.4
3		15.1	
4		12.6	
5		12.6	
6		12.6	
7		12.6	

Table 5f. Observed post-progression (distant metastasis) survival of patients with oral cavity cancer for period 1988-2014 by period of progression (N=301).

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

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Index of figures and tables

Fig./Tbl.	Page
1a Relative survival by period of diagnosis (chart)	2
1b Survival by period of diagnosis (table)	3
2a Survival by gender (chart)	4
2b Survival by gender (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 TNM staging 1988+ (chart)	7
4b Survival by TNM staging 1988+ (table)	7
4c Relative survival by TNM staging 1998+ (chart)	8
4d Survival by TNM staging 1998+ (table)	8
4e Conditional survival by extent of disease (chart)	9
4f Conditional survival by extent of disease (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