

Munich Cancer Registry



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

Cancer statistics: Survival

C73: Thyroid cancer

Year of diagnosis	1988-2013
Patients	7,072
Diseases	7,120
Cases evaluated	3,904
Creation date	05/13/2015
Export date	12/30/2014
Population	4.64 m



http://www.tumorregister-muenchen.de/en/facts/surv/surv_C73__E.pdf

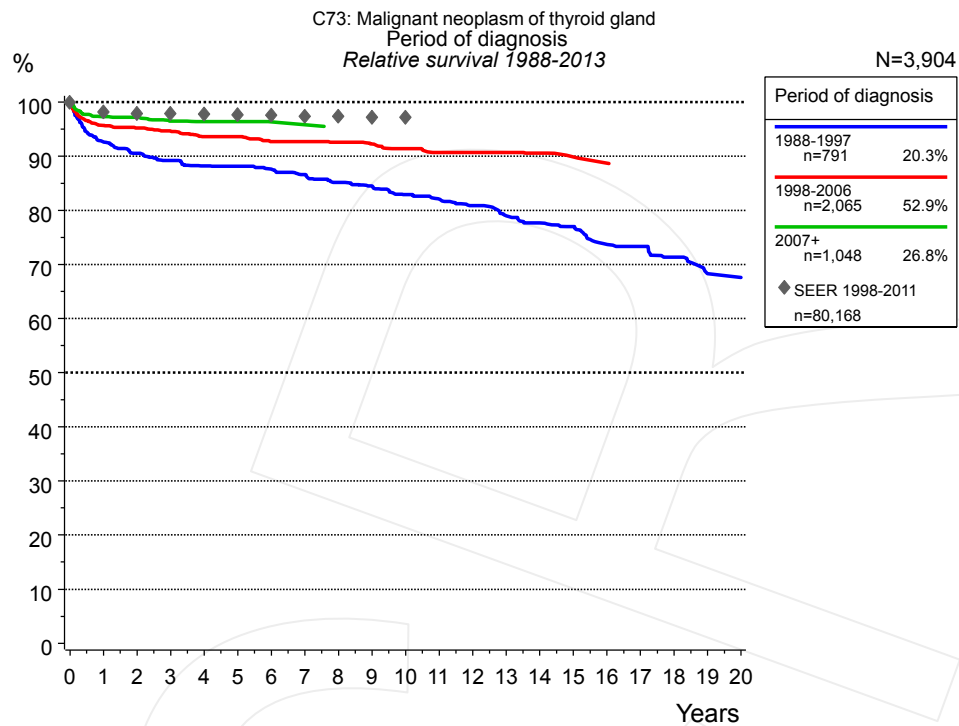


Figure 1a. Relative survival of patients with thyroid cancer by period of diagnosis. Included in the evaluation are 3,904 cases diagnosed between 1988 and 2013.

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 1988, 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=791		1998-2006 n=2,065		2007+ n=1,048	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	91.3	92.6	94.7	95.7	96.6	97.3
2	88.1	90.6	93.5	95.2	95.9	97.2
3	85.8	89.2	92.0	94.6	94.5	96.5
4	83.6	88.2	90.3	93.6	93.8	96.4
5	82.6	88.2	89.7	93.6	93.4	96.4
6	80.9	87.6	87.8	92.7	92.8	96.3
7	79.0	86.6	87.3	92.7	92.8	95.8
8	76.6	85.2	86.2	92.6		
9	75.1	84.5	84.8	92.2		
10	72.7	82.9	83.3	91.4		
11	71.1	82.1	81.7	90.7		
12	69.1	80.9	80.9	90.7		
13	66.7	79.0	80.0	90.7		
14	64.5	77.7	78.8	90.6		
15	63.2	77.0	76.9	89.8		
16	59.7	73.7	76.0	88.7		
17	58.5	73.4				
18	56.3	71.4				
19	52.8	68.3				
20	52.8	67.6				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by period of diagnosis for period 1988-2013 (N=3,904).

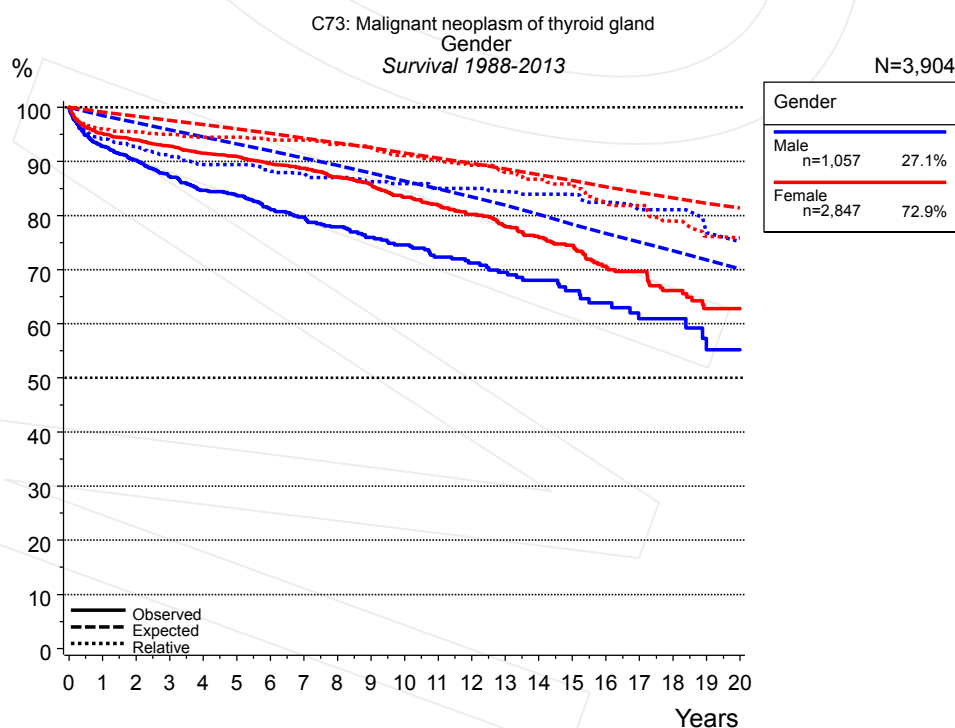


Figure 2a. Survival of patients with thyroid cancer by gender. Included in the evaluation are 3,904 cases diagnosed between 1988 and 2013.

Years	Gender			
	Male n=1,057		Female n=2,847	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	92.8	94.1	95.2	96.0
2	90.2	92.8	94.0	95.5
3	87.2	90.9	92.8	95.0
4	84.7	89.4	91.5	94.5
5	83.8	89.4	90.9	94.5
6	81.3	88.2	89.6	94.0
7	79.8	87.8	88.7	94.0
8	77.9	87.0	87.1	93.2
9	76.0	86.3	85.8	92.6
10	74.6	85.9	83.4	91.1
11	72.4	85.0	81.9	90.3
12	71.2	85.0	80.2	89.3
13	69.5	84.5	78.1	88.0
14	68.1	84.0	75.9	86.7
15	66.1	83.9	74.5	85.9
16	63.9	82.4	70.7	82.4
17	60.9	81.1	69.6	81.9
18	60.9	81.1	66.1	79.0
19	55.2	76.9	62.8	76.2
20	55.2	75.1	62.8	75.9

Table 2b. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by gender for period 1988-2013 (N=3,904).

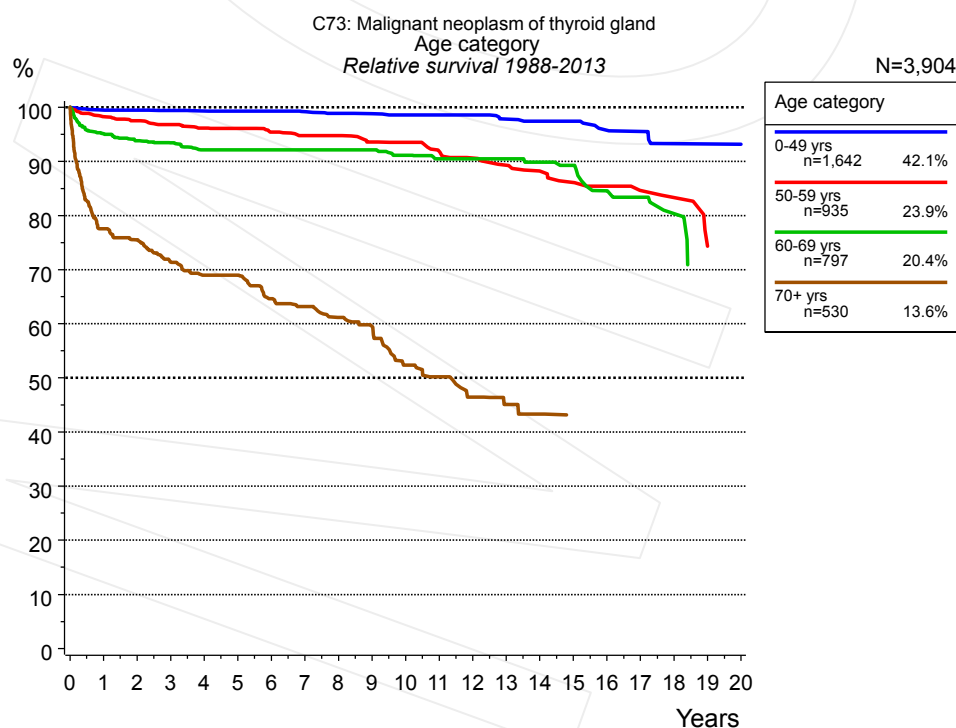


Figure 3a. Relative survival of patients with thyroid cancer by age category. Included in the evaluation are 3,904 cases diagnosed between 1988 and 2013.

Years	Age category							
	0-49 yrs n=1,642		50-59 yrs n=935		60-69 yrs n=797		70+ yrs n=530	
	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	99.4	99.5	97.8	98.3	94.2	95.1	73.9	77.6
2	99.3	99.5	96.6	97.5	91.7	93.8	68.8	75.5
3	99.1	99.4	95.5	96.8	90.1	93.5	61.9	71.4
4	98.8	99.3	94.2	96.2	87.7	92.1	57.0	69.0
5	98.7	99.3	93.9	96.1	86.8	92.1	54.2	69.0
6	98.4	99.3	92.1	95.4	86.0	92.1	47.9	64.7
7	98.2	99.2	90.9	94.8	85.6	92.1	44.4	63.2
8	97.6	98.9	90.2	94.8	82.7	92.1	39.7	61.2
9	97.4	98.9	88.3	93.6	80.8	92.1	36.2	59.6
10	96.9	98.6	87.3	93.5	78.0	91.1	29.3	52.4
11	96.7	98.6	85.1	91.9	75.0	90.5	26.3	50.2
12	96.4	98.6	83.0	90.6	74.0	90.5	22.0	46.5
13	95.1	97.8	81.0	89.3	71.7	90.5	19.1	45.1
14	94.4	97.4	78.5	88.2	68.0	89.8	17.5	43.3
15	94.4	97.4	76.3	86.1	65.6	89.3	14.7	43.0
16	92.3	95.7	74.5	85.5	59.7	84.5		
17	91.7	95.5	71.9	84.7	57.3	83.4		
18	88.9	93.3	70.3	83.4	51.6	80.4		
19	88.9	93.2						
20	88.9	93.1						

Table 3b. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by age category for period 1988-2013 (N=3,904).

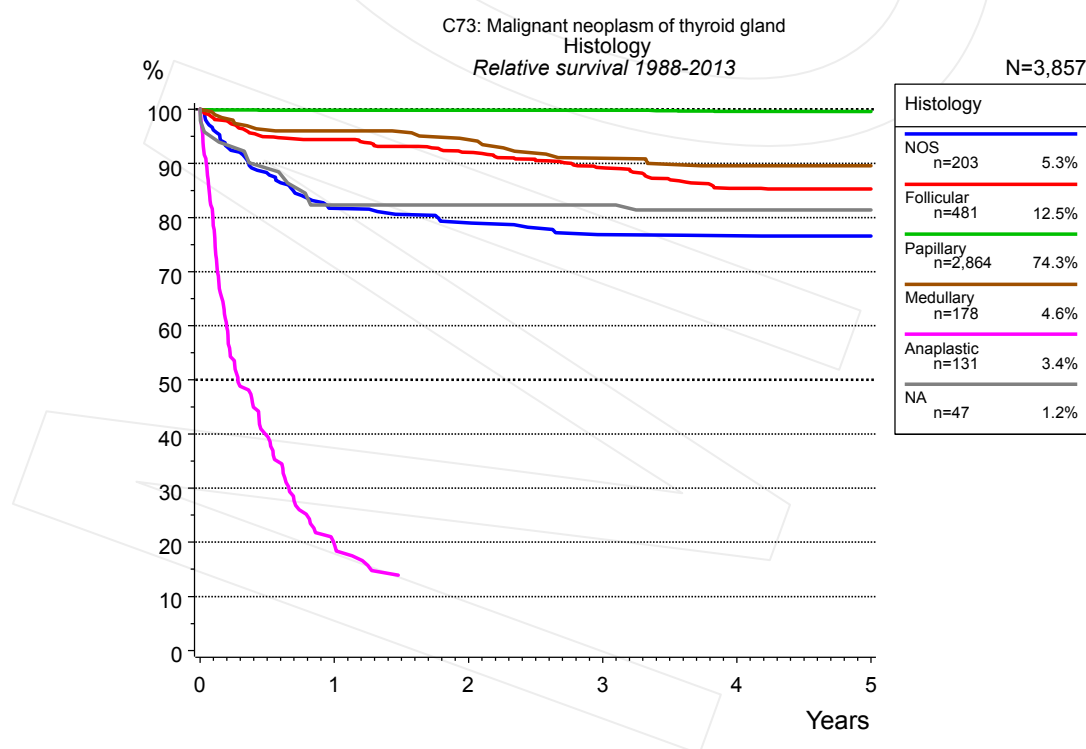


Figure 4a. Relative survival of patients with thyroid cancer by histology. For 3,857 of 3,904 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. The grey line represents the subgroup of 47 patients with missing values regarding histology (1.2% of 3,904 patients, the percent values of all other categories are related to n=3,857).

Years	Histology											
	NOS n=203		Follicular n=481		Papillary n=2,864		Medullary n=178		Anaplastic n=131		NA n=47	
	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	80.3	81.7	92.8	94.5	99.3	99.8	95.5	96.0	19.4	19.6	80.6	82.3
2	77.0	79.0	88.8	92.0	98.6	99.8	93.0	94.4			80.6	82.3
3	73.6	76.9	84.4	89.2	97.8	99.8	88.9	90.9			80.6	82.3
4	73.0	76.6	79.3	85.4	96.8	99.6	86.5	89.5			76.0	81.4
5	72.4	76.6	77.9	85.3	96.2	99.6	86.5	89.5			76.0	81.4

Table 4b. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by histology for period 1988-2013 (N=3,857).

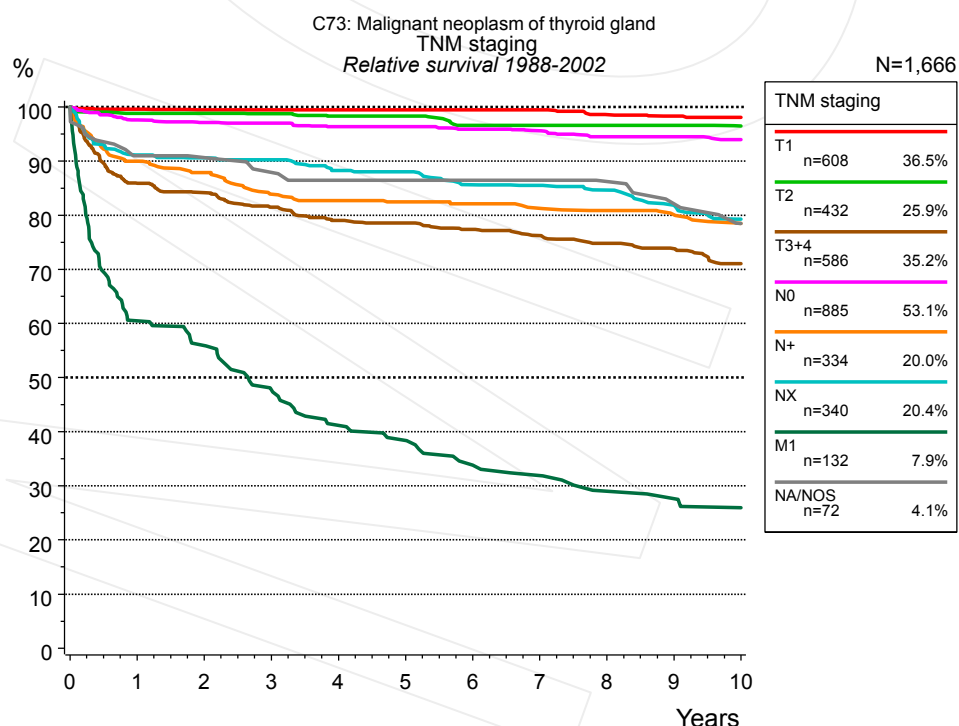


Figure 4c. Relative survival of patients with thyroid cancer by TNM staging. For 1,667 of 1,738 cases diagnosed between 1988 and 2002 valid data could be obtained for this item. For a total of 1,666 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 72 patients with missing values regarding TNM staging (4.1% of 1,738 patients, the percent values of all other categories are related to n=1,666).

Due to substantial changes in stage classification schemes long-term survival statistics over decades could not be created.

TNM staging														
Years	T1 n=608		T2 n=432		T3+4 n=586		N0 n=885		N+ n=334		NX n=340		M1 n=132	
	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	99.2	99.6	98.1	98.8	84.3	85.9	96.7	97.6	88.9	89.9	89.7	91.2	59.1	60.5
2	98.2	99.5	97.4	98.8	81.2	84.2	95.3	97.1	85.9	87.8	88.2	90.6	53.8	55.9
3	97.7	99.5	96.7	98.8	77.2	81.5	94.5	97.0	81.0	83.9	86.7	90.2	44.7	47.7
4	97.2	99.5	95.3	98.3	73.8	79.1	92.9	96.4	79.5	82.7	83.4	88.3	37.9	41.2
5	96.7	99.5	94.8	98.3	72.2	78.6	92.2	96.4	78.2	82.5	82.5	88.0	34.8	38.4
6	95.7	99.5	92.1	96.6	70.0	77.4	90.5	95.9	77.2	82.1	78.9	85.7	30.2	33.9
7	94.8	99.5	91.9	96.6	67.8	76.2	89.4	95.6	75.7	81.2	77.8	85.5	27.8	31.9
8	92.5	98.6	91.2	96.6	65.6	74.8	87.3	94.5	74.5	80.9	75.8	84.6	24.3	29.0
9	91.5	98.3	90.9	96.6	63.6	73.8	86.8	94.5	73.1	80.1	72.4	81.8	23.3	27.6
10	91.0	98.1	88.7	96.5	60.1	71.0	85.1	94.0	70.8	78.5	68.7	79.3	21.2	25.9

TNM staging cont'd		
NA/NOS n=72		
Years	obs. %	rel. %
0	100.0	100.0
1	88.9	91.0
2	87.5	90.6
3	83.3	87.9
4	80.6	86.4
5	80.6	86.4
6	77.7	86.4
7	77.7	86.4
8	74.7	86.2
9	70.1	82.1
10	65.3	78.5

Table 4d. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by TNM staging for period 1988-2002 (N=3,317).

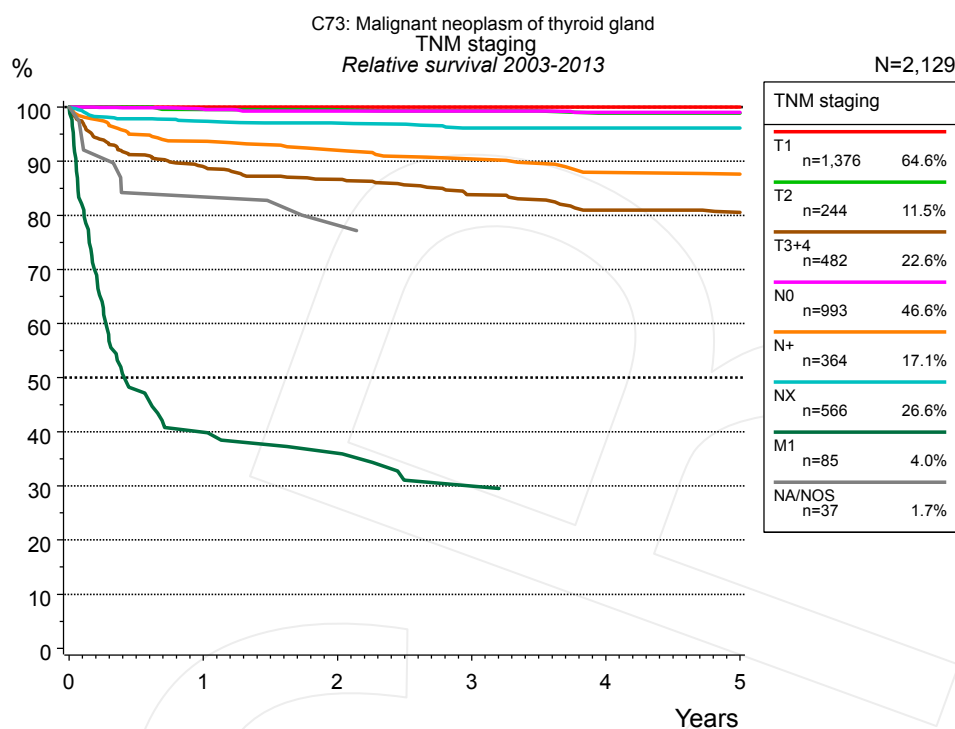


Figure 4e. Relative survival of patients with thyroid cancer by TNM staging. For 2,131 of 2,166 cases diagnosed between 2003 and 2013 valid data could be obtained for this item. For a total of 2,129 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 37 patients with missing values regarding TNM staging (1.7% of 2,166 patients, the percent values of all other categories are related to n=2,129).

Due to substantial changes in stage classification schemes long-term survival statistics over decades could not be created.

TNM staging															
Years	T1 n=1,376		T2 n=244		T3+4 n=482		N0 n=993		N+ n=364		NX n=566		M1 n=85		
	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	99.8	100.0	99.1	99.6	87.6	89.0	98.9	99.6	93.3	93.7	96.6	97.4	39.9	39.9	
2	99.2	100.0	98.1	99.5	84.5	86.6	98.1	99.3	91.0	92.0	95.3	97.0	35.7	36.0	
3	98.9	100.0	97.5	99.3	80.7	83.8	97.7	99.3	88.9	90.4	93.6	96.2	29.2	30.0	
4	98.4	100.0	95.7	98.9	77.2	80.9	96.4	99.0	86.1	87.9	93.0	96.2			
5	98.2	100.0	95.7	98.9	76.2	80.5	96.1	99.0	85.5	87.6	93.0	96.2			

TNM staging			
cont'd		NA/NOS n=37	
Years	obs. %	rel. %	
0	100.0	100.0	
1	83.5	83.4	
2	77.8	78.2	
3	74.7	75.6	
4	74.7	73.8	

Table 4f. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by TNM staging for period 2003-2013 (N=4,110).

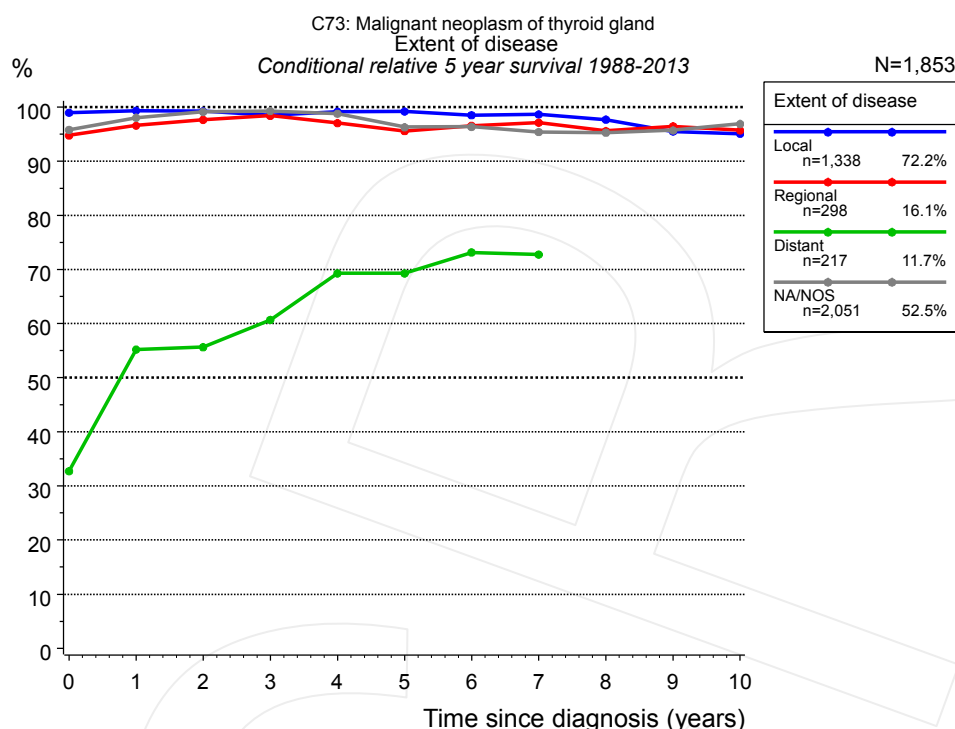


Figure 4g. Conditional relative 5-year survival of patients with thyroid cancer by extent of disease. For 3,798 of 3,904 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 1,853 cases an evaluable classification was established. The grey line represents the subgroup of 2,051 patients with missing values regarding extent of disease (52.5% of 3,904 patients, the percent values of all other categories are related to n=1,853).

Years	Extent of disease							
	Local		Regional		Distant		NA/NOS	
	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs
0	1,338	99.0	298	94.8	217	32.7	2,051	95.8
1	1,238	99.3	273	96.6	108	55.2	1,871	98.0
2	1,098	99.2	256	97.7	93	55.6	1,704	99.1
3	960	98.5	227	98.4	76	60.7	1,549	99.3
4	824	99.1	187	97.1	60	69.3	1,395	98.8
5	742	99.2	170	95.6	52	69.3	1,231	96.3
6	671	98.5	149	96.5	44	73.1	1,017	96.3
7	591	98.6	136	97.1	39	72.7	844	95.4
8	512	97.7	117	95.6			717	95.3
9	432	95.5	102	96.5			607	95.7
10	372	95.1	89	95.7			503	96.9

Table 4h. Conditional relative 5-year survival of patients with thyroid cancer by extent of disease for period 1988-2013 (N=1,853).

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 4e). 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 5-year survival rate is 98.5% (n=960).

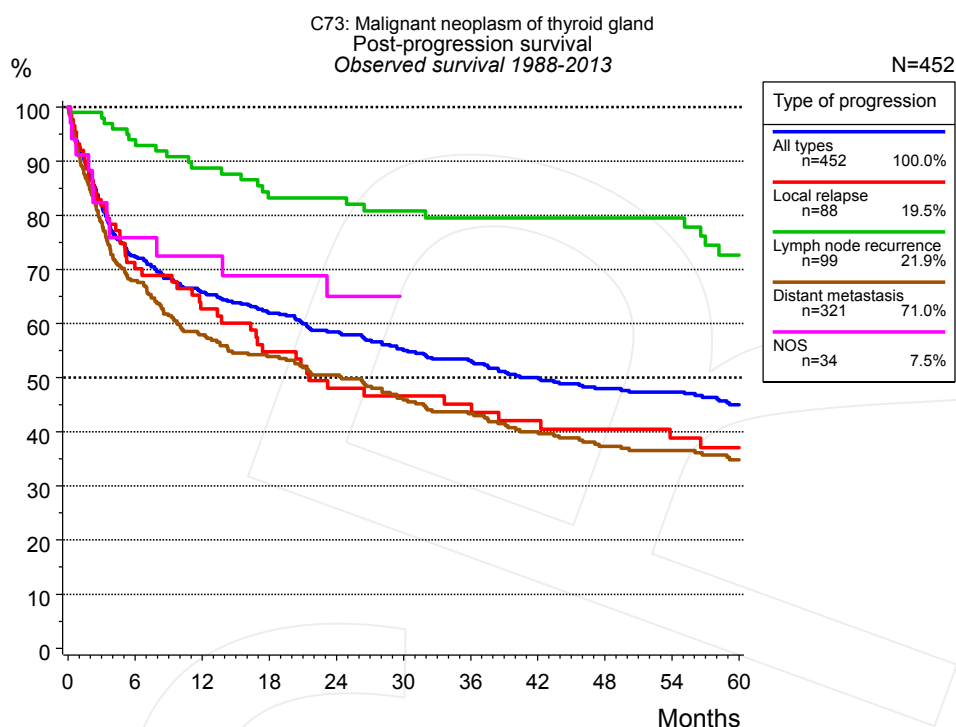


Figure 5a. Observed post-progression survival of 452 patients with thyroid cancer diagnosed between 1988 and 2013 (incl. M1). These 452 patients with documented progression events during their course of disease represent 11.6% of the totally 3,904 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=68, 1.7%). 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 “All types” 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.

Months	Type of progression				
	All types n=452	Local relapse n=88	Lymph node recurrence n=99	Distant metastasis n=321	NOS n=34
	%	%	%	%	%
0	100.0	100.0	100.0	100.0	100.0
12	65.8	62.7	88.7	57.9	72.4
24	58.4	48.0	83.2	50.5	65.0
36	53.1	45.1	79.5	43.3	65.0
48	48.0	40.5	79.5	37.3	65.0
60	45.0	37.0	72.6	34.8	

Table 5b. Observed post-progression survival of patients with thyroid cancer for period 1988-2013 (N=452).

Shortcuts

MCR	Munich Cancer Registry, Germany (Tumorregister München)
NCI	National Cancer Institute, USA
SEER	Surveillance, Epidemiology, and End Results, USA
UICC	Union for International Cancer Control, Geneva
DCO	Death certificate only. The death certificate provides the only notification to the registry.
NA	Not available
NOS	Not otherwise specified
OS	Observed/overall survival (Kaplan-Meier estimate)
RS	Relative survival, compared to the general population, ratio of observed to expected survival (Ederer II method), reflecting excess mortality among cancer patients
AS	Assembled survival chart (observed, expected, relative)
PPS	Post-progression survival, survival since first relapse (Kaplan-Meier estimate)
progression	Date of entry: Date of first locoregional recurrence, distant metastasis, unspecified
	Event: Death of all causes
CS	Conditional survival, survival probability under the condition of surviving a given period of time

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