

# Munich Cancer Registry



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

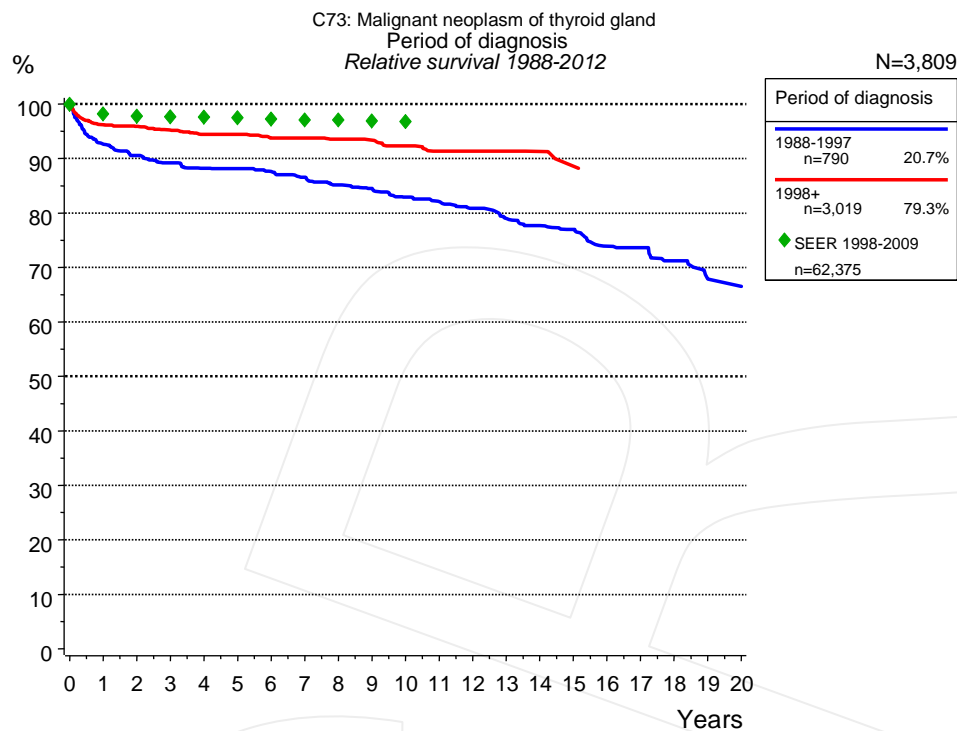
## Cancer statistics: Survival

### C73: Thyroid cancer

Year of diagnosis	1988-2012
Patients	6,663
Diseases	6,707
Cases evaluated	3,809
Creation date	03/25/2014
Export date	02/12/2014
Population	4.5 m



[http://www.tumorregister-muenchen.de/en/facts/surv/surv\\_C73\\_\\_E.pdf](http://www.tumorregister-muenchen.de/en/facts/surv/surv_C73__E.pdf)



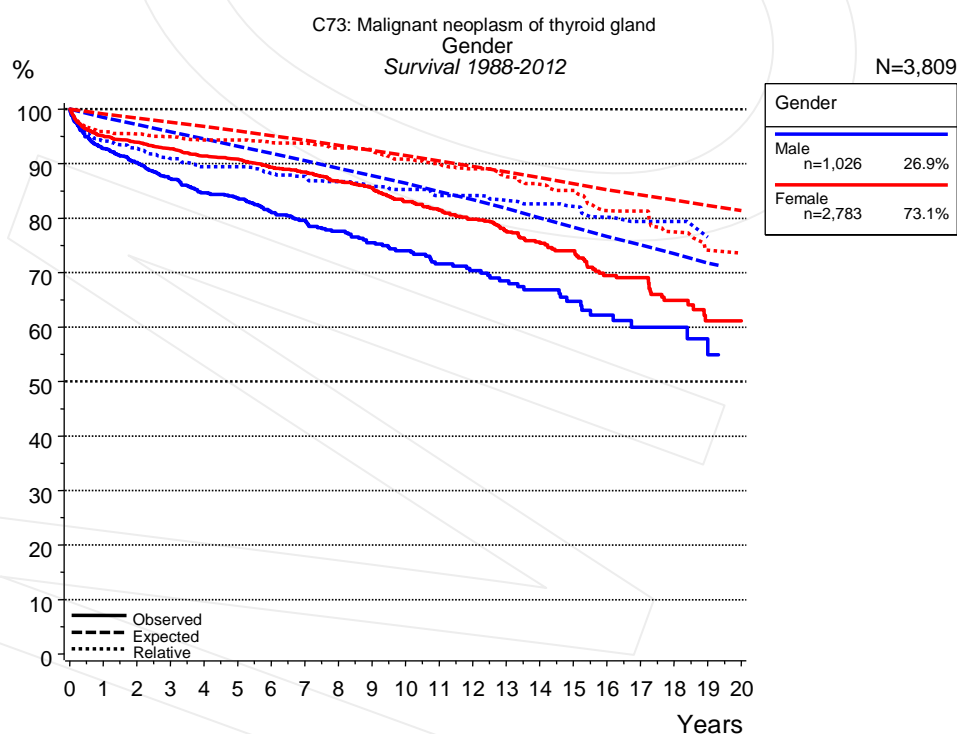
**Figure 1a.** Relative survival of patients with thyroid cancer by period of diagnosis. Included in the evaluation are 3,809 cases diagnosed between 1988 and 2012.

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 2009, and are represented by green 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		1998+	
	n=790		n=3,019	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	91.2	92.6	95.3	96.2
2	88.0	90.5	94.3	95.9
3	85.7	89.2	92.8	95.2
4	83.5	88.2	91.3	94.4
5	82.6	88.1	90.8	94.4
6	80.9	87.6	89.1	93.7
7	78.9	86.6	88.6	93.7
8	76.6	85.2	87.4	93.5
9	75.1	84.5	86.2	93.4
10	72.7	82.9	84.3	92.3
11	71.1	82.1	82.5	91.3
12	69.1	80.8	81.9	91.3
13	66.7	79.0	81.1	91.3
14	64.5	77.7	79.8	91.3
15	63.2	77.0	77.4	88.6
16	59.7	73.9		
17	58.9	73.7		
18	56.2	71.2		
19	52.6	67.9		
20	52.6	66.5		

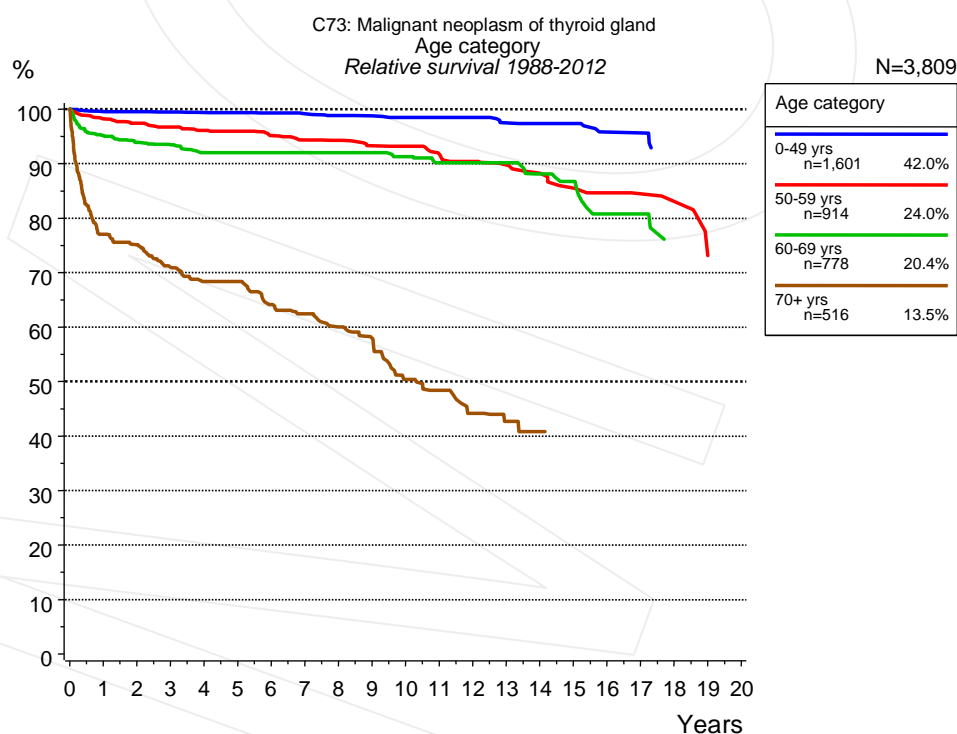
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by period of diagnosis for period 1988-2012 (N=3,809).



**Figure 2a.** Survival of patients with thyroid cancer by gender. Included in the evaluation are 3,809 cases diagnosed between 1988 and 2012.

Years	Gender			
	Male n=1,026		Female n=2,783	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	92.7	94.1	95.1	95.9
2	90.2	92.8	93.9	95.4
3	87.2	90.9	92.7	94.9
4	84.6	89.4	91.3	94.3
5	83.7	89.4	90.8	94.3
6	81.2	88.1	89.3	93.9
7	79.6	87.6	88.4	93.7
8	77.6	86.7	86.7	92.8
9	75.5	85.8	85.6	92.5
10	74.0	85.3	83.0	90.7
11	71.6	84.2	81.5	90.0
12	70.3	84.2	79.8	89.0
13	68.5	83.2	77.7	87.5
14	66.8	82.6	75.4	86.2
15	64.7	82.1	74.0	85.1
16	62.2	80.1	69.5	81.4
17	60.0	79.4	69.1	81.3
18	60.0	79.4	64.9	77.5
19	54.9	76.5	61.1	74.1
20	54.9	71.9	61.1	73.6

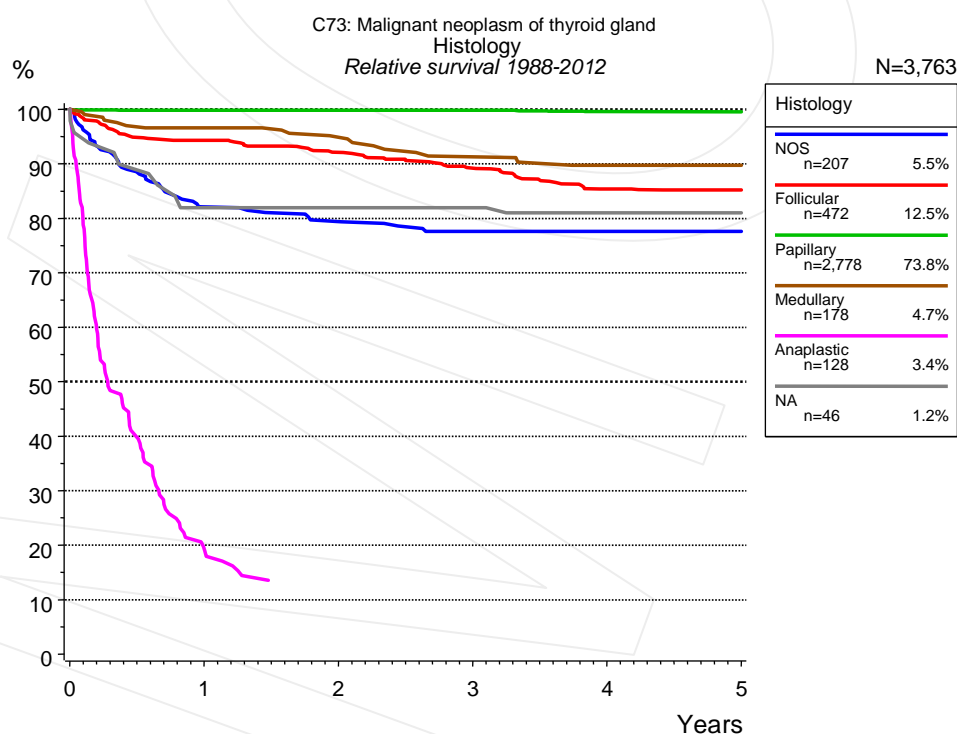
**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by gender for period 1988-2012 (N=3,809).



**Figure 3a.** Relative survival of patients with thyroid cancer by age category. Included in the evaluation are 3,809 cases diagnosed between 1988 and 2012.

Years	Age category							
	0-49 yrs n=1,601		50-59 yrs n=914		60-69 yrs n=778		70+ yrs n=516	
	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	99.5	99.6	97.8	98.2	94.2	95.1	73.4	77.1
2	99.4	99.6	96.6	97.5	91.8	93.9	68.4	75.1
3	99.1	99.5	95.4	96.7	90.1	93.5	61.5	70.9
4	98.9	99.4	94.1	96.0	87.6	92.0	56.4	68.4
5	98.8	99.4	93.7	95.9	86.8	92.0	53.8	68.4
6	98.4	99.3	91.8	95.1	85.9	92.0	47.3	64.1
7	98.1	99.2	90.5	94.3	85.5	92.0	43.6	62.4
8	97.5	98.8	89.8	94.3	82.5	92.0	38.7	60.0
9	97.3	98.8	88.0	93.3	81.1	92.0	35.0	57.9
10	96.7	98.5	87.0	93.2	78.0	91.3	27.9	50.4
11	96.5	98.5	84.9	91.7	74.6	90.1	25.1	48.4
12	96.2	98.5	83.1	90.4	73.5	90.1	20.7	44.2
13	94.8	97.5	81.4	89.8	71.0	90.1	17.8	42.7
14	94.4	97.4	78.5	88.3	66.4	88.1	16.3	40.8
15	94.4	97.4	75.9	85.5	63.5	86.7		
16	92.0	95.8	73.7	84.6	56.7	80.8		
17	92.0	95.6	72.2	84.4	55.3	80.8		
18			70.4	83.0	48.2	75.2		

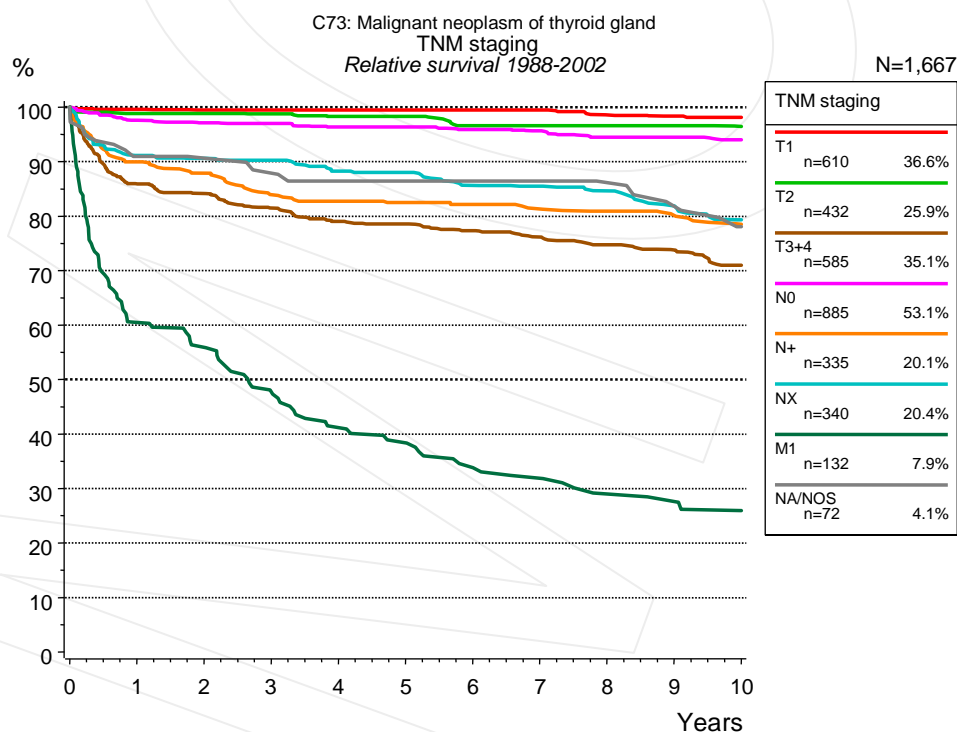
**Table 3b.** Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by age category for period 1988-2012 (N=3,809).



**Figure 4a.** Relative survival of patients with thyroid cancer by histology. For 3,763 of 3,809 cases diagnosed between 1988 and 2012 valid data could be obtained for this item. The grey line represents the subgroup of 46 patients with missing values regarding histology (1.2% of 3,809 patients, the percent values of all other categories are related to n=3,763).

Years	Histology											
	NOS n=207		Follicular n=472		Papillary n=2,778		Medullary n=178		Anaplastic n=128		NA n=46	
	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	80.6	82.1	92.7	94.3	99.3	99.8	96.0	96.6	19.0	19.2	80.1	81.9
2	77.4	79.4	88.8	92.1	98.6	99.8	93.4	94.9			80.1	81.9
3	74.6	77.6	84.4	89.2	97.8	99.8	89.2	91.3			80.1	81.9
4	74.0	77.6	79.2	85.4	96.7	99.5	86.7	89.7			75.5	81.0
5	74.0	77.6	77.8	85.2	96.1	99.5	86.7	89.7			75.5	81.0

**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by histology for period 1988-2012 (N=3,763).



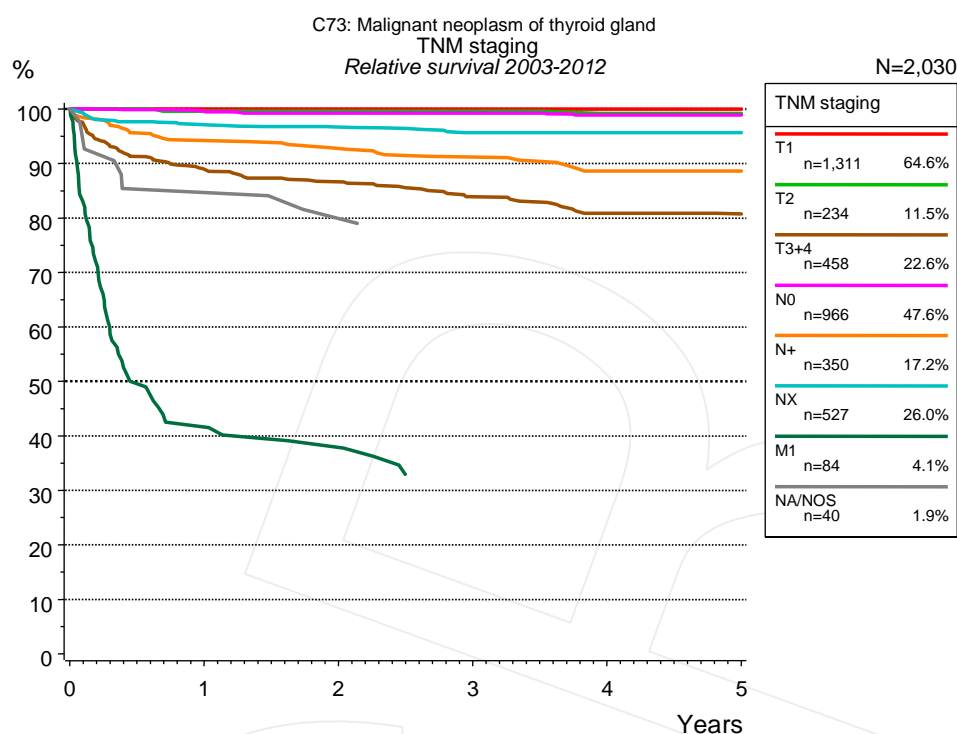
**Figure 4c.** Relative survival of patients with thyroid cancer by TNM staging. For 1,668 of 1,739 cases diagnosed between 1988 and 2002 valid data could be obtained for this item. For a total of 1,667 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value 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 1,739 patients, the percent values of all other categories are related to n=1,667).

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

Years	TNM staging													
	T1 n=610		T2 n=432		T3+4 n=585		N0 n=885		N+ n=335		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	84.2	85.9	96.7	97.6	88.9	90.0	89.7	91.2	59.1	60.5
2	98.2	99.5	97.4	98.8	81.1	84.1	95.3	97.1	85.9	87.9	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	73.7	79.0	92.9	96.4	79.5	82.8	83.4	88.3	37.9	41.2
5	96.7	99.5	94.8	98.3	72.1	78.5	92.2	96.4	78.3	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	94.9	99.5	91.9	96.6	67.8	76.2	89.4	95.6	75.7	81.3	77.8	85.5	27.8	31.9
8	92.6	98.6	91.2	96.6	65.5	74.8	87.3	94.5	74.5	80.9	75.8	84.6	24.3	29.0
9	91.6	98.4	90.9	96.6	63.5	73.8	86.9	94.5	73.2	80.1	72.4	81.9	23.3	27.6
10	91.0	98.1	88.7	96.5	60.0	71.0	85.1	94.0	70.9	78.5	68.8	79.3	21.2	25.9

Years	TNM staging cont'd NA/NOS n=72	
	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	74.6	86.1
9	69.9	81.8
10	65.0	78.0

**Table 4d.** Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by TNM staging for period 1988-2002 (N=3,319).



**Figure 4e.** Relative survival of patients with thyroid cancer by TNM staging. For 2,032 of 2,070 cases diagnosed between 2003 and 2012 valid data could be obtained for this item. For a total of 2,030 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 40 patients with missing values regarding TNM staging (1.9% of 2,070 patients, the percent values of all other categories are related to n=2,030).

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

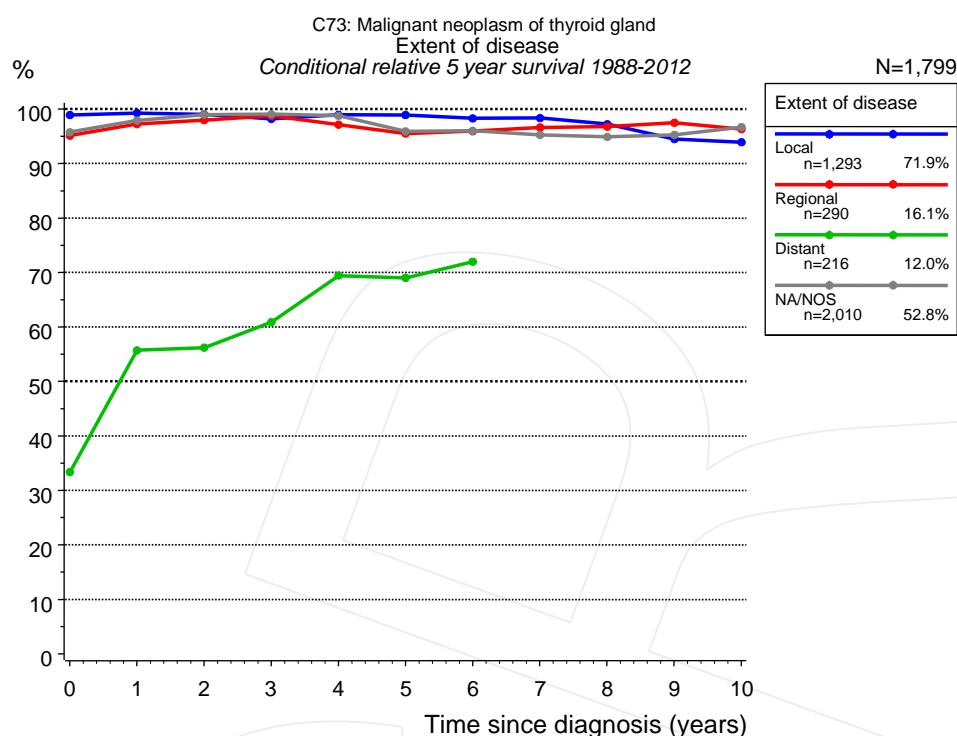
TNM staging														
Years	T1 n=1,311		T2 n=234		T3+4 n=458		N0 n=966		N+ n=350		NX n=527		M1 n=84	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	99.8	100.0	99.1	99.6	87.6	89.0	98.9	99.6	93.9	94.2	96.3	97.1	41.6	41.6
2	99.2	100.0	98.5	99.6	84.6	86.6	98.0	99.2	91.9	92.8	95.0	96.7	37.5	37.9
3	98.8	100.0	97.8	99.6	80.8	83.9	97.6	99.2	89.9	91.2	93.1	95.6	31.0	31.7
4	98.2	100.0	95.9	99.2	77.2	80.9	96.2	98.9	86.8	88.6	92.4	95.6		
5	98.0	100.0	95.9	99.2	76.6	80.8	95.9	98.9	86.8	88.6	92.4	95.6		

TNM staging		
cont'd	NA/NOS n=40	
Years	obs. %	rel. %
0	100.0	100.0
1	84.8	84.7
2	79.5	79.9
3	76.7	76.8
4	76.7	74.3
5	76.7	71.8

**Table 4f.** Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by TNM staging for period 2003-2012 (N=3,930).



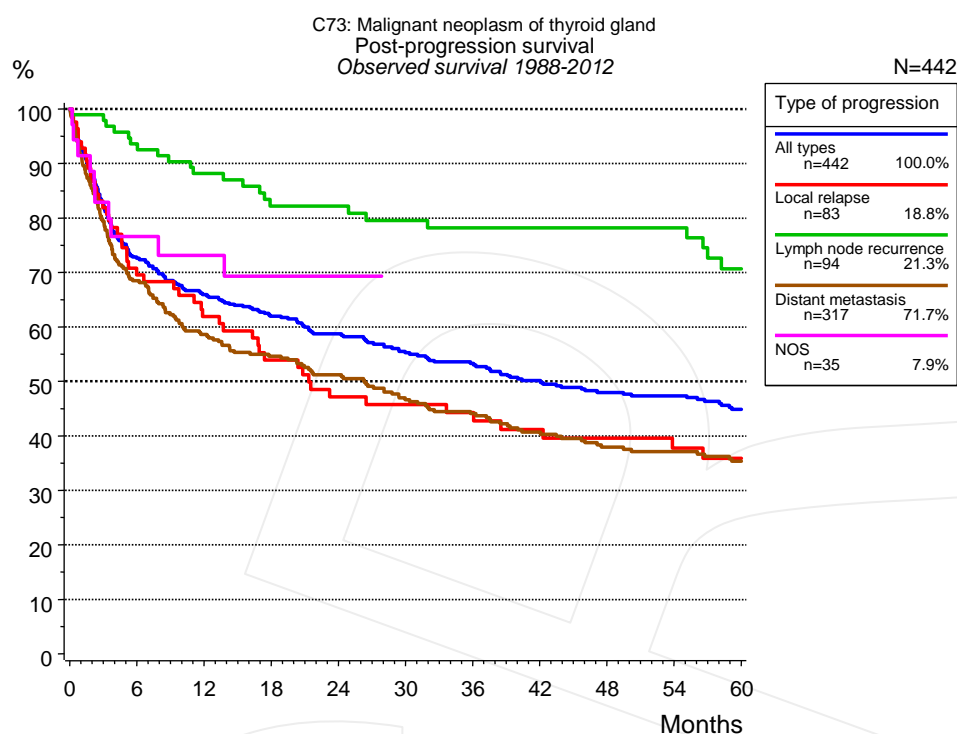


**Figure 4g.** Conditional relative 5-year survival of patients with thyroid cancer by extent of disease. For 3,700 of 3,809 cases diagnosed between 1988 and 2012 valid data could be obtained for this item. For a total of 1,799 cases an evaluable classification was established. The grey line represents the subgroup of 2,010 patients with missing values regarding extent of disease (52.8% of 3,809 patients, the percent values of all other categories are related to n=1,799).

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	1,293	98.9	290	95.1	216	33.4	2,010	95.8
1	1,194	99.3	267	97.2	109	55.7	1,830	97.9
2	1,042	99.0	243	98.0	95	56.2	1,670	99.0
3	930	98.2	209	98.7	76	60.9	1,485	99.1
4	819	98.9	180	97.1	60	69.4	1,301	98.8
5	730	98.9	164	95.5	53	69.0	1,093	95.9
6	628	98.3	144	95.9	45	72.0	903	96.0
7	546	98.3	124	96.6			767	95.3
8	466	97.2	109	96.8			654	94.9
9	401	94.5	92	97.5			563	95.2
10	327	93.9	79	96.3			457	96.7

**Table 4h.** Conditional relative 5-year survival of patients with thyroid cancer by extent of disease for period 1988-2012 (N=1,799).

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 98.2% (n=930).



**Figure 5a.** Observed post-progression survival of 442 patients with thyroid cancer diagnosed between 1988 and 2012 (incl. M1). These 442 patients with documented progression events during their course of disease represent 11.6% of the totally 3,809 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=68, 1.8%). 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=442 %	Local relapse n=83 %	Lymph node recurrence n=94 %	Distant metastasis n=317 %	NOS n=35 %
0	100.0	100.0	100.0	100.0	100.0
12	65.9	61.9	88.1	58.6	73.1
24	58.7	47.1	82.2	51.2	69.3
36	53.3	44.3	78.2	44.1	69.3
48	48.0	39.6	78.2	37.9	69.3
60	44.9	35.9	70.7	35.3	

**Table 5b.** Observed post-progression survival of patients with thyroid cancer for period 1988-2012 (N=442).

**Shortcuts**

AS	Assembled survival chart (observed, expected, relative)
CS	Conditional survival
DCO	Death certificate only. The death certificate provides the only notification to the registry.
MCR	Munich Cancer Registry, Germany (Tumorregister München)
NA	Not available
NCI	National Cancer Institute, USA
NOS	Not otherwise specified
OS	Observed/overall survival (Kaplan-Meier estimate)
PPS	Post-progression survival
RS	Relative Survival. Ratio of observed and expected survival (derived from the normal population)
SEER	Surveillance, Epidemiology, and End Results, USA
TTP	Time to progression Date of entry: Date of diagnosis Event (Progression): First local recurrence, lymph node relapse or distant metastasis, unspecified recurrence First all-cause recurrence is illustrated by survival curves (Kaplan-Meier estimate). First local recurrence, lymph node relapse or distant metastasis are depicted cumulatively, where applicable ("reverse" Kaplan-Meier estimate).
UICC	Union for International Cancer Control, Geneva

**Recommended Citation**

Munich Cancer Registry. Survival C73: Thyroid cancer [Internet]. 2014 [updated 2014 Mar 25; cited 2014 May 1]. Available from: [http://www.tumorregister-muenchen.de/en/facts/surv/surv\\_C73\\_\\_E.pdf](http://www.tumorregister-muenchen.de/en/facts/surv/surv_C73__E.pdf)

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