Munich Cancer Registry

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

ICD-10 C73: Thyroid cancer

Survival

Year of diagnosis	1988-1997	1998-2014
Patients	921	6,440
Diseases	925	6,483
Cases evaluated	849	5,667

Creation date	04/11/2016
Export date	12/23/2015
Population	4.64 m

Munich Cancer Registry at Munich Cancer Center
Marchioninistr. 15
Munich, 81377
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http://www.tumorregister-muenchen.de/en

http://www.tumorregister-muenchen.de/en/facts/surv/sC73__E-ICD-10-C73-Thyroid-cancer-survival.pdf

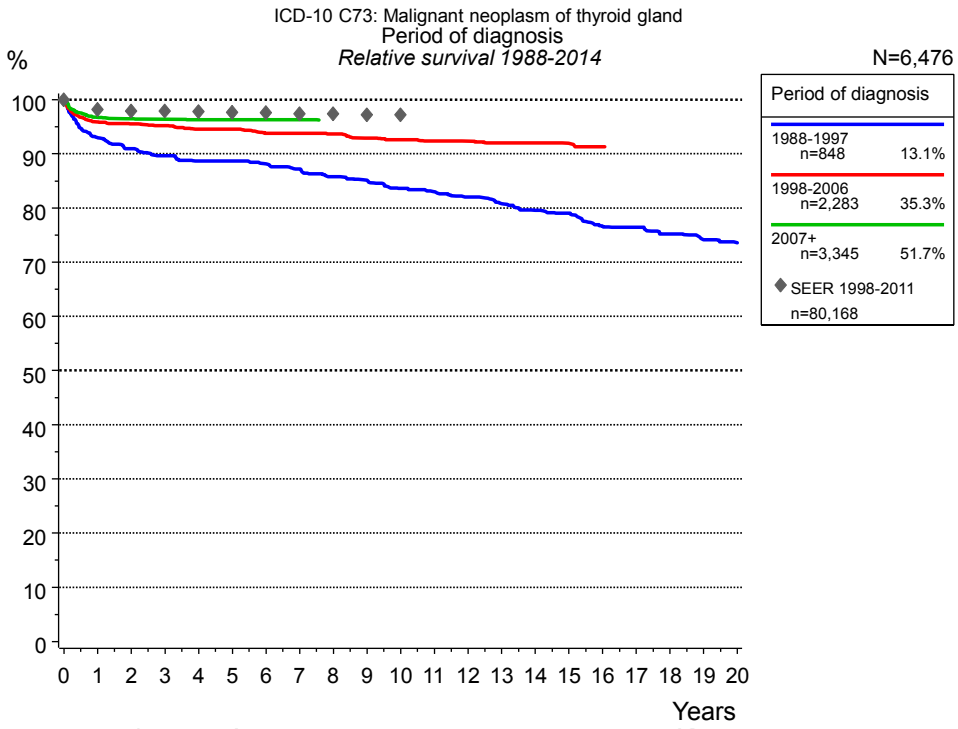

Figure 1a. Relative survival of patients with thyroid cancer by period of diagnosis. Included in the evaluation are 6,476 cases diagnosed between 1988 and 2014.

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.

	Period of diagnosis					
	1988-1997 n=848		1998-2006 n=2,283		2007+ n=3,345	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	91.6	93.0	95.0	95.9	96.0	96.7
2	88.5	91.0	93.9	95.6	95.1	96.5
3	86.3	89.7	92.7	95.2	94.3	96.4
4	84.2	88.7	91.3	94.5	93.6	96.3
5	83.3	88.7	90.6	94.5	92.9	96.3
6	81.6	88.2	88.9	93.8	92.3	96.3
7	79.7	87.2	88.2	93.8	91.9	96.3
8	77.4	85.8	87.2	93.7		
9	76.0	85.2	85.5	92.9		
10	73.6	83.6	84.4	92.6		
11	72.2	83.0	83.2	92.4		
12	70.4	82.0	82.3	92.3		
13	68.5	80.8	81.0	92.0		
14	66.5	79.6	80.2	92.0		
15	65.3	79.0	78.6	91.9		
16	62.5	76.7	77.9	91.3		
17	61.4	76.5				
18	59.7	75.3				
19	57.7	74.2				
20	56.6	73.6				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by period of diagnosis for period 1988-2014 (N=6,476).

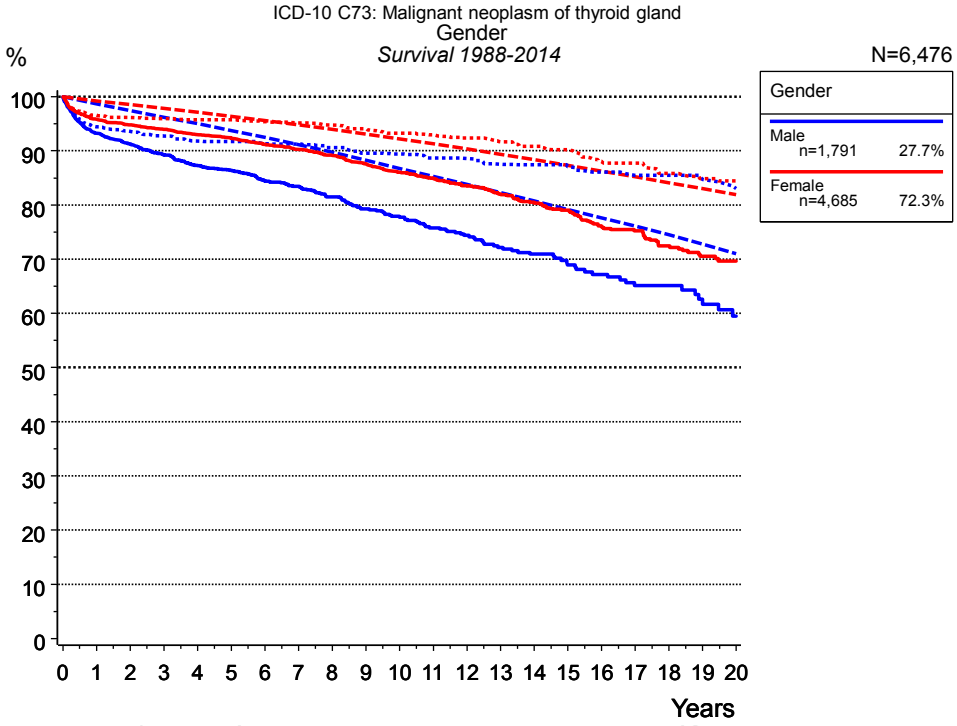

Figure 2a. Survival of patients with thyroid cancer by gender. Included in the evaluation are 6,476 cases diagnosed between 1988 and 2014.

	Gender			
	Male n=1,791		Female n=4,685	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	93.2	94.4	95.8	96.6
2	91.3	93.6	94.8	96.1
3	89.2	92.7	93.9	96.0
4	87.3	91.8	93.0	95.7
5	86.4	91.7	92.3	95.7
6	84.5	91.3	91.2	95.3
7	83.5	91.3	90.3	95.1
8	81.5	90.6	89.1	94.7
9	79.3	89.6	87.6	94.1
10	77.7	89.4	86.0	93.2
11	75.8	88.7	84.9	92.9
12	74.4	88.6	83.6	92.4
13	72.2	87.5	82.0	91.7
14	70.9	87.4	80.4	90.8
15	69.0	87.1	79.1	90.2
16	67.2	86.1	76.2	88.1
17	65.1	85.5	75.2	87.8
18	65.1	85.5	72.5	85.8
19	61.7	84.7	70.5	84.9
20	59.5	83.1	69.7	84.4

Table 2b. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by gender for period 1988-2014 (N=6,476).

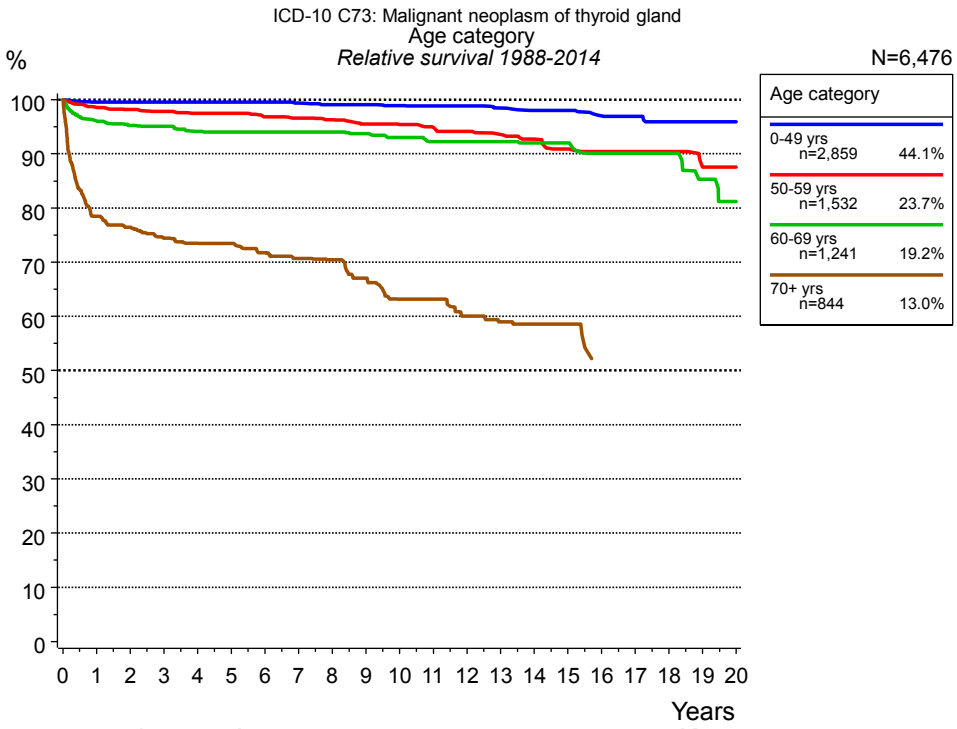

Figure 3a. Relative survival of patients with thyroid cancer by age category. Included in the evaluation are 6,476 cases diagnosed between 1988 and 2014.

	Age category							
	0-49 yrs n=2,859		50-59 yrs n=1,532		60-69 yrs n=1,241		70+ yrs n=844	
Years	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	98.2	98.6	95.2	96.1	75.0	78.4
2	99.3	99.5	97.3	98.2	93.1	95.2	70.3	76.5
3	99.2	99.5	96.5	97.8	91.9	95.1	65.3	74.5
4	99.1	99.5	95.5	97.5	89.8	94.1	61.6	73.5
5	99.0	99.5	95.3	97.5	88.7	94.0	58.8	73.4
6	98.7	99.5	93.6	96.8	87.5	94.0	54.5	71.8
7	98.3	99.4	92.8	96.6	86.9	94.0	51.0	70.7
8	97.8	99.1	91.8	96.3	84.7	94.0	47.5	70.4
9	97.7	99.1	90.2	95.5	82.0	93.7	42.6	67.1
10	97.2	98.9	89.3	95.4	80.0	93.0	36.9	63.2
11	97.0	98.9	88.0	94.9	77.0	92.2	34.4	63.2
12	96.8	98.9	86.6	94.1	75.4	92.2	29.8	60.1
13	95.8	98.4	84.9	93.6	73.3	92.2	26.3	59.0
14	95.0	98.0	82.9	92.7	70.5	92.0	24.9	58.6
15	94.8	98.0	80.7	90.9	67.9	92.0	22.5	58.6
16	93.4	97.0	79.3	90.4	64.3	90.1		
17	93.1	96.9	78.0	90.4	62.1	90.1		
18	91.5	95.9	76.5	90.4	58.3	90.1		
19	91.5	95.9	72.1	87.5	51.3	85.3		
20	91.5	95.9	72.1	87.5	46.9	81.2		

Table 3b. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by age category for period 1988-2014 (N=6,476).

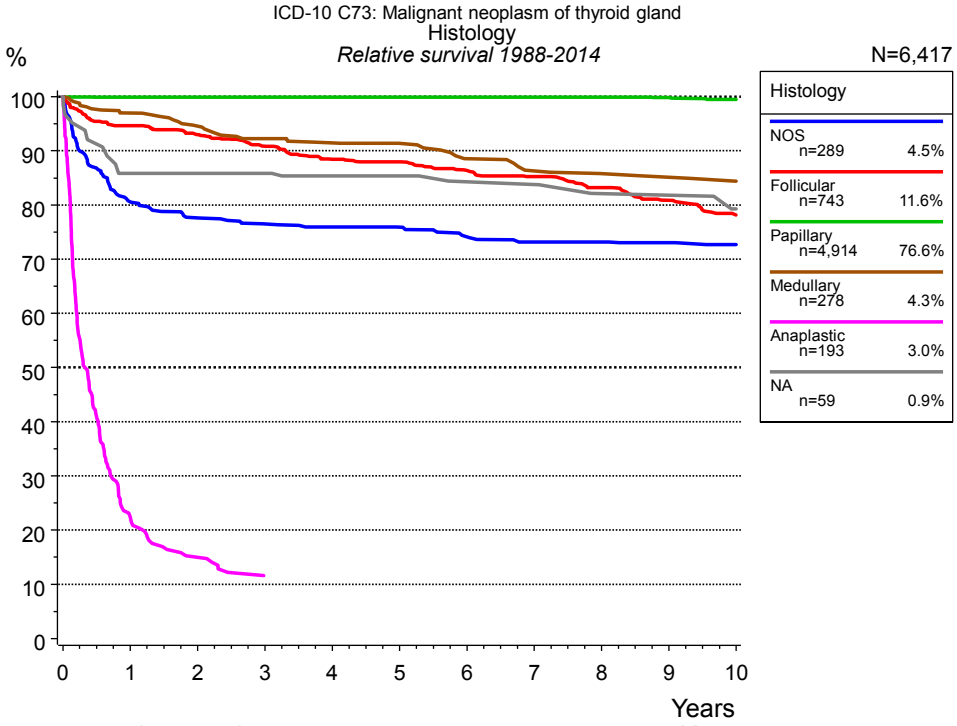

Figure 4a. Relative survival of patients with thyroid cancer by histology. For 6,417 of 6,476 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. The grey line represents the subgroup of 59 patients with missing values regarding histology (0.9% of 6,476 patients, the percent values of all other categories are related to n=6,417).

	Histology											
	NOS n=289		Follicular n=743		Papillary n=4,914		Medullary n=278		Anaplastic n=193		NA n=59	
Years	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	79.4	80.6	93.3	94.7	99.3	99.9	96.3	97.0	21.7	22.3	84.3	85.9
2	75.4	77.6	89.9	93.0	98.9	99.9	93.2	94.5	14.4	15.0	84.3	85.9
3	73.2	76.5	86.4	90.9	98.4	99.9	90.2	92.3	10.8	11.6	84.3	85.9
4	72.1	75.9	82.5	88.4	97.5	99.9	88.8	91.5	10.8	11.4	80.6	85.4
5	71.3	75.9	80.8	88.0	97.0	99.9	87.8	91.4	10.8	11.2	80.6	85.4
6	68.8	74.1	78.0	86.4	96.1	99.9	84.3	88.5			76.6	84.3
7	67.0	73.1	75.6	85.2	95.6	99.9	81.6	86.3			76.6	83.8
8	67.0	73.1	72.5	83.2	94.5	99.9	80.2	85.8			72.3	82.1
9	65.9	73.1	69.1	80.9	93.0	99.8	79.4	85.1			72.3	81.8
10	64.5	72.7	65.3	78.2	91.9	99.5	78.4	84.4			67.7	79.3

Table 4b. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by histology for period 1988-2014 (N=6,417).

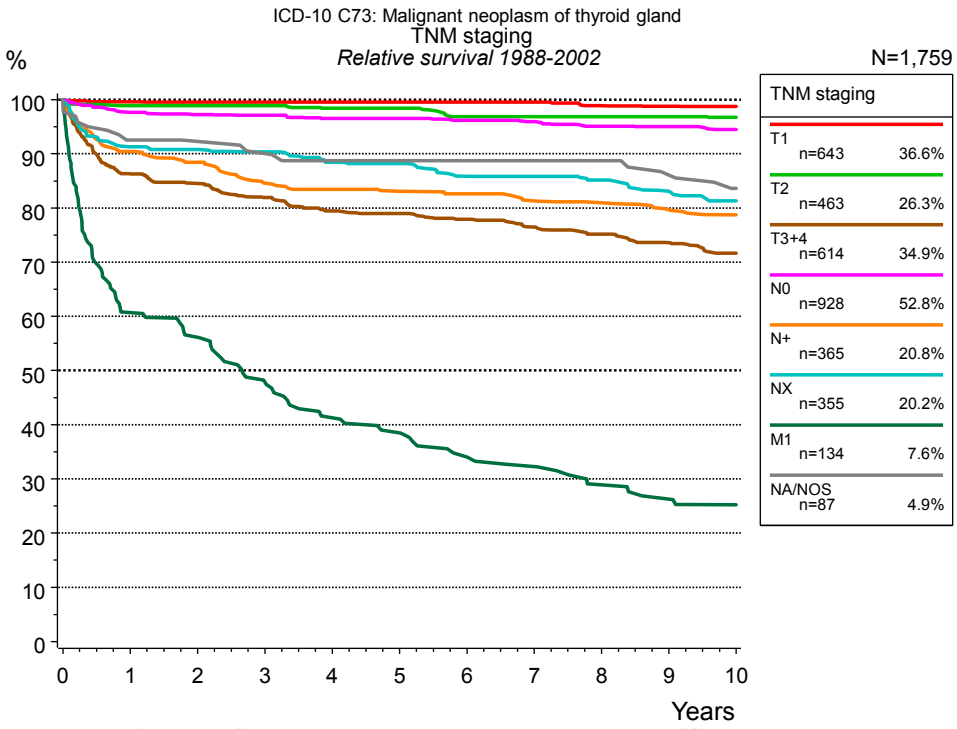

Figure 4c. Relative survival of patients with thyroid cancer by TNM staging. For 1,760 of 1,846 cases diagnosed between 1988 and 2002 valid data could be obtained for this item. For a total of 1,759 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potientially considered in more than one subgroup. The grey line represents the subgroup of 87 patients with missing values regarding TNM staging (4.7 % of 1,846 patients, the percent values of all other categories are related to n=1,759).

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

	TNM staging													
	T1 n=643		T2 n=463		T3+4 n=614		N0 n=928		N+ n=365		NX n=355		M1 n=134	
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	99.2	99.6	98.2	98.9	84.6	86.3	96.8	97.7	89.4	90.5	89.9	91.3	59.3	60.7
2	98.2	99.5	97.6	98.9	81.6	84.5	95.5	97.2	86.5	88.4	88.4	90.8	54.0	56.1
3	97.7	99.5	96.9	98.9	77.7	81.9	94.7	97.2	81.7	84.6	86.9	90.4	44.9	47.9
4	97.3	99.5	95.5	98.4	74.2	79.5	93.1	96.5	80.2	83.4	83.7	88.5	38.0	41.3
5	96.8	99.5	94.8	98.4	72.7	79.0	92.4	96.5	78.7	83.1	82.8	88.2	35.0	38.5
6	95.7	99.5	92.4	96.8	70.6	77.9	90.9	96.2	77.8	82.6	79.2	85.9	30.4	34.1
7	94.9	99.5	92.1	96.8	68.1	76.5	89.8	95.9	75.8	81.3	78.3	85.9	28.1	32.3
8	93.0	98.9	91.7	96.8	66.0	75.2	88.0	95.0	74.8	81.0	76.4	85.1	24.3	28.9
9	92.1	98.7	90.9	96.8	63.5	73.6	87.2	95.0	72.8	79.7	73.7	83.1	22.1	26.3
10	91.6	98.7	88.9	96.7	60.8	71.7	85.8	94.5	71.2	78.7	70.9	81.3	20.5	25.2

TNM staging		
cont'd	NA/NOS	
	n=87	
Years	obs. %	rel. %
0	100.0	100.0
1	90.8	92.6
2	89.6	92.3
3	86.0	90.0
4	83.6	88.8
5	83.6	88.8
6	81.2	88.8
7	81.2	88.8
8	78.8	88.8
9	75.2	86.1
10	71.6	83.6

Table 4d. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by TNM staging for period 1988-2002 (N=1,759).

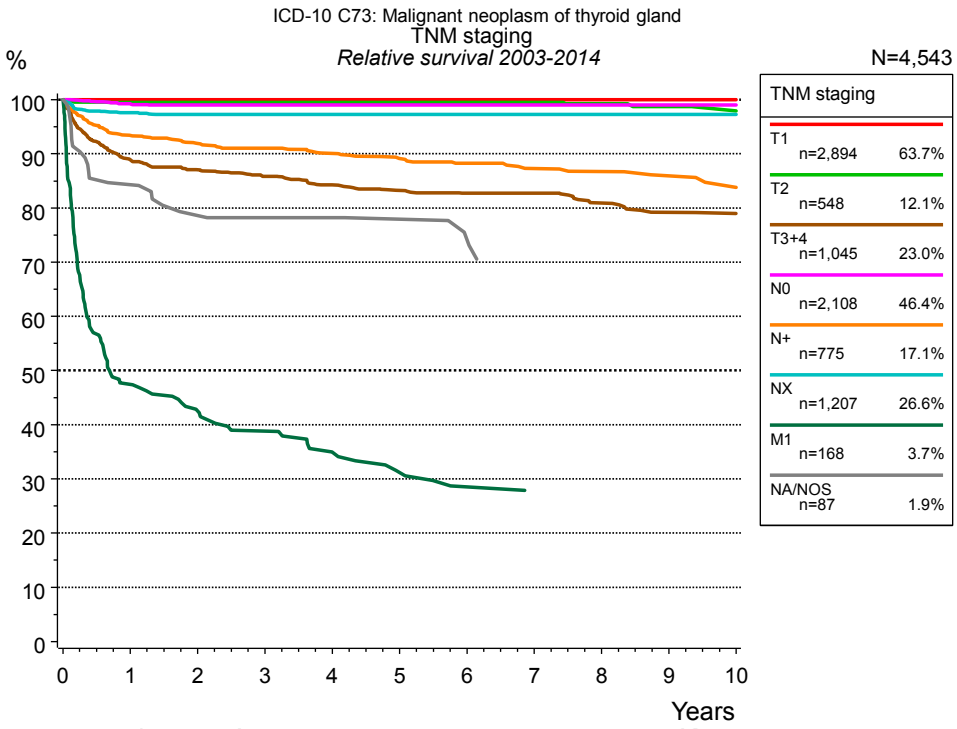

Figure 4e. Relative survival of patients with thyroid cancer by TNM staging. For 4,548 of 4,630 cases diagnosed between 2003 and 2014 valid data could be obtained for this item. For a total of 4,543 cases an evaluable classification was established. The accumulated percentage exceeds the 100% value because patients are potientially considered in more than one subgroup. The grey line represents the subgroup of 87 patients with missing values regarding TNM staging (1.9 % of 4,630 patients, the percent values of all other categories are related to n=4,543).

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

	TNM staging													
	T1 n=2,894		T2 n=548		T3+4 n=1,045		N0 n=2,108		N+ n=775		NX n=1,207		M1 n=168	
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	99.8	100.0	99.1	99.5	87.7	88.9	98.6	99.2	92.7	93.4	96.7	97.6	46.6	47.5
2	99.4	100.0	98.6	99.5	84.9	87.1	98.0	99.0	90.7	91.9	95.6	97.2	40.8	42.6
3	99.1	100.0	98.2	99.5	82.8	85.8	97.7	99.0	89.3	91.0	94.7	97.2	36.6	38.8
4	98.7	100.0	97.2	99.5	80.4	84.3	96.8	99.0	88.0	90.1	94.0	97.2	31.9	35.0
5	98.4	100.0	96.9	99.5	78.7	83.3	96.4	99.0	86.5	89.1	93.9	97.2	28.2	31.2
6	97.8	100.0	95.3	99.5	77.4	82.7	95.5	99.0	85.2	88.2	93.4	97.2	25.1	28.5
7	97.3	100.0	94.4	99.5	77.0	82.7	95.1	99.0	83.8	87.3	93.1	97.2	23.9	27.7
8	97.0	100.0	93.2	99.2	74.3	80.9	93.6	99.0	83.0	86.7	92.3	97.2	23.9	26.8
9	95.5	100.0	91.5	98.7	72.0	79.2	92.6	99.0	81.7	86.0	90.6	97.2		
10	94.9	100.0	90.4	97.9	70.8	78.9	91.9	99.0	79.9	83.8	90.6	97.2		

TNM staging		
cont'd	NA/NOS	
	n=87	
Years	obs. %	rel. %
0	100.0	100.0
1	83.5	84.3
2	76.9	78.6
3	75.4	78.2
4	75.4	78.2
5	73.7	77.9
6	69.2	74.2

Table 4f. Observed (obs.) and relative (rel.) survival of patients with thyroid cancer by TNM staging for period 2003-2014 (N=4,543).

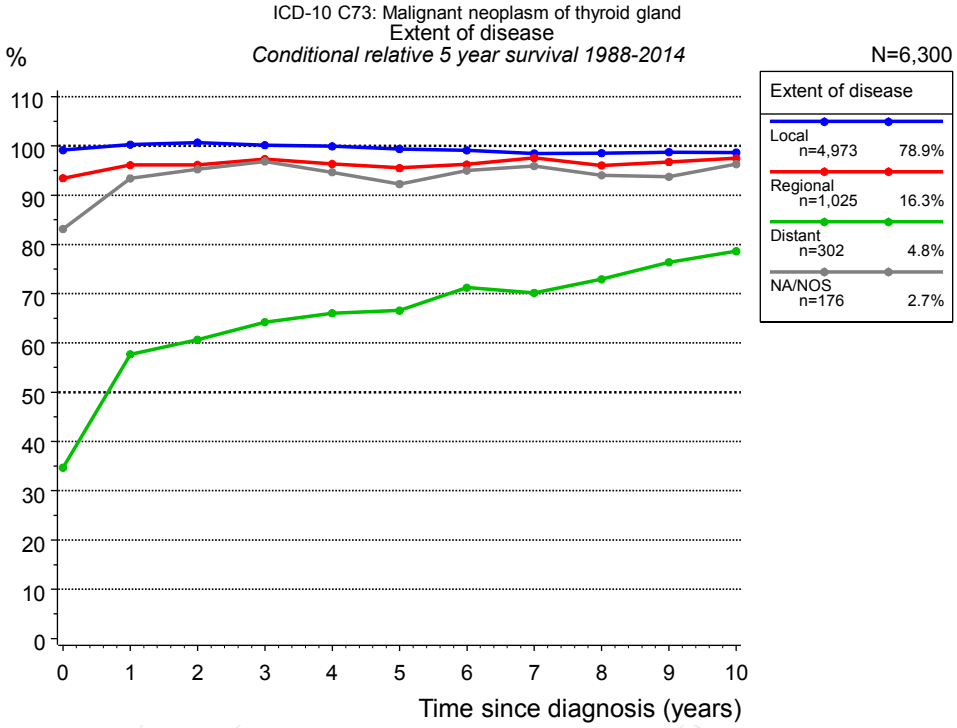

Figure 4g. Conditional relative 5-year survival of patients with thyroid cancer by extent of disease. For 6,308 of 6,476 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 6,300 cases an evaluable classification was established. The grey line represents the subgroup of 176 patients with missing values regarding extent of disease (2.7% of 6,476 patients, the percent values of all other categories are related to n=6,300).

	Extent of disease							
	Local		Regional		Distant		NA/NOS	
Years	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs
0	4,973	99.1	1,025	93.4	302	34.7	176	83.2
1	4,567	100.3	915	96.1	154	57.7	142	93.4
2	4,224	100.7	846	96.1	132	60.6	125	95.2
3	3,924	100.2	762	97.3	108	64.2	121	96.9
4	3,582	99.9	674	96.3	88	66.0	115	94.7
5	3,221	99.4	598	95.5	74	66.6	108	92.2
6	2,763	99.1	511	96.2	63	71.2	97	95.0
7	2,284	98.5	431	97.5	55	70.2	88	95.9
8	1,869	98.5	367	96.0	47	72.9	81	94.0
9	1,590	98.7	306	96.7	38	76.4	75	93.7
10	1,368	98.6	266	97.4	31	78.6	69	96.3

Table 4h. Conditional relative 5-year survival of patients with thyroid cancer by extent of disease for period 1988-2014 (N=6,300).

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 100.2% (n=3,924).

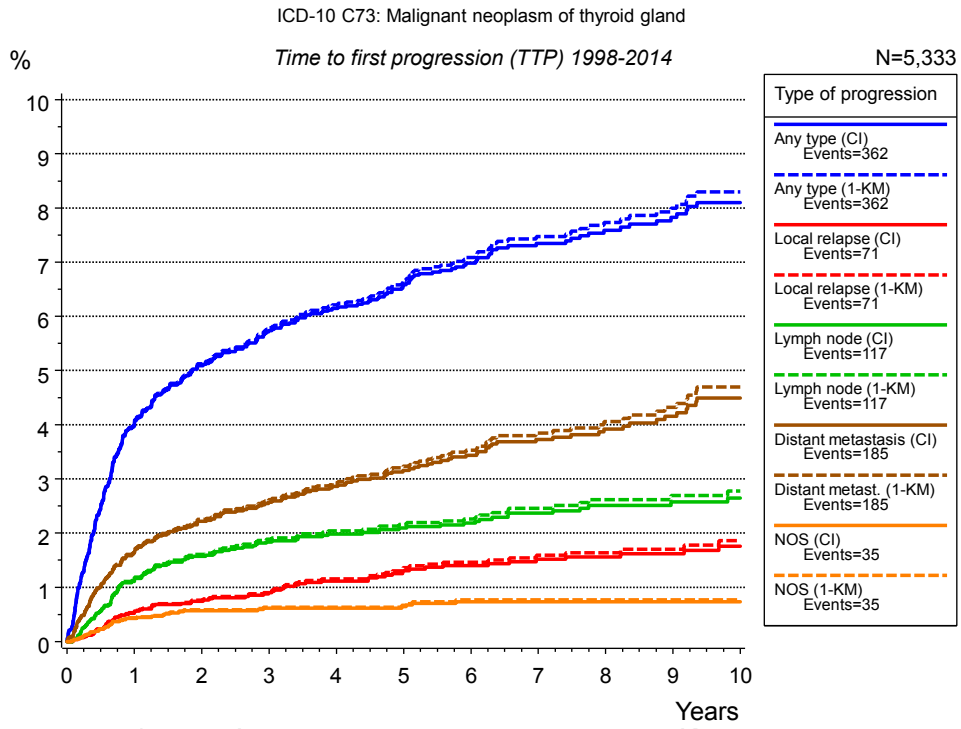

Figure 5a. Time to first progression of 5,333 patients with thyroid cancer diagnosed between 1998 and 2014 (M0 only in solid cancers) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

	Type of progression						
	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=5,333	n=5,333	n=5,333	n=5,333	n=5,333	n=5,333	n=5,333
Years	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	4.0	4.0	0.5	0.5	1.1	1.2	1.6
2	5.1	5.1	0.7	0.8	1.6	1.6	2.2
3	5.7	5.8	0.9	0.9	1.8	1.9	2.6
4	6.1	6.2	1.1	1.2	2.0	2.0	2.9
5	6.6	6.7	1.3	1.4	2.1	2.2	3.2
6	7.0	7.1	1.4	1.5	2.2	2.3	3.4
7	7.3	7.5	1.5	1.6	2.4	2.5	3.7
8	7.6	7.7	1.6	1.6	2.5	2.6	3.9
9	7.8	8.0	1.6	1.7	2.6	2.7	4.2
10	8.1	8.3	1.8	1.9	2.6	2.8	4.5

	Type of progression		
cont'd	Distant metast. (1-KM) n=5,333	NOS (CI) n=5,333	NOS (1-KM) n=5,333
Years	%	%	%
0	0.0	0.0	0.0
1	1.7	0.4	0.4
2	2.3	0.6	0.6
3	2.6	0.6	0.6
4	2.9	0.6	0.6
5	3.2	0.6	0.7
6	3.5	0.7	0.8
7	3.8	0.7	0.8
8	4.1	0.7	0.8
9	4.3	0.7	0.8
10	4.7	0.7	0.8

Table 5b. Time to first progression of patients with thyroid cancer for period 1998-2014 (N=5,333).

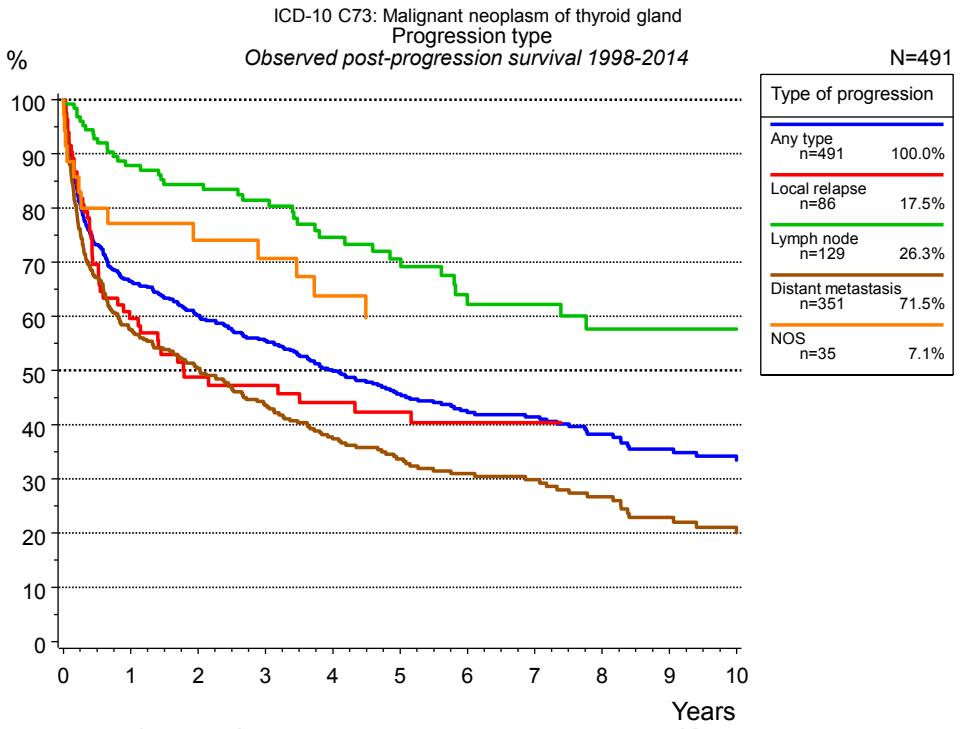

Figure 5c. Observed post-progression survival of 491 patients with thyroid cancer diagnosed between 1998 and 2014. These 491 patients with documented progression events during their course of disease represent 8.8 % of the totally 5,553 evaluated cases (incl. M1, n=220, 4.0 %). Patients with cancer relapse documented via death certificates only were excluded (n=91, 1.6 %). Multiple progression types on different sites are included in the evaluation even when not occuring 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 potientially considered in more than one subgroup.

	Type of progression				
	Any type n=491	Local relapse n=86	Lymph node n=129	Distant metastasis n=351	NOS n=35
Years	%	%	%	%	%
0	100.0	100.0	100.0	100.0	100.0
1	66.5	59.6	87.8	57.5	77.1
2	60.2	48.8	84.3	50.4	74.1
3	55.5	47.3	81.4	43.6	70.7
4	49.9	44.1	74.6	37.4	63.8
5	45.7	42.3	70.6	33.7	59.8
6	42.3	40.4	62.2	31.0	
7	41.5	40.4	62.2	29.9	
8	38.3		57.7	26.7	
9	35.5		57.7	22.9	
10	33.5		57.7	20.1	

Table 5d. Observed post-progression survival of patients with thyroid cancer for period 1998-2014 (N=491).

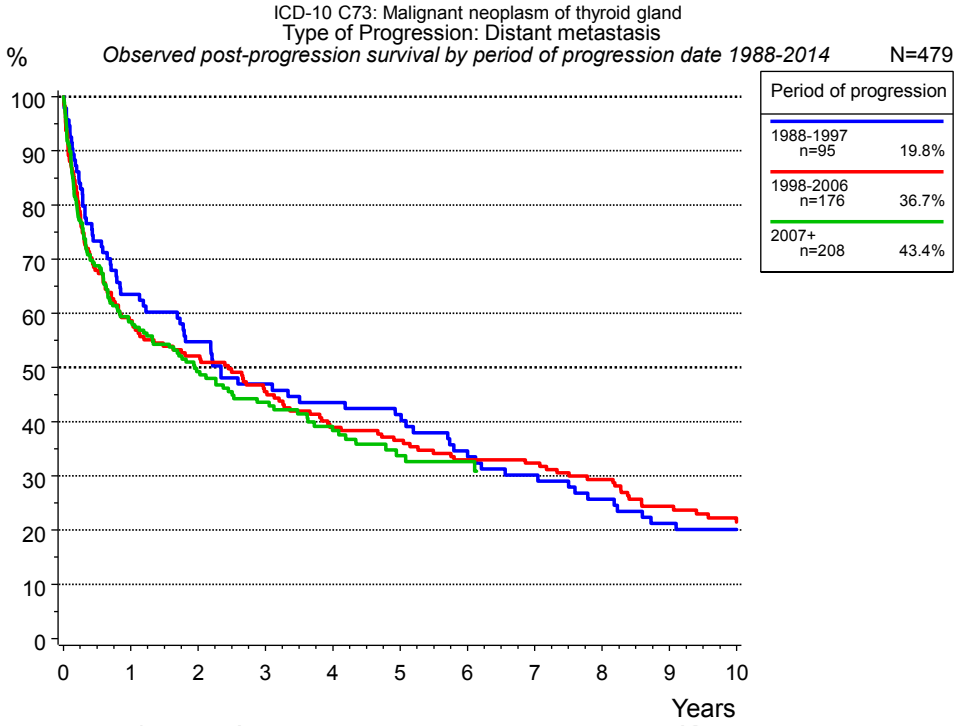

Figure 5e. Observed post-progression (distant metastasis) survival of 479 patients with thyroid cancer diagnosed between 1988 and 2014 by period of progression.

	Period of progression		
	1988-1997 n=95	1998-2006 n=176	2007+ n=208
Years	%	%	%
0	100.0	100.0	100.0
1	63.5	58.7	58.4
2	54.8	52.2	49.3
3	46.9	45.6	43.6
4	43.6	39.0	38.4
5	41.4	36.6	33.8
6	34.7	33.0	32.6
7	30.2	32.4	30.9
8	25.7	29.4	30.9
9	21.2	24.4	
10	20.1	21.5	

Table 5f. Observed post-progression (distant metastasis) survival of patients with thyroid cancer for period 1988-2014 by period of progression (N=479).

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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