Munich Cancer Registry

- Incidence and Mortality
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ICD-10 C73: Medullary thyroid ca.

Survival

Year of diagnosis	1988-1997	1998-2020
Patients	41	435
Diseases	41	435
Cases evaluated	36	367

Creation date	04/15/2022
Database export	12/20/2021
Population	4.92 m

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

https://www.tumorregister-muenchen.de/en/facts/surv/sC73M_E-ICD-10-C73-Medullary-thyroid-ca.-survival.pdf

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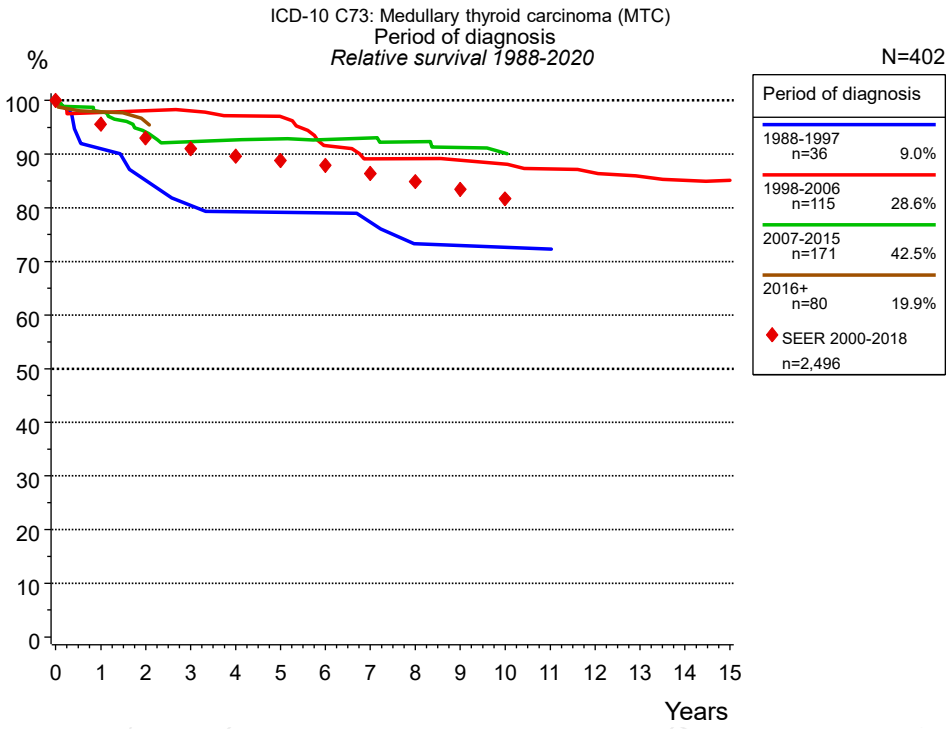

Figure 1a. Relative survival of patients with medullary thyroid ca. by period of diagnosis. Included in the evaluation are 402 cases diagnosed between 1988 and 2020.

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.

	Period of diagnosis							
	1988-1997 n=36		1998-2006 n=115		2007-2015 n=171		2016+ n=80	
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	91.2	91.0	97.4	97.8	97.5	97.9	97.5	97.9
2	85.2	85.1	97.4	98.1	93.1	94.2	94.7	96.0
3	79.1	80.4	96.4	98.1	90.6	92.4		
4	76.1	79.3	94.5	97.1	90.6	92.7		
5	76.1	79.1	93.5	97.0	90.0	92.9		
6	76.1	79.0	87.6	91.6	88.7	92.7		
7	72.9	77.3	84.7	89.1	88.7	93.0		
8	66.6	73.3	84.7	89.2	87.0	92.3		
9	66.6	72.9	83.7	88.9	85.0	91.2		
10	66.6	72.6	82.7	88.2	83.7	90.2		
11	66.6	72.3	80.7	87.2	82.3	89.4		
12	63.4	70.7	79.6	86.5	82.3	88.8		
13			77.6	85.8				
14			76.6	85.1				
15			75.5	85.1				
Median								

Table 1b. Observed (obs.) and relative (rel.) survival of patients with medullary thyroid ca. by period of diagnosis for period 1988-2020 (N=402).

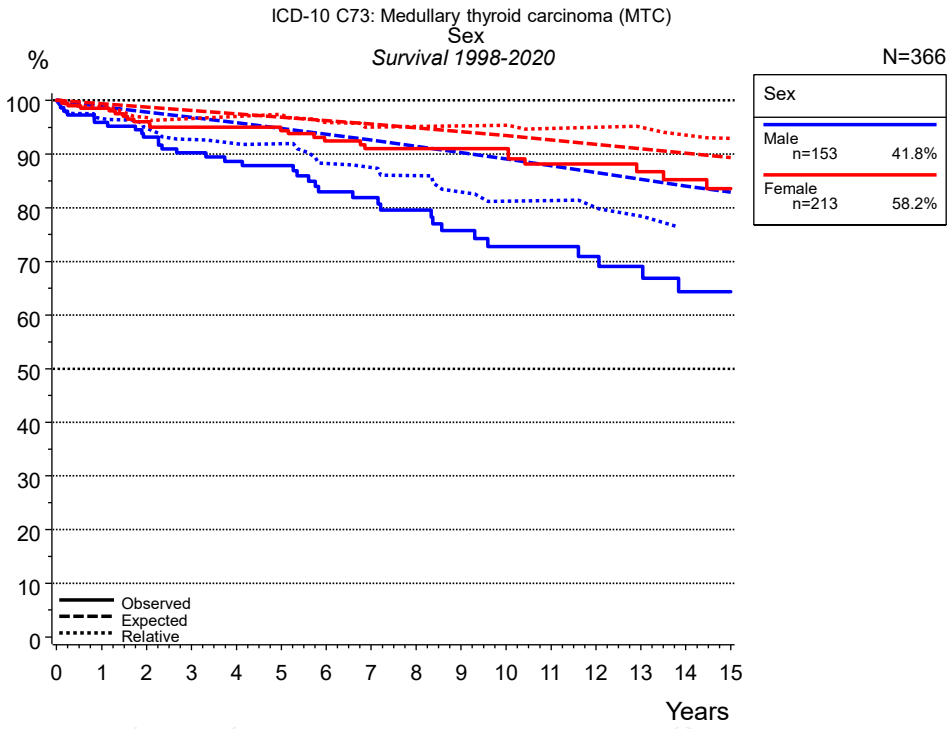

Figure 2a. Survival of patients with medullary thyroid ca. by sex. Included in the evaluation are 366 cases diagnosed between 1998 and 2020.

	Sex			
	Male n=153		Female n=213	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	95.9	96.7	98.5	98.8
2	93.1	94.8	96.0	96.8
3	90.2	92.7	95.0	96.6
4	88.7	91.9	95.0	97.0
5	87.9	91.9	94.4	97.3
6	83.0	88.3	92.4	95.9
7	81.9	87.5	91.0	95.1
8	79.6	86.0	91.0	95.2
9	75.7	82.9	91.0	95.3
10	72.7	81.2	91.0	95.4
11	72.7	81.4	88.1	94.8
12	70.9	80.1	88.1	95.0
13	69.1	78.4	86.7	95.1
14	64.4	75.8	85.2	93.6
15	64.4	71.9	83.6	92.9
Median	21.9			

Table 2b. Observed (obs.) and relative (rel.) survival of patients with medullary thyroid ca. by sex for period 1998-2020 (N=366).

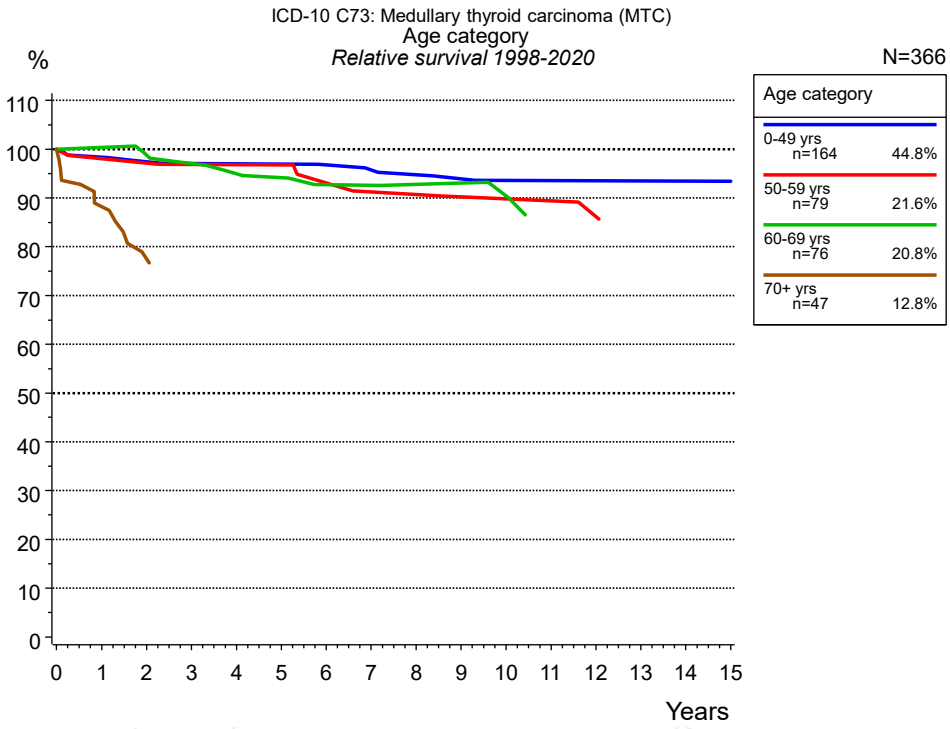

Figure 3a. Relative survival of patients with medullary thyroid ca. by age category. Included in the evaluation are 366 cases diagnosed between 1998 and 2020.

	Age category							
	0-49 yrs n=164		50-59 yrs n=79		60-69 yrs n=76		70+ yrs n=47	
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	98.8	98.4	98.6	98.1	100.0	100.4	86.3	88.2
2	97.5	97.4	98.6	97.1	97.2	98.9	74.1	77.6
3	96.8	97.1	95.8	96.9	94.4	97.1	71.6	78.0
4	96.8	97.0	95.8	96.8	91.4	95.0	71.6	79.5
5	96.8	97.0	95.8	96.8	89.9	94.2		
6	96.0	96.8	90.1	93.1	86.1	92.8		
7	95.1	95.8	88.0	91.3	86.1	92.7		
8	94.2	94.8	88.0	90.7	83.9	92.8		
9	93.1	94.0	85.6	90.2	83.9	93.1		
10	92.0	93.6	85.6	89.8	80.6	90.4		
11	92.0	93.6	85.6	89.4				
12	92.0	93.6	82.0	86.2				
13	92.0	93.5	78.5	83.7				
14	92.0	93.5						
15	92.0	93.4						
Median								

Table 3b. Observed (obs.) and relative (rel.) survival of patients with medullary thyroid ca. by age category for period 1998-2020 (N=366).

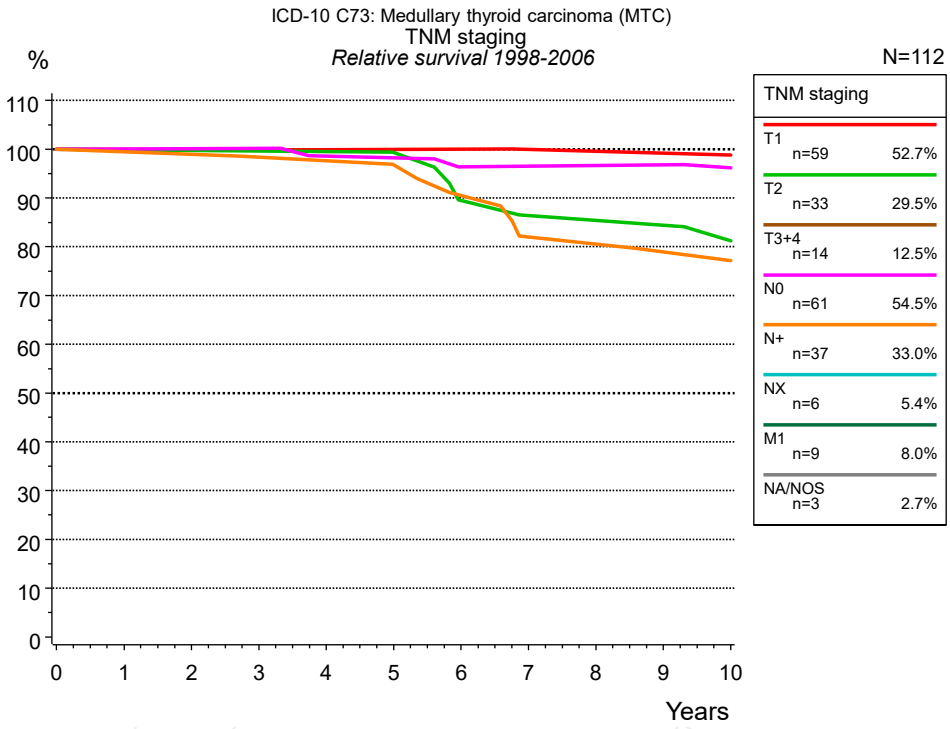

Figure 4c. Relative survival of patients with medullary thyroid ca. by TNM staging. For 113 of 115 cases diagnosed between 1998 and 2006 valid data could be obtained for this item. For a total of 112 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potientially considered in more than one subgroup. The grey line represents the subgroup of 3 patients with missing values regarding TNM staging (2.6 % of 115 patients, the percent values of all other categories are related to n=112). Subgroups with sample size <20 are omitted from the chart.

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

	TNM staging							
	T1		T2		N0		N+	
	n=59		n=33		n=61		n=37	
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	100.0	100.0	100.0	99.9	100.0	100.1	100.0	99.5
2	100.0	99.9	100.0	99.8	100.0	100.1	100.0	99.0
3	100.0	99.9	100.0	99.7	100.0	100.2	97.2	98.4
4	98.2	99.9	100.0	99.5	96.5	98.6	97.2	97.7
5	98.2	100.0	96.7	99.4	96.5	98.2	94.2	96.8
6	98.2	100.0	86.7	89.5	92.8	96.4	88.1	90.5
7	96.3	100.0	83.3	86.4	92.8	96.5	79.0	82.0
8	96.3	99.5	83.3	85.4	92.8	96.7	79.0	80.5
9	94.3	99.2	83.3	84.5	92.8	96.8	75.8	78.9
10	94.3	98.8	80.0	81.2	91.0	96.2	75.8	77.2
Median								

Table 4d. Observed (obs.) and relative (rel.) survival of patients with medullary thyroid ca. by TNM staging for period 1998-2006 (N=112).

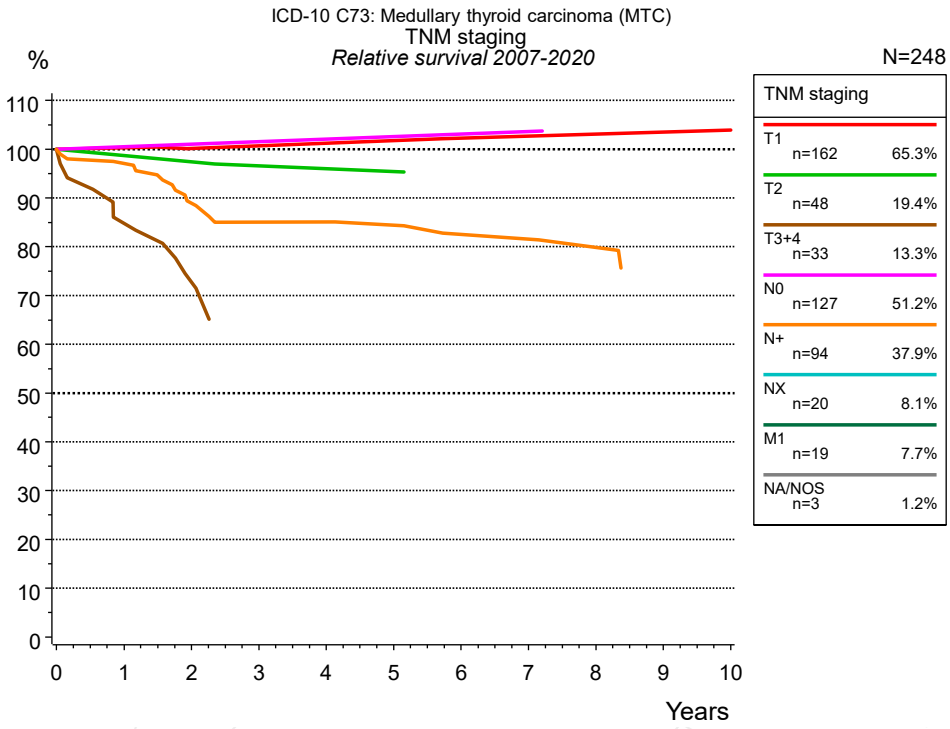

Figure 4e. Relative survival of patients with medullary thyroid ca. by TNM staging. For 248 of 251 cases diagnosed between 2007 and 2020 valid data could be obtained for this item. The accumulated percentage exceeds the 100 % value because patients are potientially considered in more than one subgroup. The grey line represents the subgroup of 3 patients with missing values regarding TNM staging (1.2 % of 251 patients, the percent values of all other categories are related to n=248). Subgroups with sample size <20 are omitted from the chart.

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

	TNM staging											
	T1 n=162		T2 n=48		T3+4 n=33		N0 n=127		N+ n=94		NX n=20	
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	100.0	100.3	100.0	98.7	84.8	84.8	100.0	100.5	96.7	97.1		
2	98.6	100.1	97.9	97.4	72.4	72.8	100.0	101.0	87.8	88.9		
3	98.6	100.7	95.6	96.6	62.9	64.4	100.0	101.6	83.2	85.1		
4	98.6	101.3	95.6	96.0			100.0	102.1	83.2	85.1		
5	98.6	101.8	95.6	95.4			100.0	102.6	81.8	84.4		
6	97.6	102.3	92.1	91.2			100.0	103.1	78.2	82.5		
7	97.6	102.7	92.1	86.3			100.0	103.6	78.2	81.6		
8	97.6	103.1					98.3	101.5	75.7	79.9		
9	97.6	103.5					98.3	98.7	69.1	74.0		
10	97.6	103.9					98.3	96.0				
Median												

Table 4f. Observed (obs.) and relative (rel.) survival of patients with medullary thyroid ca. by TNM staging for period 2007-2020 (N=248).

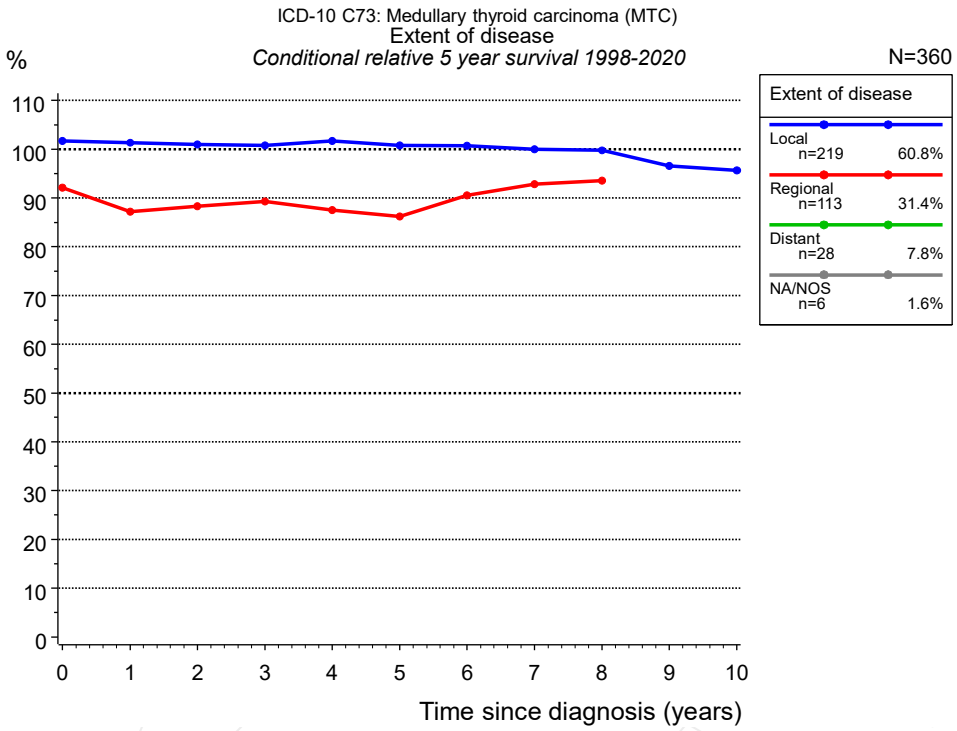

Figure 4g. Conditional relative 5-year survival of patients with medullary thyroid ca. by extent of disease. For 361 of 366 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 360 cases an evaluable classification was established. The grey line represents the subgroup of 6 patients with missing values regarding extent of disease (1.6 % of 366 patients, the percent values of all other categories are related to n=360). Subgroups with sample size <20 are omitted from the chart.

	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	219	101.7	113	92.1	28		6	
1	205	101.4	107	87.2				
2	200	101.0	100	88.3				
3	189	100.7	92	89.3				
4	178	101.6	81	87.5				
5	159	100.8	68	86.2				
6	145	100.7	61	90.5				
7	135	100.0	49	92.9				
8	124	99.8	43	93.6				
9	112	96.6						
10	100	95.7						

Table 4h. Conditional relative 5-year survival of patients with medullary thyroid ca. by extent of disease for period 1998-2020 (N=360).

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 100.7% (n=189).

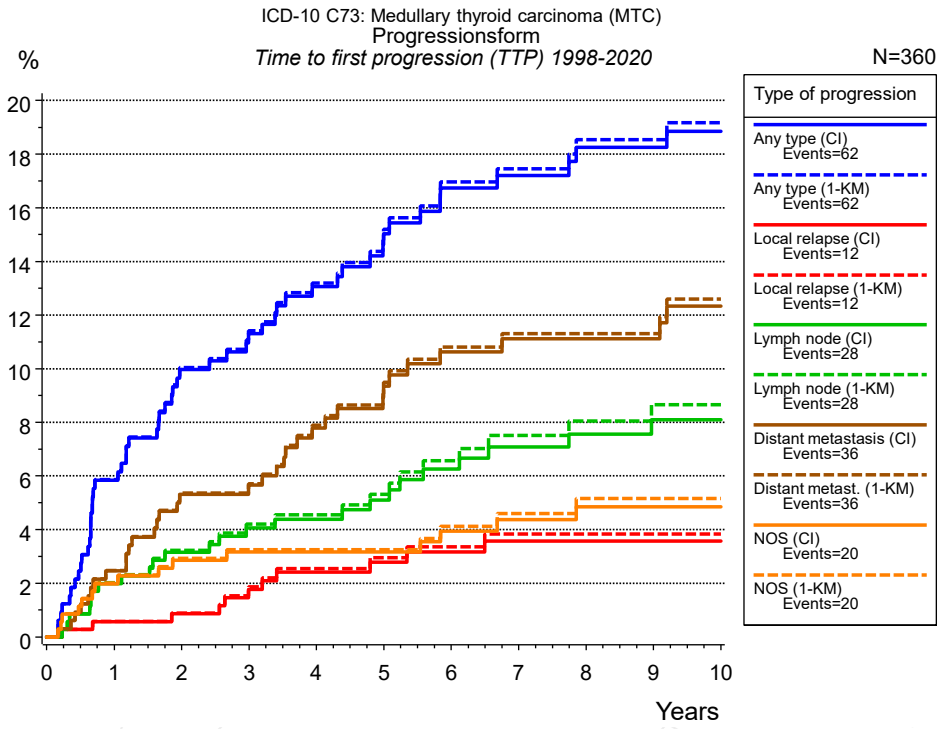

Figure 5a. Time to first progression of 360 patients with medullary thyroid ca. diagnosed between 1998 and 2020 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency 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	332	332	360	360	360	360	332
Events	54	54	11	11	24	24	34
compet.	12		43		39		13
Years	%	%	%	%	%	%	%
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	5.8	5.9	0.6	0.6	2.0	2.0	2.5
2	10.0	10.0	0.9	0.9	3.1	3.2	5.3
3	11.3	11.4	1.8	1.9	4.1	4.2	5.7
4	13.1	13.2	2.4	2.5	4.4	4.5	7.8
5	15.0	15.2	2.8	2.9	5.1	5.3	9.4
6	16.7	17.0	3.2	3.4	6.3	6.6	10.6
7	17.2	17.5	3.6	3.8	7.1	7.5	11.1
8	18.2	18.5	3.6	3.8	7.6	8.0	11.1
9	18.2	18.5	3.6	3.8	8.1	8.7	11.1
10	18.9	19.2	3.6	3.8	8.1	8.7	12.3

	Type of progression		
cont'd	Distant metast. (1-KM)	NOS (CI)	NOS (1-KM)
N	332	360	360
Events	34	15	15
compet.		44	
Years	%	%	%
0	0.0	0.0	0.0
1	2.5	2.0	2.0
2	5.4	2.9	2.9
3	5.7	3.2	3.2
4	7.9	3.2	3.2
5	9.5	3.2	3.2
6	10.8	3.9	4.1
7	11.3	4.4	4.6
8	11.3	4.8	5.1
9	11.3	4.8	5.1
10	12.6	4.8	5.1

Table 5b. Time to first progression of patients with medullary thyroid ca. for period 1998-2020 (N=360), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

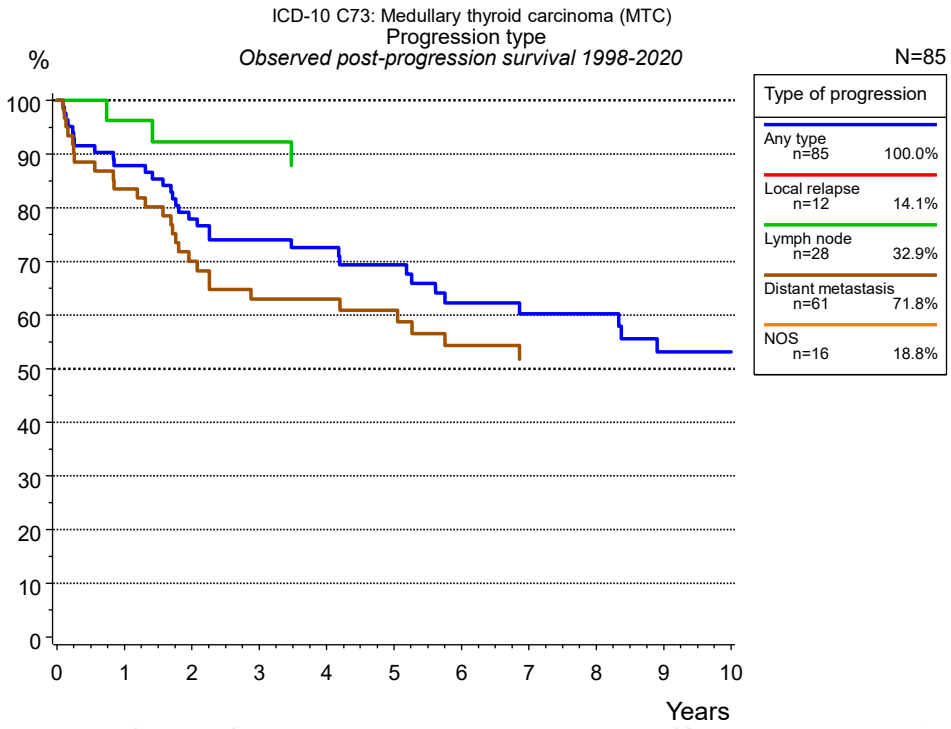

Figure 5c. Observed post-progression survival of 85 patients with medullary thyroid ca. diagnosed between 1998 and 2020. These 85 patients with documented progression events during their course of disease represent 23.6 % of the totally 360 evaluated cases (incl. M1, n=28, 7.8 %). Patients with cancer relapse documented via death certificates only were excluded (n=5, 1.4 %). 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. Subgroups with sample size <20 are omitted from the chart.

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	Lymph node	Distant metastasis
	n=85	n=28	n=61
Years	%	%	%
0	100.0	100.0	100.0
1	87.9	96.3	83.5
2	77.9	92.3	70.0
3	74.0	92.3	63.0
4	72.6		63.0
5	69.4		60.9
6	62.3		54.3
7	60.2		51.8
8	60.2		
9	53.2		
10	53.2		

Table 5d. Observed post-progression survival of patients with medullary thyroid ca. for period 1998-2020 (N=85).

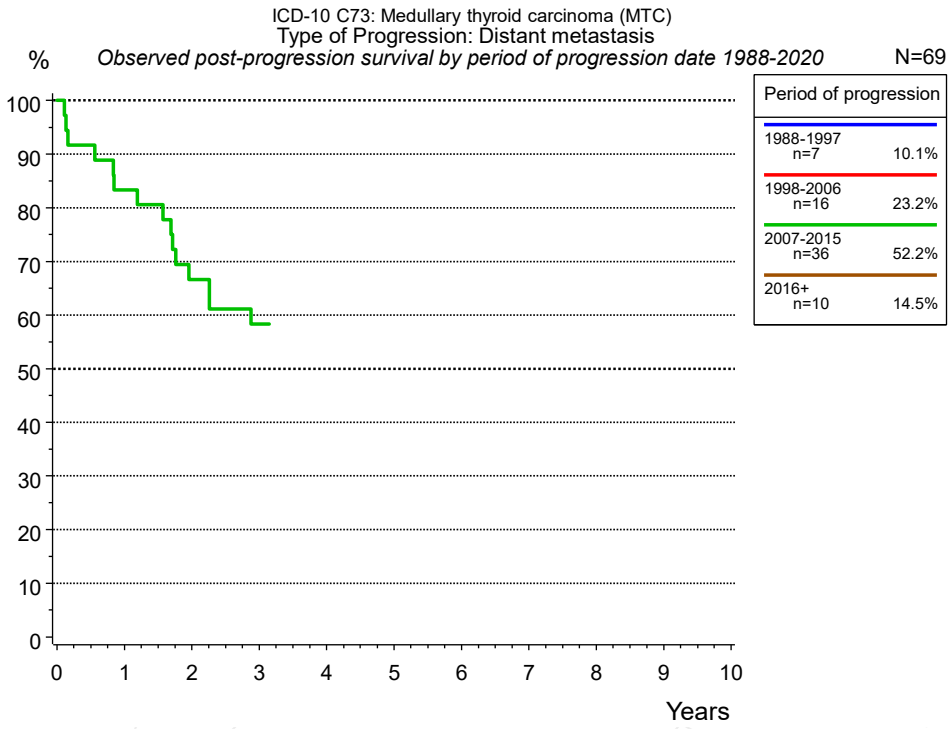

Figure 5e. Observed post-progression (distant metastasis) survival of 69 patients with medullary thyroid ca. diagnosed between 1988 and 2020 by period of progression.

Period of progression	
	2007-2015 n=36
Years	%
0	100.0
1	83.3
2	66.7
3	58.3
4	58.3

Table 5f. Observed post-progression (distant metastasis) survival of patients with medullary thyroid ca. for period 1988-2020 by period of progression (N=69).

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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