Munich Cancer Registry

ICD-10 C64-C66, C68: Urinary tract cancer

Survival

Year of diagnosis	1988-1997	1998-2020
Patients	3,117	15,844
Diseases	3,163	16,400
Cases evaluated	2,704	10,743
Creation date	04/15/2022	
Database export	12/20/2021	
Population	4.92 m	

BERLIN

GERMANY

BAVARIA

MUNICH

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninistr. 15
Munich, 81377
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https://www.tumorregister-muenchen.de/en
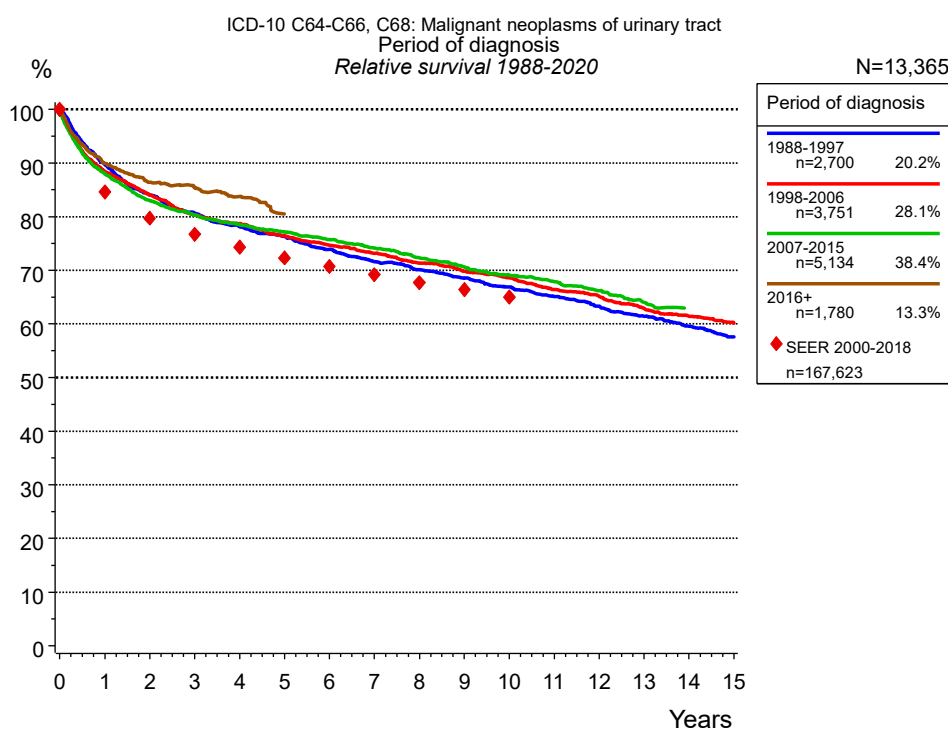
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Figure 1a. Relative survival of patients with urinary tract cancer by period of diagnosis. Included in the evaluation are 13,365 cases diagnosed between 1988 and 2020.

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=2,700 | | 1998-2006 n=3,751 | | 2007-2015 n=5,134 | | 2016+ n=1,780 | |
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	87.5	89.7	86.3	88.5	85.8	88.0	87.8	89.9
2	79.9	84.0	79.9	84.0	79.0	83.0	82.4	86.4
3	74.9	80.7	74.5	80.3	74.5	80.3	79.5	85.4
4	70.7	78.1	71.2	78.7	71.0	78.5	76.1	83.7
5	67.3	76.3	67.4	76.4	68.0	77.2		
6	63.6	73.9	64.2	74.6	64.9	75.7		
7	60.1	71.6	61.3	73.2	61.8	74.1		
8	57.3	70.1	58.1	71.4	58.6	72.3		
9	54.6	68.5	55.3	69.8	55.6	70.6		
10	51.9	66.9	52.7	68.5	52.7	69.1		
11	49.2	65.1	49.6	66.4	50.3	67.9		
12	46.5	63.3	47.1	65.1	47.5	66.2		
13	43.9	61.4	44.1	62.9	44.3	64.0		
14	41.4	59.5	41.7	61.4				
15	38.9	57.6	39.5	60.2				
Median	10.7		10.9		11.1			

Table 1b. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by period of diagnosis for period 1988-2020 (N=13,365).

ICD-10 C64-C66, C68: Malignant neoplasms of urinary tract
Sex
Survival 1998-2020

Figure 2a. Survival of patients with urinary tract cancer by sex. Included in the evaluation are 10,665 cases diagnosed between 1998 and 2020.

	Sex			
	Male n=6,794		Female n=3,871	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	86.8	89.0	85.6	87.6
2	80.7	84.9	78.5	82.2
3	75.9	81.9	74.1	79.4
4	72.6	80.5	70.5	77.3
5	69.1	78.7	67.2	75.5
6	65.9	77.2	64.0	73.8
7	63.1	76.0	60.7	71.7
8	59.8	74.1	57.5	69.9
9	57.0	72.7	54.3	67.9
10	54.2	71.3	51.7	66.5
11	51.6	69.9	48.3	64.0
12	48.6	68.1	46.3	63.2
13	45.4	65.8	43.5	61.2
14	43.0	64.4	41.1	59.7
15	40.4	62.6	39.7	59.4
Median	11.6		10.4	

Table 2b. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by sex for period 1998-2020 (N=10,665).

ICD-10 C64-C66, C68: Malignant neoplasms of urinary tract
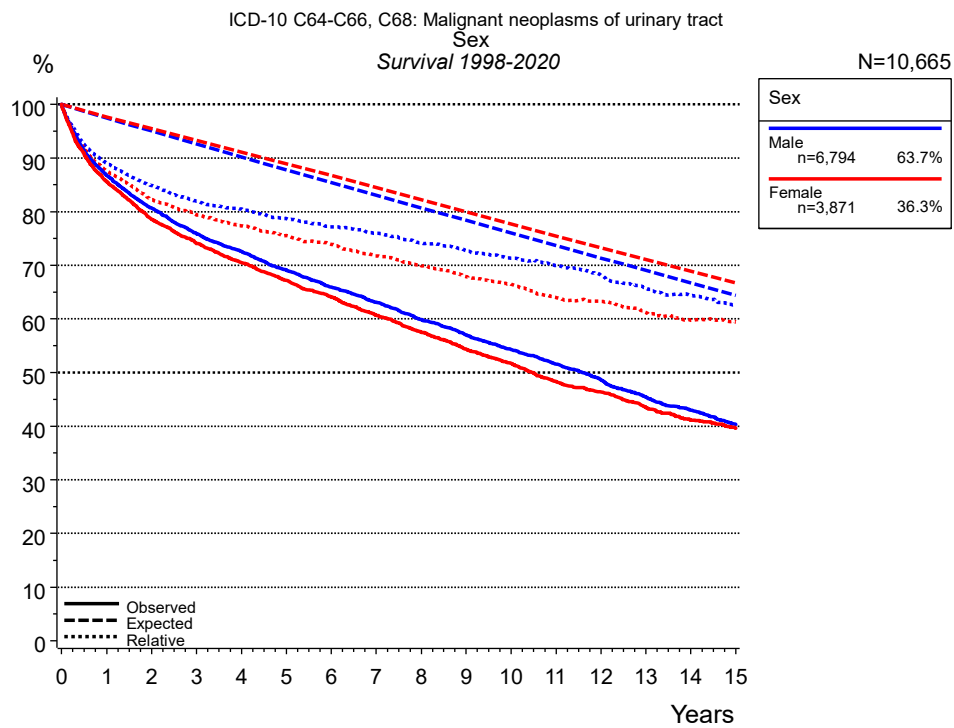Age category
Observed survival 1998-2020

Figure 3a. Observed survival of patients with urinary tract cancer by age category. Included in the evaluation are 10,665 cases diagnosed between 1998 and 2020.

ICD-10 C64-C66, C68: Malignant neoplasms of urinary tract
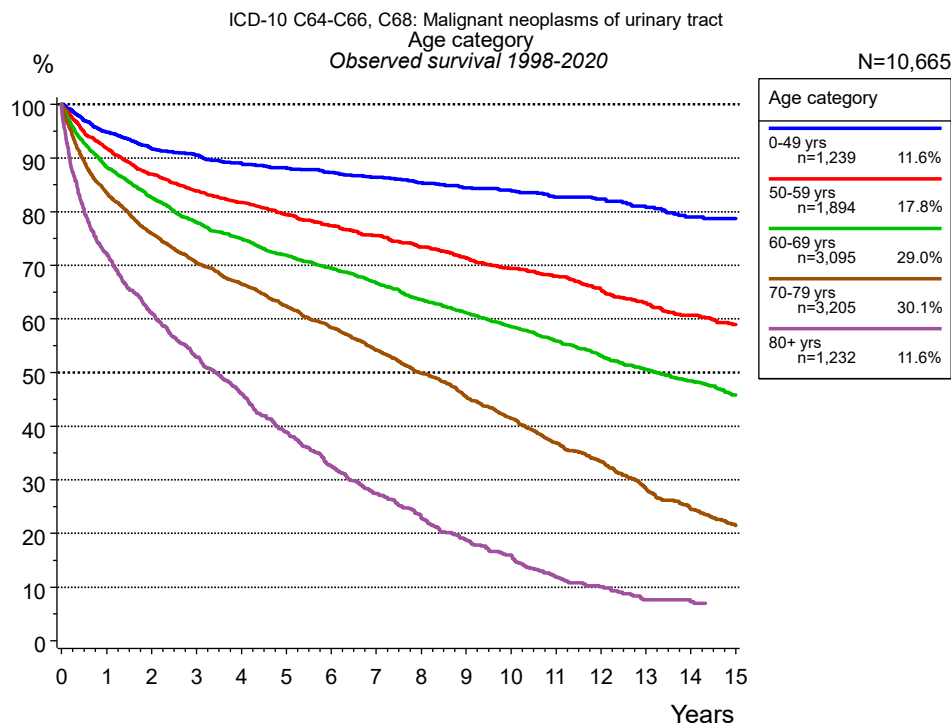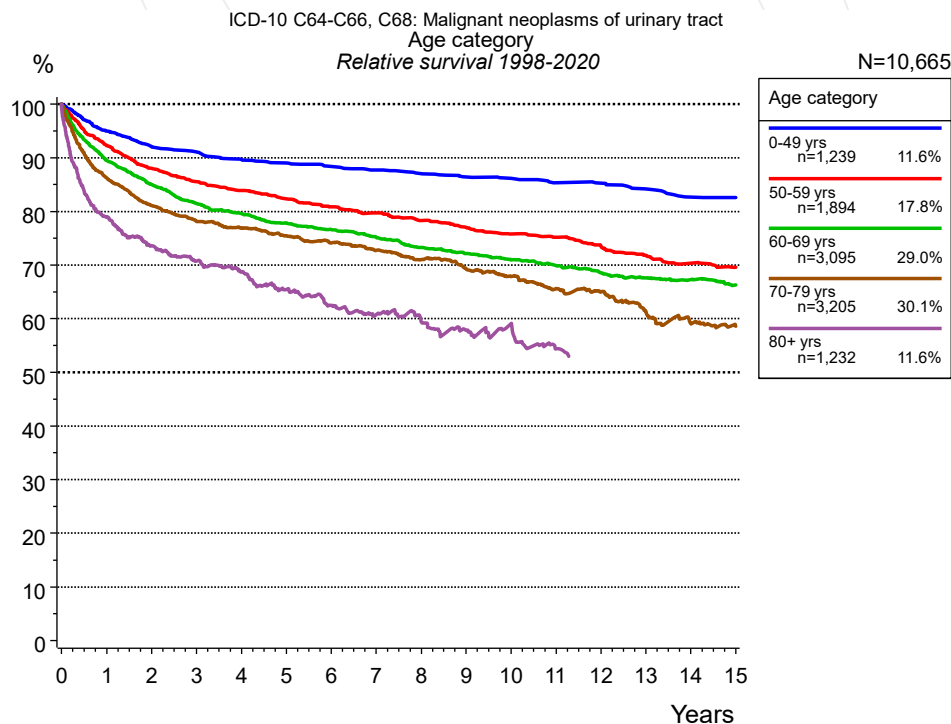Age category
Relative survival 1998-2020

Figure 3b. Relative survival of patients with urinary tract cancer by age category. Included in the evaluation are 10,665 cases diagnosed between 1998 and 2020.

	Age category									
	0-49 yrs n=1,239		50-59 yrs n=1,894		60-69 yrs n=3,095		70-79 yrs n=3,205		80+ yrs n=1,232	
Years	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
1	94.8	95.0	91.7	92.3	88.3	89.5	83.5	86.2	72.3	79.0
2	91.7	92.0	87.0	88.1	82.6	85.0	75.9	81.1	61.1	73.6
3	90.6	91.1	83.8	85.5	78.0	81.5	70.4	78.1	52.9	70.7
4	89.0	89.7	81.7	83.9	74.9	79.6	66.5	76.9	46.1	68.7
5	88.2	89.1	79.5	82.4	71.9	77.8	62.4	75.4	38.9	65.5
6	87.3	88.4	77.4	80.9	69.4	76.6	58.3	74.1	32.6	62.4
7	86.4	87.8	75.6	79.8	66.7	75.2	54.2	72.7	27.4	60.7
8	85.4	87.0	73.4	78.3	63.6	73.3	49.9	71.0	23.0	59.5
9	84.5	86.4	71.4	77.0	61.1	72.2	45.5	69.3	18.8	57.8
10	83.9	86.2	69.4	75.8	58.5	71.0	41.4	67.9	16.0	59.1
11	82.7	85.4	67.9	75.2	55.9	69.9	37.0	65.6	11.9	54.4
12	82.3	85.2	65.5	73.5	53.1	68.5	33.4	65.0	10.1	58.0
13	80.8	84.2	63.0	71.8	50.5	67.6	28.5	61.4	7.6	56.6
14	79.0	82.7	60.7	70.4	48.5	67.3	24.6	59.0	7.3	71.0
15	78.7	82.6	58.9	69.6	45.8	66.3	21.5	58.6		
Median			19.5		13.2		7.9		3.4	

Table 3c. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by age category for period 1998-2020 (N=10,665).

ICD-10 C64-C66, C68: Malignant neoplasms of urinary tract
ICD-10 classification
Relative survival 1998-2020   N=10,665
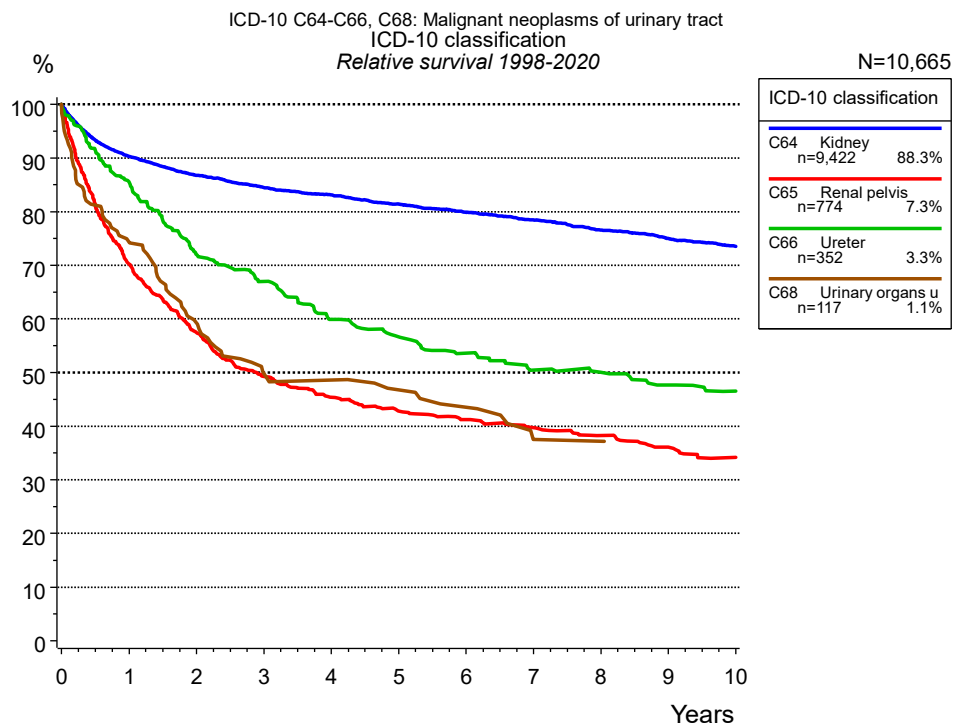

Figure 4a. Relative survival of patients with urinary tract cancer by ICD-10 classification. Included in the evaluation are 10,665 cases diagnosed between 1998 and 2020.

	ICD-10 classification							
	C64 Kidney		C65 Renal pelvis		C66 Ureter		C68 Urinary organs unspec.	
	n=9,422		n=774		n=352		n=117	
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	88.2	90.3	67.6	70.2	82.1	85.5	72.4	74.3
2	82.9	86.8	53.3	57.4	66.5	72.0	55.8	59.2
3	78.8	84.5	43.9	49.3	59.4	67.0	45.3	49.8
4	75.7	83.1	38.9	45.4	50.8	59.9	43.5	48.6
5	72.3	81.4	35.3	42.8	46.3	56.7	40.4	46.8
6	69.1	79.9	32.8	41.2	41.9	53.6	37.1	43.5
7	66.1	78.5	30.4	39.7	37.7	50.5	30.3	37.6
8	62.8	76.5	28.2	38.3	35.7	50.0	30.3	37.2
9	59.7	75.0	25.6	36.1	32.7	47.7		
10	56.9	73.5	23.5	34.2	30.4	46.5		
Median	12.3		2.2		4.3		2.4	

Table 4b. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by ICD-10 classification for period 1998-2020 (N=10,665).

ICD-10 C64-C66, C68: Malignant neoplasms of urinary tract
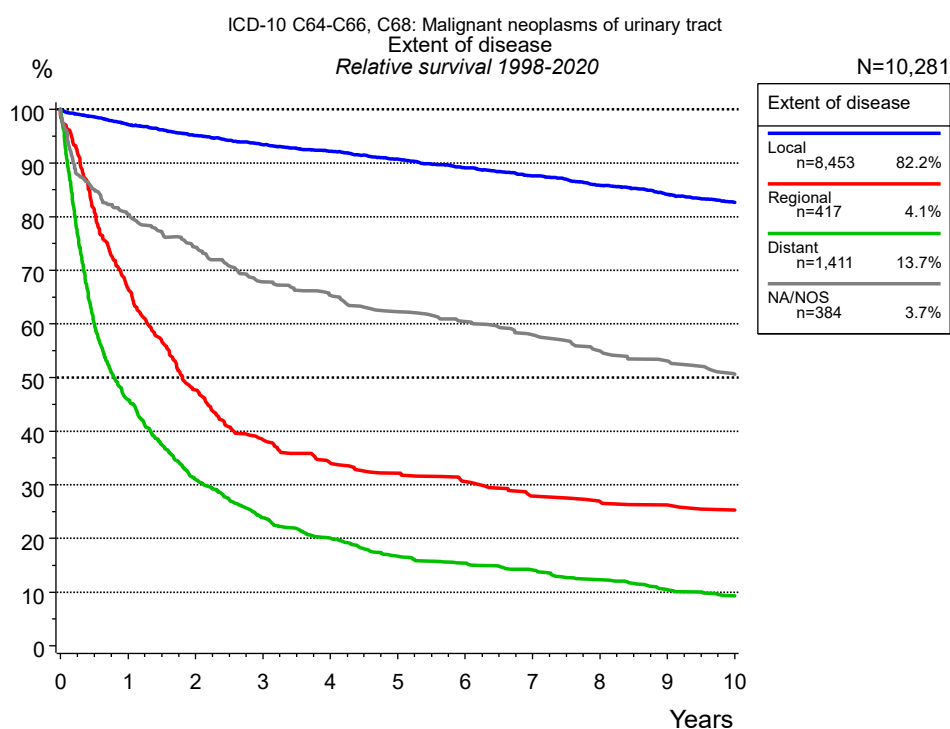Extent of disease
Relative survival 1998-2020

Figure 4c. Relative survival of patients with urinary tract cancer by extent of disease. For 10,303 of 10,665 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 10,281 cases an evaluable classification was established. The grey line represents the subgroup of 384 patients with missing values regarding extent of disease (3.6 % of 10,665 patients, the percent values of all other categories are related to n=10,281).

	Extent of disease							
	Local n=8,453		Regional n=417		Distant n=1,411		NA/NOS n=384	
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	94.9	97.2	64.4	66.4	44.6	45.8	77.8	80.5
2	90.7	95.1	45.1	47.7	29.5	31.0	69.7	74.3
3	86.9	93.4	35.4	38.4	22.2	23.9	61.7	67.8
4	83.6	92.2	30.8	34.0	18.2	20.0	58.2	65.4
5	80.1	90.7	28.1	32.2	15.0	16.7	54.2	62.3
6	76.6	89.1	25.8	30.6	13.5	15.4	51.6	60.5
7	73.3	87.6	22.8	27.9	12.1	14.1	48.6	58.0
8	69.7	85.8	21.3	26.9	10.3	12.3	45.3	55.0
9	66.4	84.1	20.1	26.2	8.6	10.4	43.0	53.1
10	63.3	82.7	19.2	25.3	7.5	9.3	40.0	50.6
Median	14.0		1.7		0.8		6.5	

Table 4d. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by extent of disease for period 1998-2020 (N=10,281).

ICD-10 C64-C66, C68: Malignant neoplasms of urinary tract
Extent of disease
Conditional relative 5 year survival 1998-2020   N=10,281
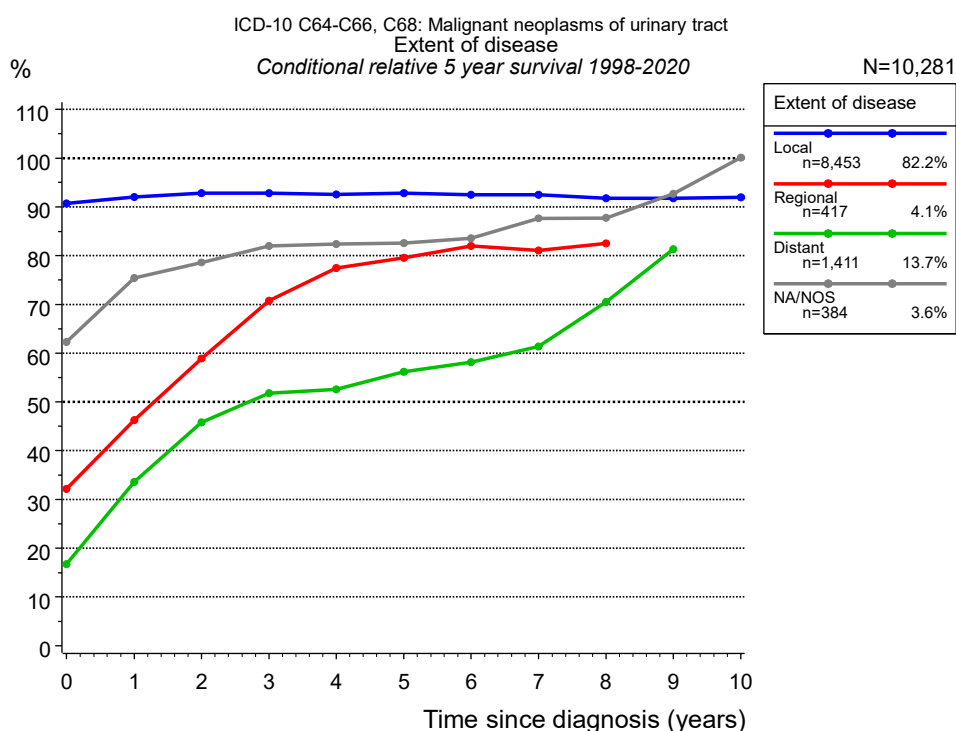

Figure 4g. Conditional relative 5-year survival of patients with urinary tract cancer by extent of disease. For 10,303 of 10,665 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 10,281 cases an evaluable classification was established. The grey line represents the subgroup of 384 patients with missing values regarding extent of disease (3.6 % of 10,665 patients, the percent values of all other categories are related to n=10,281).

	Extent of disease							
	Local		Regional		Distant		NA/NOS	
		Cond. surv. %		Cond. surv. %		Cond. surv. %		Cond. surv. %
Years	n	5 yrs	n	5 yrs	n	5 yrs	n	5 yrs
0	8,453	90.7	417	32.2	1,411	16.7	384	62.3
1	7,699	92.0	262	46.3	620	33.6	281	75.4
2	7,122	92.8	175	58.9	392	45.8	248	78.6
3	6,517	92.8	129	70.8	283	51.8	214	82.0
4	5,983	92.6	105	77.5	220	52.6	191	82.4
5	5,437	92.8	91	79.6	169	56.1	175	82.6
6	4,920	92.5	78	82.0	138	58.2	158	83.6
7	4,399	92.5	66	81.1	113	61.4	140	87.6
8	3,864	91.7	58	82.5	88	70.5	121	87.7
9	3,387	91.8			68	81.4	107	92.7
10	2,952	92.0					83	100.1

Table 4h. Conditional relative 5-year survival of patients with urinary tract cancer by extent of disease for period 1998-2020 (N=10,281).

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 92.8% (n=6,517).
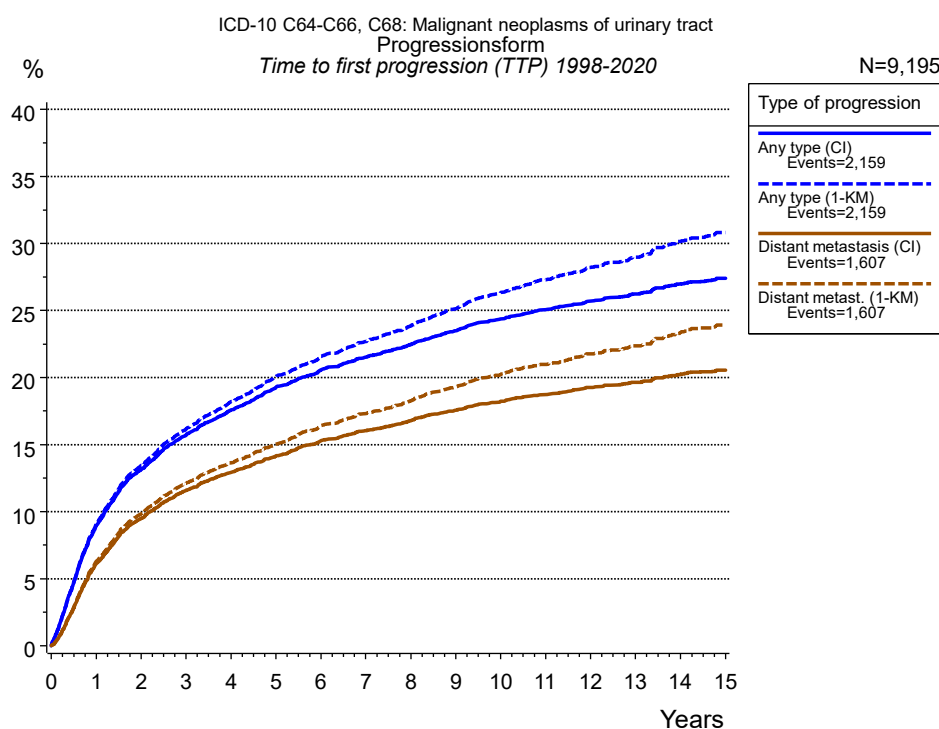
ICD-10 C64-C66, C68: Malignant neoplasms of urinary tract
Progressionsform
Time to first progression (TTP) 1998-2020

Figure 5a. Time to first progression of 9,195 patients with urinary tract cancer 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)	Distant metastasis (CI)	Distant metast. (1-KM)
N	9,195	9,195	9,195	9,195
Events	2,118	2,118	1,579	1,579
compet.	1,950		2,354	
Years	%	%	%	%
0	0.0	0.0	0.0	0.0
1	9.0	9.1	6.1	6.3
2	13.2	13.4	9.5	9.9
3	15.7	16.2	11.6	12.1
4	17.6	18.2	12.9	13.6
5	19.3	20.1	14.2	15.0
6	20.6	21.5	15.3	16.4
7	21.5	22.7	16.0	17.3
8	22.5	23.8	16.8	18.3
9	23.5	25.2	17.6	19.3
10	24.4	26.4	18.3	20.3
11	25.1	27.3	18.7	21.0
12	25.7	28.2	19.3	21.7
13	26.2	29.0	19.7	22.4
14	27.0	30.1	20.2	23.4
15	27.4	30.8	20.5	23.9

Table 5b. Time to first progression of patients with urinary tract cancer for period 1998-2020 (N=9,195), also showing the total of progression events (Events) and of deaths as competing risk (compet.).
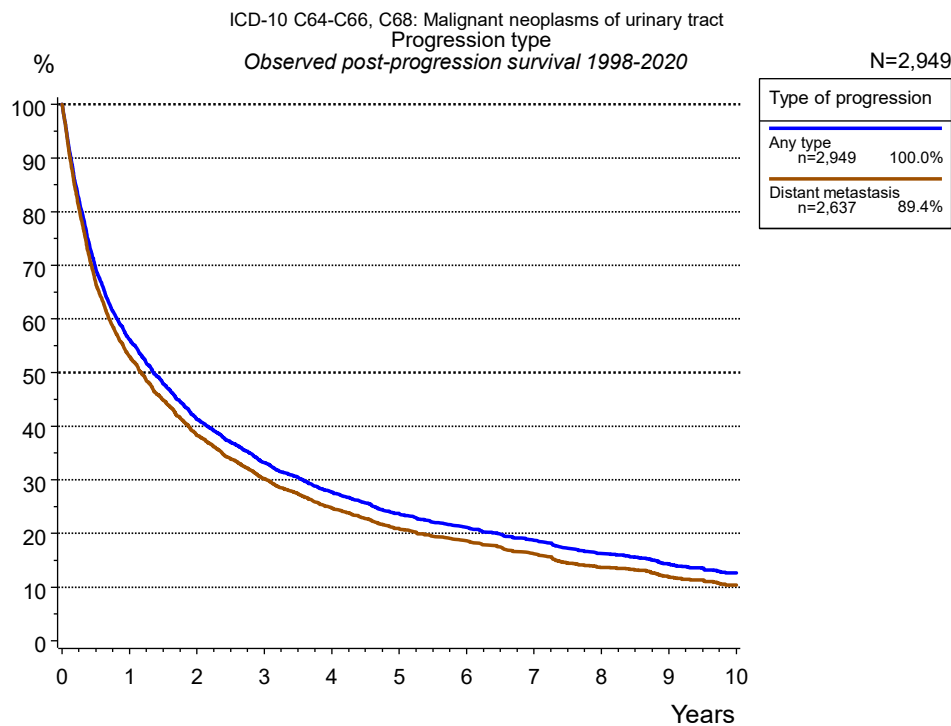
ICD-10 C64-C66, C68: Malignant neoplasms of urinary tract
Progression type
Observed post-progression survival 1998-2020

Figure 5c. Observed post-progression survival of 2,949 patients with urinary tract cancer diagnosed between 1998 and 2020. These 2,949 patients with documented progression events during their course of disease represent 27.9 % of the totally 10,584 evaluated cases (incl. M1, n=1,389, 13.1 %). Patients with cancer relapse documented via death certificates only were excluded (n=599, 5.7 %). Multiple progression types on different sites are included in the evaluation even when not occuring synchronously.

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	Distant metastasis
	n=2,949	n=2,637
Years	%	%
0	100.0	100.0
1	56.2	53.0
2	41.3	38.4
3	33.2	30.2
4	27.7	24.7
5	23.7	20.9
6	21.1	18.6
7	18.6	16.1
8	16.2	13.7
9	14.3	11.9
10	12.6	10.3

Table 5d. Observed post-progression survival of patients with urinary tract cancer for period 1998-2020 (N=2,949).

ICD-10 C64-C66, C68: Malignant neoplasms of urinary tract
Type of Progression: Distant metastasis
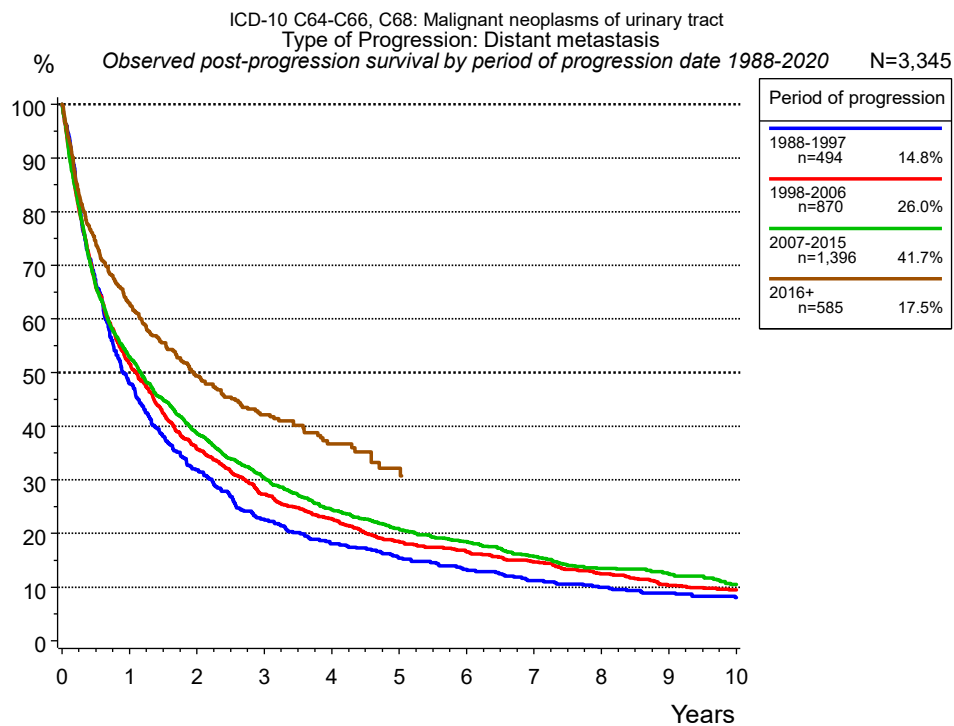*Observed post-progression survival by period of progression date 1988-2020*   N=3,345

Figure 5e. Observed post-progression (distant metastasis) survival of 3,345 patients with urinary tract cancer diagnosed between 1988 and 2020 by period of progression.

	Period of progression			
	1988-1997 n=494	1998-2006 n=870	2007-2015 n=1,396	2016+ n=585
Years	%	%	%	%
0	100.0	100.0	100.0	100.0
1	47.9	51.7	52.8	62.9
2	31.8	35.8	38.7	49.4
3	22.7	27.3	30.4	42.1
4	18.1	22.7	24.4	36.7
5	15.4	18.4	20.8	32.2
6	13.3	16.6	18.5	
7	11.2	14.7	15.7	
8	10.0	12.5	13.5	
9	8.9	10.4	12.5	
10	8.1	9.5	10.5	

Table 5f. Observed post-progression (distant metastasis) survival of patients with urinary tract cancer for period 1988-2020 by period of progression (N=3,345).

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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