

# Munich Cancer Registry



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## ICD-10 C64-C68: Urinary tract cancer

### Survival

Year of diagnosis	1988-1997	1998-2019
Patients	5,269	27,032
Diseases	5,359	28,235
Cases evaluated	4,567	18,356
Creation date	01/27/2021	
Database export	01/07/2021	
Population	4.92 m	



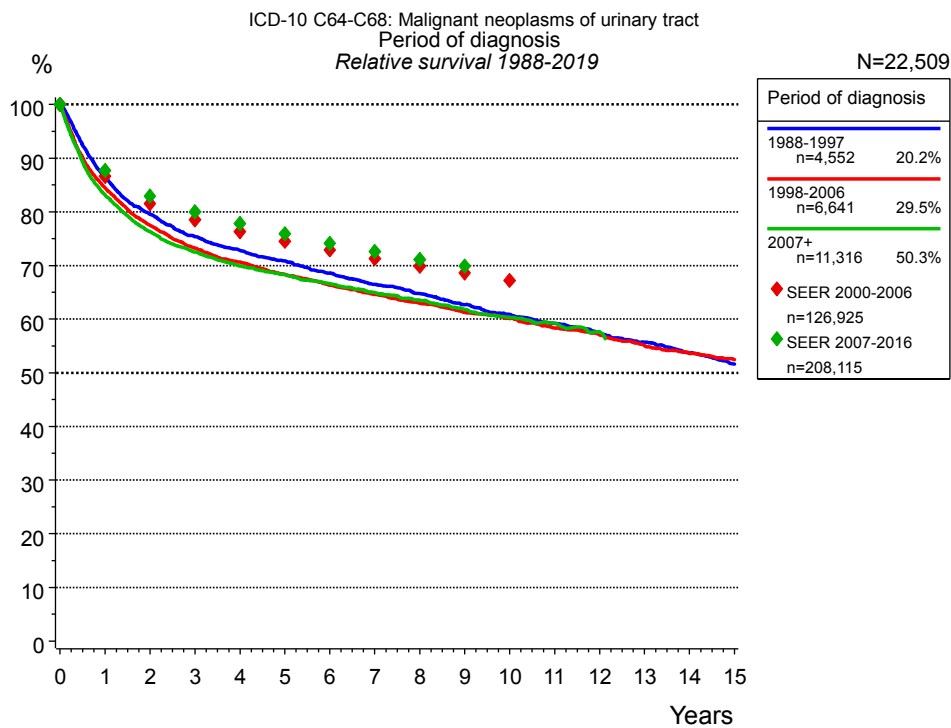
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<https://www.tumorregister-muenchen.de/en>

<https://www.tumorregister-muenchen.de/en/facts/surv/sC6468E-ICD-10-C64-C68-Urinary-tract-cancer-survival.pdf>

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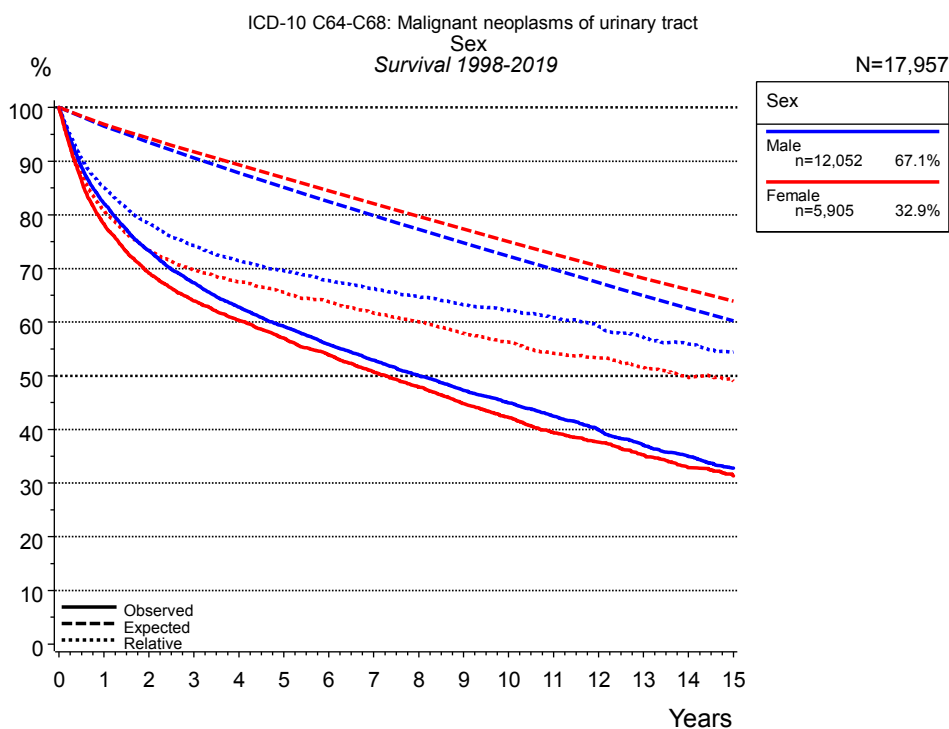
**Figure 1a.** Relative survival of patients with urinary tract cancer by period of diagnosis. Included in the evaluation are 22,509 cases diagnosed between 1988 and 2019.

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 2016, 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.

Years	Period of diagnosis					
	1988-1997 n=4,552		1998-2006 n=6,641		2007+ n=11,316	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	83.6	86.6	81.6	84.5	80.4	83.1
2	74.3	79.5	72.5	77.5	71.6	76.3
3	68.3	75.4	66.5	73.2	66.1	72.5
4	63.9	72.8	62.3	70.6	61.8	69.9
5	60.3	70.9	58.5	68.3	58.6	68.3
6	56.7	68.6	55.1	66.4	55.4	66.6
7	53.3	66.5	52.0	64.6	52.4	65.0
8	50.4	64.7	49.2	62.9	49.6	63.5
9	47.4	62.7	46.3	61.2	46.6	61.8
10	44.6	60.8	44.0	60.1	44.0	60.3
11	42.1	59.2	41.3	58.3	41.9	59.3
12	39.7	57.6	39.1	57.1	39.2	57.6
13	37.2	55.7	36.5	55.1		
14	34.8	53.7	34.2	53.6		
15	32.4	51.6	32.3	52.4		
Median	8.1		7.7		7.8	

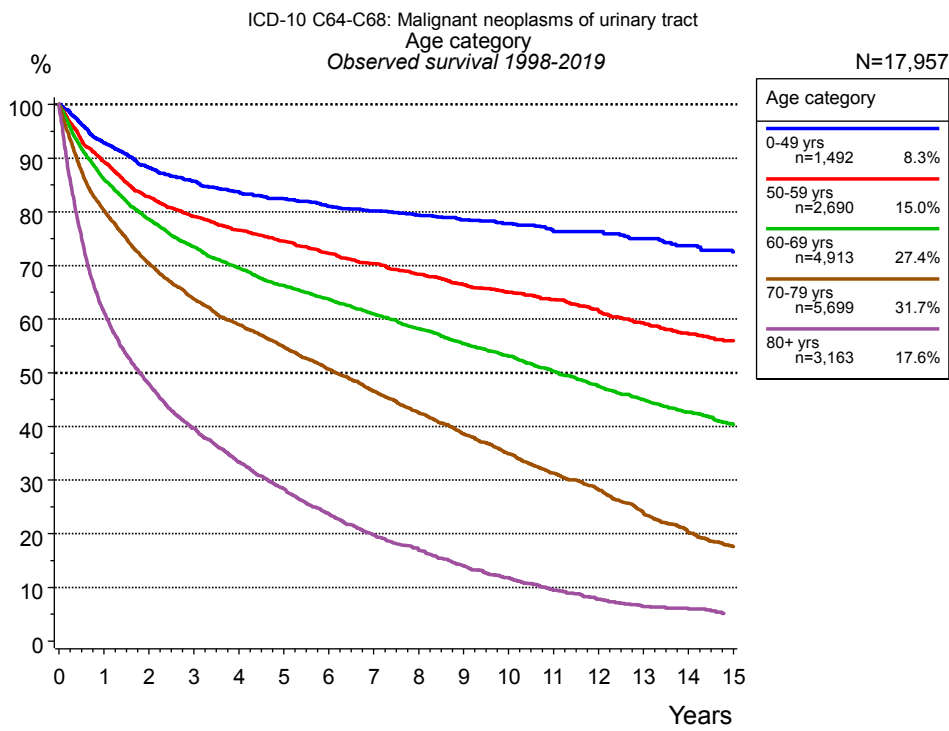
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by period of diagnosis for period 1988-2019 (N=22,509).



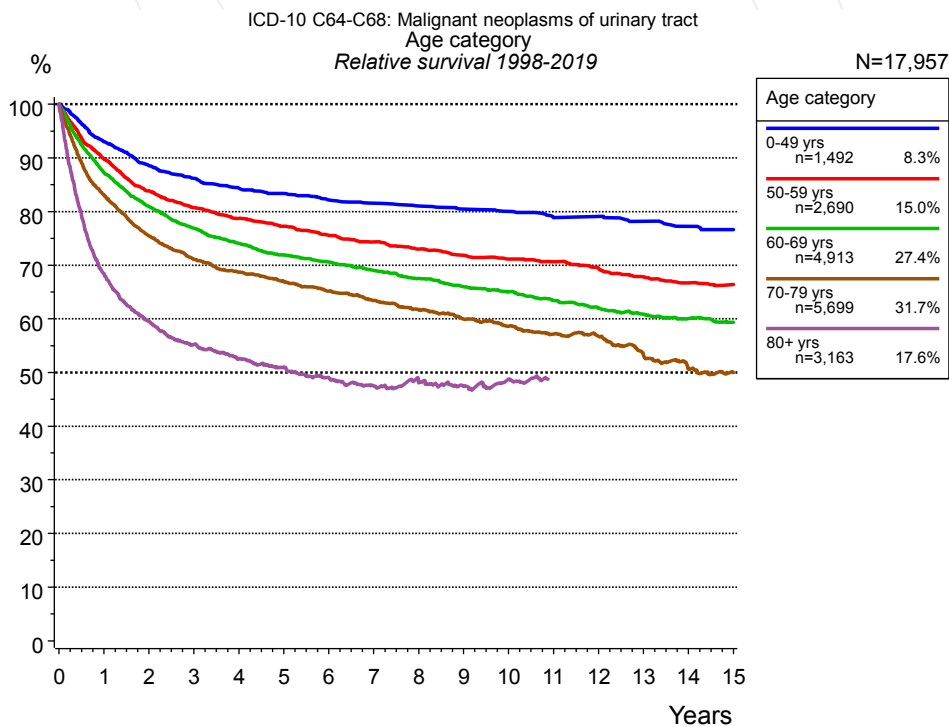
**Figure 2a.** Survival of patients with urinary tract cancer by sex. Included in the evaluation are 17,957 cases diagnosed between 1998 and 2019.

Years	Sex			
	Male n=12,052		Female n=5,905	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	82.1	85.1	78.3	80.8
2	73.3	78.4	69.1	73.3
3	67.3	74.3	64.0	69.7
4	62.8	71.5	60.3	67.5
5	59.2	69.6	57.0	65.6
6	55.9	67.7	53.9	63.8
7	52.9	66.2	50.7	61.7
8	50.0	64.7	47.9	60.0
9	47.3	63.2	44.8	57.9
10	44.9	62.1	42.2	56.3
11	42.5	60.8	39.4	54.2
12	39.9	59.2	37.6	53.3
13	37.1	57.1	35.2	51.6
14	35.0	55.9	32.8	49.7
15	32.8	54.4	31.3	49.0
Median	8.0		7.3	

**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by sex for period 1998-2019 (N=17,957).



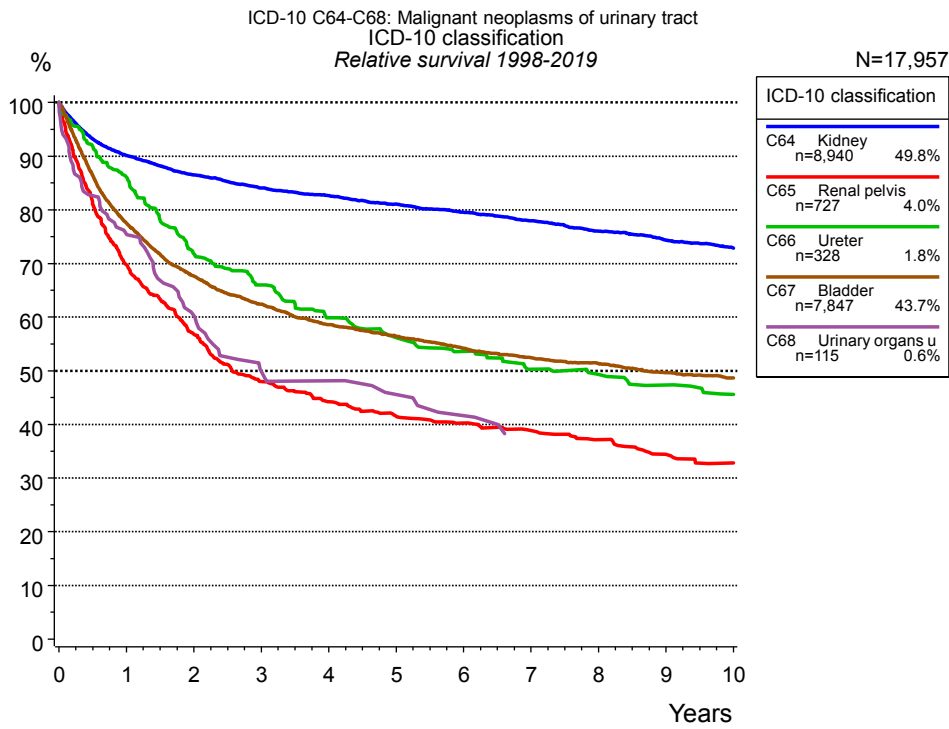
**Figure 3a.** Observed survival of patients with urinary tract cancer by age category. Included in the evaluation are 17,957 cases diagnosed between 1998 and 2019.



**Figure 3b.** Relative survival of patients with urinary tract cancer by age category. Included in the evaluation are 17,957 cases diagnosed between 1998 and 2019.

Years	Age category									
	0-49 yrs n=1,492		50-59 yrs n=2,690		60-69 yrs n=4,913		70-79 yrs n=5,699		80+ yrs n=3,163	
	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	92.8	93.0	89.3	89.8	86.0	87.3	80.2	83.0	61.4	68.4
2	88.2	88.5	82.8	83.8	78.6	81.0	70.3	75.5	48.0	59.5
3	85.7	86.2	79.1	80.7	73.4	76.9	63.7	71.1	39.7	55.2
4	83.7	84.4	76.5	78.7	69.5	74.1	58.9	68.7	33.4	52.5
5	82.5	83.4	74.5	77.3	66.3	72.0	54.9	67.0	28.3	50.9
6	81.0	82.1	72.2	75.6	63.7	70.6	50.6	65.2	23.7	49.0
7	80.2	81.6	70.3	74.3	60.9	69.0	46.6	63.4	19.7	47.5
8	79.4	81.0	68.3	73.0	58.2	67.5	42.6	61.7	17.0	48.1
9	78.5	80.4	66.4	71.8	55.4	66.0	38.6	60.0	13.9	47.4
10	77.8	80.0	65.0	71.1	53.1	65.0	34.9	58.6	11.8	48.8
11	76.3	78.9	63.6	70.6	50.3	63.4	31.3	57.2	9.5	48.6
12	76.3	79.1	61.6	69.4	47.5	62.0	28.2	56.7	7.8	50.5
13	75.0	78.2	59.3	67.8	44.9	60.8	24.0	53.4	6.4	54.4
14	73.7	77.2	57.2	66.7	42.7	60.1	20.2	50.6	6.0	67.6
15	72.5	76.6	56.0	66.4	40.3	59.4	17.6	50.0		
Median			18.4		11.1		6.2		1.8	

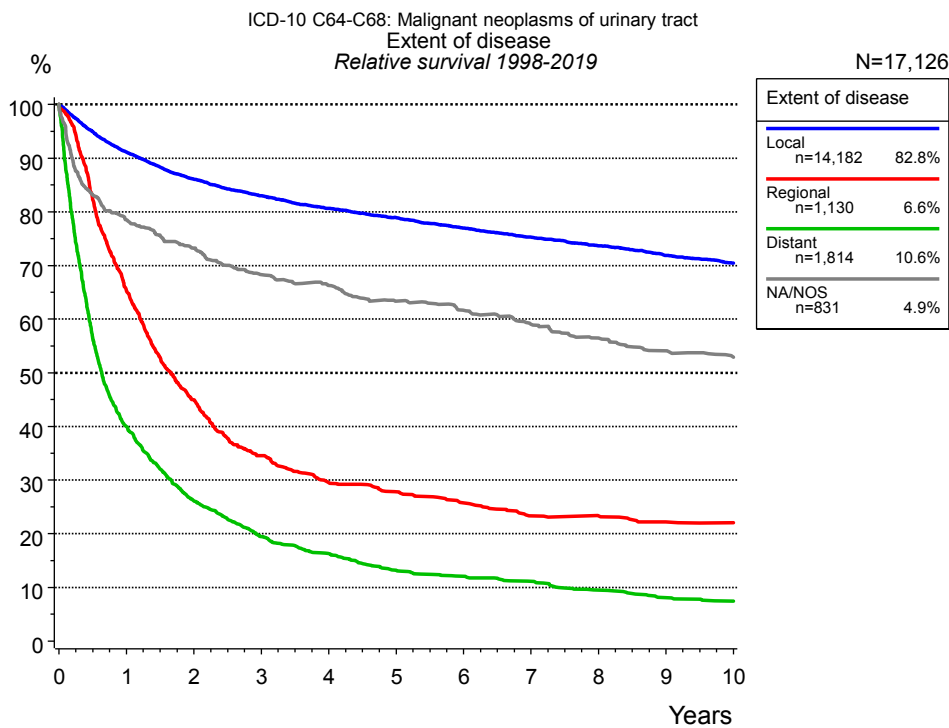
**Table 3c.** Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by age category for period 1998-2019 (N=17,957).



**Figure 4a.** Relative survival of patients with urinary tract cancer by ICD-10 classification. Included in the evaluation are 17,957 cases diagnosed between 1998 and 2019.

Years	ICD-10 classification									
	C64 Kidney		C65 Renal pelvis		C66 Ureter		C67 Bladder		C68 Urinary organs unspec.	
	n=8,940	n=727	n=328	n=7,847	n=115	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	88.0	90.1	67.1	69.7	82.7	86.1	74.0	77.5	73.6	75.5
2	82.6	86.5	52.8	56.8	66.3	71.8	62.1	67.6	56.9	60.3
3	78.4	84.1	42.7	48.0	58.5	66.0	55.1	62.4	45.4	49.9
4	75.3	82.6	37.8	44.2	50.7	59.9	49.8	58.6	43.3	48.1
5	72.0	81.1	34.1	41.5	45.8	56.2	46.2	56.4	39.4	45.6
6	68.8	79.5	31.9	40.2	41.8	53.6	42.7	54.2	35.4	41.6
7	65.7	78.0	29.8	38.9	37.5	50.3	39.7	52.4		
8	62.4	76.0	27.3	37.2	35.2	49.3	37.3	51.3		
9	59.3	74.4	24.3	34.4	32.7	47.4	34.7	49.6		
10	56.5	72.9	22.6	32.8	30.0	45.6	32.7	48.6		
Median	12.2		2.2		4.3		3.9		2.4	

**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by ICD-10 classification for period 1998-2019 (N=17,957).

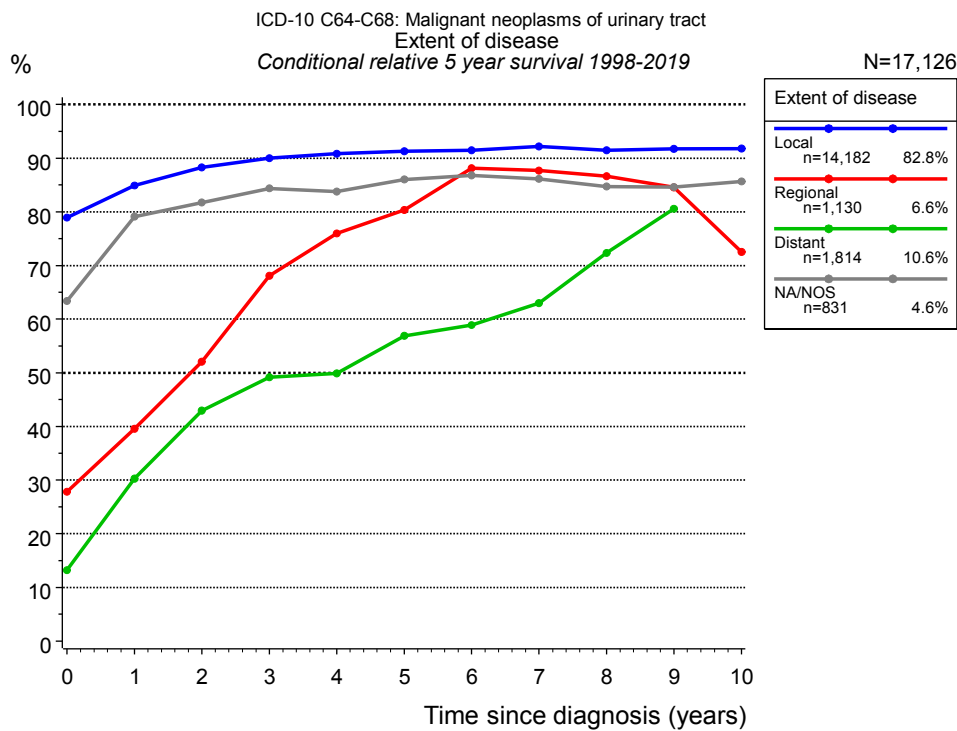


**Figure 4c.** Relative survival of patients with urinary tract cancer by extent of disease. For 17,156 of 17,957 cases diagnosed between 1998 and 2019 valid data could be obtained for this item. For a total of 17,126 cases an evaluable classification was established. The grey line represents the subgroup of 831 patients with missing values regarding extent of disease (4.6 % of 17,957 patients, the percent values of all other categories are related to n=17,126).

Years	Extent of disease							
	Local n=14,182		Regional n=1,130		Distant n=1,814		NA/NOS n=831	
	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	88.0	91.1	63.4	65.2	38.8	40.0	75.2	78.5
2	80.6	86.1	42.6	45.0	24.7	26.1	67.7	73.2
3	75.5	83.0	31.9	34.5	18.1	19.5	61.0	68.3
4	71.1	80.6	26.6	29.5	14.8	16.3	57.3	66.3
5	67.5	78.9	24.4	27.8	11.8	13.2	53.2	63.4
6	63.9	77.0	22.0	25.7	10.6	12.1	50.2	61.7
7	60.5	75.3	19.3	23.3	9.5	11.1	46.6	59.0
8	57.4	73.6	18.7	23.3	7.9	9.5	43.5	56.5
9	54.2	71.9	17.2	22.2	6.6	8.1	40.4	54.1
10	51.4	70.4	16.8	22.0	6.0	7.4	38.3	52.9
Median	10.4		1.5		0.6		6.1	

**Table 4d.** Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by extent of disease for period 1998-2019 (N=17,126).



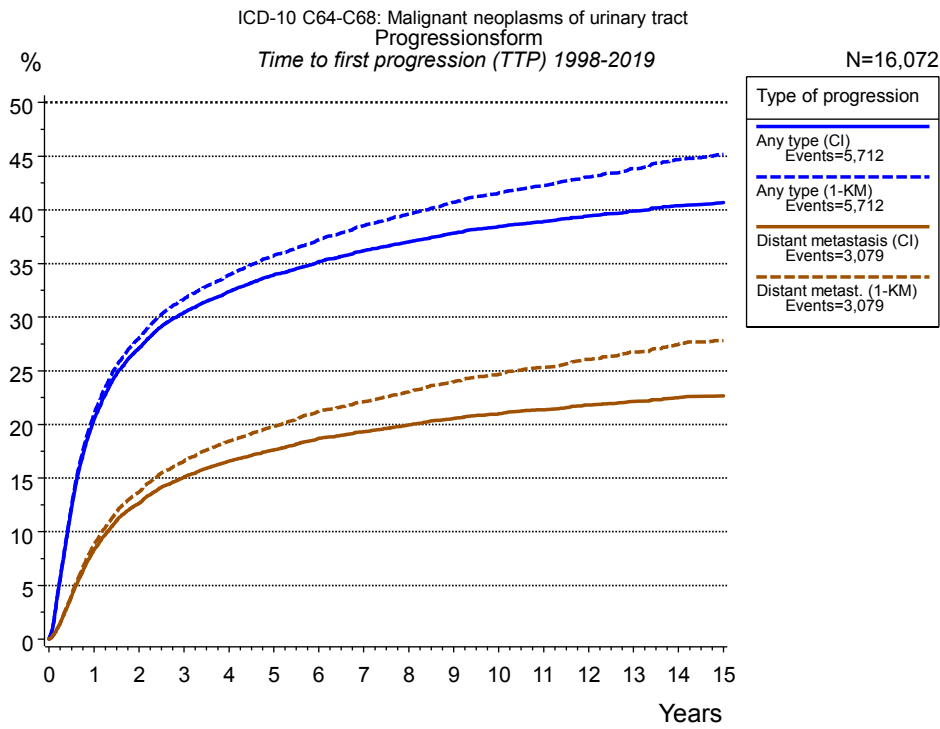


**Figure 4g.** Conditional relative 5-year survival of patients with urinary tract cancer by extent of disease. For 17,156 of 17,957 cases diagnosed between 1998 and 2019 valid data could be obtained for this item. For a total of 17,126 cases an evaluable classification was established. The grey line represents the subgroup of 831 patients with missing values regarding extent of disease (4.6 % of 17,957 patients, the percent values of all other categories are related to n=17,126).

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	14,182	78.9	1,130	27.8	1,814	13.2	831	63.4
1	11,736	84.9	672	39.6	672	30.3	582	79.1
2	10,238	88.3	420	52.1	400	42.9	504	81.7
3	9,057	90.0	291	68.1	275	49.2	439	84.4
4	8,079	90.8	230	76.0	207	49.9	389	83.8
5	7,180	91.3	185	80.4	151	56.9	349	86.0
6	6,264	91.5	148	88.1	126	58.9	317	86.8
7	5,455	92.2	113	87.7	107	63.0	275	86.2
8	4,720	91.5	95	86.6	79	72.3	233	84.7
9	4,004	91.7	80	84.6	56	80.6	197	84.6
10	3,377	91.8	69	72.5			165	85.7

**Table 4h.** Conditional relative 5-year survival of patients with urinary tract cancer by extent of disease for period 1998-2019 (N=17,126).

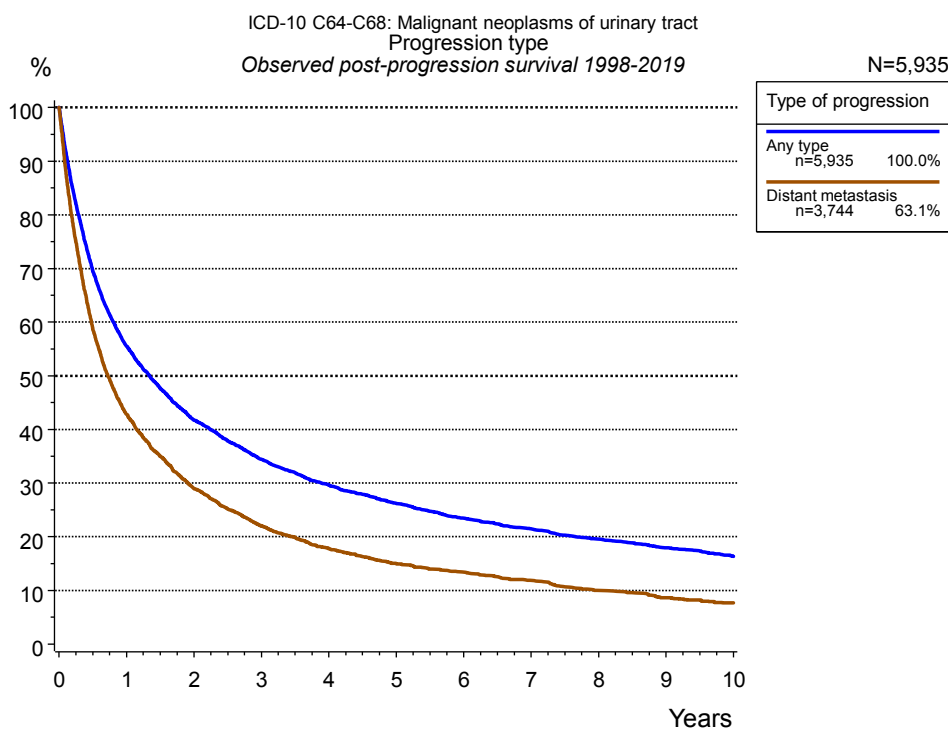
Conditional relative survival rates refer to the relative survival probability, in this case for 5 years after cancer diagnosis, compared to the age- and sex-matched population (=100 %) under the condition of being alive for a certain time period (x-axis in Figure 4e). The results illustrate to what 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 90.0% (n=9,057).



**Figure 5a.** Time to first progression of 16,072 patients with urinary tract cancer diagnosed between 1998 and 2019 (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	16,069	16,069	16,072	16,072
Events	5,684	5,684	3,053	3,053
compet.	3,088		4,905	
Years	%	%	%	%
0	0.0	0.0	0.0	0.0
1	20.5	21.0	8.3	8.8
2	27.1	28.0	12.6	13.7
3	30.4	31.7	15.1	16.6
4	32.4	33.9	16.6	18.5
5	33.9	35.7	17.6	19.8
6	35.1	37.2	18.7	21.3
7	36.2	38.5	19.3	22.1
8	37.0	39.6	19.9	23.1
9	37.8	40.7	20.6	24.0
10	38.5	41.6	21.0	24.7
11	38.9	42.3	21.4	25.3
12	39.4	43.1	21.8	26.1
13	39.9	43.8	22.1	26.7
14	40.4	44.7	22.5	27.5
15	40.7	45.2	22.7	27.8

**Table 5b.** Time to first progression of patients with urinary tract cancer for period 1998-2019 (N=16,072), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

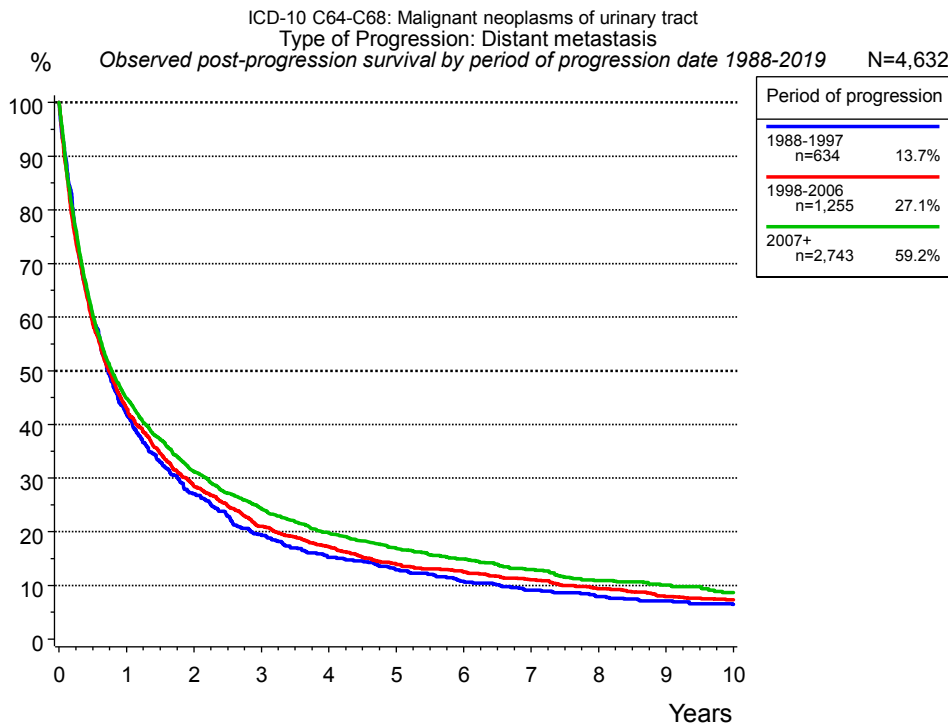


**Figure 5c.** Observed post-progression survival of 5,935 patients with urinary tract cancer diagnosed between 1998 and 2019. These 5,935 patients with documented progression events during their course of disease represent 33.3 % of the totally 17,836 evaluated cases (incl. M1, n=1,767, 9.9 %). Patients with cancer relapse documented via death certificates only were excluded (n=1,544, 8.7 %). Multiple progression types on different sites are included in the evaluation even when not occurring 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 potentially considered in more than one subgroup.

Years	Type of progression	
	Any type n=5,935 %	Distant metastasis n=3,744 %
0	100.0	100.0
1	55.6	42.8
2	41.8	29.0
3	34.4	22.0
4	29.6	17.8
5	26.2	15.0
6	23.5	13.4
7	21.4	11.8
8	19.5	9.9
9	17.9	8.7
10	16.4	7.7

**Table 5d.** Observed post-progression survival of patients with urinary tract cancer for period 1998-2019 (N=5,935).



**Figure 5e.** Observed post-progression (distant metastasis) survival of 4,632 patients with urinary tract cancer diagnosed between 1988 and 2019 by period of progression.

Years	Period of progression		
	1988-1997 n=634 %	1998-2006 n=1,255 %	2007+ n=2,743 %
0	100.0	100.0	100.0
1	41.8	43.1	44.8
2	27.1	28.6	31.2
3	19.5	21.0	24.3
4	15.2	17.2	19.7
5	12.9	13.9	16.9
6	10.8	12.6	14.9
7	9.1	11.0	13.0
8	7.9	9.4	10.9
9	7.1	7.9	10.1
10	6.4	7.3	8.6

**Table 5f.** Observed post-progression (distant metastasis) survival of patients with urinary tract cancer for period 1988-2019 by period of progression (N=4,632).

**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**

Munich Cancer Registry. Survival ICD-10 C64-C68: Urinary tract cancer [Internet]. 2021 [updated 2021 Jan 27; cited 2021 Mar 1]. Available from: <https://www.tumorregister-muenchen.de/en/facts/surv/sC6468E-ICD-10-C64-C68-Urinary-tract-cancer-survival.pdf>

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