Munich Cancer Registry

ICD-10 C64-C68: Urinary tract cancer

Survival

Year of diagnosis	1988-1997	1998-2014
Patients	5,233	20,640
Diseases	5,316	21,452
Cases evaluated	4,544	14,321
Creation date	03/02/2016	
Export date	12/23/2015	
Population	4.64 m	

BERLIN

GERMANY

BAVARIA

MUNICH

Munich Cancer Registry at Munich Cancer Center
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http://www.tumorregister-muenchen.de/en

ICD-10 C64-C68: Malignant neoplasms of urinary tract
Period of diagnosis
Relative survival 1988-2014

N=18,661

Period of diagnosis

1988-1997
    n=4,529   24.3%

1998-2006
    n=6,637   35.6%

2007+
    n=7,495   40.2%
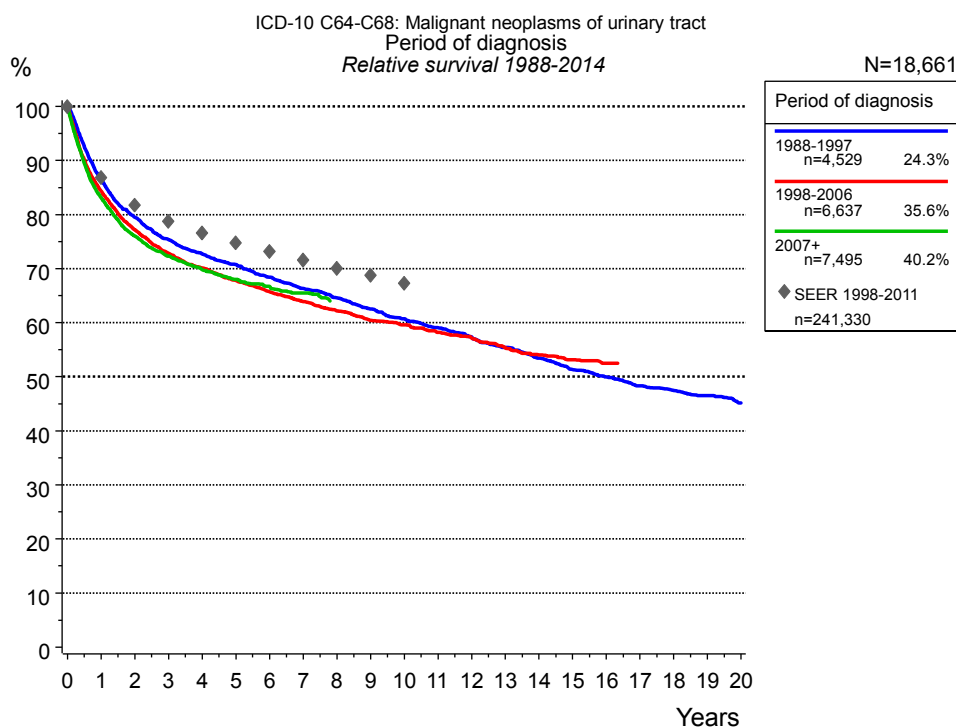
◆ SEER 1998-2011
    n=241,330

Figure 1a. Relative survival of patients with urinary tract cancer by period of diagnosis. Included in the evaluation are 18,661 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=4,529 | | 1998-2006 n=6,637 | | 2007+ n=7,495 | |
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	83.5	86.5	81.4	84.3	80.3	83.0
2	74.2	79.5	72.2	77.2	71.4	76.0
3	68.2	75.3	66.1	72.8	65.9	72.3
4	63.8	72.7	61.8	70.1	61.8	69.8
5	60.2	70.7	58.0	67.8	58.4	68.0
6	56.5	68.4	54.5	65.7	55.5	66.7
7	53.2	66.3	51.4	63.9	53.0	65.5
8	50.2	64.6	48.5	62.2		
9	47.2	62.5	45.7	60.4		
10	44.4	60.7	43.6	59.6		
11	42.0	59.1	41.3	58.2		
12	39.5	57.4	39.2	57.2		
13	37.0	55.4	36.7	55.4		
14	34.6	53.4	34.6	54.0		
15	32.1	51.3	32.9	53.1		
16	30.3	49.9	31.5	52.5		
17	28.4	48.3				
18	26.9	47.4				
19	25.6	46.5				
20	23.8	45.1				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by period of diagnosis for period 1988-2014 (N=18,661).
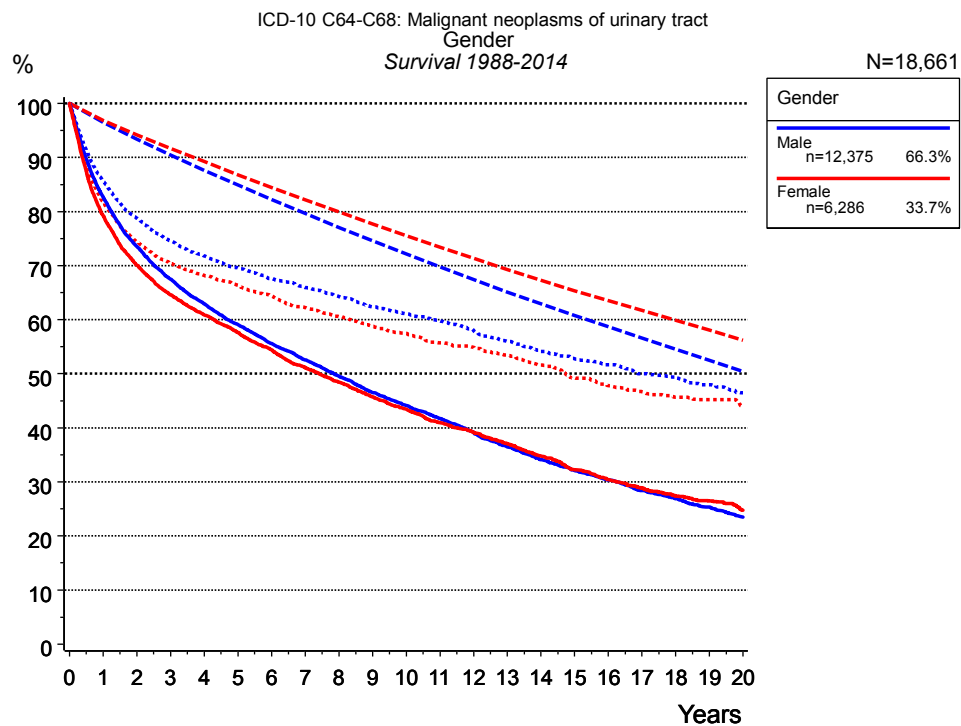
ICD-10 C64-C68: Malignant neoplasms of urinary tract
Gender
Survival 1988-2014

Figure 2a. Survival of patients with urinary tract cancer by gender. Included in the evaluation are 18,661 cases diagnosed between 1988 and 2014.

| | Gender | | | |
| | Male n=12,375 | | Female n=6,286 | |
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	82.6	85.7	79.2	81.8
2	73.5	78.7	70.1	74.4
3	67.5	74.6	64.5	70.4
4	62.9	71.8	60.9	68.2
5	59.1	69.6	57.6	66.4
6	55.6	67.6	54.4	64.4
7	52.5	66.0	51.1	62.2
8	49.5	64.3	48.4	60.6
9	46.5	62.4	45.7	58.8
10	44.1	61.1	43.4	57.5
11	41.7	59.7	41.0	55.7
12	39.2	58.1	39.2	54.9
13	36.5	56.0	37.1	53.5
14	34.1	54.1	34.8	51.6
15	32.1	52.8	32.2	49.2
16	30.3	51.7	30.4	47.8
17	28.4	50.0	28.9	46.7
18	26.9	49.2	27.4	45.7
19	25.3	48.0	26.5	45.2
20	23.5	46.5	24.8	44.1

Table 2b. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by gender for period 1988-2014 (N=18,661).

ICD-10 C64-C68: Malignant neoplasms of urinary tract
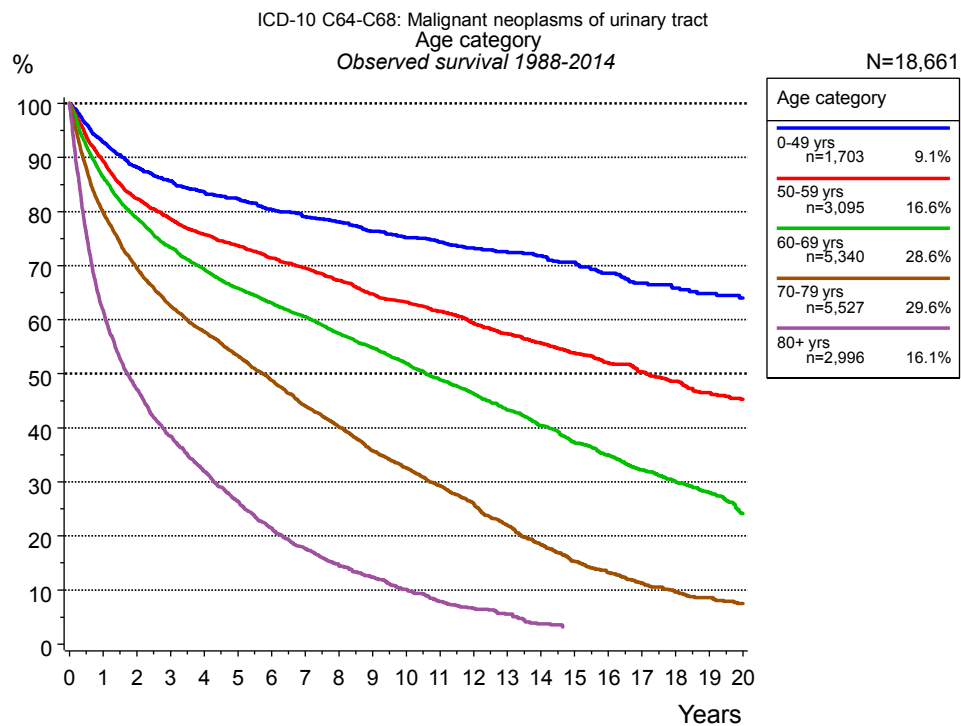Age category
Observed survival 1988-2014

Figure 3a. Observed survival of patients with urinary tract cancer by age category. Included in the evaluation are 18,661 cases diagnosed between 1988 and 2014.
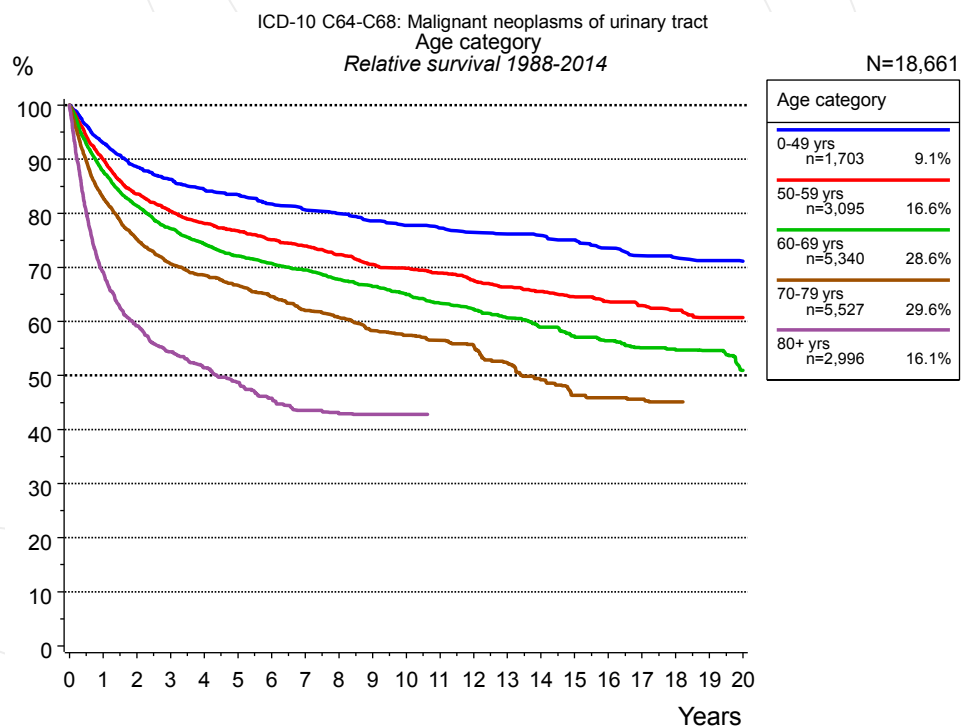
ICD-10 C64-C68: Malignant neoplasms of urinary tract
Age category
Relative survival 1988-2014

Figure 3b. Relative survival of patients with urinary tract cancer by age category. Included in the evaluation are 18,661 cases diagnosed between 1988 and 2014.

| | Age category | | | | | | | | | |
| | 0-49 yrs n=1,703 | | 50-59 yrs n=3,095 | | 60-69 yrs n=5,340 | | 70-79 yrs n=5,527 | | 80+ yrs n=2,996 | |
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	92.8	93.0	89.3	89.9	86.3	87.7	79.8	82.9	61.7	69.2
2	88.1	88.6	82.4	83.6	78.8	81.4	69.5	75.2	47.1	59.2
3	85.7	86.3	78.6	80.4	73.4	77.2	62.5	70.6	38.5	54.4
4	83.6	84.4	75.8	78.2	69.3	74.4	57.8	68.5	31.9	51.4
5	82.3	83.4	73.7	76.7	65.8	72.1	53.4	66.7	26.4	48.8
6	80.4	81.7	71.4	75.1	63.1	70.7	48.8	64.6	21.5	45.8
7	79.0	80.6	69.5	73.9	60.6	69.5	44.0	62.0	17.6	43.6
8	78.1	79.9	67.2	72.4	57.5	67.8	40.2	60.7	14.4	42.9
9	76.3	78.6	64.7	70.5	54.8	66.5	35.8	58.2	12.4	42.8
10	75.2	77.8	63.2	69.8	51.9	65.0	32.6	57.4	10.2	42.8
11	74.3	77.3	61.5	68.9	48.9	63.4	29.3	56.5		
12	73.3	76.5	59.4	67.6	46.3	62.3	26.0	55.6		
13	72.6	76.2	57.4	66.4	43.3	60.6	22.0	52.4		
14	71.8	75.9	55.7	65.5	40.4	59.0	18.4	49.2		
15	70.6	75.0	53.8	64.6	37.2	57.1	15.3	46.4		
16	68.6	73.5	52.0	63.7	34.9	56.5	13.2	45.8		
17	66.8	72.1	50.4	63.0	32.2	55.2	11.3	45.6		
18	65.9	71.8	48.6	62.1	30.0	54.8	9.6	45.1		
19	64.8	71.2	46.5	60.7	28.1	54.6				
20	64.0	71.1	45.3	60.7	24.2	51.0				

Table 3c. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by age category for period 1988-2014 (N=18,661).

ICD-10 C64-C68: Malignant neoplasms of urinary tract
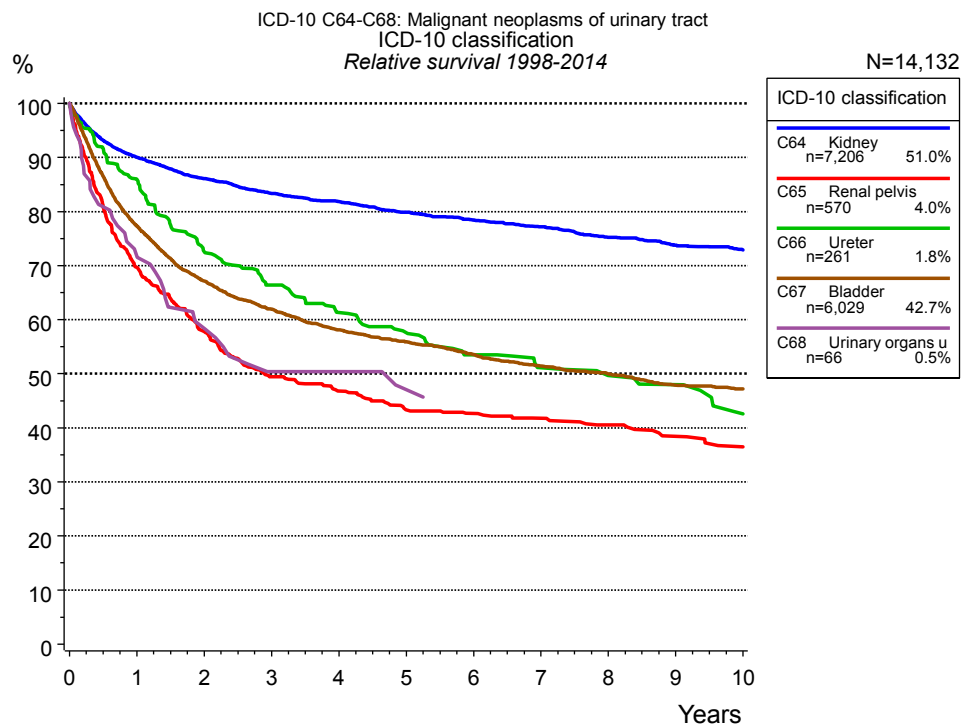ICD-10 classification
Relative survival 1998-2014

Figure 4a. Relative survival of patients with urinary tract cancer by ICD-10 classification. Included in the evaluation are 14,132 cases diagnosed between 1998 and 2014.

	ICD-10 classification									
	C64 Kidney		C65 Renal pelvis		C66 Ureter		C67 Bladder		C68 Urinary organs unspec.	
	n=7,206		n=570		n=261		n=6,029		n=66	
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	88.0	90.0	67.0	69.7	82.4	85.9	73.8	77.3	70.8	71.8
2	82.2	86.1	53.6	57.8	67.0	72.6	61.6	67.1	55.9	58.4
3	77.8	83.4	43.9	49.5	58.8	66.4	54.6	62.0	45.3	50.4
4	74.5	81.8	39.9	46.8	51.9	61.3	49.3	58.1	45.3	50.4
5	71.0	79.9	35.5	43.3	47.2	57.6	45.7	55.9	40.5	47.0
6	67.8	78.4	33.8	42.6	42.0	53.5	42.1	53.6		
7	65.0	77.1	32.0	41.8	38.5	51.1	38.9	51.4		
8	61.7	75.2	29.9	40.5	36.0	49.7	36.4	50.0		
9	58.8	73.8	27.5	38.4	34.2	48.0	33.5	47.9		
10	56.5	72.9	25.4	36.5	28.8	42.5	31.9	47.2		

Table 4b. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by ICD-10 classification for period 1998-2014 (N=14,132).

ICD-10 C64-C68: Malignant neoplasms of urinary tract
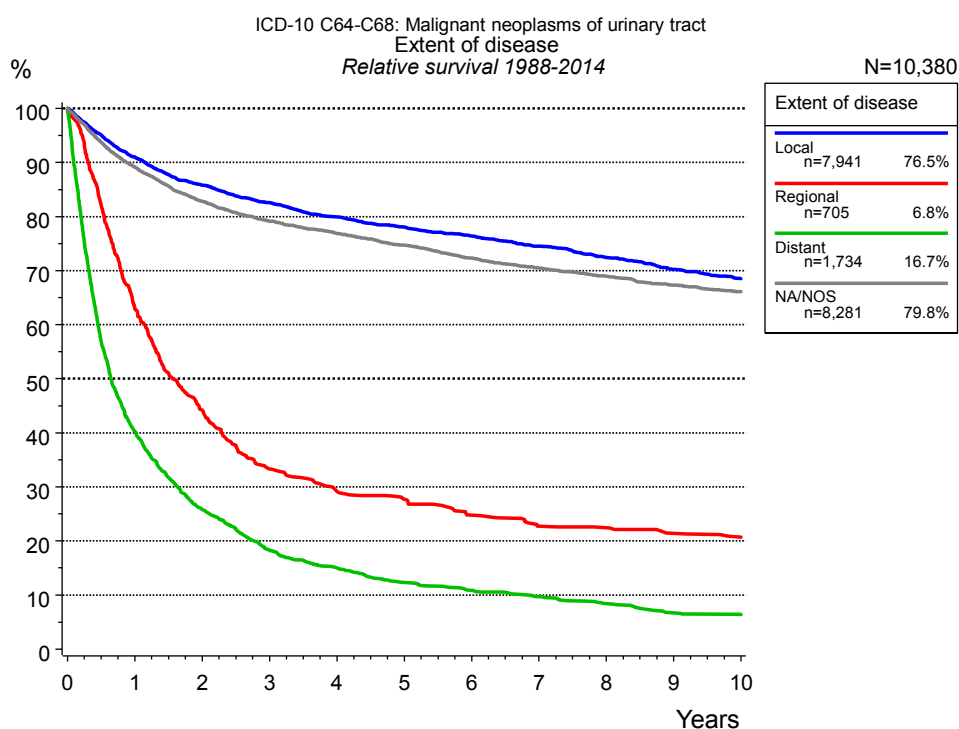Extent of disease
Relative survival 1988-2014

Figure 4c. Relative survival of patients with urinary tract cancer by extent of disease. For 17,628 of 18,661 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 10,380 cases an evaluable classification was established. The grey line represents the subgroup of 8,281 patients with missing values regarding extent of disease (44.4% of 18,661 patients, the percent values of all other categories are related to n=10,380).

	Extent of disease							
	Local n=7,941		Regional n=705		Distant n=1,734		NA/NOS n=8,281	
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	87.9	91.0	61.2	63.0	39.0	40.2	86.0	89.1
2	80.3	85.8	41.8	44.2	24.4	25.8	77.5	82.8
3	74.9	82.6	30.8	33.3	17.0	18.3	71.8	79.2
4	70.4	79.9	26.3	29.2	13.6	15.0	67.6	76.9
5	66.8	78.1	24.3	27.8	10.9	12.3	63.7	74.7
6	63.5	76.4	21.2	24.8	9.5	10.9	59.7	72.3
7	60.0	74.5	18.8	22.8	8.2	9.7	56.4	70.5
8	56.6	72.4	18.3	22.5	7.0	8.4	53.4	68.9
9	53.3	70.2	16.9	21.4	5.5	6.7	50.5	67.3
10	50.5	68.5	16.0	20.7	5.1	6.4	48.0	66.1

Table 4d. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by extent of disease for period 1988-2014 (N=10,380).

ICD-10 C64-C68: Malignant neoplasms of urinary tract
Extent of disease
Relative survival 1998-2014   N=7,635
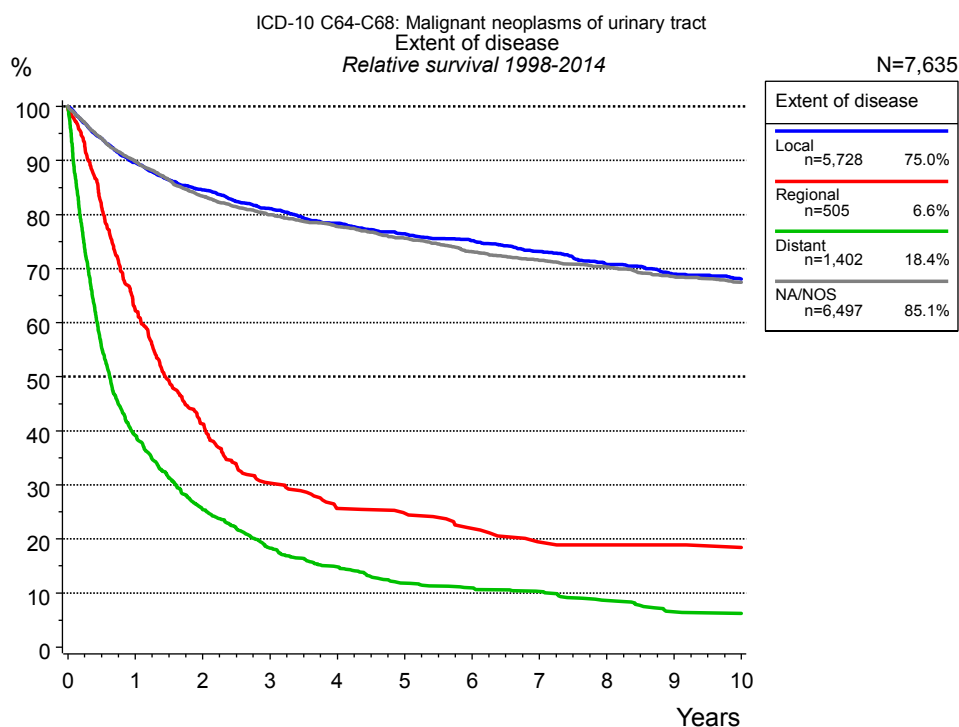

Figure 4e. Relative survival of patients with urinary tract cancer by extent of disease. For 13,469 of 14,132 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 7,635 cases an evaluable classification was established. The grey line represents the subgroup of 6,497 patients with missing values regarding extent of disease (46.0% of 14,132 patients, the percent values of all other categories are related to n=7,635).

| | **Extent of disease** | | | | | | | |
| | Local n=5,728 | | Regional n=505 | | Distant n=1,402 | | NA/NOS n=6,497 | |
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	86.4	89.6	60.6	62.2	38.0	39.1	86.9	89.8
2	78.9	84.6	39.2	41.3	24.1	25.4	78.3	83.4
3	73.4	81.1	28.2	30.3	17.0	18.3	72.9	80.0
4	68.8	78.4	23.1	25.7	13.6	14.8	68.9	77.8
5	65.0	76.4	21.8	24.8	10.5	11.8	65.0	75.7
6	62.0	75.2	18.9	22.0	9.6	10.9	60.9	73.1
7	58.5	73.2	16.2	19.4	8.8	10.3	57.8	71.5
8	54.8	70.8	15.6	18.9	7.3	8.6	55.0	70.3
9	51.8	69.0	15.6	18.9	5.4	6.5	51.9	68.5
10	49.5	68.1	14.9	18.4	5.2	6.2	49.5	67.5

Table 4f. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by extent of disease for period 1998-2014 (N=7,635).

ICD-10 C64-C68: Malignant neoplasms of urinary tract
Extent of disease
Conditional relative 5 year survival 1988-2014   N=10,380

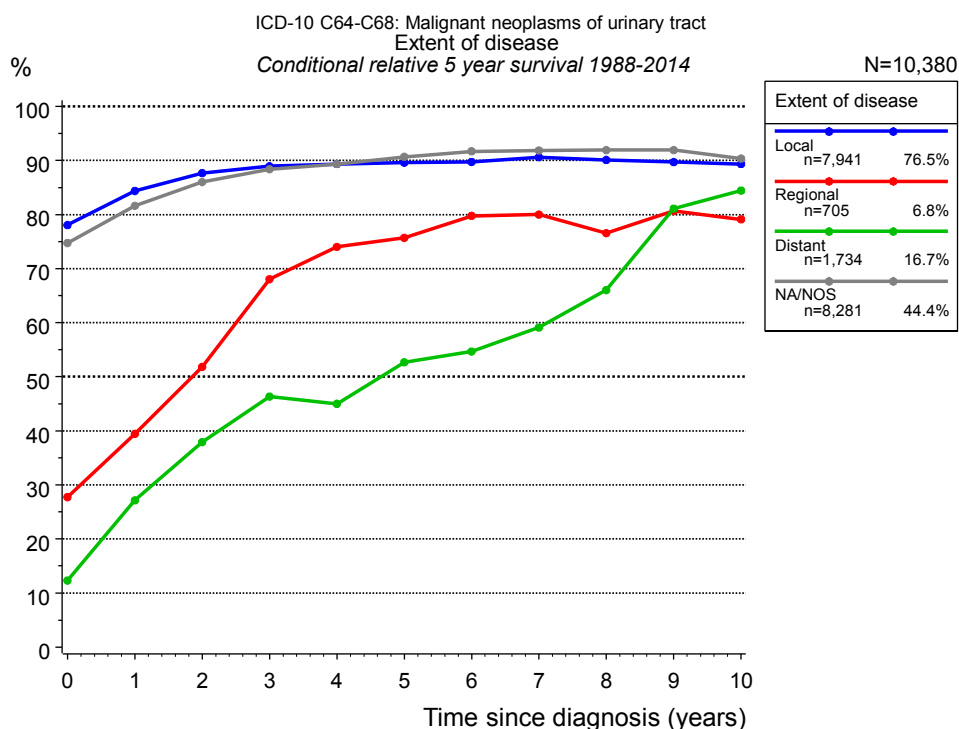| Extent of disease		
Local n=7,941		76.5%
Regional n=705		6.8%
Distant n=1,734		16.7%
NA/NOS n=8,281		44.4%

Figure 4g. Conditional relative 5-year survival of patients with urinary tract cancer by extent of disease. For 17,628 of 18,661 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 10,380 cases an evaluable classification was established. The grey line represents the subgroup of 8,281 patients with missing values regarding extent of disease (44.4% of 18,661 patients, the percent values of all other categories are related to n=10,380).

	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	7,941	78.1	705	27.8	1,734	12.3	8,281	74.7
1	6,548	84.4	396	39.4	646	27.2	6,779	81.6
2	5,613	87.7	243	51.8	386	37.9	5,841	86.0
3	4,839	88.9	155	68.1	251	46.3	5,165	88.4
4	4,206	89.3	121	74.0	191	45.0	4,628	89.3
5	3,676	89.6	103	75.7	134	52.7	4,086	90.7
6	3,266	89.7	86	79.8	107	54.7	3,492	91.7
7	2,884	90.6	71	80.0	83	59.1	2,988	91.9
8	2,506	90.1	65	76.6	65	66.0	2,535	91.9
9	2,218	89.7	58	80.7	45	81.1	2,117	91.9
10	1,974	89.3	51	79.1	35	84.5	1,740	90.4

Table 4h. Conditional relative 5-year survival of patients with urinary tract cancer by extent of disease for period 1988-2014 (N=10,380).

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 88.9% (n=4,839).
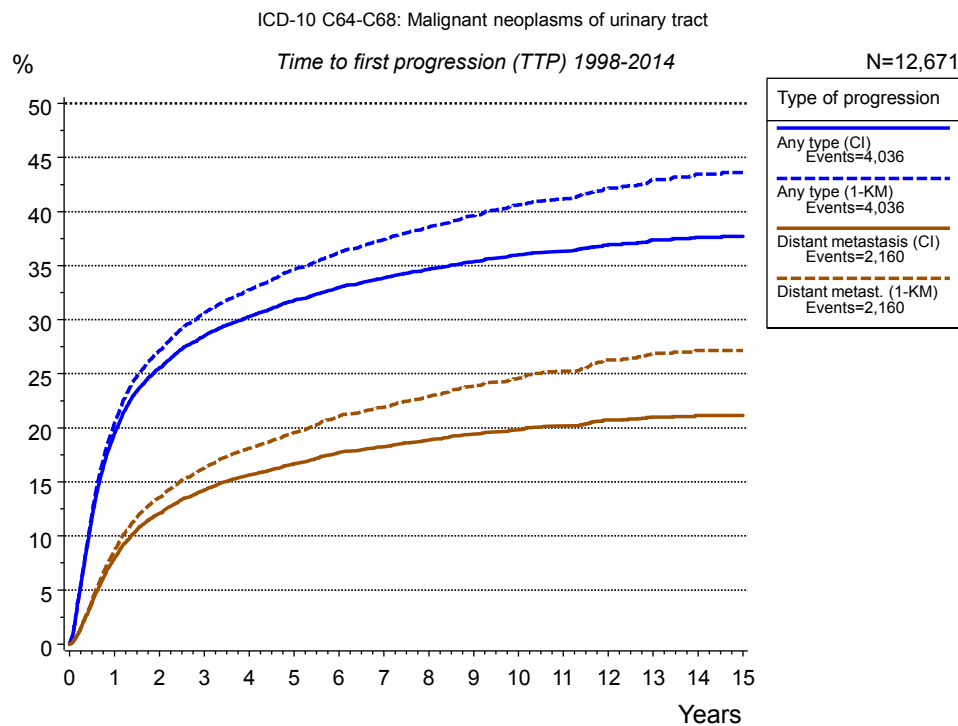
ICD-10 C64-C68: Malignant neoplasms of urinary tract

Figure 5a. Time to first progression of 12,671 patients with urinary tract 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)	Distant metastasis (CI)	Distant metast. (1-KM)
	n=12,671	n=12,671	n=12,671	n=12,671
Years	%	%	%	%
0	0.0	0.0	0.0	0.0
1	19.5	20.5	8.0	8.7
2	25.5	27.1	12.1	13.6
3	28.5	30.6	14.2	16.3
4	30.3	32.8	15.6	18.1
5	31.8	34.7	16.7	19.6
6	32.9	36.2	17.7	21.1
7	33.9	37.4	18.3	21.9
8	34.6	38.6	18.9	22.9
9	35.4	39.6	19.4	23.9
10	36.0	40.6	19.9	24.6
11	36.3	41.1	20.2	25.2
12	36.9	42.2	20.7	26.3
13	37.4	43.0	21.0	26.9
14	37.6	43.5	21.1	27.2
15	37.7	43.6	21.1	27.2

Table 5b. Time to first progression of patients with urinary tract cancer for period 1998-2014 (N=12,671).

ICD-10 C64-C68: Malignant neoplasms of urinary tract
Progression type
Observed post-progression survival 1998-2014
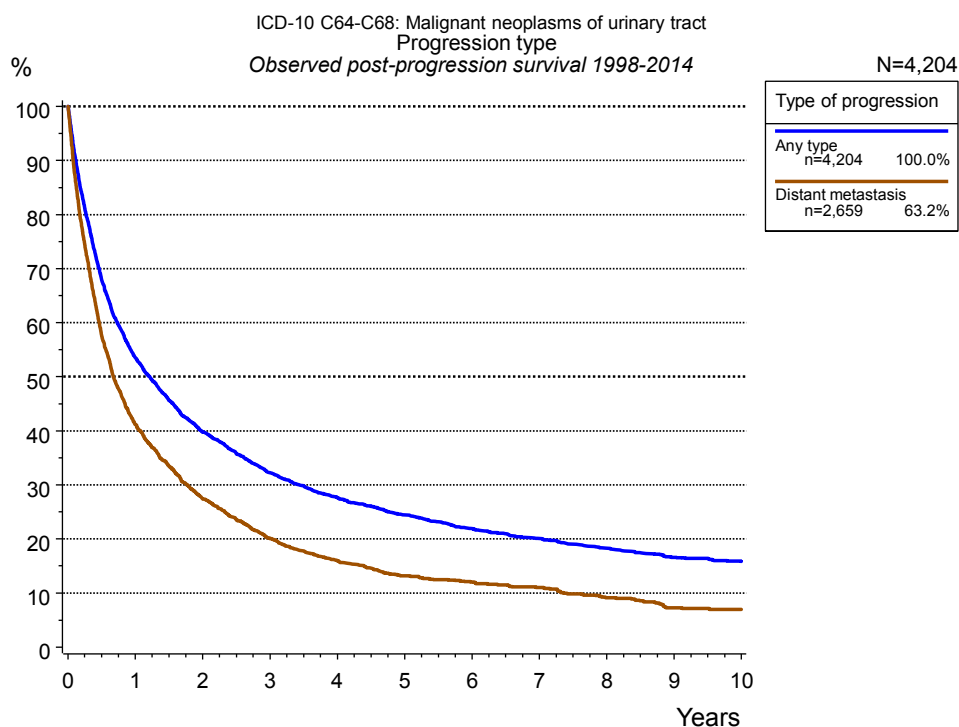
Figure 5c. Observed post-progression survival of 4,204 patients with urinary tract cancer diagnosed between 1998 and 2014. These 4,204 patients with documented progression events during their course of disease represent 30.0 % of the totally 14,033 evaluated cases (incl. M1, n=1,362, 9.7 %). Patients with cancer relapse documented via death certificates only were excluded (n=1,194, 8.5 %). 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 n=4,204	Distant metastasis n=2,659
Years	%	%
0	100.0	100.0
1	53.6	41.2
2	39.8	27.4
3	32.2	20.1
4	27.6	16.0
5	24.4	13.2
6	21.9	12.1
7	20.1	11.0
8	18.3	9.2
9	16.6	7.3
10	15.8	7.0

Table 5d. Observed post-progression survival of patients with urinary tract cancer for period 1998-2014 (N=4,204).

ICD-10 C64-C68: Malignant neoplasms of urinary tract
Type of Progression: Distant metastasis
Observed post-progression survival by period of progression date 1988-2014   N=3,488
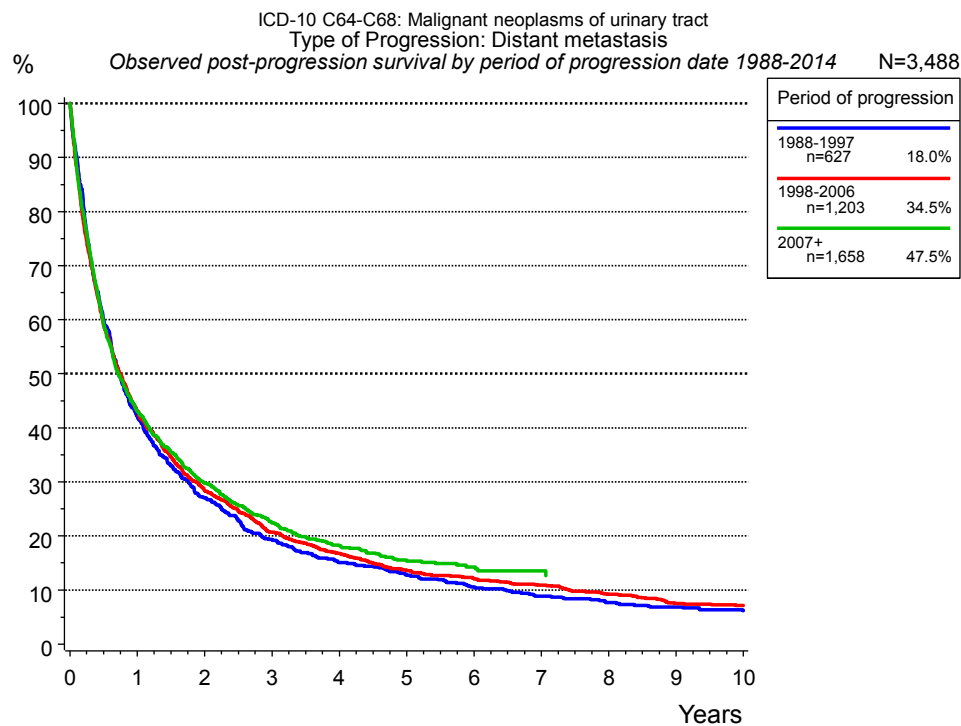

Figure 5e. Observed post-progression (distant metastasis) survival of 3,488 patients with urinary tract cancer diagnosed between 1988 and 2014 by period of progression.

| | Period of progression | | |
| | 1988-1997 n=627 | 1998-2006 n=1,203 | 2007+ n=1,658 |
Years	%	%	%
0	100.0	100.0	100.0
1	42.0	43.1	43.0
2	27.1	28.4	29.8
3	19.3	20.7	22.4
4	15.1	16.7	18.2
5	12.7	13.5	15.4
6	10.5	12.1	14.3
7	8.9	10.9	13.5
8	7.7	9.2	
9	6.8	7.5	
10	6.1	7.2	

Table 5f. Observed post-progression (distant metastasis) survival of patients with urinary tract cancer for period 1988-2014 by period of progression (N=3,488).

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]. 2016 [updated 2016 Mar 2; cited 2016 May 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/surv/sC6468E-ICD-10-C64-C68-Urinary-tract-cancer-survival.pdf

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