Munich Cancer Registry

ICD-10 C64-C68: Urinary tract cancer

Survival

Year of diagnosis	1988-1997	1998-2014
Patients	5,165	20,431
Diseases	5,247	21,231
Cases evaluated	4,486	14,154
Creation date	04/11/2016	
Export date	12/23/2015	
Population	4.64 m	

BERLIN

GERMANY

BAVARIA

MUNICH

Munich Cancer Registry at Munich Cancer Center
Marchioninistr. 15
Munich, 81377
Germany

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

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

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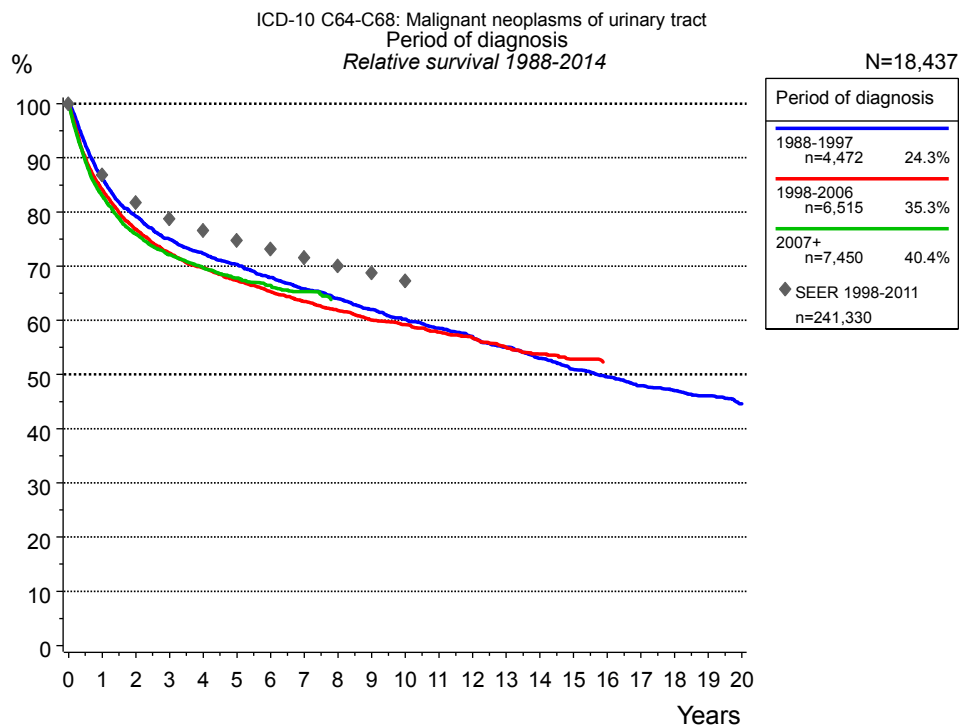Period of diagnosis
Relative survival 1988-2014

Figure 1a. Relative survival of patients with urinary tract cancer by period of diagnosis. Included in the evaluation are 18,437 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=4,472 | | 1998-2006 n=6,515 | | 2007+ n=7,450 | |
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	83.3	86.3	81.3	84.1	80.2	82.9
2	74.0	79.2	71.9	76.8	71.3	75.9
3	67.9	75.0	65.8	72.4	65.8	72.1
4	63.5	72.3	61.5	69.7	61.7	69.7
5	59.9	70.3	57.7	67.4	58.2	67.8
6	56.2	67.9	54.3	65.3	55.3	66.4
7	52.8	65.8	51.2	63.5	52.8	65.3
8	49.9	64.0	48.3	61.8		
9	46.9	62.0	45.5	60.1		
10	44.2	60.2	43.4	59.2		
11	41.7	58.6	41.0	57.8		
12	39.3	57.0	39.0	56.7		
13	36.9	55.1	36.6	55.0		
14	34.4	53.0	34.5	53.8		
15	32.0	50.9	32.9	52.9		
16	30.2	49.6				
17	28.3	48.0				
18	26.8	47.0				
19	25.4	46.1				
20	23.7	44.6				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by period of diagnosis for period 1988-2014 (N=18,437).
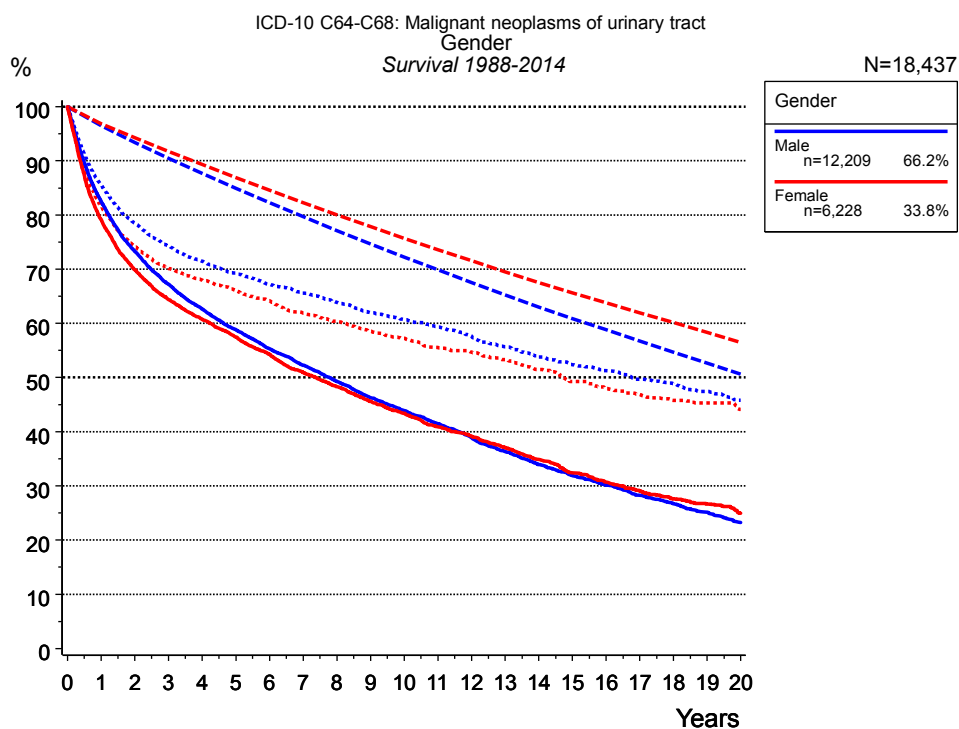
ICD-10 C64-C68: Malignant neoplasms of urinary tract
Gender
Survival 1988-2014

Figure 2a. Survival of patients with urinary tract cancer by gender. Included in the evaluation are 18,437 cases diagnosed between 1988 and 2014.

	Gender			
	Male n=12,209		Female n=6,228	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	82.5	85.5	79.1	81.7
2	73.3	78.5	69.9	74.1
3	67.2	74.3	64.4	70.2
4	62.7	71.5	60.8	68.0
5	58.8	69.3	57.5	66.1
6	55.3	67.2	54.3	64.2
7	52.3	65.6	51.0	61.9
8	49.3	63.8	48.3	60.3
9	46.3	62.0	45.6	58.6
10	43.9	60.7	43.4	57.3
11	41.5	59.3	40.9	55.5
12	38.9	57.7	39.2	54.7
13	36.3	55.6	37.1	53.3
14	33.9	53.8	34.9	51.5
15	31.9	52.3	32.4	49.3
16	30.1	51.2	30.7	48.0
17	28.2	49.7	29.1	46.9
18	26.7	48.8	27.6	45.8
19	25.1	47.4	26.7	45.3
20	23.3	45.8	25.0	44.1

Table 2b. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by gender for period 1988-2014 (N=18,437).

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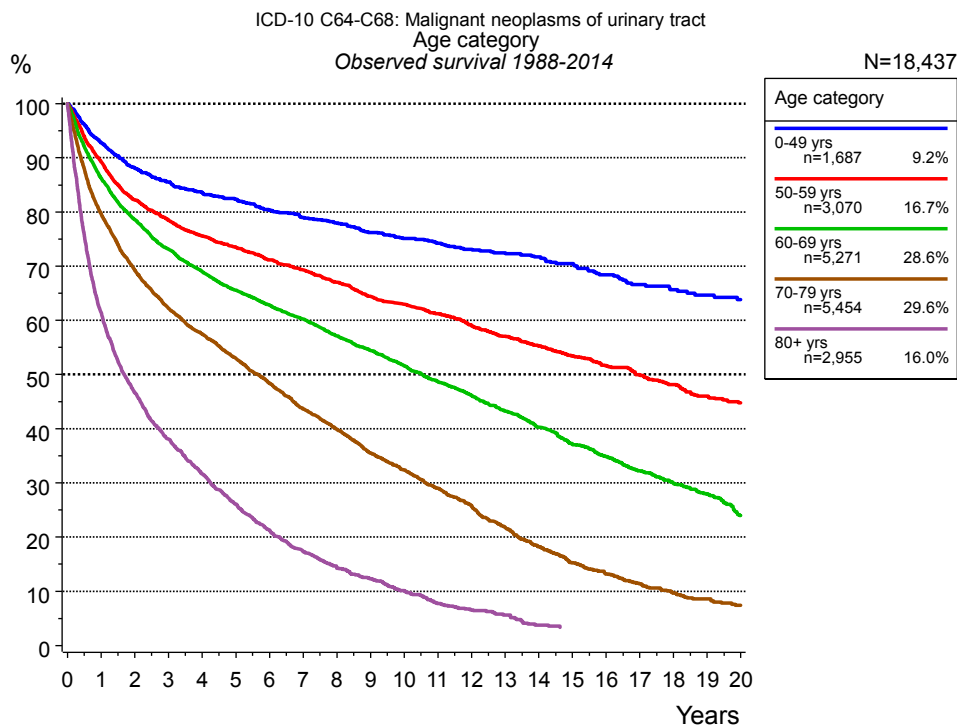Age category
Observed survival 1988-2014

Figure 3a. Observed survival of patients with urinary tract cancer by age category. Included in the evaluation are 18,437 cases diagnosed between 1988 and 2014.
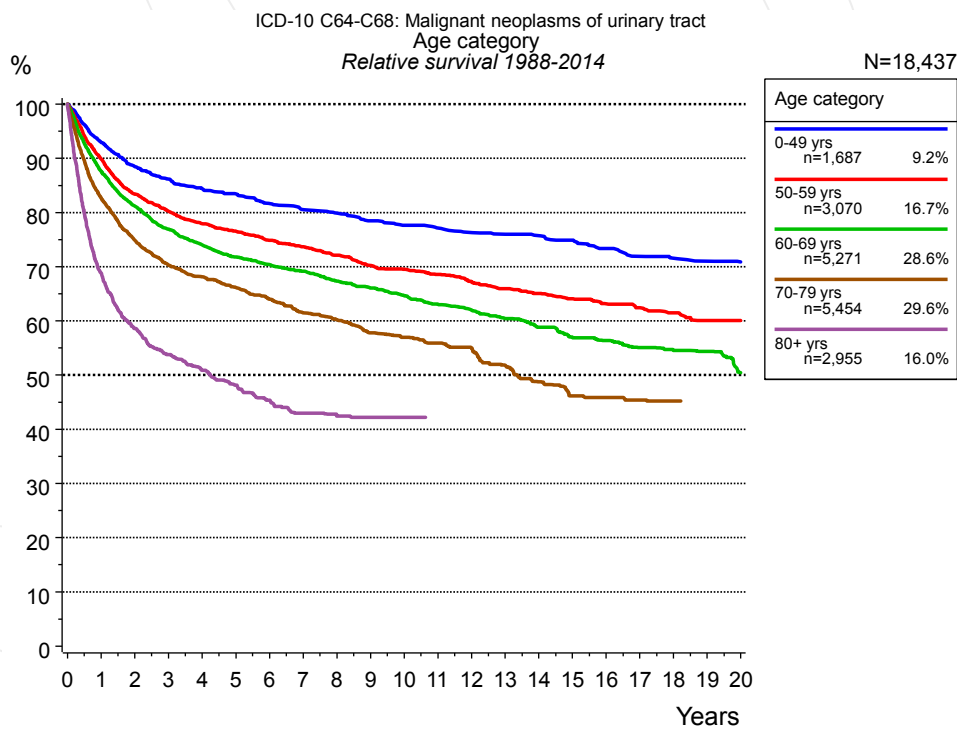
ICD-10 C64-C68: Malignant neoplasms of urinary tract
Age category
Relative survival 1988-2014

Figure 3b. Relative survival of patients with urinary tract cancer by age category. Included in the evaluation are 18,437 cases diagnosed between 1988 and 2014.

	0-49 yrs n=1,687		50-59 yrs n=3,070		60-69 yrs n=5,271		70-79 yrs n=5,454		80+ yrs n=2,955	
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	92.7	92.9	89.2	89.8	86.2	87.6	79.6	82.6	61.4	68.8
2	88.0	88.5	82.2	83.4	78.6	81.2	69.2	74.9	46.6	58.6
3	85.6	86.2	78.4	80.2	73.1	76.9	62.2	70.2	38.1	53.8
4	83.6	84.4	75.6	78.0	69.0	74.0	57.5	68.1	31.6	50.9
5	82.3	83.4	73.5	76.5	65.6	71.8	53.0	66.2	26.1	48.1
6	80.3	81.7	71.1	74.9	62.8	70.4	48.4	64.0	21.3	45.4
7	79.0	80.5	69.3	73.7	60.3	69.2	43.6	61.5	17.3	43.0
8	78.0	79.9	67.0	72.1	57.1	67.4	39.9	60.2	14.3	42.4
9	76.2	78.5	64.4	70.2	54.4	66.1	35.5	57.8	12.3	42.2
10	75.1	77.7	62.9	69.5	51.6	64.6	32.4	57.0	10.1	42.2
11	74.2	77.1	61.2	68.6	48.7	63.1	29.0	55.9		
12	73.1	76.3	59.1	67.2	46.2	62.0	25.8	55.0		
13	72.4	76.0	57.1	65.9	43.2	60.4	21.8	51.8		
14	71.7	75.7	55.3	65.1	40.3	58.8	18.3	48.7		
15	70.5	74.9	53.5	64.1	37.1	57.0	15.2	46.2		
16	68.4	73.4	51.6	63.2	34.9	56.4	13.2	45.8		
17	66.6	71.9	50.0	62.4	32.2	55.1	11.4	45.4		
18	65.7	71.6	48.2	61.5	29.9	54.6	9.7	45.2		
19	64.7	71.0	46.0	60.1	28.0	54.4				
20	63.8	70.9	44.8	60.1	24.0	50.5				

Table 3c. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by age category for period 1988-2014 (N=18,437).

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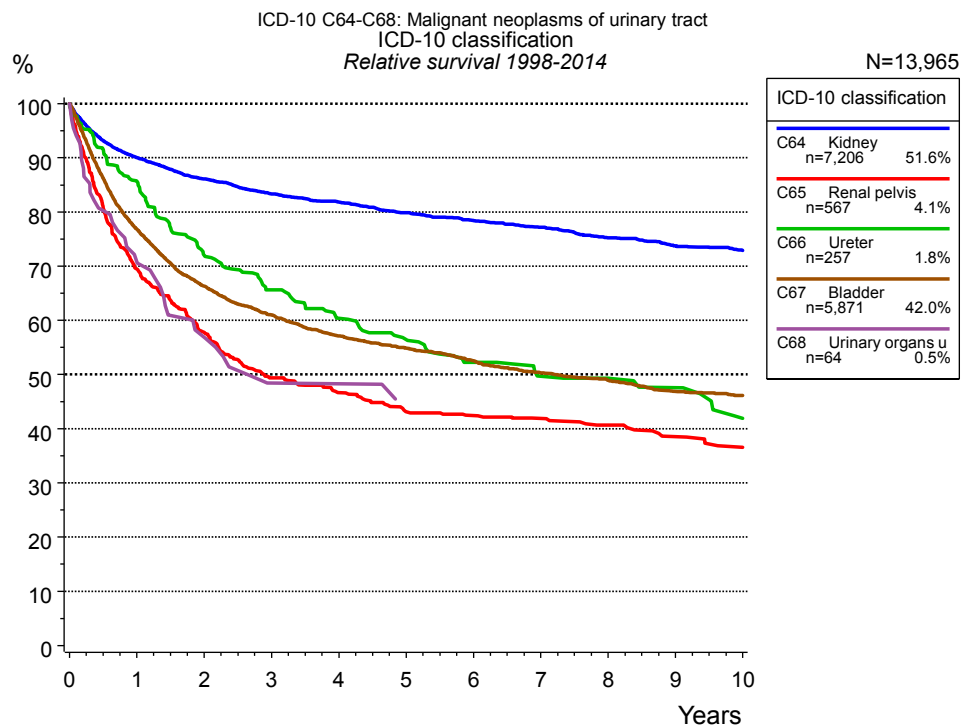*Relative survival 1998-2014*

Figure 4a. Relative survival of patients with urinary tract cancer by ICD-10 classification. Included in the evaluation are 13,965 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=567		n=257		n=5,871		n=64	
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	66.9	69.5	82.1	85.7	73.3	76.8	69.8	70.8
2	82.2	86.1	53.6	57.8	66.4	72.0	60.8	66.3	54.5	56.9
3	77.8	83.4	43.9	49.4	58.0	65.7	53.8	61.0	43.4	48.4
4	74.5	81.8	39.9	46.7	51.0	60.4	48.5	57.1	43.4	48.3
5	71.0	79.9	35.4	43.1	46.2	56.5	44.8	54.9	38.3	44.5
6	67.8	78.4	33.8	42.4	40.9	52.3	41.3	52.5		
7	65.0	77.1	32.2	41.9	37.4	49.7	38.1	50.3		
8	61.7	75.2	30.1	40.7	35.6	49.3	35.6	48.9		
9	58.8	73.8	27.6	38.6	33.7	47.6	32.8	46.9		
10	56.5	72.9	25.6	36.6	28.2	41.9	31.2	46.1		

Table 4b. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by ICD-10 classification for period 1998-2014 (N=13,965).

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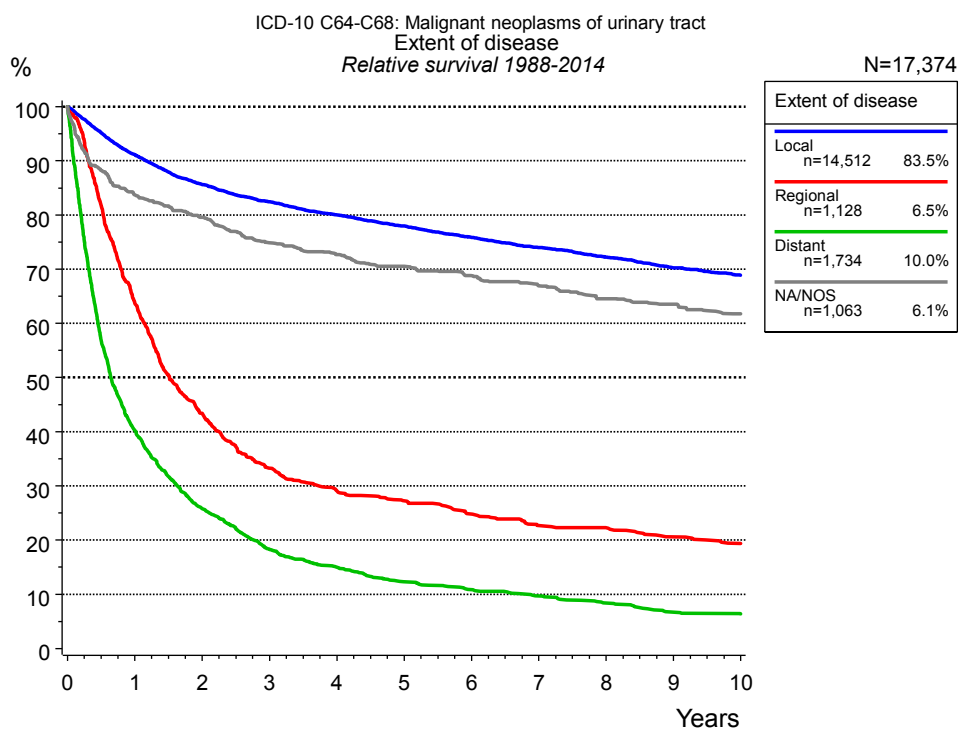Extent of disease
Relative survival 1988-2014

Figure 4c. Relative survival of patients with urinary tract cancer by extent of disease. For 17,404 of 18,437 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 17,374 cases an evaluable classification was established. The grey line represents the subgroup of 1,063 patients with missing values regarding extent of disease (5.8% of 18,437 patients, the percent values of all other categories are related to n=17,374).

	Extent of disease							
	Local n=14,512		Regional n=1,128		Distant n=1,734		NA/NOS n=1,063	
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	88.0	91.1	61.9	63.7	39.0	40.2	80.3	83.7
2	80.2	85.6	41.0	43.4	24.4	25.8	73.8	79.6
3	74.8	82.4	30.6	33.3	17.0	18.3	67.2	74.9
4	70.5	80.0	26.2	29.1	13.6	15.0	63.3	72.7
5	66.7	78.0	23.8	27.3	10.9	12.3	59.5	70.5
6	62.9	75.9	21.1	24.8	9.5	10.9	56.2	68.8
7	59.5	74.0	18.7	22.7	8.2	9.7	52.9	66.9
8	56.3	72.2	17.9	22.3	7.0	8.4	49.5	64.6
9	53.1	70.3	16.0	20.6	5.5	6.7	47.3	63.6
10	50.5	68.9	14.7	19.4	5.1	6.4	44.5	61.7

Table 4d. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by extent of disease for period 1988-2014 (N=17,374).

ICD-10 C64-C68: Malignant neoplasms of urinary tract
Extent of disease
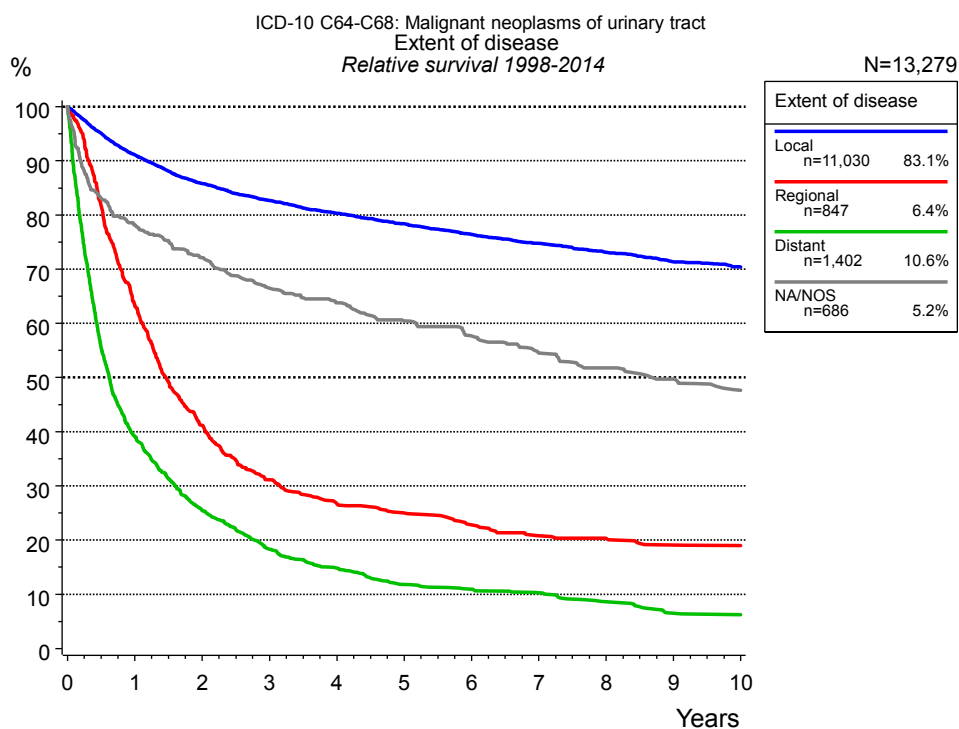*Relative survival 1998-2014*   N=13,279

Figure 4e. Relative survival of patients with urinary tract cancer by extent of disease. For 13,302 of 13,965 cases diagnosed between 1998 and 2014 valid data could be obtained for this item. For a total of 13,279 cases an evaluable classification was established. The grey line represents the subgroup of 686 patients with missing values regarding extent of disease (4.9% of 13,965 patients, the percent values of all other categories are related to n=13,279).

	Extent of disease							
	Local n=11,030		Regional n=847		Distant n=1,402		NA/NOS n=686	
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	88.1	91.1	61.4	63.2	38.0	39.1	74.7	78.2
2	80.4	85.8	39.0	41.2	24.1	25.4	66.4	72.1
3	75.2	82.7	28.8	31.1	17.0	18.3	59.1	66.5
4	70.9	80.3	24.1	26.7	13.6	14.8	54.9	63.8
5	67.2	78.4	21.9	25.0	10.5	11.8	50.3	60.5
6	63.5	76.4	19.5	22.8	9.6	10.9	46.4	57.7
7	60.3	74.8	17.1	20.8	8.8	10.3	42.4	54.5
8	57.1	73.1	16.3	20.3	7.3	8.6	39.4	51.8
9	54.0	71.4	15.0	19.1	5.4	6.5	36.6	49.8
10	51.6	70.4	14.7	19.0	5.2	6.2	33.8	47.7

Table 4f. Observed (obs.) and relative (rel.) survival of patients with urinary tract cancer by extent of disease for period 1998-2014 (N=13,279).

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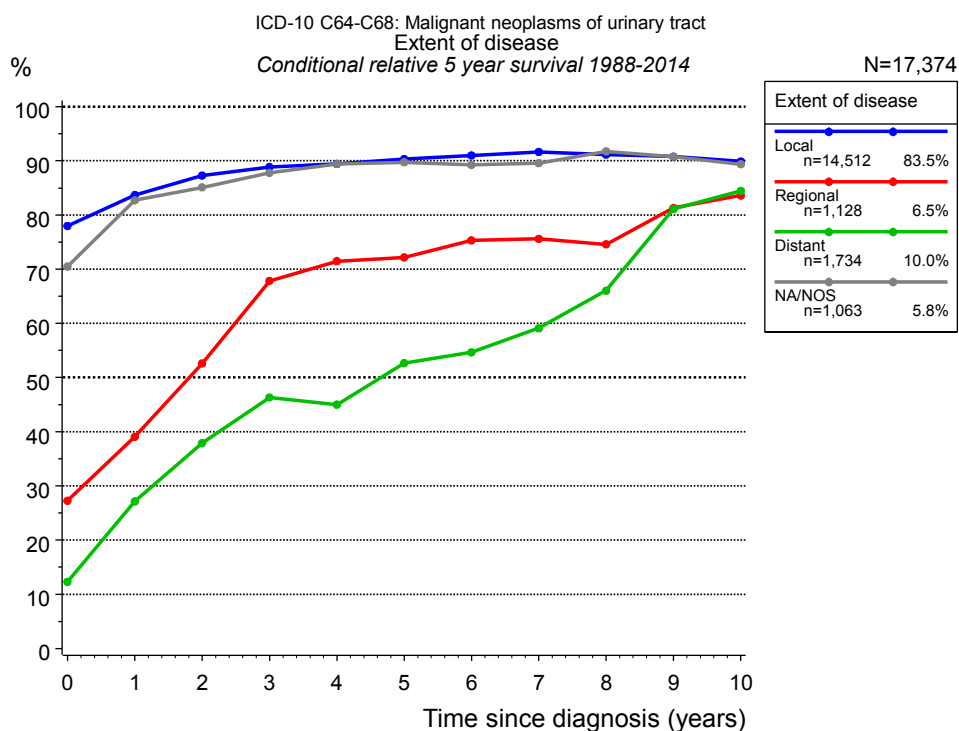*Conditional relative 5 year survival 1988-2014*

Figure 4g. Conditional relative 5-year survival of patients with urinary tract cancer by extent of disease. For 17,404 of 18,437 cases diagnosed between 1988 and 2014 valid data could be obtained for this item. For a total of 17,374 cases an evaluable classification was established. The grey line represents the subgroup of 1,063 patients with missing values regarding extent of disease (5.8% of 18,437 patients, the percent values of all other categories are related to n=17,374).

	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	14,512	78.0	1,128	27.3	1,734	12.3	1,063	70.5
1	12,045	83.7	653	39.1	646	27.2	822	82.7
2	10,373	87.3	397	52.6	386	37.9	735	85.1
3	9,062	88.9	269	67.8	251	46.3	648	87.8
4	7,996	89.4	214	71.5	191	45.0	579	89.4
5	7,005	90.3	185	72.2	134	52.7	521	89.8
6	6,078	91.0	154	75.3	107	54.7	468	89.2
7	5,268	91.6	123	75.6	83	59.1	418	89.6
8	4,514	91.1	110	74.6	65	66.0	367	91.7
9	3,875	90.8	92	81.3	45	81.1	340	90.8
10	3,320	89.9	73	83.6	35	84.5	303	89.4

Table 4h. Conditional relative 5-year survival of patients with urinary tract cancer by extent of disease for period 1988-2014 (N=17,374).

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=9,062).
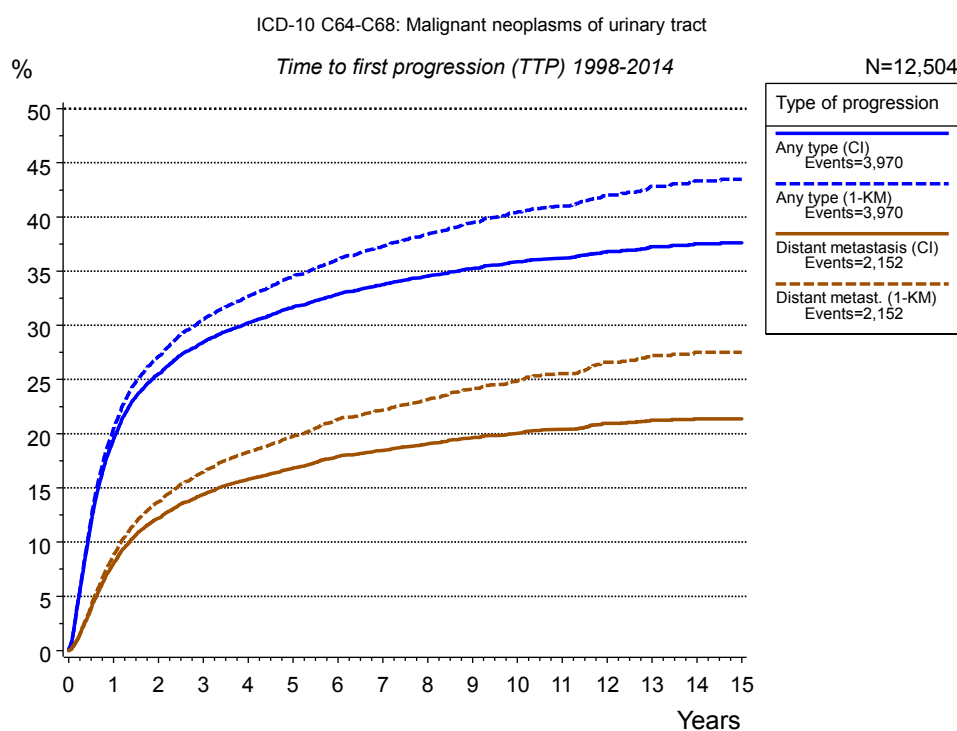
ICD-10 C64-C68: Malignant neoplasms of urinary tract

Figure 5a. Time to first progression of 12,504 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=12,504	n=12,504	n=12,504	n=12,504
Years	%	%	%	%
0	0.0	0.0	0.0	0.0
1	19.5	20.5	8.0	8.8
2	25.5	27.1	12.2	13.7
3	28.4	30.5	14.4	16.5
4	30.2	32.7	15.8	18.3
5	31.7	34.5	16.9	19.8
6	32.9	36.1	17.9	21.3
7	33.8	37.3	18.5	22.2
8	34.5	38.4	19.1	23.2
9	35.3	39.5	19.7	24.2
10	35.9	40.5	20.1	24.9
11	36.2	41.0	20.4	25.5
12	36.8	42.0	21.0	26.6
13	37.3	42.8	21.2	27.2
14	37.5	43.3	21.4	27.5
15	37.6	43.5	21.4	27.5

Table 5b. Time to first progression of patients with urinary tract cancer for period 1998-2014 (N=12,504).

ICD-10 C64-C68: Malignant neoplasms of urinary tract
Progression type
Observed post-progression survival 1998-2014 N=4,143

Figure 5c. Observed post-progression survival of 4,143 patients with urinary tract cancer diagnosed between 1998 and 2014. These 4,143 patients with documented progression events during their course of disease represent 29.9 % of the totally 13,866 evaluated cases (incl. M1, n=1,362, 9.8 %). Patients with cancer relapse documented via death certificates only were excluded (n=1,189, 8.6 %). 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=4,143	n=2,655
Years	%	%
0	100.0	100.0
1	53.0	41.2
2	39.1	27.4
3	31.6	20.0
4	27.0	16.0
5	23.8	13.2
6	21.2	12.1
7	19.4	11.0
8	17.6	9.2
9	16.1	7.3
10	15.4	7.0

Table 5d. Observed post-progression survival of patients with urinary tract cancer for period 1998-2014 (N=4,143).

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=3,484
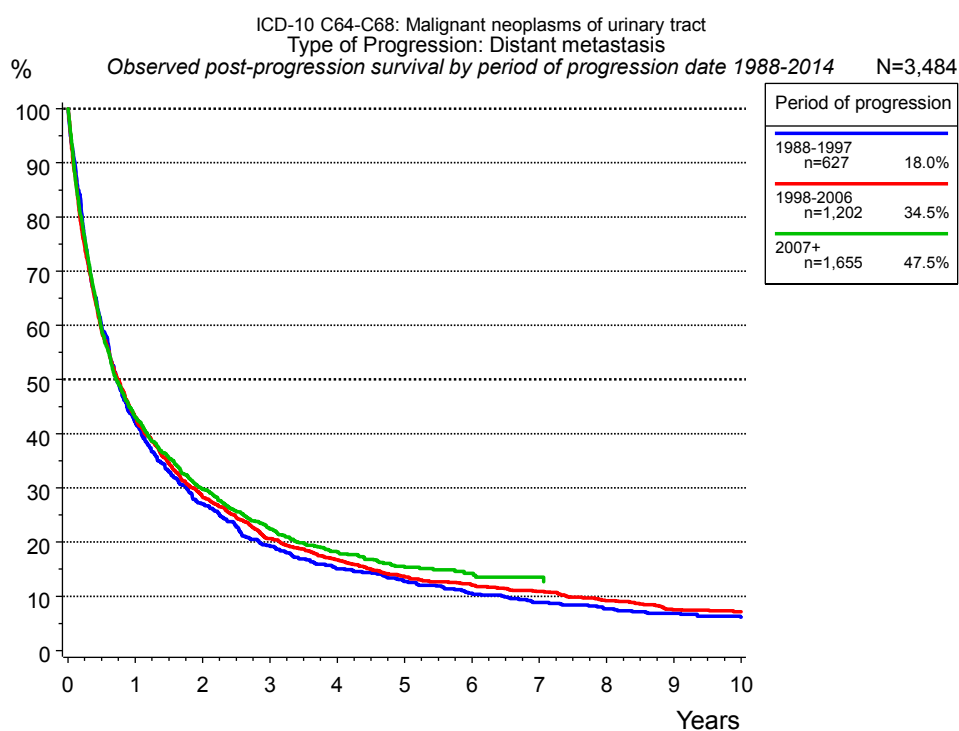

Figure 5e. Observed post-progression (distant metastasis) survival of 3,484 patients with urinary tract cancer diagnosed between 1988 and 2014 by period of progression.

	Period of progression		
	1988-1997 n=627	1998-2006 n=1,202	2007+ n=1,655
Years	%	%	%
0	100.0	100.0	100.0
1	42.0	43.1	43.0
2	27.1	28.3	29.8
3	19.3	20.7	22.4
4	15.1	16.7	18.2
5	12.7	13.6	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=3,484).

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 Apr 11; cited 2016 Jun 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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