

Munich Cancer Registry



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ICD-10 C60-C68: Urologic cancer

Survival

Year of diagnosis	1988-1997	1998-2016
Patients	13,437	76,866
Diseases	13,811	80,434
Cases evaluated	12,186	61,953
Creation date	08/22/2018	
Export date	08/09/2018	
Population	4.81 m	



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

<https://www.tumorregister-muenchen.de/en/facts/surv/sC6068E-ICD-10-C60-C68-Urologic-cancer-survival.pdf>

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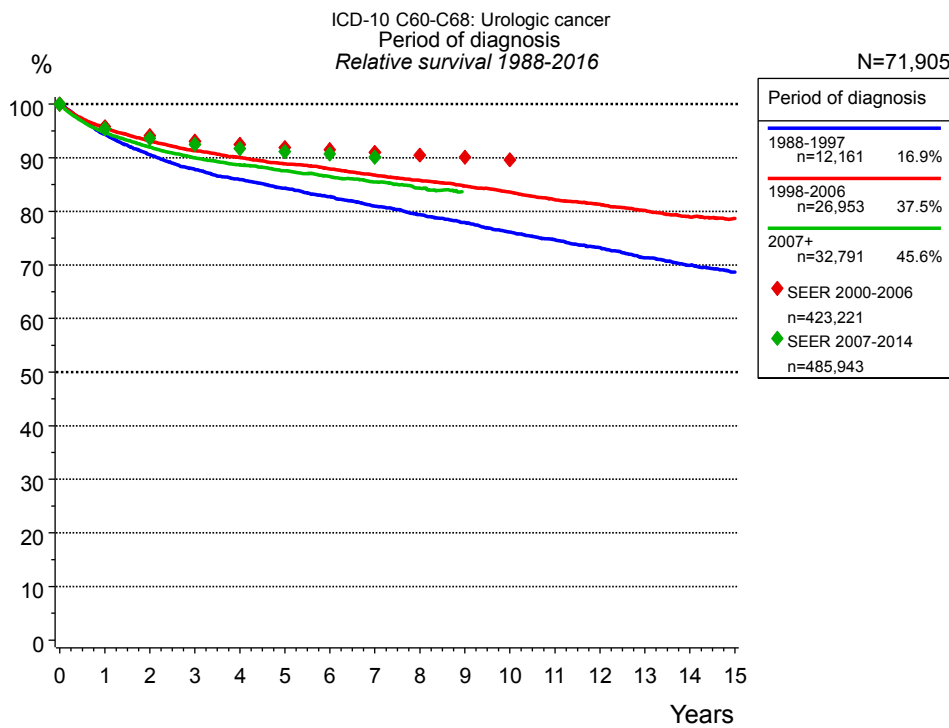


Figure 1a. Relative survival of patients with urologic cancer by period of diagnosis. Included in the evaluation are 71,905 cases diagnosed between 1988 and 2016.

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 2014, 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=12,161		1998-2006 n=26,953		2007+ n=32,791	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	90.6	94.4	92.4	95.6	91.9	94.7
2	83.6	90.5	87.3	93.2	86.7	92.0
3	78.1	87.8	82.8	91.3	82.3	90.0
4	73.5	85.9	79.1	90.0	78.7	88.7
5	69.5	84.3	75.5	88.9	75.3	87.6
6	65.7	82.7	72.2	87.9	72.1	86.5
7	61.9	81.0	68.9	86.7	68.9	85.5
8	58.5	79.4	65.8	85.8	65.6	84.3
9	55.4	77.9	62.7	84.7		
10	52.1	76.1	59.6	83.6		
11	49.3	74.7	56.4	82.2		
12	46.6	73.2	53.6	81.3		
13	43.7	71.3	50.8	80.1		
14	41.3	69.9	48.0	79.0		
15	39.0	68.6	45.8	78.7		

Table 1b. Observed (obs.) and relative (rel.) survival of patients with urologic cancer by period of diagnosis for period 1988-2016 (N=71,905).

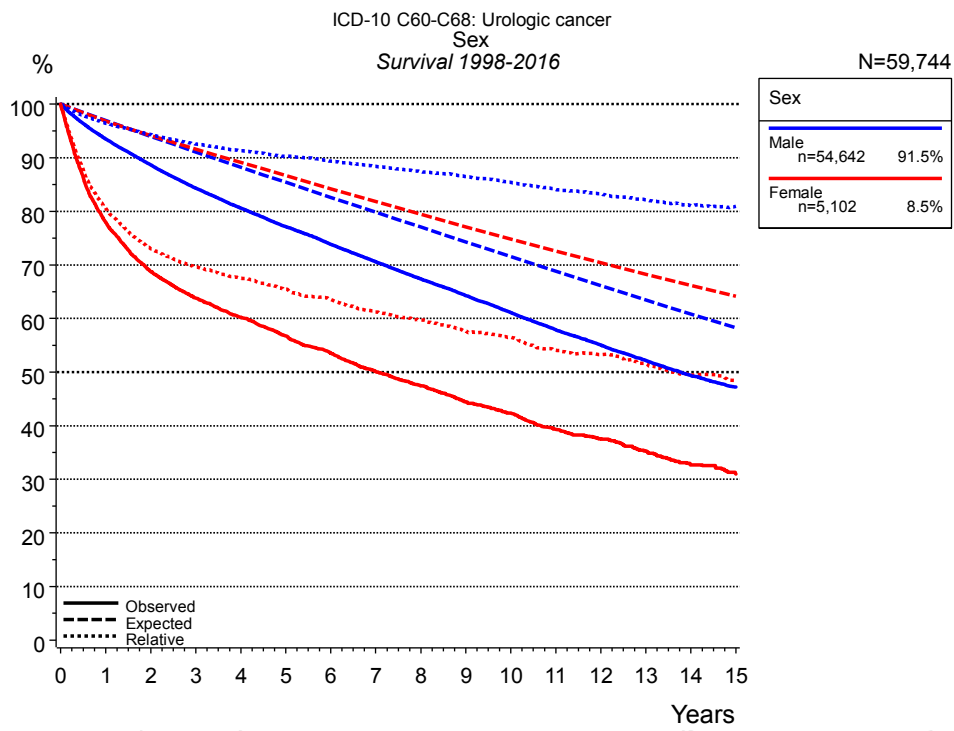


Figure 2a. Survival of patients with urologic cancer by sex. Included in the evaluation are 59,744 cases diagnosed between 1998 and 2016.

Years	Sex			
	Male n=54,642		Female n=5,102	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	93.5	96.4	78.0	80.5
2	88.7	94.3	68.8	73.0
3	84.3	92.6	63.8	69.6
4	80.6	91.3	60.2	67.5
5	77.1	90.3	56.7	65.4
6	73.8	89.4	53.5	63.5
7	70.6	88.4	50.1	61.2
8	67.4	87.4	47.4	59.7
9	64.3	86.5	44.4	57.6
10	61.1	85.4	42.3	56.5
11	57.9	84.1	39.3	54.1
12	55.1	83.3	37.6	53.2
13	52.1	82.1	35.3	51.6
14	49.4	81.1	32.7	49.4
15	47.2	80.9	31.0	48.1

Table 2b. Observed (obs.) and relative (rel.) survival of patients with urologic cancer by sex for period 1998-2016 (N=59,744).

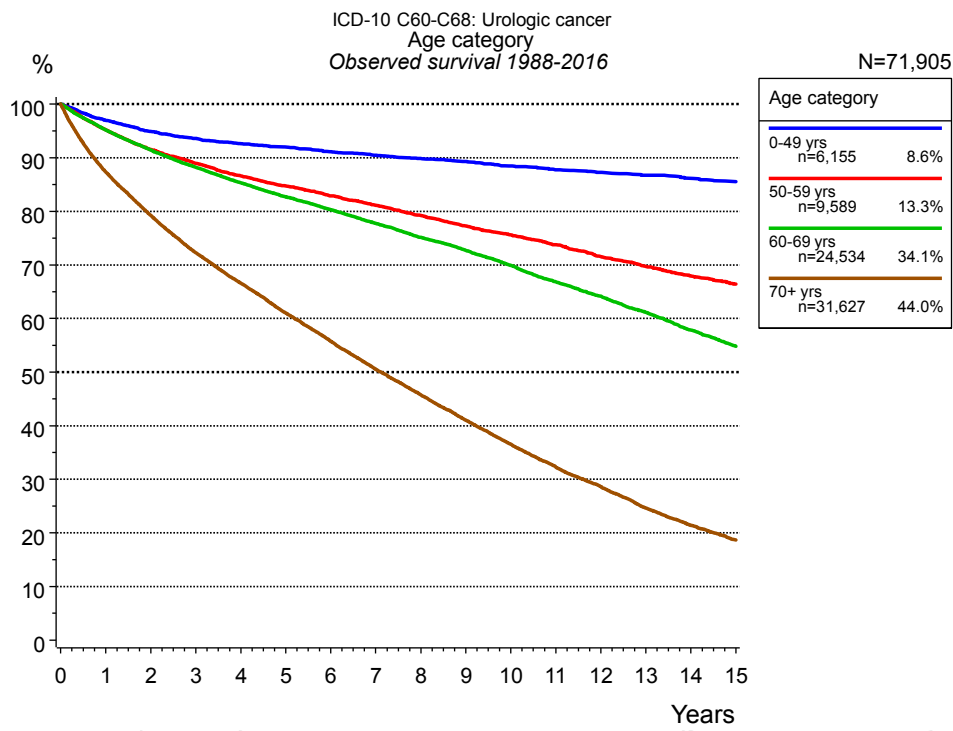


Figure 3a. Observed survival of patients with urologic cancer by age category. Included in the evaluation are 71,905 cases diagnosed between 1988 and 2016.

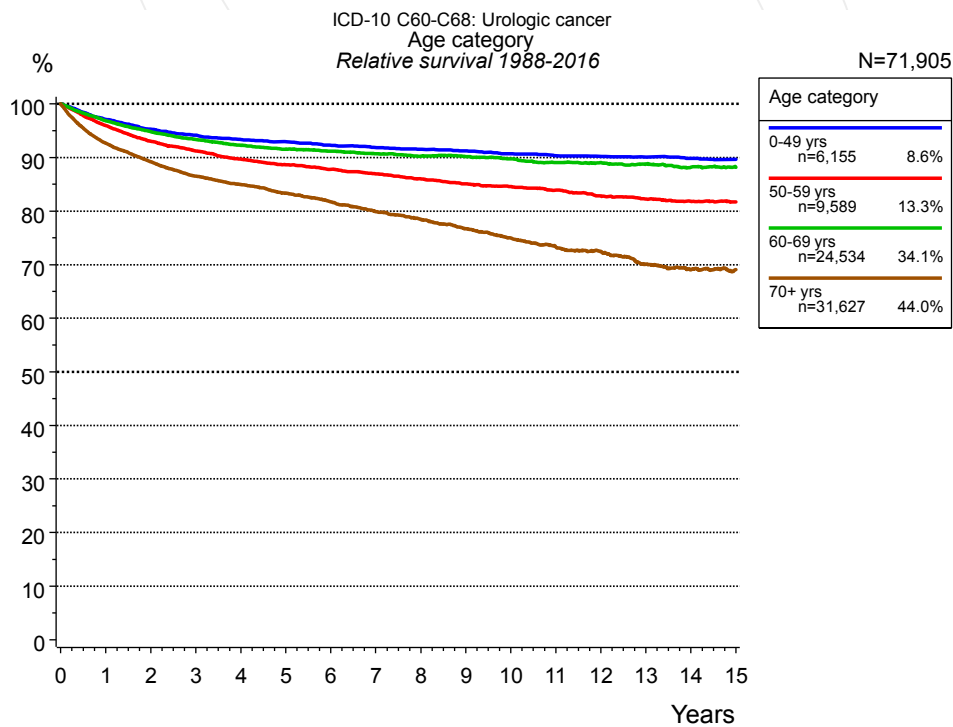


Figure 3b. Relative survival of patients with urologic cancer by age category. Included in the evaluation are 71,905 cases diagnosed between 1988 and 2016.

Years	Age category							
	0-49 yrs n=6,155		50-59 yrs n=9,589		60-69 yrs n=24,534		70+ yrs n=31,627	
	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	97.0	97.1	95.2	95.9	95.2	96.8	87.3	92.7
2	94.9	95.2	91.5	93.0	91.4	94.8	79.2	89.2
3	93.6	94.1	88.9	91.2	88.2	93.4	72.3	86.5
4	92.6	93.3	86.6	89.7	85.3	92.3	66.6	84.9
5	92.0	92.9	84.7	88.6	82.7	91.6	61.0	83.3
6	91.1	92.3	82.9	87.7	80.3	91.2	55.7	81.7
7	90.5	91.9	81.1	86.9	77.7	90.7	50.5	79.9
8	89.8	91.5	79.2	86.0	75.1	90.3	45.7	78.4
9	89.3	91.2	77.3	85.1	72.7	90.2	41.0	76.7
10	88.4	90.7	75.6	84.5	69.9	89.8	36.5	74.9
11	87.7	90.3	73.8	83.9	66.8	89.1	32.3	73.3
12	87.3	90.2	71.5	82.8	64.1	89.1	28.6	72.4
13	86.8	90.0	69.7	82.2	61.1	88.8	24.6	70.1
14	86.1	89.8	67.9	81.8	57.8	88.2	21.4	69.1
15	85.6	89.7	66.4	81.7	54.8	88.2	18.6	69.1

Table 3c. Observed (obs.) and relative (rel.) survival of patients with urologic cancer by age category for period 1988-2016 (N=71,905).

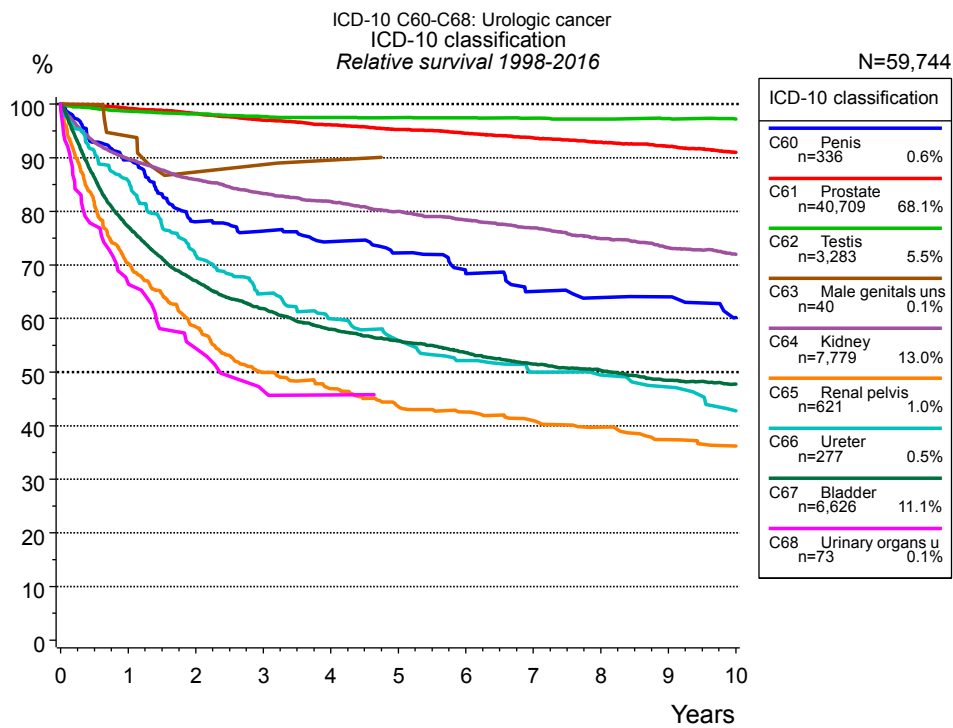


Figure 4a. Relative survival of patients with urologic cancer by ICD-10 classification. Included in the evaluation are 59,744 cases diagnosed between 1998 and 2016.

Years	ICD-10 classification														
	C60 Penis		C61 Prostate		C62 Testis		C63 Male genitals unspec.		C64 Kidney		C65 Renal pelvis		C66 Ureter		
	n=336	n=40,709	n=3,283	n=40	n=7,779	n=621	n=277	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	100.0	100.0	100.0
1	86.6	89.6	96.0	99.2	98.5	98.7	92.1	94.0	87.7	89.8	67.6	70.3	82.2	85.6	
2	72.8	78.0	92.0	98.3	97.7	98.2	81.2	87.3	82.0	85.9	54.2	58.4	66.3	71.8	
3	69.1	76.3	87.8	97.0	96.9	97.7	81.2	88.7	77.7	83.3	44.4	49.9	57.2	64.6	
4	65.4	74.4	84.1	96.1	96.5	97.5	78.2	89.5	74.5	81.8	40.1	46.9	50.8	59.9	
5	61.6	72.2	80.4	95.3	96.3	97.5	74.6	89.6	71.0	80.0	35.9	43.5	45.8	56.0	
6	56.4	68.3	76.9	94.6	95.9	97.4			67.8	78.4	33.8	42.6	40.9	52.1	
7	52.2	65.1	73.4	93.7	95.6	97.4			64.8	76.9	31.4	41.0	37.7	50.0	
8	49.9	63.9	69.9	92.9	95.0	97.2			61.4	74.9	29.3	39.7	35.8	49.5	
9	49.0	64.0	66.6	92.1	94.8	97.3			58.3	73.2	26.6	37.4	33.4	47.2	
10	43.6	60.2	63.0	91.0	94.4	97.2			55.8	72.0	25.1	36.2	28.9	42.8	

ICD-10 classification				
<i>cont'd</i>	C67 Bladder n=6,626		C68 Urinary organs unspec. n=73	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	73.6	77.1	65.4	66.6
2	61.5	67.0	52.0	54.5
3	54.6	61.8	42.4	46.5
4	49.3	58.0	40.7	45.7
5	45.7	55.8		
6	42.3	53.7		
7	39.0	51.5		
8	36.6	50.3		
9	34.0	48.4		
10	32.2	47.8		

Table 4b. Observed (obs.) and relative (rel.) survival of patients with urologic cancer by ICD-10 classification for period 1998-2016 (N=59,744).

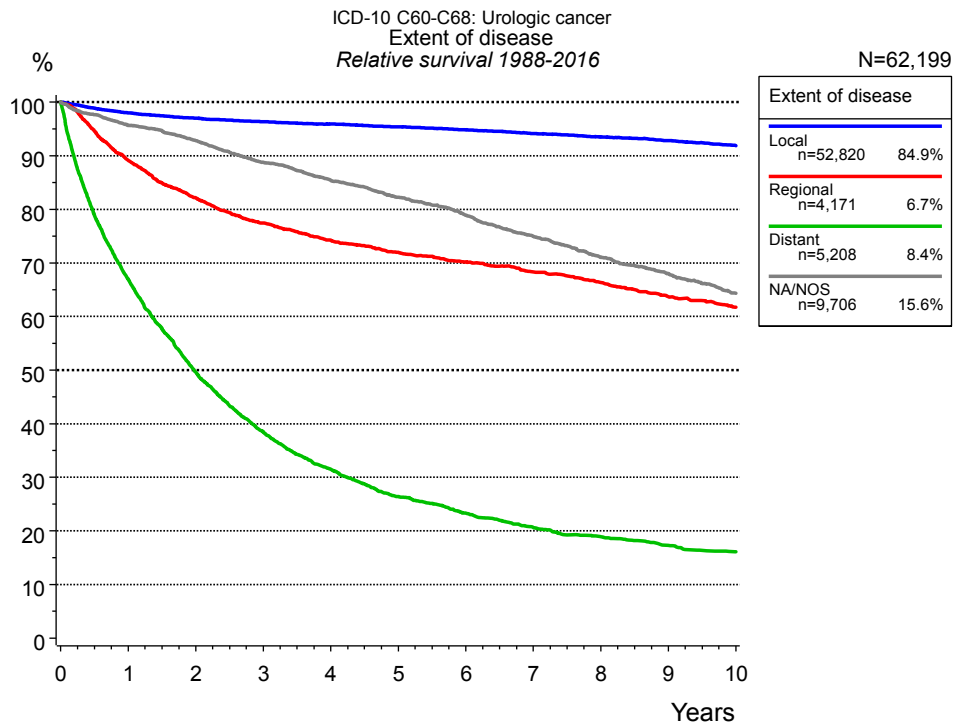


Figure 4c. Relative survival of patients with urologic cancer by extent of disease. For 62,364 of 71,905 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 62,199 cases an evaluable classification was established. The grey line represents the subgroup of 9,706 patients with missing values regarding extent of disease (13.5 % of 71,905 patients, the percent values of all other categories are related to n=62,199).

Years	Extent of disease							
	Local n=52,820		Regional n=4,171		Distant n=5,208		NA/NOS n=9,706	
	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	95.1	98.0	87.1	89.1	64.5	66.9	90.9	95.7
2	91.4	97.0	78.6	82.1	46.3	49.6	83.9	92.8
3	88.1	96.3	72.4	77.4	34.7	38.4	76.2	88.8
4	85.1	95.9	67.9	74.2	27.5	31.5	69.5	85.4
5	82.0	95.4	64.3	72.0	22.4	26.4	63.5	82.2
6	79.0	94.8	61.2	70.2	19.3	23.3	57.6	78.9
7	75.8	94.1	58.1	68.3	16.6	20.6	51.7	74.9
8	72.8	93.5	55.0	66.3	14.9	18.9	46.3	71.1
9	69.8	92.8	51.4	63.7	13.3	17.3	41.9	68.0
10	66.7	91.9	48.5	61.7	12.1	16.1	37.4	64.3

Table 4d. Observed (obs.) and relative (rel.) survival of patients with urologic cancer by extent of disease for period 1988-2016 (N=62,199).

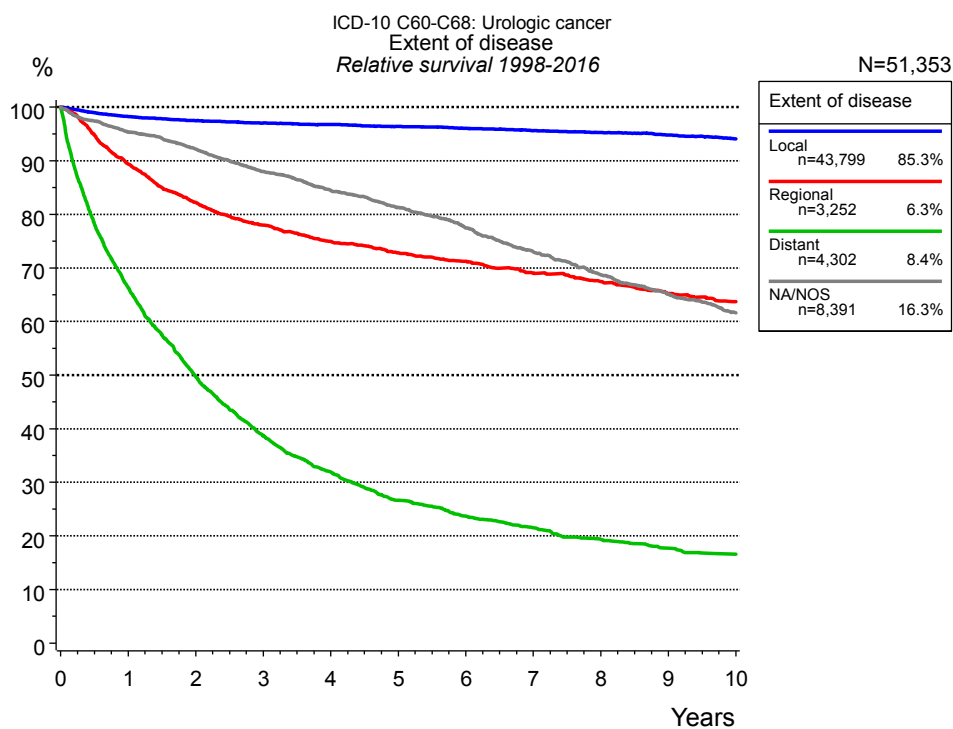


Figure 4e. Relative survival of patients with urologic cancer by extent of disease. For 51,483 of 59,744 cases diagnosed between 1998 and 2016 valid data could be obtained for this item. For a total of 51,353 cases an evaluable classification was established. The grey line represents the subgroup of 8,391 patients with missing values regarding extent of disease (14.0 % of 59,744 patients, the percent values of all other categories are related to n=51,353).

Years	Extent of disease							
	Local n=43,799		Regional n=3,252		Distant n=4,302		NA/NOS n=8,391	
	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	95.5	98.3	87.4	89.3	64.0	66.2	90.7	95.3
2	92.2	97.5	78.8	82.2	46.5	49.7	83.3	92.2
3	89.2	97.0	73.2	78.0	35.0	38.6	75.6	88.0
4	86.4	96.7	68.8	74.9	28.1	31.9	68.8	84.5
5	83.6	96.4	65.4	72.8	22.8	26.6	62.6	81.3
6	80.7	96.0	62.5	71.2	19.7	23.7	56.4	77.4
7	77.8	95.6	59.1	69.0	17.5	21.5	50.2	73.0
8	75.0	95.3	56.3	67.5	15.3	19.4	44.4	68.7
9	72.1	94.8	53.1	65.2	13.7	17.7	39.6	65.1
10	69.1	94.1	50.6	63.7	12.6	16.6	35.3	61.6

Table 4f. Observed (obs.) and relative (rel.) survival of patients with urologic cancer by extent of disease for period 1998-2016 (N=51,353).

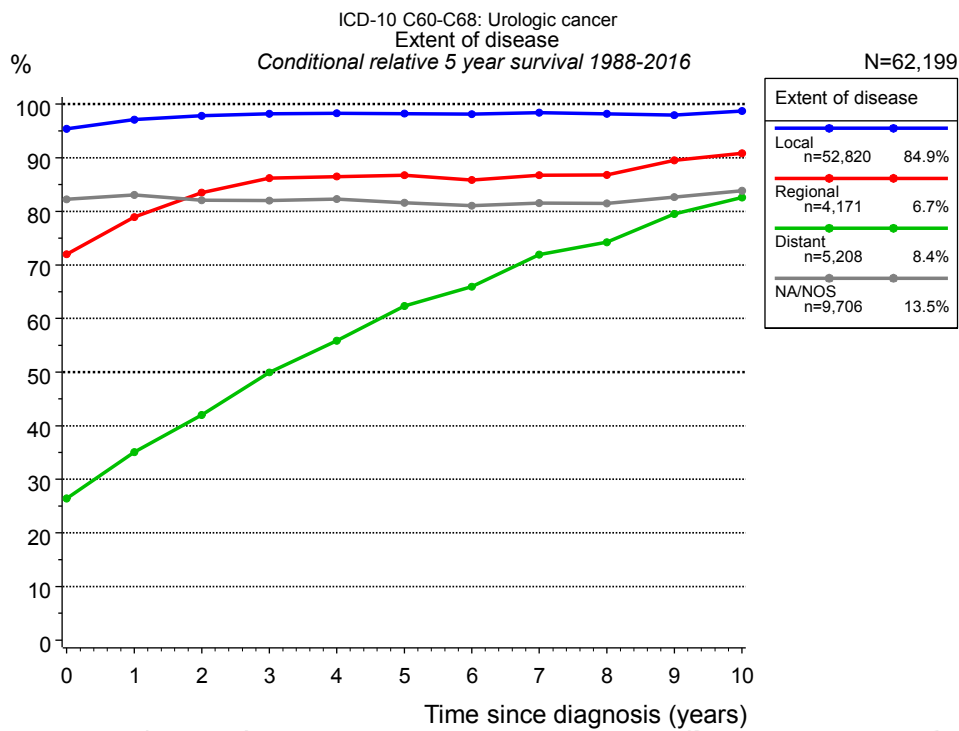


Figure 4g. Conditional relative 5-year survival of patients with urologic cancer by extent of disease. For 62,364 of 71,905 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 62,199 cases an evaluable classification was established. The grey line represents the subgroup of 9,706 patients with missing values regarding extent of disease (13.5 % of 71,905 patients, the percent values of all other categories are related to n=62,199).

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	52,820	95.4	4,171	72.0	5,208	26.4	9,706	82.2
1	47,492	97.1	3,411	78.9	3,143	35.0	8,336	83.1
2	43,380	97.8	2,853	83.5	2,111	42.0	7,248	82.1
3	39,490	98.2	2,426	86.2	1,471	49.9	6,199	82.0
4	35,655	98.3	2,102	86.5	1,077	55.9	5,187	82.3
5	32,053	98.2	1,828	86.8	811	62.3	4,285	81.6
6	28,719	98.1	1,591	85.9	639	66.0	3,568	81.0
7	25,388	98.4	1,393	86.8	500	71.9	2,983	81.5
8	22,127	98.2	1,179	86.8	399	74.2	2,480	81.5
9	18,777	97.9	983	89.5	316	79.5	2,054	82.7
10	16,051	98.7	851	90.8	253	82.6	1,692	83.8

Table 4h. Conditional relative 5-year survival of patients with urologic cancer by extent of disease for period 1988-2016 (N=62,199).

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 98.2% (n=39,490).

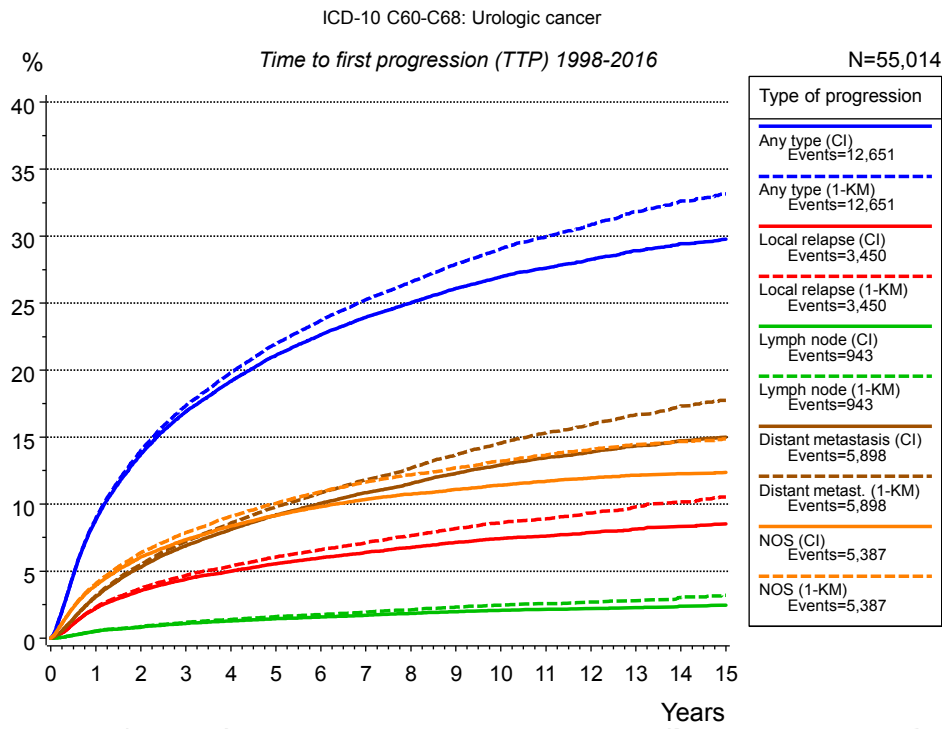


Figure 5a. Time to first progression of 55,014 patients with urologic cancer diagnosed between 1998 and 2016 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Years	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=55,014 %	n=55,014 %	n=55,014 %	n=55,014 %	n=55,014 %	n=55,014 %	n=55,014 %
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	8.8	8.9	2.2	2.3	0.5	0.5	3.1
2	13.7	14.0	3.5	3.7	0.8	0.9	5.3
3	16.9	17.3	4.4	4.7	1.1	1.2	6.9
4	19.2	19.8	5.0	5.4	1.3	1.4	8.1
5	21.1	22.0	5.6	6.0	1.5	1.6	9.2
6	22.6	23.7	6.0	6.6	1.6	1.8	10.1
7	24.0	25.3	6.4	7.1	1.7	1.9	10.9
8	25.0	26.5	6.8	7.6	1.8	2.1	11.5
9	26.1	27.9	7.2	8.2	2.0	2.3	12.3
10	27.0	29.1	7.4	8.6	2.1	2.5	12.9
11	27.6	30.0	7.6	8.9	2.1	2.6	13.5
12	28.3	30.9	7.9	9.3	2.2	2.7	13.9
13	28.9	31.8	8.1	9.8	2.3	2.8	14.4
14	29.4	32.6	8.4	10.2	2.4	3.0	14.7
15	29.8	33.2	8.5	10.5	2.5	3.2	15.0

<i>cont'd</i>	Type of progression		
	Distant metast. (1- KM)	NOS (CI)	NOS (1-KM)
	n=55,014 %	n=55,014 %	n=55,014 %
Years			
0	0.0	0.0	0.0
1	3.2	3.9	4.1
2	5.5	6.1	6.4
3	7.2	7.3	7.9
4	8.6	8.4	9.1
5	9.8	9.2	10.1
6	10.8	9.8	10.9
7	11.8	10.4	11.6
8	12.7	10.7	12.2
9	13.7	11.1	12.7
10	14.6	11.4	13.2
11	15.3	11.7	13.6
12	15.9	12.0	14.1
13	16.7	12.2	14.4
14	17.3	12.3	14.7
15	17.7	12.4	14.8

Table 5b. Time to first progression of patients with urologic cancer for period 1998-2016 (N=55,014).

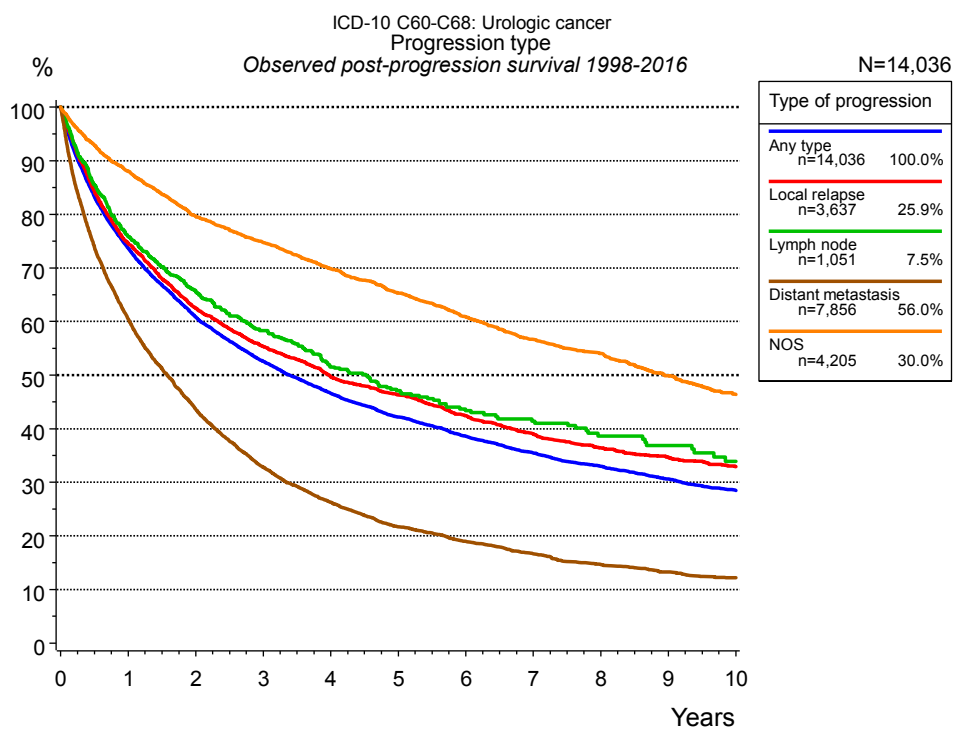


Figure 5c. Observed post-progression survival of 14,036 patients with urologic cancer diagnosed between 1998 and 2016. These 14,036 patients with documented progression events during their course of disease represent 23.7 % of the totally 59,248 evaluated cases (incl. M1, n=4,234, 7.1 %). Patients with cancer relapse documented via death certificates only were excluded (n=2,849, 4.8 %). Multiple progression types on different sites are included in the evaluation even when not occurring 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.

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=14,036 %	Local relapse n=3,637 %	Lymph node n=1,051 %	Distant metastasis n=7,856 %	NOS n=4,205 %
0	100.0	100.0	100.0	100.0	100.0
1	73.7	74.6	75.9	60.4	88.0
2	60.9	62.5	65.5	43.7	79.7
3	52.5	55.3	58.3	32.7	74.7
4	46.6	49.7	51.5	26.2	69.9
5	42.1	46.3	47.1	21.7	65.3
6	38.6	42.4	43.3	19.0	60.9
7	35.5	39.0	41.4	16.7	56.6
8	33.0	36.4	38.6	14.6	54.0
9	30.6	34.6	36.9	13.2	49.9
10	28.5	32.9	33.9	12.2	46.4

Table 5d. Observed post-progression survival of patients with urologic cancer for period 1998-2016 (N=14,036).

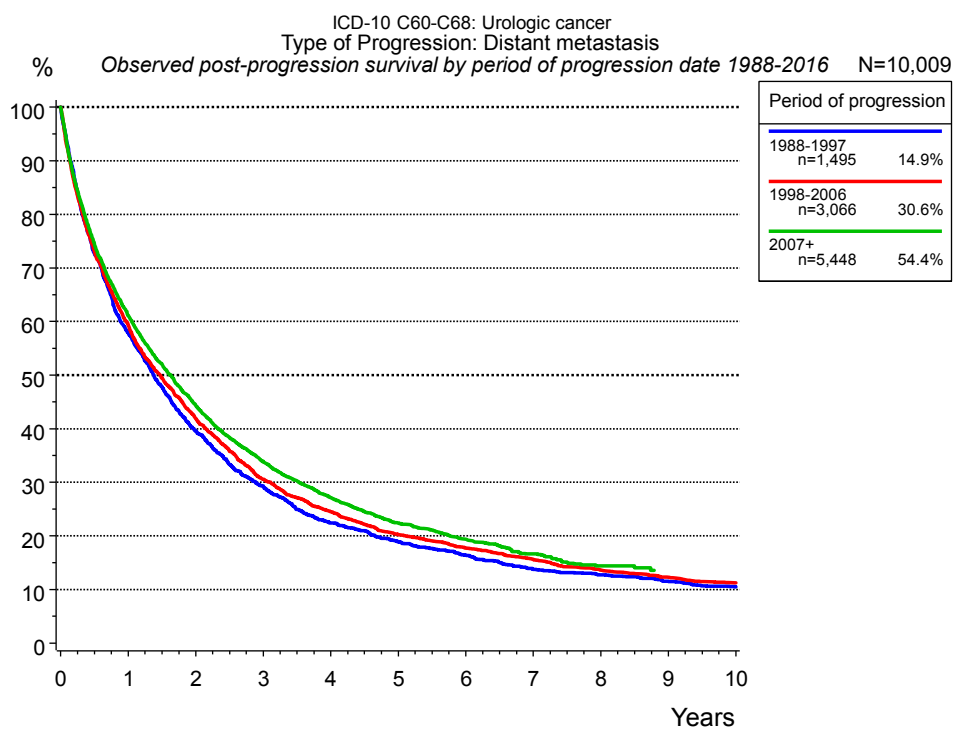


Figure 5e. Observed post-progression (distant metastasis) survival of 10,009 patients with urologic cancer diagnosed between 1988 and 2016 by period of progression.

Years	Period of progression		
	1988-1997 n=1,495 %	1998-2006 n=3,066 %	2007+ n=5,448 %
0	100.0	100.0	100.0
1	57.8	59.3	61.0
2	39.6	41.9	44.4
3	29.3	30.5	33.8
4	22.4	24.5	27.1
5	18.9	20.2	22.4
6	16.4	17.8	19.3
7	13.7	15.6	16.6
8	12.7	13.6	14.4
9	11.5	12.3	
10	10.4	11.2	

Table 5f. Observed post-progression (distant metastasis) survival of patients with urologic cancer for period 1988-2016 by period of progression (N=10,009).

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

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