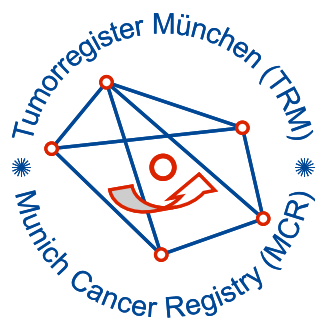


# Munich Cancer Registry



- ▶ Incidence and Mortality
- ▶ Selection Matrix
- ▶ Homepage
- ▶ *Deutsch*

## ICD-10 C23-C24: Gallbladder cancer

### Survival

Year of diagnosis	1988-1997	1998-2016
Patients	465	3,996
Diseases	465	4,002
Cases evaluated	415	2,609
Creation date	08/22/2018	
Export date	08/09/2018	
Population	4.81 m	



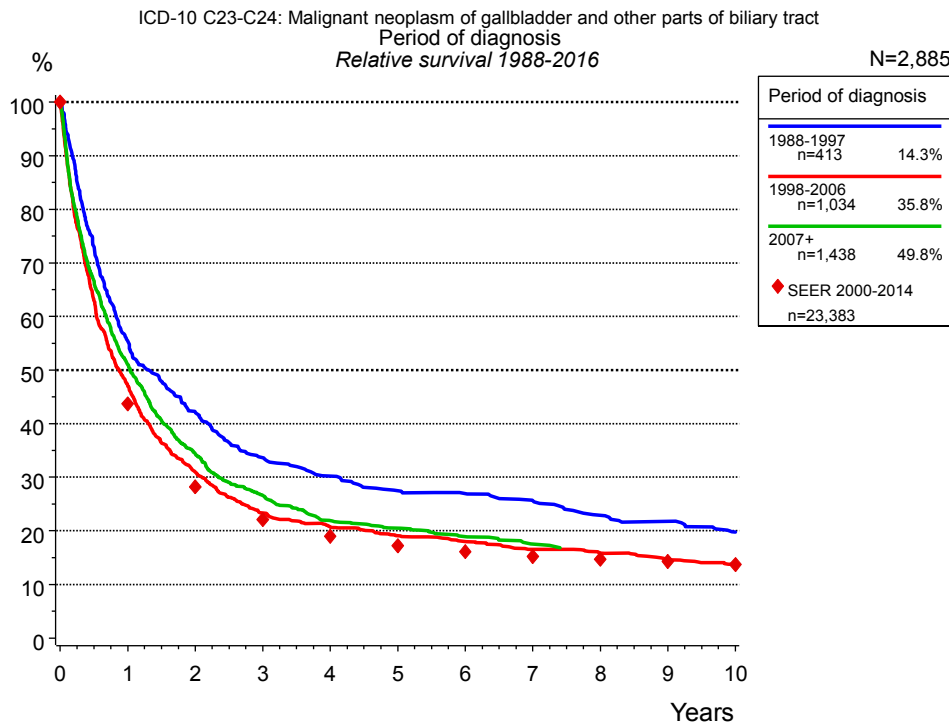
Munich Cancer Registry  
Cancer Registry Bavaria - Upper Bavaria Regional Center  
at Klinikum Grosshadern/IBE  
Marchioninstr. 15  
Munich, 81377  
Germany

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

<https://www.tumorregister-muenchen.de/en/facts/surv/sC2324E-ICD-10-C23-C24-Gallbladder-cancer-survival.pdf>

### Index of figures and tables

Fig./Tbl.		Page
1a	Relative survival by period of diagnosis (chart)	3
1b	Survival by period of diagnosis (table)	3
2a	Survival by sex (chart)	4
2b	Survival by sex (table)	4
2c	Conditional survival by sex (chart)	5
2d	Conditional survival by sex (table)	5
3a	Relative survival by age category (chart)	6
3b	Survival by age category (table)	6
4a	Relative survival by UICC 1992+ (chart)	7
4b	Survival by UICC 1992+ (table)	7
4c	Relative survival by TNM staging 2003+ (chart)	8
4d	Survival by TNM staging 2003+ (table)	8
5a	Time to first progression (chart)	9
5b	Time to first progression (table)	9
5c	Observed post-progression survival (chart)	11
5d	Observed post-progression survival (table)	11
5e	Observed post-progression survival by period of progression (chart)	12
5f	Observed post-progression survival by period of progression (table)	12



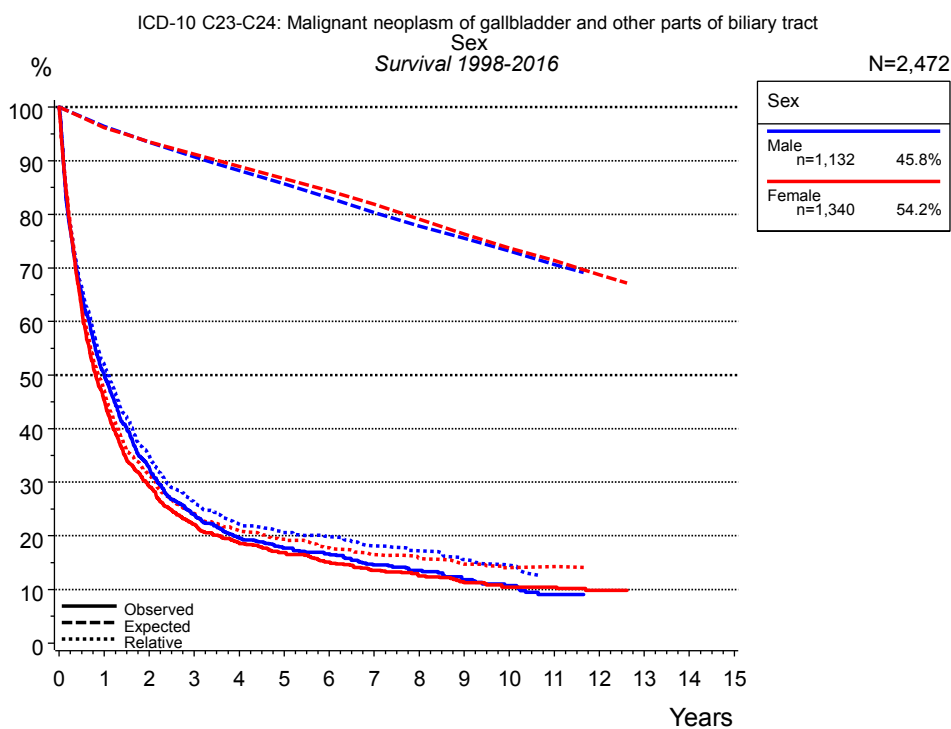
**Figure 1a.** Relative survival of patients with gallbladder cancer by period of diagnosis. Included in the evaluation are 2,885 cases diagnosed between 1988 and 2016.

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=413		1998-2006 n=1,034		2007+ n=1,438	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	53.6	55.4	45.2	47.0	49.3	51.0
2	39.6	42.2	28.8	31.0	32.3	34.4
3	30.8	33.6	21.2	23.3	24.4	26.6
4	26.9	30.2	18.3	20.7	19.5	21.9
5	23.8	27.5	16.4	19.1	17.9	20.5
6	22.7	27.0	15.2	18.0	16.1	18.9
7	20.8	25.6	13.4	16.6	14.3	17.5
8	18.2	22.9	12.4	15.9	13.6	16.5
9	16.8	21.7	11.0	14.6		
10	14.7	19.8	10.1	13.8		

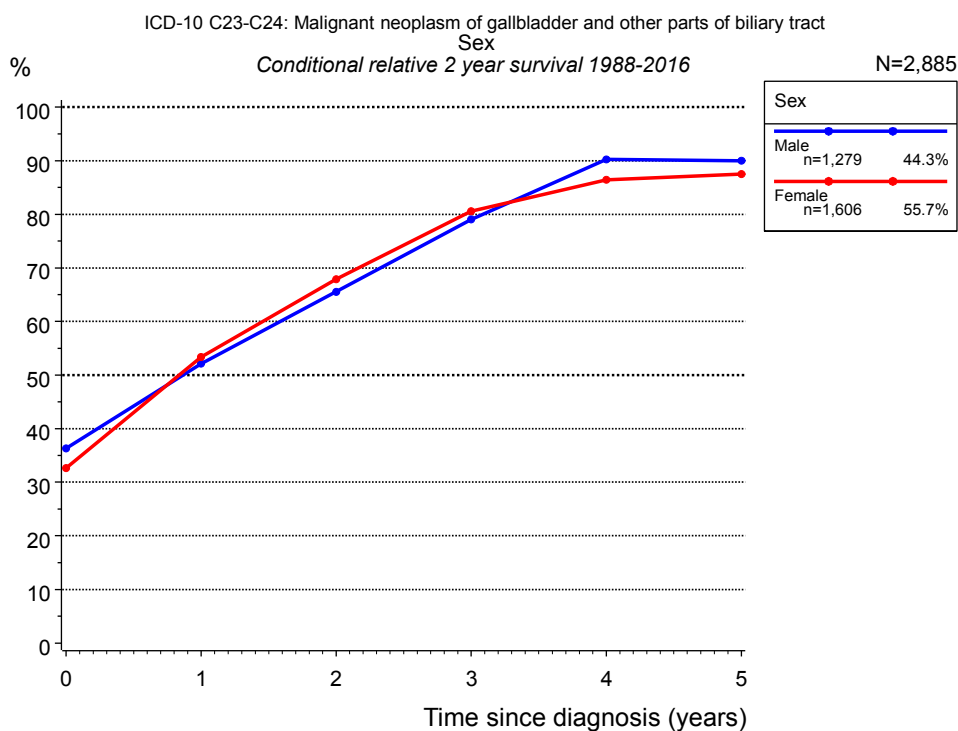
**Table 1b.** Observed (obs.) and relative (rel.) survival of patients with gallbladder cancer by period of diagnosis for period 1988-2016 (N=2,885).



**Figure 2a.** Survival of patients with gallbladder cancer by sex. Included in the evaluation are 2,472 cases diagnosed between 1998 and 2016.

Years	Sex			
	Male n=1,132		Female n=1,340	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	50.0	51.9	45.4	47.1
2	32.7	34.9	29.2	31.2
3	24.0	26.3	22.1	24.2
4	19.6	22.2	18.6	20.9
5	17.7	20.6	16.9	19.4
6	16.6	19.9	15.1	17.8
7	14.6	18.1	13.6	16.5
8	13.5	17.2	12.5	15.8
9	11.8	15.6	11.3	14.7
10	10.7	14.5	10.4	14.1
11	9.1	12.7	10.4	14.2
12			9.8	14.0

**Table 2b.** Observed (obs.) and relative (rel.) survival of patients with gallbladder cancer by sex for period 1998-2016 (N=2,472).

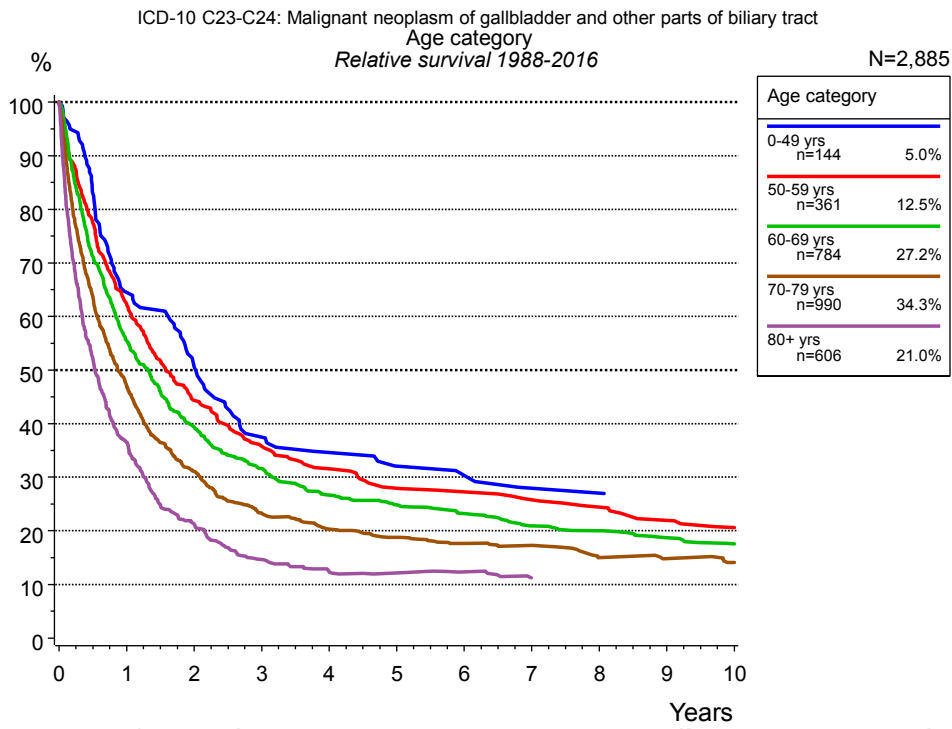


**Figure 2c.** Conditional relative 2-year survival of patients with gallbladder cancer by sex. For 2,885 of 2,885 cases diagnosed between 1988 and 2016 valid data could be obtained for this item.

Years	Sex		Sex	
	Male n	Cond. surv. % 2 yrs	Female n	Cond. surv. % 2 yrs
0	1,279	36.3	1,606	32.6
1	629	52.1	688	53.4
2	391	65.5	434	67.9
3	266	79.0	309	80.6
4	204	90.3	244	86.4
5	163	90.0	209	87.5

**Table 2d.** Conditional relative 2-year survival of patients with gallbladder cancer by sex for period 1988-2016 (N=2,885).

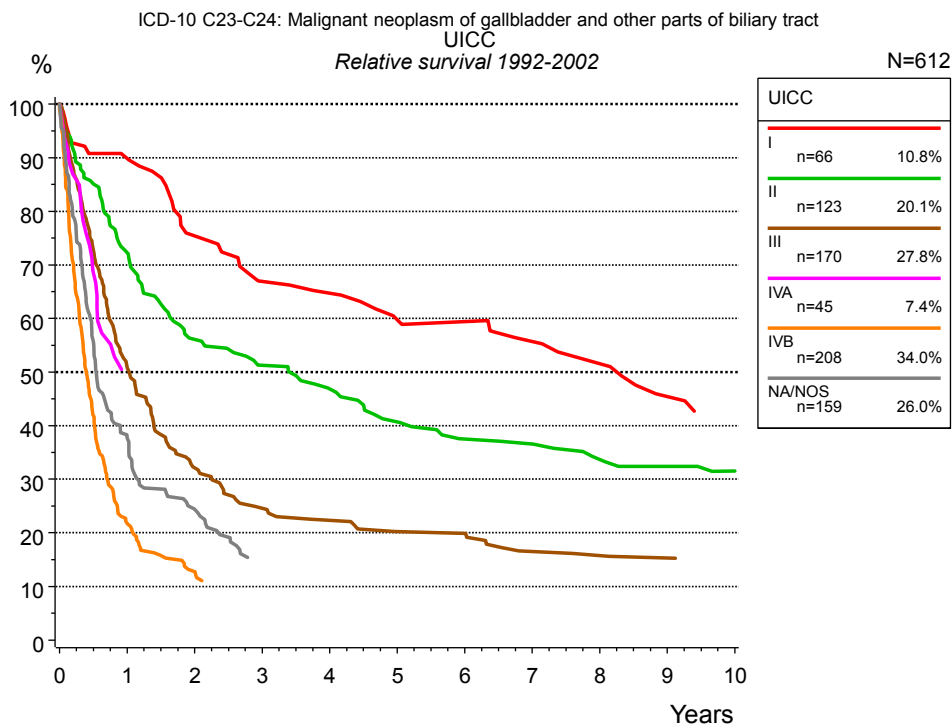
Conditional relative survival rates refer to the relative survival probability, in this case for 2 years after cancer diagnosis, compared to the age- and sex-matched population (=100 %) under the condition of being alive for a certain time period (x-axis in Figure 2a). The results illustrate to what 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 sex="Male", who are alive at least 3 years after cancer diagnosis, the conditional relative 2-year survival rate is 79.0% (n=266).



**Figure 3a.** Relative survival of patients with gallbladder cancer by age category. Included in the evaluation are 2,885 cases diagnosed between 1988 and 2016.

Years	Age category									
	0-49 yrs n=144		50-59 yrs n=361		60-69 yrs n=784		70-79 yrs n=990		80+ yrs n=606	
	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	64.6	64.4	61.8	62.1	54.7	55.5	45.6	47.1	32.9	36.5
2	50.4	50.5	43.8	44.3	38.3	39.3	29.1	31.1	17.3	21.2
3	37.9	37.4	35.1	35.8	30.4	31.6	21.2	23.3	10.9	14.7
4	34.5	34.6	31.0	31.6	25.2	26.7	17.8	20.3	8.1	12.3
5	31.7	32.1	27.3	27.9	23.0	24.8	15.7	18.8	7.3	12.1
6	30.7	30.3	26.5	27.3	21.2	23.2	14.1	17.6	6.5	12.3
7	27.6	28.0	24.6	25.8	18.6	21.0	13.2	17.3	5.1	11.2
8	27.6	27.0	23.2	24.4	17.6	20.0	10.6	15.0		
9			20.7	21.9	15.9	18.7	9.8	14.8		
10			19.1	20.6	14.6	17.6	8.7	14.1		

**Table 3b.** Observed (obs.) and relative (rel.) survival of patients with gallbladder cancer by age category for period 1988-2016 (N=2,885).

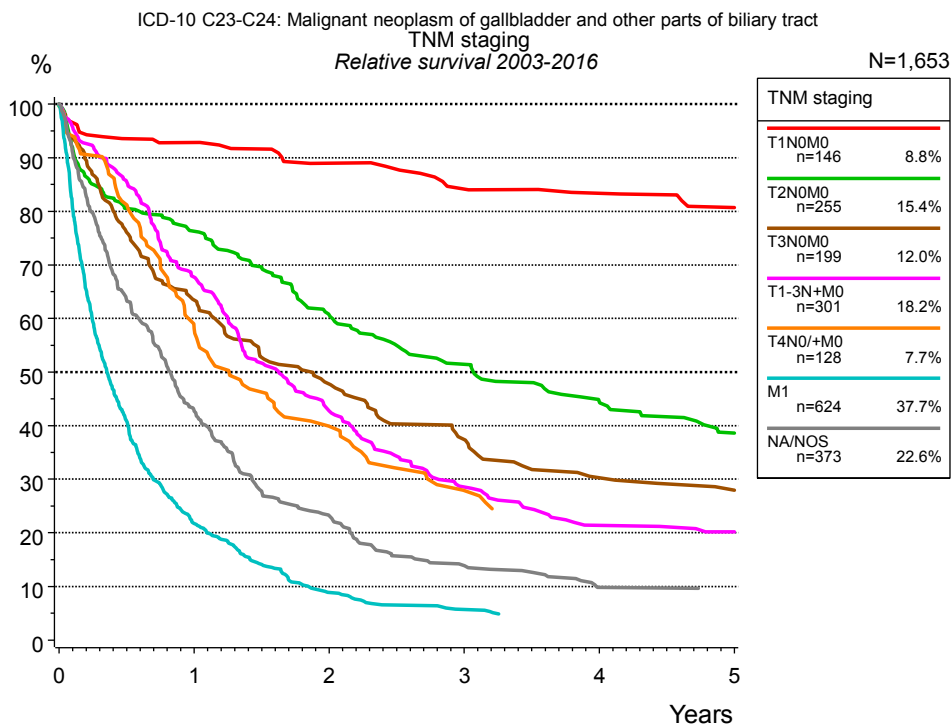


**Figure 4a.** Relative survival of patients with gallbladder cancer by UICC. For 622 of 771 cases diagnosed between 1992 and 2002 valid data could be obtained for this item. For a total of 612 cases an evaluable classification was established. The grey line represents the subgroup of 159 patients with missing values regarding UICC (20.6 % of 771 patients, the percent values of all other categories are related to n=612).

Due to substantial changes in stage classification schemes long-term survival statistics over decades could not be created.

Years	UICC											
	I n=66		II n=123		III n=170		IVA n=45		IVB n=208		NA/NOS n=159	
	obs. %	rel. %	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	100.0	100.0
1	87.9	89.9	70.1	72.3	49.4	50.8			21.4	21.8	35.9	37.8
2	71.2	75.4	52.5	56.1	30.9	32.1			12.4	12.7	21.8	24.4
3	60.6	66.9	46.6	51.3	23.4	24.6					13.3	15.0
4	57.6	64.7	41.5	46.8	20.9	22.3						
5	51.5	59.8	35.6	40.7	18.4	20.2						
6	49.9	59.4	31.4	37.5	18.4	19.9						
7	45.2	55.7	30.5	36.6	14.6	16.5						
8	40.6	51.6	27.0	33.7	13.9	15.8						
9	34.3	45.4	25.3	32.4	13.3	15.3						
10			23.5	31.5								

**Table 4b.** Observed (obs.) and relative (rel.) survival of patients with gallbladder cancer by UICC for period 1992-2002 (N=612).



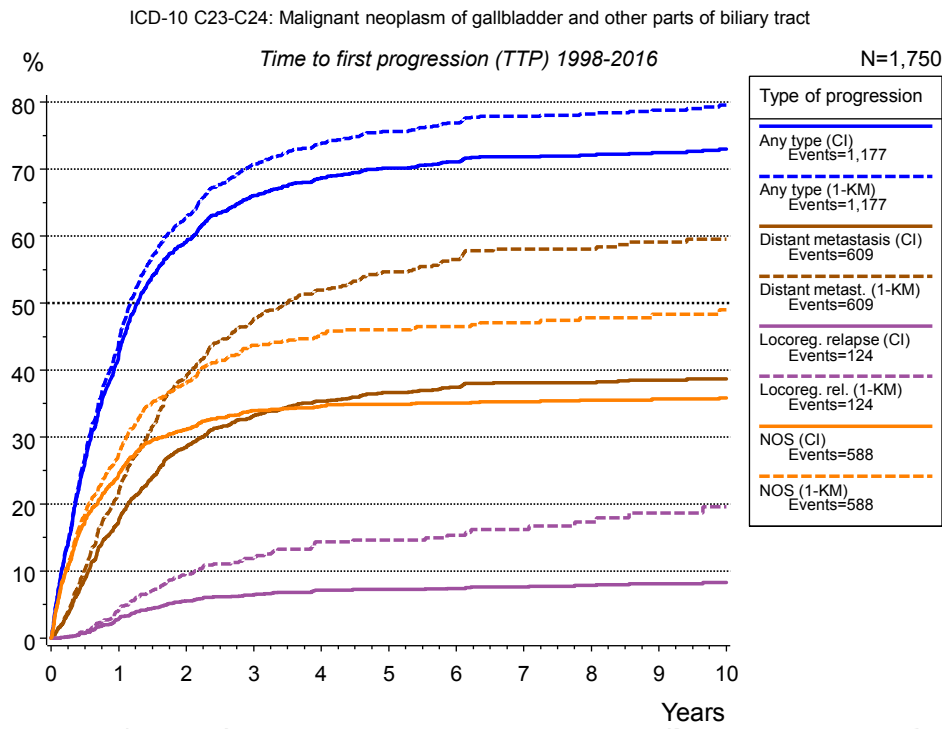
**Figure 4c.** Relative survival of patients with gallbladder cancer by TNM staging. For 1,678 of 2,026 cases diagnosed between 2003 and 2016 valid data could be obtained for this item. For a total of 1,653 cases an evaluable classification was established. The grey line represents the subgroup of 373 patients with missing values regarding TNM staging (18.4 % of 2,026 patients, the percent values of all other categories are related to n=1,653).

Due to substantial changes in stage classification schemes long-term survival statistics over decades could not be created.

Years	TNM staging													
	T1N0M0 n=146		T2N0M0 n=255		T3N0M0 n=199		T1-3N+M0 n=301		T4N0/+M0 n=128		M1 n=624		NA/NOS n=373	
	obs. %	rel. %	obs. %	rel. %	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	100.0	100.0	100.0	100.0
1	90.8	92.8	73.6	76.3	61.6	63.5	66.0	67.7	56.7	58.0	21.0	21.7	40.4	42.7
2	84.5	89.0	56.7	60.7	45.5	47.8	40.5	42.7	38.3	39.9	8.4	8.8	21.0	23.2
3	78.3	84.2	47.0	51.4	35.0	37.4	26.5	28.6	26.2	27.9	5.3	5.7	12.3	13.9
4	75.4	83.4	39.5	44.4	27.5	30.3	19.3	21.4					8.2	9.8
5	71.4	80.7	33.3	38.6	25.1	28.0	17.8	20.2						

**Table 4d.** Observed (obs.) and relative (rel.) survival of patients with gallbladder cancer by TNM staging for period 2003-2016 (N=1,653).



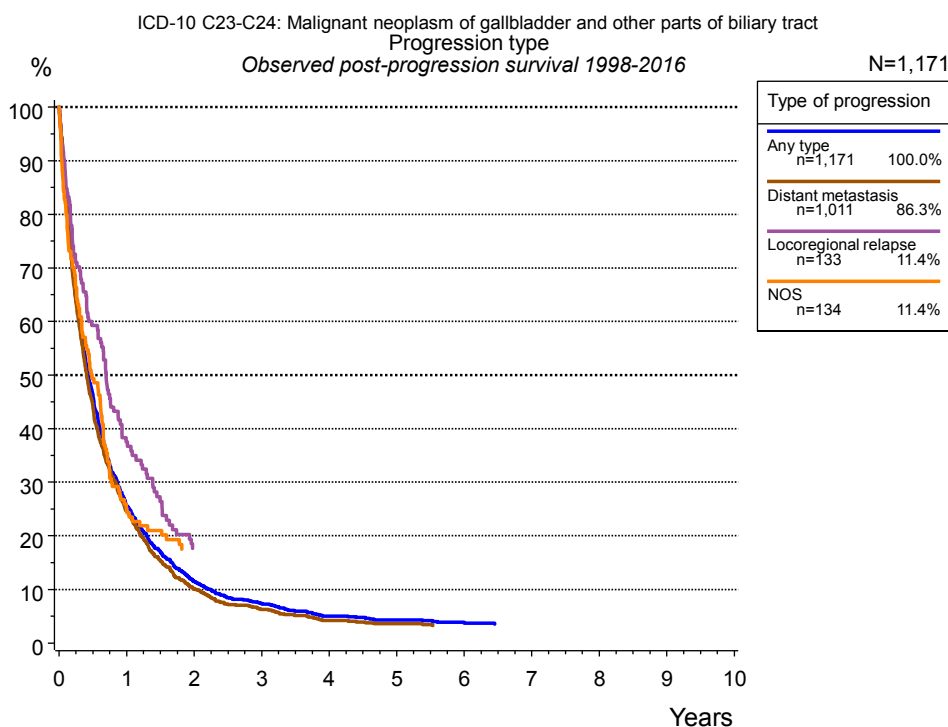


**Figure 5a.** Time to first progression of 1,750 patients with gallbladder cancer diagnosed between 1998 and 2016 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Years	Type of progression						
	Any type (CI)	Any type (1-KM)	Distant metastasis (CI)	Distant metast. (1-KM)	Locoreg. relapse (CI)	Locoreg. rel. (1-KM)	NOS (CI)
	n=1,750 %	n=1,750 %	n=1,750 %	n=1,750 %	n=1,750 %	n=1,750 %	n=1,750 %
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	42.3	44.2	17.5	21.7	2.8	4.1	24.5
2	59.2	62.8	28.5	39.1	5.5	9.6	31.1
3	66.1	70.8	33.2	47.5	6.4	11.9	33.9
4	68.6	73.8	35.4	52.0	7.1	14.3	34.6
5	70.1	75.6	36.6	54.7	7.2	14.6	34.9
6	71.1	76.9	37.4	56.5	7.4	15.4	35.1
7	71.9	77.9	38.1	58.1	7.6	16.2	35.3
8	72.1	78.2	38.1	58.1	7.8	17.3	35.5
9	72.5	78.8	38.5	59.1	8.1	18.7	35.7
10	73.0	79.5	38.7	59.5	8.3	19.6	35.8

Type of progression	
<i>cont'd</i>	NOS (1-KM) n=1,750
Years	%
0	0.0
1	27.6
2	38.0
3	43.7
4	45.3
5	46.0
6	46.5
7	47.1
8	47.8
9	48.3
10	49.0

**Table 5b.** Time to first progression of patients with gallbladder cancer for period 1998-2016 (N=1,750).

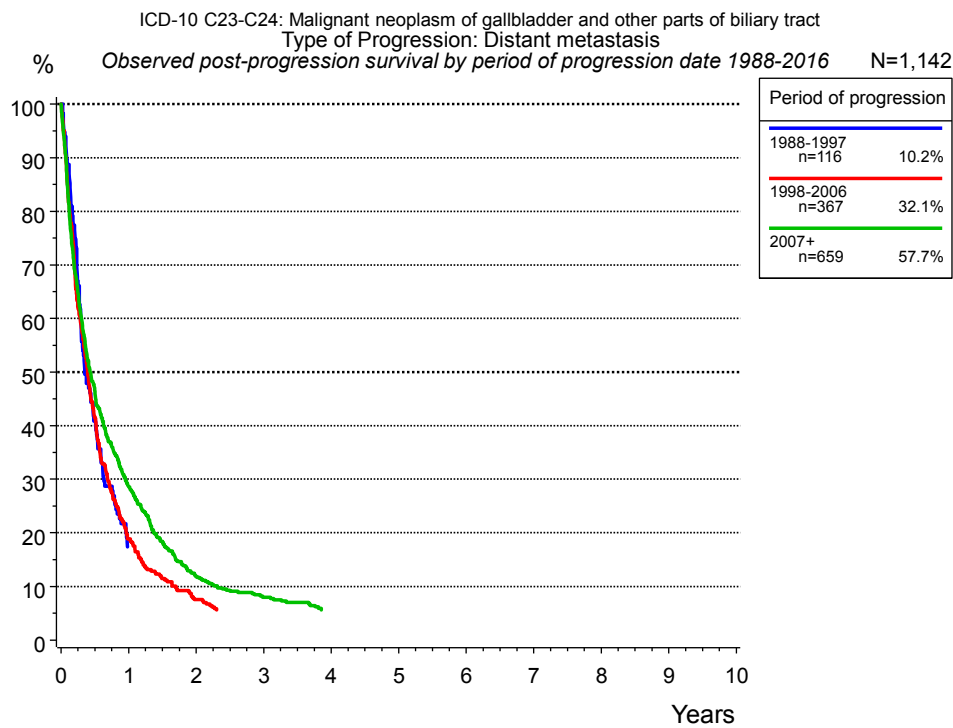


**Figure 5c.** Observed post-progression survival of 1,171 patients with gallbladder cancer diagnosed between 1998 and 2016. These 1,171 patients with documented progression events during their course of disease represent 47.5 % of the totally 2,463 evaluated cases (incl. M1, n=713, 28.9 %). Patients with cancer relapse documented via death certificates only were excluded (n=719, 29.2 %). 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=1,171 %	Distant metastasis n=1,011 %	Locoregional relapse n=133 %	NOS n=134 %
0	100.0	100.0	100.0	100.0
1	25.7	24.5	37.5	25.1
2	11.5	10.1		
3	7.4	6.3		
4	5.0	4.2		
5	4.3	3.6		
6	3.7			

**Table 5d.** Observed post-progression survival of patients with gallbladder cancer for period 1998-2016 (N=1,171).



**Figure 5e.** Observed post-progression (distant metastasis) survival of 1,142 patients with gallbladder cancer diagnosed between 1988 and 2016 by period of progression.

Years	Period of progression		
	1988-1997 n=116 %	1998-2006 n=367 %	2007+ n=659 %
0	100.0	100.0	100.0
1	17.4	18.9	28.5
2		7.5	11.9
3			8.0

**Table 5f.** Observed post-progression (distant metastasis) survival of patients with gallbladder cancer for period 1988-2016 by period of progression (N=1,142).

## 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 C23-C24: Gallbladder cancer [Internet]. 2018 [updated 2018 Aug 22; cited 2018 Oct 1]. Available from: <https://www.tumorregister-muenchen.de/en/facts/surv/sC2324E-ICD-10-C23-C24-Gallbladder-cancer-survival.pdf>

## Copyright

The content of the public web site provided by the Munich Cancer Registry is available worldwide and free of charge. All documents are free to download, utilize, copy, print-out and distribute, providing that the MCR is referenced.

## Disclaimer

The Munich Cancer Registry reserves the right to not be responsible for the topicality, correctness, completeness or quality of the information provided. Liability claims regarding damage caused by the use of any information provided, including any kind of information which is incomplete or incorrect, will therefore be rejected.