

**TABLE 1. Demographic Characteristics of Patients With Gallbladder Tumors by Decade: 18 SEER Registries, 1973-2010**

Patient Characteristics	No. of Patients (%)				
	All Patients, N=17441	1973-1982, N=2807	1983-1992, N=2929	1993-2002, N=4979	2003-2010, N=6726
<b>Gender</b>					
Men	4899 (28.09)	772 (27.50)	778 (26.56)	1377 (27.66)	1972 (29.32)
Women	12542 (71.91)	2035 (72.50)	2151 (73.44)	3602 (72.34)	4754 (70.68)
<b>Race</b>					
Non-Hispanic White	11100 (63.64)	2231 (79.48)	2149 (73.37)	2935 (58.95)	3785 (56.27)
Hispanic	3006 (17.24)	252 (8.98)	294 (10.04)	1038 (20.85)	1422 (21.14)
Black	1497 (8.58)	129 (4.60)	183 (6.25)	422 (8.48)	763 (11.34)
Other <sup>a</sup>	1838 (10.54)	195 (6.95)	303 (10.34)	584 (11.73)	756 (11.24)
<b>Age, years</b>					
<50	1161 (6.66)	105 (3.74)	130 (4.44)	390 (7.83)	536 (7.97)
50-59	2278 (13.06)	325 (11.58)	325 (11.10)	609 (12.23)	1019 (15.15)
60-69	4004 (22.96)	675 (24.05)	689 (23.52)	1101 (22.11)	1539 (22.88)
70-79	5335 (30.59)	951 (33.88)	985 (33.63)	1576 (31.65)	1823 (27.10)
80+	4663 (26.74)	751 (26.75)	800 (27.31)	1303 (26.17)	1809 (26.90)
<b>Marital Status*</b>					
Married	8174 (48.70)	1267 (46.55)	1359 (47.62)	2321 (48.65)	3227 (50.12)
Single	1823 (10.86)	182 (6.69)	233 (8.16)	564 (11.82)	844 (13.11)
Other <sup>b</sup>	6788 (40.44)	1273 (46.77)	1262 (44.22)	1886 (39.53)	2367 (36.77)
<b>Geographic Region</b>					
Atlantic	2935 (16.83)	474 (16.89)	434 (14.82)	720 (14.46)	1307 (19.43)
Pacific/West	9001 (51.61)	1184 (42.18)	1350 (46.09)	2908 (58.41)	3559 (52.91)
MidWest	4008 (22.98)	1073 (38.23)	1021 (34.86)	950 (19.08)	964 (14.33)
South	1497 (8.58)	76 (2.71)	124 (4.23)	401 (8.05)	896 (13.32)

**a Other races included Asian or Pacific Islander, American Indian, Alaska Native, or unspecified.**

**b Other Marital Status included Divorced, Widowed, Separated.**

**\* All unspecified or missing cases were excluded (N=656)**

**TABLE 2. Clinicopathologic Characteristics of Gallbladder Tumors by Decade: 18 SEER Registries, 1973-2010**

Clinicopathologic Characteristics	No. of Patients (%)				
	All Patients, N=17441	1973-1982, N=2807	1983-1992, N=2929	1993-2002, N=4979	2003-2010, N=6726
<b>Histologic Type</b>					
Non-papillary features <sup>a</sup>	15066 (86.38)	2482 (88.42)	2587 (88.32)	4321 (86.78)	5676 (84.39)
Papillary features <sup>b</sup>	976 (5.60)	161 (5.74)	164 (5.60)	246 (4.94)	405 (6.02)
Squamous features <sup>c</sup>	657 (3.77)	126 (4.49)	128 (4.37)	187 (3.76)	216 (3.21)
Neuroendocrine features <sup>d</sup>	278 (1.59)	11 (0.39)	20 (0.68)	78 (1.57)	169 (2.51)
Other <sup>e</sup>	464 (2.66)	27 (0.96)	30 (1.02)	147 (2.95)	260 (3.87)
<b>Behavior</b>					
Non-invasive <sup>f</sup>	686 (3.93)	67 (2.39)	118 (4.03)	198 (3.98)	303 (4.50)
Invasive	16755 (96.07)	2740 (97.61)	2811 (95.97)	4781 (96.02)	6423 (95.50)
<b>Stage</b>					
In-situ	686 (3.93)	67 (2.39)	118 (4.03)	198 (3.98)	303 (4.50)
Localized	4725 (27.09)	603 (21.48)	756 (25.81)	1426 (28.64)	1940 (28.84)
Regional	4671 (26.78)	880 (31.35)	849 (28.99)	1464 (29.40)	1478 (21.97)
Distant	6402 (36.71)	1091 (38.87)	1057 (36.09)	1598 (32.09)	2656 (39.49)
Unstaged	957 (5.49)	166 (5.91)	149 (5.09)	293 (5.88)	349 (5.19)
<b>Grade</b>					
Well Differentiated	1747 (10.02)	304 (10.83)	346 (11.81)	466 (9.36)	631 (9.38)
Moderately Differentiated	4076 (23.37)	341 (12.15)	687 (23.46)	1316 (26.43)	1732 (25.75)
Poorly Differentiated	4753 (27.25)	575 (20.48)	819 (27.96)	1544 (31.01)	1815 (26.98)
Undifferentiated	489 (2.80)	127 (4.52)	87 (2.97)	131 (2.63)	144 (2.14)
Unknown	6376 (36.56)	1460 (52.01)	990 (33.80)	1522 (30.57)	2404 (35.74)
<b>Surgery</b>					
Yes	10897 (62.48)	2746 (97.83)	2674 (91.29)	3621 (72.73)	1856 (27.59)
No	6544 (37.52)	61 (2.17)	255 (8.71)	1358 (27.27)	4870 (72.41)
<b>Vital status</b>					
Alive	2490 (14.28)	41 (1.46)	119 (4.06)	511 (10.26)	1819 (27.04)
Death due to Gallbladder Cancer	8673 (49.73)	1801 (64.23)	1678 (57.29)	2528 (50.77)	2664 (39.61)
Death due to Pancreatic or Biliary cancer	2432 (13.94)	274 (9.76)	356 (12.15)	735 (14.76)	1067 (15.86)
Death due to Other causes	3846 (22.05)	689 (24.55)	776 (26.49)	1205 (24.20)	1176 (17.48)

**a Non-papillary: Adenocarcinoma, Carcinoma NOS with non-papillary f**

**b Papillary: Carcinoma arising from pre-invasive lesions, adenoma, with papillary features**

**c Squamous: Squamous cell carcinoma and adenosquamous carcinomas**

**d Neuroendocrine tumors**

**e Other: other malignant carcinomas and sarcomas**

**f Non-invasive features characterize in-situ behavior**

**TABLE 3. The Histopathologic Characteristics of Gallbladder Tumors by Stage; 18 SEER Registries, 1973-2010**

Clinicopathologic Characteristics	No. of Cases (%)					
	All GBC Cases N=17441	In-Situ N=686	Localized N=4725	Regional N=4671	Distant N=6402	Unstaged N=957
<b>Histologic Type</b>						
<b>Non-papillary features</b> <sup>a</sup>	15066 (86.38)	535 (77.99)	3871 (81.93)	4161 (89.08)	5827 (91.02)	672 (70.22)
<b>Papillary features</b> <sup>b</sup>	976 (5.60)	148 (21.57)	582 (12.32)	125 (2.68)	116 (1.81)	5 (0.52)
<b>Squamous features</b> <sup>c</sup>	657 (3.77)	2 (0.29)	143 (3.03)	258 (5.52)	231 (3.61)	23 (2.40)
<b>Neuroendocrine features</b> <sup>d</sup>	278 (1.59)	1 (0.15)	101 (2.14)	66 (1.41)	101 (1.58)	9 (0.94)
<b>Other</b> <sup>e</sup>	464 (2.66)	0 (0.00)	28 (0.59)	61 (1.31)	127 (1.98)	248 (25.91)

**a Non-papillary: Adenocarcinoma, Carcinoma NOS with non-papillary features**

**b Papillary: Carcinoma arising from pre-invasive lesions, adenoma, with papillary features**

**c Squamous: Squamous cell carcinoma and adenosquamous carcinomas**

**d Neuroendocrine tumors**

**e Other: other malignant carcinomas and sarcomas**

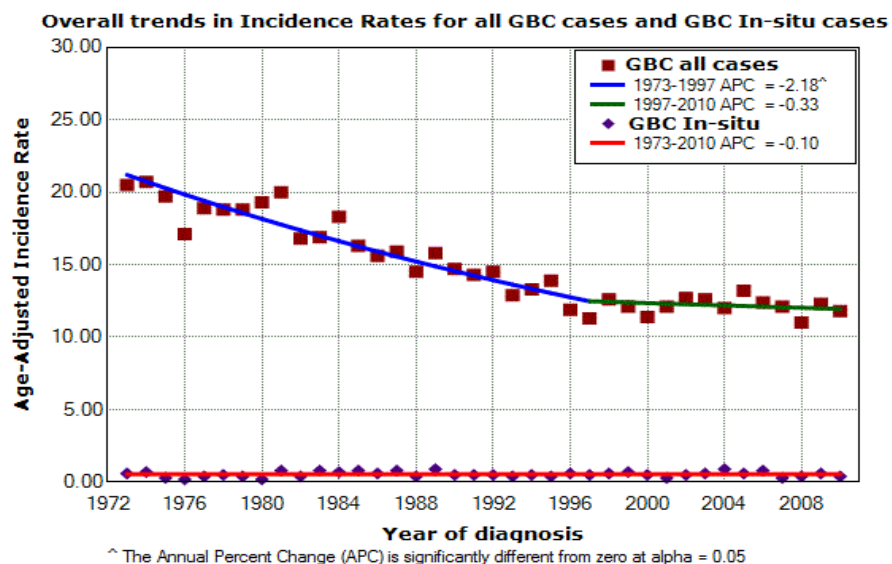
**TABLE 4. Age-adjusted Incidence Rates & Incidence Rate Ratios of Gallbladder Tumors by Sex, Race & Stage.  
(9 Surveillance, Epidemiology, and End Results Registries, 1973-2010)**

<b>Population Groups</b>	<b>Rate (95% CI)*</b>	<b>Rate ratio (95% CI, p.value)</b>
<b>All groups</b>	14.30 (14.10, 14.60)	N/A
<b>Gender</b>		
<b>Men (N=3440)</b>	10.10 (9.80, 10.50)	Reference
<b>Women (N=8415)</b>	17.50 (17.10, 17.90)	1.73 (1.66, 1.80, 0.00)
<b>Race</b>		
<b>White (N=9733)</b>	13.90 (13.60, 14.10)	Reference
<b>Black (N=888)</b>	14.20 (13.20, 15.20)	1.02 (0.95, 1.10, 0.55)
<b>Other<sup>a</sup> (N=1234)</b>	19.20 (18.1, 20.3)	1.38 (1.30, 1.47, 0.00)
<b>Stage</b>		
<b>In-situ (N=454)</b>	0.5 (0.5, 0.6)	Reference
<b>Localized (N=3179)</b>	3.9 (3.7, 4.0)	7.12 (6.45, 7.88, 0.00)
<b>Regional (N=3246)</b>	3.9 (3.8, 4.1)	7.23 (6.55, 8.00, 0.00)
<b>Distant (N=4307)</b>	5.2 (5.0, 5.3)	9.57 (8.69, 10.57, 0.00)
<b>Unstaged (N=669)</b>	0.8 (0.8, 0.9)	1.52 (1.35, 1.72, 0.00)

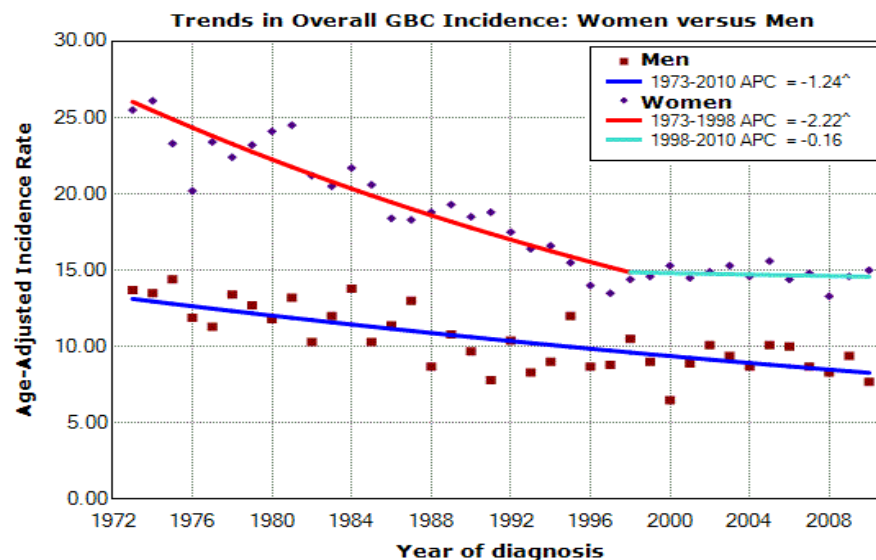
**a Other races included Asian or Pacific Islander, American Indian, Alaska Native, or unspecified.**

**\* Rates are per 1,000,000 and age-adjusted to the 2000 US population**

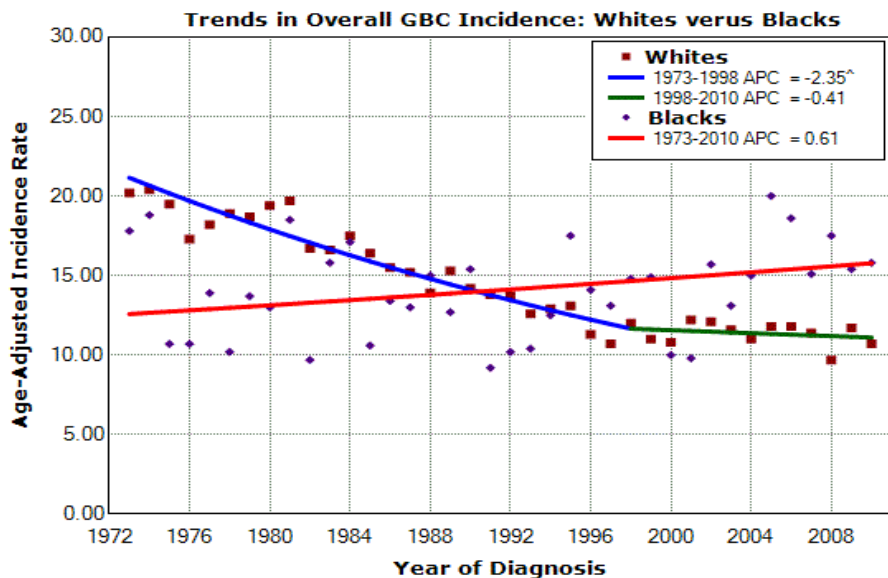
Figure 1 (A-D). Trends in observed Incidence of GBC tumors (1973-2010)



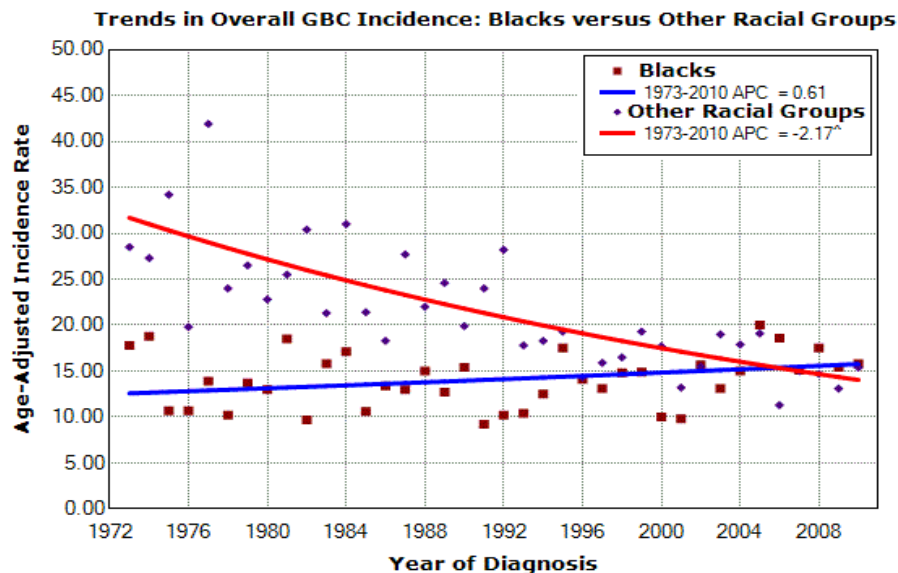
A. Trends in Overall GBC & GB-CIS Incidence (1973-2010)



B. Overall GBC Incidence in Men vs Women



C. GBC Incidence in Whites vs. Blacks



D. GBC Incidence in Blacks vs. Other Racial Groups

**TABLE 5. The 5 and 10-year Survival or patients with Gallbladder Tumors by Sex, Race, Marital Status and Stage.  
(18 Surveillance, Epidemiology, and End Results Registries, 1973-2010)**

Patient & Clinical Characteristics	Survival Interval	OS (95% CI)*	RS (95% CI)**
<b>All groups (N=17264)</b>	5-year	14.50 (13.90, 15.10)	17.60 (17.00, 18.30)
	10-year	9.70 (9.20, 10.30)	14.80 (14.00, 15.60)#
<b>Gender</b>			
<b>Men (N=4858)</b>	5-year	13.70 (12.70, 14.80)	17.10 (15.80, 18.40)
	10-year	8.70 (7.80, 9.70)	13.60 (12.10, 15.10)#
<b>Women (N=12406)</b>	5-year	14.80 (14.10, 15.50)	17.90 (17.10, 18.70)
	10-year	10.10 (9.50, 10.80)	15.20 (14.30, 16.20)#
<b>Race</b>			
<b>White (N=13921)</b>	5-year	14.10 (13.40, 14.70)	17.30 (16.60, 18.10)
	10-year	9.50 (8.90, 10.00)	14.90 (12.00, 15.80)#
<b>Black (N=1498)</b>	5-year	13.20 (11.30, 15.10)	15.80 (13.60, 18.10)
	10-year	7.50 (5.90, 9.40)	11.00 (8.60, 13.70)#
<b>Other<sup>a</sup> (N=1845)</b>	5-year	19.10 (17.20, 21.20)	21.30 (19.10, 23.50)#
	10-year	13.40 (11.60, 15.30)	16.90 (14.60, 19.20)#
<b>Marital Status</b>			
<b>Married (N=8136)</b>	5-year	16.70 (15.90, 17.60)	19.40 (18.40, 20.40)
	10-year	12.10 (11.30, 13.00)	16.90 (15.70, 18.00)#
<b>Single (N=1812)</b>	5-year	15.30 (13.50, 17.20)	17.30 (15.30, 19.50)
	10-year	10.40 (8.70, 12.30)	13.10 (11.0, 15.40)#
<b>Other<sup>b</sup> (N=7316)</b>	5-year	11.90 (11.10, 12.70)	15.70 (14.70, 16.80)
	10-year	7.00 (6.30, 7.70)	12.60 (11.40, 13.90)#
<b>Histology</b>			
<b>Non-Papillary (N=14871)</b>	5-year	12.80 (12.20, 13.40)	15.60 (14.90, 16.30)
	10-year	8.40 (7.90, 9.00)	13.00 (12.20, 13.80)#
<b>Papillary (N=972)</b>	5-year	44.50 (27.30, 34.50)	54.00 (49.70, 58.10)
	10-year	30.80 (27.30, 34.50)	46.50 (41.10, 56.70)#
<b>Squamous Cell (N=656)</b>	5-year	6.60 (4.70, 8.80)	7.30 (5.20, 9.70)#
	10-year	4.90 (3.30, 7.00)	6.10 (4.10, 8.60)#
<b>Neuroendocrine (N=274)</b>	5-year	31.70 (25.70, 37.80)	35.30 (28.60, 42.00)#
	10-year	24.40 (18.00, 31.50)	30.50 (22.30, 39.10)#
<b>Other (N=381)</b>	5-year	5.10 (3.10, 7.80)	6.60 (4.00, 10.20)#
	10-year	3.00 (1.40, 5.40)	4.30 (2.00, 7.90)#
<b>Stage</b>			
<b>In-situ (N=685)</b>	5-year	72.10 (68.30, 75.60)	87.40 (82.20, 91.10)
	10-year	53.20 (48.50, 57.70)	79.40 (71.60, 85.30)#
<b>Localized (N=4711)</b>	5-year	32.30 (30.90, 33.80)	39.80 (38.00, 41.60)
	10-year	21.80 (20.40, 23.20)	33.90 (31.80, 36.10)#
<b>Regional (N=4661)</b>	5-year	5.80 (5.10, 6.50)	6.80 (6.00, 7.70)#
	10-year	3.40 (2.80, 4.00)	4.90 (4.00, 5.80)#
<b>Distant (N=6346)</b>	5-year	1.70 (1.30, 2.10)	2.00 (1.50, 2.40)#
	10-year	1.00 (0.70, 1.40)	1.50 (1.00, 2.00)#
<b>Unstaged (N=860)</b>	5-year	8.90 (6.90, 11.00)	11.40 (8.90, 14.10)
	10-year	4.30 (2.90, 6.20)	6.70 (4.50, 9.40)#

**a** Other races included Asian or Pacific Islander, American Indian, Alaska Native, or unspecified.

**b** Other Marital Status included Divorced, Widowed, Separated.

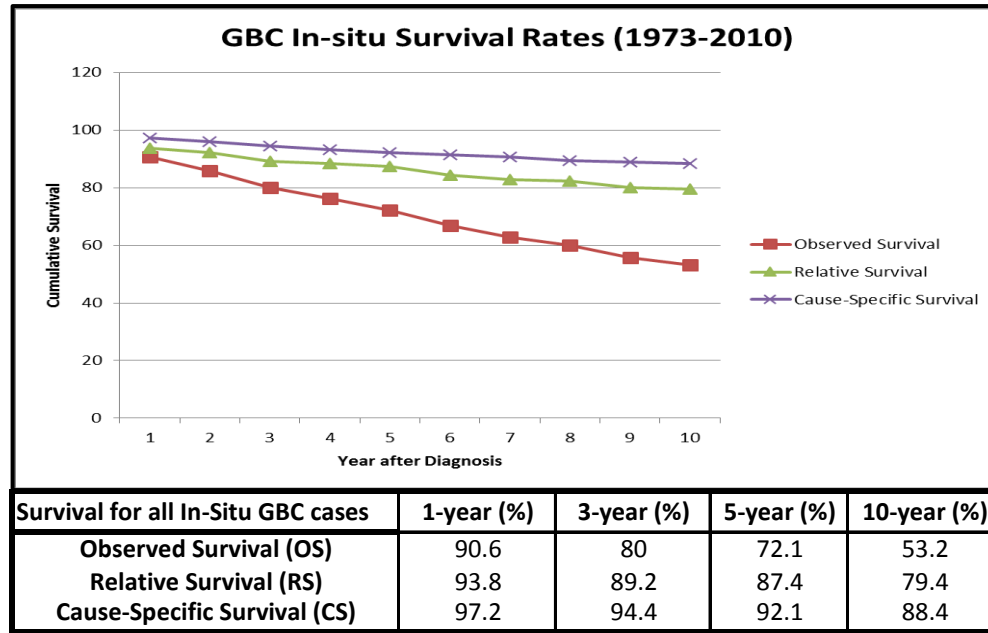
\*OS = Observed Survival, percent of patients surviving beyond a given interval

\*\*RS = Relative Survival, OS of gallbladder cancer patients divided by the expected survival in population with the same age, race & gender characteristics.

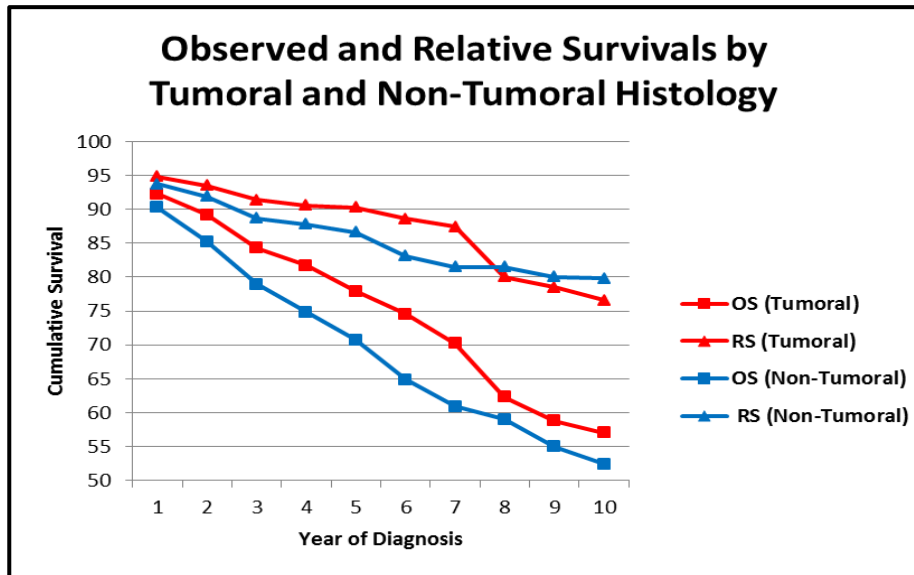
# = Relative survival increased from a prior interval and has been adjusted.

Figure 2 (A-C). Survival Rates for all GB-CIS cases, overall and by histology (1973-2010)

A.



B.



C.

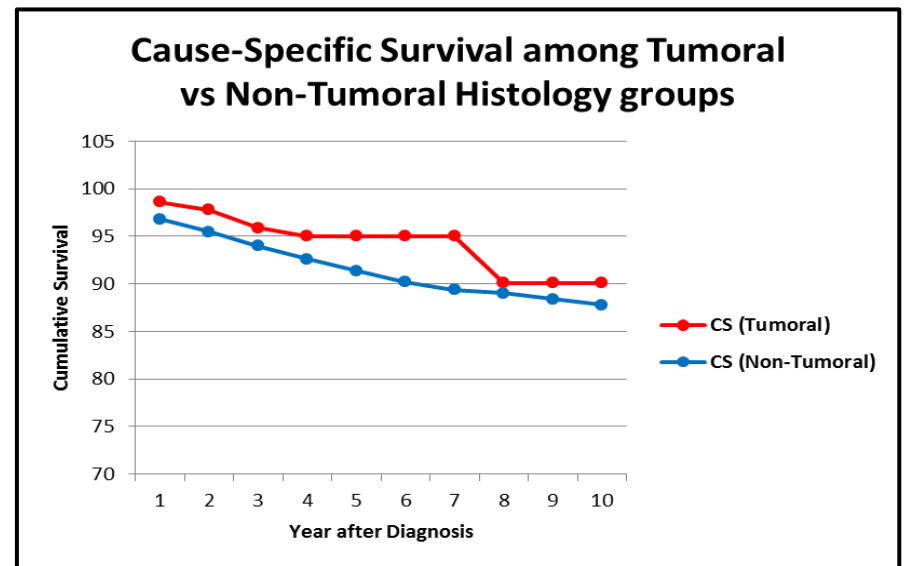
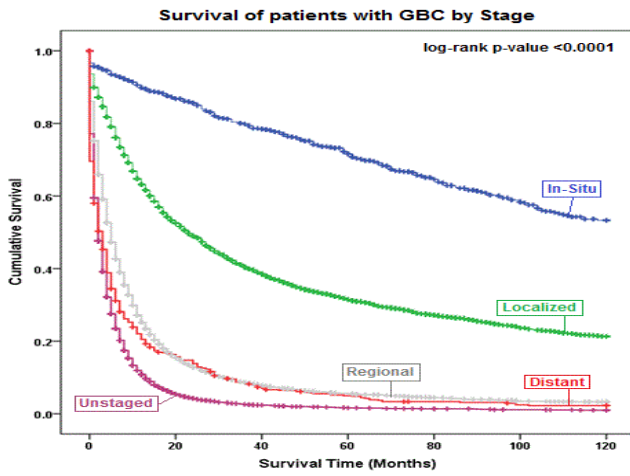
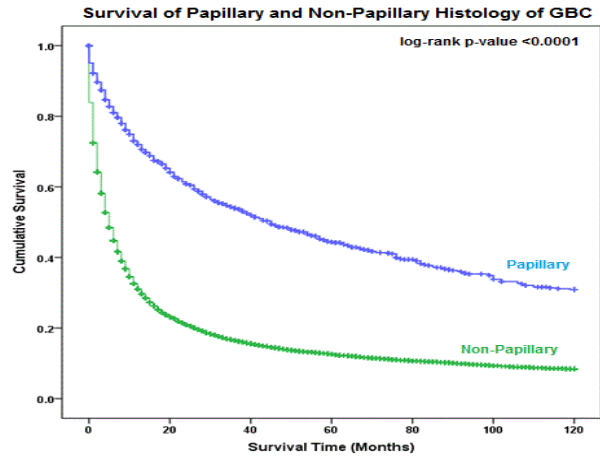


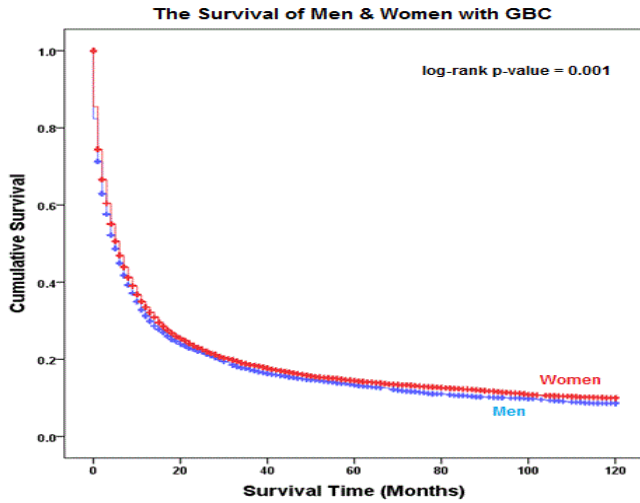
Figure 3 (A-E). Kaplan-Meier (K-M) Survival Curves for GBC cases (1973-2010)



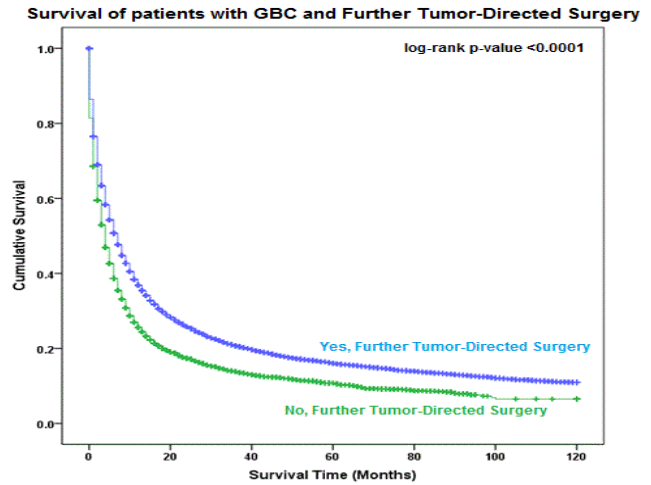
A. K-M Survival Curves for GBC cases by Stage



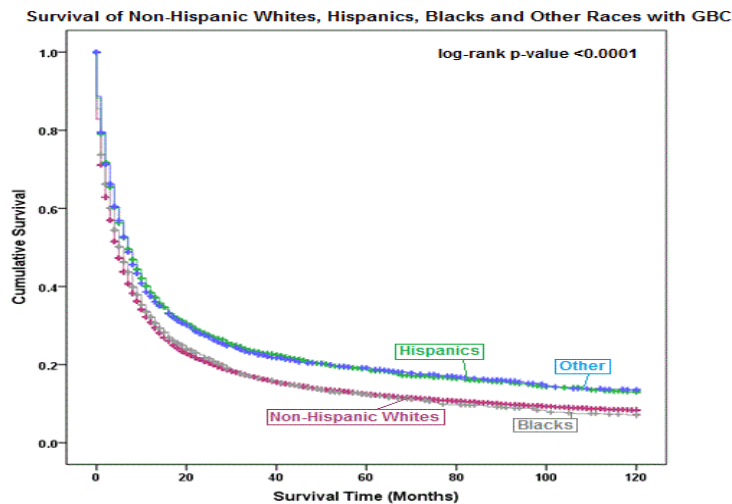
B. K-M Survival Curves for GBC cases by Histology



C. K-M Survival Curves for GBC cases by Gender



D. K-M Survival Curves for Further Surgery



E. K-M Survival Curves for GBC cases by Race/ethnicity



**Table 6. 10-Year Survival Cox Multivariate Regression Parameters for all GBC tumors (1973-2010)**

Covariate	Hazard Ratio (HR)	95% CI for HR		
		Lower	Upper	
<b>Age<sup>a</sup></b>				
	50-59	1.22	1.12	1.34
	60-69	1.44	1.32	1.57
	70-79	1.73	1.59	1.88
	80+	2.42	2.22	2.64
<b>Female Sex<sup>b</sup></b>	0.88	0.85	0.92	
<b>Race/Ethnicity<sup>c</sup></b>				
	Non-Hispanic Black	1.09	1.02	1.16
	Hispanic	0.95	0.9	1
	Other	0.91	0.85	0.96
<b>Papillary (Tumoral) Histology<sup>d</sup></b>	0.6	0.55	0.66	
<b>Further Tumor Directed Surgery<sup>e</sup></b>	0.6	0.58	0.63	
<b>Stage<sup>f</sup></b>				
	Localized	2.64	2.31	3.02
	Regional	6.97	6.1	7.98
	Distant	11.17	9.76	12.77
	Unstaged	6.72	5.76	7.84
<b>Period of Diagnosis<sup>g</sup></b>				
	1983-1992	0.79	0.74	0.83
	1993-2002	0.65	0.61	0.68
	2003-2010	0.44	0.41	0.46

**Reference groups:**

**a: Ages <50 years**

**b: Male sex**

**c: Non-Hispanic Whites**

**d: Non-papillary (flat) histology**

**e: No Further Tumor Directed Surgery (re-resection)**

**f: In-situ stage**

**g: Time period 1973-1982**

**Table 7. Cause-specific death classification of Gallbladder Tumors by Stage: 18 Surveillance, Epidemiology, and End Results Registries, 1973-2010**

Cause of Death	No. of Patients (%)					
	All Patients, N=17441	In-Situ N=686	Localized N=4725	Regional N=4671	Distant N=6402	Unstaged N=957
<b>Alive</b>	2490 (14.28)	378 (55.10)	1299 (27.49)	379 (8.11)	384 (6.00)	50 (5.22)
<b>Accidents &amp; Other Adverse Events<sup>a</sup></b>	482 (2.76)	40 (5.83)	234 (4.95)	99 (2.12)	79 (1.23)	30 (3.13)
<b>Cardiovascular<sup>b</sup></b>	1072 (6.15)	113 (16.47)	545 (11.53)	198 (4.24)	161 (2.51)	55 (5.75)
<b>Endocrine<sup>c</sup></b>	86 (0.49)	12 (1.75)	45 (0.95)	10 (0.21)	15 (0.23)	4 (0.42)
<b>Female Reproductive Organs<sup>d</sup></b>	74 (0.42)	3 (0.44)	41 (0.87)	10 (0.21)	19 (0.30)	1 (0.10)
<b>Gallbladder</b>	8673 (49.73)	15 (2.19)	1575 (33.33)	2715 (58.12)	3777 (59.00)	591 (61.76)
<b>Hematopoietic cancers<sup>e</sup></b>	26 (0.15)	5 (0.73)	19 (0.40)	1 (0.02)	1 (0.01)	0 (0.00)
<b>Infectious etiology<sup>f</sup></b>	156 (0.89)	18 (2.62)	66 (1.40)	31 (0.66)	30 (0.47)	11 (1.15)
<b>Liver<sup>g</sup></b>	350 (2.01)	5 (0.73)	59 (1.25)	97 (2.08)	169 (2.64)	20 (2.09)
<b>Malignancy, other<sup>h</sup></b>	671 (3.85)	11 (1.60)	92 (1.95)	133 (2.85)	404 (6.31)	31 (3.24)
<b>Neurologic<sup>i</sup></b>	45 (0.26)	5 (0.73)	32 (0.68)	1 (0.02)	5 (0.08)	2 (0.21)
<b>Other Digestive Organs<sup>j</sup></b>	241 (1.38)	15 (2.19)	69 (1.46)	45 (0.96)	98 (1.53)	14 (1.46)
<b>Pancreas, Other Biliary<sup>k</sup></b>	2432 (13.94)	25 (3.64)	415 (8.78)	790 (16.91)	1081 (16.89)	121 (12.64)
<b>Prostate</b>	16 (0.09)	3 (0.44)	8 (0.17)	3 (0.06)	1 (0.01)	1 (0.10)
<b>Pulmonary<sup>l</sup></b>	169 (0.97)	21 (3.06)	81 (1.71)	30 (0.64)	31 (0.48)	6 (0.63)
<b>Renal-Urinary Tract<sup>m</sup></b>	164 (0.94)	6 (0.87)	60 (1.27)	38 (0.81)	53 (0.83)	7 (0.73)
<b>State Death Certificate or Cause of Death not available</b>	294 (1.69)	11 (1.60)	86 (1.82)	91 (1.95)	93 (1.45)	13 (1.36)

a Accidents & Adverse Events: Include suicides, self-inflicted injuries, signs & symptoms of an ill-defined condition, other causes of death.

b Cardiovascular: Aortic aneurysm & dissection, atherosclerosis, cerebrovascular diseases, other diseases of arterioles, arteries and capillaries, diseases of the heart, hypertension.

c Endocrine: Diabetes, thyroid and Other endocrine including thymus.

d Female Reproductive Organs: Breast, Cervix, Uterus & Ovary

e Hematopoietic cancers: Acute Lymphocytic Leukemia, Acute Myeloid Leukemia, Chronic Lymphocytic Leukemia, Other acute leukemia, Non-Hodgkins Leukemia, Myeloma.

f Infectious etiology: Pneumonia, influenza, sepsis, Other infectious and parasitic etiology including HIV

g Liver: Chronic liver disease including cirrhosis and other liver etiology.

h Malignancy, other: In-situ, benign, or unknown behavior neoplasm, melanoma, other malignancies.

i Neurologic: Related to Head, neck, throat, includes Alzheimers, Other brain and nervous system disorders, gum-oropharynx and larynx.

j Other digestive organs: esophagus, stomach, stomach and duodenal ulcers, colon, rectosigmoid, peritoneum, omentum, mesentery and small intestine.

k Pancreas & Other Biliary: pancreas, other biliary and intra-hepatic bile ducts

l Pulmonary: COPD and other allied conditions, lung, bronchus.

m Renal/Urinary Tract: Kidney, renal pelvis, nephritis/nephrotic syndrome, urinary bladder, urinary tract, and ureter