

## SUPPLEMENTARY INFORMATION

### **Survival improvement in patients with pancreatic cancer by decade: A period analysis of the SEER database, 1981-2010**

Huanhuan Sun<sup>1†</sup>, Haiqing Ma<sup>1†\*</sup>, Guobin Hong<sup>2†</sup>, Hongliu Sun<sup>3</sup> & Jin Wang<sup>4\*</sup>

<sup>1</sup>Department of Oncology, The Fifth Affiliated Hospital of Sun Yat-sen University, Zhuhai, Guangdong 519000, China;

<sup>2</sup>Department of Radiology, The Fifth Affiliated Hospital of Sun Yat-sen University, Zhuhai, Guangdong 519000, China;

<sup>3</sup>Department of Pathology, University of Toledo Medical Center, Toledo, OH 43614, United States;

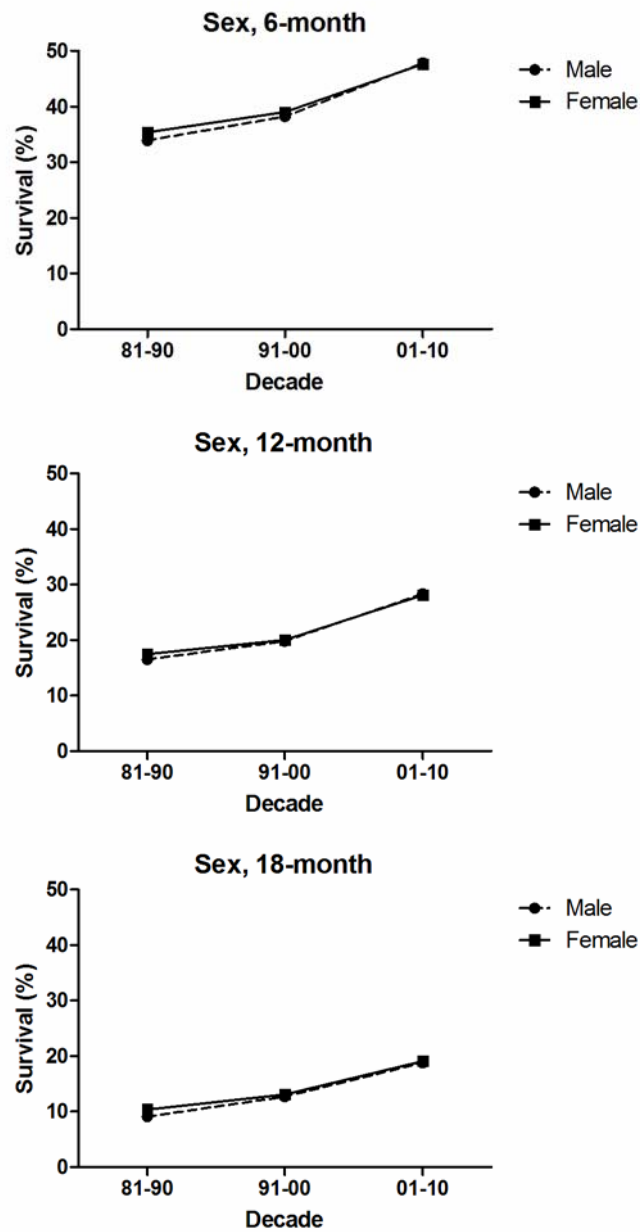
<sup>4</sup>Department of Translational Molecular Pathology, The University of Texas MD Anderson Cancer Center, Houston, TX 77030, United States.

<sup>†</sup>These authors contributed equally to this work.

\*Correspondence to: Haiqing Ma, M.D. & Ph.D., (haiqingma10@gmail.com); Jin Wang, Ph.D., (JWang4@mdanderson.org)

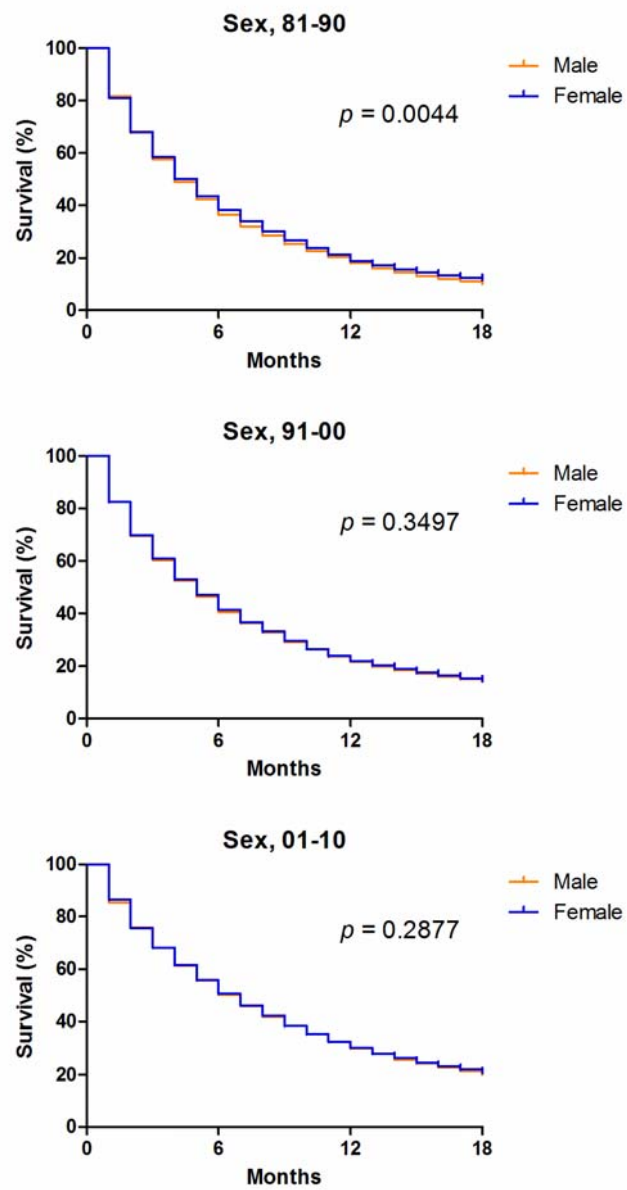
- 4 Supplementary Figures
- 6 Supplementary Tables

Supplementary Figure S1



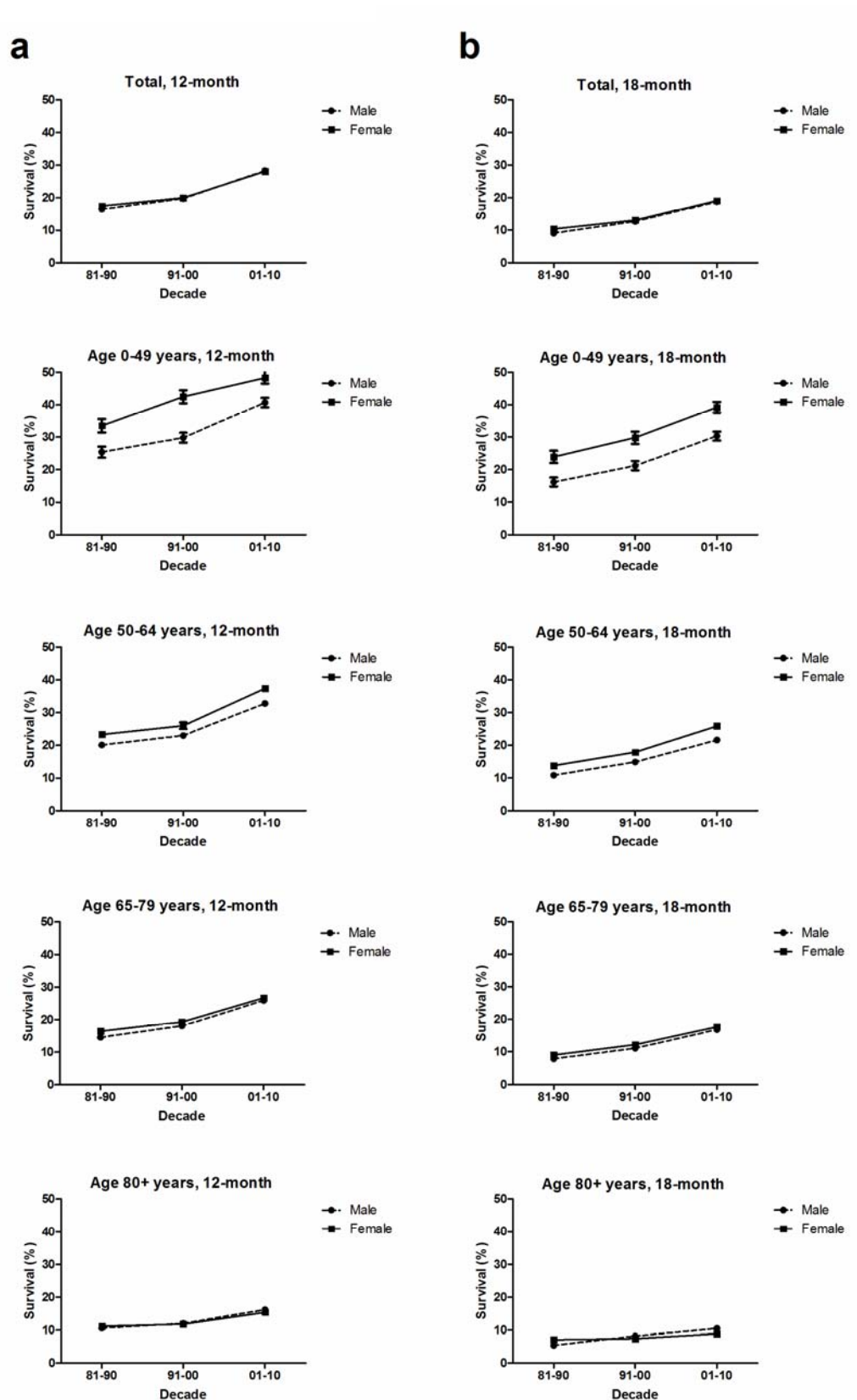
Supplementary Figure S1. Six-month, 12-month, and 18-month relative survival rates for patients with PaCa from 1981 to 2010 at nine SEER sites by sex and calendar period.

## Supplementary Figure S2



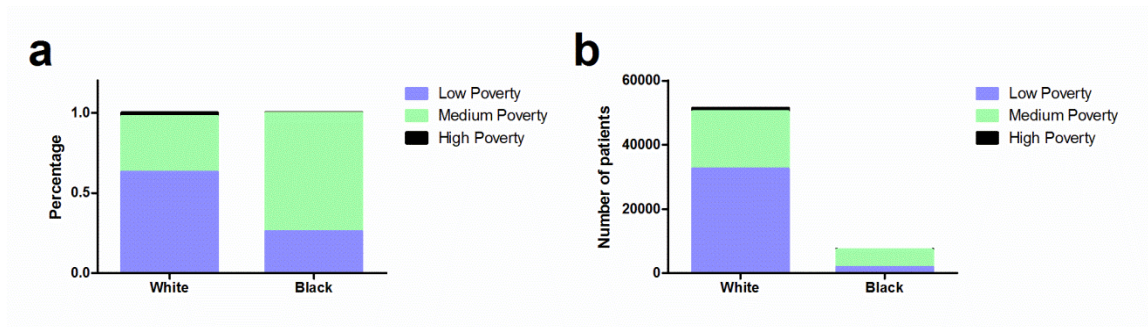
**Supplementary Figure S2.** Kaplan-Meier survival analysis for patients with PaCa from nine SEER sites from 1981 to 2010 according to sex and calendar period.

## Supplementary Figure S3



**Supplementary Figure S3.** Twelve-month (a) and 18-month (b) relative survival rates for patients with PaCa at nine SEER sites from 1981 to 2010 according to sex and age group (total and ages 0-49, 50-64, 65-79, and 80+ years).

## Supplementary Figure S4



**Supplementary Figure S4.** Distribution of SES by race for patients with PaCa at nine SEER sites from 1981 to 2010. Percentage (a) and number (b) of patients with PaCa in low-poverty, medium-poverty, and high-poverty groups.

**Supplementary Table S1.** The incidence of PaCa according to age group and decade

within sex, SES, and race groups from 1981 to 2010 at the nine original SEER sites.

Data are incidence per 100,000 people by year of diagnosis, with the number of patients in parentheses.

Variable	Age Group	Decade					
		1981-1990		1991-2000		2001-2010	
Total	All	9.7	(19024)	8.6	(20101)	8.8	(24405)
	0-49	0.9	(1176)	0.8	(1484)	0.9	(1884)
	50-64	15.9	(5128)	14.6	(5006)	15.6	(7555)
	65-79	46.3	(8931)	42.6	(9498)	43.1	(9946)
	80+	69.0	(3789)	55.1	(4113)	52.2	(5020)
Sex	Male						
	All	11.3	(9432)	9.7	(9811)	9.8	(12232)
	0-49	1.1	(685)	1.0	(898)	1.1	(1063)
	50-64	19.4	(2986)	17.7	(2936)	18.9	(4454)
	65-79	53.5	(4391)	47.2	(4577)	46.8	(4856)
	80+	78.8	(1370)	56.6	(1400)	54.0	(1859)
	Female						
	All	8.4	(9592)	7.6	(10290)	7.9	(12173)
	0-49	0.8	(491)	0.6	(586)	0.8	(821)
	50-64	12.6	(2142)	11.7	(2070)	12.4	(3101)
	65-79	41.0	(4540)	39.0	(4921)	40.0	(5090)
	80+	64.5	(2419)	54.2	(2713)	51.1	(3161)
SES	Low poverty						
	All	9.5	(10321)	8.5	(11219)	8.8	(14695)
	0-49	0.9	(627)	0.8	(818)	1.0	(1171)
	50-64	15.2	(2723)	14.4	(2787)	15.4	(4480)
	65-79	45.8	(4844)	42.1	(5235)	43.4	(5922)
	80+	69.5	(2127)	55.5	(2379)	52.9	(3122)
	Medium poverty						
	All	9.9	(8297)	8.8	(8452)	8.9	(9209)
	0-49	1.0	(529)	0.9	(635)	0.9	(682)
	50-64	16.9	(2307)	15.1	(2114)	16.1	(2911)
	65-79	46.8	(3875)	43.7	(4055)	43.5	(3795)
	80+	68.3	(1586)	54.6	(1648)	52.3	(1821)
	High poverty						
	All	9.2	(404)	7.4	(430)	6.5	(497)
	0-49	0.6	(19)	0.7	(31)	0.6	(31)
	50-64	12.8	(97)	11.6	(105)	12.8	(163)
	65-79	48.0	(212)	36.9	(208)	32.5	(227)
	80+	70.0	(76)	51.2	(86)	33.6	(76)
Race	White						

	All	9.3	(15977)	8.3	(16311)	8.5	(19149)
	0-49	0.8	(893)	0.8	(1102)	0.9	(1379)
	50-64	15.0	(4118)	13.9	(3909)	15.0	(5760)
	65-79	45.2	(7585)	41.4	(7782)	42.2	(7889)
	80+	68.5	(3381)	53.7	(3518)	50.5	(4121)
Black	All	13.9	(2029)	13.1	(2377)	12.2	(2950)
	0-49	1.6	(192)	1.4	(263)	1.3	(315)
	50-64	27.4	(712)	24.5	(745)	23.2	(1118)
	65-79	62.1	(862)	62.6	(1021)	57.1	(1076)
	80+	86.5	(263)	77.3	(348)	73.8	(441)
Other	All	8.5	(1005)	7.3	(1394)	7.7	(2236)
	0-49	0.9	(88)	0.7	(115)	0.7	(180)
	50-64	13.0	(291)	10.8	(345)	12.3	(654)
	65-79	42.8	(481)	37.1	(688)	37.8	(949)
	80+	58.4	(145)	51.8	(246)	52.9	(453)

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Abbreviations: SES, socioeconomic status.

**Supplementary Table S2.** 12-month and 18-month relative survival rates of PaCa patients according to sex, age group, and calendar period from 1981 to 2010 at nine SEER sites. Data are means  $\pm$  standard error of the mean, with number of patients in parentheses.

Decade	Age Group	Sex		
		Male	Female	
81-90	12-mo RSR			
	All	16.5 $\pm$ 0.4 (9432)	17.5 $\pm$ 0.4 (9592)	
	0-49	25.4 $\pm$ 1.7 (685)	33.5 $\pm$ 2.1 (491)*	
	50-64	20.1 $\pm$ 0.7 (2986)	23.3 $\pm$ 0.9 (2142)*	
	65-79	14.5 $\pm$ 0.5 (4391)	16.4 $\pm$ 0.6 (4540)	
	80+	10.6 $\pm$ 0.9 (1370)	11.2 $\pm$ 0.7 (2419)	
	18-mo RSR			
	All	9.1 $\pm$ 0.3	10.4 $\pm$ 0.3*	
	0-49	16.2 $\pm$ 1.4	23.9 $\pm$ 1.9**	
	50-64	10.9 $\pm$ 0.6	13.8 $\pm$ 0.8*	
	65-79	7.9 $\pm$ 0.4	9.0 $\pm$ 0.4	
	80+	5.4 $\pm$ 0.7	7.1 $\pm$ 0.6	
	91-00	12-mo RSR		
		All	19.8 $\pm$ 0.4 (9811)	20.0 $\pm$ 0.4 (10290)
0-49		29.8 $\pm$ 1.5 (898)	42.5 $\pm$ 2.0 (586)***	
50-64		23.0 $\pm$ 0.8 (2936)	26.0 $\pm$ 1.0 (2070)	
65-79		18.0 $\pm$ 0.6 (4577)	19.3 $\pm$ 0.6 (4921)	
80+		12.0 $\pm$ 0.9 (1400)	11.8 $\pm$ 0.7 (2713)	
18-mo RSR				
All		12.7 $\pm$ 0.3	13.1 $\pm$ 0.3	
0-49		21.2 $\pm$ 1.4	29.8 $\pm$ 1.9**	
50-64		14.9 $\pm$ 0.7	17.9 $\pm$ 0.9*	
65-79		11.1 $\pm$ 0.5	12.2 $\pm$ 0.5	
80+		8.2 $\pm$ 0.8	7.4 $\pm$ 0.5	
01-10		12-mo RSR		
		All	28.3 $\pm$ 0.4 (12232)	28.1 $\pm$ 0.4 (12173)
	0-49	40.7 $\pm$ 1.5 (1063)	48.3 $\pm$ 1.8 (821)*	
	50-64	32.8 $\pm$ 0.7 (4454)	37.4 $\pm$ 0.9 (3101)***	
	65-79	25.9 $\pm$ 0.6 (4856)	26.7 $\pm$ 0.6 (5090)	
	80+	16.2 $\pm$ 0.9 (1859)	15.4 $\pm$ 0.7 (3161)	
	18-mo RSR			
	All	18.8 $\pm$ 0.4	19.1 $\pm$ 0.4	
	0-49	30.3 $\pm$ 1.4	39.2 $\pm$ 1.7***	
	50-64	21.6 $\pm$ 0.6	25.9 $\pm$ 0.8***	
	65-79	16.8 $\pm$ 0.6	17.7 $\pm$ 0.6	
	80+	10.5 $\pm$ 0.8	8.9 $\pm$ 0.6	

Abbreviations: mo, month; RSR, relative survival rate; SEM, standard error of the mean.

\* $p < 0.01$ , \*\* $p < 0.001$ , and \*\*\* $p < 0.0001$  for comparisons with the Male group.



**Supplementary Table S3.** Summary data for Cox regression analysis of survival in patients with PaCa from 2001 to 2010 at nine SEER sites.

Variable	Relative Risk (95% CI)	p-value
<b>All</b>		
Univariate		
Sex	0.996 (0.969 - 1.024)	0.782
Age	1.022 (1.021 - 1.023)	< 0.001
Race	0.887 (0.852 - 0.923)	< 0.001
SES	0.920 (0.894 - 0.946)	< 0.001
Multivariate		
Age	1.023 (1.022 - 1.024)	< 0.001
Race	0.838 (0.804 - 0.873)	< 0.001
SES	0.936 (0.909 - 0.963)	< 0.001
<b>Age 0-49 years</b>		
Univariate		
Sex	1.254 (1.126 - 1.398)	< 0.001
Age	1.050 (1.039 - 1.061)	< 0.001
Race	0.898 (0.785 - 1.029)	0.120
SES	0.879 (0.788 - 0.980)	0.020
Multivariate		
Sex	1.217 (1.092 - 1.356)	< 0.001
Age	1.049 (1.038 - 1.060)	< 0.001
<b>Age 50-64 years</b>		
Univariate		
Sex	1.131 (1.075 - 1.191)	< 0.001
Age	1.016 (1.010 - 1.023)	< 0.001
Race	0.808 (0.756 - 0.865)	< 0.001
SES	0.886 (0.842 - 0.933)	< 0.001
Multivariate		
Sex	1.146 (1.088 - 1.206)	< 0.001
Age	1.017 (1.011 - 1.023)	< 0.001
Race	0.819 (0.764 - 0.878)	< 0.001
SES	0.911 (0.865 - 0.960)	< 0.001
<b>Age 65-79 years</b>		
Univariate		
Sex	1.034 (0.990 - 1.079)	0.132
Age	1.023 (1.018 - 1.028)	< 0.001
Race	0.817 (0.765 - 0.872)	< 0.001
SES	0.924 (0.884 - 0.965)	< 0.001
Multivariate		
Age	1.024 (1.019 - 1.029)	< 0.001
Race	0.825 (0.771 - 0.882)	< 0.001
SES	0.938 (0.896 - 0.981)	0.005

**Age 80+ years**

Univariate

Sex	0.973 (0.916 - 1.035)	0.387
Age	1.036 (1.029 - 1.044)	< 0.001
Race	0.854 (0.773 - 0.944)	0.002
SES	0.951 (0.894 - 1.010)	0.103

Multivariate

Age	1.036 (1.028 - 1.043)	< 0.001
Race	0.861 (0.779 - 0.952)	0.003

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Abbreviations: 95% CI, 95% confidence interval; SES, socioeconomic status.

**Supplementary Table S4.** 12-month and 18-month relative survival rates of PaCa patients according to race, age group, and calendar period from 1981 to 2010 at nine SEER sites. Data are means  $\pm$  standard error of the mean, with number of patients in parentheses.

Decade	Age Group	Race			
		White	Black	Other	
81-90	12-mo RSR				
	All	17.0 $\pm$ 0.3 (15977)	16.0 $\pm$ 0.8 (2029)	18.7 $\pm$ 1.2 (1005)	
	0-49	29.0 $\pm$ 1.5 (893)	29.9 $\pm$ 3.3 (192)	23.9 $\pm$ 4.6 (88)	
	50-64	21.7 $\pm$ 0.6 (4118)	18.5 $\pm$ 1.5 (712)	23.7 $\pm$ 2.5 (291)	
	65-79	15.7 $\pm$ 0.4 (7585)	12.0 $\pm$ 1.1 (862)*	17.4 $\pm$ 1.8 (481)	
	80+	10.9 $\pm$ 0.6 (3381)	11.9 $\pm$ 2.1 (263)	9.7 $\pm$ 2.6 (145)	
	18-mo RSR				
	All	9.6 $\pm$ 0.2	10.2 $\pm$ 0.7	11.4 $\pm$ 1.0	
	0-49	19.0 $\pm$ 1.3	21.6 $\pm$ 3.0	18.2 $\pm$ 4.1	
	50-64	12.2 $\pm$ 0.5	11.5 $\pm$ 1.2	12.6 $\pm$ 2.0	
	65-79	8.5 $\pm$ 0.3	6.8 $\pm$ 0.9	10.8 $\pm$ 1.4	
	80+	6.3 $\pm$ 0.5	8.9 $\pm$ 1.9	6.9 $\pm$ 2.2	
	91-00	12-mo RSR			
		All	20.0 $\pm$ 0.3 (16311)	17.6 $\pm$ 0.8 (2377)*	22.3 $\pm$ 1.1 (1394)
0-49		35.9 $\pm$ 1.4 (1102)	30.7 $\pm$ 2.9 (263)	32.2 $\pm$ 4.4 (115)	
50-64		24.7 $\pm$ 0.7 (3909)	19.2 $\pm$ 1.5 (745)*	29.0 $\pm$ 2.5 (345)	
65-79		18.8 $\pm$ 0.5 (7782)	15.5 $\pm$ 1.2 (1021)	21.3 $\pm$ 1.6 (688)	
80+		12.1 $\pm$ 0.6 (3518)	9.9 $\pm$ 1.7 (348)	10.9 $\pm$ 2.1 (246)	
18-mo RSR					
All		12.9 $\pm$ 0.3	11.2 $\pm$ 0.7	16.3 $\pm$ 1.0*	
0-49		25.1 $\pm$ 1.3	20.0 $\pm$ 2.5	27.9 $\pm$ 4.2	
50-64		16.3 $\pm$ 0.6	12.5 $\pm$ 1.2*	20.9 $\pm$ 2.2	
65-79		11.6 $\pm$ 0.4	10.0 $\pm$ 1.0	14.7 $\pm$ 1.4	
80+		7.8 $\pm$ 0.5	5.1 $\pm$ 1.3	8.5 $\pm$ 1.9	
01-10		12-mo RSR			
		All	28.8 $\pm$ 0.3 (19149)	24.0 $\pm$ 0.8 (2950)***	28.0 $\pm$ 1.0 (2236)
	0-49	44.7 $\pm$ 1.3 (1379)	39.5 $\pm$ 2.8 (315)	44.8 $\pm$ 3.8 (180)	
	50-64	36.0 $\pm$ 0.6 (5760)	28.3 $\pm$ 1.4 (1118)***	33.5 $\pm$ 1.9 (654)	
	65-79	27.3 $\pm$ 0.5 (7889)	20.1 $\pm$ 1.3 (1076)***	25.2 $\pm$ 1.4 (949)	
	80+	15.8 $\pm$ 0.6 (4121)	11.3 $\pm$ 1.6 (441)	19.4 $\pm$ 1.9 (453)	
	18-mo RSR				
	All	19.4 $\pm$ 0.3	16.1 $\pm$ 0.7***	18.7 $\pm$ 0.9	
	0-49	35.0 $\pm$ 1.3	31.6 $\pm$ 2.7	32.3 $\pm$ 3.6	
	50-64	24.2 $\pm$ 0.6	18.3 $\pm$ 1.2***	23.6 $\pm$ 1.7	
	65-79	17.9 $\pm$ 0.4	13.0 $\pm$ 1.1***	16.5 $\pm$ 1.2	
	80+	9.7 $\pm$ 0.5	6.4 $\pm$ 1.3	10.8 $\pm$ 1.6	

Abbreviations: mo, month; RSR, relative survival rate; SEM, standard error of the mean.

\* $p < 0.01$ , \*\* $p < 0.001$ , and \*\*\* $p < 0.0001$  for comparisons with the White group.

**Supplementary Table S5.** 12-month and 18-month relative survival rates of PaCa patients according to SES, age group, and calendar period from 1981 to 2010 at nine SEER sites. Data are means  $\pm$  standard error of the mean, with number of patients in parenthesis.

Decade	Age Group	SES		
		Low Poverty	Medium Poverty	High Poverty
81-90	12-mo RSR			
	All	17.9 $\pm$ 0.4 (10321)	16.0 $\pm$ 0.4 (8297)**	14.7 $\pm$ 1.8 (404)
	0-49	29.0 $\pm$ 1.8 (627)	28.3 $\pm$ 2.0 (529)	31.7 $\pm$ 10.7 (19)
	50-64	23.9 $\pm$ 0.8 (2723)	18.7 $\pm$ 0.8 (2307)***	15.7 $\pm$ 3.7 (97)
	65-79	16.0 $\pm$ 0.5 (4844)	14.8 $\pm$ 0.6 (3875)	14.7 $\pm$ 2.5 (212)
	80+	11.0 $\pm$ 0.7 (2127)	10.9 $\pm$ 0.8 (1586)	8.9 $\pm$ 3.5 (76)
	18-mo RSR			
	All	10.3 $\pm$ 0.3	9.1 $\pm$ 0.3*	8.4 $\pm$ 1.4
	0-49	20.2 $\pm$ 1.6	18.1 $\pm$ 1.7	26.4 $\pm$ 10.1
	50-64	13.4 $\pm$ 0.7	10.6 $\pm$ 0.7*	8.4 $\pm$ 2.8
	65-79	9.0 $\pm$ 0.4	7.8 $\pm$ 0.4	7.5 $\pm$ 1.9
	80+	6.3 $\pm$ 0.6	6.8 $\pm$ 0.7	6.3 $\pm$ 3.1
91-00	12-mo RSR			
	All	20.8 $\pm$ 0.4 (11219)	18.8 $\pm$ 0.4 (8452)**	18.8 $\pm$ 1.9 (430)
	0-49	36.3 $\pm$ 1.7 (818)	32.9 $\pm$ 1.9 (635)	32.3 $\pm$ 8.4 (31)
	50-64	25.7 $\pm$ 0.8 (2787)	22.4 $\pm$ 0.9 (2114)*	24.1 $\pm$ 4.2 (105)
	65-79	19.5 $\pm$ 0.6 (5235)	17.7 $\pm$ 0.6 (4055)	15.9 $\pm$ 2.6 (208)
	80+	12.3 $\pm$ 0.7 (2379)	11.2 $\pm$ 0.8 (1648)	14.1 $\pm$ 4.0 (86)
	18-mo RSR			
	All	13.7 $\pm$ 0.3	12.0 $\pm$ 0.4**	11.0 $\pm$ 1.6
	0-49	26.7 $\pm$ 1.6	22.3 $\pm$ 1.7	16.2 $\pm$ 6.6
	50-64	17.1 $\pm$ 0.7	14.9 $\pm$ 0.8	13.6 $\pm$ 3.4
	65-79	12.4 $\pm$ 0.5	10.6 $\pm$ 0.5	11.1 $\pm$ 2.2
	80+	7.9 $\pm$ 0.6	7.5 $\pm$ 0.7	5.4 $\pm$ 2.6
01-10	12-mo RSR			
	All	29.7 $\pm$ 0.4 (14695)	26.0 $\pm$ 0.5 (9029)***	22.7 $\pm$ 1.9 (497)*
	0-49	46.9 $\pm$ 1.5 (1171)	39.0 $\pm$ 1.9 (682)*	42.0 $\pm$ 8.9 (31)
	50-64	36.5 $\pm$ 0.7 (4480)	32.4 $\pm$ 0.9 (2911)**	25.4 $\pm$ 3.4 (163)*
	65-79	27.8 $\pm$ 0.6 (5922)	24.4 $\pm$ 0.7 (3795)**	21.4 $\pm$ 2.8 (227)
	80+	16.6 $\pm$ 0.7 (3122)	14.1 $\pm$ 0.9 (1821)	12.8 $\pm$ 4.0 (76)
	18-mo RSR			
	All	20.0 $\pm$ 0.3	17.6 $\pm$ 0.4***	13.4 $\pm$ 1.6***
	0-49	36.4 $\pm$ 1.4	30.4 $\pm$ 1.8*	34.9 $\pm$ 8.7
	50-64	24.7 $\pm$ 0.7	21.7 $\pm$ 0.8*	15.2 $\pm$ 2.9
	65-79	18.2 $\pm$ 0.5	16.2 $\pm$ 0.6	11.3 $\pm$ 2.2*
	80+	10.0 $\pm$ 0.6	8.8 $\pm$ 0.7	7.4 $\pm$ 3.2

Abbreviations: mo, month; RSR, relative survival rate; SEM, standard error of the mean.

\* $p < 0.01$ , \*\* $p < 0.001$ , and \*\*\* $p < 0.0001$  for comparisons with the White group.

**Supplementary Table S6.** Summary data for race distribution by SES and calendar period in patients with PaCa from 1981 to 2010 at nine SEER sites.

Period	SES	Number	Race		
			White	Black	Other
81-10	Total	63422	81.1%	11.6%	7.3%
	Low Poverty	36174	89.7%	5.3%	5.0%
	Medium Poverty	25917	68.7%	20.9%	10.4%
	High Poverty	1331	87.4%	1.6%	11.0%
81-90	Total	19009	84.0%	10.7%	5.3%
	Low Poverty	10313	94.8%	3.8%	1.5%
	Medium Poverty	8292	70.5%	19.7%	9.8%
	High Poverty	404	87.6%	2.0%	10.4%
91-00	Total	20082	81.2%	11.8%	6.9%
	Low Poverty	11212	91.8%	5.2%	3.0%
	Medium Poverty	8440	66.7%	21.2%	12.1%
	High Poverty	430	90.0%	1.4%	8.6%
01-10	Total	24331	78.7%	12.1%	9.2%
	Low Poverty	14649	84.6%	6.5%	9.0%
	Medium Poverty	9185	69.0%	21.7%	9.3%
	High Poverty	497	84.9%	1.4%	13.7%