Factors Influencing Prostate Cancer Treatment Decisions for African American and White Men: Prostate Cancer Follow Back Study

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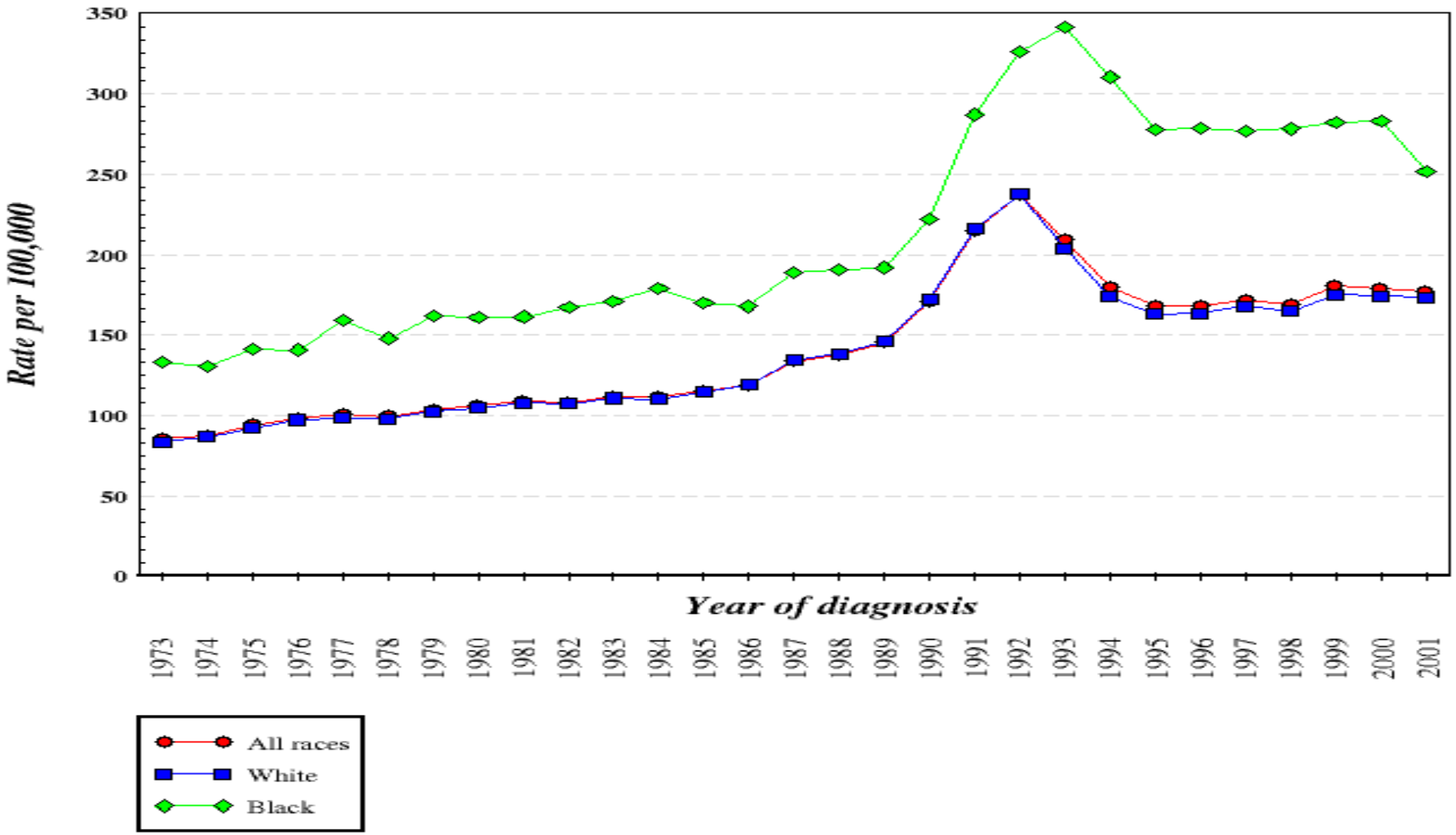
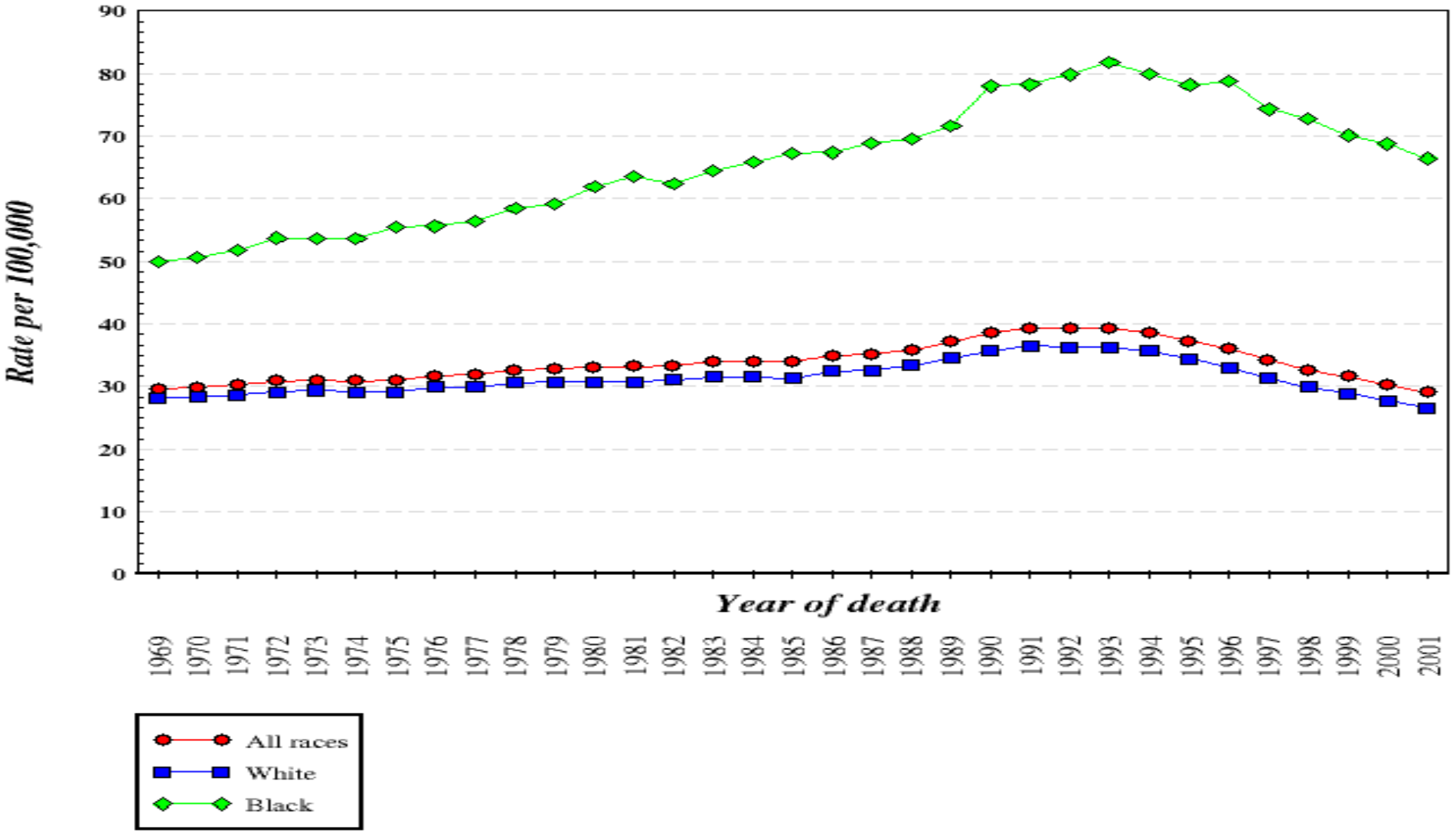
Prostate Cancer Disparities

- Chronic diseases overwhelmingly dominate the health disparities scenario in the United States
- Prostate cancer among AA men shows strikingly disproportionate incidence and adverse clinical course (ACS 2005)
- AA men also tend to be diagnosed with more aggressive prostate cancer at younger ages compared to other races (Croslisk et al 1999).

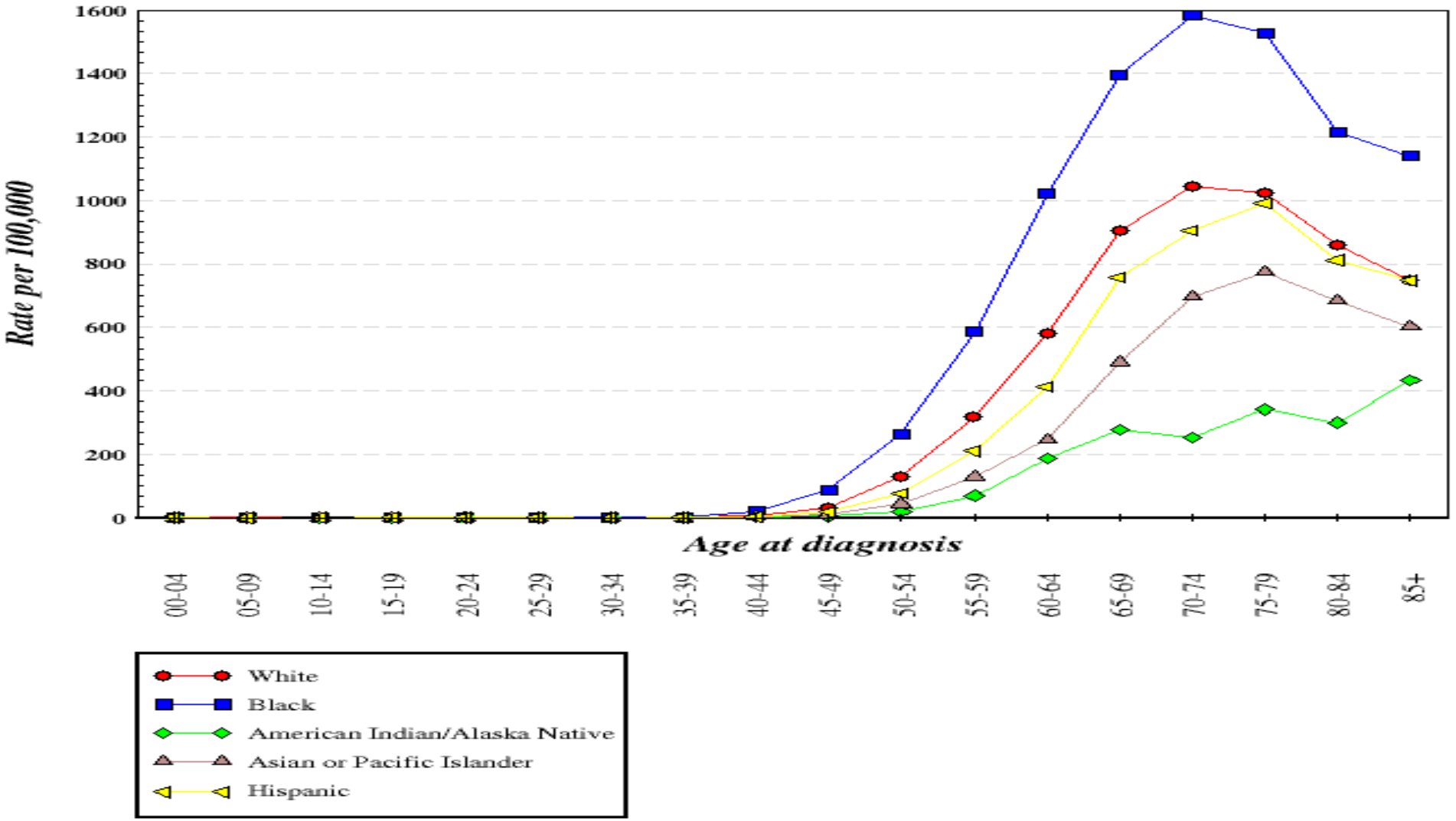
Prostate Cancer Incidence in US: to 2001



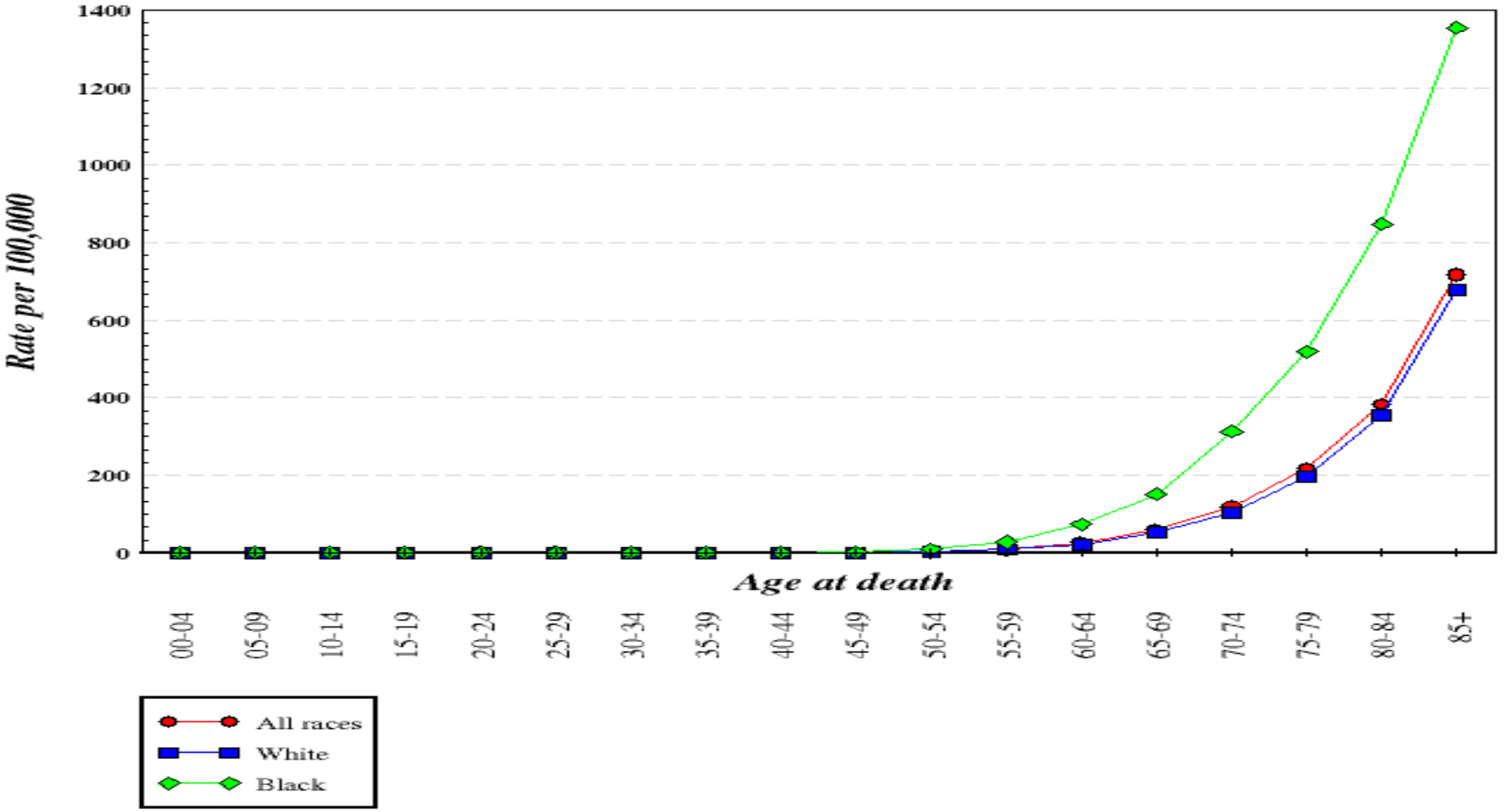
Prostate Cancer Mortality in US: to 2001



PrCA Incidence by Age in US: 1997-2001



PrCA Mortality by Age in US: 1997-2001

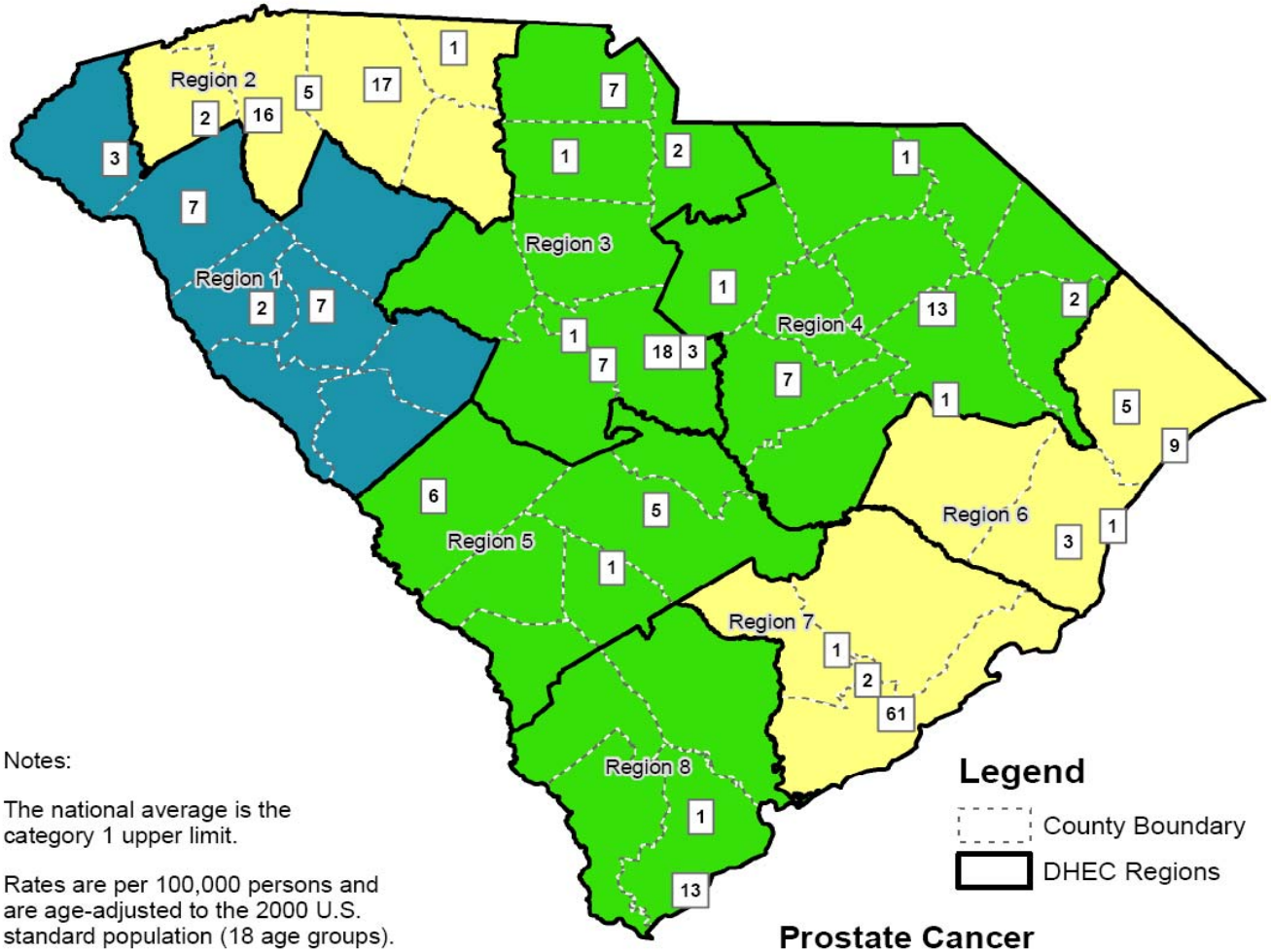


South Carolina

- African American men in South Carolina have the highest Prostate cancer incidence and mortality in the world

1996-2002 SC Age-Adjusted Prostate Cancer M/I Ratios for White Males by SC DHEC Region*

With Count of Urologists per City Labeled



Notes:

The national average is the category 1 upper limit.

Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population (18 age groups).

* Data does not include in-situ cases
* Incident data are subject to change as datasets are updated.
* Incidence data originates from the 1996-2002 statisticalfile (3.05)

** Mortality data originates from the 1994-2003 Cancermortalityfile

0 15 30 60 90 120 Miles

Legend

County Boundary

DHEC Regions

Prostate Cancer

Cutpoints for Showing M:I Ratios

<= 0.17 (Category 1)

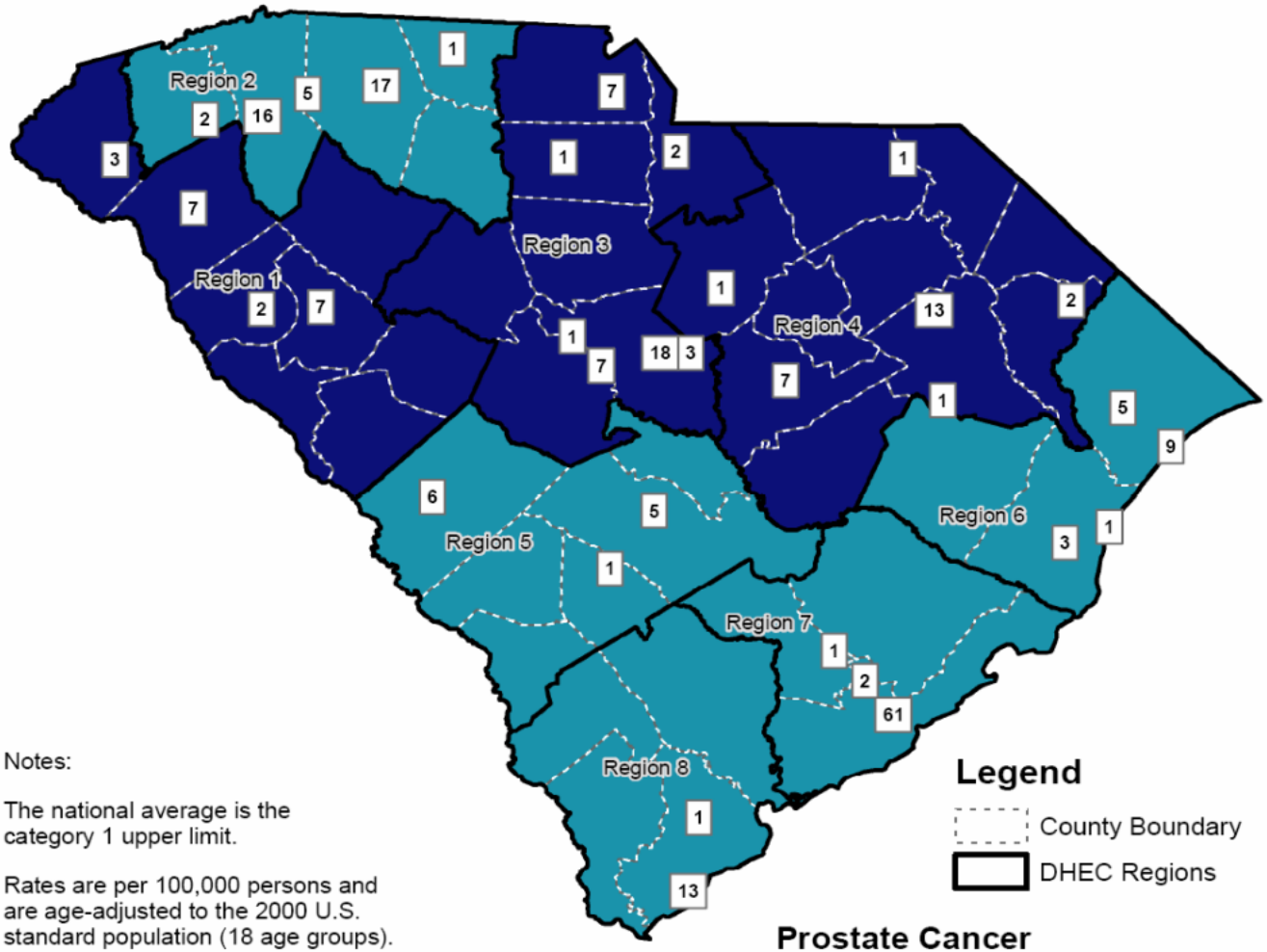
0.18 - 0.23 (Category 2)

0.24 - 0.30 (Category 3)

> 0.30 (Category 4)

1996-2002 SC Age-Adjusted Prostate Cancer M/I Ratios for Black Males by SC DHEC Region*

With Count of Urologists per City Labeled



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County Boundary

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Prostate Cancer

Cutpoints for Showing M:I Ratios

- <= 0.17 (Category 1)
- 0.18 - 0.23 (Category 2)
- 0.24 - 0.30 (Category 3)
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SC Prostate Cancer Age Adjusted Incidence Rates

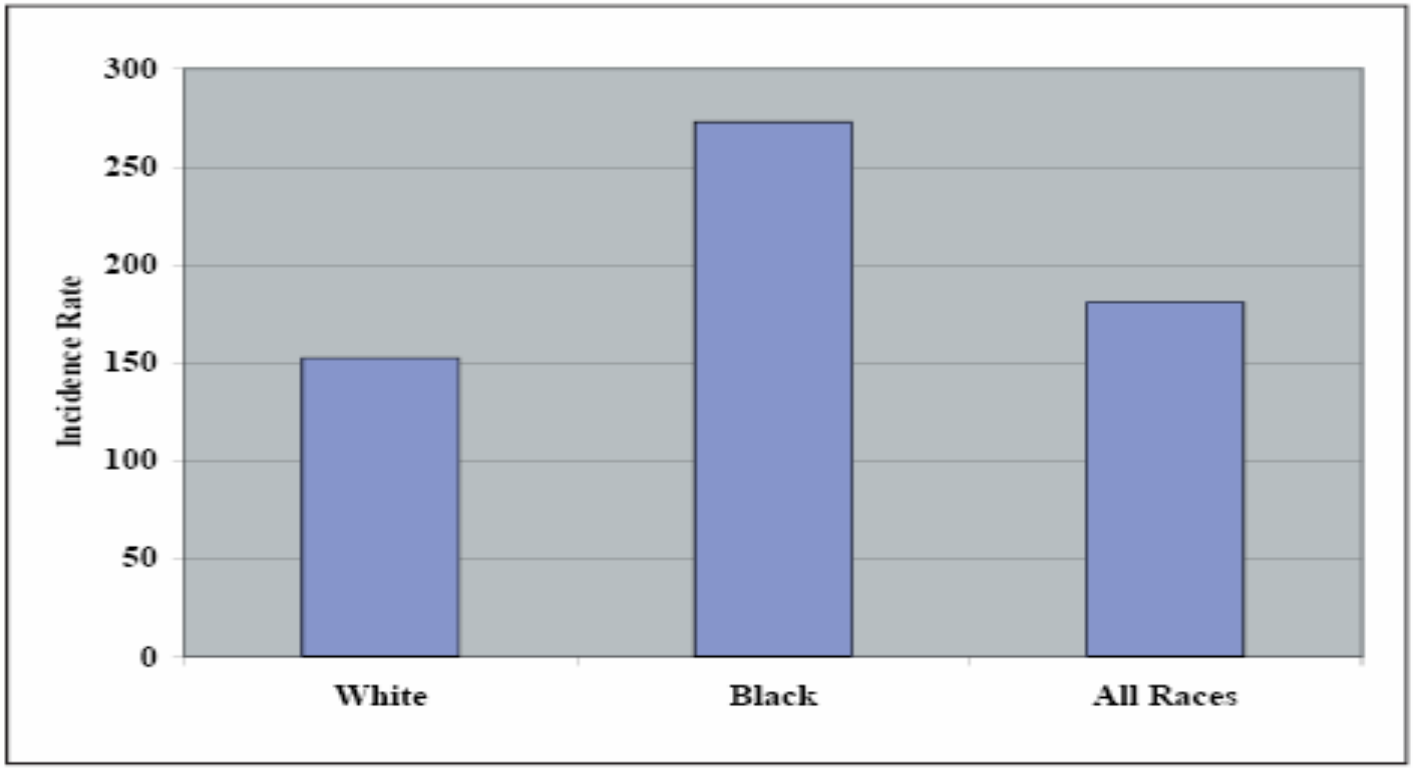

Figure 1. *Prostate Cancer Age-Adjusted Incidence Rates per 100,000 in SC by Race, 1996-2001*

SC Prostate Cancer Age-Adjusted Mortality Rates

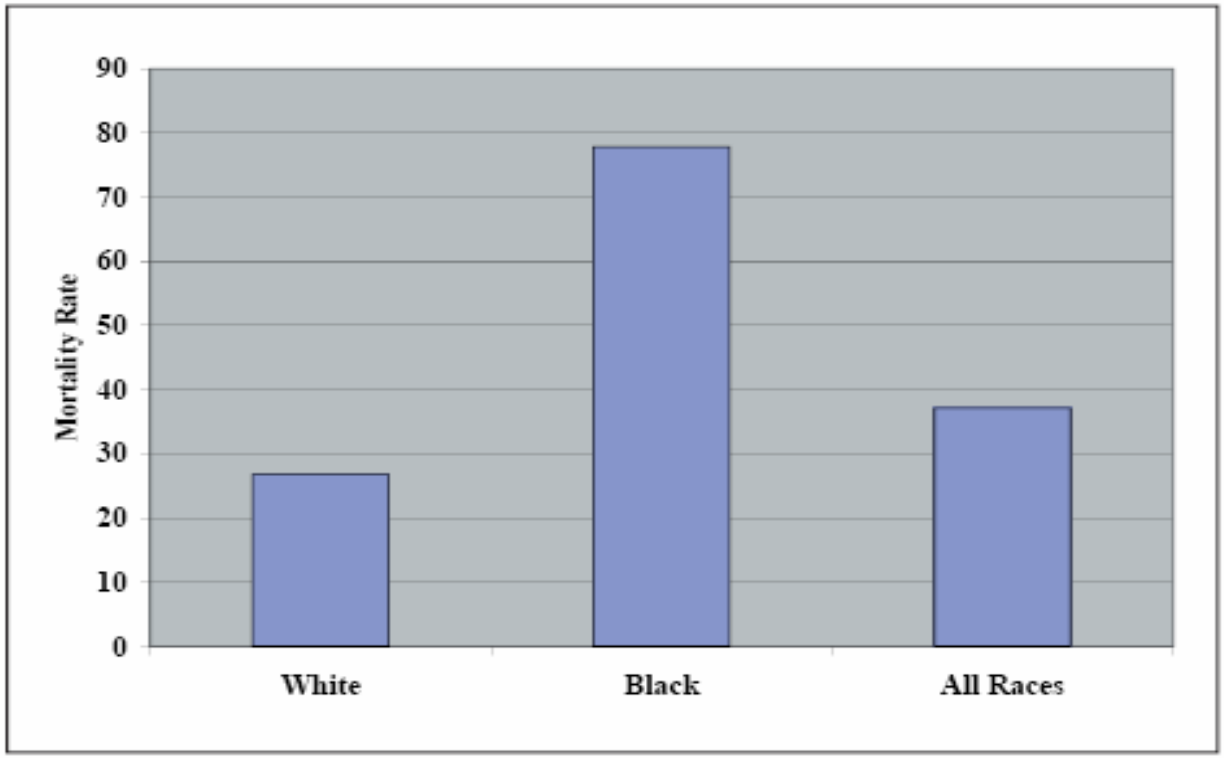

Figure 2. *Prostate Cancer Age-Adjusted Mortality Rates per 100,000 in SC by Race, 1998-2003*

Stage at Diagnosis

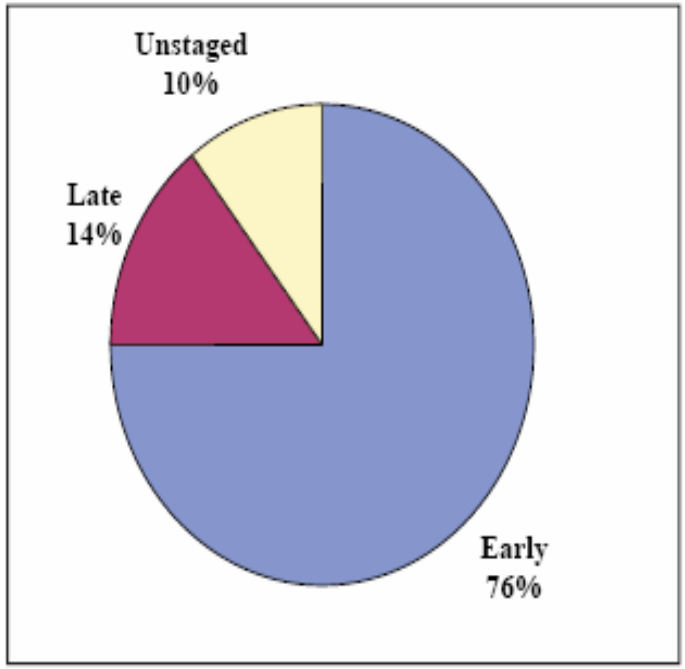

Figure 3. *Prostate Cancer Stage at Diagnosis in SC among White Men, 1996-2001*

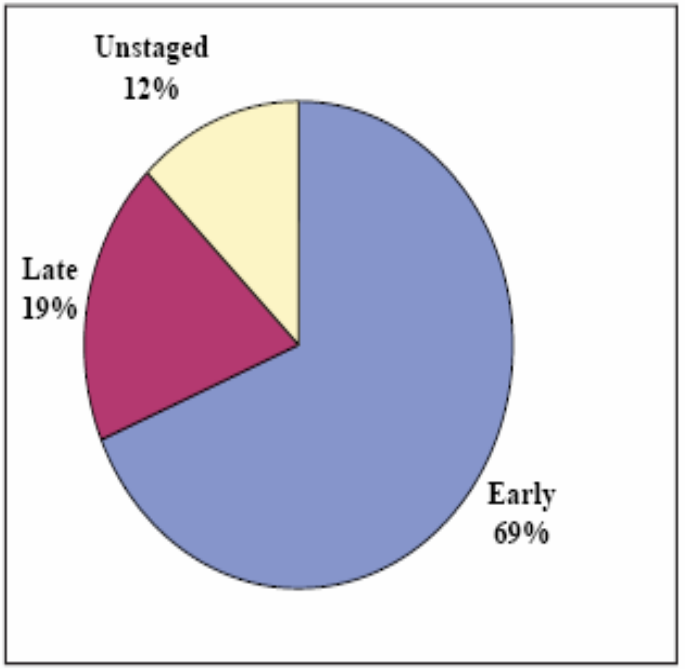

Figure 4. *Prostate Cancer Stage at Diagnosis in SC among Black Men, 1996-2001*

Treatment

- Treatment offered to AA men with PrCA is systematically different from that offered to EA men (Jones et al 1995; Harlan 2001; Schapira et al 1995; Desch 1996; Mettlin 1997)
- AA men are more likely than white men to receive no treatment (Jones et al 1995; Desch 1996; Evans 1992)

Influences of treatment

- Physicians play a critical role in patients' treatment decisions, providing both information and treatment recommendations (Cohen and Britten 2003)
- A major portion of the decision-making process occurs within the context of the family (Boehmer and Clark 2001; Volk et al 2004; Srirangam 2003

Methods

- *Subjects:* Prostate cancer cases from an eight-county area in the Midlands of South Carolina (Calhoun, Fairfield, Kershaw, Lexington, Newberry, Orangeburg, Richland and Sumter) are identified through the South Carolina Central Cancer Registry (SCCCR). All men diagnosed between 1996 and 2002 were eligible to participate.

Diagnoses of prostate cancer between 1996-2002 in SC Midlands

	All races		White		Black	
	*Rate	Count	*Rate	Count	*Rate	Count
Calhoun County	77.11	87	48.62	32	120.48	55
Fairfield County	86.27	148	54.34	53	124.77	94
Kershaw County	74.72	274	56.69	159	121.83	106
Lexington County	57.81	744	52.57	623	97.81	93
Newberry County	63.80	183	54.85	122	86.90	56
Orangeburg County	120.52	774	95.50	329	152.33	442
Richland County	75.91	1,366	59.27	712	106.70	618
Sumter County	218.11	578	153.27	247	312.89	324
SC: Midlands	84.27	4,154	63.79	2,277	135.13	1,788

Participant Characteristics

Characteristics	African American (N=110) N(%)	European American (N=432) N(%)	X2 (p-value)
Age (mean)** t-test	68 (sd-8)	72 (sd-8)	4.30 (<.0001)
Marital Status			16.94 (.0002)
*Unmarried (sep, divorce, widow)	24 (22)	35 (8)	
Married	83 (75)	381 (88)	
Unknown	3 (3)	15 (3)	
Treatment			
Watchful Waiting	6 (5)	20 (5)	.13 (.7216)
Surgery	58 (53)	224 (52)	.02 (.8875)
Radiation	43 (39)	176 (41)	.11 (.7394)
Hormone Therapy	10 (9)	59 (14)	1.67 (.1969)
Other (chemo, other)	3 (3)	7 (2)	.59 (.4433)
Unknown* (including missing)	2 (2)	0 (0)	7.87 (.0050)

Participant Characteristics

Characteristics	African American (N=110) N(%)	European American (N=432) N(%)	X2 (p-value)
TreatmentAggressivenes†			.9916 (.3193)
Aggressive	90 (86)	350 (82)	
Conservative	15 (14)	79 (18)	
Unknown (missing)	5 (5)	2 (.5)	
Tumor grade			3.34 (.5025)
Well differentiated	5 (5)	37 (9)	
Moderately	80 (73)	307 (71)	
Poorly	17 (15)	65 (15)	
Undifferentiated	1 (1)	1 (.2)	
Not determined	7 (6)	21 (5)	
Tumor stage			. 1.63 (.8035)
Localized	88 (80)	348 (81)	
Regional	17 (15)	61 (14)	
Distant Metastasized	1 (1)	2 (.5)	
Unstaged	4 (4)	20 (5)	

Participant Characteristics

Characteristics	African American (N=110) N(%)	European American (N=432) N(%)	X2 (p-value)
Lives with wife or partner* Yes No Missing	 84 (79) 23 (22) 3 (3)	 379 (89) 45 (11) 7 (2)	9.06 (.0026)
Number of other people in the household* 0 1 ➢1 Missing	 18 (16) 62 (56) 24 (22) 6 (5)	 49 (11) 327 (76)4 5 (10) 10 (2)	18.21 (.0004)
Difficulty attending doctor visits* Yes No Missing	 8 (7) 101 (93) 1 (1)	 6 (1) 423 (99) 2 (.5)	. 12.10 (.0005)

Social and Clinical Influences of Treatment

	African American (n = 110)	European American (n = 432)	
Influences	N (%)	N (%)	X^2 (p-value)
Social ‡			
Doctor	60 (55)	248 (57)	.29 (.5885)
Family	27 (25)	93 (22)	.46 (.4962)
Friend	4 (4)	10 (2)	.61 (.4353)
Yourself	36 (33)	163 (38)	.94 (.3310)
Other	1 (1)	6 (1)	.16 (.6907)
Clinical			
Cure*	72 (65)	362 (84)	18.98 (<.0001)
Impotence	30 (27)	96 (22)	1.23 (.2682)
Incontinence	25 (23)	88 (20)	.30 (.5948)
Pain*	13 (12)	15 (3)	12.41 (.0004)
Other	4 (4)	39 (9)	3.51 (.0610)
None*	14 (13)	18 (4)	11.51 (.0007)

Univariate Analyses

Variable	Estimate	P-value
Race	0.152	0.32
Stage	-0.220	0.14
Grade	-0.674	<.0001
PSA Change		
No PSA Change Vs. 1 PSA Change	-0.562	0.03
No PSA Change Vs. 2 PSA Changes	-0.461	0.43
Age at diagnosis	-0.049	0.002
Marital Status	-0.221	0.19
Prior cancer diagnoses	0.073	0.85
Insurance		
Medicare	-0.460	0.10
Medicaid	0.385	0.48
Private	0.295	0.21
Transportation Problems	-0.258	0.70
Social Predictors		
Doctor	-0.257	0.27
Family	-0.136	0.61
Friend	0.958	0.36
Yourself	0.057	0.81
Clinical Predictors		
Cure	0.334	0.22
Impotence	-0.275	0.28
Incontinence	-0.316	0.23
Pain	-0.524	0.25
None	-0.333	0.45

Unconditional logistic regression

Variable	Odds Ratio	95% Confidence Interval
Social Predictors		
Doctor	0.85	0.45,1.63
Family	0.71	0.37,1.36
Friend	2.19	0.25, 18.91
Yourself	0.84	0.44, 1.62
Grade	0.23	0.13, 0.40
Age at diagnosis	0.95	0.92, 0.98
No PSA Change Vs. 1 PSA Change	0.56	0.33, 0.97

Final unconditional logistic regression clinical model predicting treatment

Variable	Odds Ratio	95% Confidence Interval
Clinical Predictors		
Cure	1.27	0.64, 2.53
Impotence	0.66	0.33, 1.31
Incontinence	0.91	0.47, 1.79
Pain	0.93	0.33, 2.58
None	0.64	0.21, 1.92
Grade	0.23	0.13, 0.40
Age at diagnosis	0.94	0.91, 0.98
No PSA Change Vs. 1 PSA Change	0.54	0.31, 0.93

Results of the final unconditional logistic regression social model predicting aggressive treatment.

Variable	Odds Ratio	95% Confidence Interval
Social Predictors		
Doctor	0.86	0.45, 1.67
Family	0.75	0.38, 1.47
Friend	2.00	0.23, 17.45
Yourself	0.82	0.43, 1.59
Grade* (low grade = referent)	0.23	0.13, 0.41
Age at diagnosis (years)	0.95	0.92, 0.98
PSA Change (no change Vs. ≥ 1 change)	0.48	0.26, 0.87

Results of the final unconditional logistic regression clinical model predicting aggressive treatment.

Variable	Odds Ratio	95% Confidence Interval
Clinical Predictors		
Cure	1.11	0.54, 2.82
Impotence	0.65	0.33, 1.31
Incontinence	0.94	0.48, 1.86
Pain	0.93	0.33, 2.60
None	0.69	0.22, 2.20
Grade* (low grade = referent)	0.23	0.13, 0.41
Age at diagnosis (years)	0.94	0.91, 0.98
PSA Change(no change Vs. ≥ 1 change)	0.46	0.25, 0.84

Univariate statistics modeling the probability of surgery (n=282) versus all other treatments (n=252).

Variable	β Coefficient‡	P-value
Race (White = referent)	0.061	0.58
Stage* (early stage = referent)	0.776	<.0001
Grade† (low grade = referent)	-0.183	0.13
PSA Change (no change Vs. ≥ 1 change)	-0.551	<.0001
Age at diagnosis (years)	-0.102	<.0001
Marital Status (married Vs. unmarried)	-0.480	0.001
Prior cancer diagnoses (none Vs. ≥ 1)	-0.373	0.20
Insurance		
Medicare	-1.013	<.0001
Medicaid	-0.905	0.02
Private	0.256	0.14
Other	0.114	0.52
Unknown/No Insurance	0.112	0.87
Transportation Problems (yes Vs. no)	-2.724	0.01
Social Predictors		
Doctor	-0.143	0.41
Family	0.648	0.003
Friend	-0.274	0.63
Yourself	-0.003	0.99
Clinical Predictors		
Cure	0.508	0.02
Impotence	-0.763	0.0003
Incontinence	-1.082	<.0001
Pain	-0.513	0.20
None	-0.326	0.38

Results of the full unconditional logistic regression social model predicting surgery (versus all other treatments)

Variable	Odds Ratio	95% Confidence Interval
Social Predictors		
Doctor	1.46	0.84, 2.54
Family	2.18	1.19, 3.97
Friend	0.46	0.12, 1.73
Yourself	1.43	0.82, 2.50
Stage* (early stage = referent)	5.13	2.62, 10.06
PSA Change (no change Vs. ≥ 1 change)	0.31	0.19, 0.49
Age at diagnosis (years)	0.89	0.85, 0.92
Marital Status (married Vs. unmarried)	1.36	0.66, 2.81
Insurance		
Medicare	1.11	0.59, 2.07
Medicaid	0.57	0.21, 1.49
Transportation Problems (yes Vs. no)	0.06	0.01, 0.56

Results of the final unconditional logistic regression social model predicting surgery (versus all other treatments)

Variable	Odds Ratio	95% Confidence Interval
Social Predictors		
Doctor	1.48	0.85, 2.56
Family	2.23	1.23, 4.02
Friend	0.50	0.13, 1.88
Yourself	1.42	0.82, 2.48
Stage* (early stage = referent)	5.31	2.71, 10.38
PSA Change(no change Vs. ≥ 1 change)	0.32	0.20, 0.50
Age at diagnosis (years)	0.89	0.86, 0.92
Transportation problems (yes Vs. no)	0.05	0.01, 0.47

Results of the full unconditional logistic regression clinical model predicting surgery (versus all other treatments)

Variable	Odds Ratio	95% Confidence Interval
Clinical Predictors		
Cure	1.29	0.68, 2.45
Impotence	0.57	0.31, 1.03
Incontinence	0.43	0.23, 0.81
Pain	0.98	0.34, 2.79
None	0.66	0.22, 2.01
Stage* (early stage = referent)	4.95	2.49, 9.82
PSA Change (no change Vs. ≥ 1 change)	0.34	0.21, 0.55
Age at diagnosis (years)	0.88	0.85, 0.92
Marital Status (married Vs. unmarried)	1.54	0.73, 3.23
Insurance		
Medicare	1.08	0.57, 2.06
Medicaid	0.62	0.24, 1.64
Transportation Problems (yes Vs. no)	0.10	0.01, 0.86

Results of the final unconditional logistic regression clinical model predicting surgery (versus all other treatments)

Variable	Odds Ratio	95% Confidence Interval
Clinical Predictors		
Cure	1.35	0.73, 2.51
Impotence	0.56	0.31, 1.00
Incontinence	0.43	0.23, 0.80
Pain	1.09	0.40, 2.98
None	0.75	0.26, 2.19
Stage* (early stage = referent)	5.15	2.60, 10.19
PSA Change (no change Vs. ≥ 1 change)	0.35	0.22, 0.55
Age at diagnosis (years)	0.89	0.86, 0.91
Transportation problems (yes Vs. no)	0.08	0.01, 0.69

Results of the final unconditional logistic regression social model predicting radiation (versus all other treatments).

Variable	Odds Ratio	95% Confidence Interval
Social Predictors		
Doctor	0.66	0.38, 1.13
Family	0.52	0.29, 0.93
Friend	1.62	0.44, 5.97
Yourself	0.84	0.49, 1.44
Stage* (early stage = referent)	0.19	0.09, 0.39
PSA Change (no change Vs. ≥ 1 change)	2.53	1.62, 3.97
Age at diagnosis (years)	1.10	1.07, 1.13
Transportation Problems (yes Vs. no)	9.74	1.82, 52.21

Results of the final unconditional logistic regression clinical model predicting radiation (versus all other treatments).

Variable	Odds Ratio	95% Confidence Interval
Clinical Predictors		
Cure	0.53	0.29, 0.98
Impotence	2.04	1.15, 3.61
Incontinence	2.16	1.20, 3.89
Pain	0.78	0.30, 2.02
None	1.42	0.50, 4.01
Stage* (early stage = referent)	0.19	0.09, 0.39
PSA Change (no change Vs. ≥ 1 change)	2.42	1.53, 3.85
Age at diagnosis (years)	1.11	1.08, 1.14
Transportation Problems (yes Vs. no)	6.28	1.21, 32.75

Results of the final unconditional logistic regression social model predicting hormones (versus all other treatments).

Variable	Odds Ratio	95% Confidence Interval
Social Predictors		
Doctor	1.71	0.81, 3.61
Family	1.41	0.66, 3.02
Yourself	1.29	0.62, 2.70
Grade* (low grade = referent)	3.51	1.87, 6.58
PSA Change (no change Vs. ≥ 1 change)	2.24	1.11, 4.55
Age at Diagnosis (years)	1.05	1.01, 1.10

Results of the final unconditional logistic regression clinical model predicting hormones (versus all other treatments).

Variable	Odds Ratio	95% Confidence Interval
Clinical Predictors		
Cure	0.58	0.27, 1.26
Impotence	2.65	1.24, 5.65
Incontinence	0.70	0.32, 1.52
Pain	0.89	0.27, 2.93
None	0.95	0.25, 3.61
Grade* (low grade = referent)	3.91	2.05, 7.46
PSA Change (no change Vs. ≥ 1 change)	2.46	1.20, 5.07
Age at Diagnosis (years)	1.07	1.02, 1.11