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Racial disparities in cancer related mortality in patients with squamous cell carcinoma of the esophagus in the US

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Disclosures

The presenters have no conflict of interest.

Background

- Esophageal cancer - approx1% of all diagnosed cancer in the US
- Five-year relative survival of 19% since 2000
- Racial and ethnic minorities have worse outcomes
- Blacks have more than fivefold higher incidence of esophageal SCC, more likely to be diagnosed at a more advanced stage, and higher cancer-related mortality than whites

Background

- Increased incidence of Asian/Pacific Islanders with GI cancer
- No recent studies include Asian/Pacific Islanders in their investigation of survival and esophageal SCC

Objective

To determine whether there is an association between race (white, black, Asian/Pacific Islanders) and cancer-related survival in patients with esophageal squamous cell carcinoma.

Methods

Study Design

Retrospective cohort study

Secondary data analysis using National Cancer Institute's Surveillance, Epidemiology, and End Result (SEER) database

- Adults ages 18 and older of White, Black, or Asian/Pacific Islander
- Diagnosed with squamous cell carcinoma of the esophagus
- Diagnosed between 1973 to 2013

Methods

Variables

- Independent Variable: Race (White, Black, Asian/Pacific Islander)
- Dependent Variable: Survival time
- Covariates: Age, Sex, Date of diagnosis, Partner status, Ethnicity, Cancer stage, Radiation, Surgery

Study Population

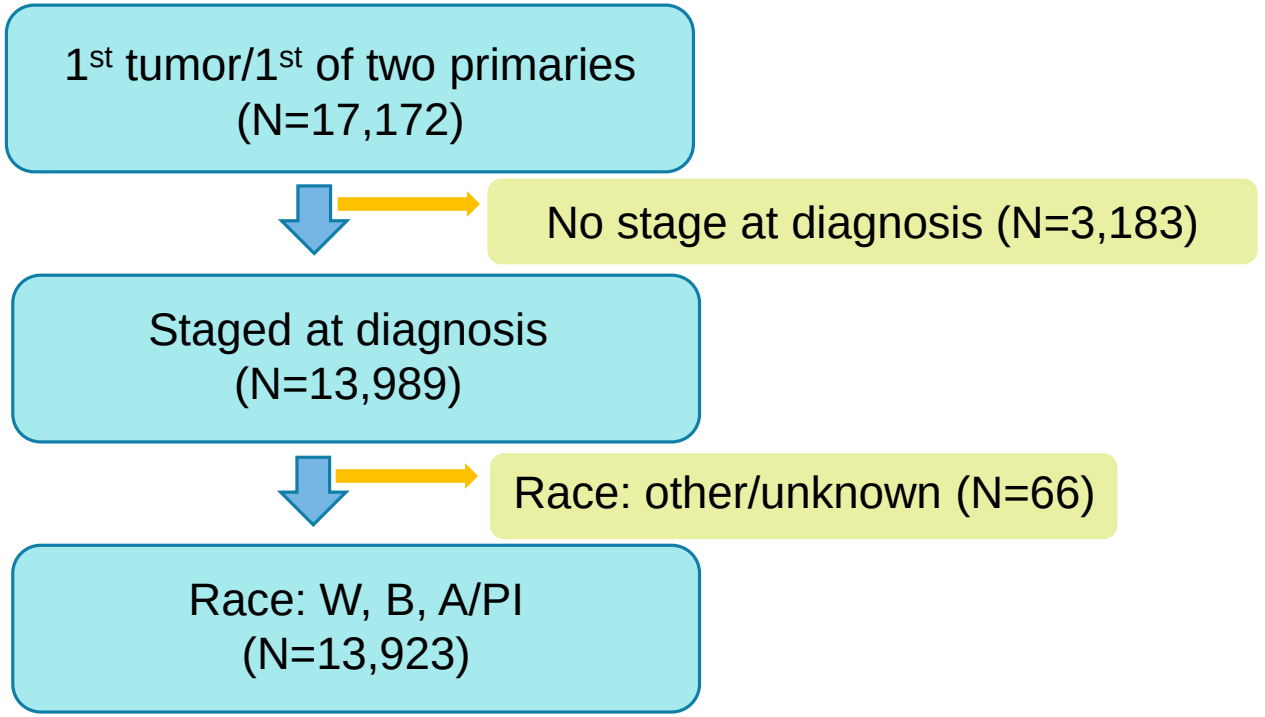
Total study population = 13,923

Inclusion Criteria

- Squamous cell carcinoma of esophagus (primary or first of two primaries)
- Ages 18 and older

Exclusion Criteria

- Unknown stage at diagnosis
- Other/unknown races



Statistical methods

- Descriptive and exploratory data analysis
- Bivariate analysis
- Collinearity assessment
- Kaplan-Meier survival analysis (overall survival)
- Cox proportional hazards regression (unadjusted and adjusted hazard ratios)
- p-value <0.05 statistically significant
- SPSS for analysis

Results

Table 1. Baseline characteristics of the study population according to race.

	Race			
	White N (%)	**Black N (%)**	**Asian/PI N (%)**	**p-value**
Age (years)				<0.001
18-49	406 (4.7)	544 (13.7)	94 (7.4)	
50-59	1653 (19.0)	1317 (33.2)	257 (20.2)	
60-69	2970 (34.2)	1328 (33.5)	415 (32.5)	
70-79	2524 (29.1)	635 (16.0)	335 (26.3)	
>=80	1132 (13.0)	139 (3.5)	174 (13.6)	
Sex				<0.001
Male	5638 (64.9)	2856 (72.1)	1038 (81.4)	
Year of diagnosis				<0.001
1973-1979	1696 (19.5)	670 (16.9)	145 (11.4)	
1980-1989	2331 (26.8)	1219 (30.8)	247 (19.4)	
1990-1999	2076 (23.9)	1031 (26.0)	308 (24.2)	
2000-2013	2582 (29.7)	1043 (26.3)	575 (45.1)	
Partnered				<0.001
Unpartnered[1]	3623 (43.1)	2436 (65.5)	436 (35.1)	

Table 1. Baseline characteristics of the study population according to race (con't)

	Race			
	White N (%)	**Black N (%)**	**Asian/PI N (%)**	**p-value**
Ethnicity				<0.001
Non-Spanish/Hispanic/Latino	8209 (94.5)	3947 (99.6)	1262 (99.0)	
Spanish/Hispanic/Latino	476 (5.5)	16 (0.4)	13 (1.0)	
Staging				<0.001
In-situ	93 (1.1)	16 (0.4)	10 (0.8)	
Localized	2984 (34.4)	1250 (31.5)	319 (25.0)	
Regional	2950 (34.0)	1253 (31.6)	488 (38.3)	
Distant	2658 (30.6)	1444 (36.4)	458 (35.9)	
Radiation				0.314
Yes	5734 (67.4)	2556 (66.5)	870 (68.7)	
Surgery				<0.001
Yes	2378 (30.1)	982 (26.0)	346 (27.5)	

Table 2. Baseline characteristics of the study population according to cancer-specific mortality.

	Cause-specific mortality		
	Alive	**Dead**	**p-value**
	N (%)	**N (%)**	
Race			<0.001
White	1848 (21.3)	6837 (78.7)	
Black	726 (18.3)	3237 (81.7)	
Asian/Pacific Islander	295 (23.1)	980 (76.9)	
Age			0.013
18-49	233 (22.3)	811 (77.7)	
50-59	597 (18.5)	2630 (81.5)	
60-69	1004 (21.3)	3709 (78.7)	
70-79	738 (21.1)	2756 (78.9)	
>=80	297 (20.6)	1148 (79.4)	
Sex			<0.001
Male	1857 (19.5)	7675 (80.5)	
Year of diagnosis			<0.001
1973-1979	346 (13.8)	2165 (86.2)	
1980-1989	653 (17.2)	3144 (82.8)	
1990-1999	651 (19.1)	2764 (80.9)	
2000-2013	1219 (29.0)	2981 (71.0)	

Table 2. Baseline characteristics of the study population according to cancer-specific mortality (con't)

	Cause-specific mortality		
	Alive	**Dead**	**p-value**
	N (%)	**N (%)**	
Partnered			0.009
Unpartnered[1]	1278 (19.7)	5217 (80.3)	
Ethnicity			0.025
Non-Spanish/Hispanic/Latino	2745 (20.5)	10673 (79.5)	
Spanish/Hispanic/Latino	124 (24.6)	381 (75.4)	
Staging			<0.001
In-situ	72 (60.5)	47 (39.5)	
Localized	1213 (26.6)	3340 (73.4)	
Regional	1032 (22.0)	3659 (78.0)	
Distant	552 (12.1)	4008 (87.9)	
Radiation			0.463
Yes	1878 (20.5)	7282 (79.5)	
Surgery			<0.001
Yes	1067 (28.8)	2639 (71.2)	

Kaplan-Meier Curve for Race in Esophageal Squamous Cell Carcinoma Patients

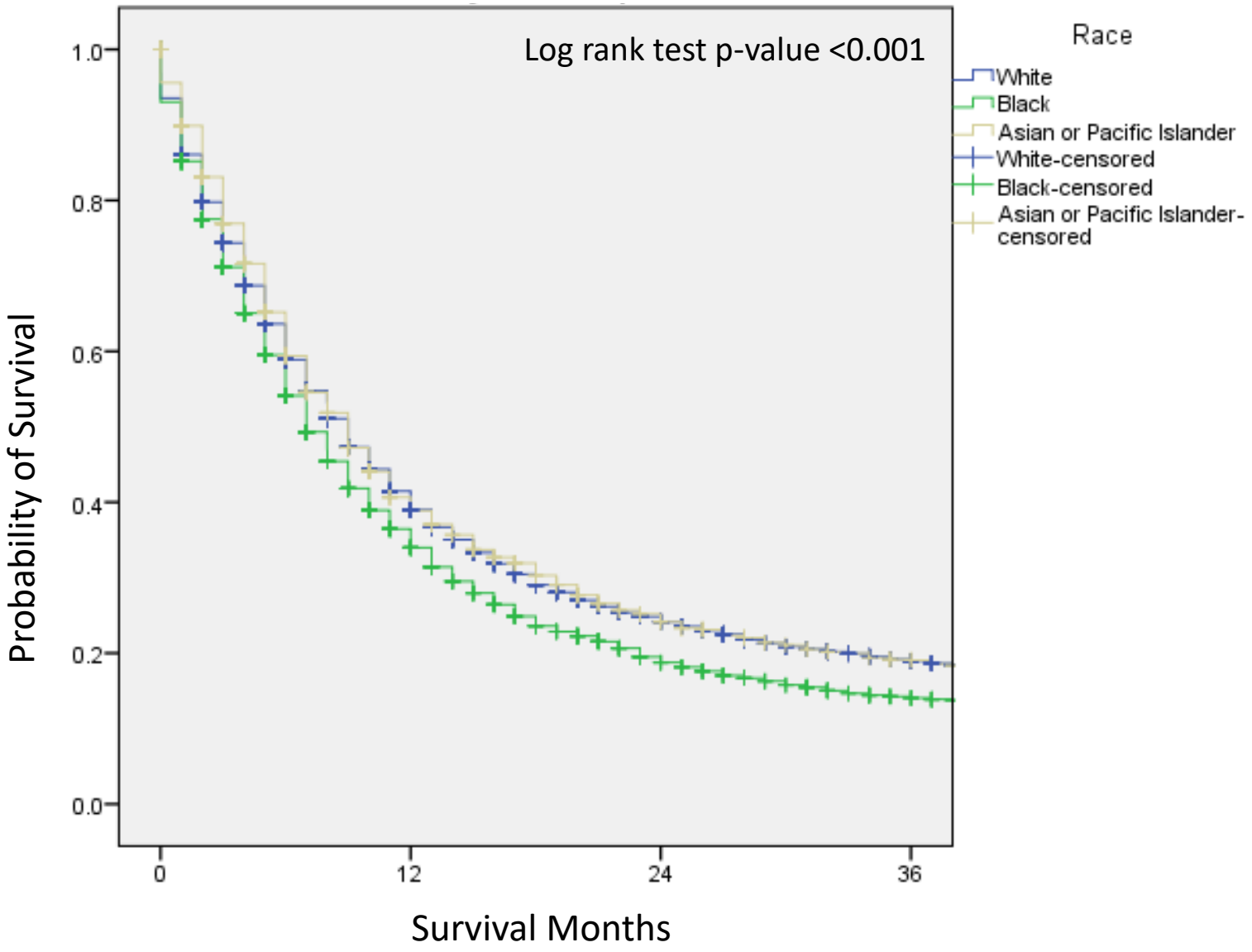


Table 3. Unadjusted and adjusted hazard ratios for the associations between predictors of cause-specific mortality

	Unadjusted HR[1] (95% CI[2])	**Adjusted* HR (95% CI)**
Race		
White	Ref[3]	Ref
Black	1.15 (1.11-1.20)	1.08 (1.03-1.13)
Asian/Pacific Islander	0.97 (0.91-1.04)	1.00 (0.93-1.07)

* Model adjusted for: age, sex, year of diagnosis, partnered, ethnicity, stage, radiation, surgery

Summary

- After adjustment for all other variables except insurance
  - Blacks had a statistically significant higher risk of death compared to whites
  - Asian/Pacific Islanders do not have a significantly different survival time compared to white individuals
  - Survival continuously improved in in all races across all four decades

Strengths

- Large sample size (N=13,923)
- Incorporation & adjustment of variables - including race/ethnicity, sex, age at diagnosis, stage, and radiation

Limitations

- Data from 13 US states, which is not completely representative the entire US population.
- Socioeconomic status not included
- Information on insurance status only available from 2007 and onward
- 3,183 patients excluded due to no stage at diagnosis

Practical Implications

- Identify factors that may explain for the persistent difference in hazard ratio for blacks (socioeconomic status, access to healthcare, etc)
- Outcome equality within health care will improve cost in the long-run and bring optimal care regardless of race.
- Further research should be done on the underlying factors on why mortality is higher in blacks.

Questions?

Supplemental. Sub-analysis of 3182 patients excluded due to missing stage

	Missing Stage		
	No	**Yes**	**p-value**
	N (%)	**N (%)**	
Race			<0.001
White	8685 (62.4)	2202 (69.6)	
Black	3963 (28.5)	759 (24.0)	
Asian/Pacific Islander	1275 (9.2)	203 (6.4)	
SEER Cause-Specific Death			0.721
Alive	2869 (20.6)	643 (20.3)	
Dead	11054 (79.4)	2521 (79.7)	