

# INTRODUCTION

- Breast cancer is the second leading cause of cancer death in U.S. women.
  - In 2013, an estimated 232,340 women will be diagnosed and 39,620 will die from breast cance
- There is no conclusive evidence of causality, but smoking may be associated with mortality in breast cancer patients.
  - This association may differ by race, ethnicity, and socioeconomic status (SES).
- With enhancement of the Florida Cancer Data Syste (FCDS) Registry, disparities in survival of cancer patients can be examined.

# PURPOSE

The purpose of this study was to examine the association between smoking and mortality in breast cancer patients, and determine if this differs by race, ethnicity, and SES using an enhanced dataset of FCDS linked with the Florida Agency for Health Care Administration (ACHA)

# METHODS

- Data from 1996-2007 FCDS was enhanced by linkage with AHCA and information from the US Census.
- AHCA contains diagnosis and procedure codes for all in- and out-patient encounters at hospitals & free standing surgical & radiological treatment centers.
- Outcome of interest: survival time from date of diagnosis to date of death.
- Inclusion criteria: Females ≥18 years old, diagnosed with breast cancer in the state of Florida.
- Smoking status was assessed by self report in FCDS.
- Final sample size, N=127,754.
- Statistical analyses:
  - Univariate and multivariate Cox proportional hazard regression model.
  - Multivariate models were conducted sequentially with progressive adjustments for:
    - Sociodemographic variables
    - **Clinical-pathological variables**
    - Comorbidities.

# SMOKING AND MORTALITY IN BREAST CANCER PATIENTS

Alicia Padron<sup>1</sup>, Tulay Koru-Sengul<sup>1,3</sup>, Stacey L. Tannenbaum<sup>3</sup>, Feng Miao<sup>3</sup>, Damien Hansra<sup>3</sup>, David Lee<sup>1</sup>, Margaret M. Byrne<sup>1,2,3</sup> <sup>1</sup>Departments of Public Health Sciences, and <sup>2</sup>Surgery, <sup>3</sup>Sylvester Comprehensive Cancer Center, University of Miami Miller School of Medicine, Miami, Florida

	De	emographic	Characte	eristics		
		All patients	Smoking status			
r			% in each category			
		N	Never	Former	Current	Unknown
	All patients	127,754	62,361	23,365	15,793	26,235
۶r	Race					
	White	115,506	48	19	13	21
t	Black	10,820	59	11	10	20
	Native American	60	52	12	18	18
d	Asian	656	70	6	5	18
	Pacific Islander	50	64	18	2	16
em	Asian Ind/Pakistani	212	66	7	2	25
	Other	450	53	9	5	33
	Hispanic origin					
	No	115,514	47	19	13	21
	Yes	12,240	64	10	8	18
	SES					
	Lowest	14,381	53	14	13	20
	Middle-low	37,382	49	17	14	21
S	Middle-high	48,356	47	19	12	21
	Highest	27,635	49	21	11	20

### **Cox Proportional Hazards Models by Smoking Status**

	· •		• •		
	Univariate		Multivariate		
	HR (95%CI)	P-value	HR (95%CI)	P-value	
<b>Smoking Status</b>					
Never	1 (reference)		1 (reference)		
Former	1.04 (1.01 <i>,</i> 1.08)	0.009	1.08 (1.04,1.12)	<0.001	
Current	1.15 (1.11 <i>,</i> 1.19)	<0.001	1.31 (1.26, 1.37)	<0.001	
Unknown	1.37 (0.96, 1.96)	0.082	1.04 (0.97, 1.11)	0.255	
Aultivariate model	includes additional de	omographi	lalinical prodictors or	d comorbi	

### Multivariate Cox Proportional Hazards Model by Race/Ethnicity/SES Subgroups

	Former*		Current*		Unknown*	
	HR (95%CI)	P-value	HR (95%CI)	<b>P-value</b>	HR (95%CI)	<b>P-value</b>
Race						
White	1.08 (1.05, 1.12)	<0.001	1.39 (1.32, 1.46)	<0.001	1.07 (1.02, 1.12)	0.010
Black	1.03 (0.92, 1.15)	0.636	1.10 (0.99, 1.23)	0.089	0.99 (0.90, 1.08)	0.808
Other	1.06 (0.72, 1.54)	0.781	1.70 (1.02, 2.82)	0.040	1.04 (0.71, 1.51)	0.846
Hispanic						
No	1.08 (1.05, 1.12)	<0.001	1.36 (1.30, 1.43)	<0.001	1.05 (1.00, 1.10)	0.051
Yes	0.94 (0.81, 1.09)	0.416	1.05 (0.91, 1.20)	0.514	1.11 (1.00, 1.24)	0.045
SES						
Lowest	1.04 (0.94, 1.15)	0.412	1.22 (1.11, 1.34)	<0.001	1.11 (1.02, 1.20)	0.013
<b>Middle-low</b>	1.09 (1.04, 1.15)	<0.001	1.32 (1.23, 1.42)	<0.001	1.05 (0.97, 1.13)	0.197
Middle-high	1.09 (1.04, 1.15)	<0.001	1.41 (1.33, 1.51)	<0.001	1.04 (0.97, 1.12)	0.222
Highest	1.02 (0.96, 1.09)	0.532	1.33 (1.20, 1.48)	<0.001	1.05 (0.98, 1.14)	0.181

## RESULTS

- The majority of the sample were White (90.4%), non-Hispanic (90.4%), and in the middle-high or highest SES category (59.5%).
- In the unadjusted model compared with never smokers, worse survival was found in: Current smokers HR 1.15 (P<0.001)
  - Former smokers HR 1.04 (P=0.009)
- In the model adjusting for extensive demographic, clinical characteristics and comorbidities, worse survival was found in:
  - Current smokers HR 1.31 (P<0.001) Former smokers HR 1.08 (P<0.001)
- In multivariate analyses on racial, ethnic, and SES subgroups of the population, compared with never smokers, we found:
  - RACE
  - Worse survival for Whites with current (HR 1.39; P<0.001), former (HR 1.08; P<0.001), or unknown (HR 1.07; P=0.01) smoking status. No different in survival for Blacks based on smoking

  - history.
  - ETHNICITY
  - P<0.001) smokers.
  - <u>SES</u>
  - (P<0.001).

## CONCLUSION

- Using an enhanced FCDS registry for female breast cancer patients provided a strengthened ability to identify an association of smoking status with survival as well as its differing associations by race, ethnicity, and SES, therefore:
- Further use of a enhanced FCDS registry is needed to explore cancer disparities.
- Further exploration is needed to clarify the survival disparities.

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Worse survival was seen for non-Hispanics who were current (HR 1.36; P<0.001) or former (HR 1.08;

Worse survival was observed for current smokers across all SES categories (P<0.001 for all) and for former smokers in the middle 2 SES categories