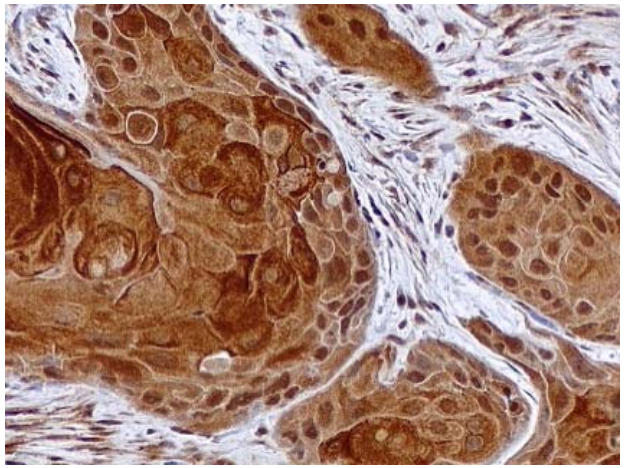
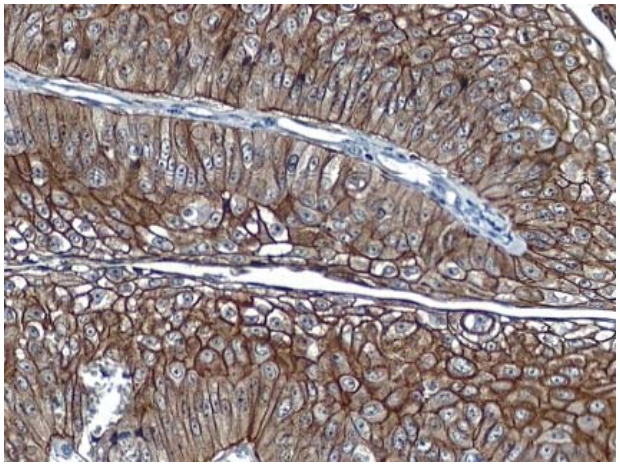
Race and Ethnicity in HPV related Oropharyngeal Cancer

Kevin J. Cullen – Director, University of Maryland Greenebaum Cancer Center

Markers Analyzed (3)





- Beta-tubulin-II
  - Target of taxanes - ?adverse prognosis

    (Biogenex JDR 3B8)
- Her-2 neu
  - Negative prognostic factor in several cancers

    (Dako A0485)

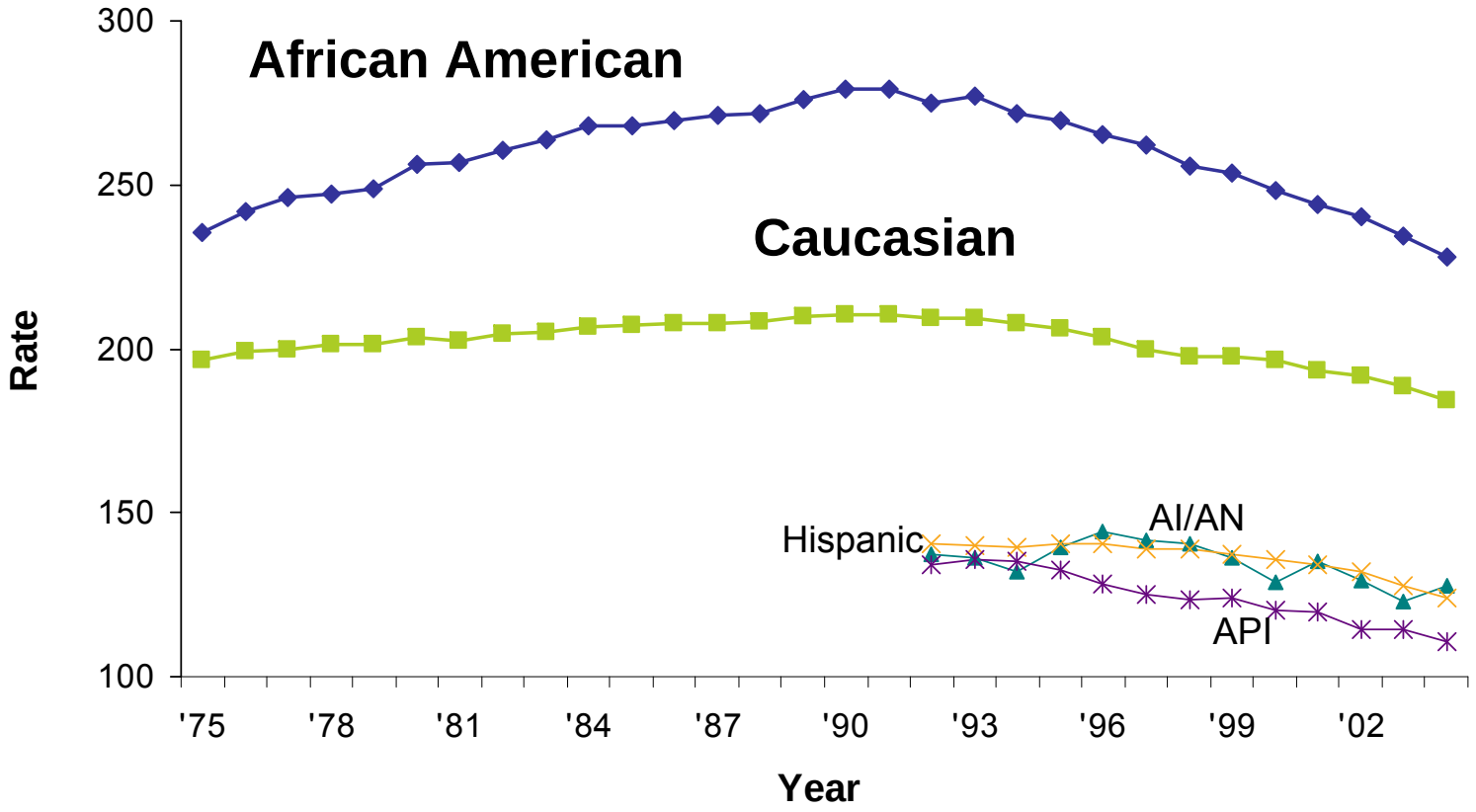
RACIAL DISPARITIES IN HEAD AND NECK CANCER

Race – a neglected biomarker in cancer

- African American men with cancer are 30% more likely to die than whites

- African American women with breast cancer are 17% more likely to die than whites

All Sites – Cancer Mortality Rates 1973-2004 By Race, Males and Females



Incidence and mortality rates per 100,000 and age-adjusted to 2000 US standard population
SEER Cancer Statistics Review 1975-2004.

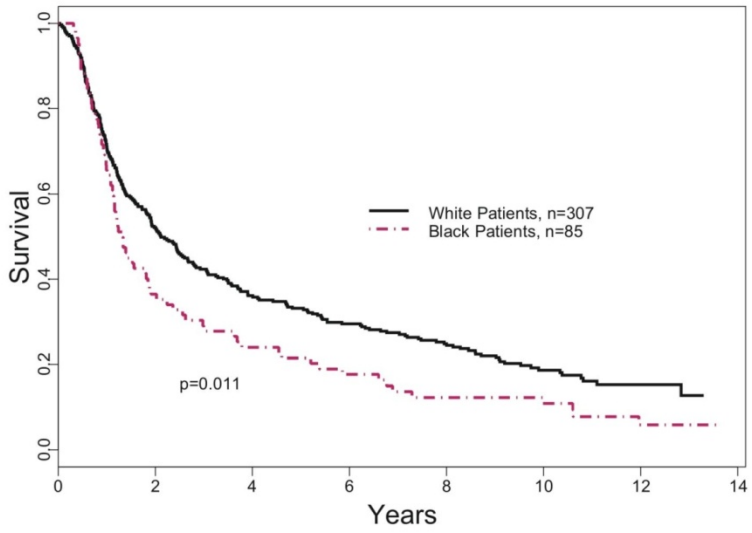
Survival Rates RMS Titanic

Concept of Dr. Lisa Newman

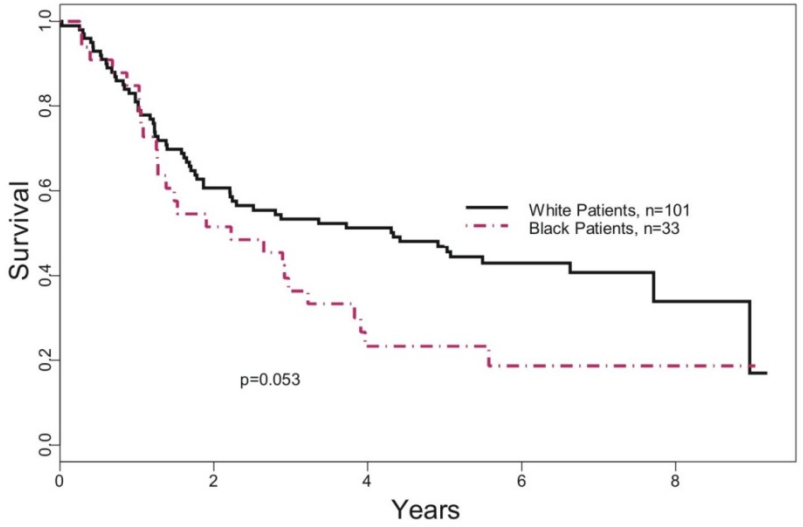
First Class	60%
Second Class	43%
Third Class	20%

Black patients with locally advanced HNSCC show poor survival compared to whites – RTOG 9003, 9501

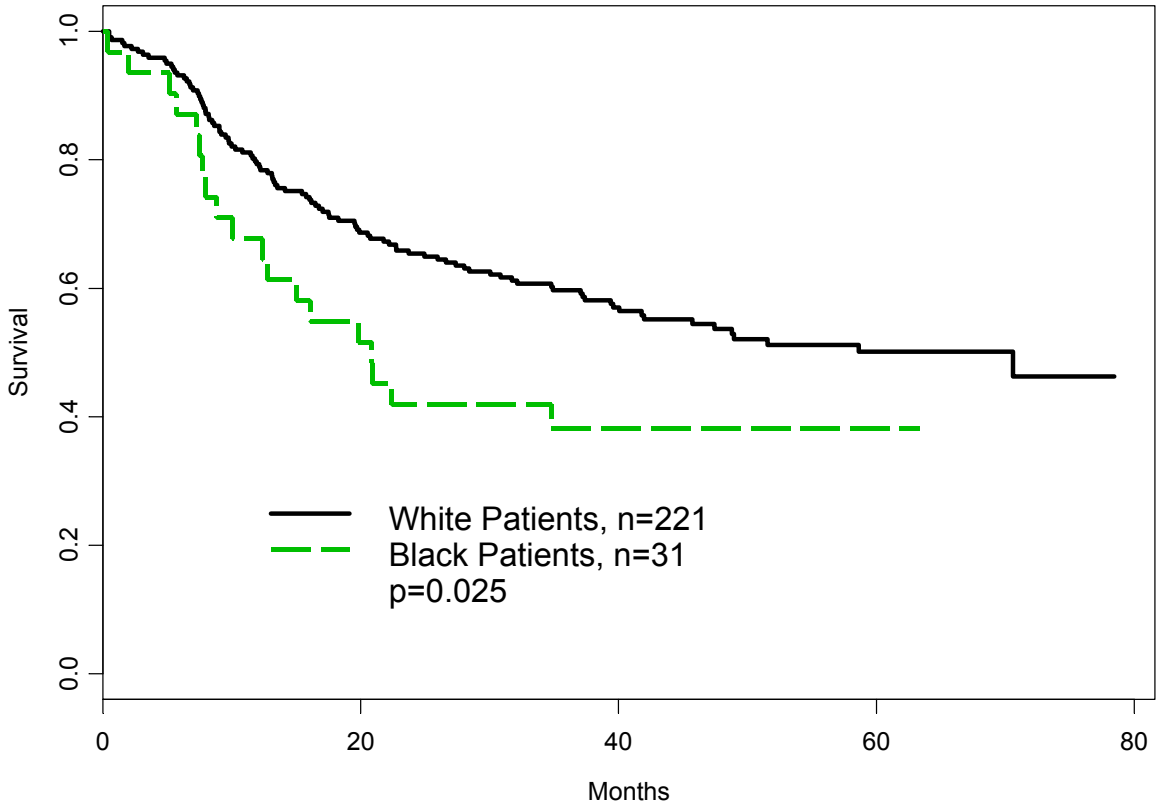
RTOG 9003



RTOG 9501



Black patients with locally advanced HNSCC show poor survival compared to whites – TAX 324



Cancer **Prevention** Research

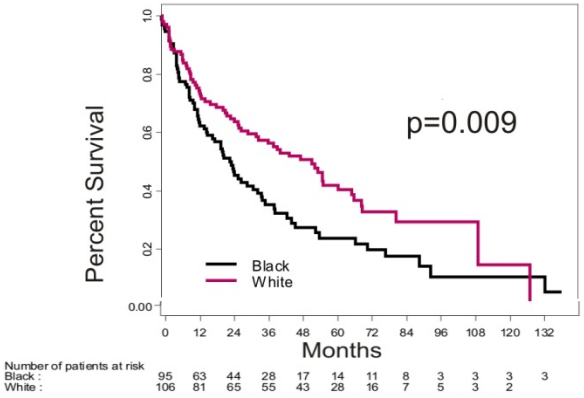
Cancer Prev Res 2009;2(9) September 2009

Racial Survival Disparity in Head and Neck Cancer Results from Low Prevalence of Human Papillomavirus Infection in Black Oropharyngeal Cancer Patients

Kathleen Settle,[1] Marshall R. Posner,[2] Lisa M. Schumaker,[1] Ming Tan,[1] Mohan Suntharalingam,[1] Olga Goloubeva,[1] Scott E. Strome,[1] Robert I. Haddad,[2] Shital S. Patel,[1] Earl V. Cambell III,[1] Nicholas Sarlis,[3] Jochen Lorch[2] and Kevin J. Cullen[1]

Impact of Race on Survival University of Maryland

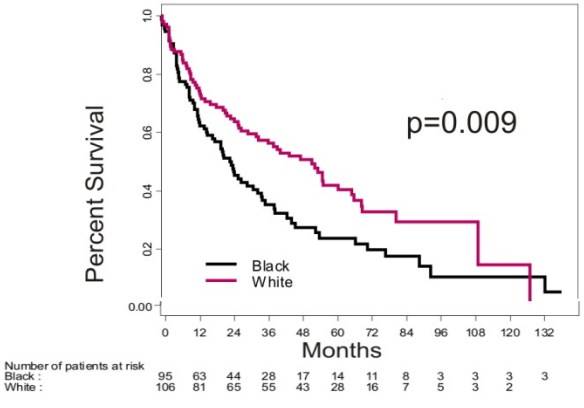
A.



All Patients

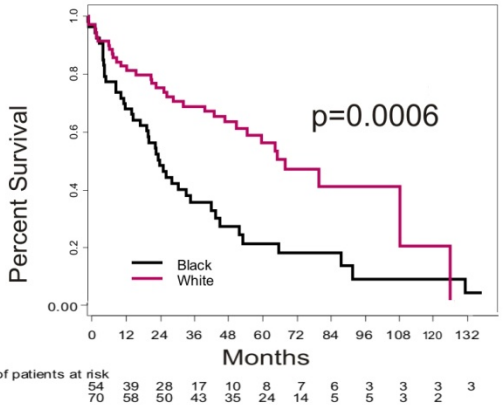
Impact of Race on Survival University of Maryland

A.



All Patients

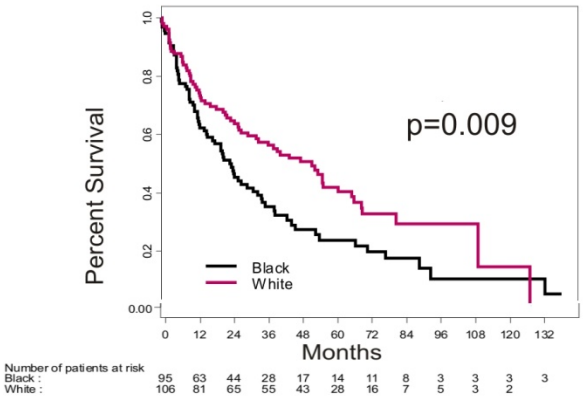
B.



Oropharynx

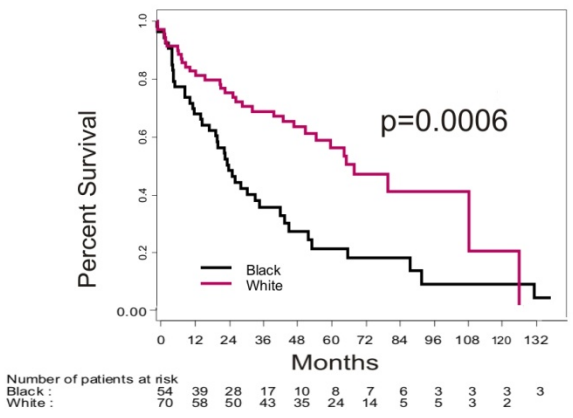
Impact of Race on Survival University of Maryland

A.



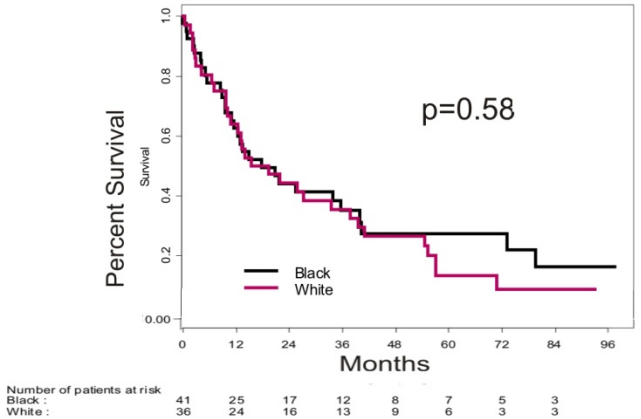
All Patients

B.



Oropharynx

C.



Non-Oropharynx

HPV Positive Cases by Race – TAX 324

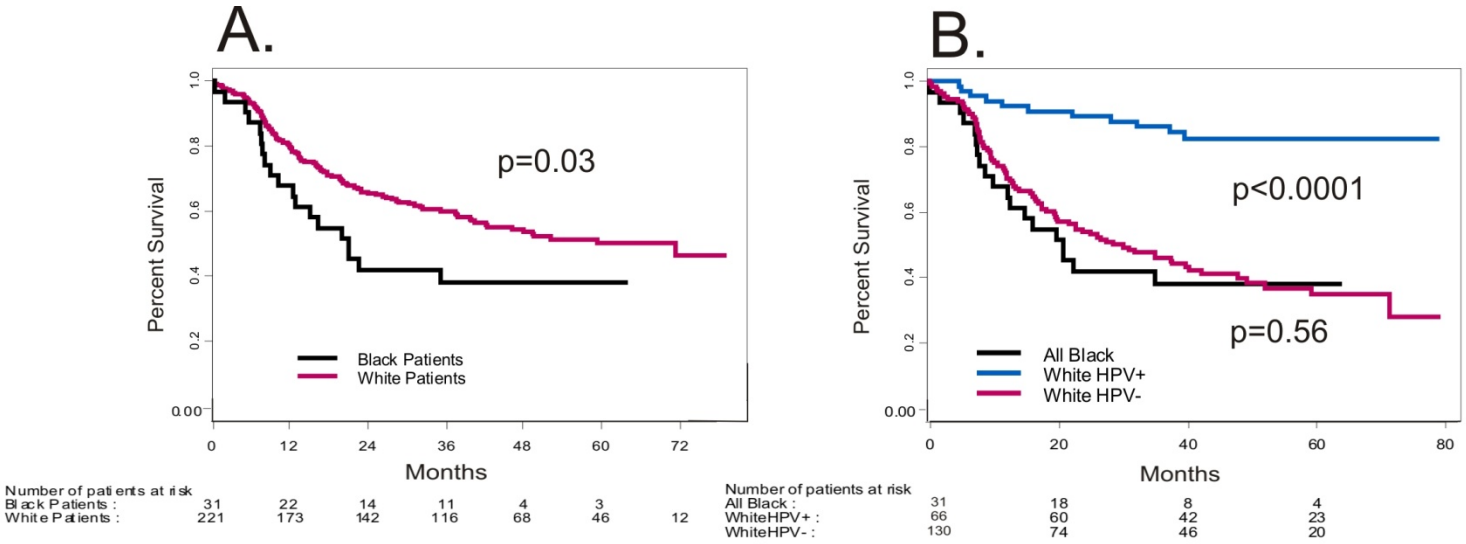
Race	HPV negative	HPV positive	Total
White	130, 66%	66, 34%	196
Black	28, 97%	1, 3%	29
Total	158	67	225

HPV Positive Cases by Race – TAX 324

Race	HPV negative	HPV positive	Total
White	130, 66%	66, 34%	196
Black	28, 97%	1, 3%	29
Total	158	67	225

Whites 10 times more likely than blacks to be HPV positive p=0.0003

Impact of Race on Survival
TAX 324 Study



All Patients **Racial Disparities**

Racial disparity is due to large number of white patients with good prognosis HPV positive tumors – rate of HPV positive tumors very low in blacks.

HPV and Race

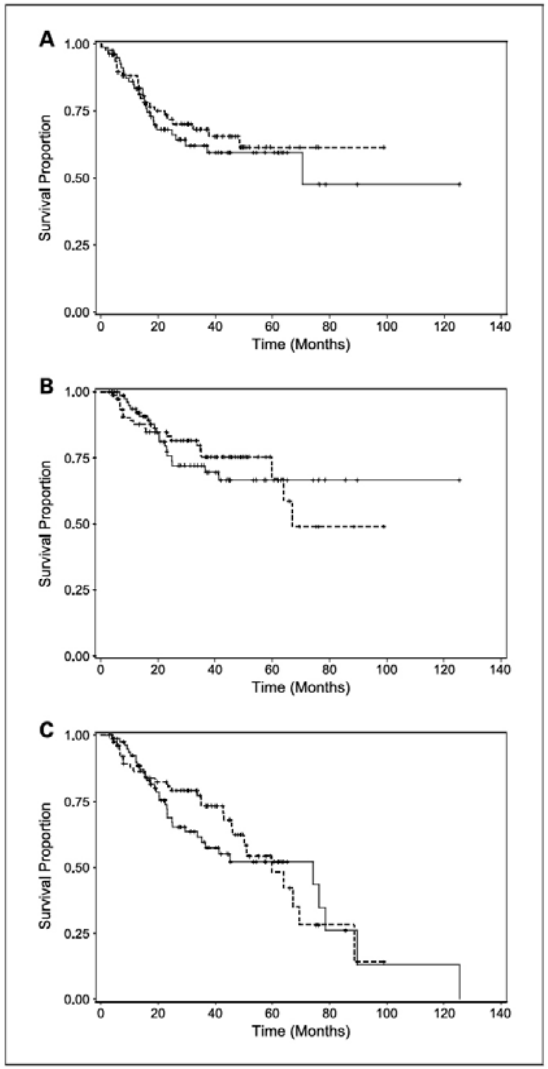
Validation studies – MD Anderson and U Maryland

Cancer **Prevention** Research

Matched-Pair Analysis of Race or Ethnicity in Outcomes of Head and Neck Cancer Patients Receiving Similar Multidisciplinary Care

Leon M. Chen,[1,5] Guojun Li,[1,2] Lorraine R. Reitzel,[3] Kristen B. Pytynia,[6] Mark E. Zafereo,[1,4] Qingyi Wei[2] and Erich M. Sturgis[1,2]

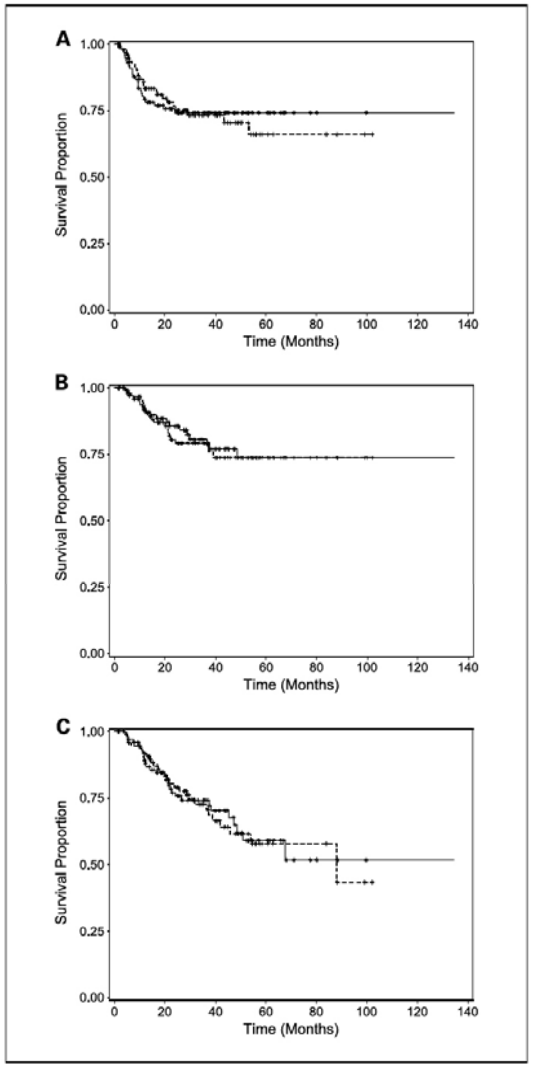
African-American v white



RFS

DSS

OS

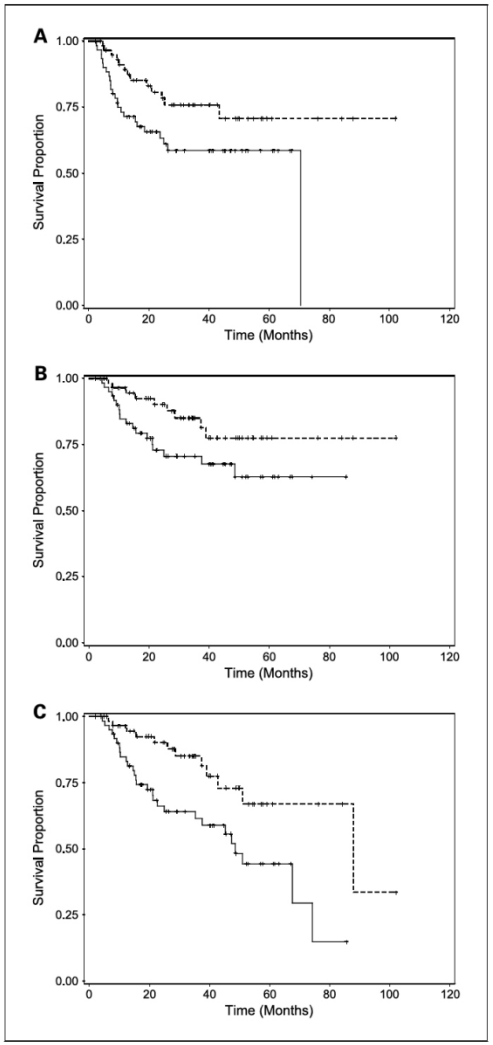


Hispanic v white

Fig. 1. Survival of African American case and matched non-Hispanic white control patients with SCCHN. The case group is represented by solid lines, the control group by dashed lines. *A*, recurrence-free survival ($P = 0.569$); *B*, disease-specific survival ($P = 0.826$); *C*, overall survival ($P = 0.536$).

Fig. 2. Survival of Hispanic American case and matched non-Hispanic white control patients with SCCHN. The case group is represented by solid lines, the control group by dashed lines. *A*, recurrence-free survival ($P = 0.954$); *B*, disease-specific survival ($P = 0.873$); *C*, overall survival ($P = 0.844$).

African-American + Hispanic v white



RFS

DSS

OS

Oropharyngeal Cancer Only

Fig. 3. Survival of minority case and matched non-Hispanic white control patients with oropharyngeal cancer. The case group is represented by solid lines, the control group by dashed lines. *A*, recurrence-free survival ($P = 0.028$); *B*, disease-specific survival ($P = 0.067$); *C*, overall survival ($P = 0.004$).

Discussion

We found no evidence of disparities in survival for either African American or Hispanic American patients with SCCHN compared with similar non-Hispanic white patients who received similar multidisciplinary-team directed treatment at a tertiary cancer center…. The site-specific disparity we found among oropharyngeal cancer patients despite careful matching on smoking and treatment is consistent with a recent report of an unmatched single-institution study (worse disease-free and overall survival for African American oropharyngeal cancer patients) and suggests that a biology-based factor underlies this site-specific disparity.

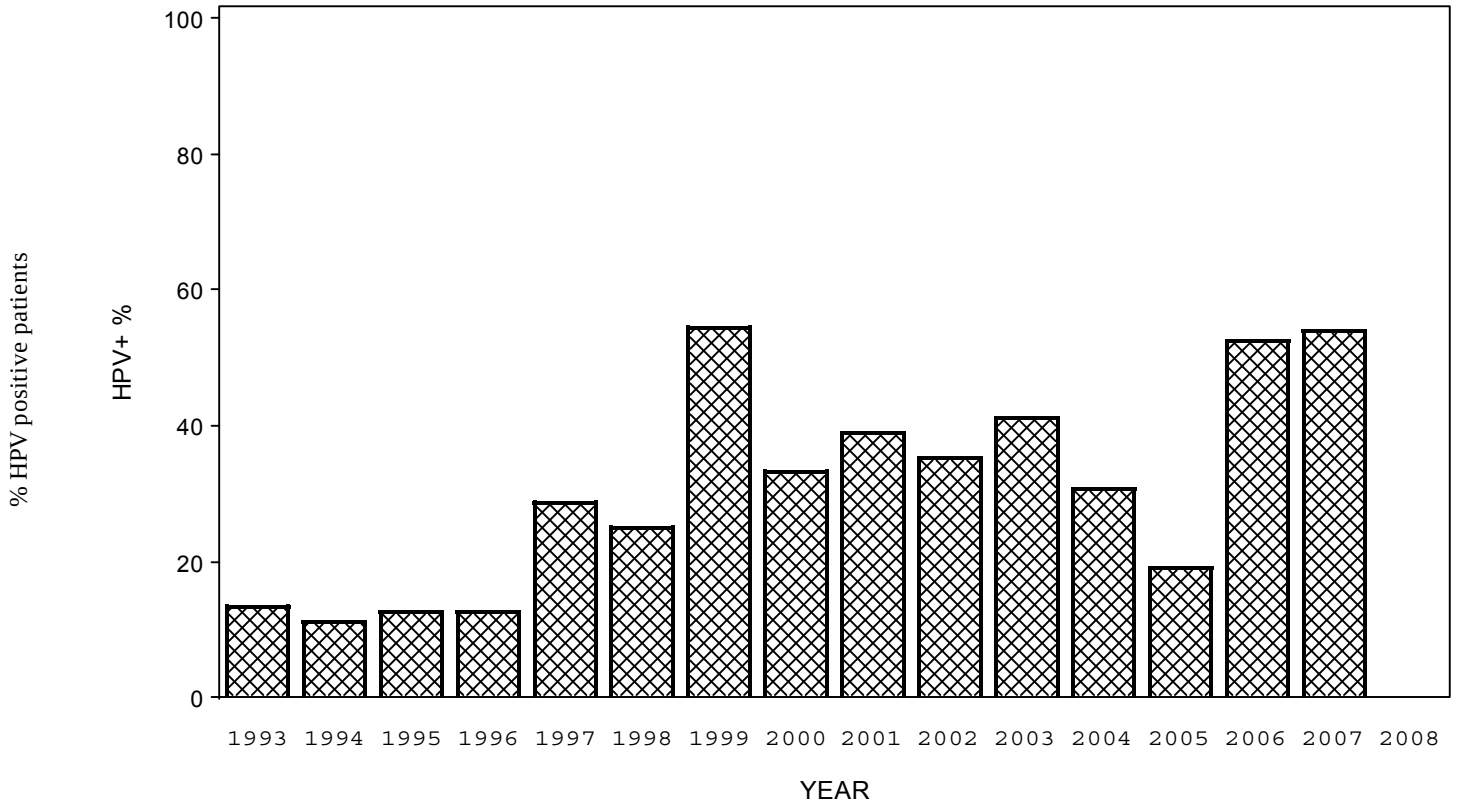
U. Maryland expanded retrospective analysis – 311 OPC patients 1992-2007

Table 1. Baseline characteristics of the 311 study patients.	
Characteristic	**Value**
Race-no.(%)	
White	196 (59)
Black	134 (41)
Sex – no.(%)	
Male	270 (82)
Female	59 (18)
Age at the end of treatment for 300 subjects –yr	
Median	56
Range	35-94
Smoking status-no. (%)	
Yes	259 (78)
No	34 (10)
Unknown	37 (11)
ETOH use –no.(%)	
Yes	202 (61)
No	90 (27)
Unknown	38 (12)
Stage –no. (%)	
I-III	84 (25)
IV	237 (72)
Unknown	9 (3)
HPV status	
Negative	132 (40)
Positive	64 (19)
Unknown	134 (41)

Race and HPV – U. Maryland Confirmation Set (only pts with complete clinical data)

Ethnicity	HPV status		Total
	HPV+	HPV-	
Black	9 (13%*)	60	69
White	49 (49%)	52	101
Total	58	112	170

% HPV positive OPC by year 1992-2007 – All patients



Proportion of patients who were tested HPV positive from 1992 to 2007

HPV Positive OPC by year – University of Maryland

OSCC	Black				White			
	1992-95	1996-99	2000-03	2004-08	1992-95	1996-99	2000-03	2004-08
Age at Diagnosis, Median (N)	53 (23)	56 (39)	55 (53)	55 (43)	58 (23)	59 (42)	58 (83)	55 (77)
Male, % (N)	83 (23)	92 (39)	85 (53)	88 (43)	79 (24)	84 (43)	76 (82)	81 (80)
Ever smokers, % (N)	95 (20)	93 (30)	98 (41)	90 (40)	93 (15)	81 (27)	84 (67)	83 (69)
Ever drinkers, % (N)	85 (20)	83 (30)	78 (40)	83 (40)	80 (15)	59 (27)	60 (68)	58 (69)
Tumor HPV16 positive, % (N)	0 (18)	13 (16)	20 (20)	22 (23)	33 (15)	43 (21)	40 (42)	50 (44)

Multivariable Cox Anal. (path samples only)

Factor	HR, 95% CI	p-value
Race White Black	 1.0 1.9,1.2-2.9	 0.01
Gender M F	 1.0 2.0, 1.1-3.4	 0.02
Smoking status No Yes	 1.0 0.9,0.4-1.9	 0.74
Alcohol use No Yes	 1.0 1.3, 0.7-2.3	 0.34
HPV status Positive Negative	 1.0 2.3,1.3-4.0	 0.004

Where do we go from here?

- HPV is causing an emerging epidemic of non cervical cancer first in whites and soon in minority populations
- Vaccination rates for girls in US now are approximately 15% v 85% in Canada and UK.
- Public Health professionals must redouble efforts to promote HPV vaccination for boys as well as girls.