

Incidence of HPV-Associated Head and Neck Cancers by Sub-site Among Diverse Racial/Ethnic Populations in the United States



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Introduction

- Incidence
 - U.S. = 36,540 new cases of oral cavity and pharyngeal cancer (OPC) in 2010
 - U.S. = 12,720 new cases of laryngeal cancer in 2010
 - Higher in individuals over the age of 50, males, and African-Americans
 - Age-adjusted incidence rates have declined for OPC since 1975 for men and since 1980 for women
- Mortality
 - U.S. = 7,880 deaths from OPC in 2010
 - U.S. = 3,600 deaths from laryngeal cancer in 2010
- Survival
 - Five-year relative survival rate for OPC is 61% and is 62% for larynx
 - African-Americans have lower survival rates than Whites

Risk Factors

- Alcohol and Tobacco Exposure
 - Risk related to intensity and duration of exposure
 - Over 80% of head and neck cancer (HNC) cases are attributable to alcohol and tobacco exposure
- Human Papillomavirus (HPV) Prevalence
 - Approximately 25% of all HNCs are positive for HPV-DNA
 - Varies by anatomic sub-site
 - HPV prevalence is significantly higher in the oropharynx and tonsil than the oral cavity and larynx

Study Objectives

- To describe the incidence of HNC in the U.S., 1995 - 2005
- To describe the distribution and trends in HNC incidence for specific anatomical sub-sites by race and sex
 - To compare HPV-associated sites and non HPV-associated sites
- To investigate whether the incidence of HNC is increasing for the sub-sites associated with HPV infection compared to the sub-sites not associated with HPV

Methods

- Case Identification
 - Cases were identified through the North American Association of Central Cancer Registries (NAACCR) Cancer in North America (CINA) Deluxe Analytic Data for 1995-2005
 - To be included in CINA Deluxe:
 - Data must meet NAACCR high quality standards (either gold or silver status) on data quality indicators
 - Registries included represent approximately 82% of the U.S. population
 - Excluded overlapping metropolitan areas to avoid double counting of cases

Methods

- Case Classification
 - Includes all cancers with anatomic sites under the heading of “lip, oral cavity and pharynx” and “larynx” according to the International Classification of Diseases for Oncology (ICD-O)

ANATOMICAL SITES	ICD-O-3 CODES
Lip	C00.0 – C00.9
Tongue	C01.9 – C02.9
Gum	C03.0 – C03.9
Floor of Mouth	C04.0 – C04.9
Palate	C05.0 – C05.9
Other and unspecified parts of mouth	C06.0 – C06.9
Salivary Gland	C07.9 – C08.9
Tonsil	C09.0 – C09.9
Oropharynx	C10.0 – C10.9
Nasopharynx	C11.0 – C11.9
Hypopharynx	C12.9, C13.0 – C13.9
Other oral cavity and pharynx	C14.0 – C14.8
Larynx	C32.0 – C32.9

Did not include these sites in the analysis due to etiologic and histological differences from the other sub-sites

Methods

- Classified all HNC cases into two groups:

HPV-Associated Sites	Non HPV-Associated Sites
Tonsil, including the Waldeyer ring C09.0-C09.9 C14.2	All other remaining HNC sites C02.0-C02.3 C02.8-C06.9 C10.0-C10.1 C12.9-C14.0 C14.8 C32.0-C32.9
Base of tongue and lingual tonsil C01.9 C02.4	
Oropharynx C10.2 C10.9	

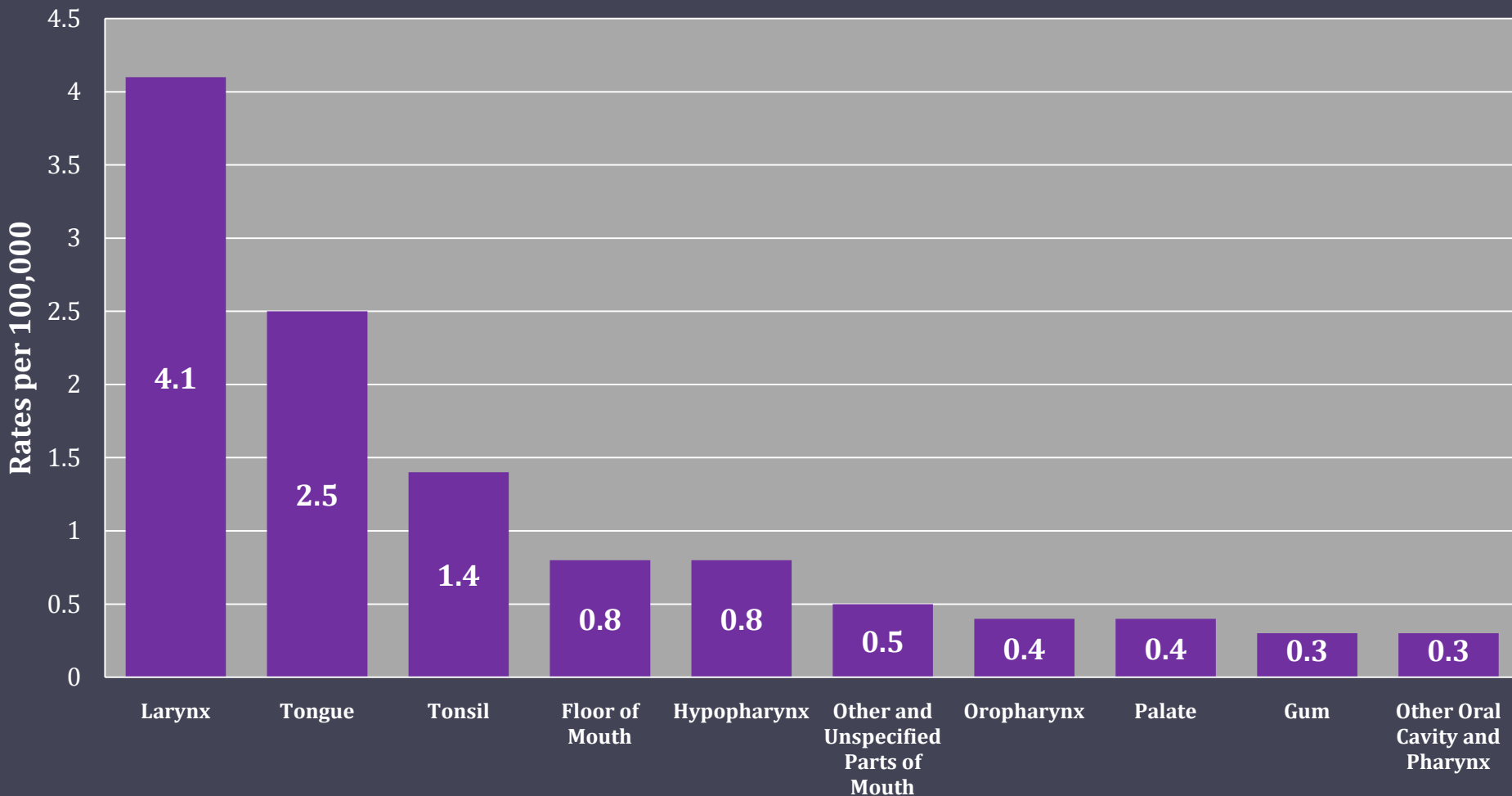
Statistical Analysis

- Frequency and percent distribution
- Age-adjusted incidence rates (2000 U.S. Standard)
 - By sex, race/ethnicity, and HNC sub-site
- HPV-associated sites and Non HPV-associated sites
 - Compared age-adjusted incidence rates
 - By sex, age, and race/ethnicity
- Annual percent change (APC)
 - Only used data from registries that contributed data for the entire 1995-2005 time period
 - Examined whether trends differ between HPV-associated sites and non HPV-associated sites
 - By race/ethnicity groupings
- Data analyses conducted using SEER*Stat, version 6.2.4

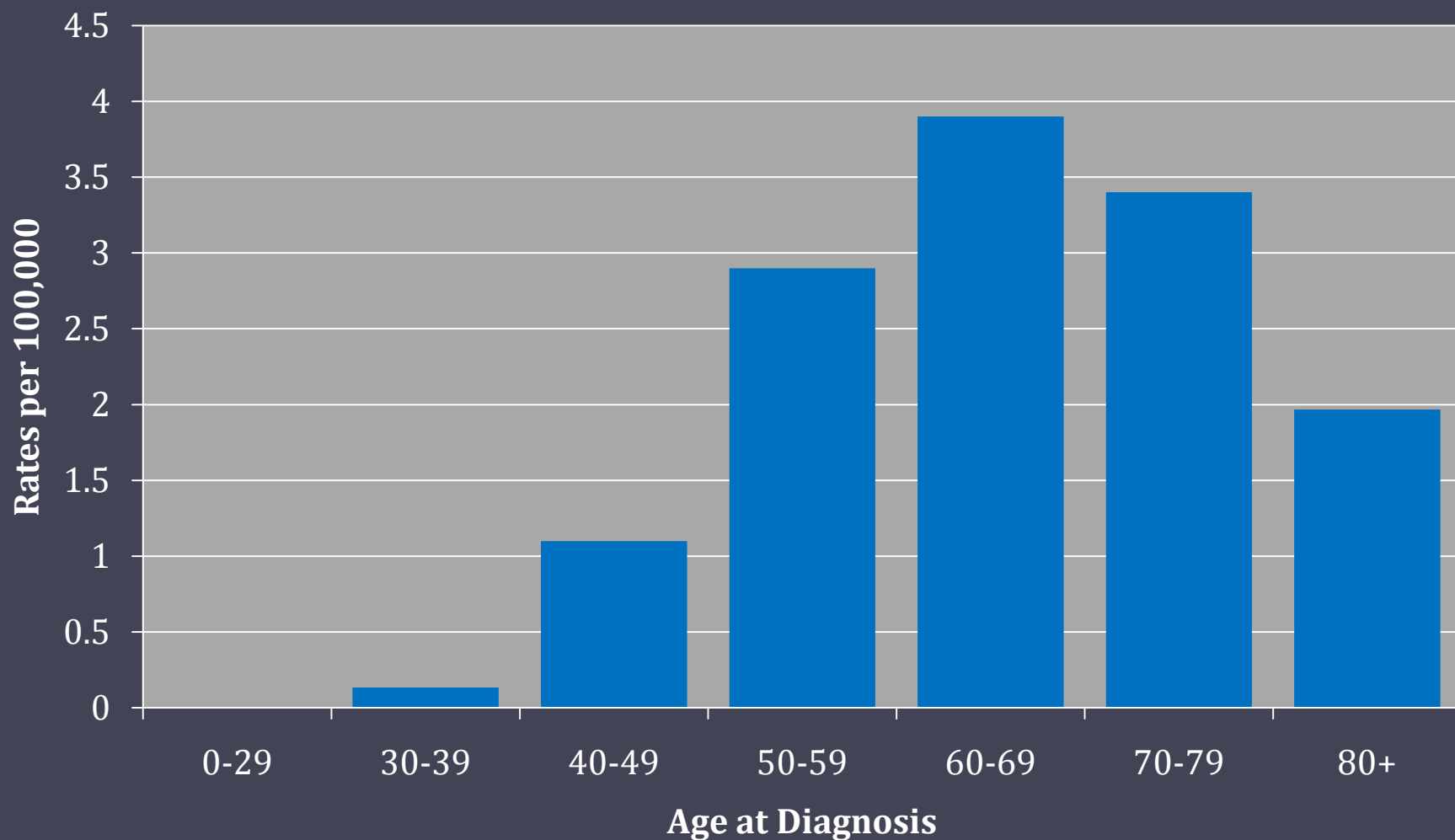
Results

- 215,419 HNC cases were identified in the U.S., 1995 - 2005
 - Highest frequency of cases were male (73.2%)
 - Highest frequency of cases were Non-Hispanic White (78.5%)

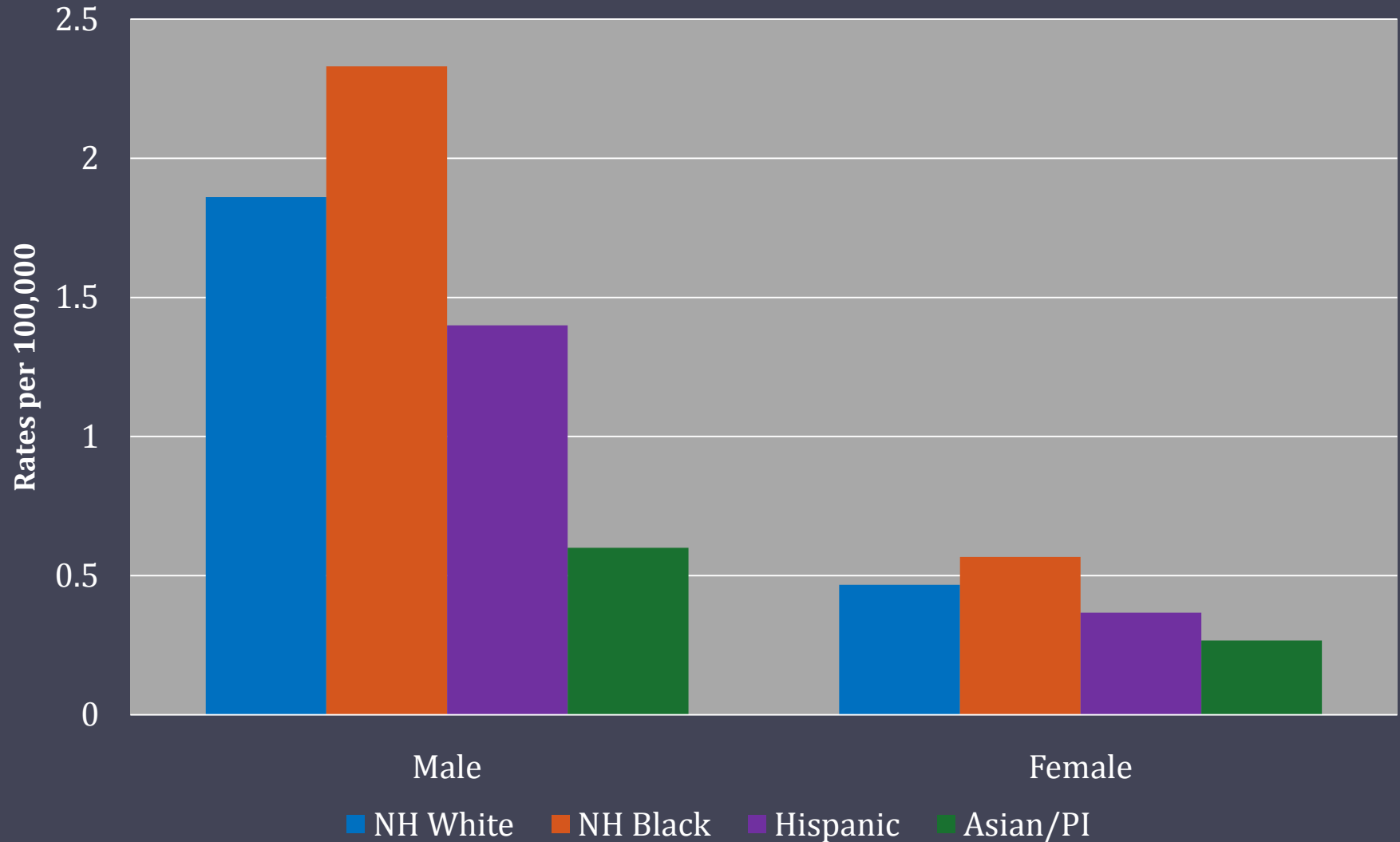
HNC Age-Adjusted Incidence Rates (2000 U.S. Standard) by Sub-site in the U.S., 1995-2005



Age-Adjusted Incidence Rates (2000 U.S. Standard) for HPV-Associated Sites by Age in the United States, 1995 to 2005

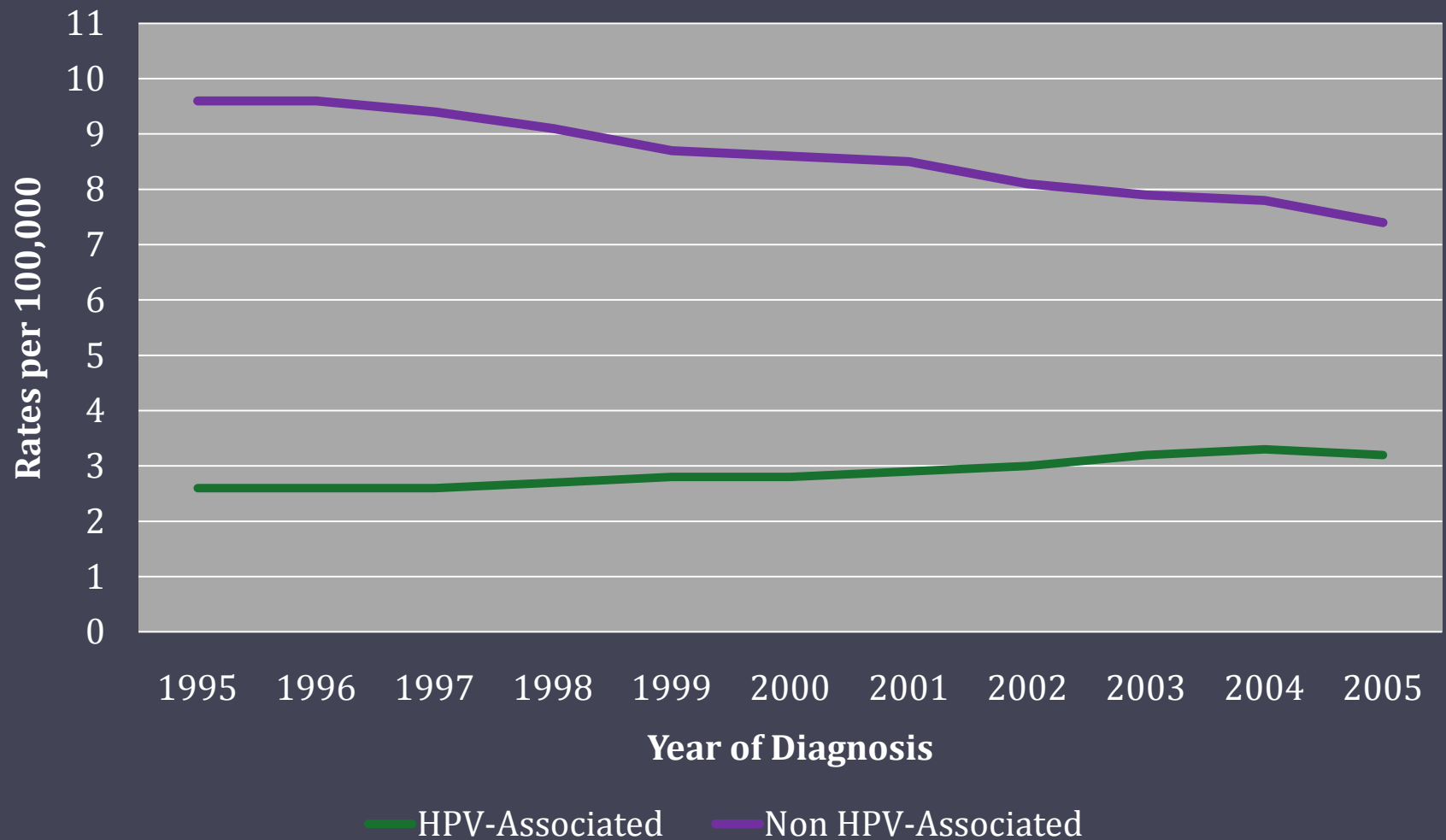


Age-Adjusted Incidence Rates (2000 U.S. Standard) for HPV-Associated Sites by Sex and Race in the United States, 1995 to 2005

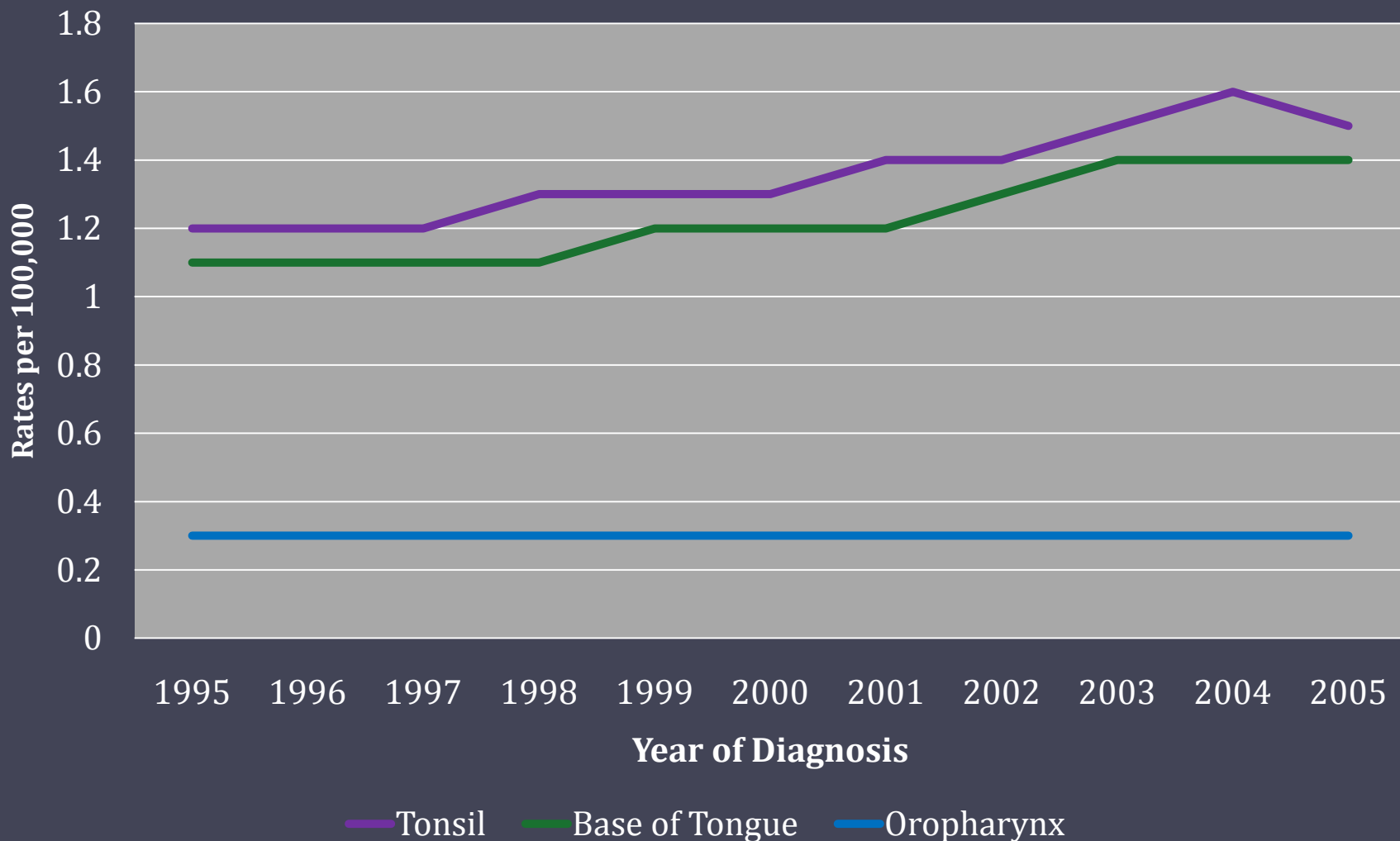


*Races are NHIA derived

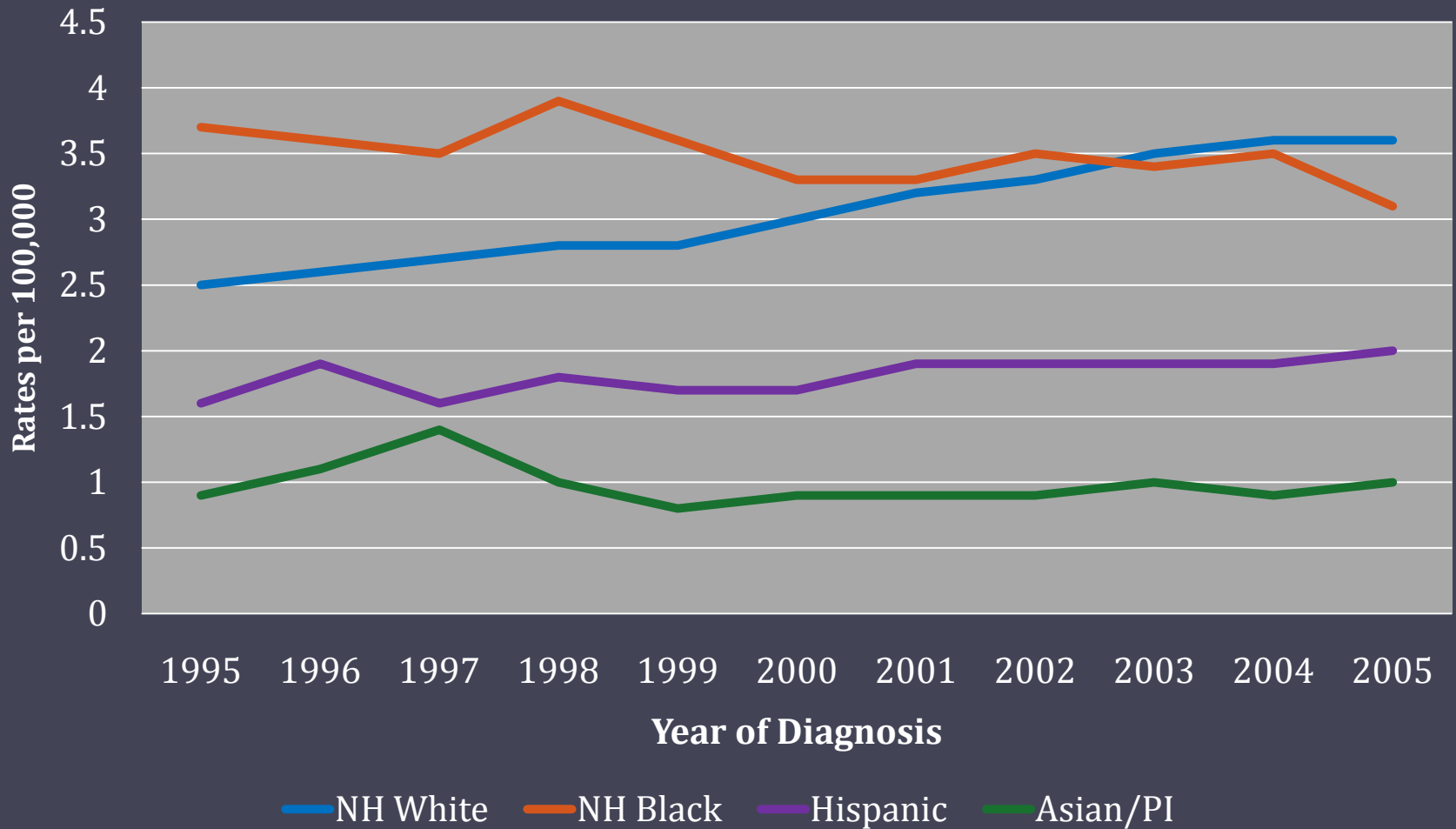
Age-Adjusted Incidence Rates (2000 U.S. Standard) for HPV-Associated Sites and Non HPV-Associated Sites in the United States, 1995 to 2005



Age-Adjusted Incidence Rates (2000 U.S. Standard) for HPV-Associated Sites in the U.S., 1995 to 2005

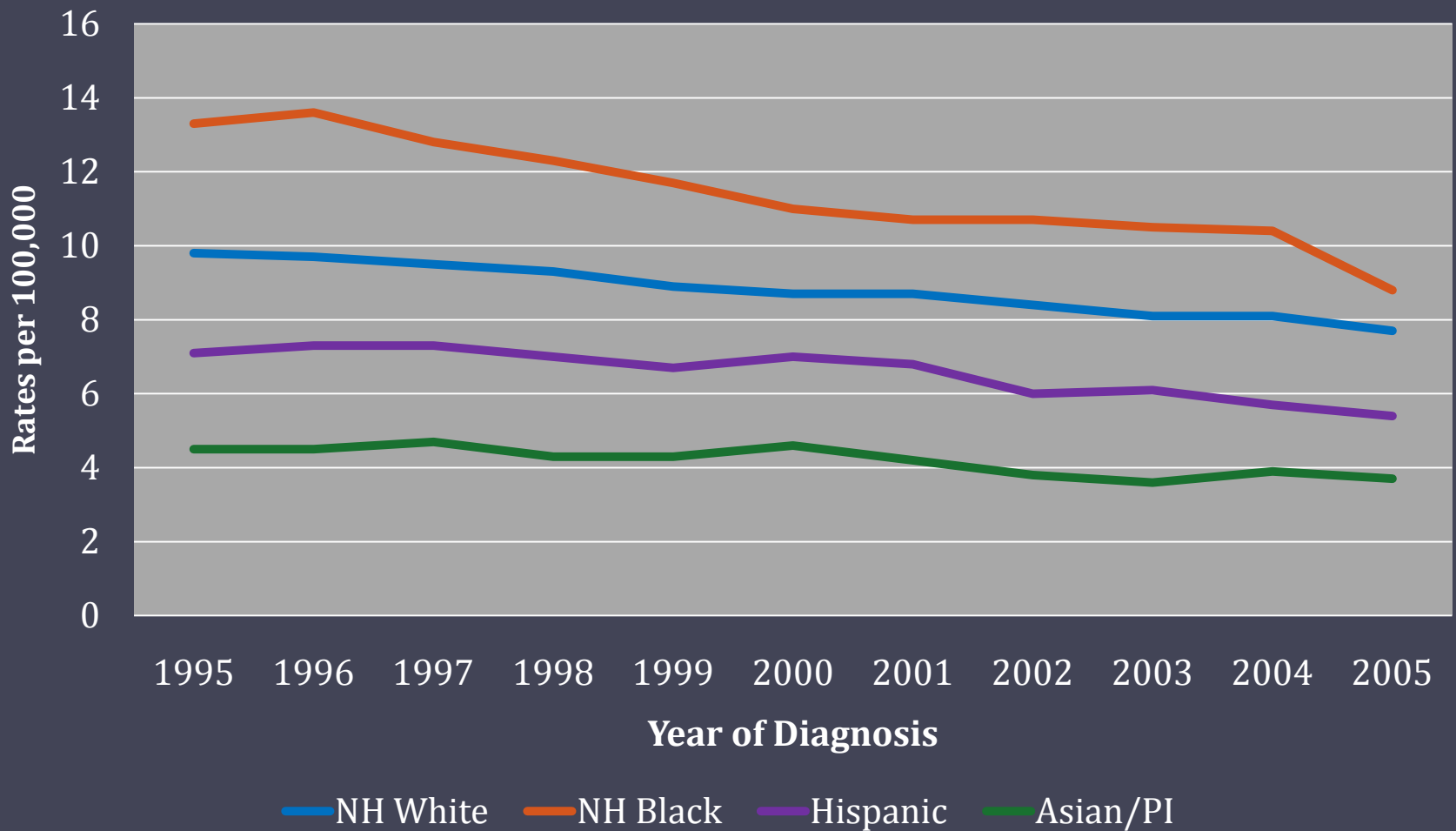


Age-Adjusted Incidence Rates (2000 U.S. Standard) for HPV-Associated Sites by Race in the U.S., 1995 to 2005



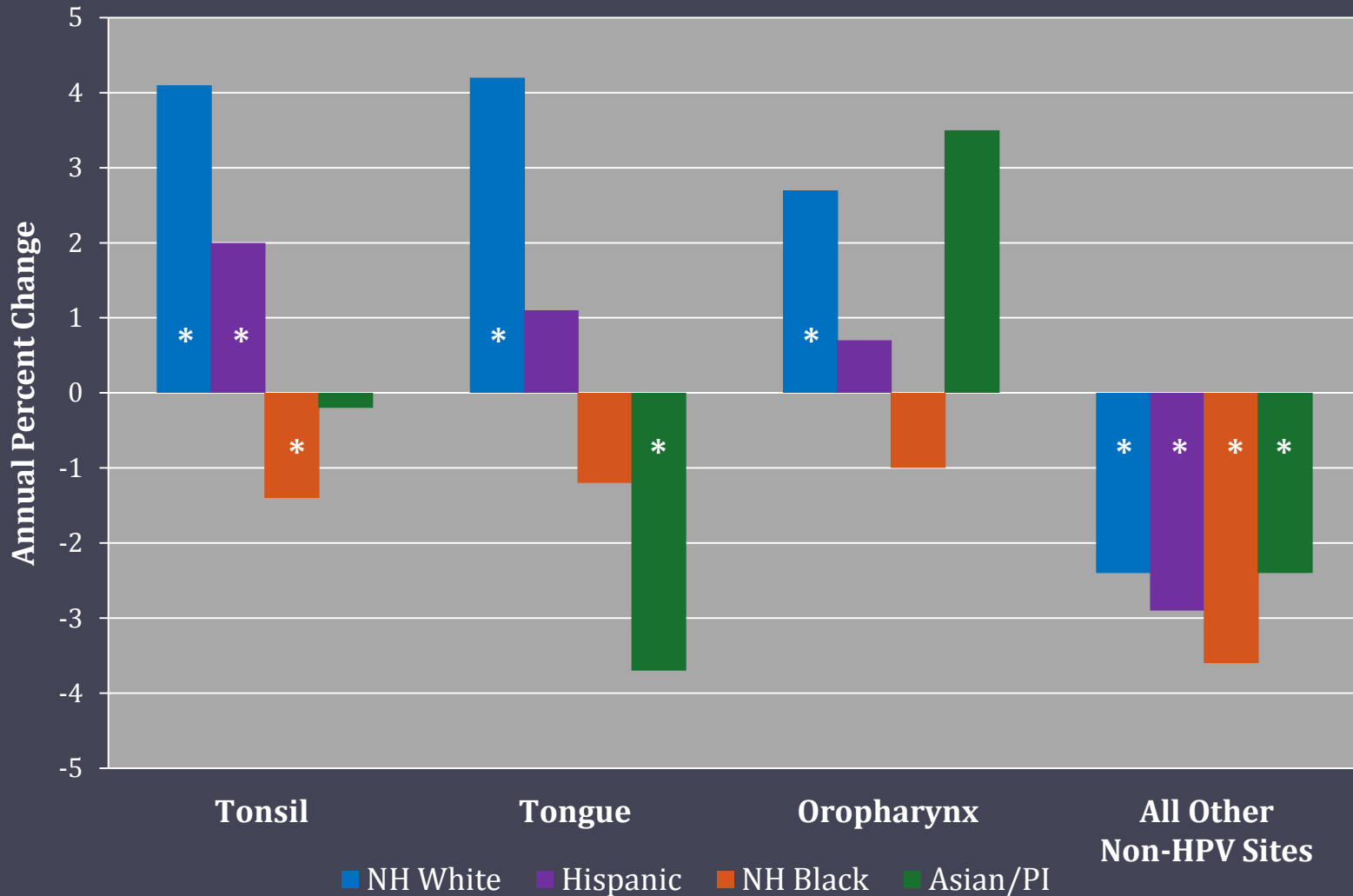
*Races are NHIA derived

Age-Adjusted Incidence Rates (2000 U.S. Standard) for Non HPV-Associated Sites by Race in the U.S., 1995 to 2005



*Races are NHIA derived

Annual Percent Change for Age-Adjusted Incidence Rates (2000 U.S. Standard) by Race and HPV and Non HPV-Associated Sites in the U.S., 1995-2005



* APCs are significantly different from zero (p < 0.05)
 APCs were calculated using the weighted least squares method

In Summary

- HNC age-adjusted incidence rates are higher in males and in Non-Hispanic Blacks
- When HNC age-adjusted incidence rates are broken down by sub-site, different trends are seen
 - Age-adjusted incidence rates for HPV-associated sites are increasing, while decreasing for non HPV-associated sites
 - When broken down by race, HNC age-adjusted incidence rates for Non-Hispanic Blacks are decreasing across HPV-associated sites as well as non HPV-associated sites

Discussion and Implications

- Decrease in incidence for NH Blacks across all sub-sites
 - Possible that those cancer sub-sites are not mediated by HPV infection
 - Decline in incidence could be more related to the decline in alcohol and tobacco use than HPV infection
- Increase in incidence for tonsil and base of tongue (HPV-associated sites)
 - Sites are composed of lymphoid associated tissue suggesting interesting biologic mechanisms involved
- No HPV-typing data included in registry data

Discussion and Implications

- HPV Vaccine
 - With the introduction of the HPV vaccine for young women, will the HPV associated HNC cancers decline in the next decade?
 - Recently, the HPV vaccine has been approved for young men – how will this effect the HNC incidence rates of men?
- Treatment implications
 - With these findings, treatment options for HNC could be improved upon by using:
 - Possible vaccine-mediated therapy
 - Biological modifiers for tongue cancer for organ sparing

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Thank you!

Questions??

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