# Oral Cavity and Oropharynx Cancer Trends

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# Disclaimer

*This presentation was prepared while Dr. Darien Weatherspoon was employed at The University of Illinois at Chicago College of Dentistry. The opinions expressed in this presentation are the author's own and do not reflect the view of the National Institutes of Health, the Department of Health and Human Services, or the United States government.*

# Objectives

- Provide an overview of the common characteristics of oral cavity and oropharynx cancers in the U.S.
- Describe recent incidence and survival epidemiological trends for oral cavity and oropharynx cancers in the U.S.
- Describe disparities observed in oral cavity and oropharyngeal cancers in the U.S.

# Oral Cavity and Pharynx Cancer Overview

| | |
|---|---|
| Estimated New Cases in 2016 | 48,330 |
| % of All New Cancer Cases | 2.9% |
| Estimated Deaths in 2016 | 9,570 |
| % of All Cancer Deaths | 1.6% |

**Source: SEER Cancer Fast Stats: Oral Cavity and Pharynx Cancer**

# Oral Cavity and Pharynx Cancer Overview

Estimated New Cases

| Male | | | Female | | |
|---|---|---|---|---|---|
| Prostate | 161,360 | 19% | Breast | 252,710 | 30% |
| Lung & bronchus | 116,990 | 14% | Lung & bronchus | 105,510 | 12% |
| Colon & rectum | 71,420 | 9% | Colon & rectum | 64,010 | 8% |
| Urinary bladder | 60,490 | 7% | Uterine corpus | 61,380 | 7% |
| Melanoma of the skin | 52,170 | 6% | Thyroid | 42,470 | 5% |
| Kidney & renal pelvis | 40,610 | 5% | Melanoma of the skin | 34,940 | 4% |
| Non-Hodgkin lymphoma | 40,080 | 5% | Non-Hodgkin lymphoma | 32,160 | 4% |
| Leukemia | 36,290 | 4% | Leukemia | 25,840 | 3% |
| Oral cavity & pharynx | 35,720 | 4% | Pancreas | 25,700 | 3% |
| Liver & intrahepatic bile duct | 29,200 | 3% | Kidney & renal pelvis | 23,380 | 3% |
| **All sites** | **836,150** | **100%** | **All sites** | **852,630** | **100%** |

**Source: American Cancer Society, Cancer Facts and Figures 2017**

**8th most incident cancer type in U.S. males**

**6th most incident cancer type globally**

# Oral Cavity and Pharynx Cancer Overview

- Morbidity associated with oral cavity and pharynx cancers:
  - Pain in mouth/throat
  - Difficulty chewing
  - Difficulty swallowing
  - Difficulty moving tongue/jaw
  - Disfigurement with treatment
- Mortality

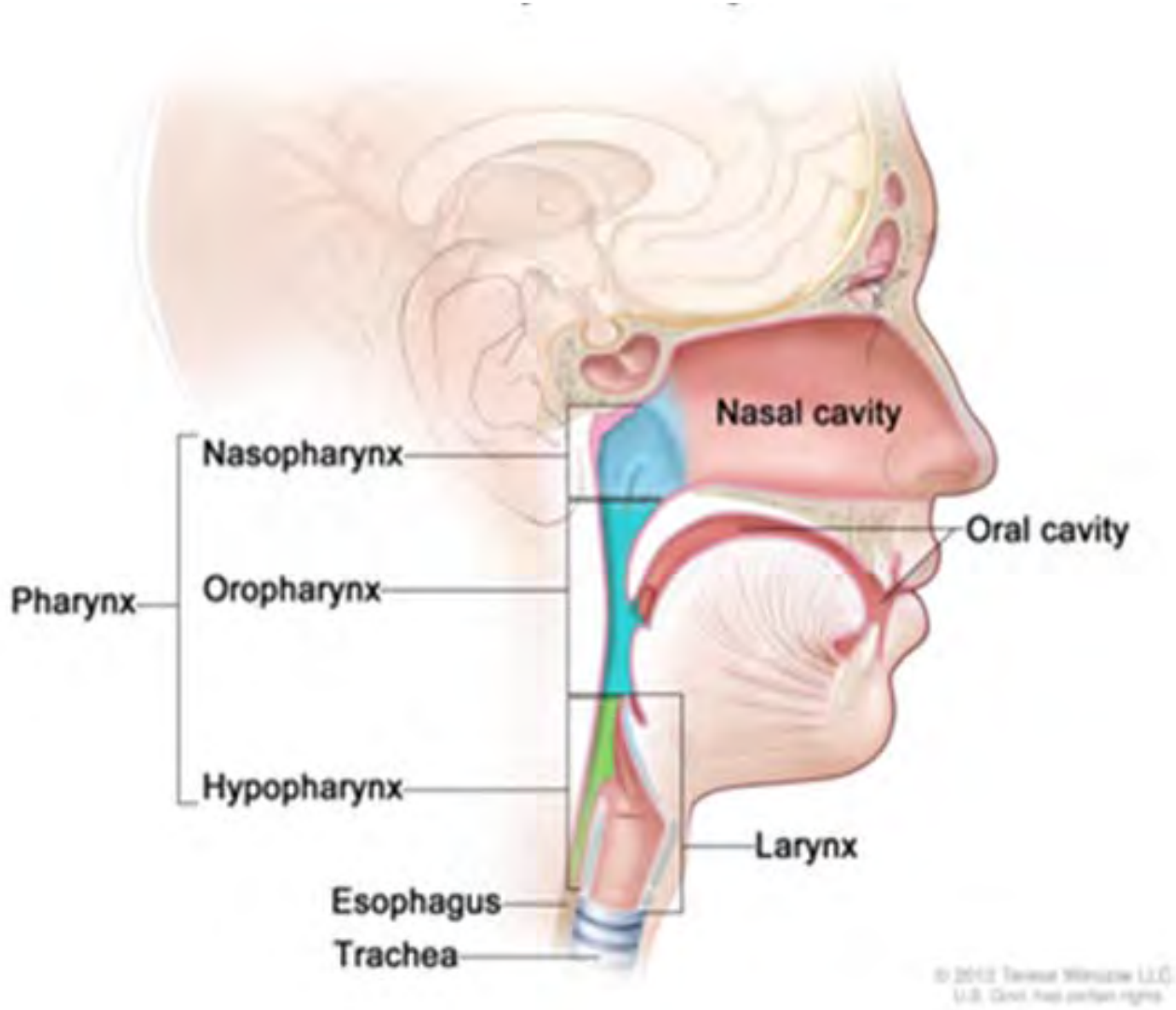
# Oral Cavity and Pharynx Cancer Overview

- Approximately 90% are squamous cell carcinomas (SCCs)
- Risk factors tend to vary by anatomic location
- Racial/ethnic disparities in incidence, mortality, and survival
- Distinct epidemiological trends based on anatomic location and demographic subgroups

# Terminology: What is “Oral Cancer?”

- Nomenclature
  - Oral Cancer
  - Oral and Pharyngeal Cancer
  - Head and Neck Cancer
  - Oral Cavity Cancer
  - Oropharynx Cancer
- Terminology is important when describing epidemiological trends and etiologies

# Oral Cavity and Oropharynx Anatomy




**Source: https://www.cancer.gov/types/head-and-neck/patient/oral-prevention-pdq**

# Oral Cavity and Oropharynx Anatomy

- **Oral Cavity (OC)**
  - anterior 2/3 of tongue, gingiva, floor of the mouth, hard palate, buccal mucosa
- **Oropharynx (OPC)**
  - posterior 1/3 of tongue (base of tongue), tonsils, soft palate, “other” oropharyngeal sites

# Epidemiological Trends: Methods

- Targeted literature review
- Article publication dates Jan. 1995- March 2016
- English
- U.S.-based studies
- MeSH terms: mouth neoplasms, oropharyngeal neoplasms, incidence, survival, health status disparities, healthcare disparities, minority health

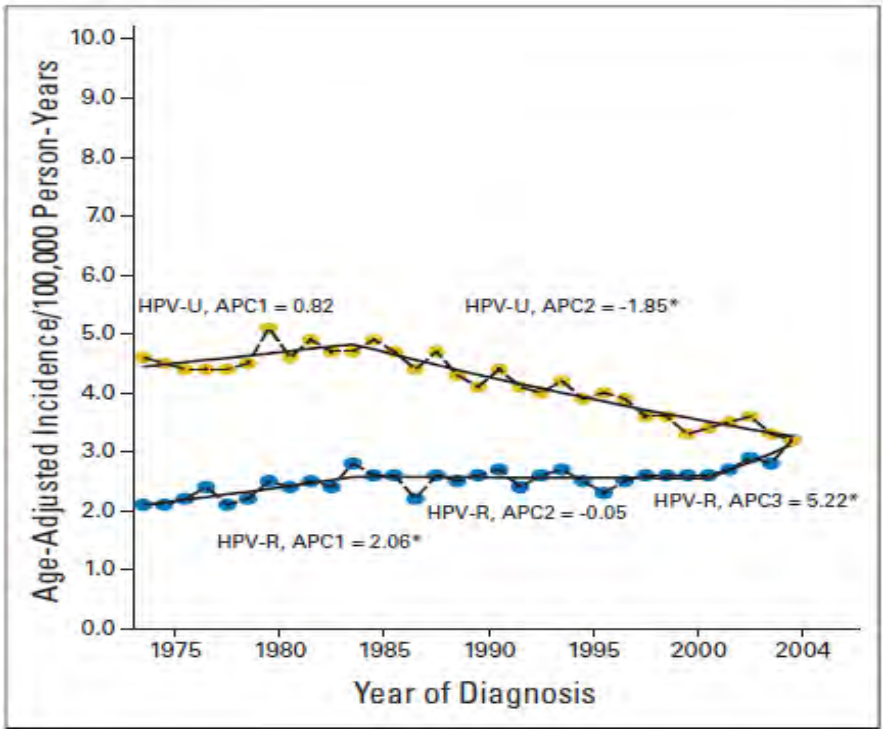
# Trend Data Sources

- National Cancer Institute - Surveillance Epidemiology End Results (SEER)
- American College of Surgeons/American Cancer Society - National Cancer Database
- Centers for Disease Control and Prevention (CDC) - Program of Cancer Registries
- State Cancer Registries
- International Classification of Disease Oncology codes (ICD-O-3)
  - Describe tumor's anatomical site of origin

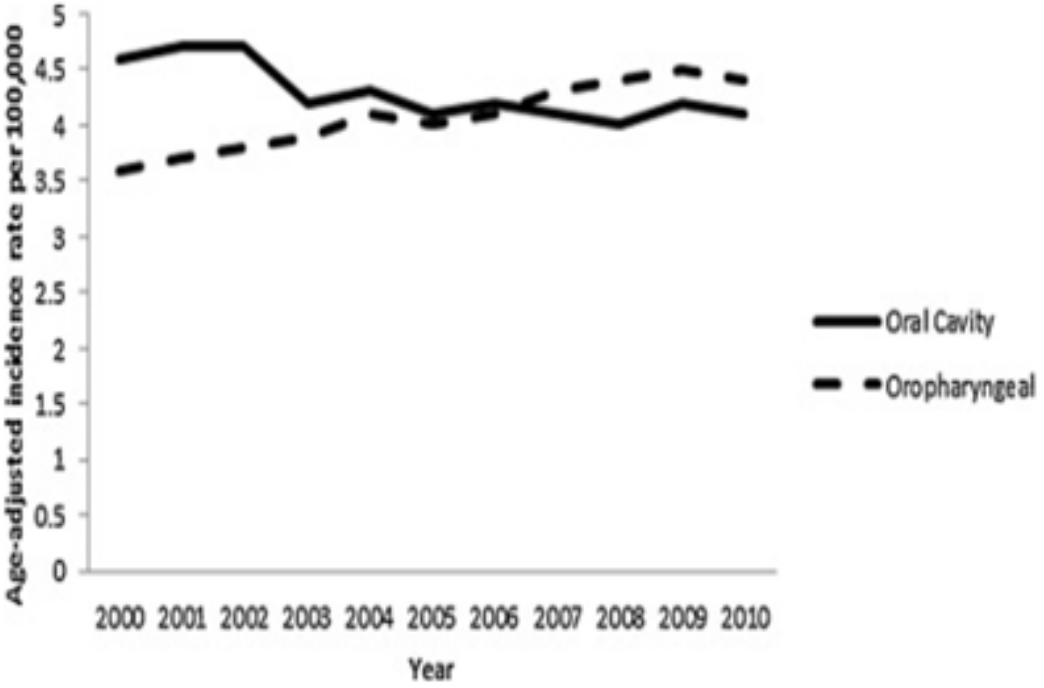
# Incidence Trends for OC and OPC

- Diverging epidemiological trends:
  - Incidence of Oral Cavity (OC) and Oropharynx (OPC) Cancers
- Significant Increase in the age-adjusted incidence of OPC from 1970's - 2000's
  - Annual Percentage Change and joinpoint analyses
  - Greater rate increases in more recent years
- Significant Decrease in the age-adjusted incidence of OC from 1980's -2000's
  - Annual Percentage Change and joinpoint analyses
- Consistent across:
  - SEER, State Cancer Registries, National Cancer Database

# Incidence Trends for OC and OPC: SEER

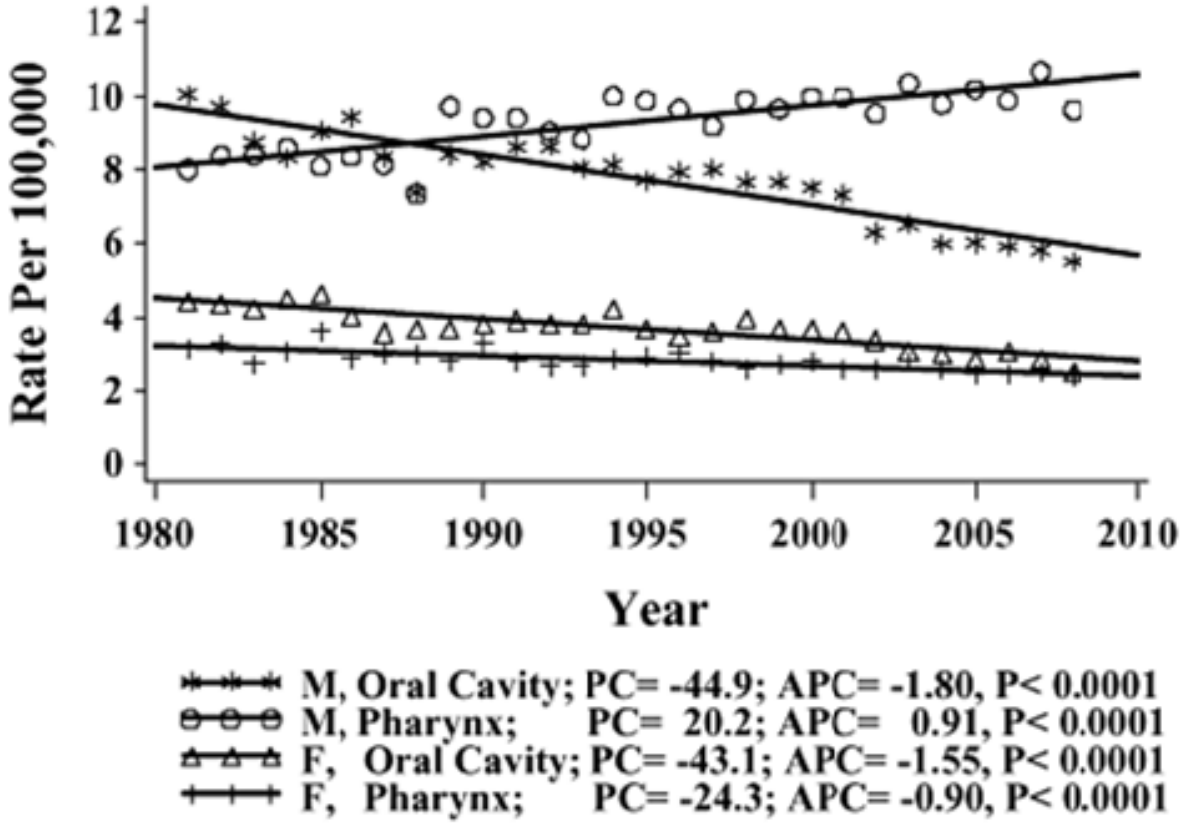



Source: Chaturvedi et al. Incidence Trends for Human Papillomavirus–Related and –Unrelated Oral Squamous Cell Carcinomas in the United States. *J Clin Oncol. 2008;26:612-619*



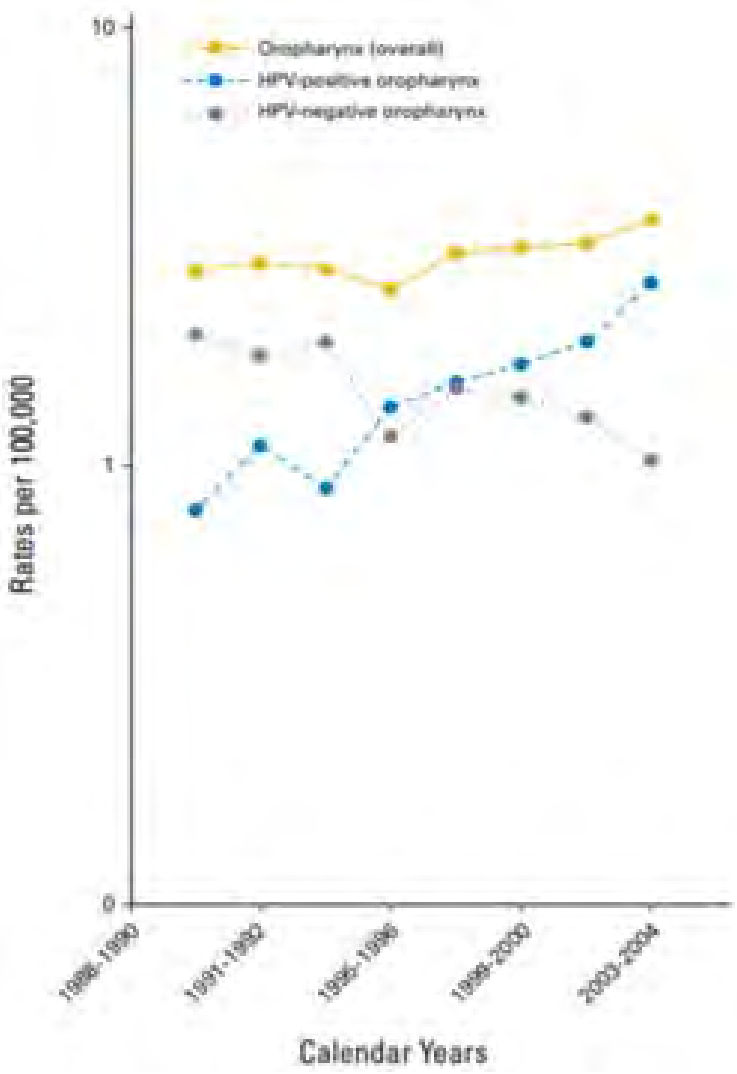

Source: Weatherspoon et al. Oral cavity and oropharyngeal cancer incidence trends and disparities in the United States: 2000-2010. *Cancer Epidemiol.* 2015 Aug;39(4):497-504.

# Incidence Trends for OC and OPC: State Registry




Source: McGorray et al.
Trends in incidence of oral and pharyngeal carcinoma in Florida: 1981-2008. J Public Health Dent. 2012 Winter;72(1):68-74

# Risk Factors Related to Incidence Trends for OC and OPC



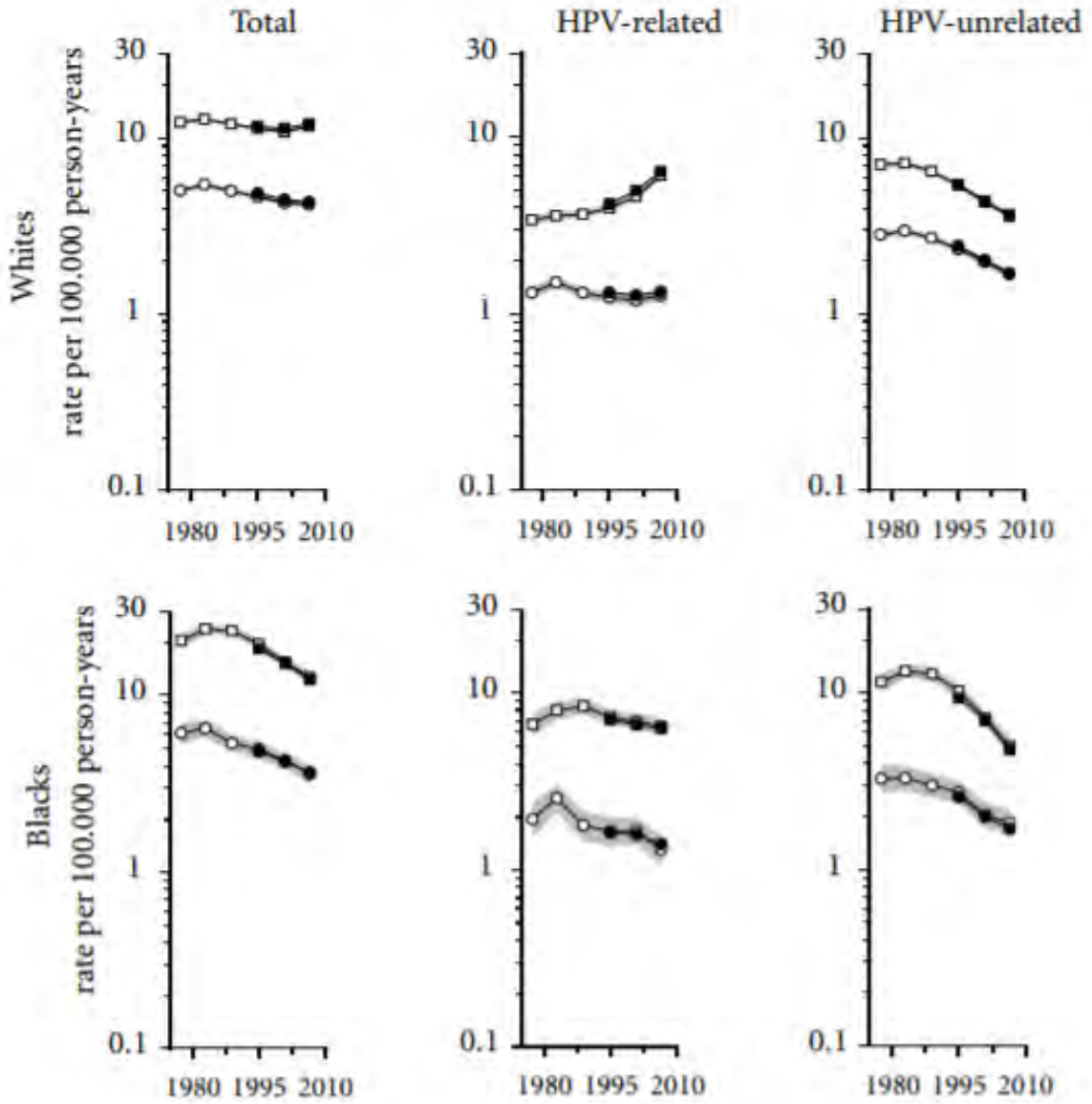

- HPV prevalence in OPC has significantly increased
- Decreased tobacco use and alcohol consumption due to public health efforts

Source: Chaturvedi et al. Human papillomavirus and rising oropharyngeal cancer incidence in the United States. J Clin Oncol. 2011 Nov 10;29(32):4294-301.

# Disparities in OC and OPC Incidence

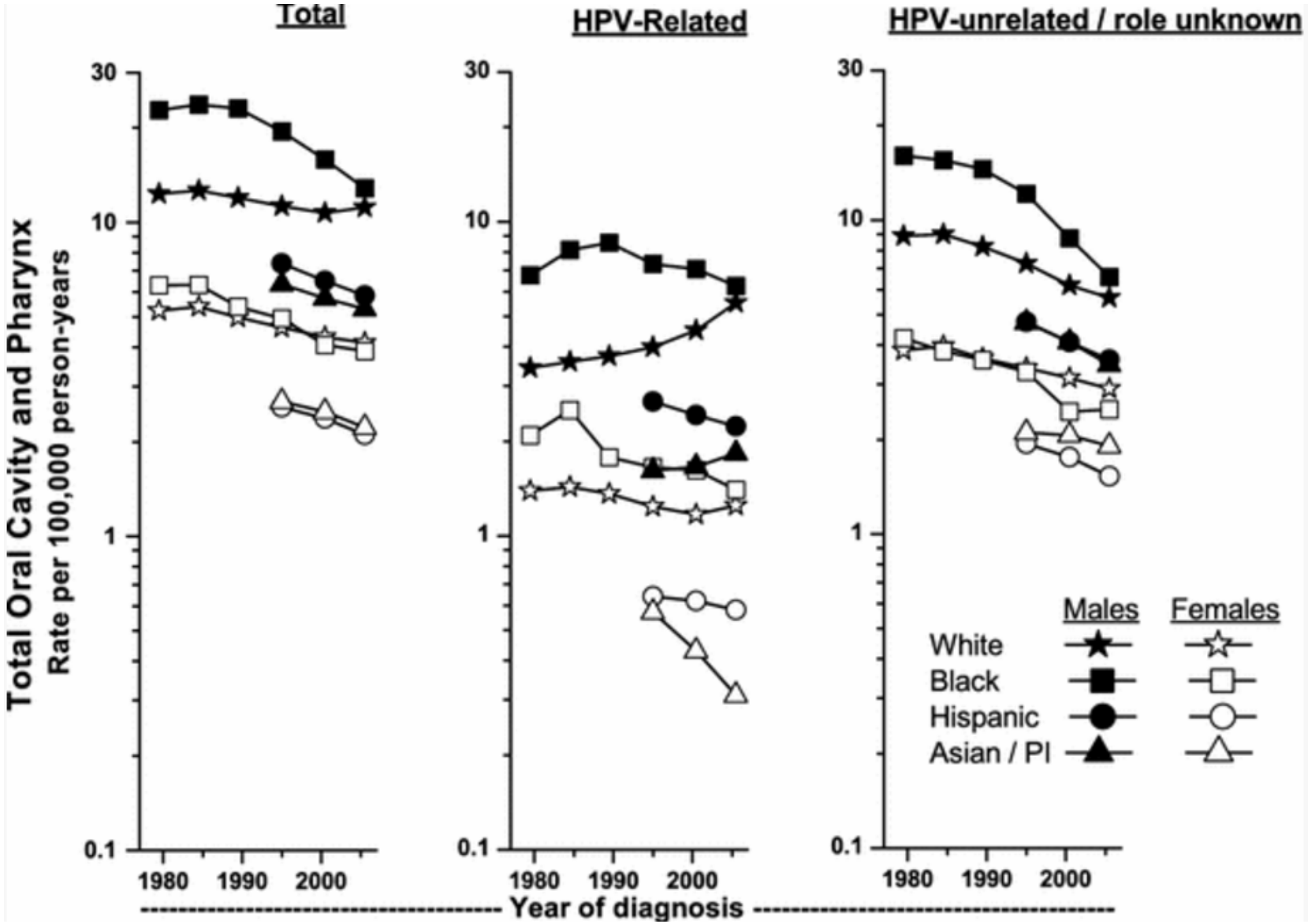
- Men total OC and OPC incidence rates 2-4x women
- Increased incidence of OPC seen among more recent birth cohorts (younger individuals)
- African Americans showed significant decrease in both OC and OPC cancer incidence beginning in the mid-80's
- White men displayed increase in OPC incidence since the 1990's, in contrast to more stable or declining rates in other race/ethnic-gender groups
- Significant increasing trend in oral tongue cancer (non HPV-related) incidence in White women < 45 yrs of age

# Disparities in OC and OPC Incidence




Source: Brown et al. Oral cavity and pharynx cancer incidence trends by subsite in the United States: changing gender patterns. J Oncol. 2012;2012:649498

# Disparities in OC and OPC Incidence




Source: Brown et al. Oropharyngeal cancer incidence trends: diminishing racial disparities. Cancer Causes Control. 2011 May;22(5):753-63.

# Oral Cavity and Pharynx Trends: 5 year Relative Survival Rates (%) by Race, U.S., 1975-2012 (SEER)

| All races | | | White | | | Black | | |
|---|---|---|---|---|---|---|---|---|
| 1975-77 | 1987-89 | 2006-12 | 1975-77 | 1987-89 | 2006-12 | 1975-77 | 1987-89 | 2006-12 |
| **53** | **54** | **67** | **54** | **56** | **69** | **36** | **34** | **47** |

Source: Howlander N, Noone AM, Kapcho, et al. (eds). *SEER Cancer Statistics Review*, 1975-2013, National Cancer Institute, Bethesda, MD, www.seer.cancer.gov/csr/1975_2013/, based on November 2015 SEER data submission, posted to the SEER website April 2016. Cancer Facts and Figures 2017, American Cancer Society

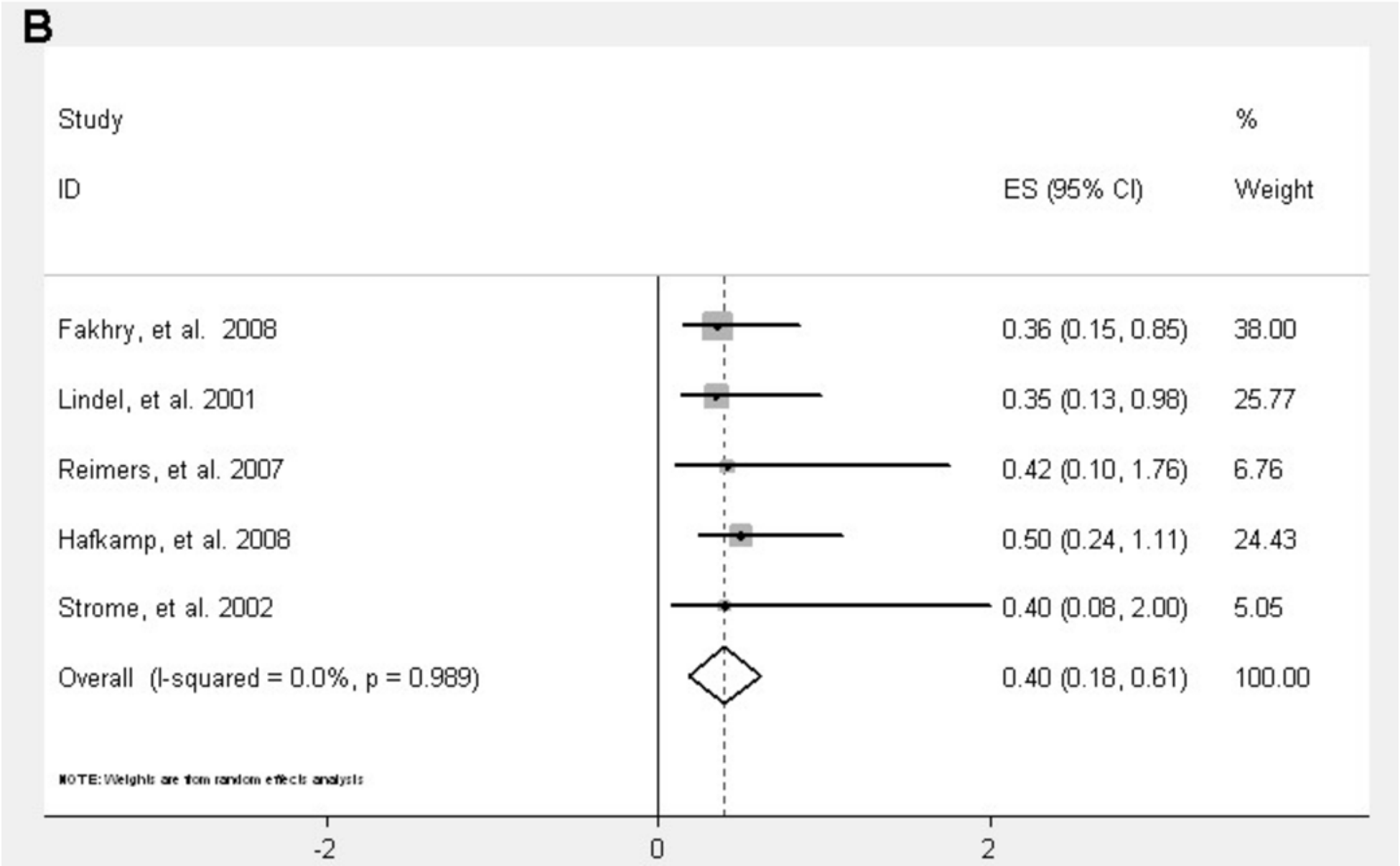
Disparities persist if stratified by stage at diagnosis

# Survival: HPV-positive vs HPV-negative Head and Neck SCCs

- Patients with HPV-positive Head and Neck SCCs display higher survival rates than patients with HPV-negative Head and Neck SCCs

- Better response to chemotherapy and radiotherapy in HPV-positive vs HPV-negative Head and Neck SCCs

# Survival: Hazard Ratios HPV-positive vs HPV-negative OPC Patients




Source: Dayyani F et al. Meta-analysis of the impact of human papillomavirus (HPV) on cancer risk and overall survival in head and neck squamous cell carcinomas (HNSCC). *Head Neck Oncol*. 2010;2:15. doi:10.1186/1758-3284-2-15

# Summary of Epidemiological Trends

- Decreasing incidence of OC
- Increasing incidence of OPC
- Disparities in incidence for OC and OPC by race/ethnicity, gender, age
  - Men OC and OPC incidence rates 2-4x Women
  - White males greater increase in OPC incidence
  - Increased incidence of OPC seen among more recent birth cohorts
- Disparities in 5 yr. relative survival rates for OC and OPC by race/ethnicity
  - African Americans display significantly lower survival rates
- Higher HNSCC survival rates for HPV-pos. vs HPV-neg.

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