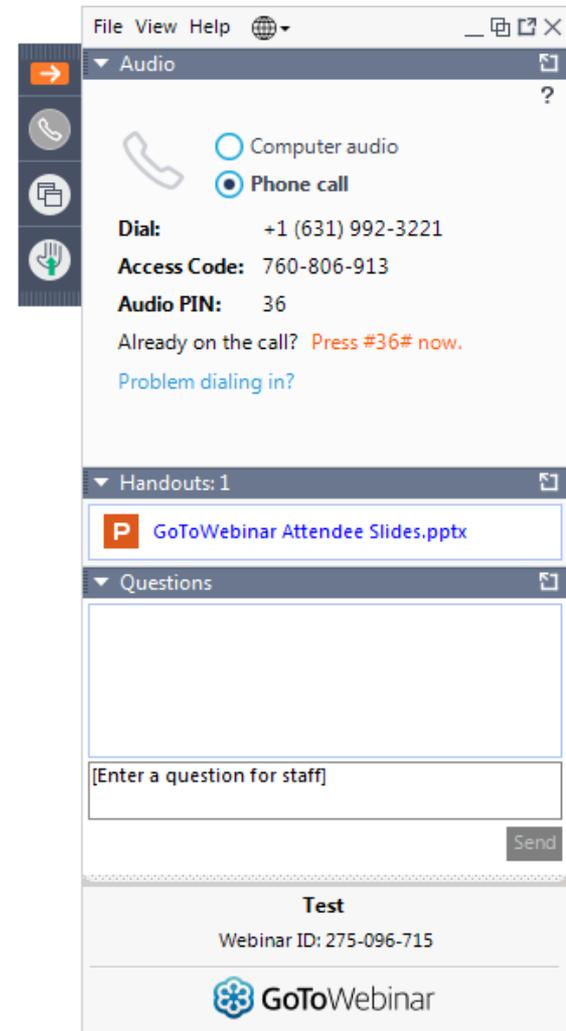


# Perspectives on Oropharyngeal Cancer: Scientific Overview, Clinical Expertise, and Personal Experience

February 13, 2019

# Housekeeping Items

- All attendees are muted. If you are using your phone, please choose the “Phone call” option and enter your Audio PIN (found in the “Audio” panel). If you are using your computer speakers, please choose the “Computer audio” option.
- The slides are available for download in the “Handouts” section of your control panel.
- Please use the “Questions” panel to ask questions and submit comments throughout the webinar.
- This webinar is being recorded and will be archived. The archive will be made available following the webinar.



# Today's Presenters



Amber D'Souza, PhD, MS, MPH  
Associate Professor, Department of Epidemiology  
Johns Hopkins Bloomberg School of Public Health



Carole Fakhry, MD, MPH  
Associate Professor, Department of Otolaryngology-  
Head and Neck Surgery  
Johns Hopkins University School of Medicine



Jason Mendelsohn  
Survivor, Superman HPV  
Executive Board, Head & Neck Cancer Alliance

# Objectives

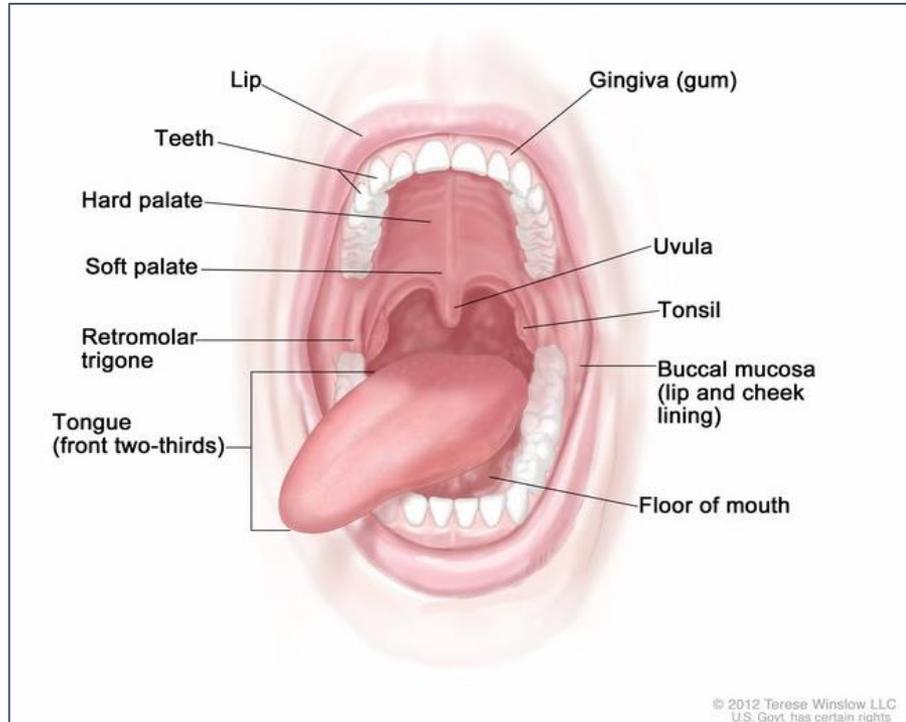
To understand

- Burden and epidemiology of oropharyngeal cancer *Dr. Amber D'Souza*
- Oral HPV natural history *Dr. Amber D'Souza*
- Difference between oral cancers and oropharyngeal cancers *Dr. Carole Fakhry*
- How to address common questions about oropharyngeal cancer and HPV vaccine *Dr. Carole Fakhry*
- Process of diagnosis, treatment, and recovery from oropharyngeal cancer from a cancer survivor's perspective *Jason Mendelsohn*

# Epidemiology of oropharyngeal cancer in the U.S.

Dr. Amber D'Souza

# Oropharynx

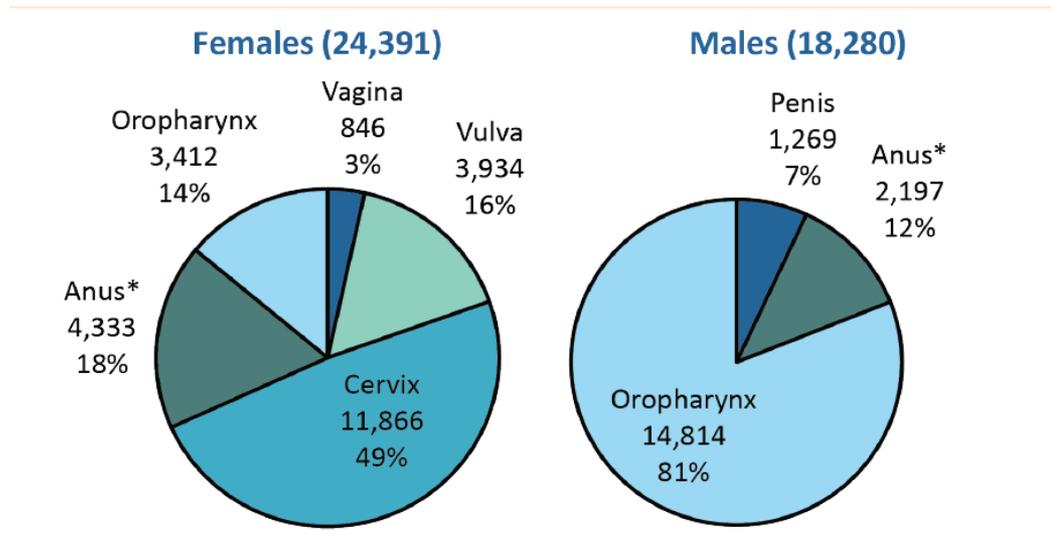


Tonsil  
Base of Tongue  
Pharyngeal wall  
Uvula  
Soft palate

# Burden of HPV related cancers in US, by sex

Most HPV-related cancer is

- Oropharyngeal – in men
- Cervical – in women



In U.S. now

Number of cervical cancers < Number of oropharyngeal cancers

11,866

18,226

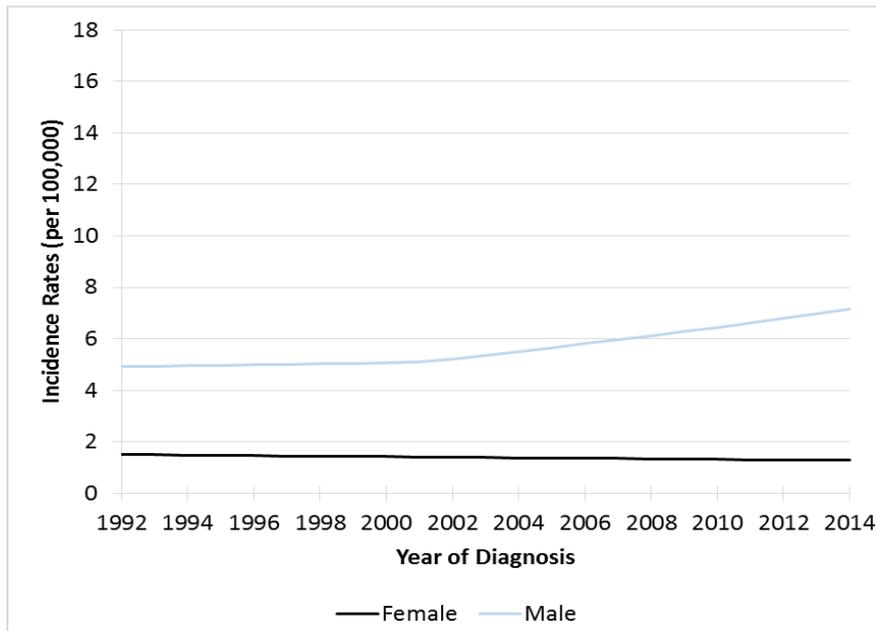
(14,914 in men and 3,412 in women)

<https://www.cdc.gov/cancer/hpv/pdf/USCS-DataBrief-No4-August2018-508.pdf>

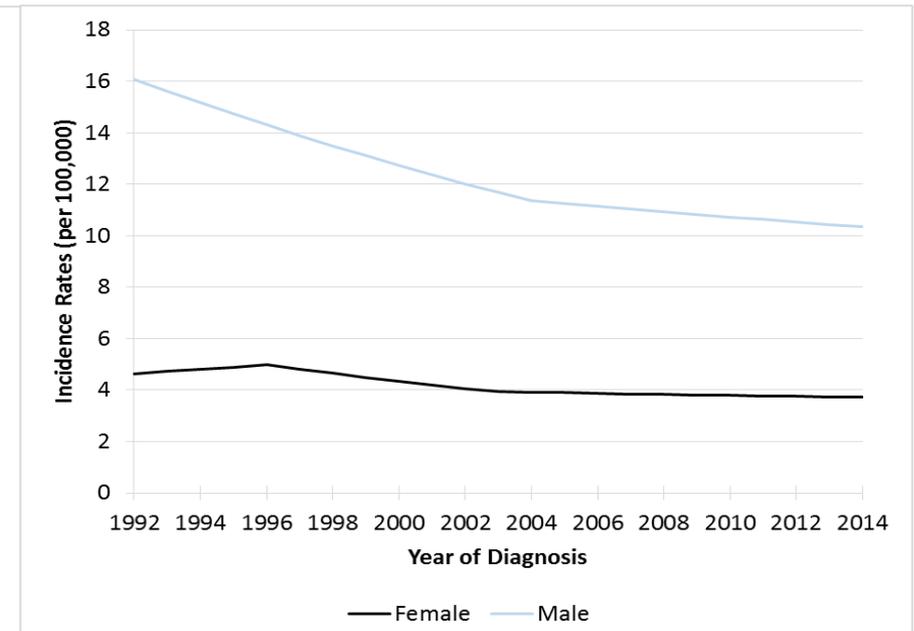
# Incidence of oropharynx cancer (OPC) & non-oropharynx head and neck cancer in US by sex

*Incidence higher in men than women. OPC continuing to increase in men.*

## A. OPC



## B. Non-oropharyngeal head and neck cancer



Fakhry.... D'Souza. [Cancer](#). 2018 May 15;124(10):2125-2133.

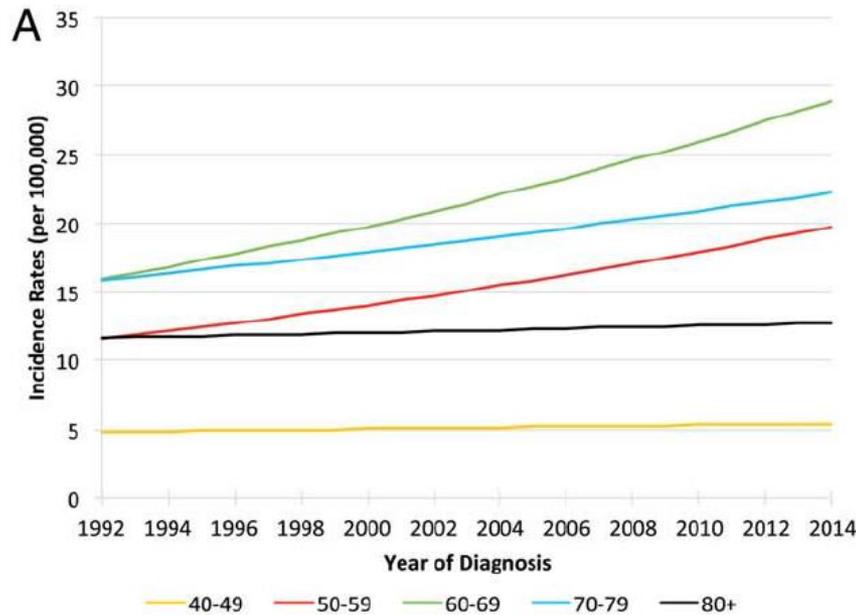
# U.S. OPC trends by age & sex

*OPC increasing among men 50-79 yo*

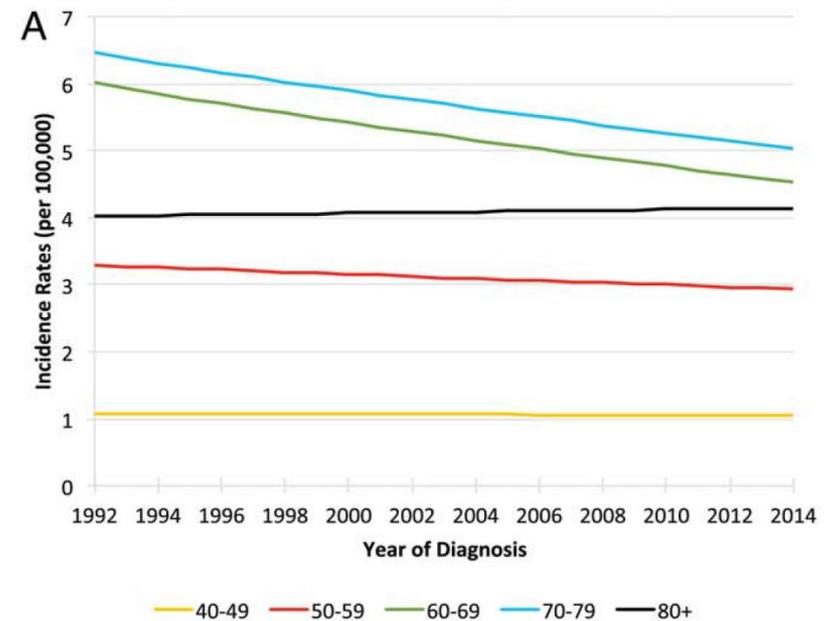
- 2-3% per year

*OPC not increasing among women*

## MEN OPSCC



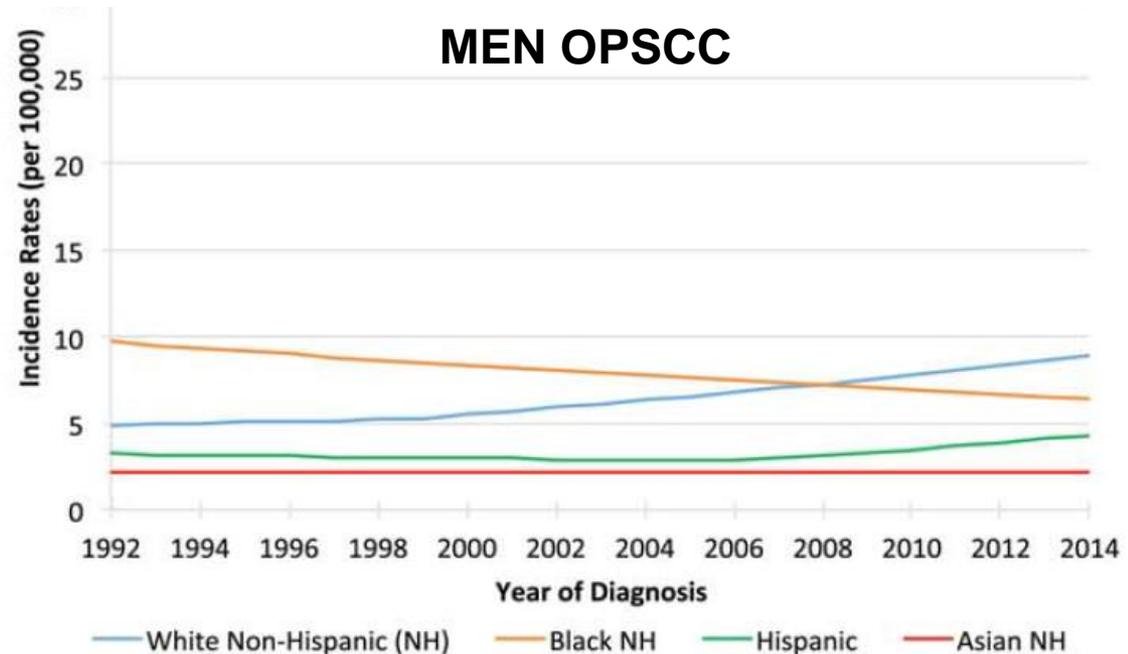
## WOMEN OPSCC



Fakhry.... D'Souza. Cancer 2018 May 15;124(10):2125-2133.

# U.S. OPC trends among men, by race

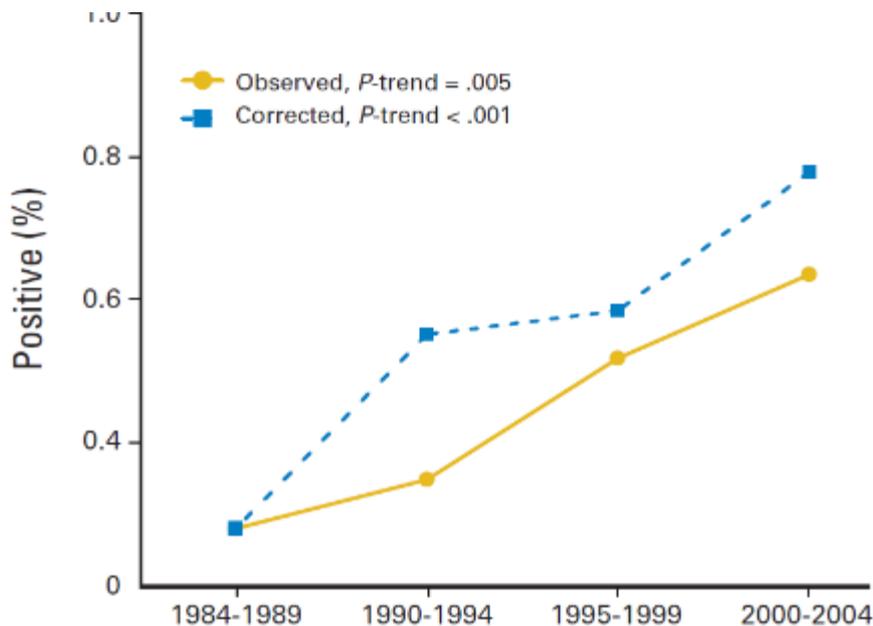
*Although previously OPC was higher among Blacks, since 2009 incidence has been higher among White compared to Black men in the U.S. (same is true for women)*



Fakhry.... D'Souza. Cancer 2018 May 15;124(10):2125-2133.

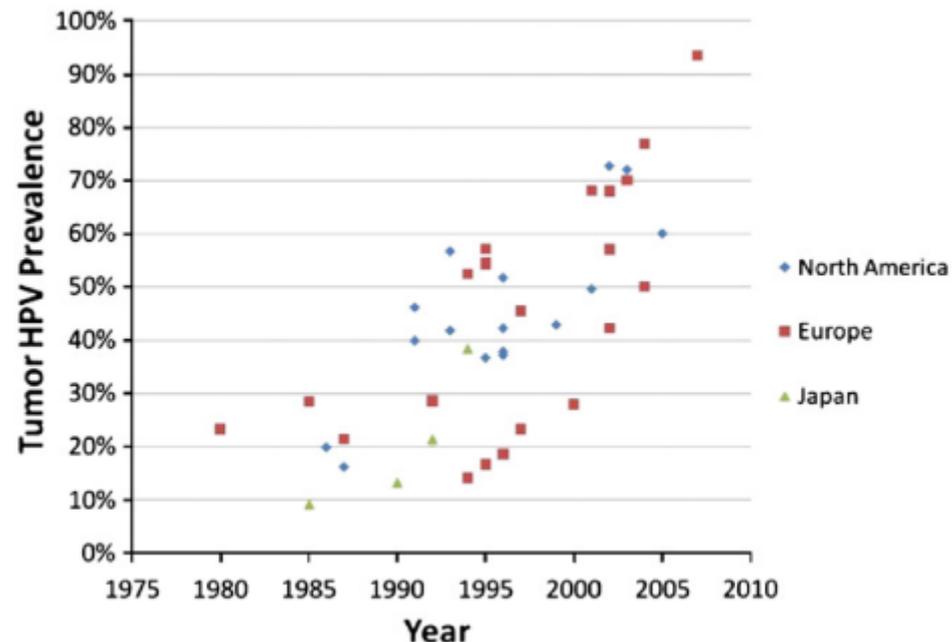
# An increasing percentage of OPC have HPV DNA

## U.S.



Chaturvedi et al. JCO. 2011 29: 4294-4301

## Summary of the Literature



D'Souza and Dempsey. Prev Med. 2011: S5-11.

# Oral HPV natural history

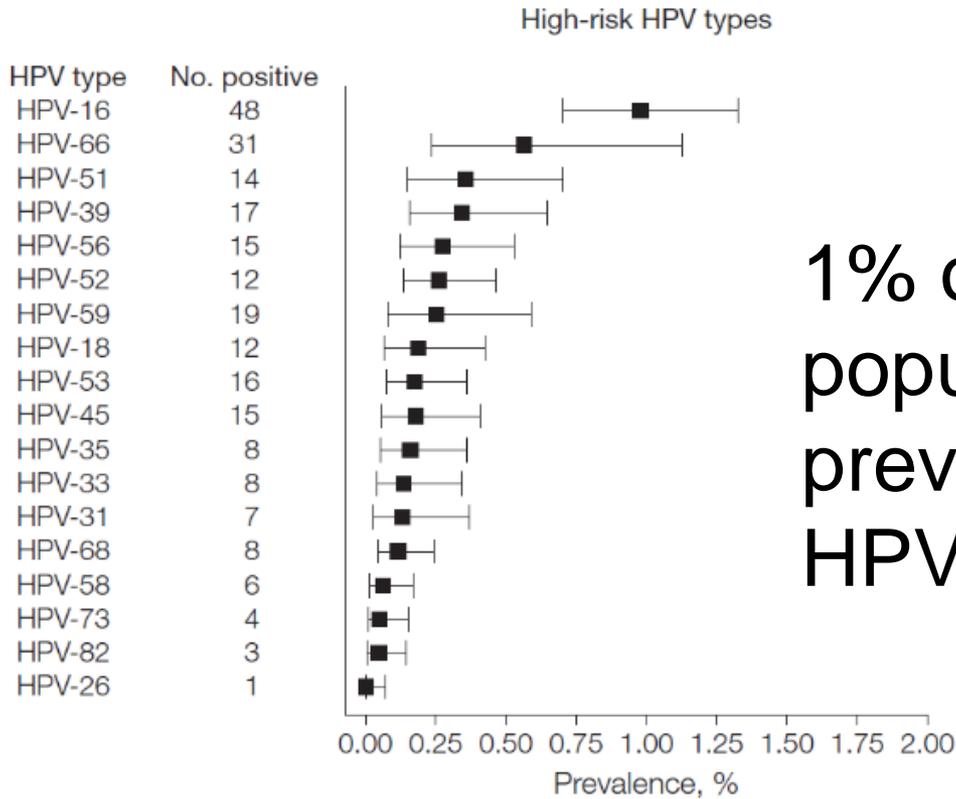
# Measuring “oral” HPV infection

- Tumor samples
- Blood sample
- Swab
- Oral Rinse and Gargle



- \* Exfoliated cells from throat and mouth tested for HPV DNA

# Oncogenic oral HPV prevalence, (HPV DNA tested in oral rinse) NHANES

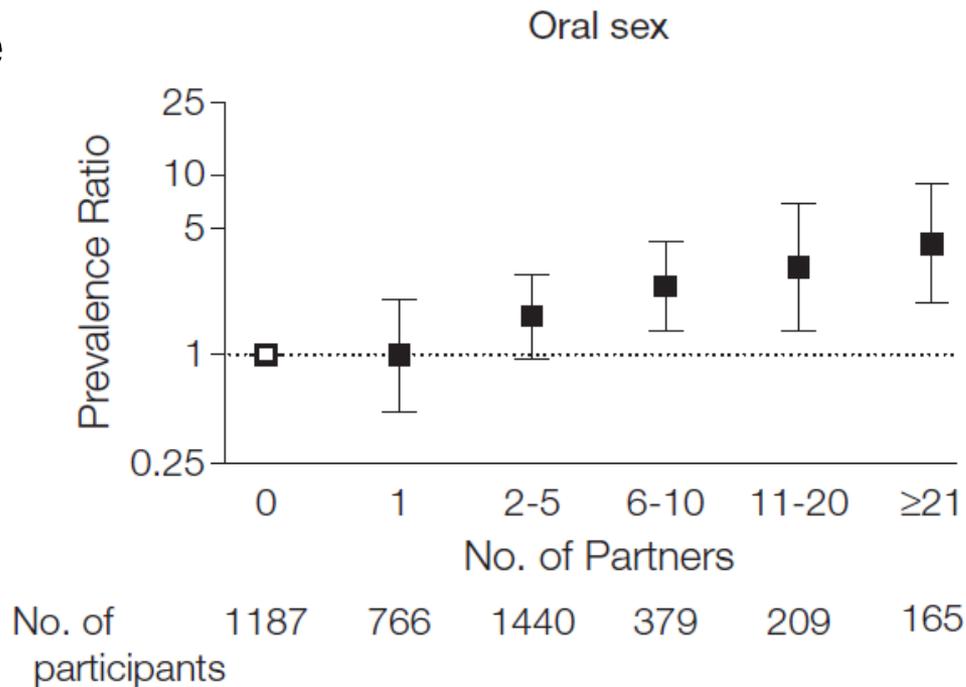


1% of general population has prevalent oral HPV16 infection

Gillison et al. JAMA 2012; 307: 693-703

# Oral HPV prevalence increases with number of lifetime oral sexual partners

# lifetime oral sex partners	Prevalence
0	3%
1	3%
2-5	6%
6-10	10%
11-20	15%
21+	22%



Gillison et al. JAMA 2012; 307: 693-703

# Oral HPV prevalence higher in men

Oral HPV DNA prevalence	20-29	30-44 (adult)	45-59	60-69
	(young adult)		(middle age)	(senior)
Any Oral HPV				
Men	8.2%	10.4%	13.5%	13.5%
Women	4.0%	2.3%	3.7%	3.5%

Oral HPV16				
Men	1.5%	1.8%	2.3%	2.1%
Women	0.2%	0.1%	0.5%	0.5%

*Oral HPV16 is 6 times more common among men than women*

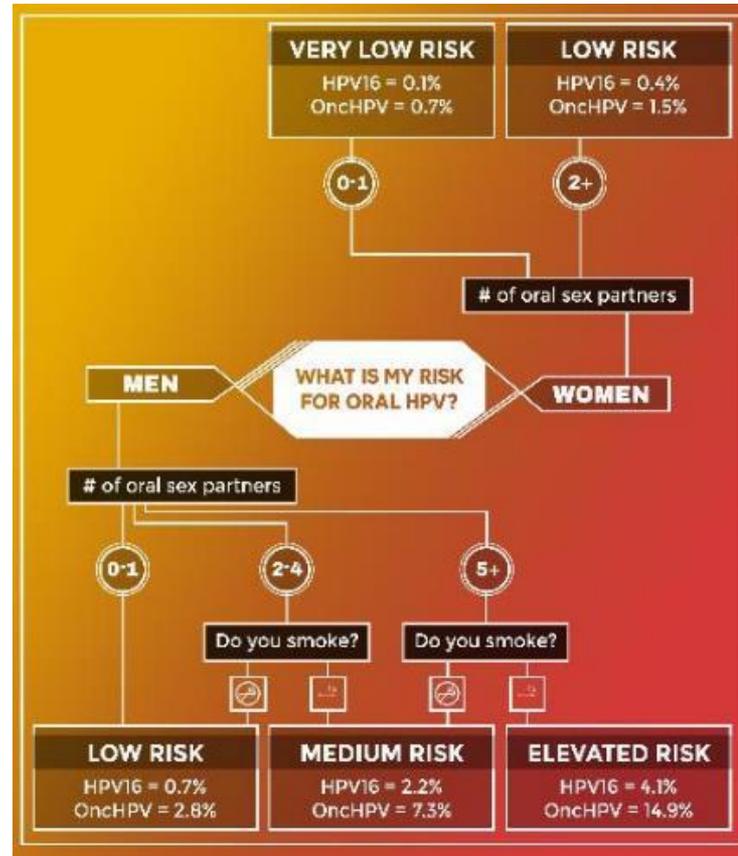
- *NOT explained by differences in oral sex*

D'Souza et al. PLOS One, 2014, 9(1): e86023. (NHANES)

# What is my risk for oral HPV?

Oral HPV prevalence  
in U.S. general population

Stratifies into risk groups  
by sexual behavior,  
tobacco, and sex



DSouza, McNeel, Fakhry. Annals of Oncology. Oct 19 2017 [Epub ahead of print] PMID: 29059337

# Oral HPV incidence

Group	Sex	Incidence Rate Per 1,000 person-months	Cum Inc in one year
Adult (HIM cohort)	Men	6 / 1,000 pm	7%
18-24 yrs Univ Students	Men	10 / 1,000 pm	12%
18-25 yrs STD Clinic	Men	20 / 1,000 pm	24%
18-25 yrs STD Clinic	Women	13 / 1,000 pm	16%

Many people are likely exposed to oral HPV infection in their lives

Kreimer et al. *Lancet* 2013; 382(9895):877-87.  
D'Souza et al. *J Infect Dis.* 2016; 213(12):1893-6.  
Edelestein et al. *Sex Trans Dis.* 2012; 39: 860-7.

# Oral HPV16 incidence

Group	Sex	Incidence Rate Per 1,000 person-months	Cum Inc in one year
Adult (HIM cohort)	Men	0.8/ 1,000 pm	1.0%
18-24 yrs Univ Students	Men	0.7 / 1,000 pm	0.8%
High-risk 18-25 yrs	Men	2.5 / 1,000 pm	3.0%
High-Risk 18-25 yrs	Women	0.7/ 1,000 pm	0.8%

Oral HPV16 infection is rarer

*Lifetime* risk of oral HPV16 infection...

Men 3 - 30% ?

Women <1 - 8% ?

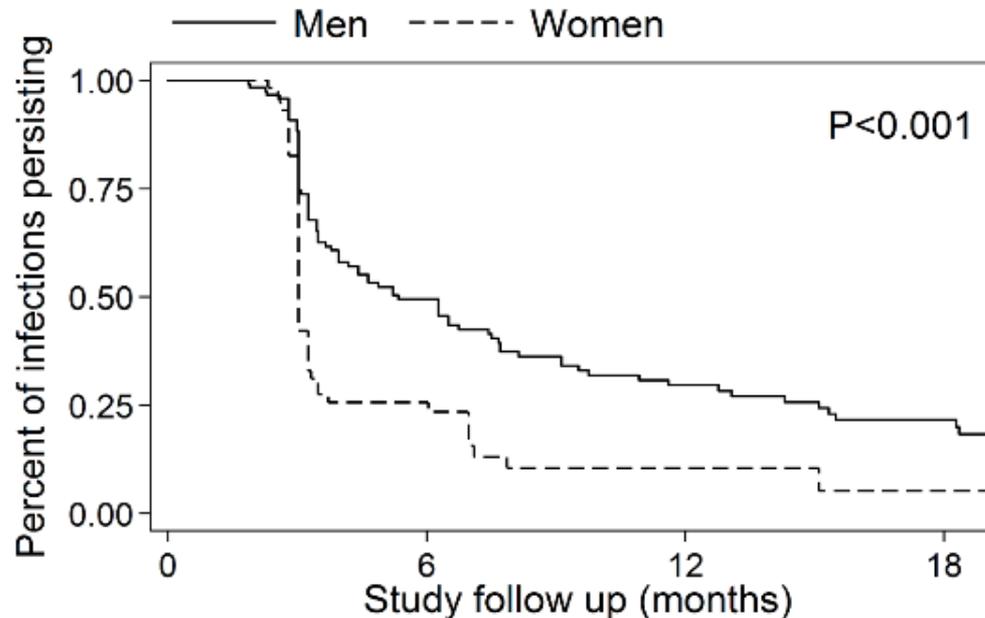
D'Souza et al. *J Infect Dis*. 2016 Feb 10 [Epub ahead of print]  
Kreimer et al. *Lancet* 2013; 382(9895):877-87.

# Risk factors for incident oral HPV may differ for men and women

	Men	Women
Any recent oral sex	<b>3.15 (1.4-7.0)</b>	0.66 (0.27-1.6)
# recent oral sex partners: 0	1.00	1.00
1	<b>3.02 (1.3-6.8)</b>	0.56 (0.22-1.4)
2	<b>3.07 (1.1-8.9)</b>	1.13 (0.39-3.2)
≥ 3	<b>4.54 (1.4-14.8)</b>	0.95 (0.19-4.8)
P-trend	<b>0.001</b>	0.86
Recent cunnilingus (oral sex on a woman)	<b>2.52 (1.3-5.0)</b>	0.77 (0.31-1.9)
Recent fellatio (oral sex on a man)	0.85 (0.29-2.5)	0.43 (0.17-1.1)

D'Souza et al. *J Infect Dis.* 2016 Feb 10 [Epub ahead of print]

# Oral HPV clearance by sex: SPITT study (18-25 year olds)



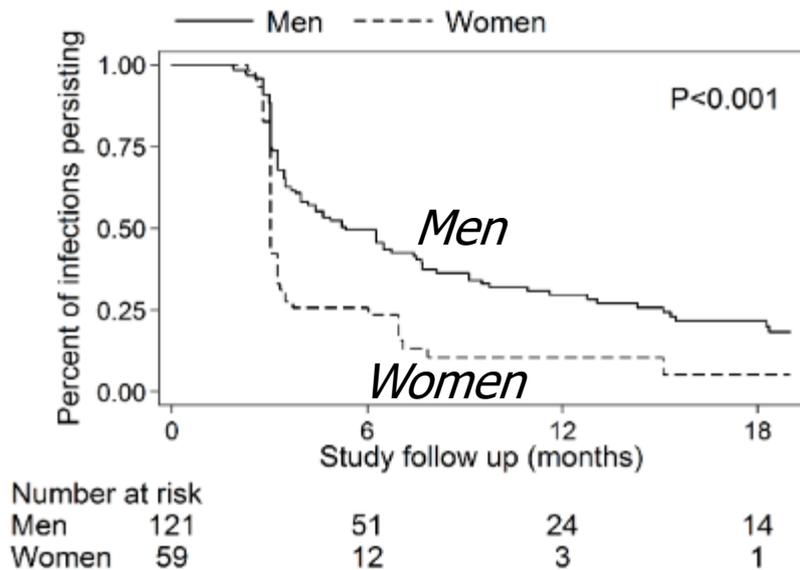
Number at risk					
Men	121	51	24	14	
Women	59	12	3	1	

D'Souza et al. *J Infect Dis.* 2016 Feb 10 [Epub ahead of print]

# Oral HPV clearance

... similar to what we know for cervical HPV

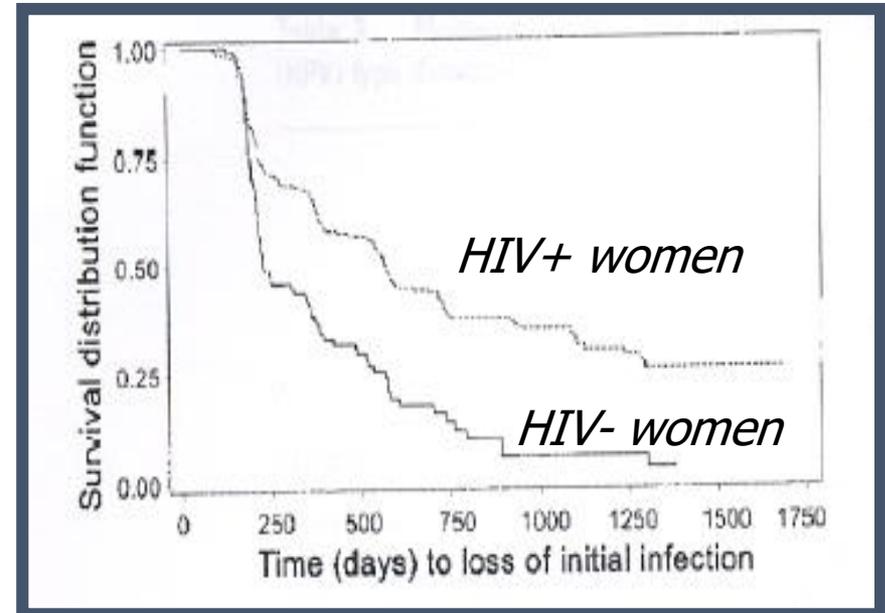
## ORAL HPV



*Most oral HPV infections... clear within 1-2 years*

D'Souza et al. *J Infect Dis.* 2016 Feb 10 [Epub ahead of print]

## CERVICAL HPV



*Most cervical HPV infections... clear within 1-2 years*

Moscicki, et al. *JID* 2004;190:37-45.

# Why is the risk of HPV-related oropharyngeal cancer so different by gender & race?

## Differences in Oral Sexual Behaviors by Gender, Age, and Race Explain Observed Differences in Prevalence of Oral Human Papillomavirus Infection

Gypsyamber D'Souza<sup>1,2\*</sup>, Kevin Cullen<sup>3</sup>, Janice Bowie<sup>4</sup>, Roland Thorpe<sup>5,6</sup>, Carole Fakhry<sup>1,2,7\*</sup>

- NHANES 2009-10
- 2,116 men and 2,140 women
- Oral rinse and gargle tested for HPV DNA

D'Souza G et al(2014) PLoS ONE 9(1): e86023.

# Are disparities in HPV-OPC explained by differences in behavior? **SEX**

NHANES DATA FROM 2009–2010

SEER DATA FROM 2009

## Sexual behavior

Ever performed oral sex

5 lifetime oral sex partners\*

Oral HPV16 Infection

Age adjusted OSCC incidence/100,000

## Gender

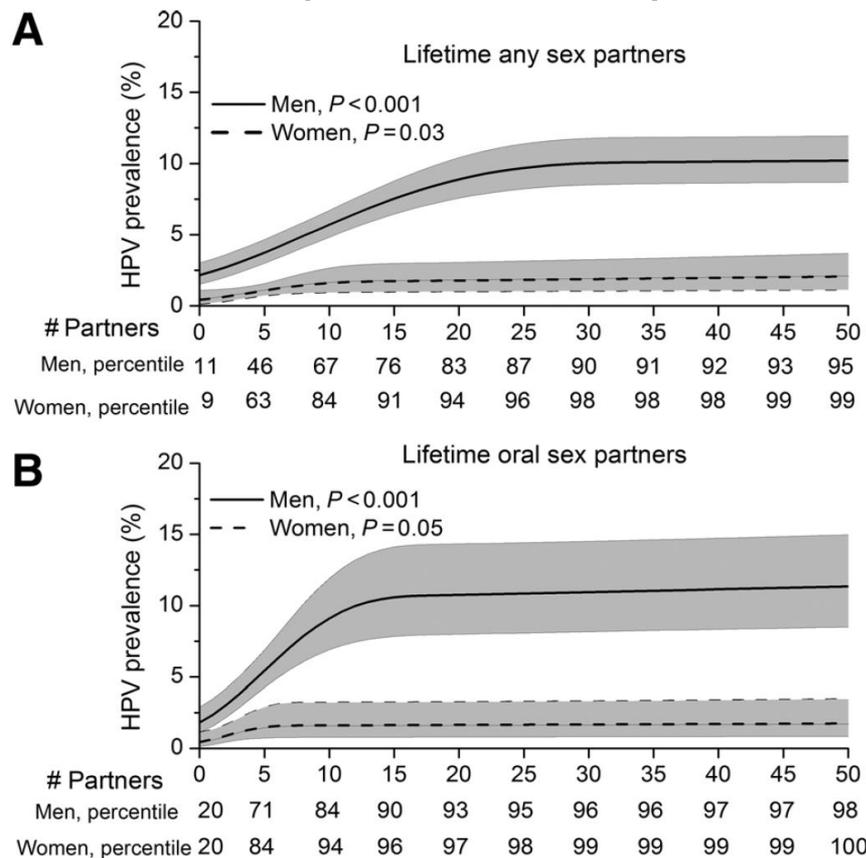
Male	85.4%	32.4%	1.95%	9.1
Female	83.2%	17.6%	0.29%	1.9
Ratio** (M/F)	<b>1.03 (1.01, 1.05)</b>	<b>1.84 (1.54, 2.20)</b>	<b>6.79 (2.07, 22.26)</b>	<b>4.71 (4.42, 5.02)</b>

D'Souza G et al(2014) PLoS ONE 9(1): e86023.

# Risk factors

## Sex & oral HPV prevalence (NHANES)

With same number of lifetime sexual partners – men have higher oral HPV prevalence



Chaturvedi et al.  
Cancer Res. 2015 Jun  
15;75(12):2468-77

# Risk of developing OPC, by sex

Risk Spectrum: Infection to Cancer		
	NHANES: Prevalence	SEER: OPC cases/100 people
Sex	Oncogenic Oral HPV	Lifetime
Men	6.0%	0.7%
Women	1.1%	0.2%

Higher oral HPV prevalence in men than women → higher OPC incidence in men

DSouza, McNeel, Fakhry. *Annals of Oncology*. Oct 19 2017 [Epub ahead of print] PMID: 29059337

# Risk of developing OPC *in next 20 years*, by sex & age

	20 yr OPC risk: Cases/100 people	
Age	Men	Women
20-29	0.01%	<0.01%
30-39	0.07%	0.01%
40-49	0.3%	0.05%
50-59	0.4%	0.08%
60-69	0.4%	0.10%

In every age group, OPC risk is higher among men than women

DSouza, McNeel, Fakhry. Annals of Oncology. Oct 19 2017 [Epub ahead of print] PMID: 29059337

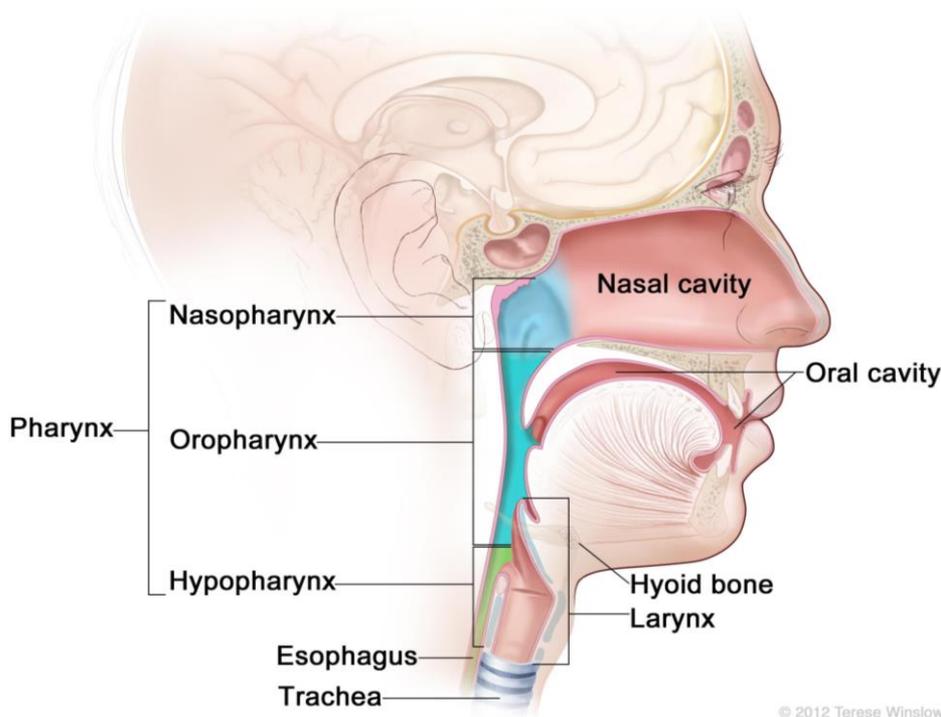
# Summary

- Oral HPV incidence lower than genital HPV
- Most infections clear within 1-2 years, but not all
- Men have
  - higher oral HPV acquisition
  - lower oral HPV clearance
  - Not fully explained by # oral sex partners
- Oral HPV16 prevalence is low, and most people with infection will not develop OPC

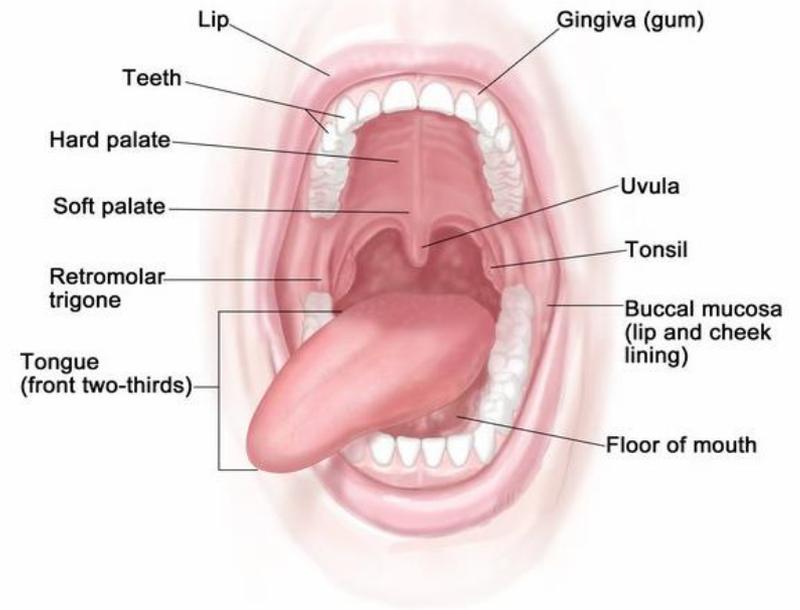
# Differences between oral cancers and oropharyngeal cancers

Dr. Carole Fakhry

# Oropharynx vs. other head and neck anatomic sites



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# How to address common questions about oropharyngeal cancer and HPV vaccine

Dr. Carole Fakhry

# Questions in those without cancer: What is my risk of oropharyngeal cancer?

Risk is higher in men - but overall cancer risk still low

Many men likely exposed to oral HPV at some point

- Risk increases with number of oral sex partners
- Most people clear infection within 2 years

Risk of HPV-OPC has increased due to:

- Changing sexual behavior (more oral sex at earlier age)?
- Lower immunity in men?
- Evidence suggests HPV vaccine will prevent

# Questions in those without cancer: Should I be tested for oral HPV infection?

- There are no FDA approved tests to detect oral HPV infection
- If there were a test and oral HPV DNA were detected
  - No treatment
  - No screening recommendations
  - Most infections will clear on their own

# Should I offer saliva HPV testing to patients?

- Having oral HPV DNA in your mouth at one time is not a good predictor of risk since most people clear these infections
- No treatment to offer for infection
- Benefit vs harm
- American Dental Association does NOT recommend using available salivary adjuncts – do not demonstrate sufficient diagnostic test accuracy to support routine use
  - Reference: Lingen et al. Evidence-based clinical practice guideline for the evaluation of potentially malignant disorders in the oral cavity. JADA 2017.

# HPV vaccine – Why vaccinate?

**Reason #1 – Anal and Cervical Precancer and Cancer**

**Reason #2 – Genital Warts**

**TABLE 3. Summary of quadrivalent human papillomavirus (HPV) vaccine efficacy studies in the per protocol populations\***

Outcome and protocol	Quadrivalent vaccine		Placebo		% Efficacy	(95% CI) <sup>§</sup>
	No. <sup>†</sup>	Cases	No.	Cases		
<b>HPV 16- or 18- related CIN 2/3 or AIS<sup>1</sup></b>						
Protocol 005**	755	0	750	12	100.0	(65.1–100.0)
Protocol 007	231	0	230	1	100.0	(-3734.9–100.0)
Protocol 013	2,200	0	2,222	19	100.0	(78.5–100.0)
Protocol 015	5,301	0	5,258	21	100.0 <sup>††</sup>	(80.9–100.0)
Combined protocols <sup>§§</sup>	8,487	0	8,460	53	100.0 <sup>††</sup>	(92.9–100.0)
<b>HPV 6-, 11-, 16-, 18- related CIN (CIN 1, CIN 2/3) or AIS</b>						
Protocol 007	235	0	233	3	100.0	(-137.8–100.0)
Protocol 013	2,240	0	2,258	37	100.0 <sup>††</sup>	(89.5–100.0)
Protocol 015	5,383	4	5,370	43	90.7	(74.4–97.6)
Combined protocols <sup>§§</sup>	7,858	4	7,861	83	95.2	(87.2–98.7)
<b>HPV 6-, 11-, 16-, 18- related genital warts</b>						
Protocol 007	235	0	233	3	100.0	(-139.5–100.0)
Protocol 013	2,261	0	2,279	29	100.0	(86.4–100.0)
Protocol 015	5,401	1	5,387	59	98.3	(90.2–100.0)
Combined protocols <sup>§§</sup>	7,897	1	7,899	91	98.9	(93.7–100.0)

NEJM 2007, Munoz et al. 2010 JNCI 102:325-39.

# HPV vaccine – Why vaccinate?

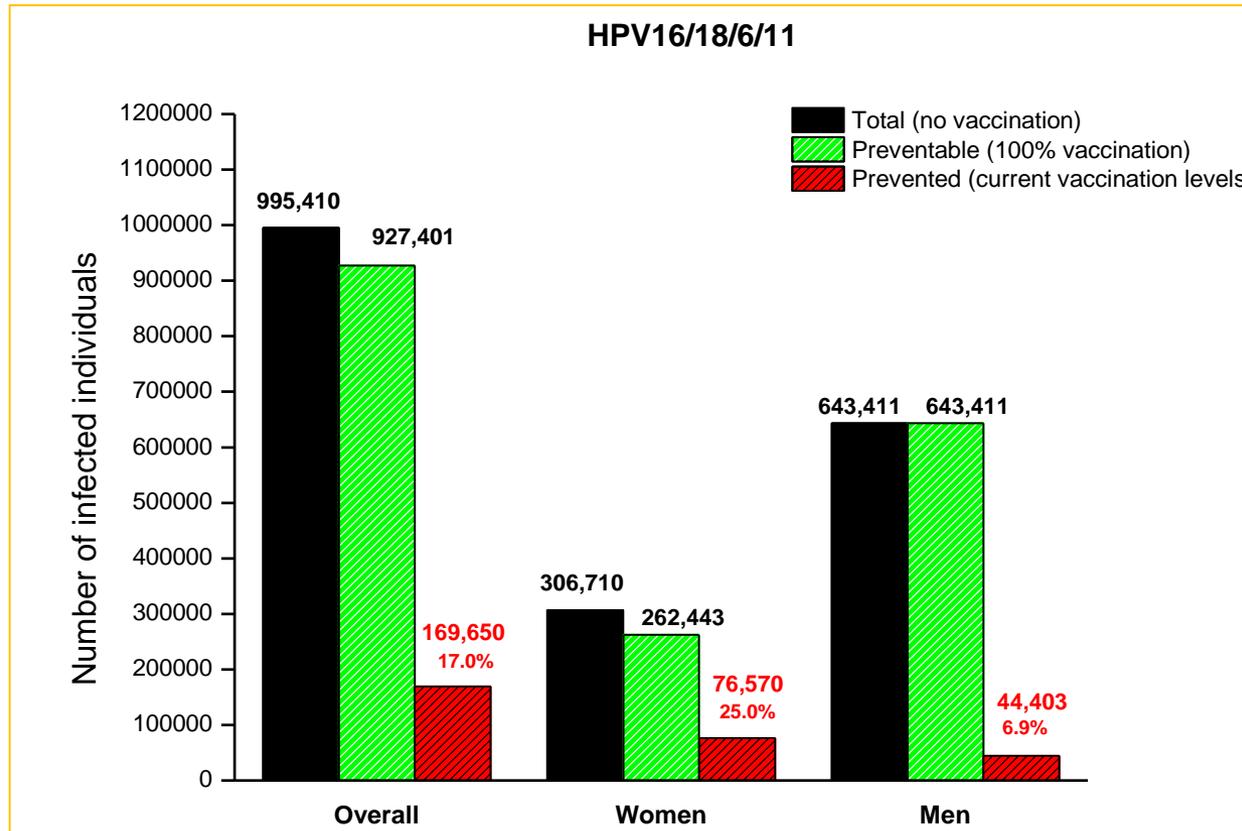
## Reason #3 – Oropharyngeal Cancer

Arm	# Women	# HPV16/18 Infections	HPV16/18 VE (95%CI)
HPV	2910	1	93% (63% to 100%)
Control	2924	15	

Evidence suggests that vaccine will also prevent new oral HPV infection and thus HPV-related OPC

Herrero R et al Kreimer A. *PLOS ONE*. 2013. 8(7): e68329

# Opportunity to reduce oral HPV infections; low vaccination for men



Chaturvedi and Gillison, ASCO 2017

# Physician – Patient Communication

- Talking HPV is *cancer* prevention
  - If you are comfortable puts patients more at ease
- When patients are worried about their risk:
  - Oral sex is common, infection is somewhat common, cancer is rare
- We don't have effective screening, we are optimistic about prevention

Thank You

# Jason T. Mendelsohn

## Survivor

“At age 44 I made videos to my kids saying goodbye. Today I share my story to stop other parents from ever having to make similar videos to their kids.”

“My goal is to have my cancer story shared in as many languages as possible, on all seven continents to save lives worldwide.”

# Jason's Story





## Jason T. Mendelsohn Survivor

Contact me:

[Jason@SupermanHPV.com](mailto:Jason@SupermanHPV.com)

[www.SupermanHPV.com](http://www.SupermanHPV.com)

[www.HeadandNeck.org](http://www.HeadandNeck.org)

# Questions?



**Dr. Amber D'Souza**



**Dr. Carole Fakhry**



**Jason Mendelsohn**

# Thank You!

Webinar archive will be available at:

[www.pfh.org/immunization](http://www.pfh.org/immunization)

Questions or comments?

[immunization@pfh.org](mailto:immunization@pfh.org)