

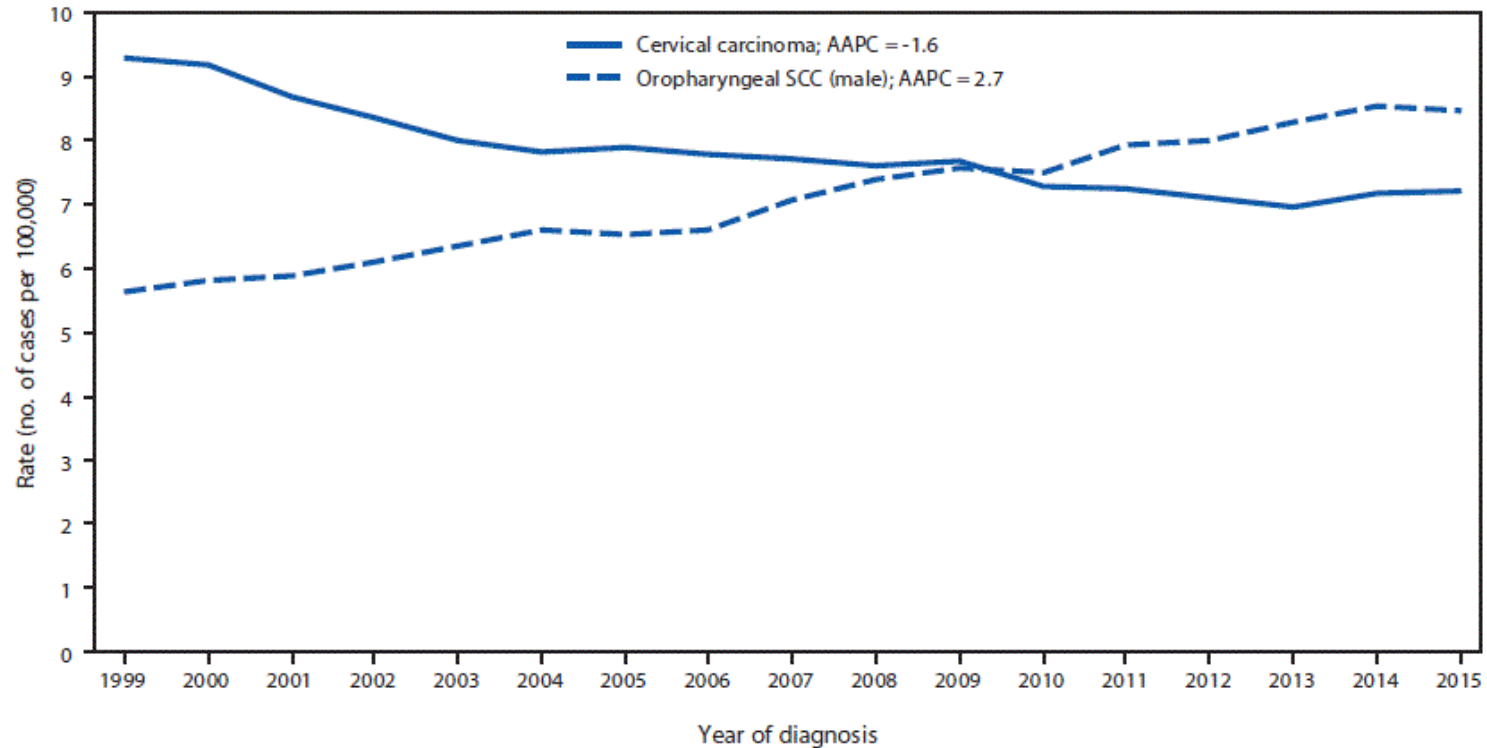


# Using data to inform targeted reminder- recall

**An example from an ongoing,  
email-based HPV reminder  
recall program**

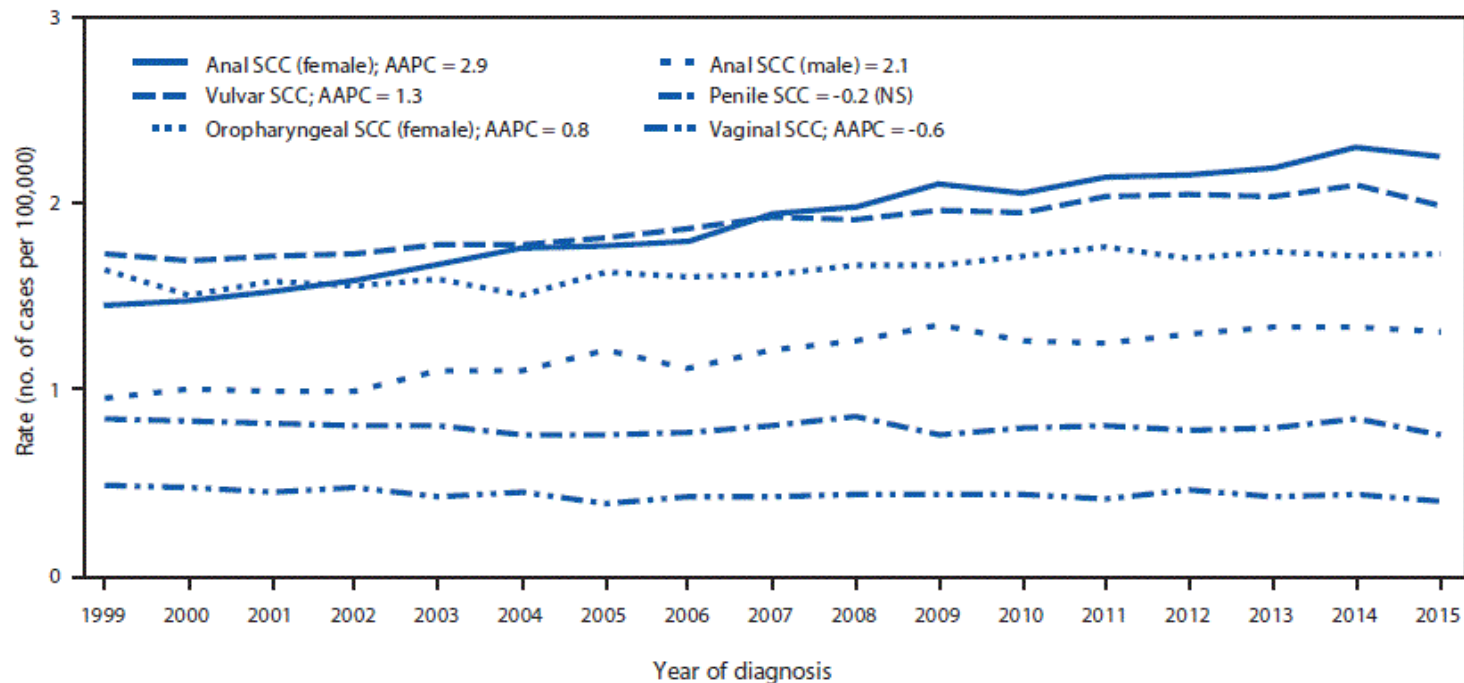
Kyle Freese, PhD, MPH  
Chief Epidemiologist, STChealth

# HPV-associated cervical and oropharyngeal cancer trends



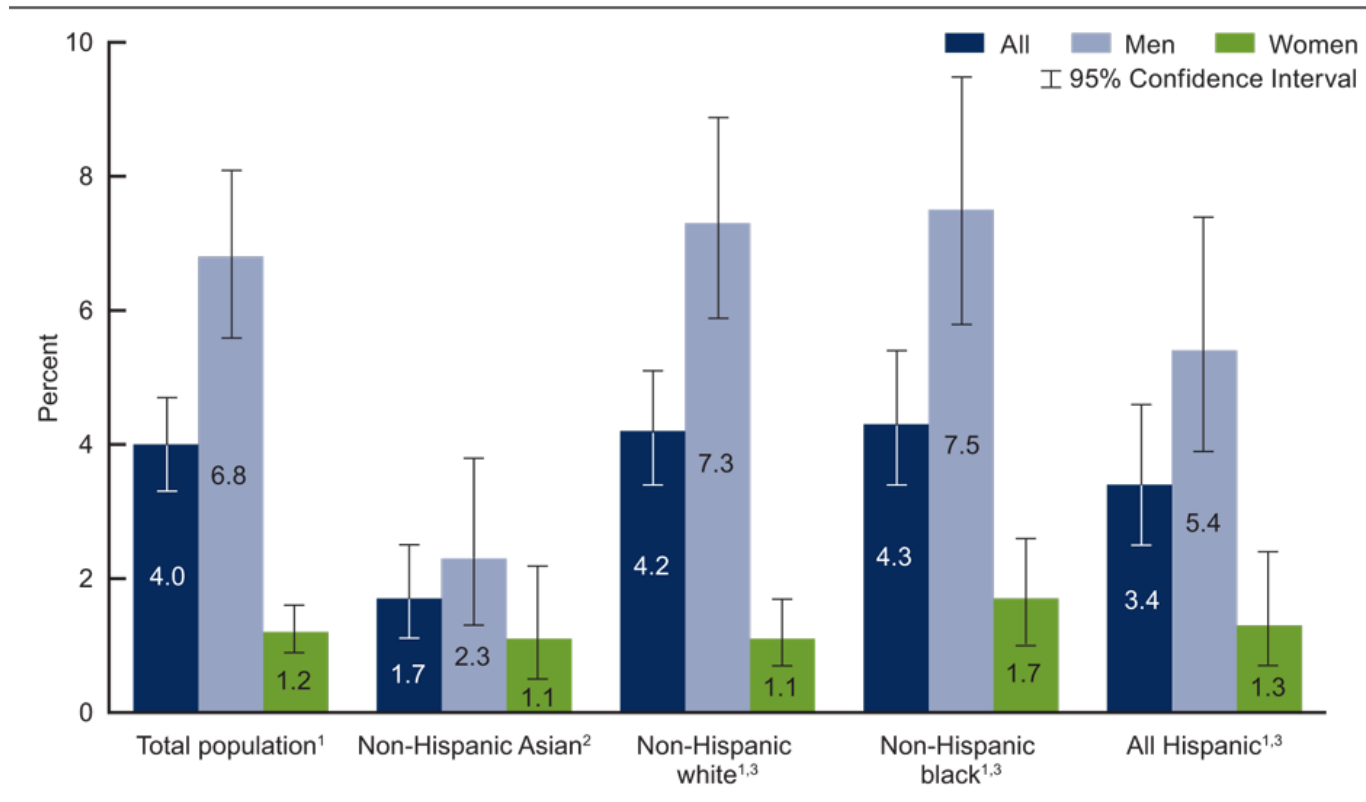
Van Dyne EA, Henley SJ, Saraiya M, Thomas CC, Markowitz LE, Benard VB. Trends in Human Papillomavirus–Associated Cancers — United States, 1999–2015. MMWR Morb Mortal Wkly Rep 2018;67:918–924. DOI: [http://dx.doi.org/10.15585/mmwr.mm6733a2external\\_icon](http://dx.doi.org/10.15585/mmwr.mm6733a2external_icon)

## Other HPV-associated cancer trends



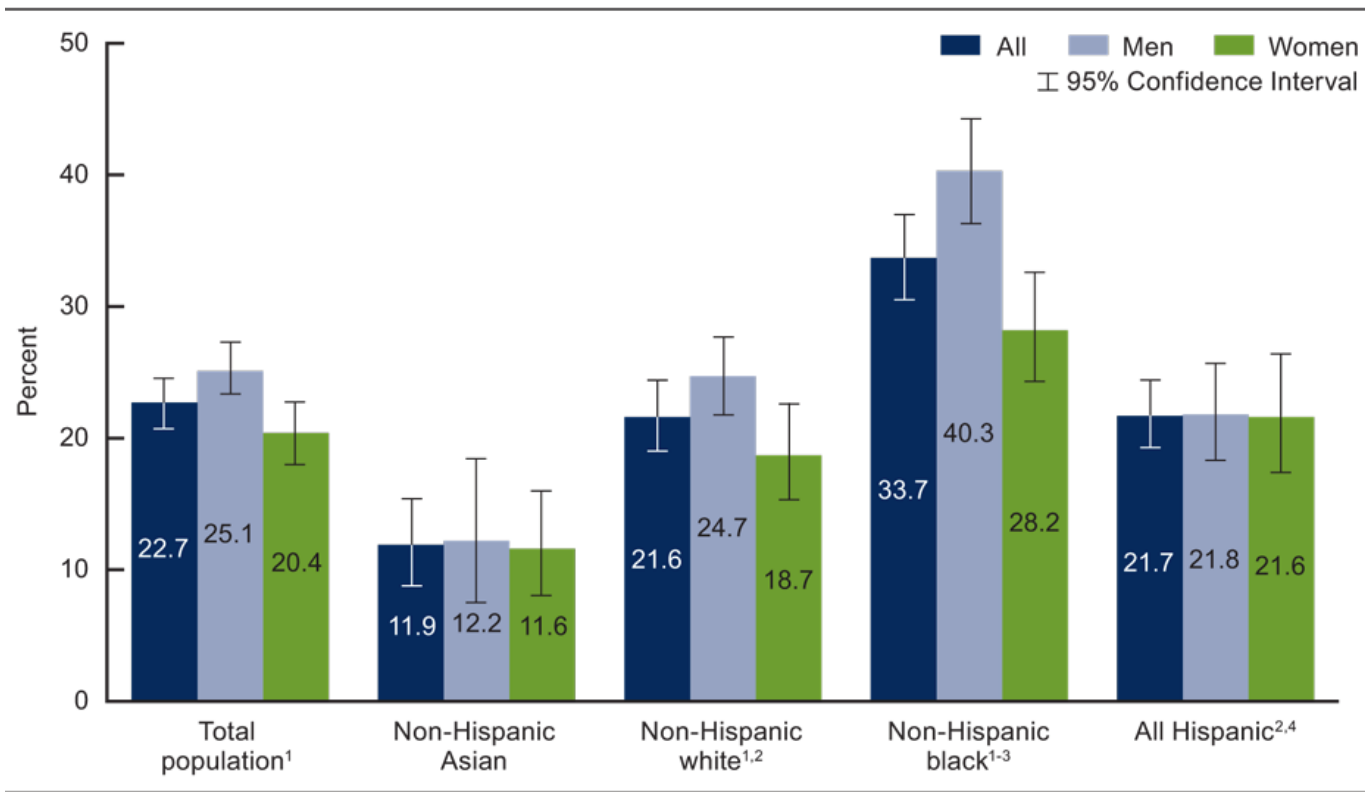
Van Dyne EA, Henley SJ, Saraiya M, Thomas CC, Markowitz LE, Benard VB. Trends in Human Papillomavirus–Associated Cancers — United States, 1999–2015. MMWR Morb Mortal Wkly Rep 2018;67:918–924. DOI: <http://dx.doi.org/10.15585/mmwr.mm6733a2external icon>

# Racial/Ethnic and sex disparities in prevalence of high-risk oral HPV



McQuillan G, Kruszon-Moran D, Markowitz LE, Unger ER., Paulose-Ram R. Prevalence of HPV in adults aged 18–69: United States, 2011–2014. NCHS data brief, no 280. Hyattsville, MD: National Center for Health Statistics. 2017.

# Racial/ethnic and sex disparities in prevalence of high-risk genital HPV



McQuillan G, Kruszon-Moran D, Markowitz LE, Unger ER, Paulose-Ram R. Prevalence of HPV in adults aged 18–69: United States, 2011–2014. NCHS data brief, no 280. Hyattsville, MD: National Center for Health Statistics. 2017.

# HPV mortality and morbidity

- 45,000 HPV-related cancers in the U.S. annually (25,000 among women)
- 66% 5-year survival rate for cervical cancer
- At least \$4 billion in direct healthcare costs per year
- Prolonged morbidity (for both, low and high-risk variants)
- 92% of HPV-related cancers could be prevented by vaccination

# HPV vaccination recommendations and trends

**Start Talking Early**  
Ages 9-10  
2 doses



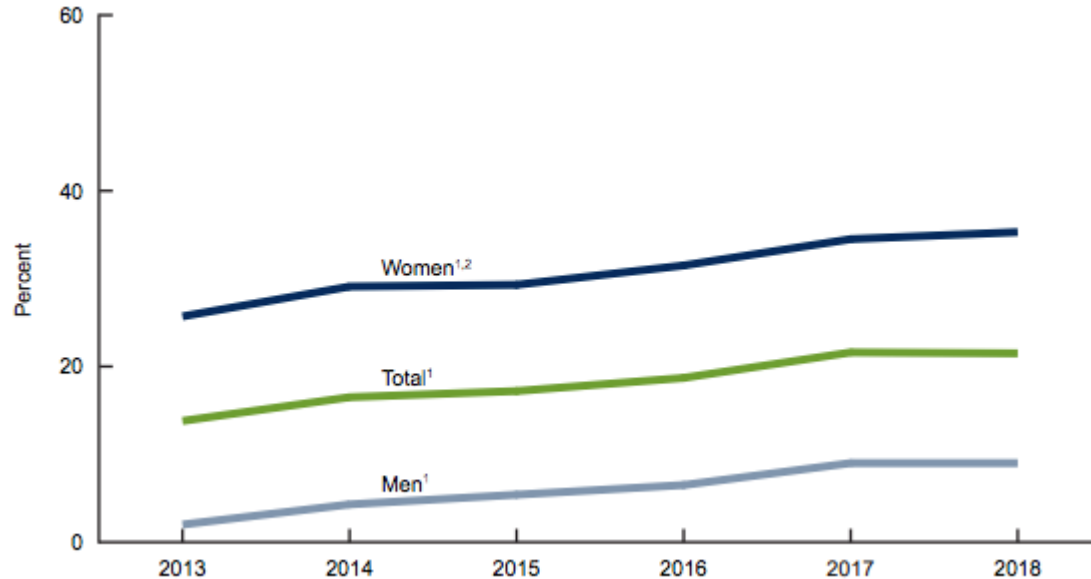
**On Time**  
Ages 11-12  
2 doses



**Late**  
Ages 13-14  
2 doses



**Late**  
Ages 15-26  
**3 doses**



## Objective

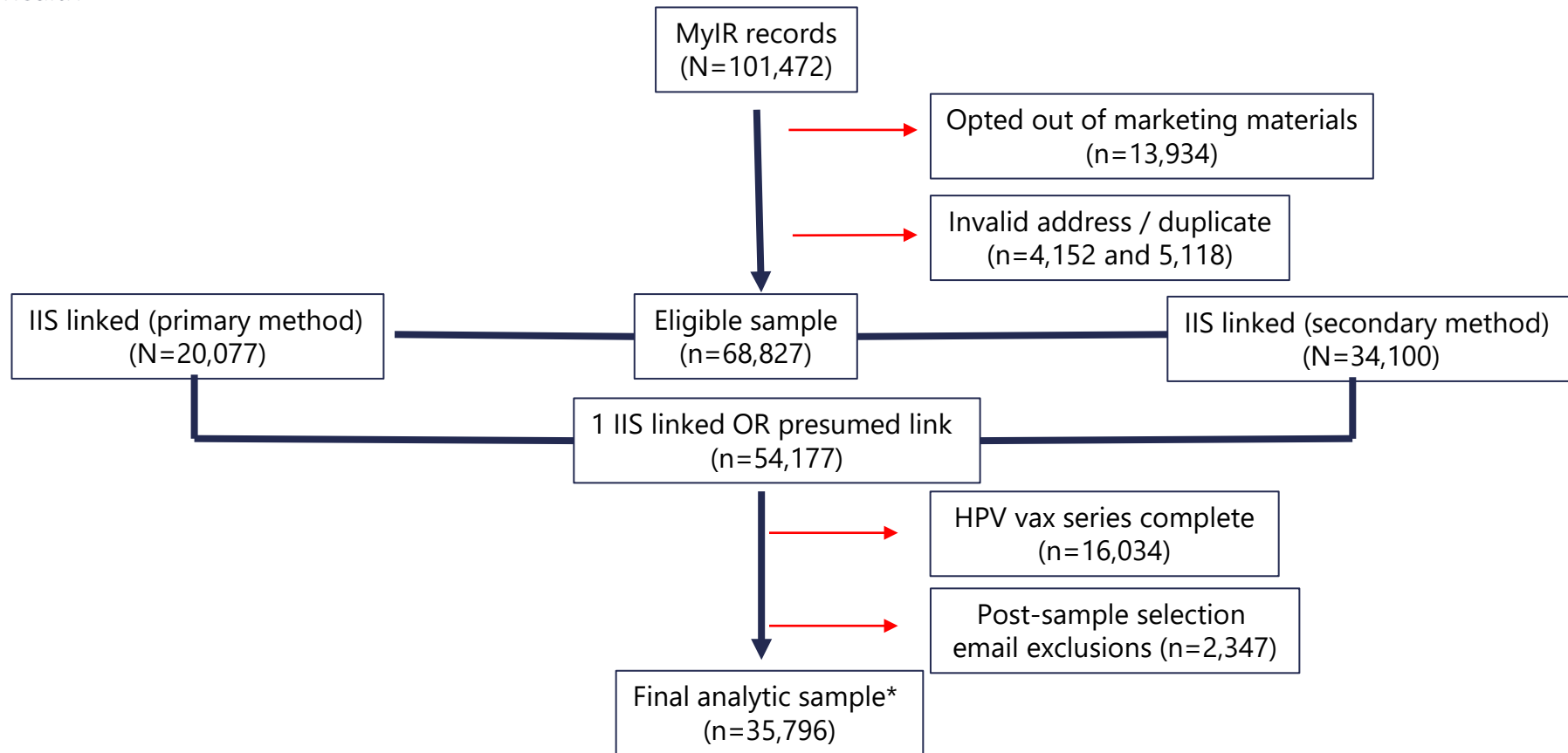
- Develop a tailored, reminder/recall campaign for MyIR users in the STChealth network who have not completed their HPV vaccine series.

## Analytic Outcomes

- Describe consumer engagement
- Determine association between vaccine uptake by individual characteristic and geography



# Sample Selection



\*individuals for whom prospective vaccine uptake can be measured.

Updated data pull reflects 2016 changes in CDC guidelines for 2 vs. 3 doses for series initiation before one's 15<sup>th</sup> birthday

# Table 1. Sample Characteristics\* (n=35,796)

Characteristic		Median (IQR)		
Current age	22 (13, 34)	< 18 years (n= 13,275)	18-26 years (n= 7,474)	27+ years (n= 15,002)
		n(%)	n(%)	
Sex				
Female	23,044 (64)	6,533 (49)	4,030 (54)	12,481 (83)
Male	12,702 (36)	6,742 (51)	3,442 (46)	2,518 (17)
Race/ ethnicity				
Non-Hispanic White	16,743 (47)	6,502 (50)	3,665 (50)	6,576 (44)
Non-Hispanic Black	9,173 (26)	3,544 (27)	1,559 (21)	4,070 (27)
Non-Hispanic Other	6,063 (17)	2,422 (18)	1,247 (17)	2,394 (16)
Hispanic	3,346 (9.5)	647 (4.9)	897 (12)	1,802 (12)

\*Sample includes only those for whom vaccine uptake can be measured because of MyIR/ IIS linkage and are due for at least 1 dose

## Table 2. Individual Characteristics by HPV Vaccine Series Status

Characteristic	n(%)		
	Overall (n=35,796)	<i>Began series</i> (n=6,822)	<i>Did not begin</i> (n=28,971)
<b>Age category</b>			
<18 years	13,275 (37)	3,278 (48)	9,997 (35)
18-26 years	7,474 (21)	2,327 (34)	5,147 (18)
27+ years	15,002 (42)	1,210 (18)	13,792 (48)
<b>Sex</b>			
Female	23,044 (64)	4,103 (60)	18,941 (65)
Male	12,702 (36)	2,712(40)	9,990 (35)
<b>Race/ ethnicity</b>			
Non-Hispanic White	16,743 (47)	2,934 (44)	13,809 (48)
Non-Hispanic Black	9,173 (26)	2,319 (35)	6,854 (24)
Non-Hispanic Other	6,063 (17)	891 (13)	5,172 (18)
Hispanic	3,346 (9.5)	575 (8.6)	2,771 (9.7)

**Know the facts about HPV and how it could affect your child.**



#### What you should know.

HPV is more common than you may think. An estimated 79 million people in the United States were infected with genital HPV from 2003-2006.

**For most people, HPV clears on its own.** But, for others who don't clear the virus, it could cause certain cancers and other diseases later in life. Talk to your child's doctor about HPV.



#### What is HPV?

HPV (short for human papillomavirus) is a virus that can cause certain cancers and diseases in both males and females later in life.



#### Signs and symptoms.

Because HPV often has no visible signs or symptoms, many people who have the virus don't even know it.



#### What can parents do?

It is important to know the facts. Now that you're armed with more information, talk to your child's doctor.

[Learn more](#)

**Remember to talk to your child's doctor about HPV.**

# Campaign Details

- 2 email reminders staggered by 4 weeks

- Stratified by age group (adolescent and adult)

**Know the facts about HPV and how it could affect you.**



#### What you should know.

From 2003-2006, approximately 14 million new genital human papillomavirus (HPV) infections occurred in the US each year.

**For most people, HPV clears on its own.** But, for others who don't clear the virus, it could cause certain cancers and other diseases later in life. Talk to your doctor about HPV.



#### What is HPV?

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#### What can you do?

It is important to know the facts. Now that you're armed with more information, talk to your doctor.

[Learn more](#)

**Remember to talk to your doctor about HPV.**

# Preliminary engagement results

## Total Emails Delivered

9,738  
Total Delivered

## Email List vs Reminder Email Count

1,129  
Opened List Count

139  
Reminder Opened Count

▲ 990

Metric: Opened... Color: Opened ... Comparison Metric: Remi...

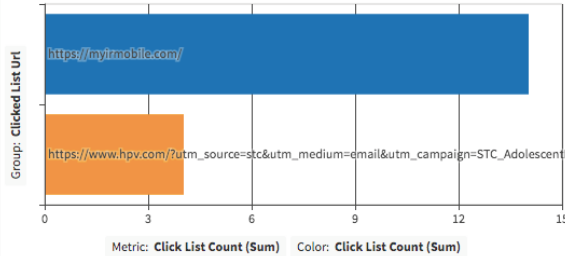
## Open Email Gender

[Null] | 2 (0.18%)

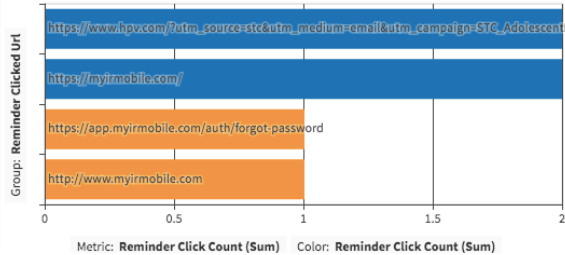


Group: Gender Size: Opened List Count (Sum)

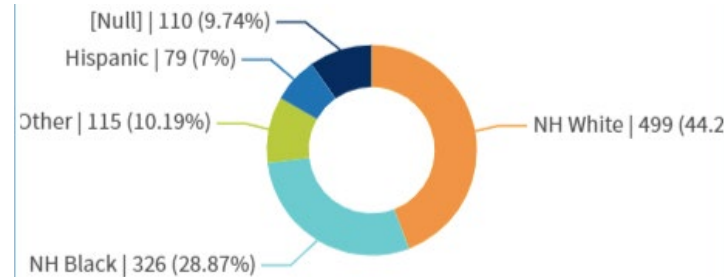
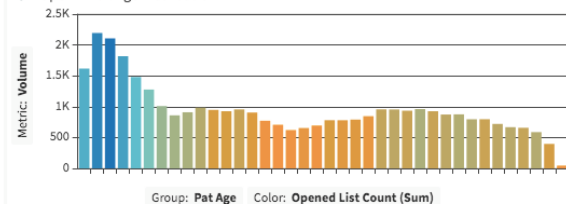
## Email Click Chart



## Reminder Email Chart



## Open Email Age Distribution



# Next steps

## *Near-term*

1. Measure vaccine uptake in study sample over 3 months
2. Describe vaccine uptake trends by geography, race, ethnicity, age, and sex
3. Multivariable regression modeling to determine associations between individual characteristics and vaccine uptake
4. Describe consumer engagement by geography, race, ethnicity, age, and sex and whether engagement translates to action

## *Long-term*

1. Externally validate approach in different population and time

Thank you

Questions?

