Post-market surveillance trial of Gardasil-9 HPV vaccine in adults with HIV

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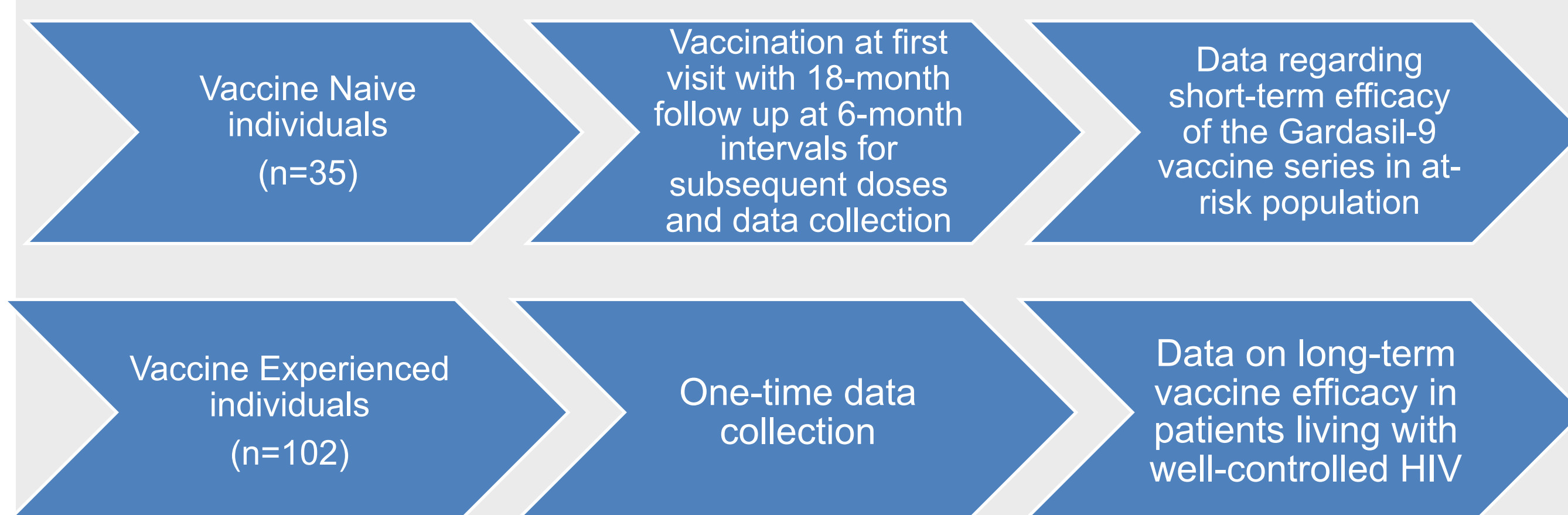
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Introduction

Objective: This two-armed study seeks to investigate Gardasil-9 immunogenicity and protection in patients living with well-controlled HIV

- Human papillomavirus (HPV) estimated to contribute to 5% of cancers globally[1]
- Several strains cause dysplasia and cancers of mucosal epithelial tissues, including the cervix, oropharynx and anus[2,3]
- The Gardasil-4 and Gardasil-9 vaccines immunize individuals to HPV-16 and HPV-18[2]
- Patients living with Human Immunodeficiency Virus (HIV) are at greater risk for HPV infection and subsequent dysplasia and neoplasia
- Vaccination is less effective in immunodeficient populations and continued surveillance is required for maintenance of optimal vaccine recommendations[4]

Methods

Vaccine Naïve individuals (n=35) → Vaccination at first visit with 18-month follow up at 6-month intervals for subsequent doses and data collection → Data regarding short-term efficacy of the Gardasil-9 vaccine series in at-risk population

Vaccine Experienced individuals (n=102) → One-time data collection → Data on long-term vaccine efficacy in patients living with well-controlled HIV

Enrollment procedures
- Informed consent
- Behavioral survey assessing risk factors for HPV infection
- Venipuncture, whole saliva (~5cc), anal swab, vaginal swab to assess HPV infection status at mucosal sites
- Electronic medical record capture of relevant clinical data (CD4, HIV viral load, recent cytology screening results)
- Data entered into REDCap database

Sample processing
- Genomic DNA extracted from swab specimens (Qiagen)
- Sample adequacy determined by detection of human cellular beta-globin
- Infection with HPV determined by PCR test that amplifies the L1 gene of common HPV genotypes
- High throughput sequencing (HPV-MY-Seq) to determine HPV strains.
- Serum antibodies will be tested by chemiluminescence immunoassay (Merck)

Results

Table 1. Participant Characteristics

Category		Naïve (n=35)	Expert (n=102)
Race			
	Black or African American	27 (77%)	79 (77%)
	White	8 (23%)	17 (17%)
	Other	0	3 (3%)
	Unknown / Not Reported	0	2 (2%)
	American Indian/Alaska Native	0	1 (1%)
Ethnicity			
	Not hispanic or Latino	34 (97%)	91 (89%)
	Hispanic or Latino	1 (3%)	11 (11%)
Age			
	Average	39	36
	Range	19-46	19-51
Gender			
	Male	24 (67%)	65 (64%)
	Female	10 (29%)	37 (36%)
	Chose not to respond	1 (3%)	0
Insurance Status			
	Medicaid/Medicare	31 (89%)	73 (72%)
	Private	4 (11%)	23 (23%)
	No	0	6 (6%)
Relevant Lab Values			
	Average CD4+ T cell Count	659	666
	Median HIV Viral Load	20	19
Risk Factors			
	Condom Use	6 (17%)	24 (24%)
	Genital Infection Past 6 months	20 (57%)	37 (36%)
	Recreational Drug Use	6 (17%)	8 (8%)

Table 1. Demographic data for vaccine experienced and vaccine naïve cohorts.
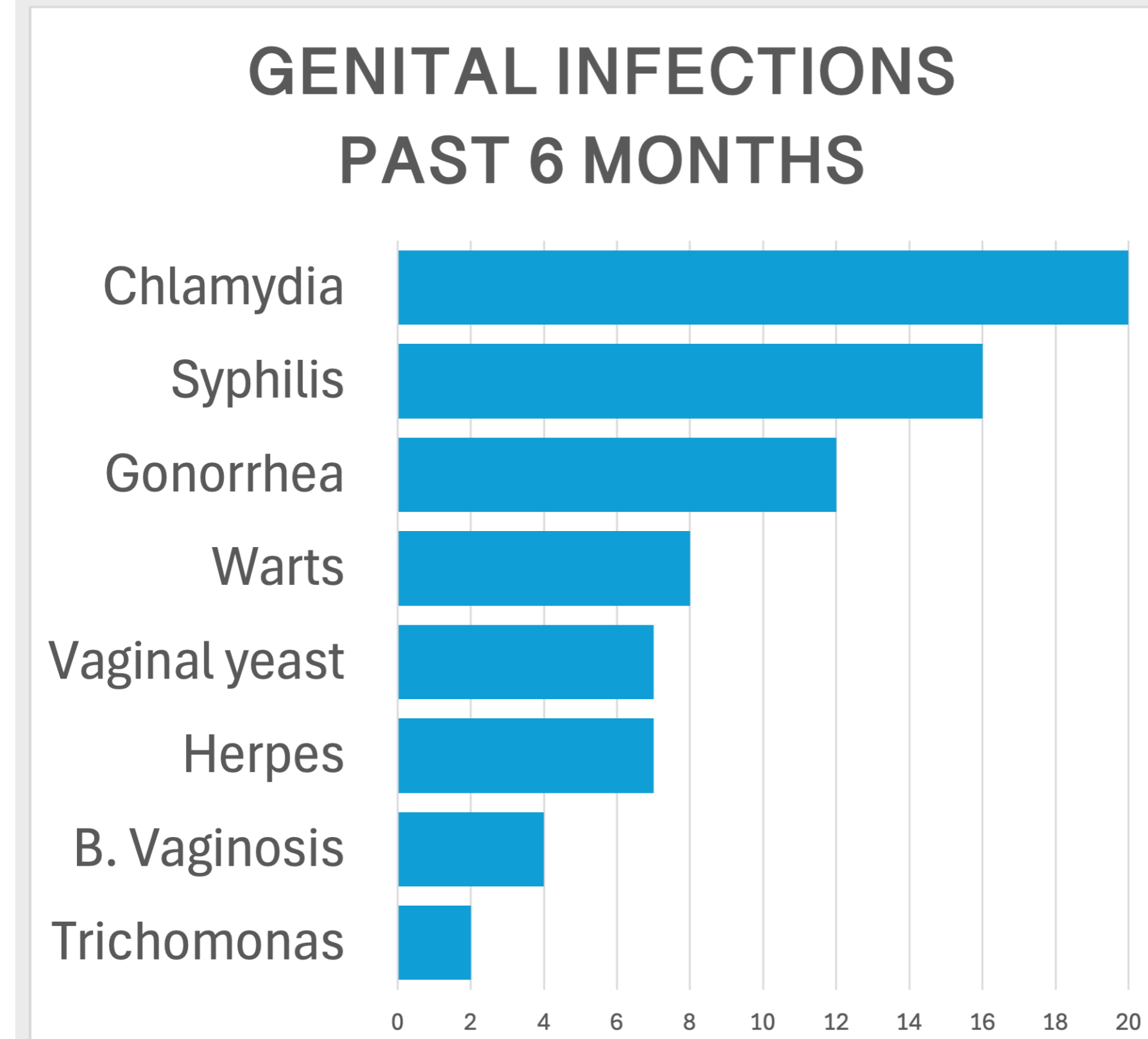

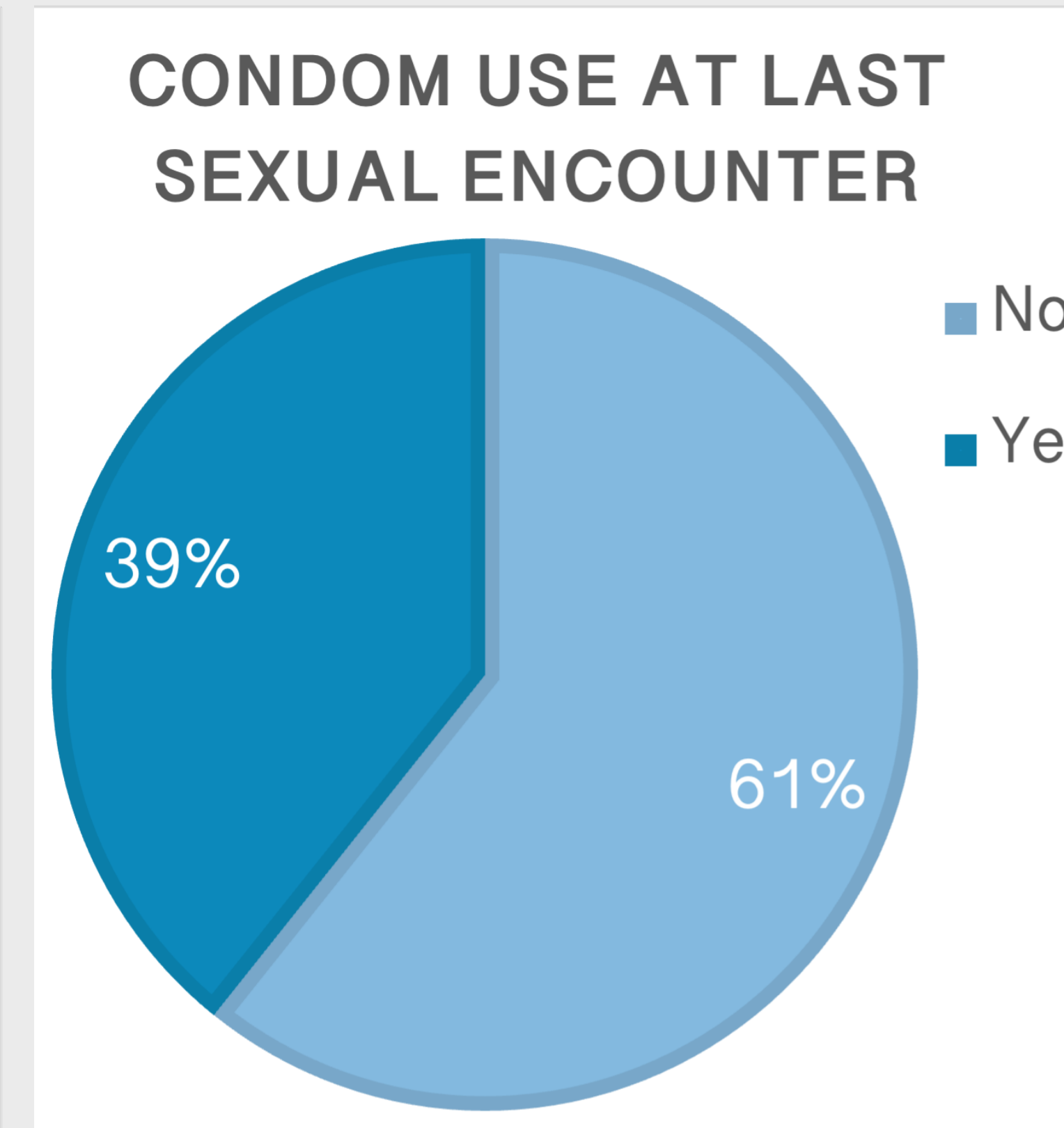Figure 1. Of 137 participants, 57/120 respondents reported a non-HPV genital infection in the last 6 months.

Figure 2. Of 137 participants, 79 responded to whether they used a condom at their last sexual encounter (vaginal, receptive anal, or insertive anal sex)
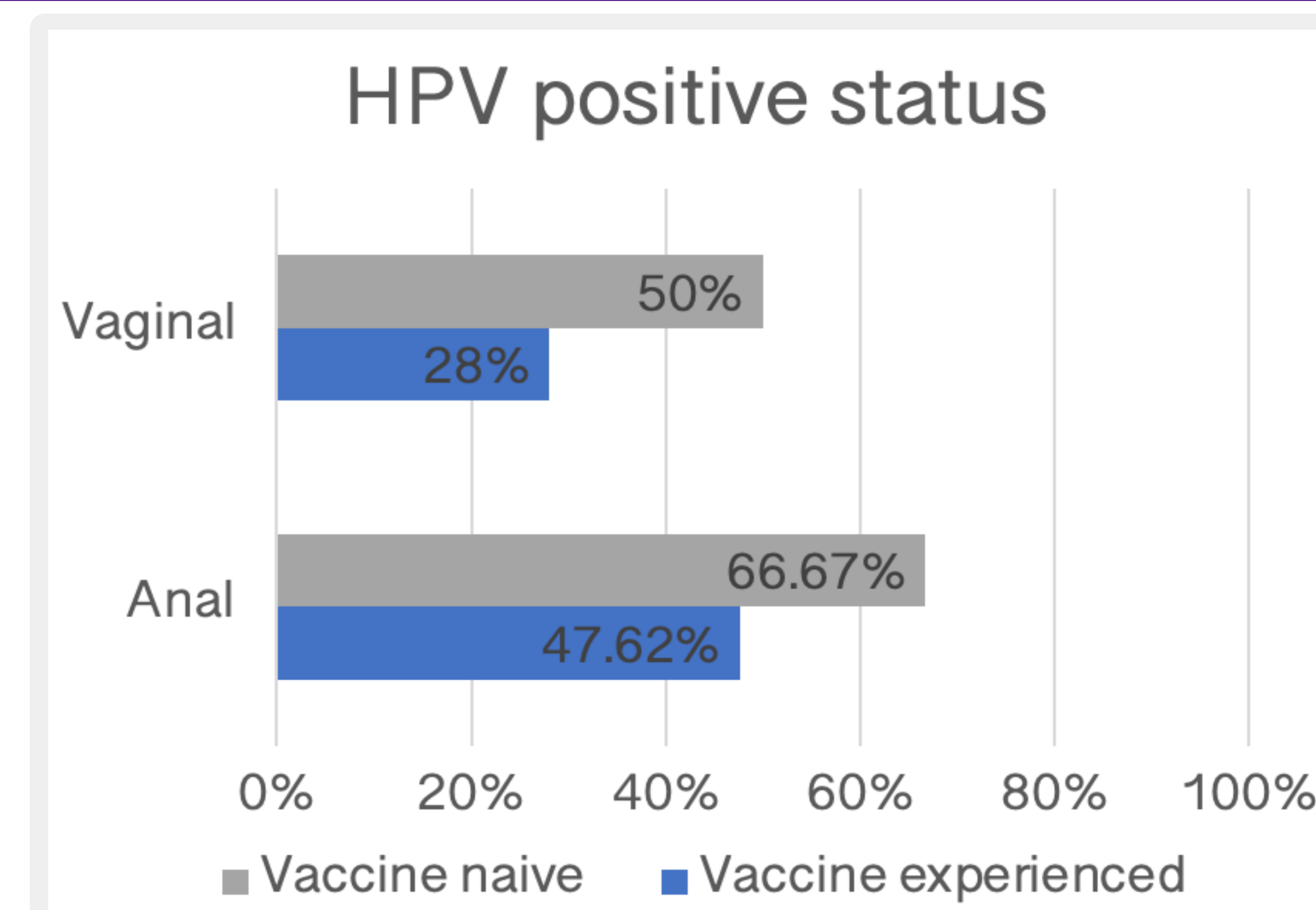

Figure 3. HPV prevalence at mucosal sites between vaccinated and unvaccinated groups.

Conclusions

- Participants in the study are predominantly African-American (77%), male (65%), single (69%) and insured via Medicaid (79%). The average age of participants is 37 years
- All participants are prescribed combination antiretroviral therapy with Biktarvy (bictegravir/emtricitabine/tenofovir) reported most frequently (57%)
- 39% of respondents reported condom use at last sexual encounter
- 48% of respondents reported a non HPV-genital infection in the last 6 months.
- Among vaccine-experienced individuals, 48% tested positive for anal HPV, and among women, 28% tested positive for vaginal HPV. In vaccine-naïve individuals, 67% and 50% tested positive for anal and vaginal HPV, respectively.
- Of reported genital infection in the past 6 months, chlamydia, gonorrhea, and syphilis were most prevalent.

Future Directions

- Antibody titer data by Merck
- Compare relative concentrations of antibody in blood with time since vaccination to investigate long-term efficacy
- Compare HPV infection at mucosal sites with blood antibody titers to determine sterilizing efficacy at mucosal sites
- Investigate correlations between high-risk behaviors (ie unprotected sex) and HPV infection rates
- Statistical comparisons between vaccine experienced and vaccine naïve cohorts for different characteristics

Acknowledgements

MERCK

Citations

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