

# Urethral & Coronal Sulcus Microbiome of Adolescent Males

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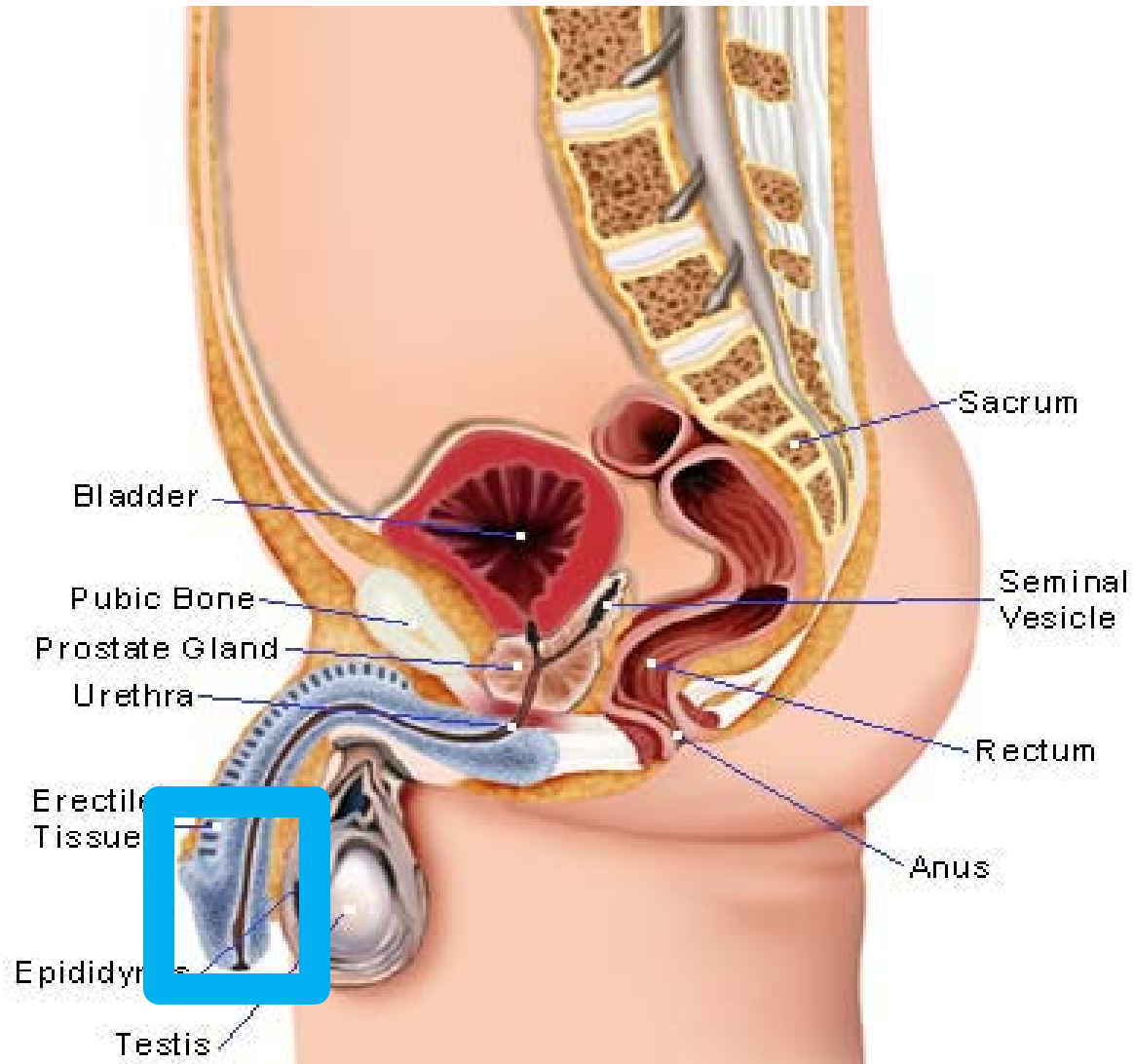
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*Urethral Microbiome of Adolescent Males*  
**Form, Function, and Microbiota**

- The multiple microbiomes of the penis
  - Urethra
  - Coronal sulcus
- Episodic interaction with other microbial communities during partnered sexual activities
  - Vagina
  - Oro-pharynx
  - Anus and rectum
- Sexually transmitted infections

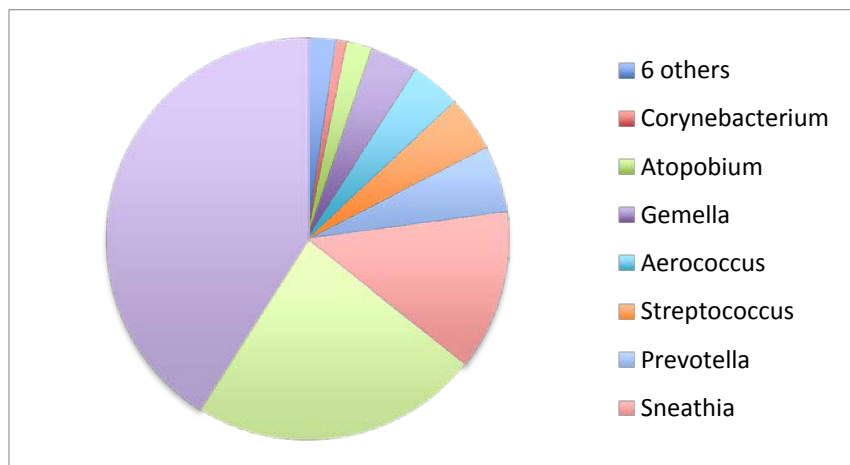
# Anatomical relationships of urethra, prostate gland, and bladder



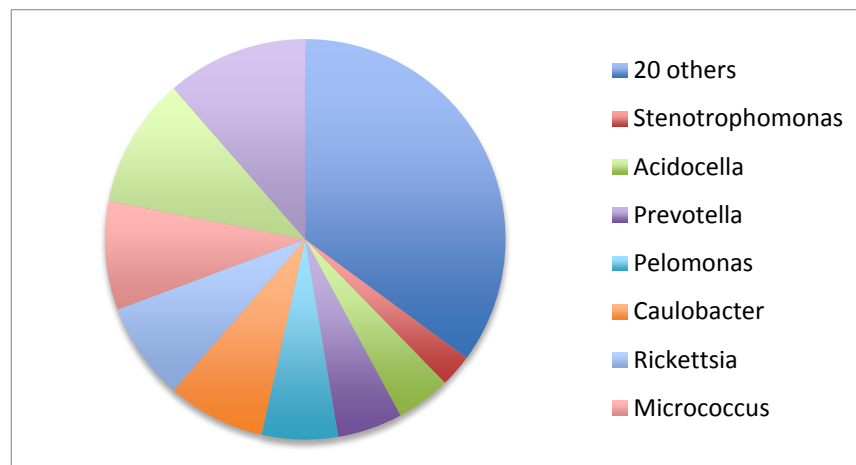


# Different microbial communities in 3 forms of urethritis

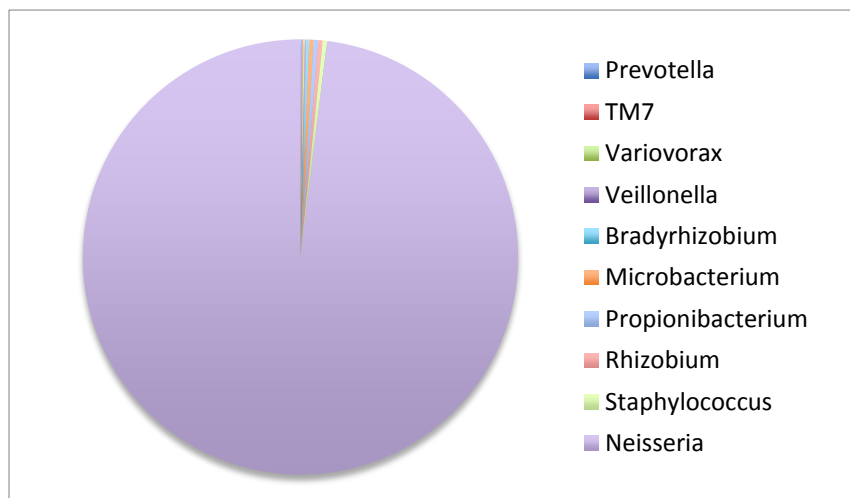
No Urethritis



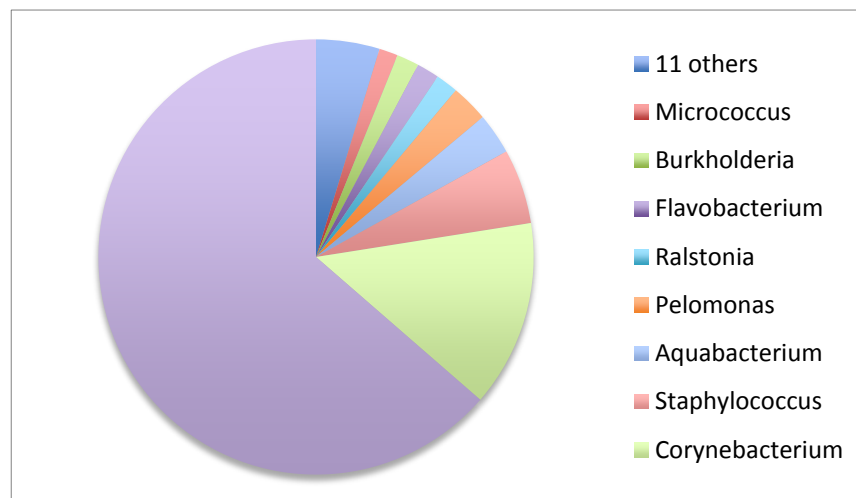
*C. trachomatis*



*N. gonorrhoeae*



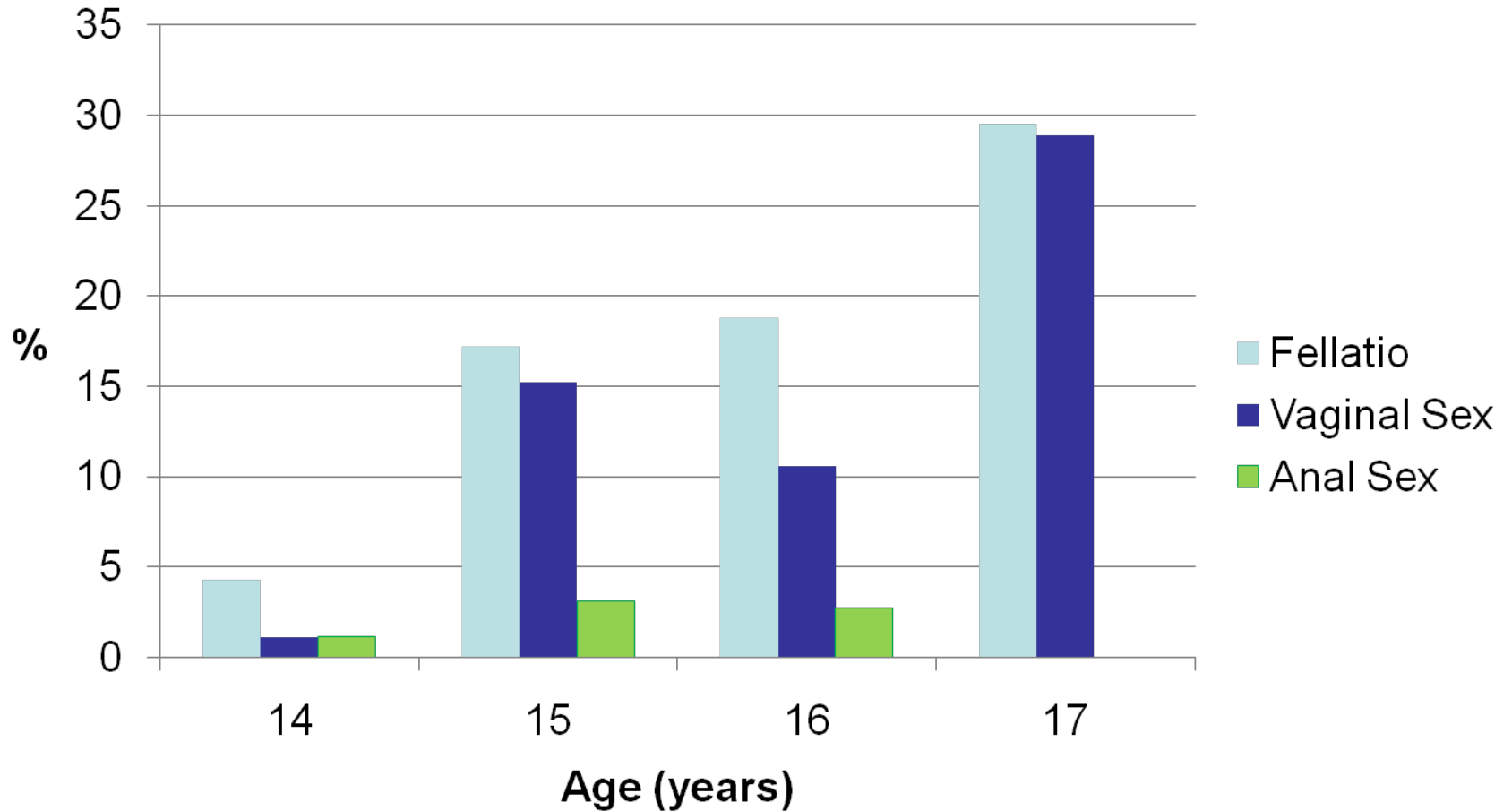
Urethritis – unknown etiology



## **Developmental Change during Adolescence**

- Physical growth associated with puberty
- Initiation of partnered sexual activities
- Partner change

# Fellatio, Vaginal & Anal Sex (past 90 days) U.S. Males, ages 14-17





## **How to study behaviorally mediated interactions of microbiota over time**

- Characterize prior exposure status
- Describe the existing microbiome
- Capture new exposures and changes in existing microbiome
- Repeat over time

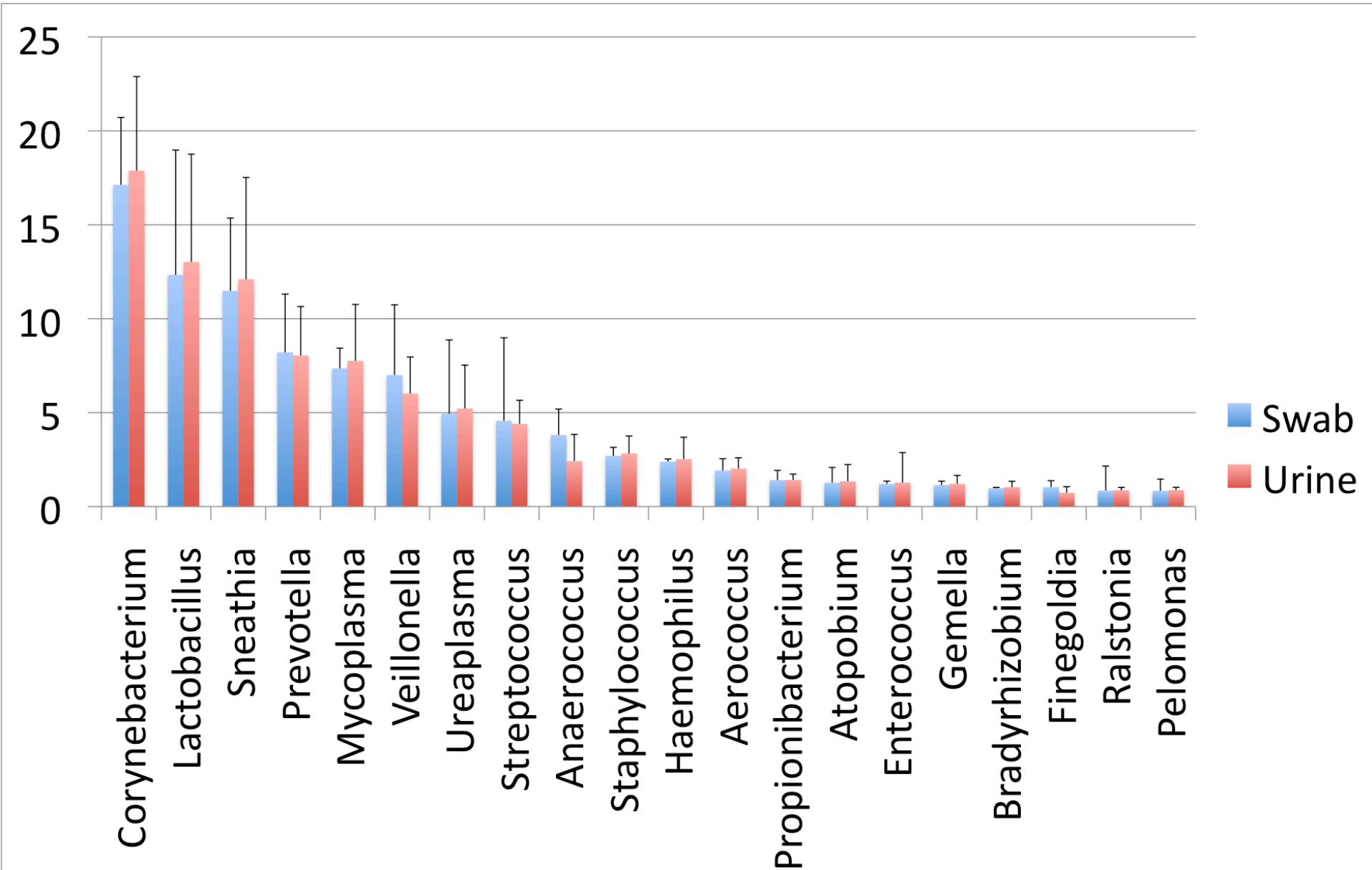
*Urethral Microbiome of Adolescent Males*

## **Specimens**

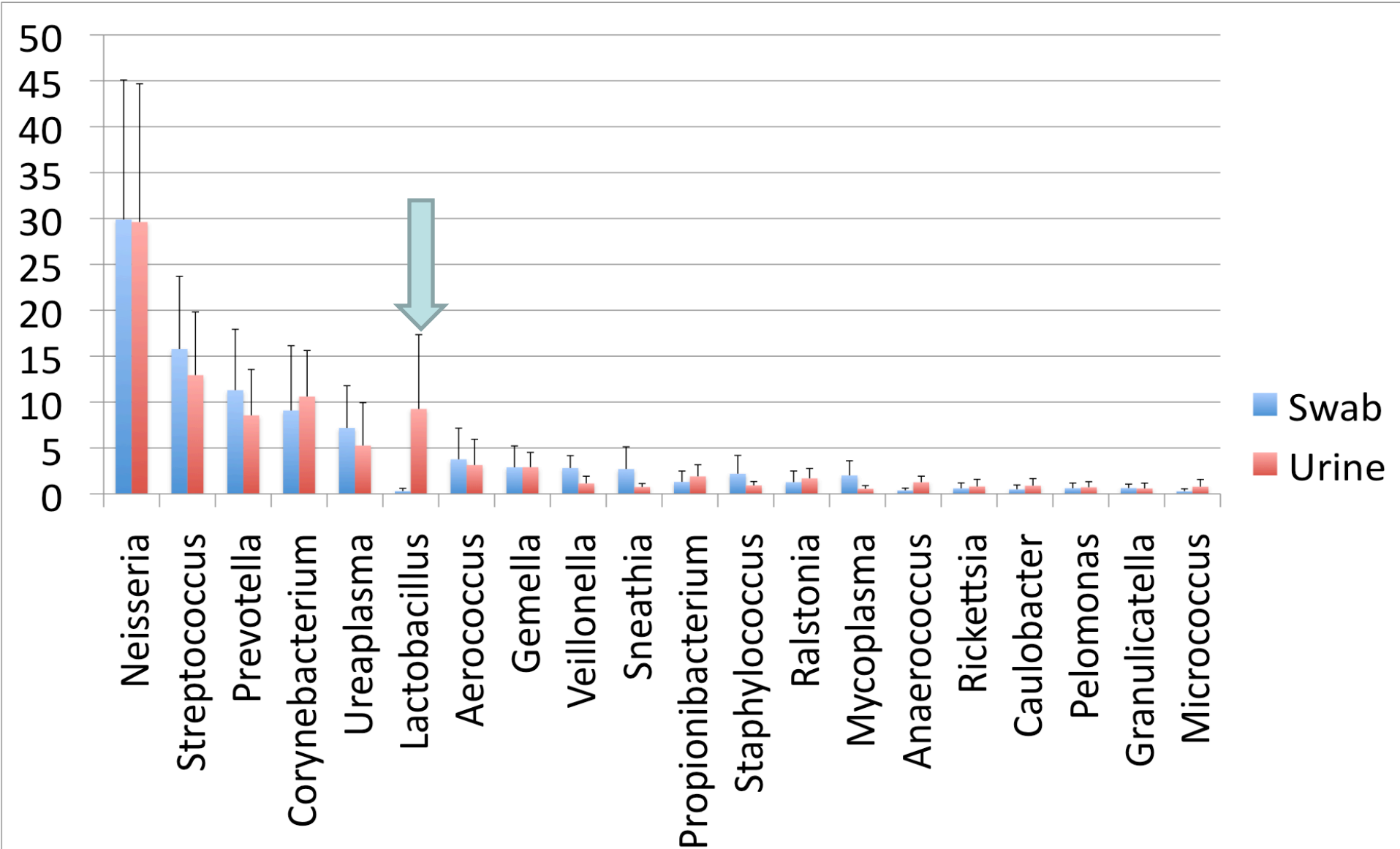
- Behavioral self-report (enrollment & quarterly)
- Daily behavioral report by cell phone diary
- Surveillance specimens (enrollment & monthly)
  - Urine
  - Coronal sulcus
- Event-contingent urine
  - Oral, anal, vaginal sexual exposures
  - Genital symptoms

Urine is an appropriate sample for study of male urethral microbiome

Comparison of 20 Most Common Genera in Urine and Urethral Swab – Men without STI



Comparison of 20 Most Common Genera in Urine and Urethral Swab – Men with STI



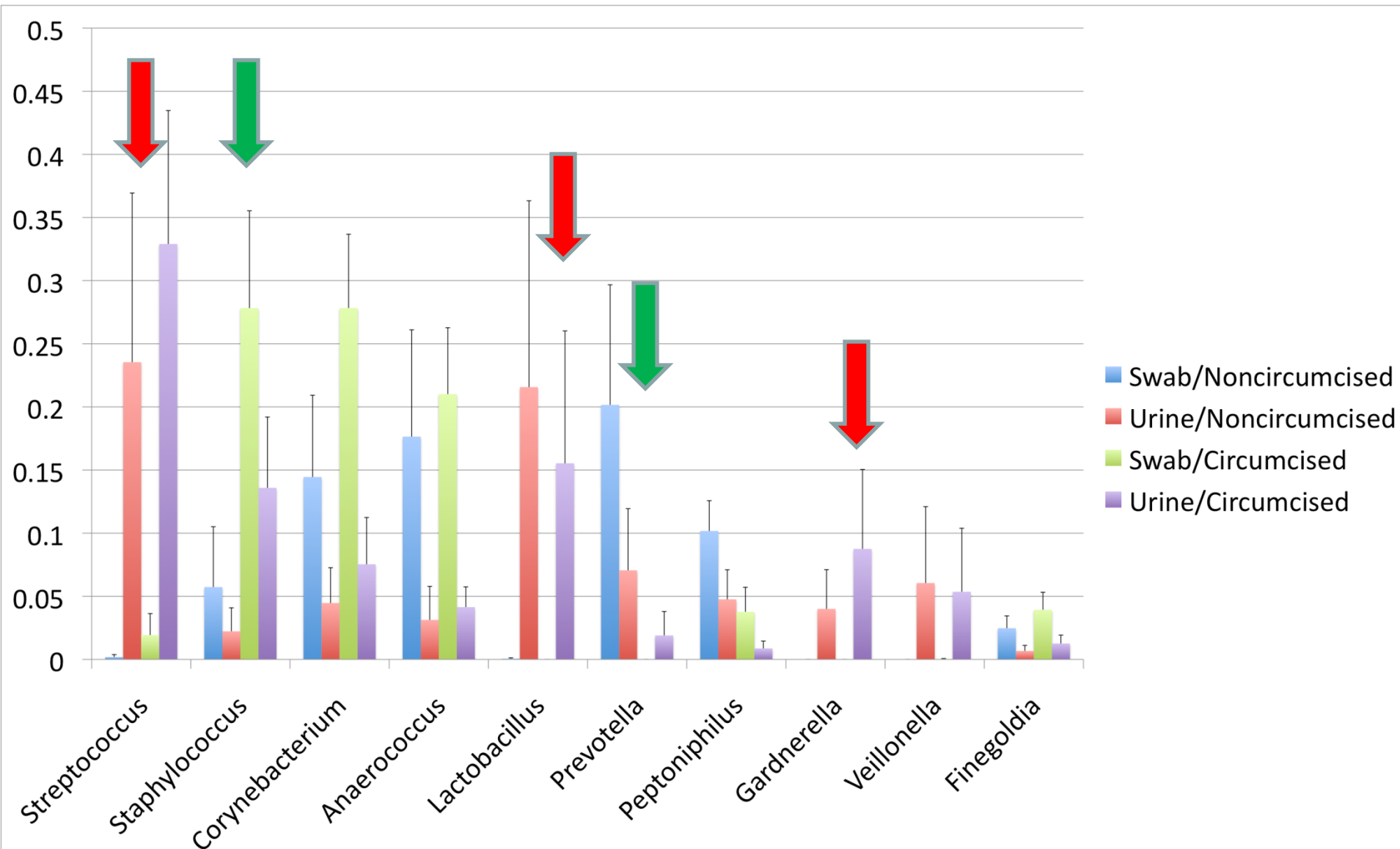
# Preliminary Data

Adolescent Males

# Sociodemographic characteristics, circumcision status, and sexual behavior at enrollment

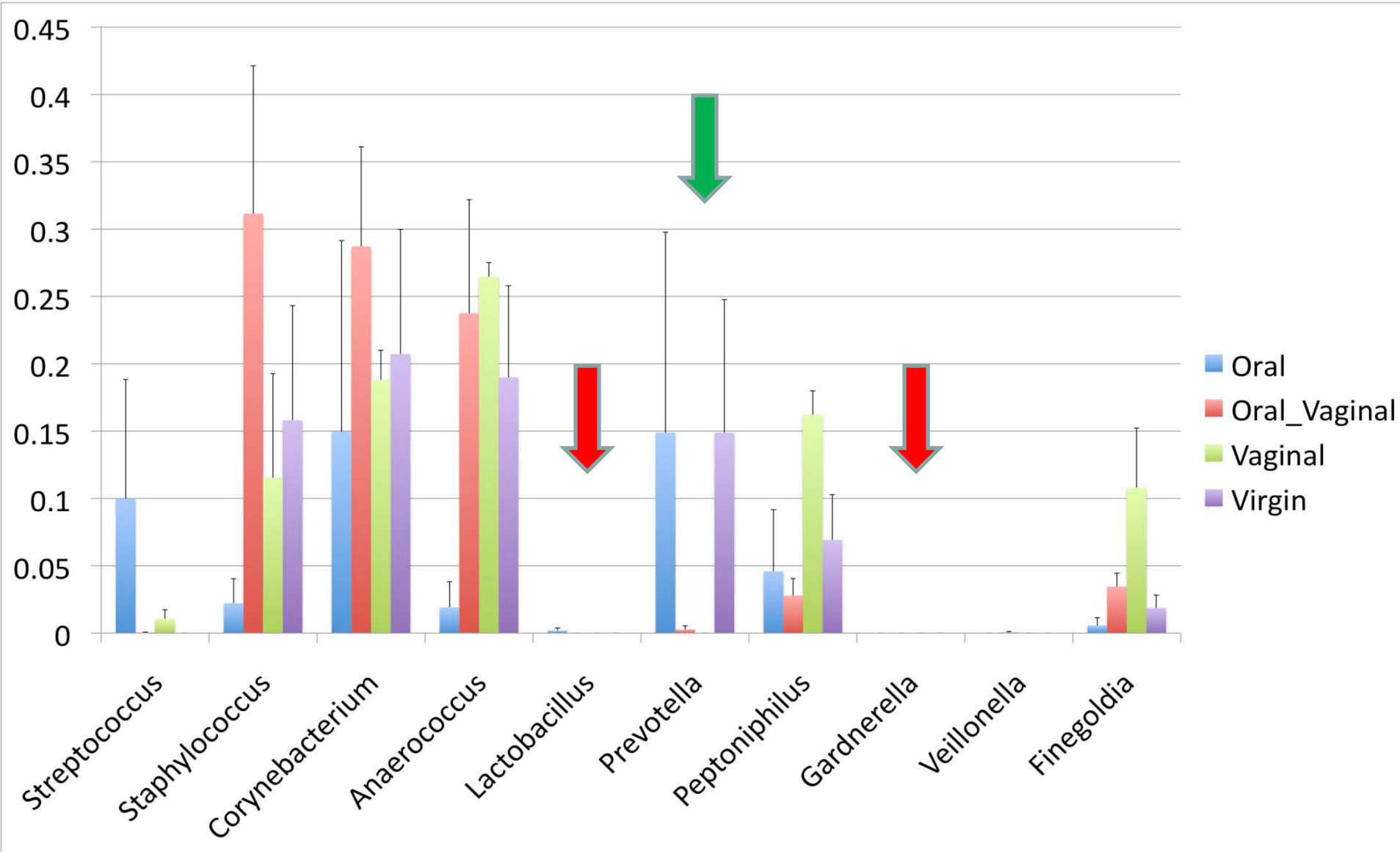
	<b>White N=7</b>	<b>Black N=7</b>	<b>Latino N=4</b>	<b>Total N=18</b>
<b>Circumcised</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>11</b>
<b>Vaginal sex</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>8</b>
<b>Oral sex</b>	<b>4</b>	<b>4</b>	<b>1</b>	<b>9</b>
<b>Anal sex</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

# Comparison of 10 Most Common Genera in Uncircumcised and Circumcised Adolescents – Coronal Sulcus Swabs & Urine

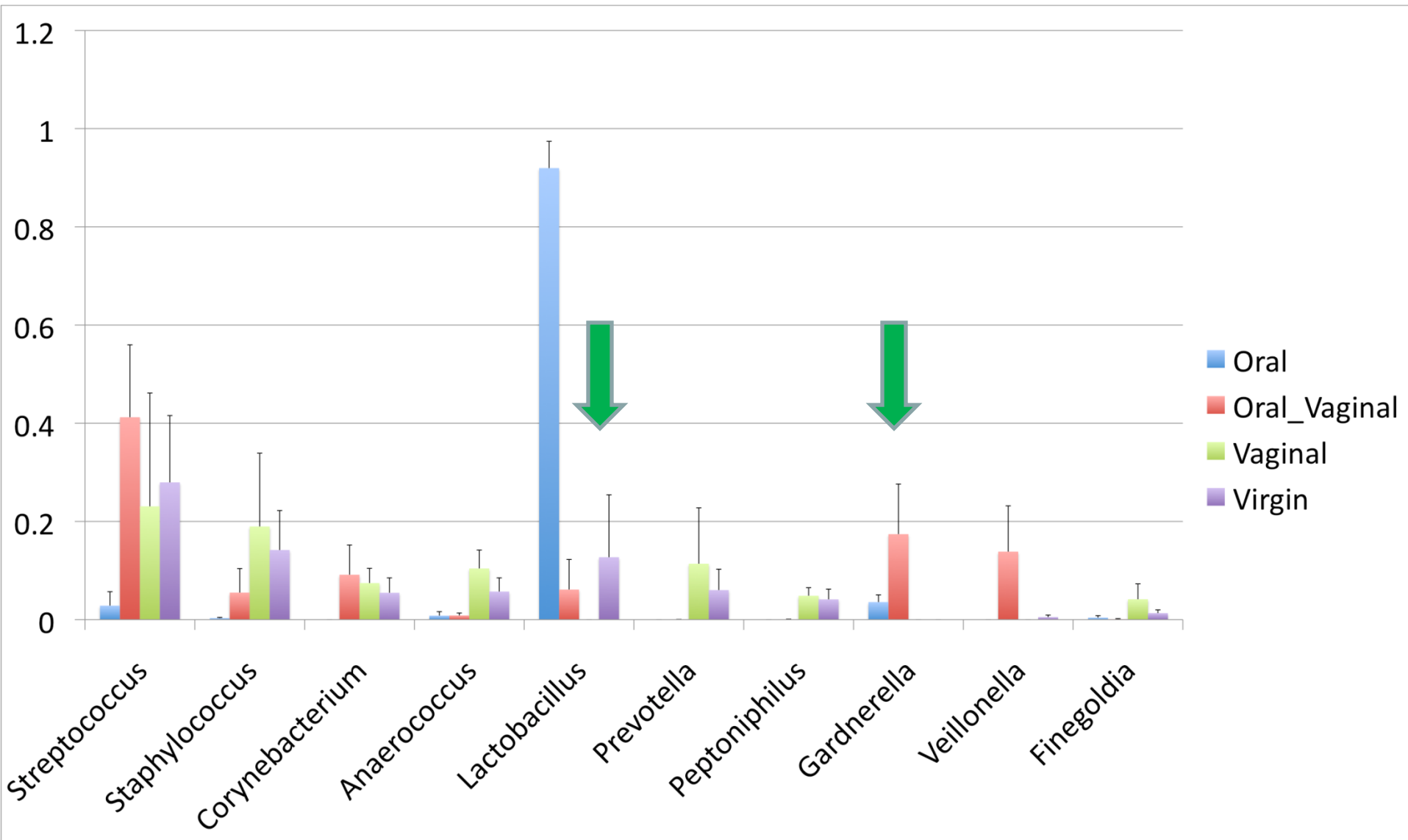




# Comparison of 10 Most Common Genera in Adolescents with and without Prior Oral/Vaginal Sex – Coronal Sulcus

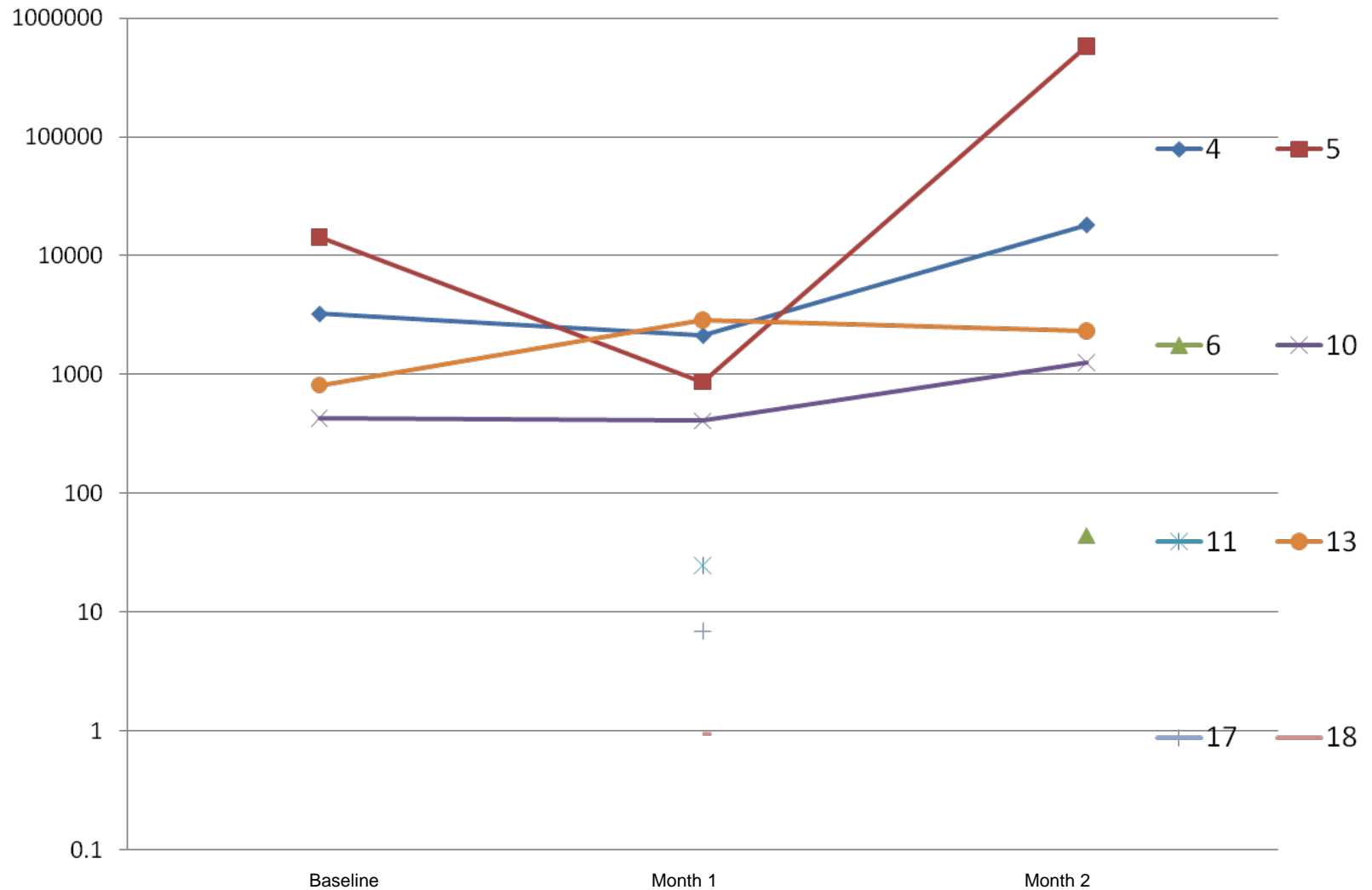


# Comparison of 10 Most Common Genera in Adolescents with and without Prior Oral/Vaginal Sex – Urine

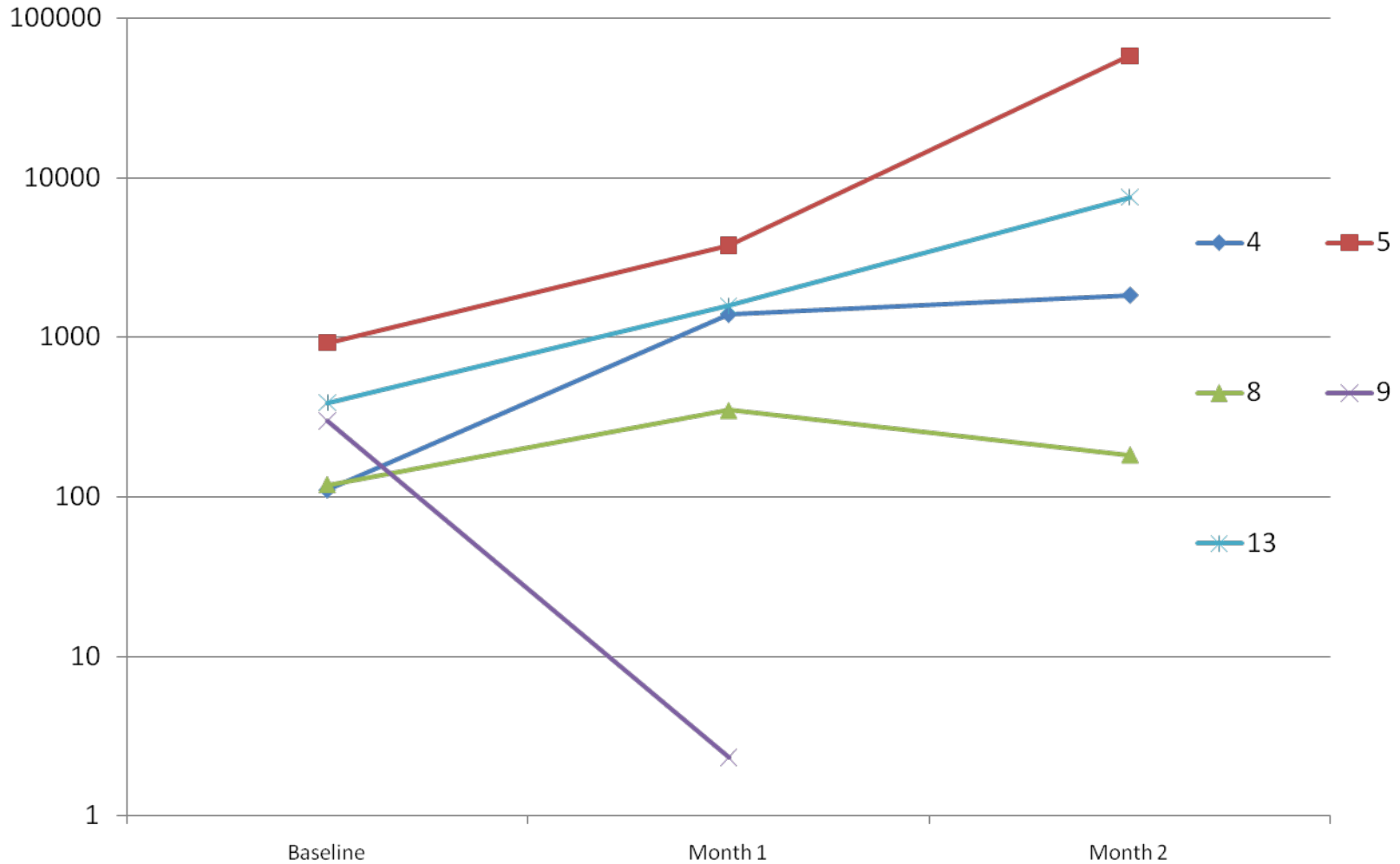


# *Lactobacillus* qPCR over time

## 8 participants - urine



# *Gardnerella* qPCR over time, urine 5 participants



# Ethical issues in study of adolescents

- Understanding of issues associated with genomic research
- Issues related to prospective study of sexual behavior
- Balance of adolescent autonomy and parental involvement
- Cell telephones as a research tool and a research incentive/payment

# Urethral & Coronal Sulcus Microbiome of Adolescent Males – Current Status

- 134 monthly samples
- 23 event-contingent based on symptoms or exposures (7 samples for each event)
- 3058 diary days (88% of expected)
- Sample expansion to 54 by 9/15/2010

## Discussion

### *The intersection between male sexual behavior and microbial communities in adolescents*

- Urethra and coronal sulcus have distinct but related microbial populations
- Evidence of relatively stable population in distal urethra
- Circumcision alters composition of both coronal sulcus and urethra
- Possible alteration of microbial communities by sexual exposures