

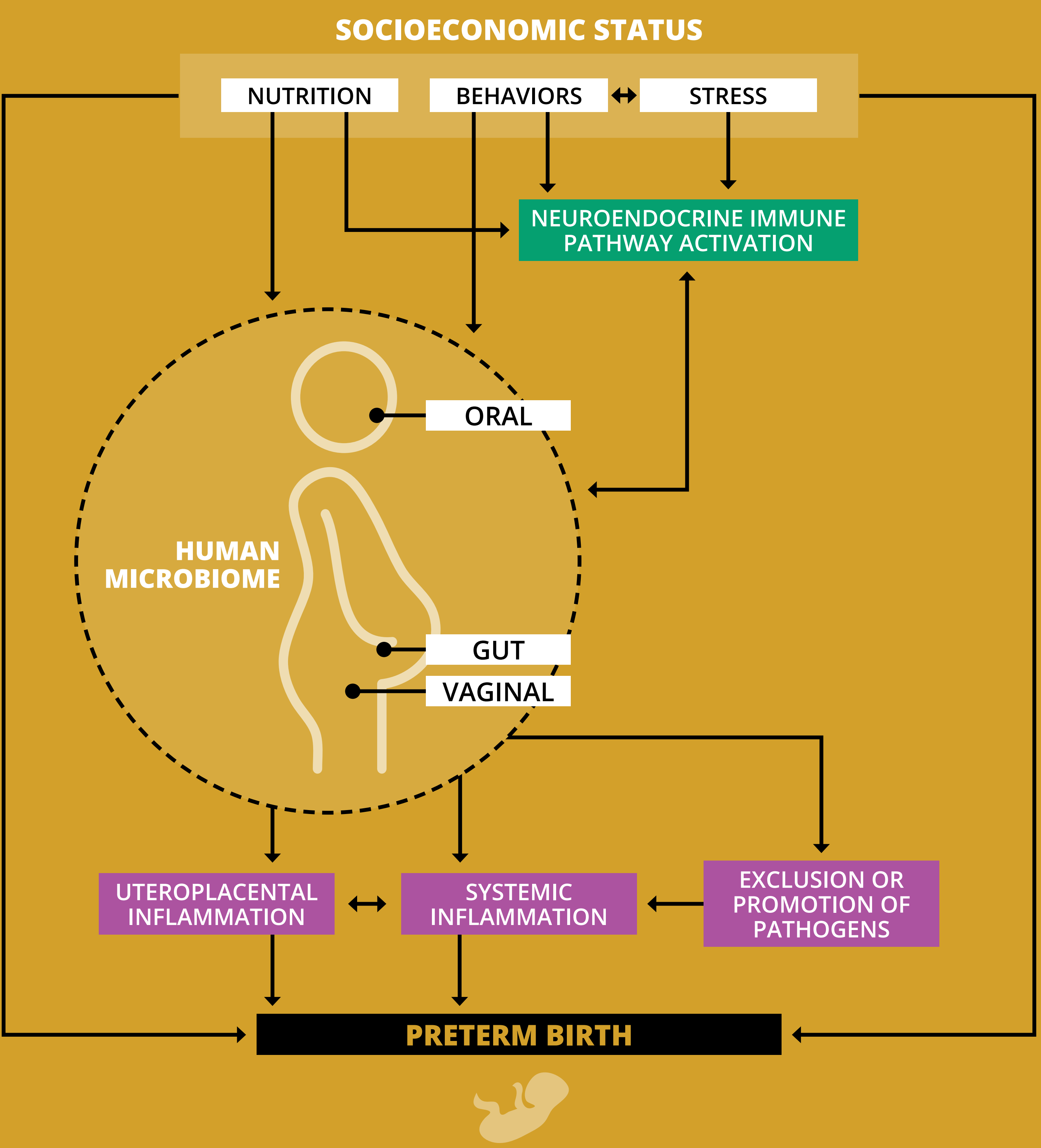
Stability of the vaginal, oral, and gut microbiota across pregnancy among African American women: the effect of socioeconomic status and antibiotic exposure



BACKGROUND

Changes in the maternal microbiota across pregnancy have been studied in relation to preterm birth, with conflicting findings within and across racial/ethnic groups. Yet these studies have not considered the potential confounding effect of maternal characteristics that are themselves linked to adverse pregnancy outcomes, such as socioeconomic status. **The purpose of this study was to investigate the stability of the vaginal, oral, and gut microbiota** from early through later pregnancy among African American women according to measures of socioeconomic status, accounting for prenatal antibiotic use.

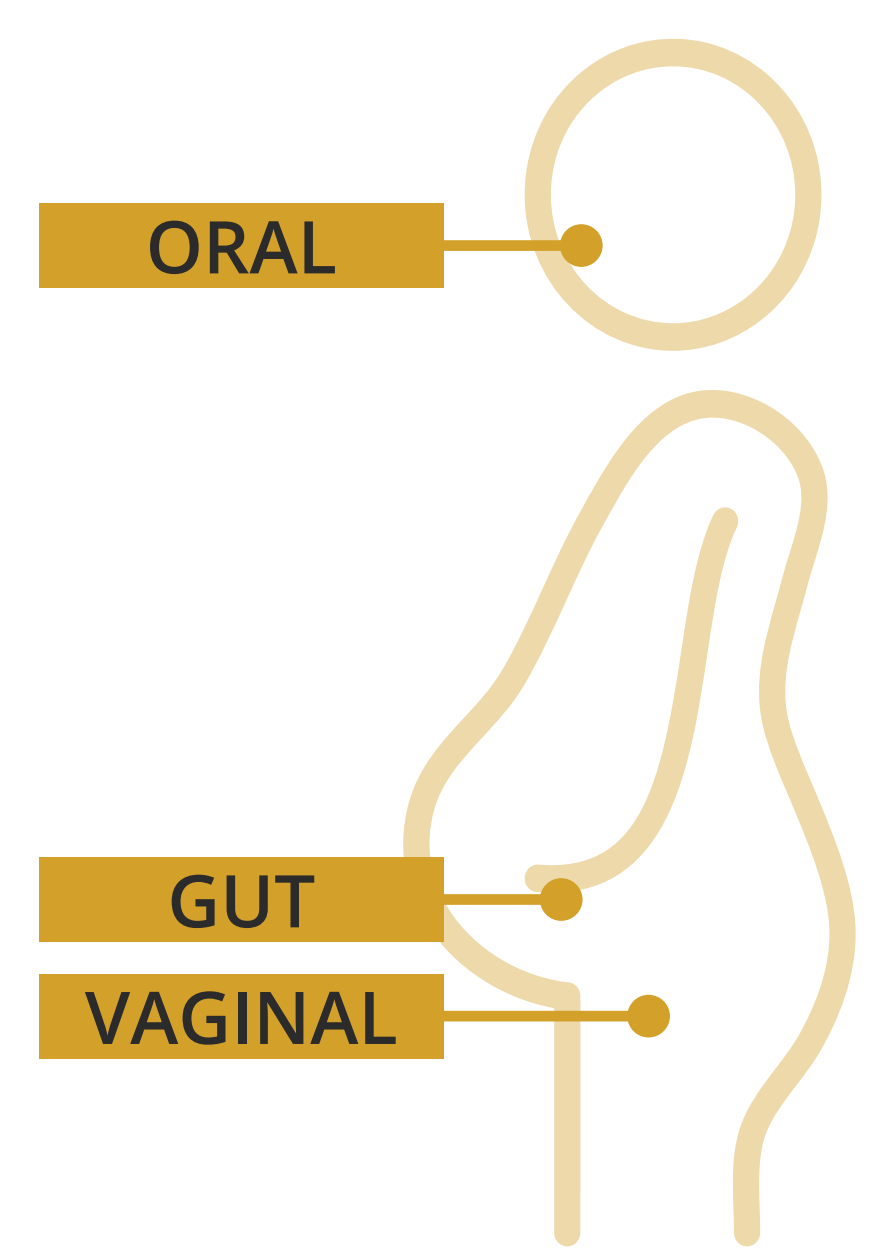
CONCEPTUAL FRAMEWORK



METHODS

We used **paired vaginal, oral, or gut samples** available for 16S rRNA gene sequencing from two time points in pregnancy (8-14 and 24-30 weeks) to compare within-woman changes in measures of alpha diversity (Shannon and Chao1) and beta diversity (Bray-Curtis dissimilarity) among pregnant African American women.

We used **multivariable linear regression** to examine the effect of level of education and prenatal health insurance as explanatory variables for changes in diversity, considering antibiotic exposure as a mediator, adjusting for age, obstetrical history, and weeks between sampling.



RESULTS

For the **vaginal microbiota**, low level of education (high school or less) was associated with an increase in Shannon and Chao1 diversity across pregnancy, with minimal attenuation when controlling for prenatal antibiotic use. Conversely, for within-woman Bray-Curtis dissimilarity for early compared to later pregnancy, low level of education and prenatal antibiotics were associated with **greater dissimilarity for the oral and gut sites**, with minimal attenuation when controlling for prenatal antibiotics, and no difference in dissimilarity for the vaginal site.

CONCLUSION

Measures of maternal socioeconomic status are variably associated with changes in diversity across pregnancy for the vaginal, oral, and gut microbiota, with minimal attenuation by prenatal antibiotic exposure. Measures of socioeconomic status - which reflect access to resources that shape exposures to the physical, social, and psychosocial environments - themselves have well-established links with women's risk for preterm birth, which may or may not reflect their influence upon microbiota composition.

Studies that evaluate stability of the microbiota across pregnancy in association with health outcomes themselves associated with socioeconomic status (such as preterm birth) should incorporate measures of socioeconomic status to avoid finding spurious relationships.