



# The interaction between vaginal microbiota and cervical length during pregnancy

Ebru Celik<sup>1</sup>, Gulin Ozcan<sup>2,3</sup>, Cansel Vatansever<sup>2,3</sup>, Erxiati Paerhati<sup>4</sup>, Mert Turgal<sup>1</sup>, Lütfiye Uygur<sup>5</sup>, Aykut Ozek<sup>1</sup>, Tugba Gursoy<sup>6</sup>,

Attila Gürsoy<sup>4</sup>, Özlem Keskin<sup>4</sup>, Fusun Can<sup>2,3</sup>,

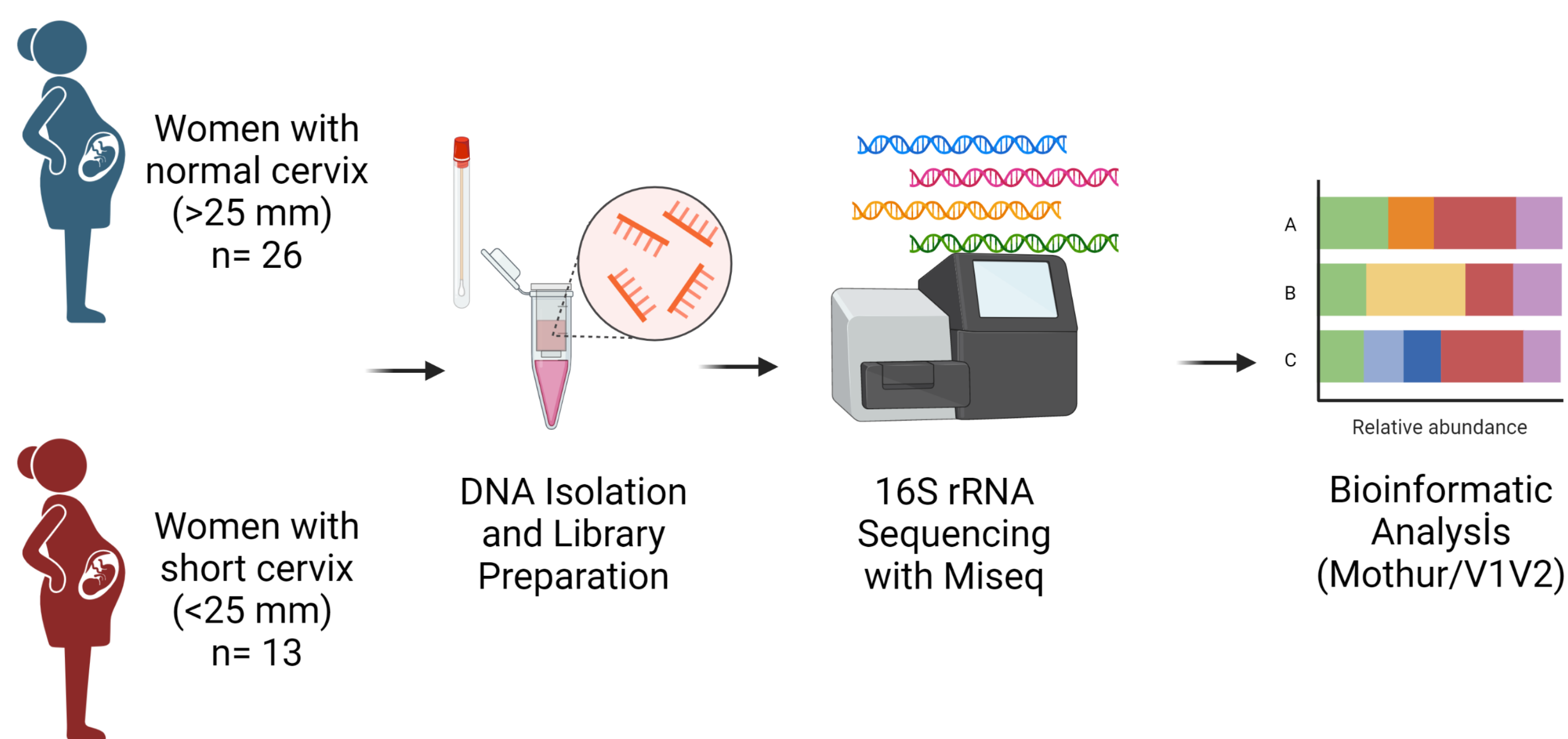
<sup>1</sup>Koc University, School of Medicine, Department of Obstetrics and Gynecology - Istanbul (Turkey), <sup>4</sup>Koc University, School of Medicine, Department of Medical Microbiology - Istanbul (Turkey), <sup>2</sup>Koç University İşBank Research Center for Infectious Diseases (KUISCID) - Istanbul (Turkey), <sup>4</sup>Koç University, College of Engineering - Istanbul (Turkey), <sup>5</sup>Zeynep Kamil Woman and Childrens Health Research and Training Hospital, Department of Perinatology – Istanbul (Turkey) <sup>6</sup>Koc University School of Medicine, Department of Pediatrics

## INTRODUCTION

Preterm birth is the primary cause of infant death worldwide. Vaginal dysbiosis and short cervix in the second trimester of pregnancy have been found to be associated with an increased rate of preterm birth. We aimed to describe the alterations of vaginal microbiota in pregnant women with short cervical length.

## METHODS

- Women who were treated with progesterone or cerclage were excluded.
- To investigate the effect of cervical shortening, the first-trimester samples of the same patients with a short cervix in the 2nd trimester were also collected.



## RESULTS

- During the second trimester of pregnancy, a short cervix was associated with vaginal dysbiosis, indicated by an increased alpha diversity index (p=0.04).

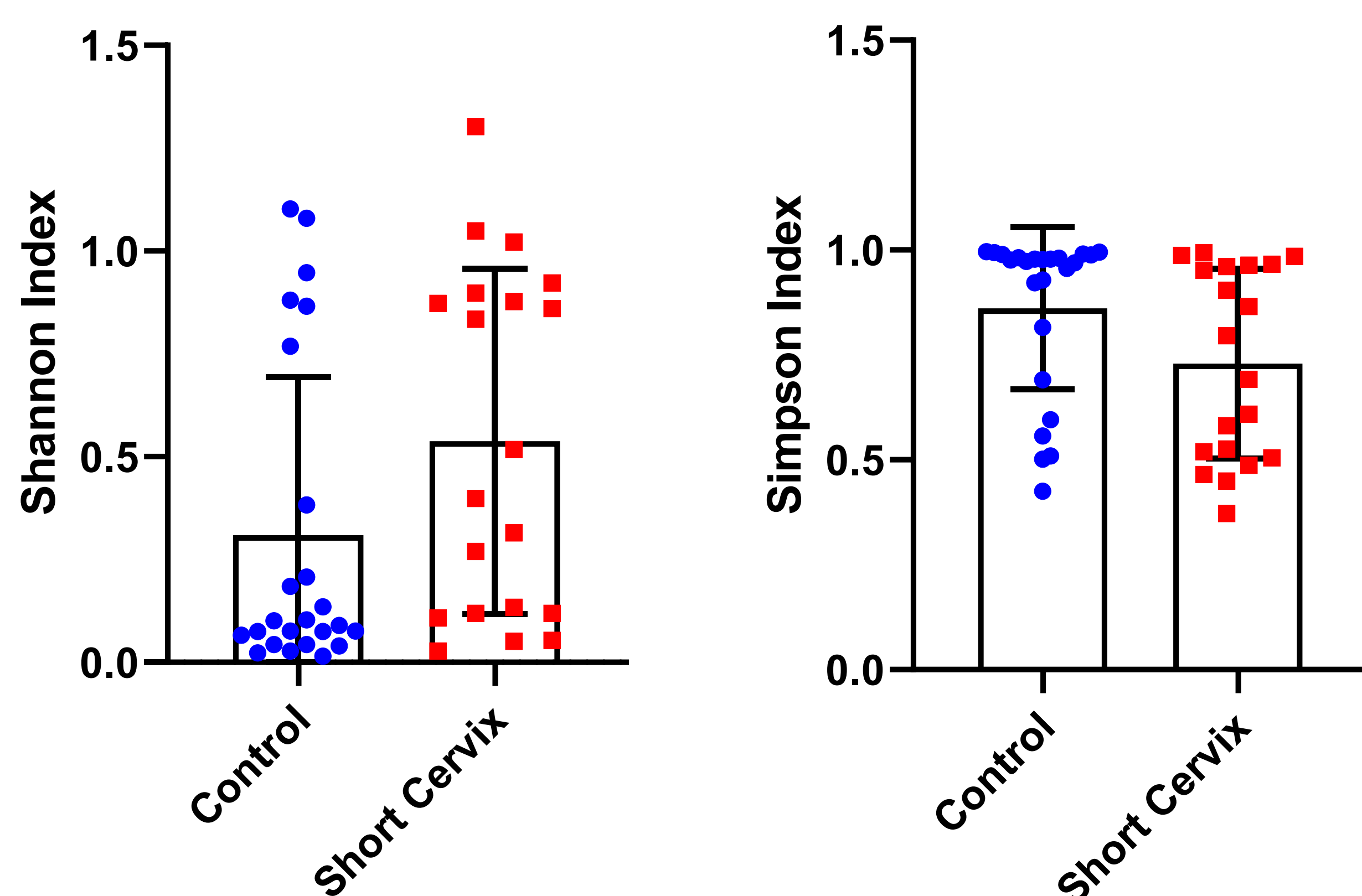


Figure 1. Comparison of alpha diversity. Shannon index (species diversity); Simpson index (species dominance).

## Vaginal microbiota composition of women with normal and short cervical length

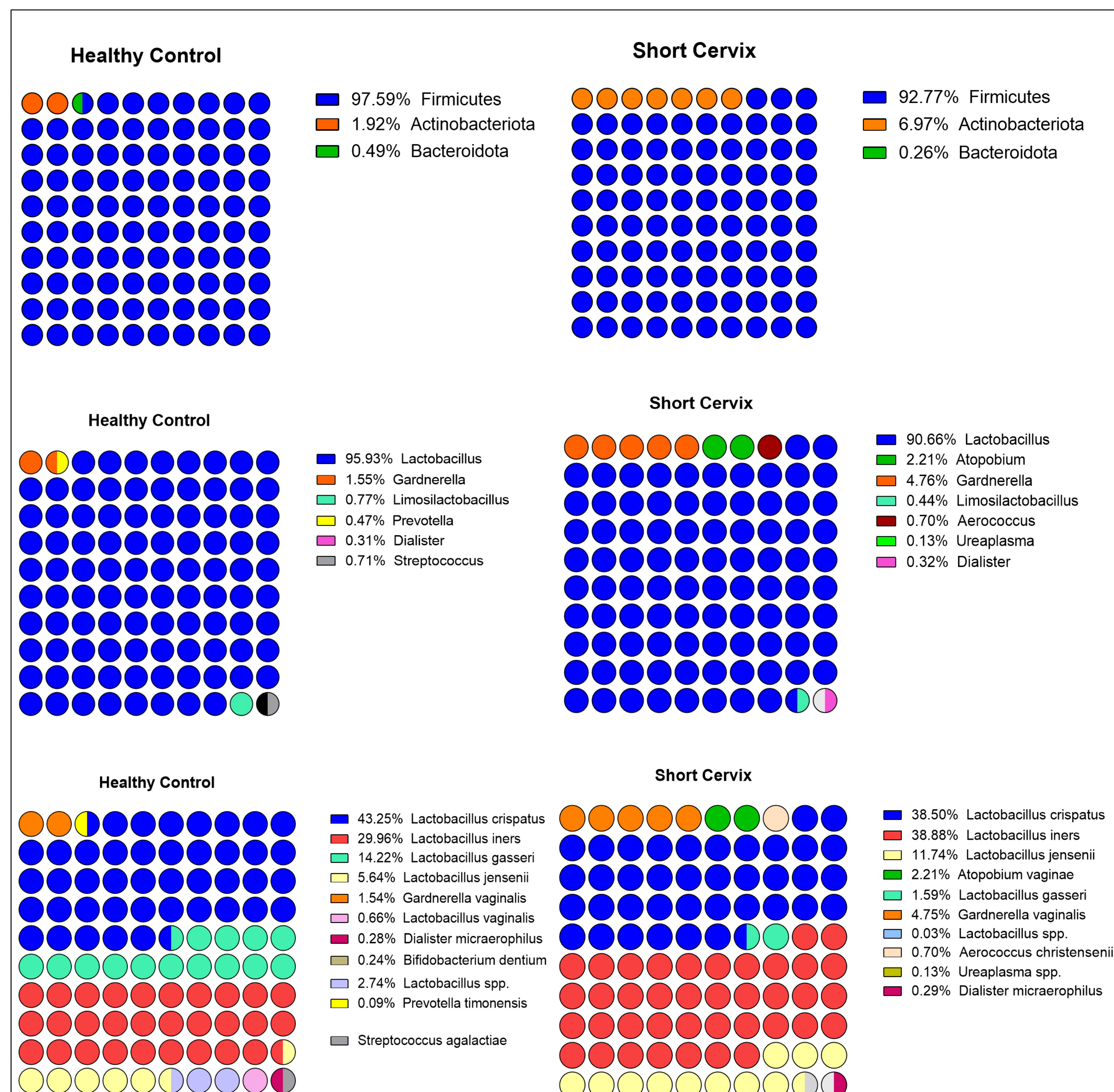
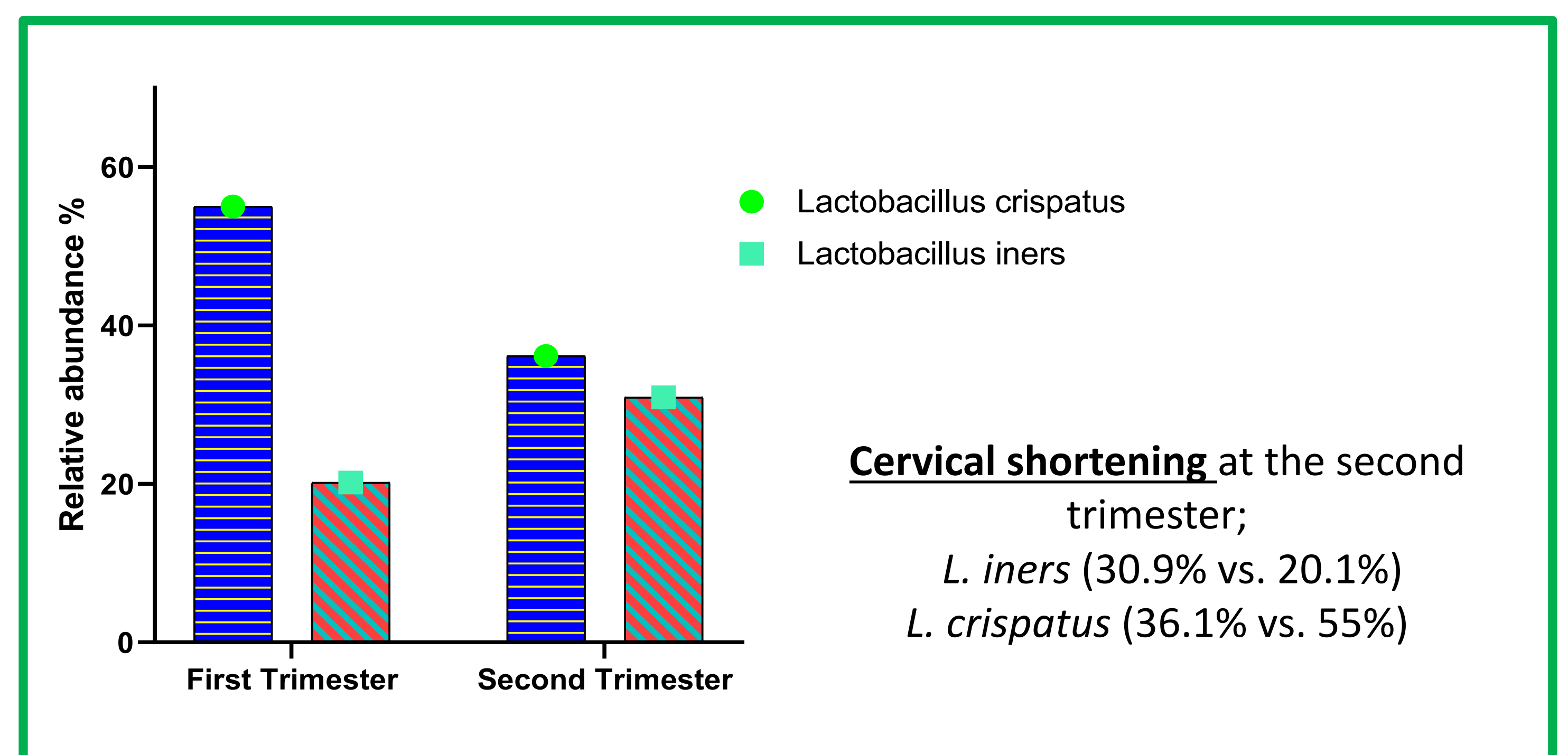


Figure 2. Microbiota analysis of vaginal samples.

↓ *Lactobacillus crispatus* (37% vs. 43%) and *Lactobacillus gasseri* (1.8% vs. 14.1%; p=0.04) were lower in women with short cervix.

↑ In contrast, the abundance of *Lactobacillus iners* (%36.6 vs. 29.8%), *Gardnerella vaginalis* (5.4% vs. 1.5%), and *Atopobium vaginae* (2% vs. 0.07%) increased in women with short cervix compared to women with the normal cervix.



**Cervical shortening** at the second trimester;  
*L. iners* (30.9% vs. 20.1%)  
*L. crispatus* (36.1% vs. 55%)

## CONCLUSION

*L. crispatus* dominance is highly predictive of term birth, while high *L. iners* abundance is associated with an increased risk of preterm birth. Determination of vaginal microbiota may be a useful marker for the prediction and management of women at risk to reduce preterm birth.