

GASTROINTESTINAL SYMPTOMS ARE COMMON IN CHRONIC HIV INFECTION

- Abdominal pain, weight loss, diarrhea are associated with decreased quality-of-life¹ and are prevalent despite anti-retroviral therapy²
- Immunodeficiency is a risk factor for small intestinal bacterial overgrowth (SIBO)

OBJECTIVES

- Compare the incidence of SIBO among symptomatic HIV(+) patients to controls
- Identify HIV-related risk factors for SIBO

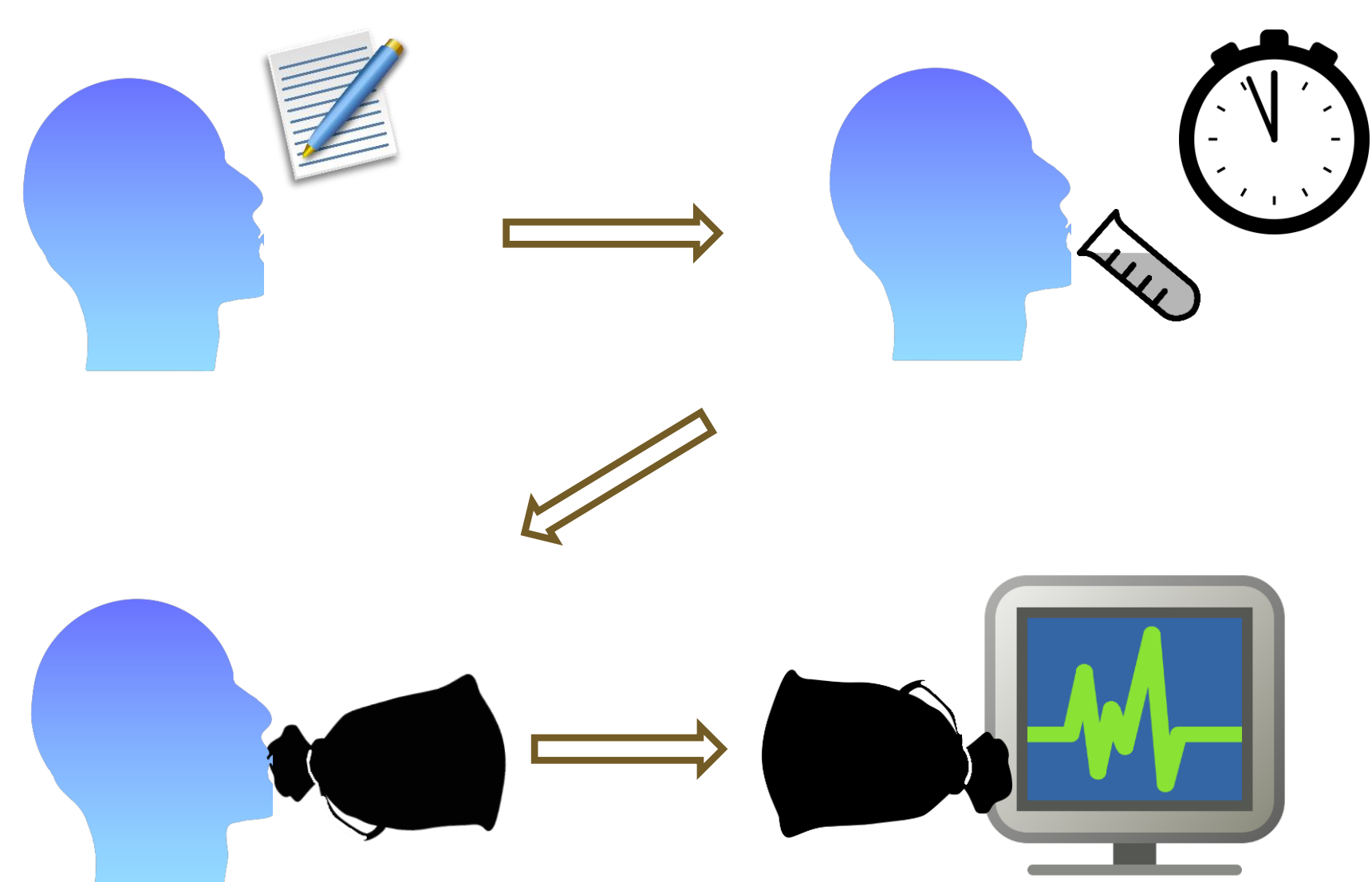
HYPOTHESES

- HIV Seropositivity → ↑ SIBO risk
- ↑ HIV viral load, ↓ CD4 count → ↑ SIBO risk

METHODS

- Design:** retrospective, 2:1 control-matched study using the electronic medical record (IRB00080748)
- Cohort:** symptomatic adults seen in the Atrium Health Wake Forest Digestive Health Clinic
- Primary Outcome:** SIBO(+) diagnosis based on rise in exhaled H₂ (≥ 20 ppm) and/or CH₄ (≥ 10 ppm) following an oral dextrose load

BREATH TESTING PROCEDURE



MATCHED CHARACTERISTICS			
	Control (N=58)	HIV (N=29)	P
Age (y), μ ± σ	51 ± 15	53 ± 8	0.531
Female, %	38	41	0.938
African American, %	50	55	0.654
BMI, μ ± σ	30 ± 12	29 ± 6	0.366
PPI, %	76	66	0.445
Type 2 Diabetes, %	28	24	0.932
Cholecystectomy, %	43	38	0.817

Table 1. Any antibiotics were held for two weeks prior to breath testing. All HIV+ patients had active prescriptions for anti-retroviral therapy.

PRIMARY ANALYSIS			
	Control	HIV	P
SIBO diagnosis, %	31.0	41.4	0.340

Table 2. An increased relative risk for SIBO of 34% was observed in the HIV(+) group but this difference failed to reach statistical significance.

SECONDARY ANALYSIS			
	SIBO(-)	SIBO(+)	P
CD4+ / μL, μ ± σ	861 ± 478	665 ± 202	0.280
HIV Viral Load			
RNA / mL, μ ± σ	7 ± 24	28 ± 92	0.418
RNA, % detected	18	18	0.971

Table 3. Neither CD4+ or HIV viral counts were statistically associated with a SIBO(+) diagnosis.

SYMPTOM SUB-ANALYSIS			
	Control	HIV	P
# of Symptoms, μ ± σ	3.8 ± 1.5	4.3 ± 1.4	0.254

Table 4. Symptoms at breath testing (listed below) were not statistically different between groups.

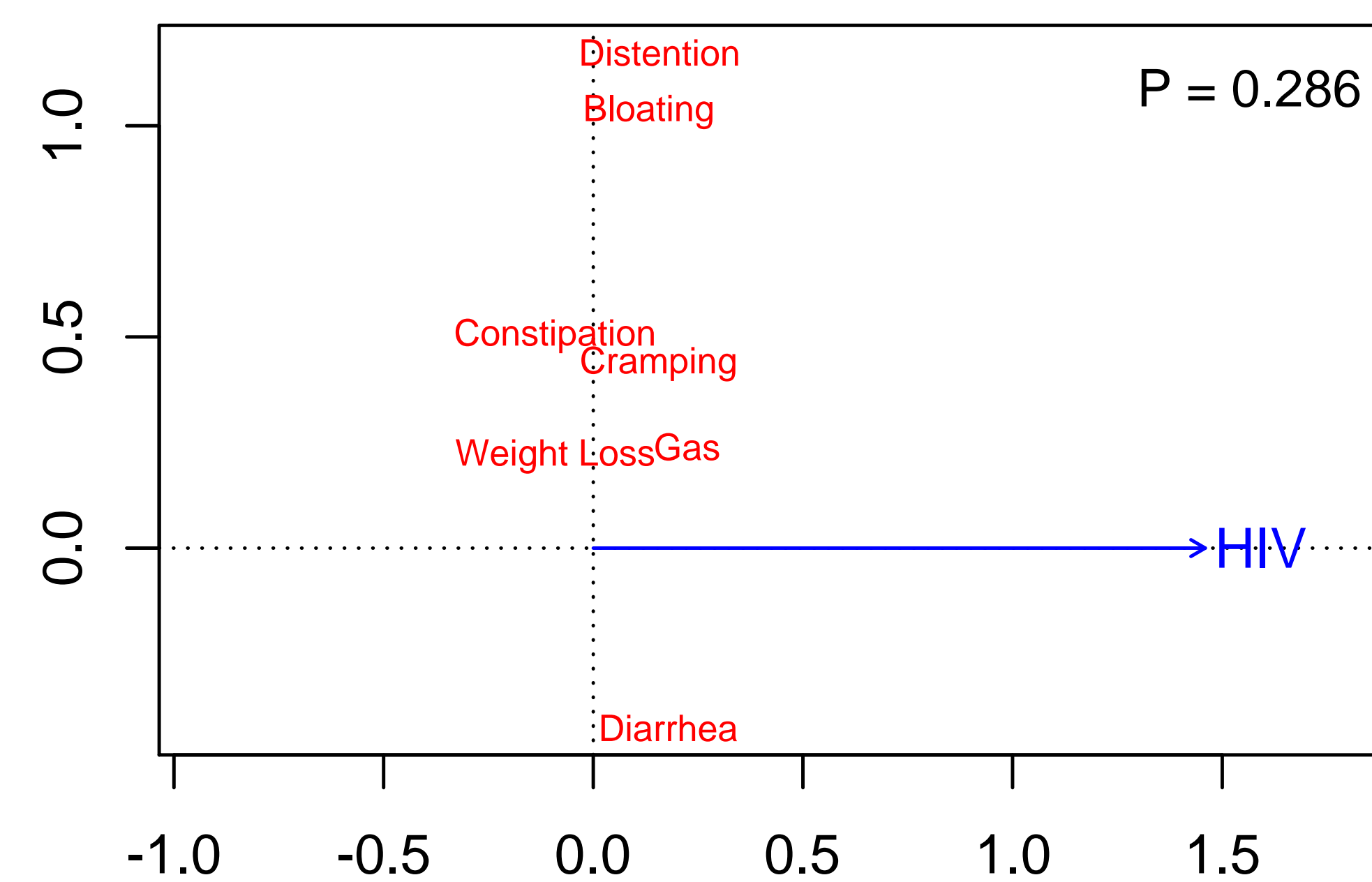


Figure 1. HIV status did not cluster symptoms in a principal components redundancy analysis.

CD4+ T-cell Counts & Breath Gases

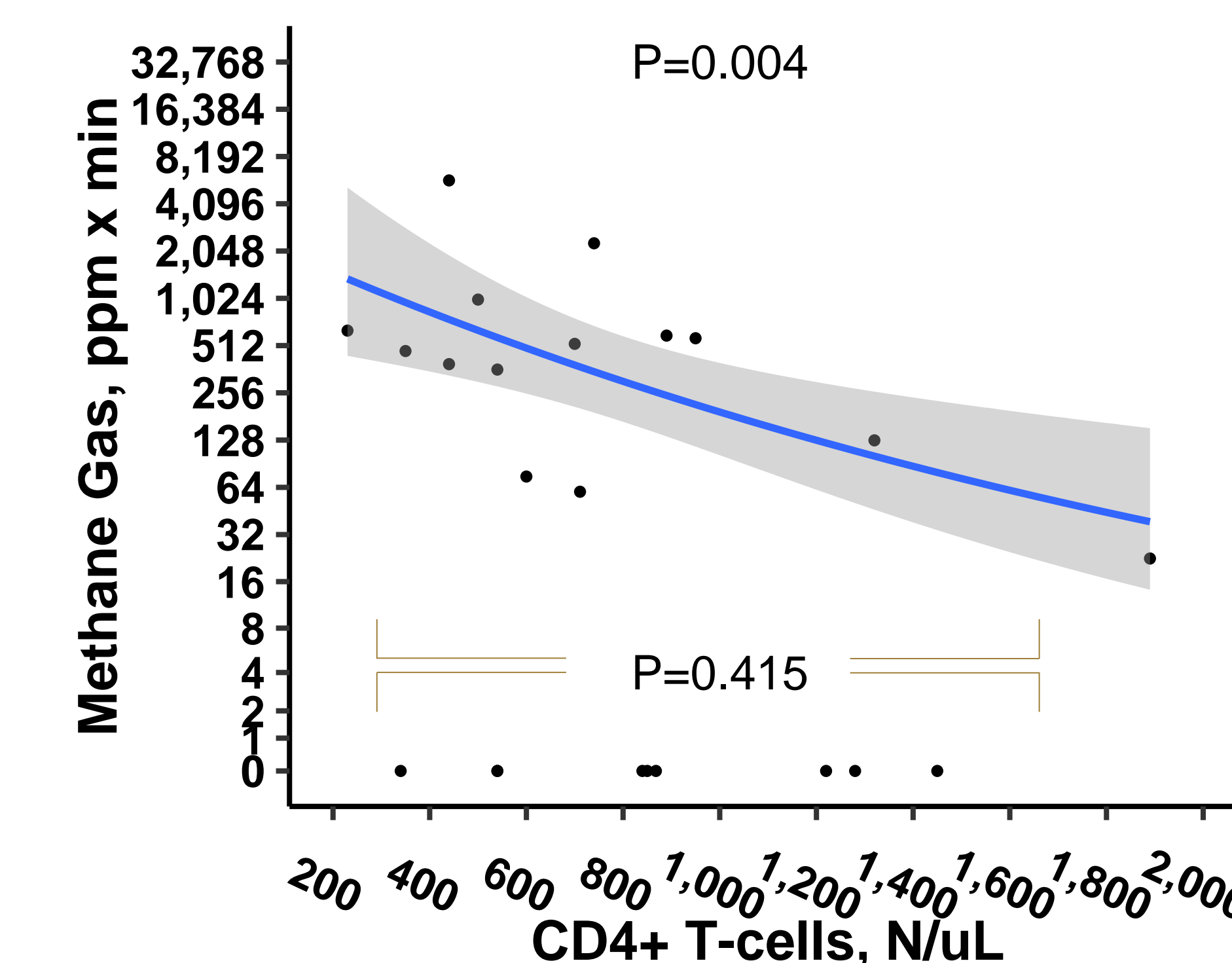


Figure 4. In subjects with CH₄ production (AUC in ppm-min), CD4+ count was inversely related to total CH₄ production (top). Complete lack of CH₄ was not associated with CD4+ count (bottom).

HIV Status & Breath Gases

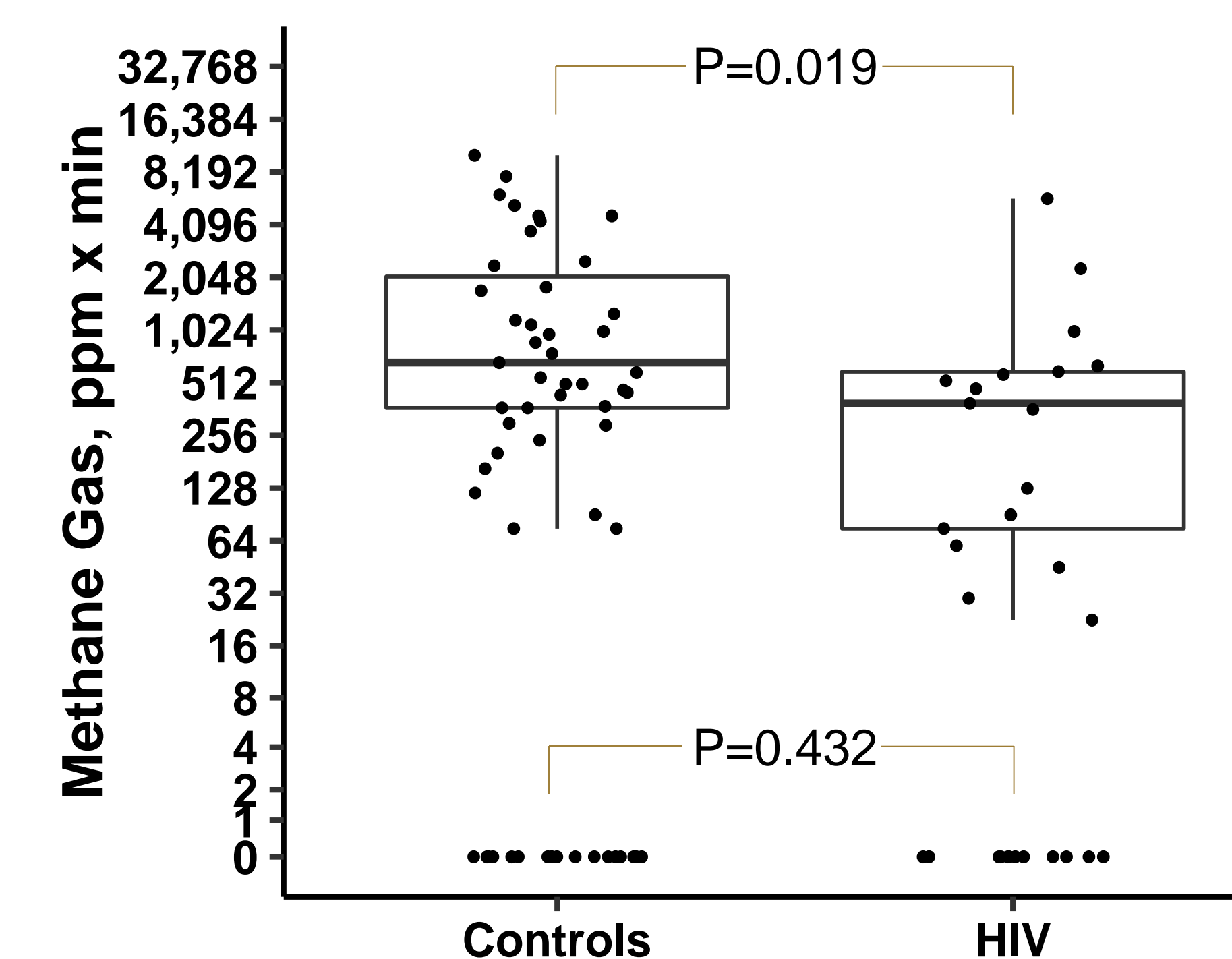


Figure 2. In subjects with CH₄ production (AUC in ppm-min), total CH₄ was lower in HIV(+) patients (top). Complete lack of CH₄ production was not associated with CD4+ count (bottom).

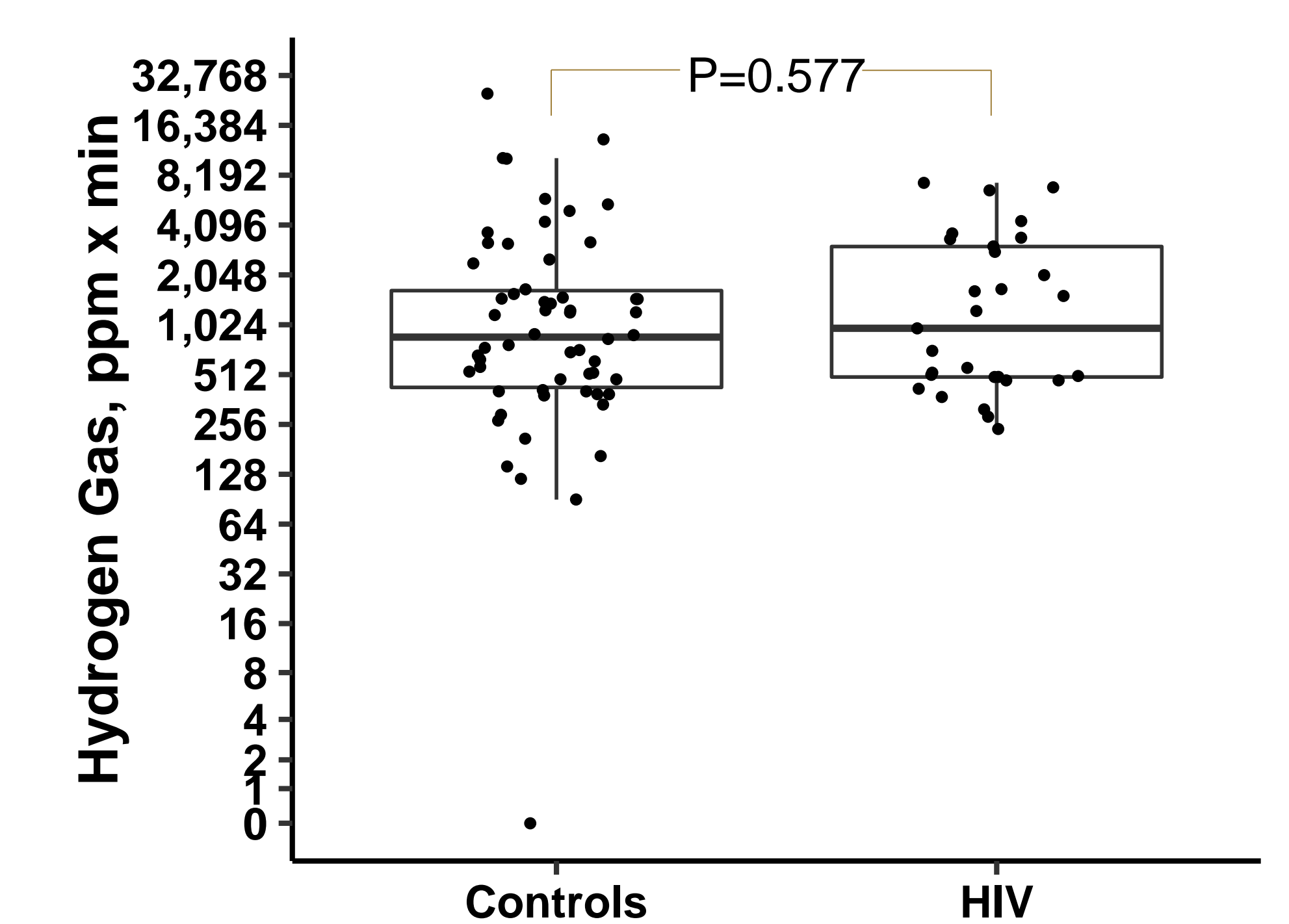


Figure 3. Intestinal H₂ production (AUC ppm-min) was statistically similar between groups.

Bottom Line: SIBO is as prevalent among symptomatic HIV(+) patients as general referral population controls

CONCLUSIONS

- Methanogen dysbiosis in HIV(+) patients is associated with higher CD4+ T-cell counts
- SIBO should be considered as part of HIV care

STUDY LIMITATIONS

- Sample size, referral population, retrospective

FUTURE DIRECTIONS

- Augment sample with Atrium Health partner data
- Conduct prospective breath testing in HIV clinic
- Investigate motility disorders in HIV(+) patients

REFERENCES

- Siddiqui U, Bini EJ, Chandarana K, *et al.* J Clin Gastroenterol 2007;41:484–490.
- O'Neill TJ, Raboud JM, Tinmouth J, *et al.* AIDS Care 2017;29:156–167.