Effects of Depressive Symptoms on HIV Suppression at Delivery and Postpartum in P1025

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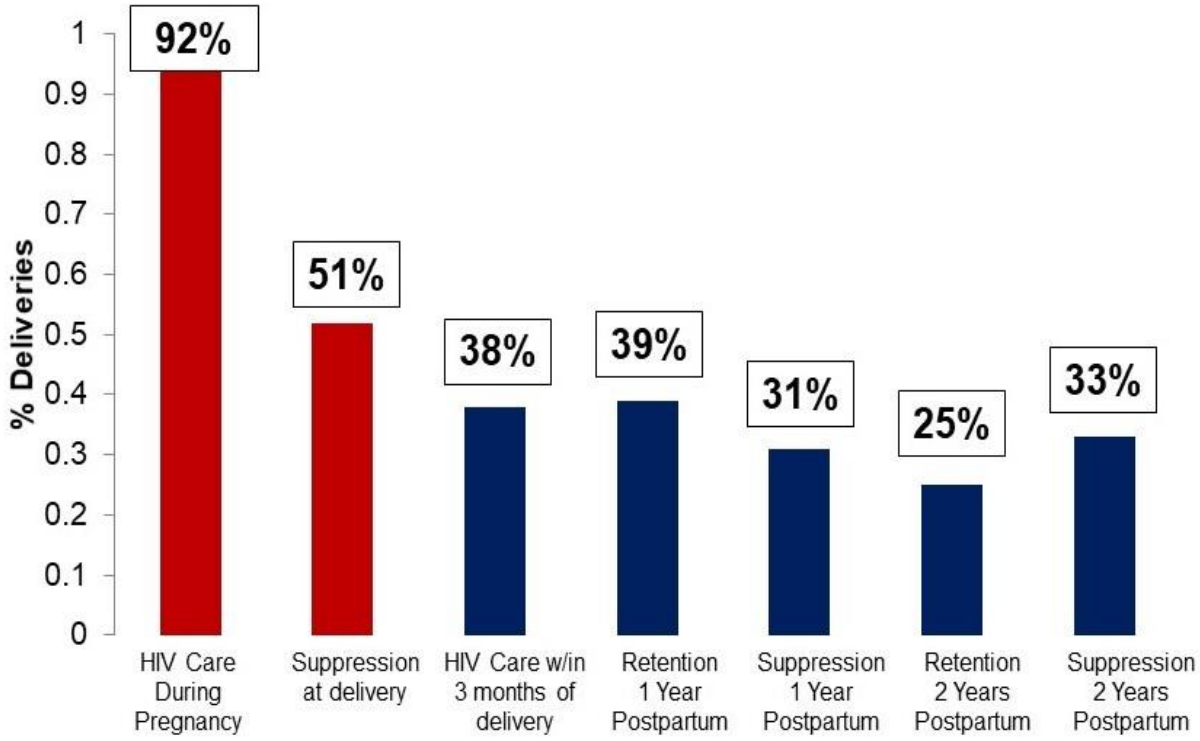
Introduction

- Women living with HIV (WLH) represent 25% of people living with HIV (PLH) in the United States[1]
- Approximately 8,687 WLH give birth every year[2]
- A significant proportion of women do not achieve viral suppression at delivery and many experience poor retention and viral suppression postpartum (Fig.1)

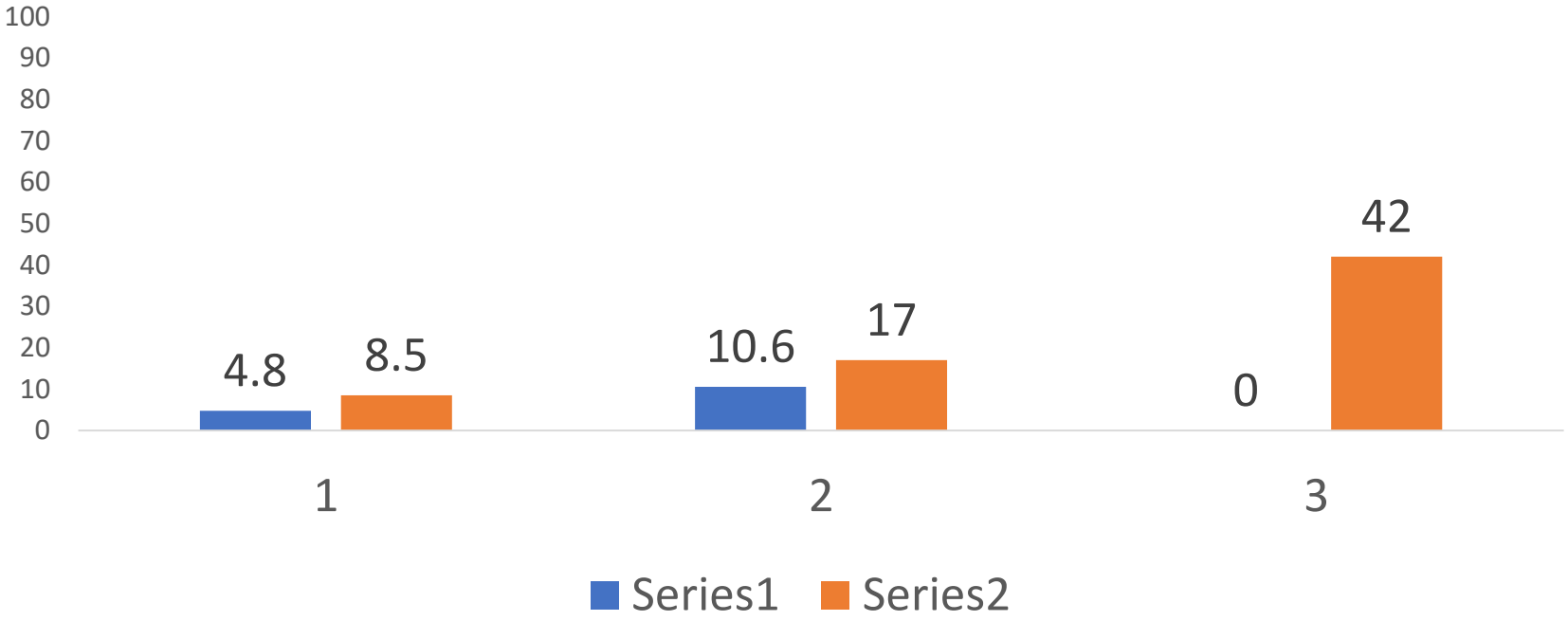
Figure 1. HIV care continuum during pregnancy and for two years postpartum for 598 HIV-infected women (n=756 deliveries), Philadelphia 2005-2011.



[1]CDC; [2]Whitmore et al. *J Acquir Immune Defic Syndr*. 2011;57(3):218-222.

Depression disproportionately affects WLH

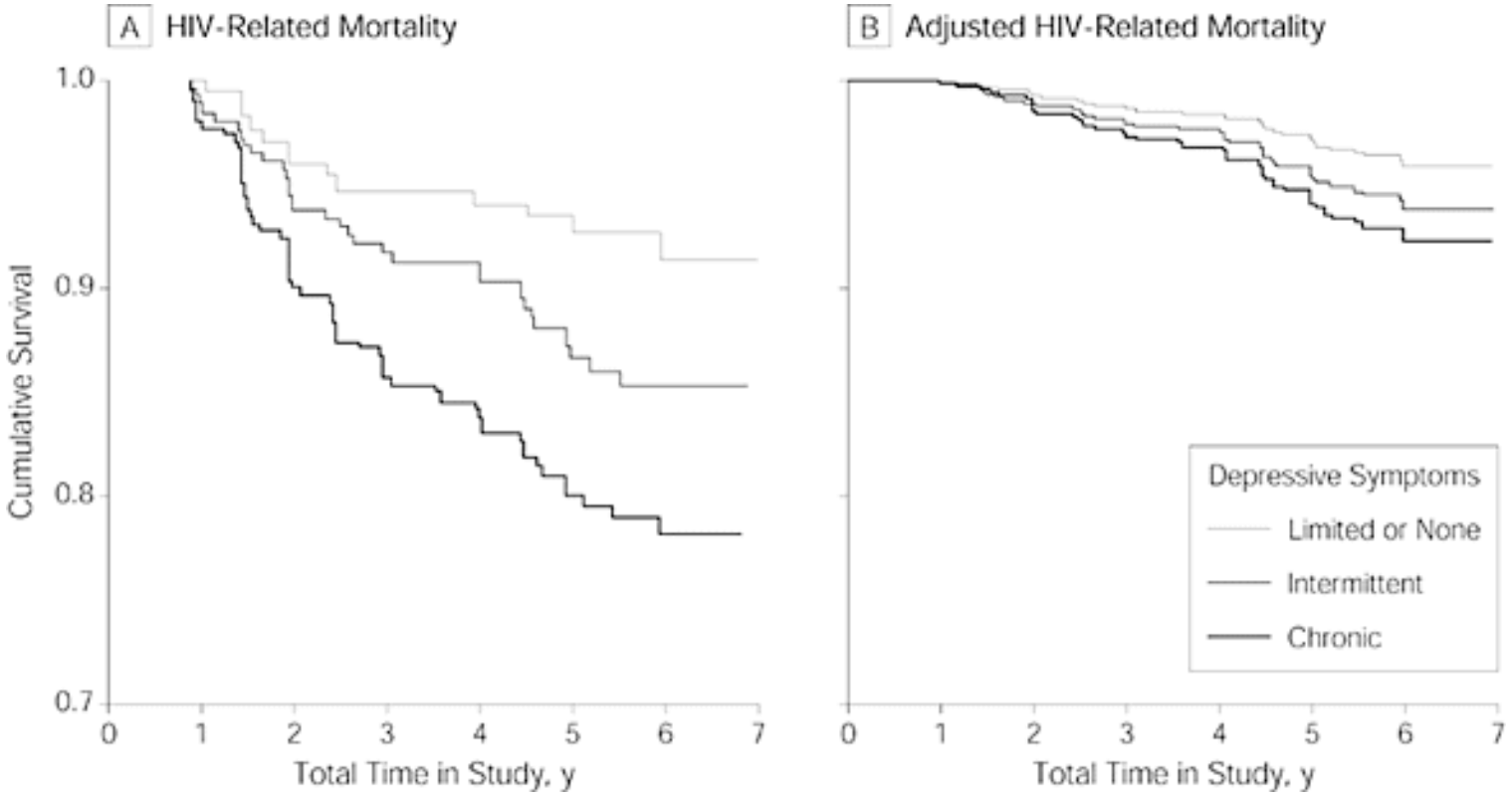
- Prevalence of depression among women is almost twice that of men[1]
- WLH are disproportionately affected by depression compared to men with HIV[2]
- Depression is even higher among pregnant and postpartum WLH[3]



[1]Substance Abuse and Mental Health Services Administration. (2017) https://www.samhsa.gov/data/; [2]Do AN, et al. (2014). PLoS ONE 9(3): e92842. doi:10.1371/ journal.pone.0092842; [3]Kapetanovic S, et al (2014) AIDS Behav 18(6):1152–1173

Depressive Symptoms and Mortality among WLH

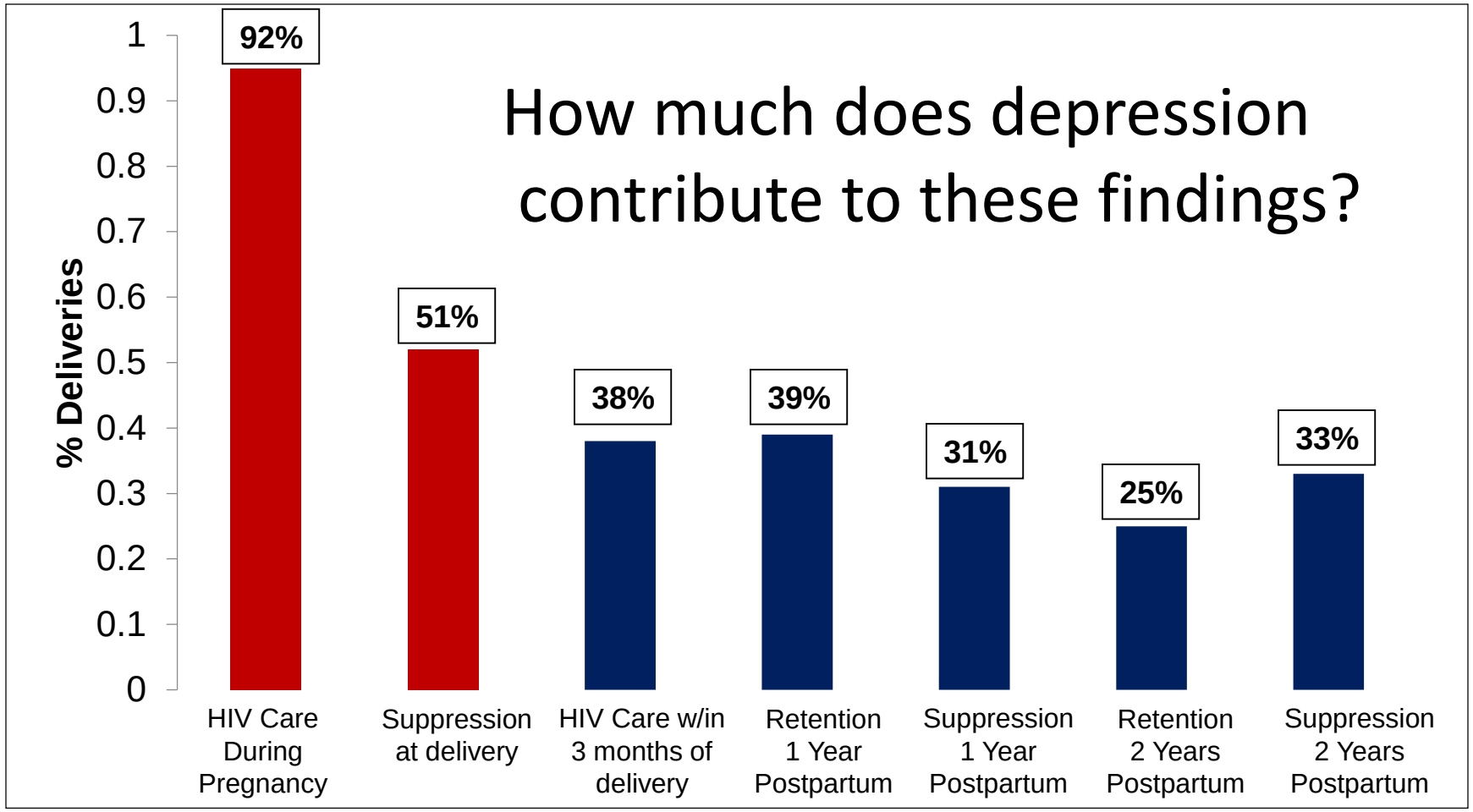
WLH who have depressive symptoms are at elevated risk for death, n=765



Depression was measured using the Center for Epidemiologic Studies Depression Scale (CES-D)

Ickovics, JR., et al. *JAMA* (2001)

HIV Care Continuum Postpartum



Momplaisir**,** Brady, Fekete, Thompson, Diez Roux, Yehia. *PLOS ONE, July 1, 2015.*
Adams, Brady, Michael, Yehia, Momplaisir. Postpartum Engagement in HIV Care. *Clinical Infectious Diseases* 61.12 (2015): 1880-1887.

Purpose of the Study

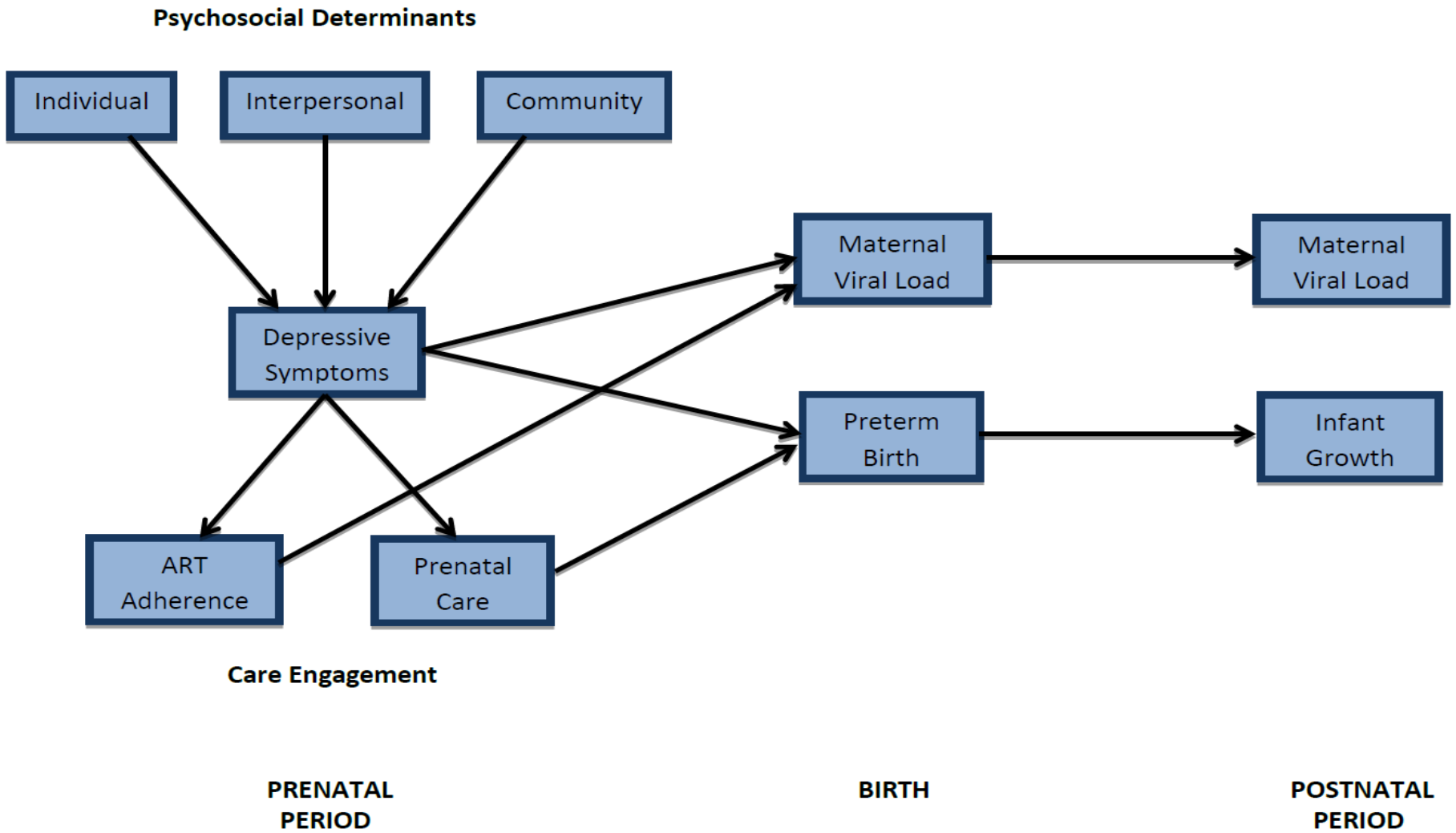
The association between prenatal depressive symptoms and viral suppression at birth and postpartum has not been previously examined in a prospective study

- Question 1: Do prenatal depressive symptoms predict viral suppression at delivery and postpartum?
- Question 2: How is this relationship mediated by adherence?

Data Source

- P1025 is a prospective multicenter cohort of mother-infant pairs, 2002-2013
  - Multicenter observational study in the United States
  - Designed to assess use and outcomes of ART in pregnancy
  - n=2756 mother-infant pairs, entry in pregnancy and followed up to 24 weeks postpartum
  - WLH, age≥13, with a viable pregnancy of ≥ 8 weeks gestation
- Analysis limited to women with a VL at delivery and 24 weeks postpartum, n=1,367

Proposed model by which depressive symptoms impact maternal and pediatric outcomes



Methods-Depressive symptoms

Mental health Inventory-5 (MHI-5)[1,2]

Participants rate the frequency of each item from 1 (“none of the time”) to 6 (“all of the time”) over the past month

- Have you felt calm or peaceful?
- Have you felt down-hearted and blue?
- Have you been a happy person?
- Did you have trouble keeping your attention on any activity for long?
- Did you have difficulty reasoning and solving problems

Average score obtained in pregnancy

1. Berwick D et al. *Medical care.* 1991;29(2). 2. Rumpf H-J et al. *Psychiatry research.* 2001;105(3).

Study Variables

Outcome: Viral Suppression
VL<400 copies/ml at delivery and at 24 weeks postpartum
Mediator: Self-reported adherence to ART in pregnancy
Any missed doses in the past 4 weeks versus no missed doses
Co-variates
Age: <21, 21-29, 30-35, >35
Multiparity: having ≥ 1 birth prior to current pregnancy
Race: White, non-Hispanic; Black, non-Hispanic; Hispanic
Education: <11th grade; High school diploma; some college or more
Substance use: Any substance use in the past month other than tobacco, alcohol, and marijuana

Analyses

- Multiple imputation using chained equations (MICE) to impute missing data for depressive symptoms (22%)
- Multiple logistic regression models to evaluate the effects of prenatal depressive symptoms on viral suppression at L&D
  - **Model 1**: Dep Sxs association with viral suppression at L&D, adjusted for confounders (age, race, multiparity, education, substance use)
  - **Model 2**: Everything in *Model 1* + Adherence in pregnancy

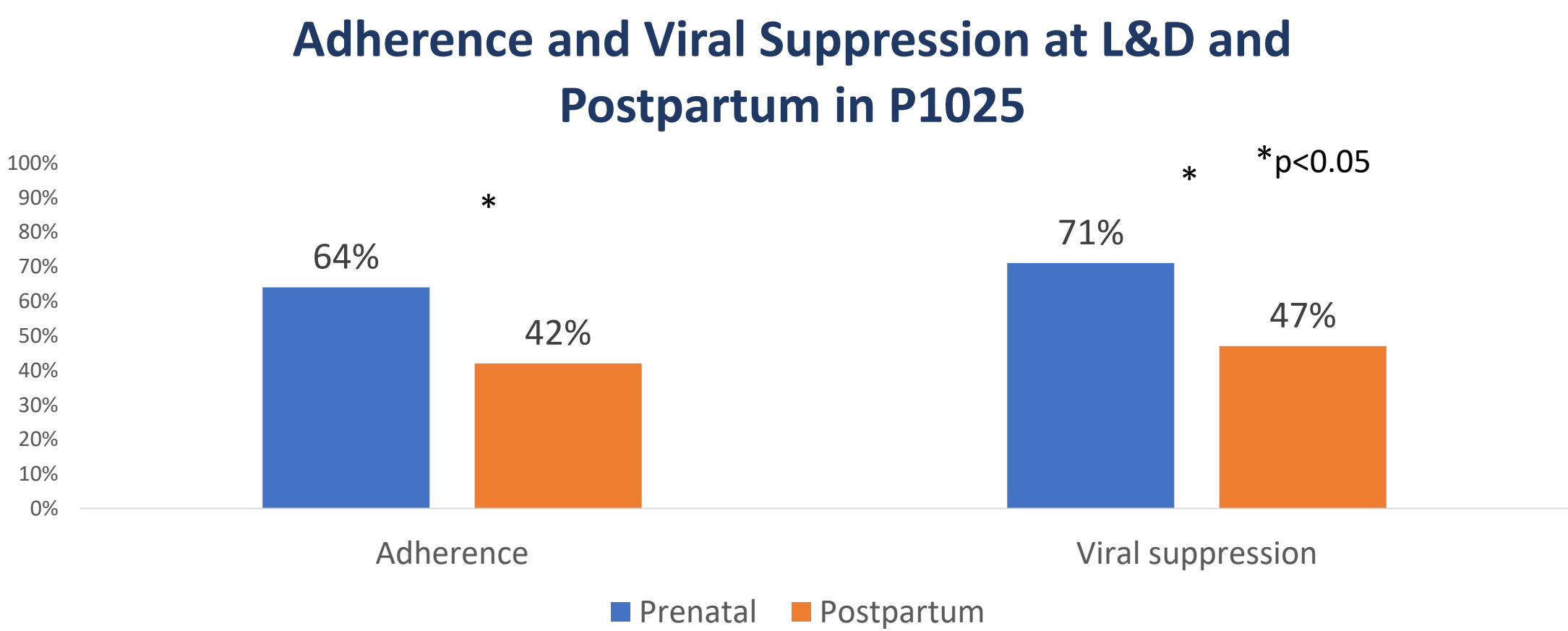
Effects of prenatal depressive symptoms on viral suppression postpartum

  - **Model 1**: Dep Sxs association with viral suppression postpartum, adjusted for confounders
  - **Model 2**: Everything in *Model 1* + Adherence in pregnancy

Results

Characteristics, n=1,367	Values
Depressive symptoms, average (SD) Lowest tertile Middle tertile Highest tertile	12.6 (4.6) 7.6 (1.3) 11.7 (1.3) 17 (3.0)
Age, <21, n (%) 21-29 30-35 >35	151 (11) 650 (48) 332 (24) 234 (17)
>1 previous birth, n (%)	196 (14)
Race: Black n (%) Hispanic White	797 (58) 418 (31) 152 (11)
Education: <11th grade, n (%) High school, GED some college or more	516 (38) 575 (42) 276 (20)
Substance use, n (%)	58 (4)

Results


Adherence and Viral Suppression at L&D and Postpartum in P1025
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
64%
42%
71%
47%
*
*
*p<0.05
Adherence
Viral suppression
Prenatal
Postpartum

Regression Models at L&D and Postpartum

	Viral Suppression at L&D		Viral Suppression Postpartum	
	Model 1	Model 2	Model 1	Model 2
Depressive Sx Tertiles , *ref: lowest*				
Middle	0.9 [0.6,1.3]	0.9 [0.6,1.4]	0.9 [0.7,1.3]	1.0 [0.7,1.4]
Highest	0.6** [0.4,0.8]	0.6* [0.4,0.9]	0.7 [0.5,1.0]	0.8 [0.5,1.2]
Adherence, prenatal, *ref: no missed doses in > 4 weeks*				
Missed dose in last 1-4 wks		0.6** [0.5,0.9]		0.4***[0.3,0.6]

* p<0.05, ** p<0.01, *** p<0.001

Prenatal adherence mediates 8% of the effect of depressive sx on suppression at L&D

Prenatal adherence mediates 15% of the effect of depressive sx on suppression at 24 weeks postpartum

Strengths and Limitations

- First study to prospectively evaluate the relationship between prenatal depressive symptoms and viral suppression during pregnancy and postpartum
- Findings based on WLH in the United States

- Selection bias: study participants had to enroll in the cohort, findings can not be extrapolated to all WLH
- Missing data, addressed with multiple imputation
- Depressive symptoms and adherence measures could have been more comprehensive

Conclusions

- Adherence and viral suppression significantly dropped postpartum
- Women in the highest tertile for depressive symptoms were significantly less likely to be suppressed at delivery; this effect was no longer significant postpartum
- Women with missed prenatal ART doses were significantly less likely to be suppressed at delivery and postpartum but the effect was strongest on postpartum viral suppression

Policy Implications

- Findings suggest that investing in the prenatal period, when women engage highly in care to prevent perinatal HIV transmission, can yield long term health benefits for the new mother
- This can be done by:
  - Universally screening WLH for depression in pregnancy
  - Treating women with a diagnosis of depression
  - Investing in programs and interventions to encourage prenatal adherence to ART
- Addressing these issues postpartum can be more challenging and bring less impact on postpartum suppression

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