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AND PREVENTION
ADHERENCE

Internalized HIV stigma is longitudinally associated with lower HIV medication adherence

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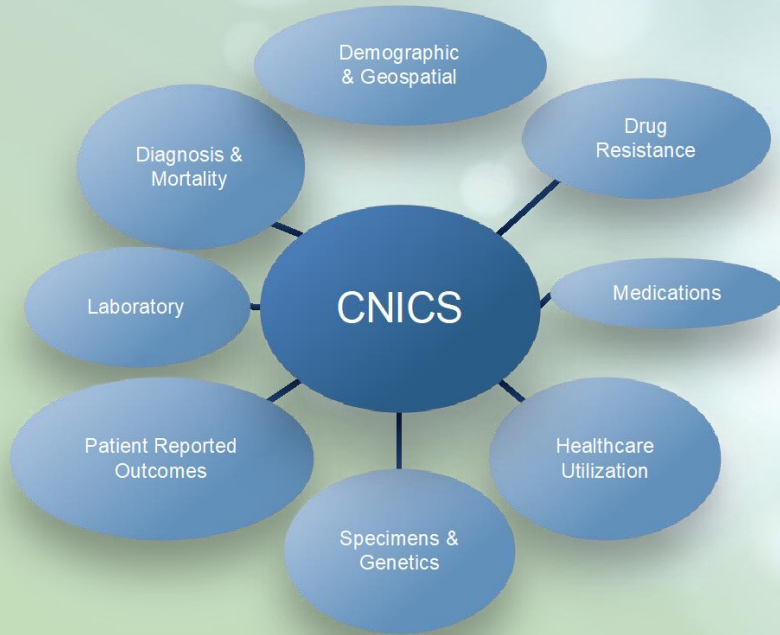
Stigma

- The reduction "in our minds from a whole and usual person to a tainted, discounted one." (Goffman, 1963)

- "Labelling, stereotyping, separation, status loss and discrimination", with stigmatization occurring when "power is exercised" with respect to a stigma. (Link & Phelan, 2001)

- Common Classifications of Types of Stigma

   - <u>Enacted</u> – the experience of stigmatizing or unfair treatment from others (Gray, 2002)

   - <u>Perceived</u> – an individual's beliefs about the attitudes of others with respect to a stigma (Latalova, Kamaradova, Prasko, 2014), which can further translate into the fear of being stigmatized (Tesfaw, Kibru, Ayano, 2020)

   - <u>Anticipated</u> – "the belief that prejudice, discrimination and stereotyping will be directed at the self from others in the future" (Earnshaw, Quinn, Park, 2012)

   - <u>Internalized</u> – sometimes referred to as "self-stigma" (Latalova, Kamaradova, Prasko, 2014) is the feeling an individual has about him/her/themselves with respect to the stigma based on internalization of social norms (Sayles, *et. al.*, 2008)

      - **How an individual feels about him/her/themselves with respect to their HIV status**

CFAR Network of Integrated Clinical Systems (CNICS)

- PWH in clinical care at 8 sites across the US
- Clinical, laboratory, and genetic data, as well as adjudicated outcomes and patient reported outcomes and measures (PROs)
- >45,000 PWH enrolled
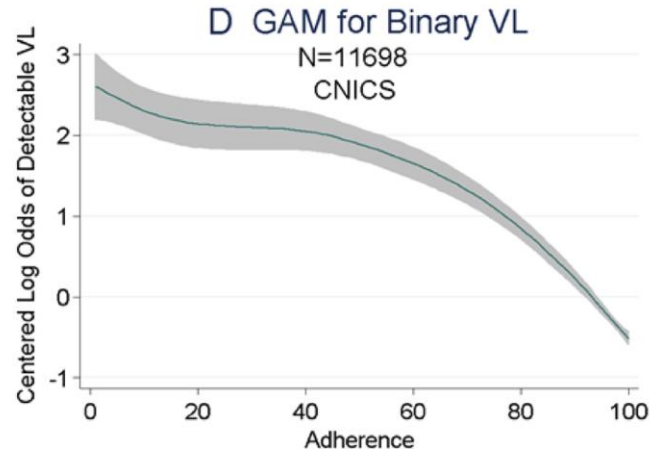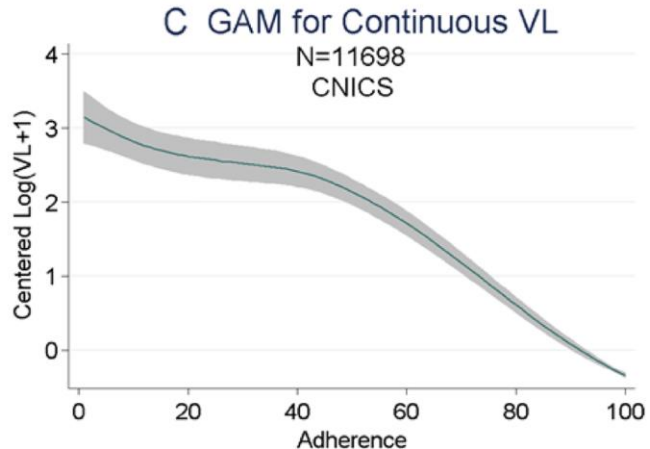- >20,000 have PRO data for >111,000 assessments

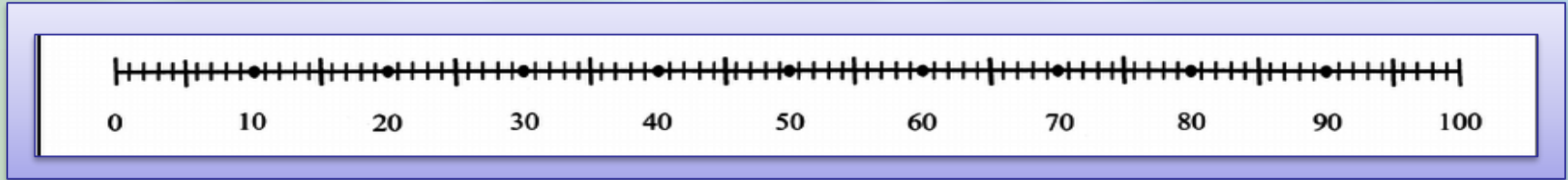# Measures: ART Adherence

- Self-reported visual analog scale (VAS) for antiretroviral therapy (ART) adherence
- "Touch or click on the point along the line that most closely reflects how much of your HIV medications you have taken in the last month."

Cunningham, et. al. 2019.
BMC Infectious Diseases.
doi.org/10.1186/s12879-019-4443-z

Measures: Internalized HIV Stigma

Assessment (adapted from Earnshaw, *et. al.* AIDS Behav 2013; 17:1785–1795.)

Having HIV makes me feel like a bad person

Having HIV is disgusting to me

I think less of myself because I have HIV
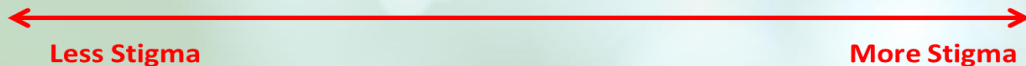
I feel ashamed of having HIV

Strongly Disagree　　**Disagree**　　**Neither Agree nor Disagree**　　**Agree**　　**Strongly Agree**

Less Stigma ← → **More Stigma**

- We have previously shown that internalized HIV stigma is associated with:
  - HIV viremia
  - Unsuppressed viral load
  - Poorer retention in care

  When stigma measures were time-lagged with relation to the outcome

  Using data on baseline stigma among initial responders

Christopoulos, et. Al. 20120 *AIDS*, 34: 1665-1671;

Table 2. Association between internalized HIV stigma and unsuppressed viral load for patients undergoing stigma assessment in six clinics across the United States ($N = 6589$).

Characteristic	Adjusted odds ratio (95% CI)	P
Stigma	1.16 (1.05–1.28)	0.004
Age (years)		
18–29	2.41 (1.49–3.89)	<0.001
30–39	2.11 (1.49–3.01)	<0.001
40–49	2.04 (1.53–2.73)	<0.001
≥50	Reference	–
Gender identity		
Cis-female	1.29 (0.93–1.80)	0.13
Gender minority	0.72 (0.30–1.74)	0.47
Cis-male	Reference	–
Race/ethnicity		
Black	1.84 (1.35–2.50)	<0.001
Latinx	1.19 (0.77–1.83)	0.44
Other	1.25 (0.65–2.43)	0.50
White	Reference	–
Sexual identity		
Heterosexual	1.14 (0.83–1.57)	0.42
Sexual minority	Reference	–
Years in CNICS	1.01 (0.99–1.03)	0.52

Measures: Covariates

- Depression

  - Patient Health Questionnaire (PHQ-9)

  - Scored 0-3 per question (sum of questions)

      - 0-4   none
      - 5-9   mild
      - 10-14   moderate
      - 15-19   moderately severe
      - 20-27   severe

- Health related quality of life (HR-QoL)

  - EuroQol 5 Dimension (EQ-5D) 3 Level (EQ-5D-3L): No problems, some problems, not able to do

  - 5 Domains: Mobility, Self-care, Usual activities, Pain/Discomfort, Anxiety/Depression

  - Responses scored as an index adjusted for average scores for sex and country

- Substance use

  - Alcohol Use Disorders Identification Test (AUDIT)

      - Total score against 10 items including frequency and number of drinks, binge drinking, dependency measures and social consequences

  - WHO modified Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)

      - "In your LIFETIME, which of the following have you ever used?"

      - "In the past 3 months how often have you used the following?"

Analyses

- Associations between self-reported adherence using VAS and internalized HIV stigma over time

- We used generalized linear latent and mixed models (GLLAMMs)
  - Random intercept for each individual, modelled nonparametrically using a discrete 12-bin distribution
  - Happy medium between modeling variability in every individual on the one extreme and assuming normally distributed variability among individuals

Cohort Characteristics

- Demographics
  - Median age: 49 years
  - Years in care 1-27, median 7 years
  - 58.5% non-white
  - 79.9% cisgender men
  - 55% self-identified as gay/lesbian

- ART Adherence by VAS
  - 6-100%; mean 92.5%

- Internalized HIV Stigma
  - Averaged 1-5; mean 2.0; median 1.75

- Other covariates
  - PHQ-9 depression: 0-27; mean 5.14; median 3
  - EQ-5D HR-QoL: median 0.844
  - Substance use: Past: high (~45% cocaine/cannabis);
  - Substance use Current: lower (meth 9.5%, cocaine 7%, opioids 3%, cannabis 30%)

Multiply Adjusted Predictors of Adherence by Visual Rating Scale among PWH by GLLAMM (N=10,892 with observations=22,669)

		Coefficient	95% CI	p-value
CONSTANT		98.8158		
Internalized HIV stigma score		**-0.4847**	-0.6949, -0.2744	**<0.001**
PHQ-9 Depression score		**-0.2568**	-0.3021, -0.2114	**<0.001**
EQ-5D quality of life index score		**3.3868**	2.1285, 4.652	**<0.001**
Years in care (centered on 6 years)		**-0.0596**	-0.0985, -0.0206	**0.003**
Age (centered on 50 years)		**0.0940**	0.0719, 0.1161	**<0.001**
Gender:	Cis-man	REF		
	Cis-woman	-0.6546	-1.3785, 0.0693	0.076
	Trans-woman	**-3.1809**	-5.0866, -1.2752	**0.001**
	All others	-0.9910	-3.3938, 1.4118	0.419
Race/Ethnicity:	White	REF		
	Black/ African American	**-3.0081**	-3.6020, -2.4142	**<0.001**
	Hispanic/ Latinx	**-0.8483**	-1.5803, -0.1161	**0.023**
	All others	-0.9265	-2.0120, 0.1586	0.094
Sexual orientation:	Gay/Lesbian	REF		
	Heterosexual	0.2037	-0.4444, 0.8519	0.538
	Bisexual	**-0.8549**	-1.6757, -0.0341	**0.041**
	All others	**-2.5160**	-3.4545, -1.5776	**<0.001**
Location:	Southeast	REF		
	Northeast	**-0.6562**	-1.2955, -0.0169	**0.044**
	West	**-0.9821**	-1.5880, -0.3761	**0.001**
	Midwest	1.1092	-1.0501, 3.2685	0.341
AUDIT alcohol score		-0.0454	-0.1373, 0.0652	0.333
Cocaine use:	Never	REF		
	Past	-0.0690	-0.7007, 0.5626	0.830
	Current (past 3 months)	**-2.2283**	-3.2197, -1.2369	**<0.001**
	Not reported	-1.2743	-2.7695, 0.2210	0.095
Meth use:	Never	REF		
	Past	-0.3334	-0.9921, 0.3254	0.321
	Current (past 3 months)	**-8.2903**	-9.2154, -7.3652	**<0.001**
	Not reported	-0.3130	-1.8269, 1.2009	0.685
Opioid use:	Never	REF		
	Past	-0.0258	-0.5666, 0.5151	0.926
	Current (past 3 months)	**-1.4813**	-2.7440, -0.2186	**0.021**
	Not reported	-0.8486	-2.2496, 0.5524	0.235
Cannabis use:	Never	REF		
	Past	-0.0486	-0.7112, 0.6141	0.886
	Current (past 3 months)	-0.6889	-1.4142, 0.0364	0.063

Fully Adjusted Associations with ART Adherence VAS (N=10,892; Observations= 22,669)

- Average 2% reduction in ART adherence from lowest to highest internalized HIV stigma score
- Average 6.9% reduction in ART adherence from no depression to the most severe depression
- Average 3.4% reduction in ART adherence from lowest to highest quality of life score

Significance

- *These changes in ART adherence are relevant for HIV VL, especially at higher adherence levels*
- *This could impact many PWH*

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Not reported	**-2.6706**	-4.1505, -1.1907	**<0.001**

Impact of Stigma on Average ART Adherence Profiles based on Analyses

Constant = average adherence for a White, gay, cisgender man, 50 years-old, in care for 6 years, with an internalized HIV stigma score of 1 (i.e., no stigma), no depression, a quality of life (QoL) index score of 0.844, living in the southeast US, and no substance use = 98.82%

Characteristics	Average ART Adherence Profiles		
	No	Medium	High
	Stigma=1	Stigma=3	Stigma=5
White, gay-identified, cisgender man, 50 years old, 6 years of care, living in the southeast, no depression, mean QoL, no substance use	98.8	97.9	96.9
Black, 25-year-old, transgender woman, reporting other sexual orientation, in care 1 year, with severe depression (20), with low QoL, who uses meth, living in the west	73.0	72.0	71.0
Latinx, 40-year-old, bisexual-identified, cisgender woman, in care for 4 years, with moderate depression (10), mean QoL, living in the northeast, who uses opioids	91.5	90.6	89.6

Conclusions

- Internalized HIV stigma can have an impact on ART adherence that could result in large impacts on viral load

- Lack of viral suppression has been shown to result in negative comorbid outcomes for HIV

- Understanding mechanisms of how internalized HIV stigma impacts ART adherence is important
  - Stigma reduction interventions
  - Improved health of PWH across their lifespan

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Co-authors

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CNICS Patients