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FAST-TRACK CITIES 2024
13-15 October 2024 | Maison de la Mutualité, Paris

# A Decade of Improving Adherence: A Longitudinal Study of the Undetectables Intervention

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Background

- High adherence to ART is essential to meet the 90-90-90 goals

- The epidemic is driven by social determinants: (Ghose et al., 2019, *Aids & Behavior)*
  - Poverty
  - Homelessness
  - Substance use
  - Mental illness

- Financial Incentives have been shown to be effective in improving adherence
  Petry et al. (2012). *Am J Med.*
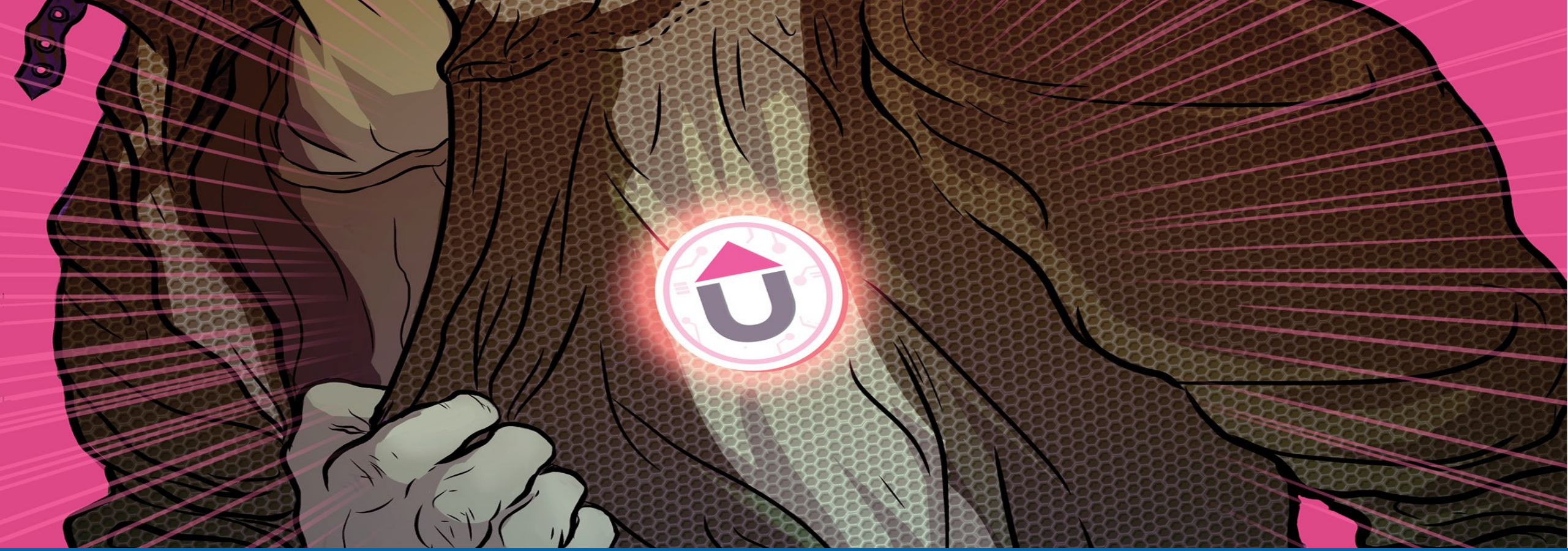
The Undetectables Project.
Housing Works, New York &
The University of Pennsylvania

The Partners

- Housing Works is a NYC community-based organization providing integrated care for homeless and formerly homeless people with HIV/AIDS
  - Primary health care
  - Behavioral health services
  - Housing and assistance with other basic subsistence needs
  - Case management and care coordination

- Penn Research & Training Partners

The Undetectables Initiative

Stepped approach to ARV adherence

✓ **Launched in 2014**

✓ **Individual-level ARV adherence planning and support**
- case conferences among client, health providers & case manager
- motivational interviewing & assistance to meet subsistence needs
- Behavioral health assessment/referral

✓ **$100 gift card incentive for quarterly lab result showing undetectable viral load.**

Examining UI Impact
Ghose, T., Shubert, G, Poitvien, V, Chowdhuri, S., & Gross, R. (2019). *Aids & Behavior.*

- Four-year repeated measures analysis with two-year post-enrollment viral load trajectory compared to 2-year pre-enrollment

- Proportion undetectable at all timepoints 39% pre vs. 62% post

- Disparities across baseline social indicators disappeared post-enrollment

- UI designated a model program by Fast-Track Cities, CDC, Ryan White

Methods

- Repeated measures analysis of 10-year viral load trajectories of UI participants
    - n=2,216 participants
    - total n with multiple time-points for each participant: 32,464

- Utilizing two types of statistical models:
    - Hierarchical models with randomized intercept and time slope
    - Logistic regression models to examine undetectability

Demographics

Variables	Means & Percentages
Mean age	40.8
Race	
Black	74
Latinx	16.7
White	8
Gender: Men	76.8
Sexual Orientation	
Straight	34.5
LGBTQ/Other	47
Mean # of follow-ups	15.6

Viral Load Trajectories (n=2,216)

	Percentage
Undetectable at last timepoint in 2024	89.3
Undetectable at baseline	77.3
Proportion detectable at baseline who become undetectable[1] during UI	76.6
Proportion undetectable at baseline who become detectable[1] during UI	16.3
Undetectable at last timepoint	79.4

Undetectability Regressed on Correlates (n=2,216)

	AOR[1] (95% CI)
# follow-ups	1.03[2] (1.02, 1.04)
Black	N.S.
LGBTQ	N.S.

[1] adjusted for race, age, sexual orientation, viral load at baseline
[2] by last follow-up, UI increases odds of undetectability by 45% on average

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Time Series Analysis: Viral Load regressed on correlates

	β
# follow-ups	-0.133 *
Cohort 1 vs. cohort 2	-0.371*
Baseline undetectable (BU) vs baseline detectable (BD)	-3.44*
# follow-ups*cohort (VL time slope for cohort 1 vs 2)	0.063*
# follow-ups* BU (VL time slope for BU vs. BD)	0.1128*

* $p < 0.0001$

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Viral Load Trajectory by Baseline Undetectability
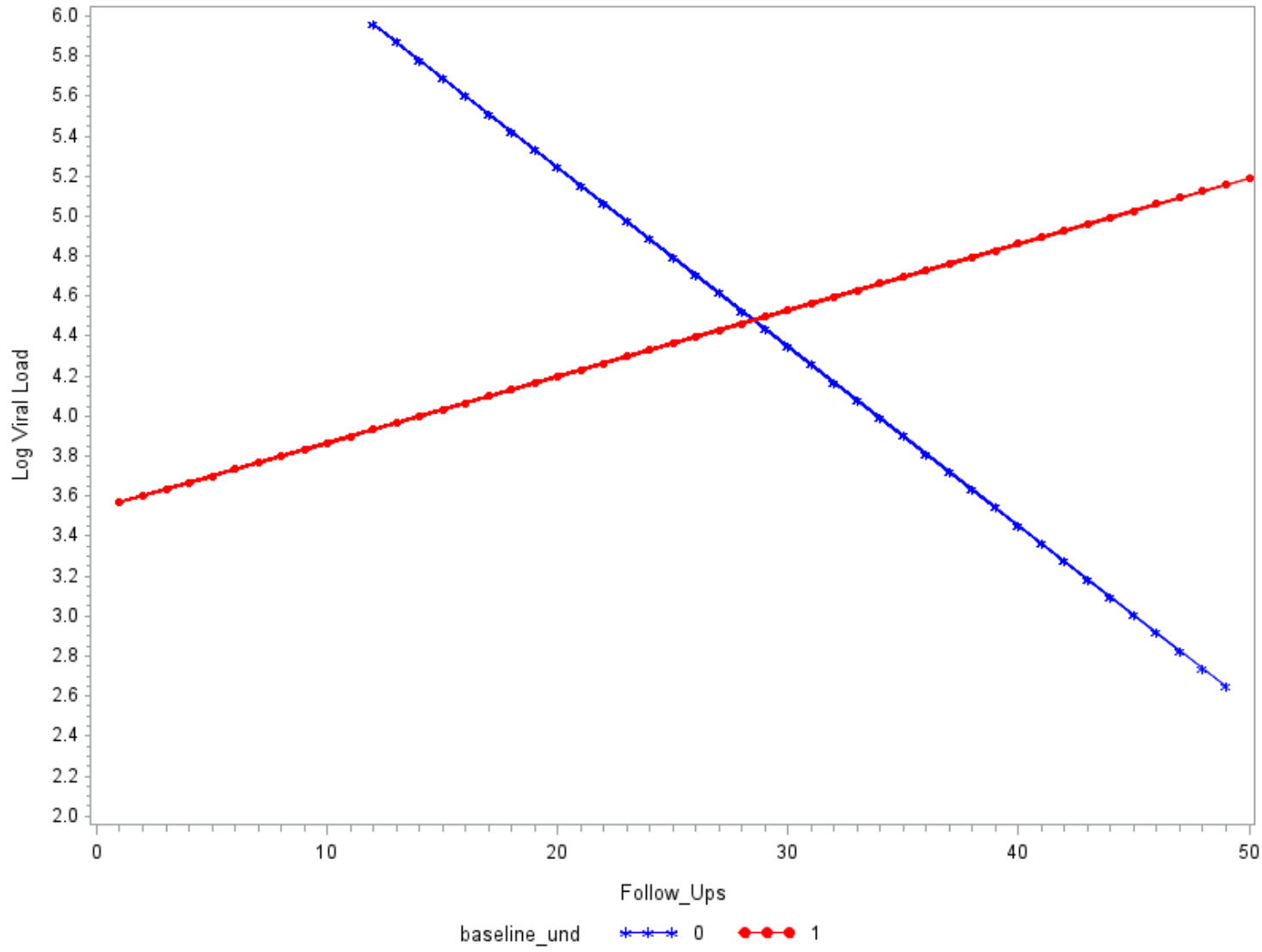
Discussion

- Financial Incentives are effective in reaching undetectability
  - …especially for an extremely socially precarious population:
  - UI removed racial disparities in outcomes.

- UI enabled long-term adherence

- Treatment fatigue indicates the need for booster interventions

Discussion

- Limitations:

  - Associations that may not establish causation

  - Cohort of participants, not controls

  - Real-world settings that may complicate uniformity and symmetry of data

Acknowledgements

- Housing Works staff, clients, and activists. Especially:

  - Virginia Shubert, JD, Research Coordinator

  - Charles King, CEO, and

  - Dr. Vaty Poitevien, Medical Director

- Drs. Alison Neff, Sambuddha Chaudhuri

- Robin Hood Foundation