

Sub-group effect heterogeneity of conditional food and cash transfers provided to HIV-infected adults in improving adherence to antiretroviral therapy and retention in care in Shinyanga, Tanzania



Kadota JL¹, McCoy SI¹, Fahey CA¹, Njau PF², Kapologwe N³, Padian NS¹, Dow WH¹



¹ University of California, Berkeley, United States, ² Ministry of Health, Community Development, Gender, Elderly and Children, Dar es Salaam, United Republic of Tanzania, ³ Regional Medical Office, Shinyanga, United Republic of Tanzania

BACKGROUND

- Incentive-based programs have emerged as an important strategy for the promotion of HIV prevention behaviors^{1,2}. Fewer studies have assessed their impact on antiretroviral therapy (ART) adherence and retention in care among people living with HIV infection (PLHIV).
- We recently concluded a randomized study in Tanzania that found short-term conditional cash and food transfers significantly improved ART adherence and reduced loss to follow-up (LTFU) among PLHIV.³
- Despite these promising findings, there is a lack of conclusive evidence indicating whether using incentives works differentially amongst subgroups of study populations.⁴⁻⁷

STUDY OBJECTIVE

To understand whether cash and food transfers had differential effects within key population subgroups defined by: sex (M vs. F), age (18-35 vs. ≥35 years), wealth (poorest quartile vs. all others), and time elapsed between HIV diagnosis and ART initiation (<90 days vs. ≥90 days) on improving ART adherence and decreasing LTFU.

METHODS

- 805 individuals were randomized to standard of care (SOC) HIV services or cash or food transfers valued at ~\$11/month, provided for up to 6 months, and conditional on HIV clinic attendance. Eligible PLHIV were: ≥18 years, food insecure, and initiated ART ≤90 days prior.
- For this analysis, we combined the cash and food groups for a total of 112 in the SOC and 688 in the cash/food group.
- The primary outcome was the medication possession ratio (MPR) ≥95% at 6 and 12 months and LTFU at 12 months.
- We estimated adjusted risk percentages for outcomes in each study arm and subgroup, and compared within the strata of each subgroup to obtain adjusted risk differences.
- To assess for statistical significance, we examined p-values for the relative excess risk due to interaction (RERI) term, which is used for assessing additive interaction.⁸ Similar to other secondary analyses assessing effect heterogeneity⁹, we specified a threshold value of p<0.20 to indicate potential effect measure modification (EMM).

RESULTS

6 and 12 Month MPR ≥ 95%

- Neither sex nor age met our criteria for a potential subgroup effect heterogeneity for MPR ≥ 95% at either 6 or 12 months (Table).
- Time elapsed between HIV diagnosis and ART initiation and wealth showed potential effect heterogeneity at both 6 and 12 months: the effect of the intervention was significantly greater in improving adherence in those more recently diagnosed with HIV, and in the poorest population members (Figure).

12 Month LTFU

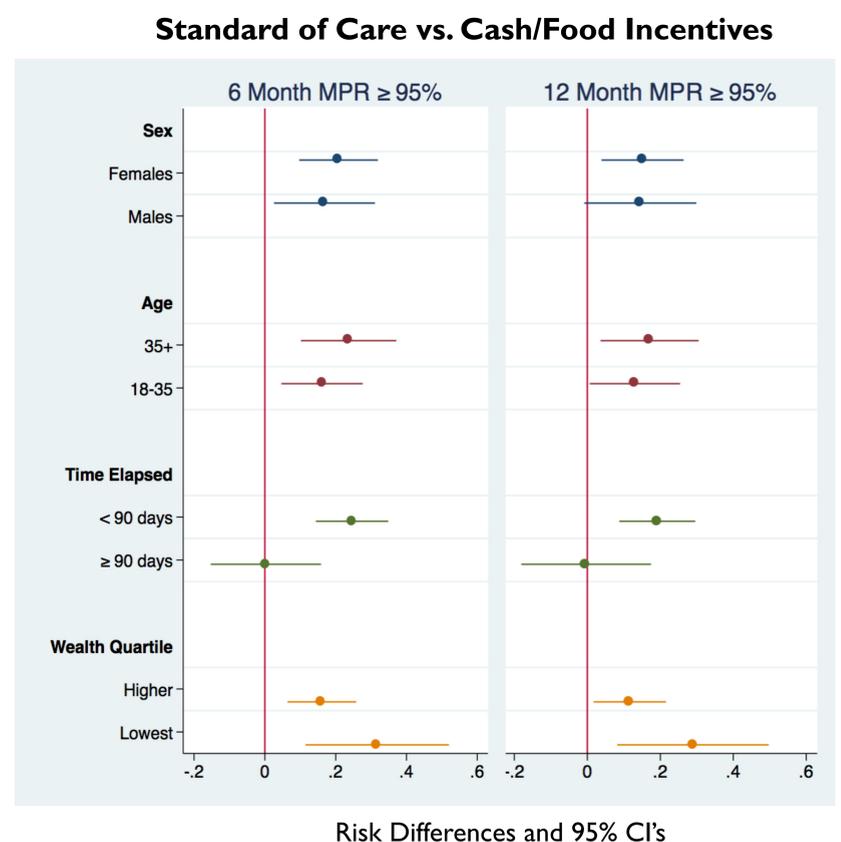
- There was no evidence of effect heterogeneity using our pre-specified p<0.20 criteria for 12 month LTFU for any EMM.

Table. Predicted risk differences between standard of care and cash/food groups, 6 and 12 month MPR ≥ 95% and 12 month LTFU.

	ADHERENCE			LTFU		
	6M MPR ≥ 95% Risk Difference % (95% CI)	RERI p-value	12M MPR ≥ 95% Risk Difference % (95% CI)	RERI p-value	12M LTFU Risk Difference % (95% CI)	RERI p-value
Sex						
Female	20.8 (8.1, 33.5)	0.71	15.1 (2.3, 28.0)	0.99	-6.4 (-15.8, 2.9)	0.45
Male	16.8 (0.53, 33.1)		14.5 (-3.0, 32.1)		-13.4 (-29.3, 2.4)	
Age						
18-35 years	16.2 (3.0, 29.3)	0.41	13.0 (-1.1, 27.2)	0.64	-9.9 (-21.7, 1.8)	0.77
35+ years	23.7 (8.3, 39.1)		17.1 (1.7, 32.4)		-7.4 (-18.9, 4.1)	
Time Elapsed between HIV diagnosis and ART initiation						
< 90 days	24.6 (13.0, 36.3)	0.02	19.2 (7.3, 31.1)	0.09	-7.9 (-17.4, 1.6)	0.69
≥ 90 days	0.32 (-17.5, 18.1)		-0.30 (-20.6, 20.0)		-11.4 (-27.9, 5.0)	
Wealth quartile						
Lowest	31.8 (8.6, 54.9)	0.18	29.0 (5.2, 52.7)	0.14	-18.7 (-40.6, 3.1)	0.30
Higher	16.1 (5.0, 27.2)		11.6 (0.31, 23.0)		-6.3 (-15.1, 2.4)	

RERI: Relative excess risk due to interaction.

Figure. Does the effect of cash/food transfers on MPR ≥ 95% at 6 and 12 months differ across levels of sex, age, time elapsed between HIV diagnosis and ART initiation, and/or wealth?



CONCLUSIONS

- Understanding potential subgroup effects is crucial for the informed design and targeting of future programs, and for ultimately supporting the achievement of the UNAIDS '90-90-90' target goals.¹⁰
- Although not powered for subgroup analyses, exploratory findings from the present study show a stronger effect of the intervention on 6 and 12-month MPR ≥ 95% amongst the poorest population members, and may indicate that targeting those most disadvantaged may lead to greater beneficial effects for HIV outcomes. Findings also suggest that targeting interventions to patients more recently diagnosed with HIV, whose HIV healthcare habits are still being formed, may be worthwhile.
- Study results may imply that pairing short-term incentives with universal test and treat¹¹ could be a crucial strategy for improving ART adherence in patients recently diagnosed with HIV.
- Future larger studies to detect subgroup effects are warranted.

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Contact: Jillian L. Kadota, MPH, Division of Epidemiology, University of California, Berkeley
jill.kadota@berkeley.edu, +1 310 600-3922