CCTs and HIV care: Preliminary results and priority areas for intervention

Harsha Thirumurthy, Ph.D.

Gillings School of Global Public Health

UNC-Chapel Hill

Outline

1. Background on HIV treatment, adherence
2. Randomized trial of CCT for retention in care in Uganda – study overview
3. *Preliminary* results
4. Additional design considerations and applications to other HIV behaviors

Expanding access to treatment

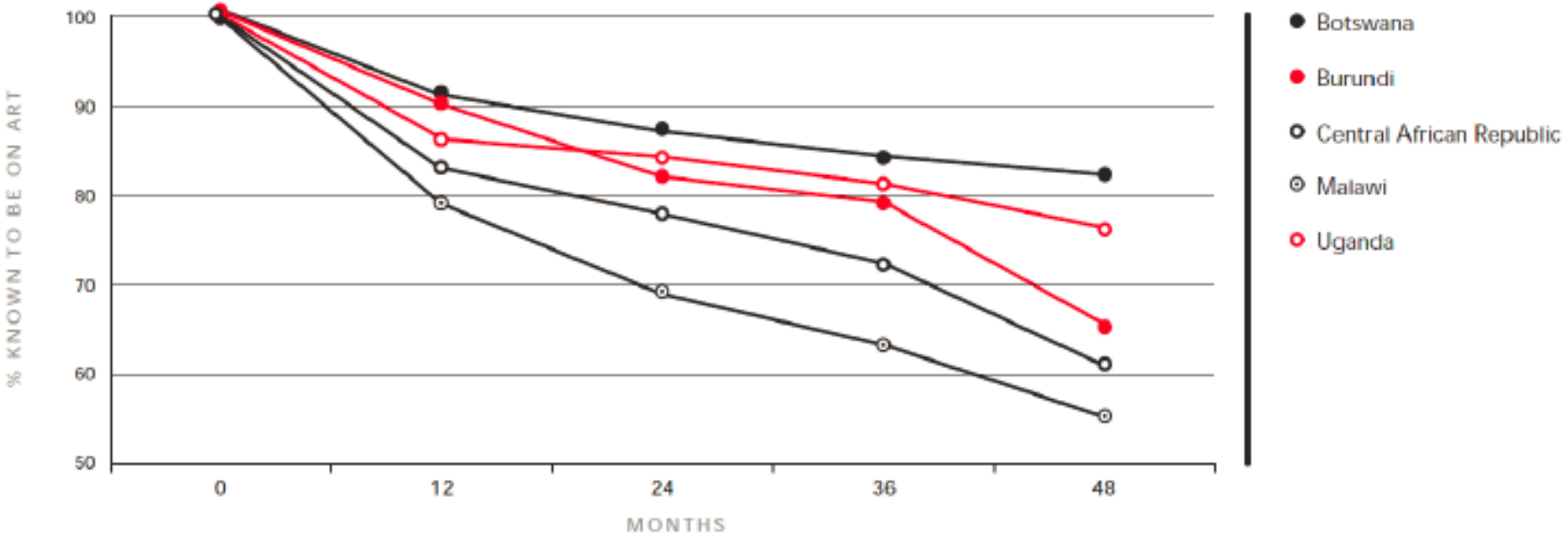
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of people living with HIV (in millions)	29.5 [27.7-31.7]	30.2 [28.4-32.1]	30.7 [28.8-32.5]	31.0 [29.2-32.7]	31.4 [29.6-33.0]	31.8 [29.9-33.3]	32.3 [30.4-33.8]	32.9 [31.0-34.4]	34.0 [31.6-35.2]
Number of people newly infected with HIV (in millions)	3.1 [3.0-3.3]	3.0 [2.8-3.1]	2.9 [2.7-3.0]	2.8 [2.6-3.0]	2.8 [2.6-2.9]	2.7 [2.5-2.9]	2.7 [2.5-2.9]	2.7 [2.5-2.9]	2.7 [2.4-2.9]
Number of people dying from AIDS-related causes (in millions)	2.0 [1.8-2.3]	2.1 [1.9-2.4]	2.2 [2.0-2.5]	2.2 [2.1-2.5]	2.2 [2.1-2.4]	2.1 [2.0-2.3]	2.0 [1.9-2.2]	1.9 [1.7-2.1]	1.8 [1.6-1.9]
% of pregnant women tested for HIV[a]				8%	13%	15%	21%	26%	35%
Number of facilities providing antiretroviral therapy[a]						7 700	12 400	18 600	22 400
Number of people receiving antiretroviral therapy[a]	300 000	400 000	700 000	1 330 000	2 084 000	2 970 000	4 053 000	5 255 000	6 650 000
Number of children receiving antiretroviral therapy[a]				71 500	125 700	196 700	275 400	354 600	456 000
Coverage of antiretroviral medicines for preventing mother-to-child transmission (%)[a]			9%[b]	14%[b]	23%[b]	33%[b]	43%[b]	48%[b]	48%[c]

Source: WHO (2011)

Importance of adherence & retention

- ART has turned HIV from death sentence into chronic disease
- BUT, requires life-long retention in care and high medication adherence
- Incomplete adherence is major cause of
  - Treatment failure
  - Development of drug resistance
  - HIV disease progression and death

Adult retention in ART, 0-48 months



In, Sub-Saharan Africa (SSA), an estimated 30-40% of HIV positive patients drop out of regular care (Fox & Rosen PLoS Med, 2010)

Source: WHO (2010)

Adherence to ART

- Commonly referenced goal is 95% adherence
  - Associated with reliable viral suppression
- Recent evidence that 80-90% adherence adequate for reliable viral suppression (Bangsberg CID, 2006)
- Treatment interruptions are most problematic
  - Oyugi (AIDS, 2007): Resistance at 24-weeks more likely for those with treatment interruptions greater than 48 hours

Barriers and facilitators to adherence & retention

- Mills et al. (PLoS Med, 2006) systematic review of qualitative and quantitative studies

- Barriers
  - Fear of disclosure
  - Concomitant substance abuse
  - Forgetfulness
  - Regimens too complicated, # of pills, **side effects**
  - **Transport costs**
  - Work and family responsibilities
  - Social isolation

- Facilitators
  - Having sense of self-worth
  - Seeing positive effects of ARVs
  - Accepting own HIV status
  - Understanding need for strict adherence
  - Making use of reminder tools
  - Having a simple regimen

CCT for better adherence & retention

- Very recently completed study in Uganda
  - Data analysis ongoing
- Compensate ART patients for coming to monthly clinic appointments
- *Conditional:* compensation only if patient comes to clinic

Rationale #1

- CCT effectively removes/reduces transport cost & opportunity cost of time as barrier to coming to clinic

Rationale #2

- Behavioral psychology: people discount future costs and benefits; pay attention to present costs and benefits
- Costs are in the present: side effects, transport
- Benefits are in the future: lower viral load, live longer

- CCT generates *more immediate* benefits

Study setting

- Study site
  - HIV clinic in Mbarara (southwestern Uganda)
- Enrollment criteria
  - Adults (>18 years) initiating HIV antiretroviral therapy
  - Lived 20-100 km from Mbarara University of Science and Technology Immune Suppression Syndrome (ISS) Clinic

Study design

- Randomized controlled trial
- Cash transfer of 5,000-15,000 Uganda Shillings (2.5-7.5 USD) for each monthly clinic visit
  - Administered at Mbarara HIV clinic upon arrival for scheduled clinic visit
- Cross-over design
  - Patient received cash transfer in either the first 12 months OR the second 12 months of 24 month study period

Adherence measurement

- Hard to do this correctly with just self-reports

- Medication Event Monitoring System (MEMS)
- MEMS data download at each pharmacy visit


PROPERTY OF CAPS
AARDEX
HP 510
IMPORTANT NOTICE
intel


256333
256334
256337
256338
256340
256341
256342
256345
256346
256349
256351
256352
5
10
15
20
25
18jun2007
02jul2007
16jul2007
30jul2007
13aug2007
Date of opening
Graphs by monitor

Follow-up

- Followed passively with quarterly interviews at the ISS clinic for the first 12 months
- Active outreach to determine vital status and HIV RNA at month 12 when patients were assigned to the alternative group

- Lost-to-follow-up: not attending clinic for 3 or more consecutive months

Conclusions, next steps

- Small sample size limits generalizability
- Millions receiving ART, so large potential for scale-up
  - Intervention may be cost-effective if we consider costs of treatment failure, drug resistance
- Can also apply to other issues in HIV care: linkage from testing to care

Further motivation for CCTs
& lessons for program design

- Origin: decades of behavioral psychology research on *contingency management* (CM)
  - Precursor to CCTs
  - Focused on systematically using behavioral science principles of reinforcement and 'punishment' to promote healthy behavior change
  - Most common application: treatment of substance use disorders (cocaine depedence, smoking during pregnancy)

CM lessons for CCTs

- Voucher-based rewards for treatment of cocaine dependence
- *Escalating schedule of incentives*
  - Value of voucher that patients receive for abstaining from recent drug use increases in tandem with duration of continuous cocaine abstinence achieved (Higgins et al., 1991)
- *Reset contingency*
  - Escalating value of incentive goes back to original low value should person fail to meet therapeutic target

Applications to HIV care

- We're trying to apply lessons of CM in proposed CCT studies

- Retention in HIV care: escalating incentives as greater # of on-time visits are maintained
- Retention in PMTCT care (PMTCT cascade): attending each of 3-5 appointments results in greater incentive payment each time