The impact of (financial) incentives on health outcomes and behaviors

Damien de Walque,
Development Research Group,
The World Bank
Lisbon, December 11, 2017
Some health outcomes and behaviors might be easier to influence from the demand side (patients, population) rather than from the supply side (health care providers).

(Conditional) cash transfers have been widely used and evaluated as a social protection mechanism.

When they are conditional, the conditions are linked to educational and/or health behaviors.

They usually have impacts on reducing poverty, but also on improving education and health outcomes.
Gender and Conditionality: A Randomized Evaluation of Alternative Cash Transfer Delivery Mechanisms in Rural Burkina Faso
Cash Transfer Pilot Program Randomization Plan

75 villages (2775 households)

15 villages (540 households)
Randomized CCT to Father

15 villages (540 households)
Randomized CCT to Mother

15 villages (540 households)
Randomized UCT to Father

15 villages (540 households)
Randomized UCT to Mother

15 villages (615 households)
Randomized to Control Group
Cash Transfers Overview

- **Transfer amount:**
  - Ages 0-6: 4000 FCFA/year
  - Ages 7-10 (Grades 1-4): 8000 FCFA/year
  - Ages 11-15 (Grades 5+): 16000 FCFA/year

- $1 USD = 500 FCFA

- **CCT:**
  - Ages 0-6: Quarterly visits to health clinic for preventive care (growth monitoring)
  - Ages 7-15: School attendance rate > 90%

- **UCT:**
  - No requirements
Nahouri Social Protection Program Evaluation:

- Panel Survey – June 2008 (Baseline before Intervention), June 2009 (1-year follow-up), June 2010 (2-year follow-up)
  - $111 mean annual per capita expenditures
- Baseline randomization balance
  - Across dependent variables in this paper and child, parent, and school characteristics
- Household attrition
  - After 1 year (1.4%)
  - After 2 years (4.6%)
  - No evidence differences between characteristics of attritors and non-attritors differs across treatment and control groups
## Health Impacts of Cash Transfers, CCT versus UCT

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Routine Checkup</th>
<th>Sick during last month</th>
<th>Health clinic utilization conditional on illness</th>
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<tbody>
<tr>
<td>CCT</td>
<td>0.431**</td>
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<tr>
<td>[0.205]</td>
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<tr>
<td>UCT</td>
<td>-0.079</td>
<td></td>
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<tr>
<td>[0.195]</td>
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<td></td>
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<tr>
<td>CCT * Round 2</td>
<td>-0.064**</td>
<td>0.236***</td>
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<tr>
<td>[0.027]</td>
<td>[0.077]</td>
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<tr>
<td>UCT * Round 2</td>
<td>-0.041</td>
<td>0.081</td>
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<tr>
<td>[0.026]</td>
<td>[0.081]</td>
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<tr>
<td>CCT * Round 3</td>
<td>-0.056*</td>
<td>0.199***</td>
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<tr>
<td>[0.030]</td>
<td>[0.074]</td>
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<tr>
<td>UCT * Round 3</td>
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<tr>
<td>Number observations</td>
<td>2559</td>
<td>8840</td>
<td>948</td>
</tr>
</tbody>
</table>

*P-value testing equality between CCT and UCT:*

- CCT = UCT \(0.002\)
- CCT*Rd2 = UCT*Rd2 \(0.103\), \(0.058\)
- CCT*Rd3 = UCT*Rd3 \(0.671\), \(0.137\)
### Health Impacts of Cash Transfers, Mother versus Father

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Routine Checkup</th>
<th>Sick during last month</th>
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</thead>
<tbody>
<tr>
<td>CTF</td>
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<td>0.181**</td>
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<td>[0.209]</td>
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<td>[0.085]</td>
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<tr>
<td>CTM</td>
<td>0.235</td>
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<td>0.125*</td>
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<tr>
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<td>0.160*</td>
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<td>[0.072]</td>
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</table>

Number observations: 2559 | 8840 | 948

*P-value testing equality between CCT and UCT:*

- CTF = CTM: 0.346
- CCT*Rd2 = UCT*Rd2: 0.494
- CCT*Rd3 = UCT*Rd3: 0.032
## Anthropometric Impacts of Cash Transfers, CCT versus UCT

<table>
<thead>
<tr>
<th>Variable:</th>
<th>Weight for age z-score</th>
<th>Arm circumference z-score</th>
<th>Height for age z-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCT * Round 2</td>
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<td>0.328**</td>
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<tr>
<td>UCT * Round 2</td>
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<td>0.130</td>
<td>0.149</td>
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<tr>
<td>UCT * Round 3</td>
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<td>-0.073</td>
<td>-0.129</td>
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<td>[0.141]</td>
<td>[0.161]</td>
<td>[0.155]</td>
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</tbody>
</table>

**Round FE?** Yes Yes Yes

**Village FE?** Yes Yes Yes

**Age & Gender FE?** Yes Yes Yes

**Number of observations** 7361 7075 7016

*P-values testing equality between CCT and UCT*

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
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<td>CCT * Rd2 = UCT * Rd2</td>
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<tr>
<td>CCT * Rd3 = UCT * Rd3</td>
<td>0.085 0.006 0.000</td>
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## Anthropometric Impacts of Cash Transfers, Mothers versus Fathers

<table>
<thead>
<tr>
<th>Variable:</th>
<th>Weight for age z-score</th>
<th>Arm circumference z-score</th>
<th>Height for age z-score</th>
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</thead>
<tbody>
<tr>
<td>CTF * Round 2</td>
<td>0.518***</td>
<td>0.314**</td>
<td>0.313*</td>
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<td>CTM * Round 2</td>
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<td>0.186</td>
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<td>CTF * Round 3</td>
<td>0.162</td>
<td>0.123</td>
<td>0.143</td>
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<tr>
<td>CTM * Round 3</td>
<td>0.024</td>
<td>0.020</td>
<td>-0.007</td>
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</table>

<table>
<thead>
<tr>
<th>Round FE?</th>
<th>Village FE?</th>
<th>Child Age FE?</th>
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</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
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<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Number of observations: 7361, 7075, 7016

*P*-values testing equality between CCT and UCT

CTF * Rd2 = CTM * Rd2 = 0.017 0.048 0.262
CTF * Rd3 = CTM * Rd3 = 0.153 0.384 0.169
Traditionally CCTs target education outcomes as well as mother/child health outcomes.

More recently they have also been tested as a way to influence adolescent/young adults health outcomes and behaviors, in particular for HIV prevention.
$ \rightarrow \downarrow \text{HIV?} \quad \text{STIs?}

Baird, Garfein, McIntosh and Özler, 2012.
STDs? HIV?

STIs? HIV?
Study population (N=1,328)

Control (N=827)  Treatment (N=501)

Unconditional Cash Transfer (N=265)  Conditional Cash Transfer (N=236)
Study population (N=1,328)

Control (N=827)

Treatment (N=501)

Unconditional Cash Transfer (N=265)

Conditional Cash Transfer (N=236)

Relative risk (compared to control, adjusted)
Pregnant now: 0.16 (p<0.05)
Partner≥25: 0.36
HIV: 0.47
HSV-2: 0.08 (p<0.05)

Relative risk (compared to control, adjusted)
Pregnant now: 1.17
Partner≥25: 0.08 (p<0.05)
HIV: 0.29 (p<0.05)
HSV-2: 0.37

NB UCT significantly different than CCT only for “pregnant now” outcome.
Cash for safe sex

The photo "sex and money" in a recent issue of a popular magazine shows a prostitute holding a dollar bill. This image emphasizes the connection between sex and money, highlighting the irony of using sex to generate income. The text discusses the growing prevalence of sex work and the economic incentives that drive it.

World Bank rewards safe sex to boost fight against AIDS in Africa

Funds of $1.8m to back trial in Tanzania

By Andrew Jack in London

The World Bank has backed a major trial in Tanzania designed to boost the fight against AIDS in Africa. The idea is to provide financial incentives for patients to adhere to antiretroviral treatment, thus reducing the risk of transmission.

Cash for safe sex

The concept of using money as an incentive for safe sex has been gaining traction in recent years. Proponents argue that providing financial rewards can help people avoid risky behaviors and improve their overall health.

The financial aspect of sexual health

Money plays a significant role in influencing people's choices and behaviors. When it comes to sexual health, the availability of funds can determine whether individuals seek medical care or avoid risky activities. This interplay between finance and health is a critical area for policymakers to address.

Conclusion

In conclusion, the relationship between money and sexual health is complex and multifaceted. While financial incentives can be a tool for promoting safer behaviors, they must be part of a broader strategy that includes education, access to healthcare, and other support mechanisms. The World Bank's investment in Tanzania is a positive step towards combating AIDS, but more comprehensive solutions are needed to ensure long-term success.

Editorial Comment

Page 8
STIs? HIV?

De Walque, Dow, Nathan et al. 2012
Study Population (N=2,409)

Control (N=1,124)

Treatment (N=1,285)

$10 if STI-free (N=660)

$20 if STI-free (N=615)
Study Population (N=2,409)

Control (N=1,124)

$10 if STI-free (N=660)

Treatment (N=1,285)

$20 if STI-free (N=615)

Relative risk (compared to control, adjusted)
4 STIs : 1.06

Relative risk (compared to control, adjusted)
4 STIs : 0.73 (p<0.05)
Should we pay people life-long in order for them to choose safe sex?
Sustained effects after the end of the intervention?

Baseline

4 months

8 months

12 months

24 months

Conditional cash transfers and STI testing every 4 months for 1 year

No CCTs, No testing For 1 year
1-Year Post-intervention Follow-Up: Hypotheses

(1) Positive sustained risk reduction: Learning

(2) Zero long-run effect: Incentives must be continued for sustained effect

(3) Adverse long-run effect: The cash transfers destroyed the intrinsic motivation
Results of 1 year post-intervention follow-up

• There were no adverse effects 1-year later (e.g. from destroyed intrinsic motivation).

• But gender differences:
  • Effect sustained among men.
  • Effect disappeared for women.
Nice idea, but how do you scale it up?
Lotteries as incentives for HIV prevention in Lesotho

Lottery Tickets for Staying HIV-Free Cut Infections 25%
STIs? HIV?

Björkman-Nyqvist, Corno, de Walque, Svensson, Under review
Study Population
Men and Women aged 18-32 (N=3,029)

Control (N=1,208)
Lottery ticket for $100 if STI-free (N=962)

Treatment (N=1,821)
Lottery ticket for $50 if STI-free (N=859)
Mobile clinic tested for syphilis and Trichomonas every four months over 2 years + HIV at baseline and months 16, 20 and 24
If in lottery intervention groups (T1 and T5) and STI negative, name entered in lottery boxes.
Winners announced and received lottery prizes at public village level ceremonies
After 2 years, HIV incidence is 22% lower in the 2 lotteries groups, effect strongest for women
Prevalence of curable STIs decreased and safe sexual behavior increased.
For high-risk individuals, number of risky sexual encounters reduced by as much as 62 percent.
HIV incidence can be reduced using financial incentives for remaining STI free

A lottery design is easier and cheaper to scale-up

Risk takers love lotteries
Future work: Swaziland

• Evaluate a combination of conditional cash transfers for education and lottery incentives for HIV prevention for young women aged 14-22.
• Test “scaled-up” version of the lottery: no STI test for everybody, but only for the lottery winners, who will win their prize if they are STI negative.
Incentives for safe sex for female sex workers in Dar-es-Salaam
Non financial incentives: using information and communication technology (ICT)

Mobile phone technologies improve adherence to antiretroviral treatment in a resource-limited setting: a randomized controlled trial of text message reminders

Cristian Pop-Eleches\textsuperscript{a,b,*}, Harsha Thirumurthy\textsuperscript{c,d,*}, James P. Habyarimana\textsuperscript{e,*}, Joshua G. Zivin\textsuperscript{f}, Markus P. Goldstein\textsuperscript{g}, Damien de Walque\textsuperscript{g}, Leslie Mackeen\textsuperscript{h}, Jessica Haberer\textsuperscript{i,o}, Sylvester Kimaiyo\textsuperscript{j}, John Sidle\textsuperscript{k,l}, Duncan Ngare\textsuperscript{m} and David R. Bangsberg\textsuperscript{n,p}

Objective: There is limited evidence on whether growing mobile phone availability in
Use of SMS reminders to improve adherence to antiretroviral treatment among HIV/AIDS patients in Kenya (AIDS, 2011)

- Adherence to antiretroviral treatment is crucial for treatment success and avoiding the development of resistances
- Study in Kenya among recent enrollees in HIV/AIDS clinic
- Each participant received a cell phone
- Received regular reminders by SMS to take their pills
- Adherence was measured using medical event monitoring system (MEMS) caps
Medication Event Monitoring System (MEMS) TrackCap

- The MEMS TrackCap is a medication bottle cap containing microelectronics that record each time the bottle is opened and closed.
- The TrackCap CR provides a means of measuring a patient's drug taking behavior.
Variation in frequency and content of SMS reminders

Frequency: Daily or Weekly

Content:
- Simple: “This is your reminder”
- Supportive: “This is your reminder. Be strong and courageous, we care about you”
Results

• 53% of participants receiving weekly SMS reminders achieved adherence of at least 90% during 48 weeks of the study, compared with 40% of participants in the control group (P = 0.03).

• Significantly less likely to experience treatment interruptions > 48 h during the 48-week follow-up period than control group.

• No impact of daily SMS reminders: daily reminders intrusive, or habituation (diminishing response to repeated input)?

• The content of the message (simple or “supportive”) made no difference.

• Conclusion: ICT such as reminders can be an efficient tool for optimal treatment response by patients, but need to tailor well.
Muito obrigado!