



UNIVERSITY  
OF WOLLONGONG  
AUSTRALIA

University of Wollongong  
Research Online

---

Faculty of Social Sciences - Papers

Faculty of Social Sciences

---

2012

# Can money prevent the spread of HIV? A review of cash payments for HIV prevention

Audrey Pettifor

*University of North Carolina*

Catherine L. Mac Phail

*University of Wollongong, cmacphai@uow.edu.au*

Nadia Nguyen

*University of North Carolina*

Molly Rosenberg

*University of North Carolina*

---

## Publication Details

Pettifor, A., MacPhail, C., Nguyen, N. & Rosenberg, M. (2012). Can money prevent the spread of HIV? A review of cash payments for HIV prevention. *AIDS and Behavior*, 16 (7), 1729-1738.

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library:  
[research-pubs@uow.edu.au](mailto:research-pubs@uow.edu.au)

---

# Can money prevent the spread of HIV? A review of cash payments for HIV prevention

## **Abstract**

Cash payments to improve health outcomes have been used for many years; however, their use for HIV prevention is new and the impact not yet well understood. We provide a brief background on the rationale behind using cash to improve health outcomes, review current studies completed or underway using cash for prevention of sexual transmission of HIV, and outline some key considerations on the use of cash payments to prevent HIV infections. We searched the literature for studies that implemented cash transfer programs and measured HIV or HIV-related outcomes. We identified 16 studies meeting our criteria; 10 are completed. The majority of studies have been conducted with adolescents in developing countries and payments are focused on addressing structural risk factors such as poverty. Most have seen reductions in sexual behavior and one large trial has documented a difference in HIV prevalence between young women getting cash transfers and those not. Cash transfer programs focused on changing risky sexual behaviors to reduce HIV risk suggest promise. The context in which programs are situated, the purpose of the cash transfer, and the population will all affect the impact of such programs; ongoing RCTs with HIV incidence endpoints will shed more light on the efficacy of cash payments as strategy for HIV prevention.

## **Disciplines**

Education | Social and Behavioral Sciences

## **Publication Details**

Pettifor, A., MacPhail, C., Nguyen, N. & Rosenberg, M. (2012). Can money prevent the spread of HIV? A review of cash payments for HIV prevention. *AIDS and Behavior*, 16 (7), 1729-1738.



Published in final edited form as:

*AIDS Behav.* 2012 October ; 16(7): 1729–1738. doi:10.1007/s10461-012-0240-z.

## Can money prevent the spread of HIV? A review of cash payments for HIV prevention

Audrey Pettifor<sup>1</sup>, Catherine MacPhail<sup>2</sup>, Nadia Nguyen<sup>1</sup>, and Molly Rosenberg<sup>1</sup>

<sup>1</sup>Department of Epidemiology, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, USA

<sup>2</sup>Wits Reproductive Health and HIV Research Institute

### Abstract

Cash payments to improve health outcomes have been used for many years, however, their use for HIV prevention is new and the impact not yet well understood. We provide a brief background on the rationale behind using cash to improve health outcomes, review current studies completed or underway using cash for prevention of sexual transmission of HIV, and outline some key considerations on the use of cash payments to prevent HIV infections. We searched the literature for studies that implemented cash transfer programs and measured HIV or HIV-related outcomes. We identified 16 studies meeting our criteria; 10 are completed. The majority of studies have been conducted with adolescents in developing countries and payments are focused on addressing structural risk factors such as poverty. Most have seen reductions in sexual behavior and one large trial has documented a difference in HIV prevalence between young women getting cash transfers and those not. Cash transfer programs focused on changing risky sexual behaviors to reduce HIV risk suggest promise. The context in which programs are situated, the purpose of the cash transfer, and the population will all affect the impact of such programs; ongoing RCTs with HIV incidence endpoints will shed more light on the efficacy of cash payments as strategy for HIV prevention.

### Background

Thirty years into the global HIV epidemic, effective methods to prevent new HIV infections remain limited to biomedical interventions. Recently, several effective, new interventions, including male circumcision, oral and vaginal pre-exposure prophylaxis, and treatment as prevention have emerged.<sup>1–5</sup> If taken to scale, these interventions have the potential to significantly reduce the number of new infections globally; however, there are numerous barriers to the widespread uptake and impact of these interventions which include economic, behavioral, structural and biological factors.<sup>6–9</sup> At the structural level, barriers to successful implementation of biomedical interventions may include financial barriers to individual uptake or to government ability to offer interventions, lack of skilled personnel to offer new interventions, and/or cultural norms that are not supportive of the behaviors required for uptake or use of interventions. Effective combination prevention approaches will require interventions that address structural and behavioral risk factors to have a maximum impact on the epidemic.

Recently, the use of cash payments to reduce HIV risk, either by addressing structural risk factors such as poverty or by incentivizing behavior change, has emerged as a novel prevention tool receiving significant attention.<sup>10–12</sup> While the use of cash to improve health

outcomes has a long history in development, social protections, and psychology (e.g. contingency management), less is known about its potential impact on HIV prevention. We provide a brief background on the rationale behind using cash as a means to improve health outcomes, review current studies that have been completed or are underway using cash for HIV prevention, and outline some key considerations with regard to the use of cash payments as a means to prevent new HIV infections.

## Historical Overview

Programs that use cash payments to improve individual well-being have been in existence for a number of decades. Some of the first programs using cash to improve health outcomes come from the development and social protection fields where cash transfers have traditionally been implemented to alleviate the impact of poverty.<sup>13</sup> Cash transfer programs are currently estimated to reach over 1 billion people in the developing world.<sup>14</sup> These payments have been both unconditional (payments normally go to households deemed 'poor' but individuals are not required to do anything to receive payments) and conditional (payments are tied to behaviors deemed beneficial to the individual). It is theorized that providing cash to poor households improves health outcomes by making health care, food, or education more affordable by increasing household income.<sup>14</sup> Such programs have aimed to increase uptake of prevention health services (e.g. antenatal care services, immunizations), and to improve growth outcomes, primarily in children. Overall these programs have been effective in increasing the use of preventive health services although the evidence on improving health outcomes is mixed.<sup>15,16</sup>

Behavioral economists also theorize that improving recipients' socio-economic status and access to better food and educational opportunities can affect recipients' expectations of their life expectancy, outlook for the future, and preferences for 'healthier behaviors'.<sup>13</sup> Further, they hypothesize that cash transfers conditioned on investments in social goods such as education and health may offset myopia whereby individuals may invest more in goods or services with immediate rewards rather than those where benefits may only vest in the future, such as education.<sup>13,14</sup> Building on behavioral economic theory, lessons learned from research on incentives and health suggest include findings that small, tangible incentives provided frequently and close to the observed outcome are more effective than larger payments made less often.<sup>17</sup>

Psychologists have also used cash to improve health outcomes through contingency management (CM). Such interventions are based on the theory that behaviors targeted for change should be monitored frequently and rewarded with tangible incentives when desired behavior change is demonstrated.<sup>18</sup> Contingency management strategies have been used to address a number of unhealthy behaviors for the past 30–40 years, including smoking cessation<sup>19</sup>, obesity management<sup>20</sup>, and most commonly substance abuse<sup>21–23</sup>, and have shown varying levels of success. Lessons learned from CM interventions are similar to those from the behavioral economics literature and also emphasize the importance of measuring readily detectable target behaviors, and providing tangible incentives when desired behaviors are demonstrated and withholding when behaviors not demonstrated.<sup>24</sup> Some other strategies used in CM found to be effective for controlling substance abuse include escalating incentives that reset to zero when the desired behavior is not achieved and the use of lottery or "fish-bowl" drawing based rewards.<sup>25</sup> The efficacy of such methods has yet to be tested in the HIV prevention field.

## Methods

To provide a comprehensive summary of the evidence regarding cash for HIV prevention, we aimed to review all studies that have been completed or are underway that use cash or

financial incentives and measure HIV or HIV-related outcomes. We included studies which aim to reduce the risk of sexual transmission of HIV by either providing participants with cash transfers (both conditional and unconditional); providing incentives for particular risk reduction outcomes; or reducing financial barriers to schooling. Schooling is the focus of many cash transfer programs due to the numerous benefits found to be associated with increased years of schooling, in particular among women. Women with more education have been found to be at lower risk of HIV infection, have fewer children, and have greater earning potential.<sup>26</sup> We identified studies for inclusion in multiple ways: to identify completed studies, we searched the PubMed and EconLit databases using search terms (cash transfer, cash incentive, cash reward, monetary reward, economic assets, contingency management, or school fee) and (HIV, STD, STI, pregnancy, or sexual behavior); to identify unpublished studies and studies currently underway, we also searched the websites of The World Bank, the NIH Research Portfolio Online Reporting Tool, archived abstracts from AIDS and APHA conferences (2000–2011), and relied on personal communications. From each of the studies identified, we abstracted information about the target population (age, sex), the study (design, sample size, location), the intervention (transfer type, conditionality), and the major results, if available.

## Results

### Review of the evidence

As of April 2012, we identified 16 studies that aimed to reduce HIV risk with cash transfers, providing incentives for particular risk reduction outcomes, or reducing financial barriers to schooling (Table 1). Nine of the studies were completed in the last seven years, six are underway, and one was completed more than twenty years ago. We posit that these interventions fall into one of two categories with regard to their mechanism of action: 1) interventions that provide cash to address up-stream structural risk factors for HIV (e.g. payments to relieve poverty or increase education) and are thus more directly related to development/social protection programs or 2) interventions that provide cash incentives for immediate measureable outcomes related to HIV (e.g. cash for HIV tests or negative HIV or STD test results) and are thus most similar to contingency management. The majority of studies fall into category 1: that is, they aim to address larger structural barriers to HIV prevention by reducing poverty or alleviating economic barriers to schooling. Two studies, CAPRISA 007 and Yo Puedo, fall into both categories, as they aim to address structural risk factors through cash transfers for school-related activities, while also providing cash rewards for specific outcomes such as HIV testing or negative pregnancy tests.<sup>27,28</sup> The majority of the studies are conducted in developing countries (14/16) and focus on adolescents (15/16). Nine studies provide cash on a conditional basis, six provide cash on an unconditional basis, and one examines the effect of both. The purpose of the transfer varies by study (and conditionality or not), but include: school attendance, school completion, poverty alleviation, and completion of health promotion activities, such as STI/HIV testing. The majority of studies are randomized controlled trials (15/16) and thus controlled for confounding in the study design. The only observational study controlled for appropriate factors at a range of levels.<sup>29</sup> Studies measure a variety of outcomes, including sexual behaviors and intentions (12/16), STI status (2/16), and HIV status (5/16). Overall, the majority of studies that have measured a change in sexual behaviors found a positive impact (9/10); however, one pilot study found a negative impact in men (Malawi Incentives Project): immediately after receiving their cash incentive, men reported more sex acts (although they also reported more condom use).<sup>30</sup> Only one large RCT, the SIHR trial, has released results on HIV outcomes. At the 18-month follow up, the study found lower HIV prevalence among the intervention participants compared to the controls.<sup>31</sup> Three large RCTs are currently underway among adolescents in South Africa (CAPRISA 007 and

HPTN 068) and Tanzania (Iringa Combination HIV Prevention Trial) to determine the impact of cash transfers on HIV incidence<sup>27,32,33</sup>.

## Discussion

### Programmatic considerations of cash payment interventions

Despite the promise of interventions that provide cash to reduce HIV risk, it is not clear that there is a one-size-fits-all cash payment intervention or whether such interventions will be effective in reducing HIV infection across populations. To date only one study has found a decrease in HIV prevalence related to cash payments (primarily because few studies to date have had biological endpoints), although the vast majority of studies have found positive impacts on sexual behaviors.

The mechanism whereby cash reduces risk depends heavily on the target population and how cash may (or may not) influence HIV risk factors for that population. Thus, how a cash payment intervention should be structured—whether it should be conditioned and on what, the frequency of payments, the amount of the payment, and to whom it is made—depends heavily on these factors. For example, conditioning payments on school attendance may only be relevant in settings where there are financial barriers to schooling and where schooling appears to be protective against HIV. Formative research on incentives for HIV prevention conducted in Malawi has confirmed theory from behavioral economics and contingency management that smaller payments made more frequently and closer to the behavior being observed are more effective than larger payments in the future.<sup>24,34</sup>

As we describe, there are two main types of cash/incentive for behavior change, one that aims to address upstream drivers of risk, such as poverty and education, and the other that provides cash for the downstream behavior change itself. The majority of studies aim to address upstream, structural barriers that increase HIV risk such as education or poverty. These studies hypothesize that improving the socio-economic situation of vulnerable populations or providing cash payments conditioned on social goods, such as school attendance, will reduce HIV risk (category 1 interventions). Other studies hypothesize that providing cash for specific outcomes like a negative STI test will serve as an incentive for individuals not to engage in high risk behavior (category 2 interventions). However, it is unclear whether interventions premised on rewarding specific HIV-related outcomes actually address factors that place individuals at risk. While there is the assumption that cash payments will serve as motivation for HIV/STI reduction behaviors, there is some evidence that the relationship between cash incentives and behavior might be more complex. The Malawi Incentives Project found payments for negative HIV tests increased risk in men, suggesting that giving cash to individuals may have unintended consequences.<sup>30</sup>

The amount of the payment likely will matter in determining whether behavior change occurs or not. It is still unclear what payment amount is necessary for desired behavior change and how the type (cash vs. in-kind payment) and frequency of payment influence outcomes. Research conducted in Malawi to date suggests that even a small incentive can encourage uptake of interventions and behavior change; however, the applicability of these findings to wealthier and more urban settings is unknown. At the end of the day what matters is which intervention type is more effective in preventing new infections—likely this will not be black and white and different designs may work differently for different populations. This complexity speaks to the importance of formative and ethnographic research and pilot studies in potential study populations to understand pathways that lead to risk and how cash transfers or incentives might best be structured to reduce risk.

Who gets the payment also likely matters with regard to cash payments. For young women who are at high risk of HIV infection in sub-Saharan Africa, recent evidence from the SIHR trial suggests that addressing structural factors by providing cash to young women reduces their risk.<sup>31</sup> It appears that providing young women with access to their own income was important in reducing HIV risk, as it enabled them to make safer choices in sex partners— young women who received cash irrespective of whether or not it was conditional, were less likely to have older partners or exchange sex for money. Many existing cash transfer programs do not provide cash payments to minors; rather the parent/guardian receives the payment. Given the potential impact on HIV and sexual behavior of direct payment to adolescents, the results of the CAPRISA 007 and HPTN 068 studies, which provide cash payments to adolescents, may have implications for future recipients of cash transfer programs.

While some cash transfer interventions do not address up-stream factors that affect HIV risk (category 2 interventions), in the new prevention landscape, there are circumstances where these interventions may play a significant role. Treatment as prevention,<sup>5</sup> Pre-exposure Prophylaxis (PrEP),<sup>1,4</sup> and Prevention of Mother to Child Transmission<sup>35</sup> all require individuals to test for HIV as a necessary first step. Cash incentives may be one way to increase testing numbers. Evidence from Malawi suggests that cash incentives are effective in encouraging individuals to receive their HIV test results.<sup>36</sup> Adherence to drugs is also a critical component of the efficacy of these interventions; studies have been conducted looking at the role of contingency management in improving ART adherence, including HPTN 065/TLC PLUS,<sup>37</sup> which is currently testing the impact of using cash transfers for HIV-related health visits and adherence to ART.<sup>38–40</sup> Clearly, there are important behavioral and structural barriers to individuals testing for HIV or to adhering to medication that need to be addressed; cash incentive programs may not address these factors but may still have an impact on behavior.

While providing cash to individuals is hypothesized to reduce risk, concerns have been raised that individuals receiving the cash could be placed at risk for negative outcomes such as violence, bullying, coercion, or using the cash for high-risk activities. Similar concerns were raised when government social welfare programs provided payments to female instead of male heads of households. Concerns were raised that women would suffer negative consequences as a result of receiving the payment, however, to date, the evidence shows that payments made to female heads of have not resulted in increased intimate partner violence. In fact, women are the more effective beneficiaries with regard to multiple health and education outcomes compared to men.<sup>41,42</sup> Though there is no evidence to date of social harm to individuals as a result of providing cash transfers, existing programs should carefully monitor changes in intergenerational and gender relationships for such events. Infusing cash into communities can create complex dynamics; thus, the need for transparency about selection criteria and intended purpose for receiving the cash is paramount.

## Conclusion

Preliminary data from cash payment interventions to reduce HIV risk suggest that they might be effective, particularly among young women. As always, concerns over scalability come into play with implementing cash transfer programs. However, with large social welfare programs in place in many countries, including those hard hit by the HIV epidemic, if cash payment programs are found to be effective these programs could be tailored to address scale up and cost of implementation. Ongoing research from randomized controlled studies will provide information on whether cash payment programs are a cost-effective

strategy for preventing new HIV infections and what role they may play in the larger prevention agenda.

## References

1. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *The New England journal of medicine*. 2010 Dec 30; 363(27):2587–2599. [PubMed: 21091279]
2. Gray RH, Kigozi G, Serwadda D, et al. Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial. *Lancet*. 2007 Feb 24; 369(9562):657–666. [PubMed: 17321311]
3. Auvert B, Taljaard D, Lagarde E, Sobngwi-Tambekou J, Sitta R, Puren A. Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 Trial. *PLoS medicine*. 2005 Nov.2(11):e298. [PubMed: 16231970]
4. Abdool Karim Q, Abdool Karim SS, Frohlich JA, et al. Effectiveness and safety of tenofovir gel, an antiretroviral microbicide, for the prevention of HIV infection in women. *Science*. 2010 Sep 3; 329(5996):1168–1174. [PubMed: 20643915]
5. Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *The New England journal of medicine*. 2011 Aug 11; 365(6):493–505. [PubMed: 21767103]
6. Padian NS, McCoy SI, Karim SS, et al. HIV prevention transformed: the new prevention research agenda. *Lancet*. 2011 Jul 16; 378(9787):269–278. [PubMed: 21763938]
7. Hankins C, Forsythe S, Njeuhmeli E. Voluntary medical male circumcision: an introduction to the cost, impact, and challenges of accelerated scaling up. *PLoS Med*. 2011 Nov.8(11):e1001127. [PubMed: 22140362]
8. Dieffenbach CW. Preventing HIV transmission through antiretroviral treatment-mediated virologic suppression: aspects of an emerging scientific agenda. *Current opinion in HIV and AIDS*. 2012 Mar; 7(2):106–110. [PubMed: 22227584]
9. Stringer EM, Chi BH, Chintu N, et al. Monitoring effectiveness of programmes to prevent mother-to-child HIV transmission in lower-income countries. *Bulletin of the World Health Organization*. 2008 Jan; 86(1):57–62. [PubMed: 18235891]
10. Dugger C. African Studies Give Women Hope in HIV Fight. *New York Times*. 2010
11. Shetty P. Cash cure for the AIDS epidemic? *Nature*. 2011 <http://www.nature.com/news/2011/110606/full/news.2011.351.html>.
12. McCoy SI, Watts CH, Padian NS. Preventing HIV infection: turning the tide for young women. *Lancet*. 2010 Oct 16; 376(9749):1281–1282. [PubMed: 20851461]
13. Fiszbein, A.; Schady, N. *Conditional cash transfers: Reducing present and future poverty*. Washington, D.C.: World Bank; 2009.
14. Arnold, CCT.; Greenslade, M. [Accessed July 12, 2011] Cash Transfers Evidence Paper. 2011. <http://webarchive.nationalarchives.gov.uk/+http://www.dfid.gov.uk/Documents/publications1/cash-transfers-evidence-paper.pdf>.
15. Lagarde M, Haines A, Palmer N. The impact of conditional cash transfers on health outcomes and use of health services in low and middle income countries. *Cochrane database of systematic reviews (Online)*. 2009; (4):CD008137. [PubMed: 19821444]
16. Lagarde M, Haines A, Palmer N. Conditional cash transfers for improving uptake of health interventions in low- and middle-income countries: a systematic review. *JAMA : the journal of the American Medical Association*. 2007 Oct 24; 298(16):1900–1910. [PubMed: 17954541]
17. Volpp KG, Asch DA, Galvin R, Loewenstein G. Redesigning employee health incentives--lessons from behavioral economics. *N Engl J Med*. 2011 Aug 4; 365(5):388–390. [PubMed: 21812669]
18. Petry NM, Weinstock J, Alessi SM, Lewis MW, Dieckhaus K. Group-based randomized trial of contingencies for health and abstinence in HIV patients. *J Consult Clin Psychol*. 2010 Feb; 78(1): 89–97. [PubMed: 20099954]
19. Ledgerwood DM. Contingency management for smoking cessation: where do we go from here? *Current drug abuse reviews*. 2008 Nov; 1(3):340–349. [PubMed: 19630730]



20. Paul-Ebhohimhen V, Avenell A. Systematic review of the use of financial incentives in treatments for obesity and overweight. *Obesity reviews : an official journal of the International Association for the Study of Obesity*. 2008 Jul; 9(4):355–367. [PubMed: 17956546]
21. Dutra L, Stathopoulou G, Basden SL, Leyro TM, Powers MB, Otto MW. A meta-analytic review of psychosocial interventions for substance use disorders. *The American journal of psychiatry*. 2008 Feb; 165(2):179–187. [PubMed: 18198270]
22. Prendergast M, Podus D, Finney J, Greenwell L, Roll J. Contingency management for treatment of substance use disorders: a meta-analysis. *Addiction*. 2006 Nov; 101(11):1546–1560. [PubMed: 17034434]
23. Lussier JP, Heil SH, Mongeon JA, Badger GJ, Higgins ST. A meta-analysis of voucher-based reinforcement therapy for substance use disorders. *Addiction*. 2006 Feb; 101(2):192–203. [PubMed: 16445548]
24. Petry NM, Petrakis I, Trevisan L, et al. Contingency management interventions: from research to practice. *The American journal of psychiatry*. 2001 May; 158(5):694–702. [PubMed: 11329388]
25. Stitzer ML, Vandrey R. Contingency management: utility in the treatment of drug abuse disorders. *Clinical pharmacology and therapeutics*. 2008 Apr; 83(4):644–647. [PubMed: 18305456]
26. Education and HIV/AIDS a window of hope. Washington, D.C.: World Bank; 2002.
27. Karim, QA. A Proof of Concept Cluster Randomised Controlled Trial to Evaluate the Impact of a Cash Incentivised Prevention Intervention to Reduce HIV Infection in High School Learners in Rural KwaZulu-Natal, South Africa. 2012. <http://clinicaltrials.gov/ct2/show/NCT01187979>.
28. Minnis, AM. Yo Puedo: Future opportunities for youth. 2012. [http://projectreporter.nih.gov/project\\_info\\_description.cfm?aid=8124903&icde=11152236&ddparam=&ddvalue=&ddsub=](http://projectreporter.nih.gov/project_info_description.cfm?aid=8124903&icde=11152236&ddparam=&ddvalue=&ddsub=).
29. Galarraga, O. Conditional cash transfers to prevent sexually transmitted infections in Mexico. 2012. [http://projectreporter.nih.gov/project\\_info\\_description.cfm?aid=7744648&icde=11152236&ddparam=&ddvalue=&ddsub=](http://projectreporter.nih.gov/project_info_description.cfm?aid=7744648&icde=11152236&ddparam=&ddvalue=&ddsub=).
30. Kohler H-P, Thornton R. Conditional Cash Transfers and HIV/AIDS Prevention: Unconditionally Promising? *The World Bank Economic Review*. 2011
31. Baird SJ, Garfein RS, McIntosh CT, Ozler B. Effect of a cash transfer programme for schooling on prevalence of HIV and herpes simplex type 2 in Malawi: a cluster randomised trial. *Lancet*. 2012 Apr 7; 379(9823):1320–1329. [PubMed: 22341825]
32. Pettifor, A. Effects of cash transfer and community mobilization in young South African women. 2012. [http://projectreporter.nih.gov/project\\_info\\_details.cfm?aid=8056817&icde=11152347](http://projectreporter.nih.gov/project_info_details.cfm?aid=8056817&icde=11152347).
33. Personal communications with Deanna Kerrigan. 2012.
34. Kohler, H.; Thornton, RL. Conditional Cash Transfers and HIV/AIDS Prevention: Unconditionally Promising. University of Michigan; 2010.
35. Siegfried N, van der Merwe L, Brocklehurst P, Sint TT. Antiretrovirals for reducing the risk of mother-to-child transmission of HIV infection. *Cochrane database of systematic reviews (Online)*. 2011; (7):CD003510. [PubMed: 21735394]
36. Thornton RL. The Demand for, and Impact of, Learning HIV Status. *The American economic review*. 2008 Dec 1; 98(5):1829–1863. [PubMed: 21687831]
37. El-Sadr, W.; Branson, B. Evaluating Methods to Increase HIV Testing, Access to HIV Care, and HIV Prevention Strategies. 2012. <http://clinicaltrials.gov/ct2/show/NCT01152918?term=Wafaa&rank=4>.
38. Simoni JM, Amico KR, Pearson CR, Malow R. Strategies for promoting adherence to antiretroviral therapy: a review of the literature. *Curr Infect Dis Rep*. 2008 Nov; 10(6):515–521. [PubMed: 18945394]
39. Rosen MI, Dieckhaus K, McMahon TJ, et al. Improved adherence with contingency management. *AIDS Patient Care STDS*. 2007 Jan; 21(1):30–40. [PubMed: 17263651]
40. Sorensen JL, Haug NA, Delucchi KL, et al. Voucher reinforcement improves medication adherence in HIV-positive methadone patients: a randomized trial. *Drug Alcohol Depend*. 2007 Apr 17; 88(1):54–63. [PubMed: 17056206]
41. Adato, M.; Roopnaraine, T. Women's Status, Gender relations, and Conditional Cash Transfers. In: Adato, M.; Hoddinott, J., editors. *Conditional Cash Transfers in Latin America*. Baltimore: Johns Hopkins University Press; 2010. p. 284–314.

42. Rivera, L.; Hernández, B.; Castro, R. Asociación entre la violencia de pareja contra las mujeres de las zonas urbanas en 69 pobreza extrema y la incorporación al Programa Oportunidades. In: López, M.; Salles, V., editors. El Programa Oportunidades examinado desde el género. Mexico City: Programa de Desarrollo Oportunidades; 2006.
43. Ssewamala FM, Han CK, Neilands TB, Ismayilova L, Sperber E. Effect of economic assets on sexual risk-taking intentions among orphaned adolescents in Uganda. *American journal of public health*. 2010 Mar; 100(3):483–488. [PubMed: 20075323]
44. Hallfors D, Cho H, Rusakaniko S, Iritani B, Mapfumo J, Halpern C. Supporting adolescent orphan girls to stay in school as HIV risk prevention: evidence from a randomized controlled trial in Zimbabwe. *American journal of public health*. 2011 Jun; 101(6):1082–1088. [PubMed: 21493943]
45. Cho H, Hallfors DD, Mbai II, et al. Keeping adolescent orphans in school to prevent human immunodeficiency virus infection: evidence from a randomized controlled trial in Kenya. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*. 2011 May; 48(5):523–526. [PubMed: 21501814]
46. Handa, S. Social cash transfers, household risk and HIV prevention in Kenya. 2012. [http://projectreporter.nih.gov/project\\_info\\_description.cfm?aid=8070982&icde=11152236&ddparam=&ddvalue=&ddsub=](http://projectreporter.nih.gov/project_info_description.cfm?aid=8070982&icde=11152236&ddparam=&ddvalue=&ddsub=).
47. Personal communications with Sudhanshu Handa. 2012.
48. Duflo, ED.; Pascaline; Kremer, Michael; Sinei, Samuel. Education and HIV/AIDS prevention: evidence from a randomized evaluation in Western Kenya. World Bank; 2006.
49. Stevens-Simon C, Dolgan JI, Kelly L, Singer D. The effect of monetary incentives and peer support groups on repeat adolescent pregnancies. A randomized trial of the Dollar-a-Day Program. *JAMA : the journal of the American Medical Association*. 1997 Mar 26; 277(12):977–982. [PubMed: 9091670]
50. de Walque D, Dow WH, Nathan R, et al. Incentivising safe sex: a randomised trial of conditional cash transfers for HIV and sexually transmitted infection prevention in rural Tanzania. *BMJ open*. 2012; 2:e000747.

Table 1

Studies providing cash payments/incentives to reduce HIV risk behaviors as of April 2012 (n=16)

| Target Population                            | Primary author                                 | Study Years | Location                     | Study Base       | Study Design   | Sample Size                                      | Study Name   | Transfer Type   | Conditionality  | Main Outcome                                       | Measure of Effect  |
|--|--|-------------|------------------------------|------------------|--|--|--|---|---|--|--|
| Orphans and Vulnerable Adolescents and Youth | Ssewamala <sup>43</sup>                        | 2005–2008   | Uganda                       | School based     | Cluster randomized controlled trial<br>Randomized at school level  | 260 individuals<br>15 schools                    | SUUBI  | Savings account for secondary schooling or a family business  | Conditional<br>Attending 12 asset building and financial planning workshops<br>Contributing to matched savings  | Intention to engage in sexual risk taking behavior | $\beta$ : -1.64 (95% CI: -2.92, -0.35) **  |
|  | Hallfors <sup>44</sup>                         | 2007–2009   | Zimbabwe                     | School based     | Cluster randomized controlled trial<br>Randomized at school level  | 329 individuals<br>25 schools                    |  | Assistance with school costs  | Unconditional   | School dropout                                     | Adjusted OR: 8.48 (95% CI: 3.6, 19.8) *** <sup>1</sup>   |
|  | Cho <sup>45</sup>                              | 2008–2009   | Kenya                        | School based     | Cluster randomized controlled trial<br>Randomized at household level   | 105 individuals<br>79 households                 |  | Assistance with school costs (uniforms and fees and money to address other problems resulting in absenteeism) | Unconditional   | School dropout                                     | Absolute change: 8% point decrease **  |
|  | Handa <sup>46</sup>                            | 2007–2011   | Kenya                        | Population based | Randomized controlled trial  | 6,000 individuals (estimate)                     | Kenya Cash Transfer for Orphans and Vulnerable Children (CT-OVC)                   | Cash transfer for parent/guardian   | Unconditional   | Sexual behavior                                    | Absolute change: 14% point decrease *  |
|  | American Institutes for Research <sup>47</sup> | 2011–2013   | Zambia                       | Population based | Cluster randomized controlled trial<br>Randomized at the Community Welfare Assistance Committees (CWACS) level | 2000 individuals<br>90 CWACS                     | Zambia Vulnerability grant   | Cash transfer for guardian/ caregiver/ household head   | Unconditional   | Sexual behavior                                    | Study ongoing  |
|  | Baird <sup>31</sup>                            | 2008–2009   | Malawi                       | School based     | Cluster randomized controlled trial<br>Randomized at the enumeration area level                                | 1,289 individuals<br>176 enumeration areas       | Zomba Cash Transfer Program (also known as Schooling, Income, and HIV Risk (SIHR)) | Assistance with school costs and cash transfer for parent/guardian and child                                  | 3 treatment arms<br>Conditional on school attendance for drop out; conditional on school attendance for school girl<br>Conditional on school attendance for drop out; unconditional for school girl<br>Conditional on school attendance for drop out; no transfer for school girl | HIV prevalence<br>HSV-2 prevalence                 | Adjusted OR: 0.36 (95% CI: 0.14, 0.91) *** <sup>2</sup><br>Adjusted OR: 0.24 (95% CI: 0.09, 0.65) *** <sup>2</sup> |
| Adolescents                                  | Pettifor <sup>32</sup>                         | 2011–2013   | South Africa                 | School based     | Randomized controlled trial  | 2,900 individuals (estimate)                     | Swa Koeka (HPTN 068)   | Cash transfer for parent/guardian and child   | Conditional<br>School attendance  | HIV incidence<br>Sexual behavior                   | Study ongoing  |
|  | Karim <sup>27</sup>                            | 2010–2012   | South Africa                 | School based     | Cluster randomized controlled trial<br>Randomized at the school level  | 4,000 individuals<br>14 schools                  | CAPRISA 007 (Reducing HIV in Adolescents (RHIVA))                                  | Cash transfer for child   | Conditional<br>Improved academic performance<br>School attendance<br>Passing examinations<br>HIV test participating in after school program   | HIV incidence<br>Sexual behavior                   | Study ongoing  |
|  | Minnis <sup>28</sup>                           | 2010–2012   | San Francisco, United States | Population based | Randomized controlled trial (pilot study)  | 180 individuals (estimate)<br>60 social networks | Yo Puedo: Future Opportunities for Youth   | Cash transfer for child   | Conditional (participant defined)   | Use of reproductive health care services           | Study ongoing  |

| Target Population      | Primary author   | Study Years | Location      | Study Base       | Study Design  | Sample Size                       | Study Name   | Transfer Type                                  | Conditionality   | Main Outcome   | Measure of Effect   |
|------------------------|--|-------------|---------------|------------------|---|-----------------------------------|--|--|--|--|---|
| Adolescents and Adults | Same-aged members of their social network<br>Self-identify as Latino |             |               |                  | Randomized at the social network level                                |                                   |  |  | Educational and skill development<br>Participation in reproductive health activities                             | Pregnancy and childbearing attitudes and norms<br>Behaviors associated with pregnancy  |   |
|                        | Females and males<br>Average age: 14<br>Grade 6                      | 2003–2005   | Kenya         | School based     | Cluster randomized controlled trial<br>Randomized at the school level | 70,000 individuals<br>328 schools |  | Assistance with school costs (school uniforms) | Unconditional  | Childbearing (girls)   | Absolute change: 1.5%<br>point decrease<br>Relative change: 10% decrease *  |
|                        | Females<br>Primiparous<br>Under age 18                               | 1991–1993   | United States | Clinic based     | Randomized controlled trial   | 286 individuals                   | Dollar-a-Day Program                                     | Cash transfer for individual                   | Conditional (2 groups)<br>Remaining non-pregnant<br>non-pregnant AND participation in weekly peer support groups | Repeat pregnancy   | Absolute change: 4%<br>point decrease<br>Relative change: 9% decrease <sup>†</sup>  |
|                        | Females and males<br>15 years of age and older                       | 2004        | Malawi        | Population based | Randomized controlled trial   | 2,812 individuals                 | Malawi Diffusion and Ideational Change Project (MDICP)   | Cash transfer for individual tested            | Conditional<br>Learning HIV status   | Learning HIV test results  | Absolute change: 43%<br>point increase<br>***   |
|                        | Females and males<br>12–24 years of age                              | 2004        | Mexico        | Population based | Observational   | 3,743 individuals                 | Oportunidades  | Cash transfer for parent/guardian              | Conditional<br>Participation in health promotion activities<br>School attendance                                 | Sexually active (girl)<br>Condom at last sexual intercourse (girls)<br>Sexually active (boys)<br>Condom at last sexual intercourse (boys)              | Absolute change: 6.1%<br>point increase<br>Absolute change: 17.5%<br>point increase<br>Absolute change: 32.6%<br>point decrease<br>Absolute change: 64.8%<br>point increase   |
|                        | Females and males<br>16–75 years of age                              | 2006        | Malawi        | Population based | Randomized controlled trial   | 1,307 individuals                 | Malawi Incentives Project (part of the Malawi Diffusion) | Cash transfer to individual tested             | Conditional  | HIV incidence (women)<br>Condom use (women)<br>Risky sexual behavior (women)<br>HIV incidence (men)<br>Condom use (men)<br>Risky sexual behavior (men) | No effect (no estimate given)<br>No effect (Absolute change: 0.0% points)<br>Absolute change: 6.7%<br>point decrease *<br>No effect (no estimate given)<br>Absolute change: 5.2%<br>point increase *<br>Absolute change: 9.0%<br>point increase |

| Target Population | Primary author                       | Study Years                                      | Location | Study Base       | Study Design                                  | Sample Size                                       | Study Name   | Transfer Type                               | Conditionality                   | Main Outcome   | Measure of Effect   |
|-------------------|--------------------------------------|--|----------|------------------|---|---|--|---|----------------------------------|--|---|
|                   |                                      |  |          |                  | Randomized at the individual or couple level  |   | and Ideational Change Project (MDICP)                      |   | • Negative HIV test after 1 year |  | point increase  |
| Females 15–24     | Celentano and Kerrigan <sup>33</sup> | 2012–2015  | Tanzania | Population based | Community cluster randomized controlled trial | 12,000 individuals in larger trial<br>24 clusters | Iringa Combination HIV Prevention Trial                    | Cash transfer for parent/guardian and child | Unconditional                    | HIV incidence  | Study ongoing   |
| Adults            | de Waalque <sup>50</sup>             | 2009–2010; ongoing follow-up through Spring 2011 | Tanzania | Population based | Randomized controlled trial                   | 2,399 individuals                                 | RESPECT (Rewarding STI Prevention and Control in Tanzania) | Cash transfer to individual tested          | Conditional<br>Negative STI test | STI incidence (Chlamydia trachomatis, Neisseria gonorrhoeae, Trichomonas vaginalis, Mycoplasma genitalium) | Adjusted RR high-value transfer arm to control: 0.73 (95% CI: 0.47,0.99) **<br>Adjusted RR high-value transfer arm to low-value transfer arm: 0.69 (95% CI: 0.45,0.92) ** |

<sup>1</sup>The referent in the adjusted OR (AOR) are girls not exposed to the cash transfer

<sup>2</sup>No significant difference in effect among conditional versus unconditional intervention groups, or between individuals enrolled in school at baseline and individuals who had already dropped out.

\* P value 0.10

\*\* P value 0.05

\*\*\* P value 0.01

<sup>†</sup>No P value given