ORIGINAL RESEARCH ARTICLE

Cash Transfers to Increase Antenatal Care Utilization in Kisoro, Uganda: A Pilot Study

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Abstract

The World Health Organization recommends four antenatal visits for pregnant women in developing countries. Cash transfers have been used to incentivize participation in health services. We examined whether modest cash transfers for participation in antenatal care would increase antenatal care attendance and delivery in a health facility in Kisoro, Uganda. Twenty-three villages were randomized into four groups: 1) no cash; 2) 0.20 United States Dollars (USD) for each of four visits; 3) 0.40 USD for a single first trimester visit only; 4) 0.40 USD for each of four visits. Outcomes were three or more antenatal visits and delivery in a health facility. Chi-square, analysis of variance, and generalized estimating equation analyses were performed to detect differences in outcomes. Women in the 0.40 USD/visit group had higher odds of three or more antenatal visits than the control group (OR 1.70, 95% CI: 1.13-2.57). The odds of delivering in a health facility did not differ between groups. However, women with more antenatal visits had higher odds of delivering in a health facility (OR 1.21, 95% CI: 1.03-1.42). These findings are important in an area where maternal mortality is high, utilization of health services is low, and resources are scarce. *(Afr J Reprod Health 2015; 19[3]: 144-150).*

Keywords: Maternal mortality; conditional cash transfers; prenatal care; delivery location sub-sharan Africa

Résumé

L'Organisation mondiale de la Santé recommande quatre consultations prénatales pour les femmes enceintes dans les pays en développement. Les transferts de fonds ont été utilisés pour encourager la participation à des services de santé. Nous avons examiné si les transferts de fonds modestes pour la participation à des soins prénatals pourraient augmenter la fréquentation aux services des soins prénatals et d'accouchement dans un établissement de santé à Kisoro, en Ouganda. Vingt-trois villages ont été randomisés en quatre groupes: 1) pas d'argent; 2) 0,20 dollars américains (DA) pour chacune des quatre visites; 3) 0,40 DA pour une seule visite du première trimestre seulement; 4) 0,40 DA pour chacune des quatre visites. Les résultats étaient trois consultations prénatales ou plus et l'accouchement dans un établissement de santé. Nous avons mené une analyse de la variance Chi-carré et d'équations d'estimation généralisées pour détecter les différences dans les résultats. Les femmes du groupe de visite de 0,40 DA étaient plus susceptibles de trois consultations prénatales ou plus que le groupe de témoin (OR 1,70, IC à 95%: 1,13 à 2,57). Les chances de l'accouchement dans un établissement de santé ne sont pas différentes parmi les groupes. Cependant, les femmes avec plus de visites prénatales étaient plus susceptibles d'accoucher dans un établissement de santé (OR 1,21, IC à 95%: 1,03 à 1,42). Ces résultats sont importants dans une région où la mortalité maternelle est élevée, où l'utilisation des services de santé est faible, et les ressources sont rares. *(Afr J Reprod Health 2015; 19[3]: 144-150).*

Mots-clés: mortalité maternelle; transferts monétaires conditionnels; soins prénatals; lieu d'accouchement, Afrique sub-saharienne

Introduction

Although the World Health Organization recommends four antenatal care visits for pregnant women living in developing countries, according to the most recent data from the Demographic and Health Survey (DHS), in Uganda most pregnant women attend only one or two visits[1,2]. While the impact of antenatal care on directly reducing maternal mortality rates has been debated, it is clear that participation in antenatal care facilitates women's interactions with the health care system. Evidence suggests that women who attend more antenatal care are more likely to deliver in a health facility, and delivery in a health facility has been shown to reduce maternal mortality[3]. Moreover, antenatal service use provides potentially optimal opportunities to deliver other pertinent preventive

services and health education, including well-woman, family planning, and sexually transmitted infection services.

In recent years, conditional cash transfer (CCT) programs have received considerable attention as a means of increasing utilization of healthcare services among disadvantaged populations. CCT programs are a form of performance-based payments in exchange for compliance with certain behaviors, such as sending one's child to school or attending regular health check-ups. CCT specifically target beneficiaries, rather than the agents delivering services[4]. Governments in a number of countries have implemented CCT programs, and evidence is growing that these programs increase utilization of health services and improve clinical outcomes[5-14].

The amount of cash transferred has varied between programs, with most programs providing the average value of a day's work to help alleviate the financial burden of utilizing the health system[5]. These CCT programs have given participants meaningful cash amounts that help offset costs of daily living. For example, in Mexico's *Oportunidades* program, participants received 25% of household consumption per year, while in Honduras, women received 10% of household consumption per year[5,14]. In low-income countries where government budgets are limited, instituting cash transfer programs that require considerable funds may not be feasible.

While the use of CCT has become popular in Latin America and South Asia, little is known about the potential benefits of CCT in African countries, which continue to have among the highest rates of maternal mortality and extreme access to care issues. Moreover, even less is known about whether modest cash incentives would have a meaningful effect on health care utilization and outcomes. We designed a pilot study to determine the minimum cash threshold that may successfully incentivize utilization of antenatal care in Kisoro, Uganda.

Methods

Setting

The Kisoro district is situated in the southwest corner of Uganda, bordering Rwanda and the Democratic Republic of Congo. It is one of the most densely populated districts in the country, with an estimated population of 273,000. Kisoro is comprised of 14 principally rural sub-counties. More than 90% of the population is subsistence farmers and most households cannot produce surplus crops for sale. The literacy rate is 33%, and the physician to population ratio is 1:90,000[15].

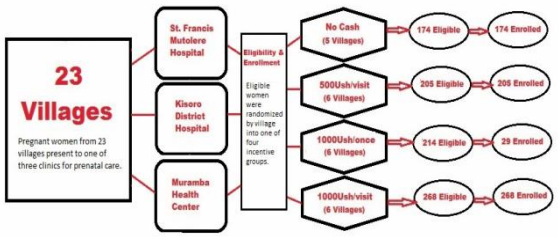
There are two hospitals in Kisoro. Kisoro District Hospital (KDH) is a public facility of the Ugandan Ministry of Health, and it is the district's only public hospital. St. Francis Mutolere Hospital is a private, non-profit, community hospital run by the Roman Catholic Church of Uganda. In addition to these two hospitals, a network of public health centers throughout the district provides varying levels of care (level I- level IV), with higher levels offering more services. For example, level III and IV health centers are assigned at least one fulltime midwife and clinical officer and are equipped to provide antenatal and postnatal care, as well as uncomplicated vaginal deliveries. Each of the 14 sub-counties in the district has at least one level III health center[15].

Study Design

Twenty-three villages in Muramba sub-county were randomized into one of four groups (villages were unit of randomization): 1) no cash (control); 2) 500 Ugandan shillings (USh) or 0.20 United States Dollars (USD) per visit for a maximum of four visits; 3) 1000 USh or 0.40 USD for a single first trimester visit only; 4) 1000 USh per visit or 0.40 USD for a maximum of four visits. One large bunch of bananas costs approximately 1000 USh. These 23 villages were selected because of their close proximity to Muramba Health Center Level III, KDH, and St. Francis Mutolere Hospital, and most women from these villages attend antenatal care at one of these three sites (Figure I). Community health workers informed villagers about the study. Pregnant women over the age of 18 from selected villages were enrolled into the study when they presented for antenatal care at Muramba Health Center Level III, KDH, or St. Francis Mutolere Hospital. Midwives at each of these sites obtained verbal consent from eligible women prior to performing their antenatal visit. Midwives were blinded to group allocation.

Eligible women were enrolled into the study between November 2011 and August 2012. Institutional review boards at the Albert Einstein College of Medicine, the University of Michigan, and each participating Ugandan site approved the study protocol.

Figure I. Screening, enrollment, and randomization



To determine the number of antenatal visits for each participant, midwives at each of the three sites documented in a separate log the names and addresses of the women they enrolled, as well as the date of each antenatal visit, age, parity, and HIV status. The log was delivered weekly to a research assistant who then delivered the appropriate cash amount to each participant in her home according to her village's random assignment, within two weeks of her antenatal visit. A research assistant also determined place of delivery by self-reports from participants or from report by community health workers.

Data Analysis

Our two outcomes of interest were: 1) receipt of three or more antenatal visits (versus less than three visits); 2) delivery in a health facility (yes or no). Although baseline rates of antenatal care in each of the 23 villages is largely unknown and there may be differences between villages, we accounted for this by controlling for possible village-level effects in our multi-level regression analysis. Baseline characteristics among randomization groups were compared using chi-squared tests for categorical data and analysis of variance for group means. Differences in outcomes between groups were further compared using simple and multivariable generalized estimating equation (GEE) to account for the cluster randomization (i.e. village level effect) and to control for significant woman-level covariates, including age, parity, and location of antenatal care. GEEs produce more appropriate estimates of statistical significance than traditional regression techniques given the potential dependence in the outcome variables due to village level correlations. Two-sided tests were considered statistically significant at alpha=0.05. Analyses were conducted in SAS, version 9.3 (SAS Institute, Inc).

Results

A total of 676 women were enrolled in the study: 26% in the control group, 30% in the 0.20 USD/visit group, 4% in the 0.40 USD for the first trimester visit only, and 40% in the 0.40 USD/visit group. A total of 9 women miscarried, and 6 women were lost to follow-up. At baseline, the 4 groups were similar with respect to age, parity, HIV status, and location of antenatal care (Table I).

The proportion of women who attended three or more antenatal care visits was 23% overall and differed across randomization groups (p=.0084) (Table I). Compared to the control group, the unadjusted odds of participating in three or more antenatal care visits was nearly twice as high for the 0.40 USD/visit group (OR 1.76, 95% CI: 1.17-2.65), but was not significantly different for the other groups. After controlling for age, parity, and location of antenatal care visits, the odds of participating in three or more antenatal care visits remained higher for the 0.40 USD/visit group compared to the control group (OR 1.70, 95% CI: 1.13-2.57) (Table II).

The proportion of women who delivered in a health facility was 70% overall and differed across randomization groups in unadjusted analysis (p=.009) (Table I). In multivariable models, the odds of delivering in a health facility were similar across groups (Table III). Finally, the number of antenatal care visits was significantly associated with delivery in a health facility. The odds of delivering in a health facility was approximately 20% higher for each additional antenatal care visit (OR 1.21, 95% CI: 1.03-1.42) (Table IV). Parity was also associated with delivery in a health facility in our model, while other covariates had no effect.

Table I: Baseline Characteristics

	Treatment Groups				P-value
	No cash (n=171)	**0.20 USD/ visit (n=200)**	**0.40 USD/ visit (n=261)**	**0.40/ once (n=29)**	
Age (mean)	25.6	25.4	26.4	23.8	0.05
Gravidity (mean)	3.4	3.1	3.3	2.8	0.45
Parity (mean)	2.5	2.3	2.4	1.8	0.26
HIV prevalence (%)	0.6	1.0	0.4	0	0.82
Location (%)					
(1) Kisoro District Hospital	30	31	35	62	.005*
(2) Muramba Health Center	67	67	63	38	0.016*
(3) St. Francis Mutolere Hospital	3	3	2	0	0.75
Mean # antenatal visits	1.91	1.88	2.06	2.62	.0007*
% ≥ 3 visits	24.56	22.00	31.03	48.28	.0084*
% delivery in health facility	68.52	61.62	73.91	85.71	.009*

°Results are presented as proportions or means. P-values from comparisons.
across groups using one-way ANOVA and chi-square
* Significance level at alpha of 0.05.

Table II: Effect of Modest Cash Incentives on Receiving ≥ 3 Visits

	Unadjusted		Adjusted	
	Odds Ratio	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**
No cash (ref)				
0.20 USD/visit	0.96	0.60 – 1.55	0.92	0.58-1.44
0.40 USD/once	1.00	0.64 – 1.57	1.00	0.66-1.51
0.40 USD/visit	1.76*	1.17-2.65*	1.70*	1.13-2.57*

°Results are presented as odds ratios with 95% confidence intervals from general estimating equations adjusting for age, parity, and location of antenatal care
*P<0.05

Table III: Effect of Modest Cash Incentives on Delivery in a Health Facility

	Unadjusted		Adjusted	
	Odds Ratio	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**
No cash (ref)				
0.20 USD/visit	0.78	0.35 – 1.71	0.68	0.31-1.50
0.40 USD/once	1.08	0.44 – 2.65	0.98	0.38-2.55
0.40 USD/visit	1.28	0.70-2.36	1.28	0.70-2.34

° Results are presented as odds ratios with 95% confidence intervals from general estimating equations adjusting for age, parity, and location of antenatal care

Table IV: Relationship Between Number of Antenatal Visits and the Odds of Delivery in a Health Facility

	Odds Ratio	**Confidence Interval**
#visits (unadjusted)	1.30*	1.10-1.52*
#visits (adjusted)	1.21*	1.03 – 1.42*

° Results are presented as odds ratios with 95% confidence intervals from general estimating equations adjusting for age, parity, and location of antenatal care.
*P<0.05

Discussion

In our pilot study of the impact of CCT on the utilization of antenatal care services, we found that even modest cash incentives may improve maternal health care for pregnant women in rural Uganda. On average, participants who received

0.40 USD/visit were nearly two times as likely to attend three or more antenatal care visits as women who received no cash.

By randomizing women to different cash amounts, we were able to assess the minimum cash value necessary to increase antenatal care utilization. Although 0.40 USD is only one-fifth of the average woman's daily wage in Kisoro, even this small cash amount resulted in large health service attendance gains. While CCT programs have largely been used to overcome cost barriers

(e.g., such as travel time and missed work), our findings suggest that there may be alternative explanations to the success of CCT beyond alleviating the costs of healthcare utilization. It is possible that providing even a small reward for attending antenatal care increases the value women attach to these services, resulting in higher rates of participation[16].

On the other hand, an opposite trend was noted among women in the 0.20 USD/visit groups, who had lower rates of attendance of three or more antenatal visits and of delivery in a health facility than in the control group. While these effects were not statistically significant, this may suggest a threshold effect for the amount of incentives offered. Additionally, perhaps a trivial CCT amount may discourage women from using health services if they do not attribute value to the cash amount. This is consistent with behavioral economics theory, which describes "motivation crowding out," or an undermining effect of rewards on the desired action. This theory suggests that providing incentives may actually undermine autonomy and result in the opposite desired effect. For example, field experiments show that parents were more often late in picking up their children from daycare when a fine was imposed than before[17,18]. Overall, further research is needed to understand the mechanisms that explain the effect of modest cash incentives on women's pregnancy-related health seeking behaviors.

The mean number of antenatal visits in our study was two, which is lower than documented rates from the recent Ugandan DHS in 2011 (4% of rural women attend one antenatal visit, 44% attend two-to-three visits and 46% attend four or more)[2]. Additionally, only 12% of these women from Kisoro presented for antenatal care in the first trimester in our study, compared to 20% of rural women surveyed in the DHS. While we did not study other reasons why women may or may not have sought antenatal services, it is likely that there remain many complex and unclear reasons for use or nonuse of antenatal services. CCT may be only one solution to increasing antenatal care utilization in remote areas, especially where access is a barrier.

We also explored whether CCT for antenatal care utilization would increase delivery in a health facility. We found no significant differences between treatment groups regarding place of delivery. However, the study was underpowered to detect a difference in place of delivery, and the proportion of women in each group who delivered in a health facility was high (e.g., 60% among controls). This may reflect the strong presence of community health workers in Muramba sub-county who specifically encourage women to deliver in a health facility and the close proximity of Muramba sub-county to the two district hospitals[19]. It is possible that CCT for antenatal care utilization in more remote sub-counties that do not have community health workers would have an effect on place of delivery, though this requires further study. Research is also needed to determine if directly incentivizing women to deliver in a health facility, rather than only incentivizing antenatal care utilization, would decrease the number of home births in Kisoro and other African countries.

Our finding that the use of antenatal services was associated with delivering in a health facility among women in our study is consistent with reports of others[3]. The positive effects of delivering in a health facility on a range of maternal and infant outcomes, including reduced maternal mortality, have been well documented[20,21]. Thus, specific efforts to target increased antenatal care utilization may be an important component of public health programs focused on reducing maternal morbidity and mortality[22,23].

Our study has several limitations. First, results of our sample from largely rural Ugandan women may not be generalizable to other groups, especially since we were only able to collect a limited number of demographic characteristics. The study may have been subject to selection bias since women were enrolled when they presented for antenatal care, and these women may have been more likely to attend antenatal care, regardless of whether they were in the control or incentive groups, compared to other women in the community. Furthermore, although antenatal health care utilization was increased in one CCT group and the number of antenatal visits was associated with delivery in a health facility, it remains unknown whether modest CCT has a

clinically meaningful effect on pregnancy outcomes, which we did not measure. Lastly, programs that are designed to change behaviors may have unintended consequences, such as increased pregnancy rates, that could not be captured in this study[24].

In conclusion, modest cash incentives increased utilization of antenatal services and antenatal care utilization was associated with an improved likelihood of delivery in a health facility among these women in Kisoro, Uganda. Our findings have important public health implications in an area where maternal mortality is high, utilization of health services is low, and resources are scarce.

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Contribution of Authors

NT and GP conceived the study design. CK, GP, NT, and MB developed the study protocol. MI and CK coordinated and performed data collection. MI performed data entry. GK performed data analysis.

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