

Effect of a Lottery Intervention on Gender-Based Violence among Female Sex Workers in Dar es Salaam, Tanzania

Results from a Randomized Trial

Rebecca Hémono

Marianna Balampama

Damien de Walque

Sandra I. McCoy

William H. Dow



WORLD BANK GROUP

Development Economics

Development Research Group

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Abstract

Financial incentives are a promising approach for HIV prevention. Some studies have shown that financial incentive interventions aimed to promote positive health and social behaviors have mixed or harmful effects on gender-based violence, and little is known about their effects among higher risk groups such as female sex workers. To address this gap, this study investigated the relationship between a lottery-based incentive and gender-based violence among female sex workers in Dar es Salaam, Tanzania. Data were analyzed from the RESPECT II trial, which enrolled 2,206 female sex workers in Dar es Salaam, Tanzania, to evaluate the effect of a lottery-based incentive on HIV and sexually transmitted infections. Participants were randomized in a one-to-one ratio to: (1) the basic test group (control), which provided baseline testing and counseling for HIV and sexually transmitted infections and bi-weekly text messages on safe sex practices; or (2) the lottery group, which included the basic test group intervention plus entry into a weekly random lottery for an award of 100,000 Tanzanian shillings conditional on negative tests for sexually transmitted infections (syphilis and trichomonas vaginalis). An intent-to-treat analysis was conducted to estimate differences in physical and sexual gender-based violence (overall), and

intimate partner violence and non-partner violence between treatment arms at endline, with estimates expressed as unadjusted prevalence differences with 95 percent confidence intervals. Adjusted estimates controlled for baseline reports of violence. Multiple imputation and inverse-probability of treatment weighting were used to account for missing data. Causal, population-level impacts were estimated using g-computation. Gender-based violence, intimate partner violence, and non-partner violence declined in both treatment arms over the study period among the sample of 1,117 female sex workers retained at endline. The lottery group had a lower prevalence of gender-based violence overall, intimate partner violence, and non-partner violence compared to control at endline; however, the differences were not statistically significant. The results indicate that the lottery intervention had no effect on violence outcomes among endline participants in the RESPECT II trial. These results suggest that this economic approach does not pose additional risks of violence in the context of sex work; however, they must be interpreted with caution due to high attrition in the study sample. Additional research is warranted to examine how this incentive mechanism impacts violence for female sex workers.

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Rebecca Hémono, Marianna Balampama, Damien de Walque, Sandra I. McCoy, William H. Dow.

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* Affiliations: Rebecca Hemono, University of California, Berkeley; Marianna Balampama, Independent scholar, Tanzania; Damien de Walque, Development Research Group, The World Bank; William Dow, University of California, Berkeley, and NBER; Sandra I McCoy, University of California, Berkeley. We are grateful for financial support from the Strategic Impact Evaluation Fund (SIEF) and Knowledge for Change Program (KCP), managed by the World Bank. We are grateful to Kathleen Beegle for useful comments. We would like to thank the study team at Innovations for Poverty Action Tanzania for their support with data collection and all study participants for their time participating in our research. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the authors' institutions or funders or of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent. All errors are our own.

Introduction

Female sex workers (FSW) are a key population who experience a disproportionately high risk of both HIV and gender-based violence (GBV).¹⁻⁴ In Sub-Saharan Africa, the prevalence of HIV among FSW is estimated at nearly 30%,³ and a study in Tanzania found that more than 50% of FSW had experienced physical or sexual violence in their lifetime.⁵ The interconnected, bidirectional relationship between GBV and HIV is particularly critical for FSW,⁶ who often have limited choices about clients and constrained decision-making before and during sex.⁶⁻⁹ FSW experiencing GBV are more likely to have higher risk sexual behaviors,⁷ increased HIV incidence,⁶ and poor HIV outcomes including suboptimal treatment adherence.^{10,11} In parallel, living with HIV also increases risk of GBV for FSW, with a study in Tanzania reporting that one-third of HIV-positive FSW had experienced violence in the past 6 months.¹⁰

In many settings, these sexual and reproductive health risks occur against a backdrop of poverty and economic insecurity, among other structural factors, which serve as primary drivers of sex work.¹²⁻¹⁴ Poverty and debt may exacerbate risks of GBV through the creation of additional pressure and urgency to work for sex in order to pay for basic needs such as food and rent.^{12,15} This can create a dynamic whereby FSW are not able to decline violent clients and thus have heightened vulnerability to coercion and physical and sexual violence, including forced condomless sex, increasing their risk of HIV and other sexually transmitted infections (STIs).^{12,16}

Financial incentives have gained increasing attention for their potential to improve a wide range of health and social outcomes, including HIV¹⁷⁻¹⁹ and their positive downstream effects on reducing GBV.²⁰⁻²² Providing conditional incentives or economic rewards has been shown to improve health behaviors via extrinsic motivation²³ and/or by addressing poverty as a primary factor influencing health and well-being. Employing this approach could potentially lower the risk of incident STIs and/or HIV for FSW through providing an economic benefit that would offset the increase in revenue earned for condomless sex.^{9,24}

At the same time, offering financial incentives could also reduce client violence, as economic support could permit FSW to avoid clients known to be violent or who present risk behaviors for physical or sexual GBV, such as threats or hostility.¹⁵ Individuals who encourage or force women into condomless sex and other risky sexual behaviors are also more likely to perpetrate GBV.²⁵⁻²⁷ Thus, if a financial incentive motivates FSW to avoid these risky partners and prevent STIs or HIV, it may also have beneficial spillover effects on GBV through reducing contact with clients who are violent. In the context of intimate partner violence (IPV), the opportunity to receive a financial incentive could also potentially be sufficient for FSW to avoid or leave violent partners in instances where women stay with violent relationships for financial stability.^{28,29}

Previous studies have demonstrated positive effects of social protection and empowerment programs such as cash transfers and other financial incentive interventions on physical or sexual violence with intimate partners in the general population.³⁰⁻³⁵ However, some studies have found mixed or negative effects on IPV in certain subgroups^{31,36-39} and there is a dearth of evidence on how incentives affect violence among FSW specifically,^{40,41} a key population with heightened vulnerability to both GBV and HIV. Moreover, while financial incentive programs have

demonstrated potential to improve HIV outcomes for FSW, most existing research has focused on cash transfer interventions (i.e., small, regular transfers) and little is known about how other types of interventions (e.g., lotteries) affect women's safety, including violence perpetrated by non-partners. We aimed to address this gap by assessing the effects of a lottery-based incentive mechanism on GBV among FSW participating in the RESPECT II study, a large-scale randomized trial conducted in Dar es Salaam, Tanzania from 2018-2022. The objective of our study was to determine whether lottery-based incentives mitigate or exacerbate risk of violence, including both IPV and non-partner violence, in the FSW population.

Methods

Study design, participants, and procedures (RESPECT II trial)

The RESPECT II (“Rewarding STI Prevention and Control in Tanzania”) trial was conducted with 2,206 FSW in Dar es Salaam, Tanzania from 2018-2022 to evaluate the effect of a lottery-based incentive intervention on HIV and STIs (AEA RCT registry: [AEARCTR-0002677](#))⁴². Respondent-driven sampling was used to identify FSW from various locations (bars, brothels, street) and enroll eligible participants via a coupon system. Ten seeds were selected and were provided with three coded recruitment coupons which were used to recruit participants at sex work venues, including bars, brothels, and the street. FSW who were enrolled and who completed a baseline survey were given three additional coupons to recruit other peers into the study. The recruitment process continued until the desired sample size was enrolled. Those who helped with recruitment were given 4,000 TZS per participant recruited and enrolled (~ \$2 USD), for up to three participants.

Individuals meeting the following criteria were eligible to participate in the study: 1) female; 2) exchanged sexual intercourse for money in the past 6 months; 3) HIV-negative at enrollment; 4) ≥ 18 years; 5) not currently pregnant; 6) lived in Dar es Salaam for past three months and plan to remain living in Dar es Salaam for at least 2 years following enrollment; 7) have a cell phone able to receive text messages; 8) able to adequately grant informed consent; 9) in possession of a valid coupon (obtained through Respondent-driven sampling).

Upon providing informed consent, FSW were enrolled and randomized in a 1:1 ratio to either 1) the basic test group (control group), which provided testing and counseling for HIV, HSV2, syphilis and trichomonas vaginalis at baseline and endline, and bi-weekly text messages on safe sex practices; or 2) the lottery group, which provided the basic test group intervention *plus* entry into a random lottery for the opportunity to win a cash prize. In the lottery, ten FSW were randomly selected each week for testing of syphilis and trichomonas vaginalis, two curable STIs with reliable, low-cost testing available. Participants who presented for testing were awarded 100,000 TZS (~\$50 USD) incentive if they received negative test results for both STIs. All participants received free treatment for STIs and counseling if they had a positive test result.

The lottery was designed as a low-probability, high-reward incentive scheme. On average, participants in the lottery group were randomly selected for STI testing one time over the intervention period (24 months) but could receive a large incentive amount of 100,000 TZS each time their name was drawn, conditional on a negative test result. This scheme was developed based

on theory suggesting that there is preference for a large potential award, even if the chances of winning are low, compared to a guaranteed small award.^{43,44}

Baseline data were collected from August 2018-February 2019. Data collection was paused from March-October 2020 due to COVID-19; endline data collection was completed from June 2021-January 2022. Surveys were conducted by research assistants from Innovations for Poverty Action Tanzania in Kiswahili on tablets. All surveys were administered in private spaces at a clinic and included an assessment of past 3-month physical and sexual violence.

Outcomes

In this pre-specified⁴⁵ secondary analysis of RESPECT II data, we estimated the effect of the lottery intervention on GBV, expressed as the proportion of FSW who experienced physical and/or sexual violence perpetrated by a spouse, boyfriend, or other sexual partner in the past three months. This outcome was measured as a binary variable and was assessed through an endline survey at 36 months.

We also investigated the effect of the lottery intervention on two distinct forms of GBV: 1) IPV, defined as physical and/or sexual violence perpetrated by a boyfriend or spouse; and 2) physical and/or sexual violence perpetrated by a non-partner (i.e., other sexual partners including, but not limited to clients). These forms of GBV are not mutually exclusive and are both components of the GBV indicator described above.

Sample size and power

The sample size for this study was pre-determined based on the RESPECT II trial, which enrolled 2,206 participants at baseline to achieve 80% power to detect a 30-percentage point difference in the primary trial outcome of combined HIV/HSV2 incidence. In this analysis, after accounting for anticipated endline attrition and estimated baseline reports of past 3-month experiences of GBV (35%), we estimated that we would have 80% power (type I error rate of 5%) for a minimum detectable effect of the lottery intervention on GBV of at least 8-percentage points.

Statistical analysis

Analyses were conducted in R version 4.04.⁴⁶ Per our pre-specified analysis plan, we descriptively explored sociodemographic characteristics and tested for baseline imbalances between treatment arms using chi-square and t-tests. An intent-to-treat analysis was conducted expressing differences in endline violence between treatment arms as unadjusted prevalence differences (PD) with 95% confidence intervals (CI) using an additive risk model (binomial distribution, identity link). Adjusted estimates were generated to control for baseline reports of violence.

We used two approaches to account for missing outcome data for 1,089 participants (49.4%) in the sample who were not reached for endline surveys and lost to follow-up: multiple imputation and inverse-probability of censoring weighting (IPCW). Multiple imputation was conducted with 20 iterations and estimates were pooled across datasets. IPCW was conducted with age, marital status, parental status (child vs. not), and duration of time living in Dar es Salaam as predictors for missingness (variables which significantly predicted missingness in the trial's primary endline analysis); weights were compared across treatment arms. Models generated using

multiple imputation and IPCW were compared with a complete case analysis (excluding missing outcome data) as a sensitivity analysis.

We also used g-computation to estimate the causal, population-level impact of being randomized to the random test group on violence. This analysis estimates how violence would be affected if everyone in the study population were to have received the lottery-based incentive intervention vs. no intervention. Marginal prevalence differences were estimated by setting the exposure for all endline participants (unweighted, complete cases only) to the control group and then to the lottery group, predicting risks for each exposure status, and taking the mean difference of the predicted outcomes; 95% CIs were constructed using bootstrapping.

Ethics

Ethical approval for the RESPECT II trial was obtained from the Committee for Protection of Human Subjects at University of California, Berkeley (Protocol 2015-08-7849) and the National Institute for Medical Research in Tanzania (NIMR/HQ/R.8a/Yol.IXI 2770). Research assistants from Innovations for Poverty Action Tanzania participated in a two-day training on ethical research practices, including GBV research. Participants were offered referrals for GBV and mental health services, as needed. All participants provided written informed consent or verbal consent if illiterate.

Results

A total of 2,489 individuals were approached for inclusion and 2,206 were enrolled in the trial and randomized (Figure 1). Of those enrolled, 1,117 participants (50.6%) completed endline surveys. The remaining 1,089 participants (49.4%) could not be located using their contact information or through in-person visits and were determined to be lost to follow-up.

Figure 1. Trial profile

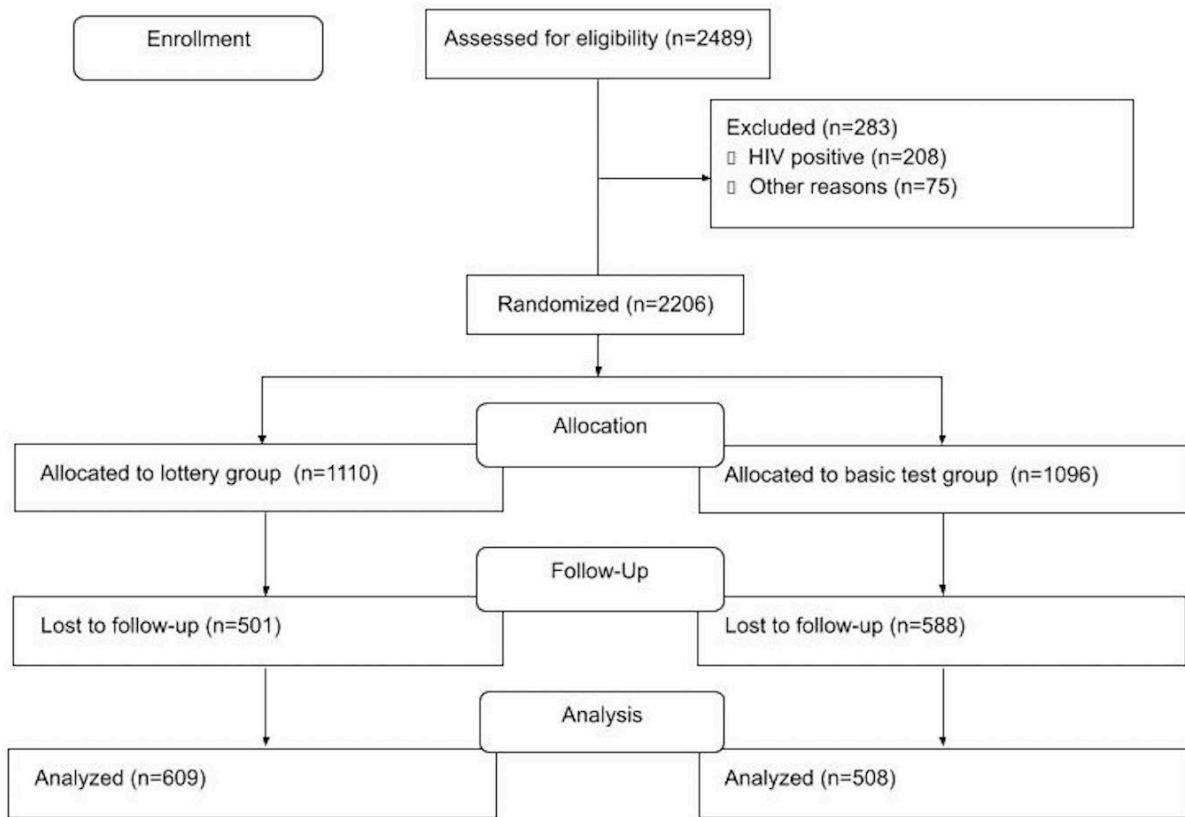


Table 1 presents the characteristics of study participants at baseline by treatment arm. The mean age of participants was 26 years and 89.7% had completed primary school or higher. The majority (97.8%) were not partnered or cohabitating; 70.6% reported having children. Sex work was the most common source of income (98.0% of participants) and 120 USD was the mean monthly income.

Sociodemographic characteristics were similar between the sample retained at endline and those who were lost to follow-up, however endline participants were slightly older in age, were more likely to have children, and had more children than those who were lost to follow-up. (Supplemental Table 1).

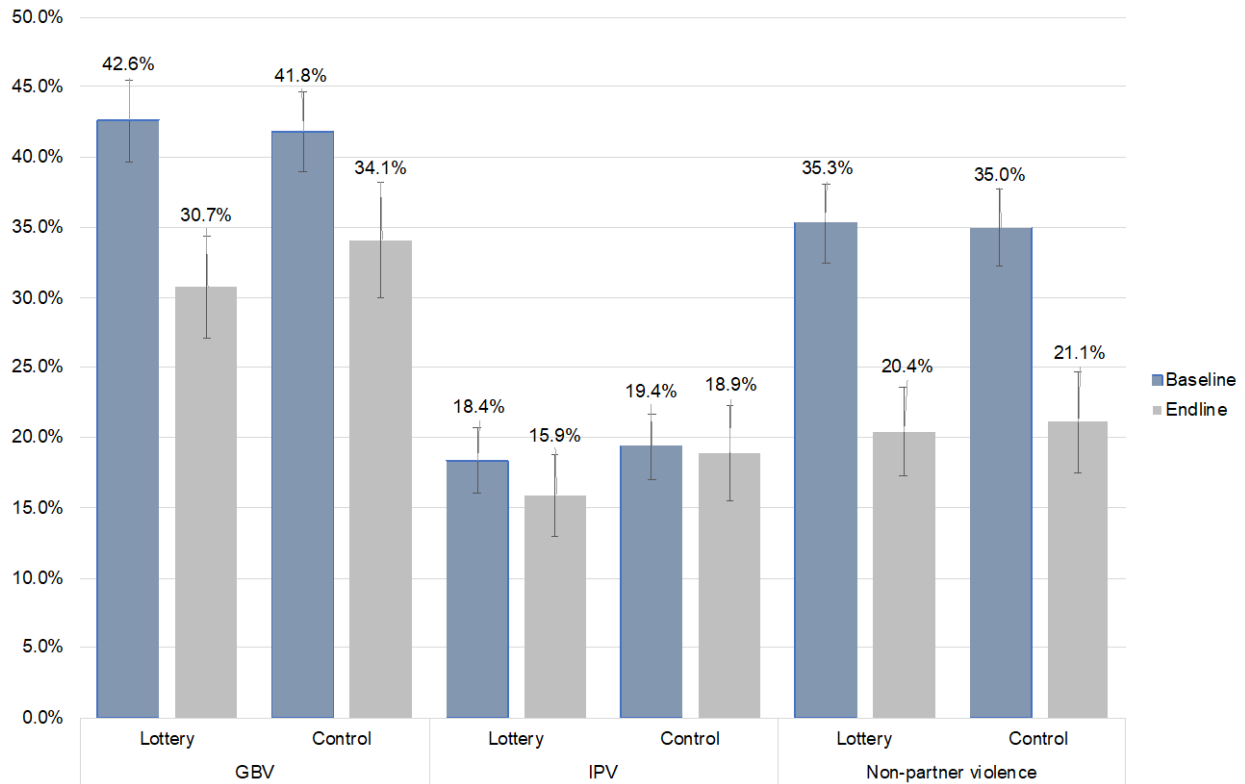
Table 1. Baseline characteristics of study participants in the RESPECT II trial

	Control (n=1096)	Treatment (n=1110)	Overall (n=2206)
Age			
Mean ± SD	26 ± 6.6	27 ± 6.8	26 ± 6.7
Median (IQR)	25 (21, 30)	25 (21, 30)	25 (21, 30)
Highest level of education			
None	38 (3.5%)	42 (3.8%)	80 (3.6%)
Some primary	69 (6.3%)	77 (6.9%)	146 (6.6%)
Primary complete	652 (59.5%)	648 (58.4%)	1300 (58.9%)
More than primary	337 (30.7%)	343 (30.9%)	680 (30.8%)
Marital status			
Married/cohabitating	22 (2.0%)	26 (2.3%)	48 (2.2%)
Non-partnered	1074 (98.0%)	1083 (97.6%)	2157 (97.8%)
Has child(ren)			
	774 (70.6%)	784 (70.6%)	1558 (70.6%)
Number of children*			
Mean ± SD	1.6 ± 0.91	1.7 ± 1.1	1.7 ± 0.99
Median (IQR)	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)
Main source of income			
Exchanging sex for money	1083 (98.8%)	1079 (97.2%)	2162 (98.0%)
Other	13 (1.2%)	26 (2.3%)	39 (1.8%)
Monthly income (USD)			
Mean ± SD	120 ± 150	120 ± 130	120 ± 140
Median (IQR)	87 (52, 150)	87 (52, 170)	87 (52, 160)
GBV overall*			
	458 (41.8%)	473 (42.6%)	931 (42.2%)
Physical	379 (34.6%)	385 (34.7%)	764 (34.6%)
Sexual	262 (23.9%)	270 (24.3%)	532 (24.1%)
IPV overall*			
	213 (19.4%)	204 (18.4%)	417 (18.9%)
Physical	156 (14.2%)	160 (14.4%)	316 (14.3%)
Sexual	125 (11.4%)	120 (10.8%)	245 (11.1%)
Non-partner violence overall*			
	384 (35.0%)	392 (35.3%)	776 (35.2%)
Physical	308 (28.1%)	319 (28.7%)	627 (28.4%)
Sexual	214 (19.5%)	224 (20.2%)	438 (19.9%)

*Reported in past 3-months

The baseline prevalence of past three-month GBV overall was 42.2%. Non-partner violence (35.2%) was more common than IPV (18.9%). Physical violence was the most frequently reported type of GBV (34.6%), IPV (14.3%), and non-partner violence (28.4%).

Figure 2. Prevalence (and 95% CIs) of past 3-month violence over the study period (2018-2022), by treatment arm



Violence declined across all forms of violence in both treatment arms over the study period, however decreases were larger in the lottery group than in the control group. Overall, the prevalence of GBV declined by 7.7 percentage points (pp) in the control group and 11.9 pp in the lottery group. The prevalence of IPV declined by 0.5 pp in the control group and 2.5 pp in the lottery group; the largest decreases were observed with non-partner violence, which declined by 13.9 pp in the control group and 14.9 pp in the lottery group.

Table 2. Effects of the RESPECT II lottery intervention on past 3-month gender-based violence, intimate partner violence, and non-partner violence among FSW at 36 months

	Control (n=508)	Lottery (n=609)	Complete case PD (95% CI)	Multiple imputation PD (95% CI)	IPCW PD (95% CI)	G-computation PD (95% CI)
GBV*	173 (34.1%)	187 (30.7%)	-0.03 (-0.09, 0.02)	-0.04 (-0.09, 0.02)	-0.04 (-0.09, 0.02)	-0.03 (-0.08, 0.18)
IPV*	96 (18.9%)	97 (15.9%)	-0.03 (-0.07, 0.01)	-0.03 (-0.08, 0.03)	-0.04 (-0.08, 0.01)	-0.03 (-0.08, 0.01)
Non-partner violence*	107 (21.1%)	124 (20.4%)	-0.01 (-0.06, 0.04)	0.00 (-0.05, 0.05)	-0.01 (-0.06, 0.04)	-0.01 (-0.06, 0.04)

Data presented as frequency and %; unadjusted prevalence differences with 95% CI generated using generalized linear models with binomial family and identity link

*Reported in past 3-months

The lottery group also had a lower prevalence of all forms of violence at endline compared to control (Table 2). In the complete case analysis, GBV overall and IPV were 3 pp lower in the lottery group than in the control group and there was a 1 pp difference in non-partner violence between treatment arms. However, in all models (unadjusted and adjusted complete case analyses, and after accounting for missingness), the differences in violence were not statistically significant (Table 2, Supplemental Table 2).

The predicted marginal prevalence estimated using g-computation was consistent with the observed conditional prevalence. Population-level estimates of GBV overall, IPV, and non-partner violence were modestly lower in the intervention group (GBV and IPV: 3 pp lower in lottery group vs. control; non-partner violence: 1 pp lower in lottery vs. control), however the width of the confidence intervals indicates no statistical differences between treatment arms.

Discussion

This study investigated the impact of a lottery-based incentive intervention on violence outcomes among FSW in Dar es Salaam, Tanzania to explore whether this financial incentive mechanism mitigates or exacerbates risks of GBV, if at all. We found that at baseline, more than 40% of FSW had experienced physical or sexual violence overall (19% IPV; 35% non-partner violence) in the past three months. We observed declines in all forms of violence in both treatment arms at the end of the intervention period. Although there was a modestly lower prevalence of GBV overall, IPV, and non-partner violence in the lottery group compared to control, there were no significant differences between treatment arms, indicating no effect of the lottery-based incentive on violence outcomes in this population.

While there is mounting evidence that social protection and empowerment programs such as cash transfers and other financial incentive programs can decrease violence against women,^{31,32,34,47-50} to our knowledge, this is the first study to date to examine a lottery-based incentive, and to assess whether a low-probability, high-reward incentive scheme can reduce violence among a key population that experiences high risk of GBV.^{1,2,4,51} Our findings are consistent with studies conducted in the general population which have shown that cash transfers do not affect GBV.^{37,52} Yet, while we did not find any beneficial effects of the lottery-based incentive on violence, we also did not observe any harmful effects, as has also been found in some studies in other populations.^{31,37,47} These results underscore that financial incentives may have heterogeneous effects on violence depending on the study population and incentive approach, and therefore should be examined carefully to ensure the safety and effectiveness in each beneficiary population before implementation.

Our baseline results also add to the evidence that FSW experience an alarmingly high burden of violence, as demonstrated in other studies.^{1,2,4,51} Notably, endline participants reported decreases in all forms of violence over the study period, particularly non-partner violence, which decreased by approximately 40% in both treatment arms. This finding is inconsistent with the existing literature on GBV during COVID-19 indicating that domestic violence increased since the onset of the pandemic,^{53,54} although most previous studies investigated the acute effects of the pandemic on GBV during the initial lockdown/confinement period in 2020 and focused on IPV specifically, which limits their comparability to our finding in this study. In the context of FSW, there may have been a unique period effect, whereby changing social dynamics during the COVID-19 pandemic could have limited interactions with violent perpetrators including clients and reduced the prevalence of GBV⁵⁵. However, there are few rigorous studies which have examined the relationship between COVID-19 and GBV,⁵⁴ thus additional research is needed to better understand the effects of the protracted pandemic on all forms of violence, especially among individuals at high-risk of non-partner violence such as FSW. While it is also possible that the observed decreases in GBV could be related to attrition in the study sample (i.e., women experiencing violence may have been more likely to be lost to follow-up), the baseline prevalence of violence was similar among endline participants and those who were lost to follow-up, which increases confidence that our results were not driven by preferential attrition related to GBV.

The high attrition in this study had important implications for our analysis. The RESPECT II trial was designed and powered for the primary outcome of combined incidence of HSV2 and HIV; with the sample size of the parent trial, this analysis was not powered to detect modest GBV effects of less than 8-percentage points. The substantially reduced endline sample size, with approximately half of all participants lost to follow-up at 36 months, further limited our power and our ability to detect an effect. Attrition may have been due to high mobility in the FSW population⁵⁶ and contextual factors relating to COVID-19, including heightened migration and study delays/longer follow-up periods. Difficulties reaching participants at endline were exacerbated by changing government regulations in Tanzania which required all mobile phone numbers to be registered using biometrics (fingerprints) and national ID cards; those who did not register lost access to their phone number, which was our main mode of contact with study participants. While multiple imputation and IPCW were employed to account for missing outcomes, these techniques may not be sufficient or appropriate for such a high level of missingness and it is possible that the assumptions required for these approaches were not met (i.e., participants were missing at random). Other limitations include the GBV assessment included in the survey, which did not examine violence specifically perpetrated by clients (only “other

sexual partners”). This impeded our ability to isolate client violence to determine whether there were reductions with this important sub-group as a result of the intervention and to explore our hypothesis that FSW may be more likely to decline clients known to be violent if they had the opportunity to receive a large sum of money elsewhere and did not need to depend on them for income. Finally, this study investigated the lottery-based incentive scheme among FSW only and has limited generalizability to the general population or other key populations that may be beneficiaries of conditional financial incentive programs.

Despite these limitations, this study fills an important gap in the literature of economic interventions and GBV. Our study sought to understand how lottery-based incentives uniquely affect experiences of violence for FSW. The relationship between different financial incentive schemes, such as cash transfers, and GBV has been widely studied, however no previous studies have examined lottery-based incentives specifically, which could motivate participants differently than other approaches, as lotteries do not ensure a cash award, but offer a higher award if received. Few studies on financial incentives have also been conducted with key populations such as FSW, who experience high risk of both HIV and GBV. Using a randomized design with an endline sample of more than 1,110 individuals, this study remains the first of its kind and size to explore this critical question about the effects of lottery-based incentives on violence for FSW.

Improving our understanding of financial incentives for FSW is particularly pertinent as lottery-based incentives have been shown to have positive impacts on other important sexual and reproductive health outcomes such as HIV⁵⁷⁻⁶⁰ and STI⁶¹ testing and prevention, and there is increased interest and investment in financial incentives for reducing risky sexual behaviors and decreasing HIV incidence,⁶² particularly for vulnerable groups who have a high prevalence of GBV such as FSW. Incentives are emerging as a promising approach to address HIV/STIs, and our findings build on this evidence to suggest that lottery-based incentives do not create any unintended harms of violence in the context of HIV/STI prevention for FSW. This might be due to the design of the lottery as a low-probability, high-reward incentive scheme, which did not guarantee consistent economic support and improve financial agency or decision-making, as a regular conditional cash transfer might have, for example.

Given the high loss to follow-up at endline, additional investigation is warranted to further assess the safety of this approach for FSW. Enhanced retention procedures, such as incentive-based tracing, may be beneficial for maintaining study participation among this population. Future studies might also explore the lottery-GBV relationship among women in the general population, and examine whether this economic approach has differential impacts depending on the regularity, incentive amount, and probability of receiving the award.

Supplemental Table 1. Baseline characteristics comparing participants who participated in endline vs. lost to follow-up

	Control		Treatment		Overall		
	Lost to follow-up (n=588)	Endline sample (n=508)	Lost to follow-up (n=501)	Endline sample (n=609)	Lost to follow-up (n=1089)	Endline sample (n=1117)	p-value (comparing overall*)
Age							0.001
Mean ± SD	25 ± 6.2	28 ± 6.9	25 ± 6.0	28 ± 7.3	25 ± 6.1	28 ± 7.1	
Median (IQR)	24 (21, 28)	26 (22, 32)	24 (21, 28)	25 (22, 32)	24 (21, 28)	26 (22, 32)	
Highest level of education							0.559
None	15 (2.6%)	23 (4.5%)	20 (4.0%)	22 (3.6%)	35 (3.2%)	45 (4.0%)	
Some primary	39 (6.6%)	30 (5.9%)	30 (6.0%)	47 (7.7%)	69 (6.3%)	77 (6.9%)	
Primary complete	341 (58.0%)	311 (61.2%)	297 (59.3%)	351 (57.6%)	638 (58.6%)	662 (59.3%)	
More than primary	193 (32.8%)	144 (28.3%)	154 (30.7%)	189 (31.0%)	347 (31.9%)	333 (29.8%)	
Marital status							0.725
Married	11 (1.9%)	11 (2.2%)	11 (2.2%)	15 (2.5%)	22 (2.0%)	26 (2.3%)	
/cohabitating							
Non-partnered	577 (98.1%)	497 (97.8%)	490 (97.8%)	593 (97.4%)	1067 (98.0%)	1090 (97.6%)	
Has child(ren)	385 (65.5%)	389 (76.6%)	342 (68.3%)	442 (72.6%)	727 (66.8%)	831 (74.4%)	<0.001
Number of children							
Mean ± SD	1.5 ± 0.81	1.7 ± 0.99	1.7 ± 1.1	1.8 ± 1.0	1.6 ± 0.96	1.8 ± 1.0	0.001
Median (IQR)	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)	
Main source of income							0.372
Exchanging sex for money	580 (98.6%)	503 (99.0%)	491 (98.0%)	588 (96.6%)	1071 (98.3%)	1091 (97.7%)	
Other	8 (1.4%)	5 (1.0%)	8 (1.6%)	18 (3.0%)	16 (1.5%)	23 (2.1%)	
Monthly income (USD)							0.569
Mean ± SD	120 ± 180	120 ± 110	110 ± 110	120 ± 150	120 ± 150	120 ± 130	
Median (IQR)	87 (52, 170)	87 (52, 150)	87 (52, 150)	96 (57, 170)	87 (52, 150)	87 (56, 160)	
GBV	252 (42.9%)	206 (40.6%)	207 (41.3%)	266 (43.7%)	459 (42.1%)	472 (42.3%)	0.994
Physical	206 (35.0%)	173 (34.1%)	172 (34.3%)	213 (35.0%)	378 (34.7%)	386 (34.6%)	0.975
Sexual	142 (24.1%)	120 (23.6%)	115 (23.0%)	155 (25.5%)	257 (23.6%)	275 (24.6%)	0.610
IPV	118 (20.1%)	95 (18.7%)	97 (19.4%)	107 (17.6%)	215 (19.7%)	202 (18.1%)	0.347
Physical IPV	86 (14.6%)	70 (13.8%)	76 (15.2%)	84 (13.8%)	162 (14.9%)	154 (13.8%)	0.503
Sexual IPV	69 (11.7%)	56 (11.0%)	55 (11.0%)	65 (10.7%)	124 (11.4%)	121 (10.8%)	0.729
Non-partner violence	214 (36.4%)	170 (33.5%)	167 (33.3%)	225 (36.9%)	381 (35.0%)	395 (35.4%)	0.888
Physical	168 (28.6%)	140 (27.6%)	141 (28.1%)	178 (29.2%)	309 (28.4%)	318 (28.5%)	0.998
Sexual	119 (20.2%)	95 (18.7%)	93 (18.6%)	131 (21.5%)	212 (19.5%)	226 (20.2%)	0.691

Missing data: marital status (n=1), main source of income (n=3)

*p-value comparing all participants who were lost to follow-up vs. in the endline sample

Supplemental Table 2. Adjusted effects of the RESPECT II lottery intervention on gender-based violence, intimate partner violence, and non-partner violence at 36 months, controlling for baseline reports of violence

	Control (n=508)	Lottery (n=609)	Complete case PD (95% CI)	Multiple imputation PD (95% CI)	IPCW PD (95% CI)	G-computation PD (95% CI)
GBV	173 (34.1%)	187 (30.7%)	-0.04 (-0.09, 0.02)	-0.04 (-0.10, 0.01)	-0.03 (-0.09, 0.02)	-0.04 (-0.08, 0.01)
IPV	96 (18.9%)	97 (15.9%)	-0.03 (-0.07, 0.02)	-0.03 (-0.08, 0.01)	-0.04 (-0.08, 0.01)	-0.03 (-0.07, 0.02)
Non-partner violence	107 (21.1%)	124 (20.4%)	-0.01 (-0.06, 0.03)	0.01 (-0.06, 0.03)	-0.01 (-0.05, 0.04)	-0.01 (-0.06, 0.03)

Data presented as frequency and %; adjusted prevalence differences with 95% CI generated using generalized linear models with binomial family and identity link, controlling for baseline reports of violence

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