Cost-Effectiveness Analysis of Female Condoms

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CLEAR FUTURE
INCORPORATED

TOTAL
IMPACT
CAPITAL

Introduction and Executive Summary

Female/internal condoms (FCs) are the only women-initiated contraceptive method that protects women from both unintended pregnancy and sexually transmitted infections (STIs), including HIV. As the only dual protection method that women can use without their partner's active participation, female/internal condoms are uniquely positioned to provide women with control over safer sex, their own health, and their families' health. Studies show that many women and men prefer female condoms over male condoms for reasons such as comfort, lack of male responsibility, and increased control over safe sex.

Women in lower income countries are at especially high risk for HIV, STIs, and unplanned pregnancies, which can lead to unsafe abortions or maternal death. The Lancet estimates that over 160 million women have unmet contraception needs, and a recent report found that about half (49%) of pregnancies in low-and middle-income countries (111 million annually) are unintended. In 2015 alone, an estimated 3.3 billion risky sex acts occurred without condoms in Sub-Saharan Africa, leading to 910,000 new HIV infections.

However, despite female condoms' unique benefits, growing demand, and massive need, their procurement and availability remains relatively limited. The United Nations Commission on Life-Saving Commodities for Women and Children listed female condoms as one of the top 13 high-impact but often overlooked life-saving commodities that "if more widely accessed and properly used, could save the lives of more than 6 million women and children."

As global health funding needs vastly exceed available resources, it is critical to invest in the most efficient, cost-effective solutions that maximize the impact of each dollar and ensure long-term sustainability. This report therefore examines the evidence for investment in female condoms, including an analysis of cost-effectiveness, return on investment, and wider economic impacts.

This business case first conducts a cost-effectiveness analysis using peer-reviewed modeling tools to calculate (for four case study countries) both the cost of providing one million female condoms and the resulting economic benefits in terms of 1) cost savings to the health system, and 2) economic productivity losses avoided through the use of female condoms. At a high level, this cost-effectiveness analysis shows that the economic benefits from female condoms far outweigh the costs. Across the four case study countries, the ROI ranges from a $1 investment in female condoms yielding $4.22 in economic benefits, to a $1 investment yielding $8.48 in economic benefits.

This business case then analyzes existing evidence of cost-effectiveness inputs that go beyond this initial analysis, namely studies demonstrating that when female condoms are available, there are higher rates of protected sex than when only male/external condoms are available. Across studies analyzed, after the introduction of female condoms, unprotected sex decreased by between 27%-81%. This report then discusses broader macroeconomic benefits of increased contraceptive access and closes with recommendations for the future.

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High Level Methodology

To calculate the return on investment, the authors first assessed the expected cost of the intervention. Building on the methodology used in The Équilibres & Populations and Global Health Vision's report, "The Business Case for Female Condoms," we used a hypothetical number of 1 million female condoms to calculate a) the cost of delivering 1 million FCs in each of the four case study countries and b) the resulting projected cost savings and economic benefits. We selected four case study countries: Kenya, Mozambique, Tanzania and Uganda based on availability of data, historical programming, and proven demand from countries and donors. We assume the same quantity of units would be distributed in each country to enable intercountry comparison.

The authors then modeled the economic benefits of delivering 1 million female condoms in each of the four case study countries. For this analysis, economic benefits include:

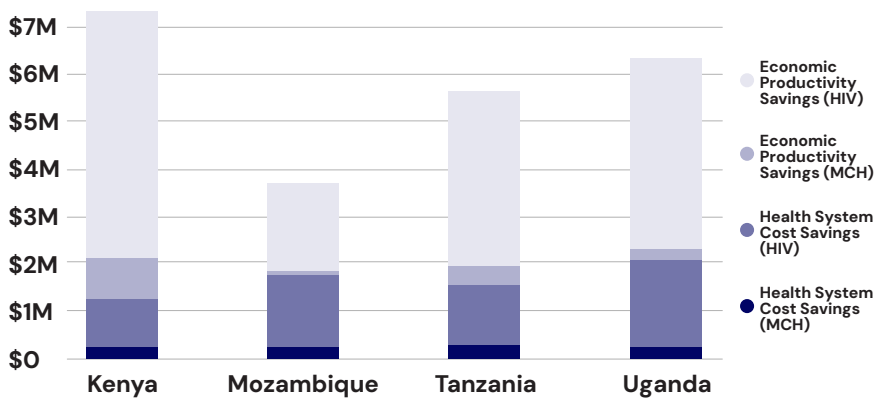
1. Cost savings to the country's health system due to not needing to treat the maternal morbidity and the HIV/AIDS cases averted through the use of female condoms
2. Economic productivity losses that are avoided through both the lives saved and continued workforce participation of adults who avoid maternal mortality and HIV infection due to the use of female condoms

Quantifying Expected Costs

To calculate the total costs of delivering 1 million FCs in each case study country, we include both the per-unit commodity cost and the per-unit programming cost. Programming costs for female condoms include activities around user awareness, education, demonstrations, and behavior change communication.

This analysis used a female condom commodity cost of $0.60 per unit, which has been a stable price for female condoms over many years. To calculate the per unit programming cost, the authors reviewed The Female Health Company (FHC)'s data on their in-country programming costs (implemented by Pathfinder International). From 2017 to 2024, the programming cost averaged $0.01 per FC in Mozambique, $0.04 per FC in Uganda, $0.10 in Kenya, and $0.22 per FC in Tanzania. For a conservative estimate, we assumed a programming cost of $0.25 per FC in each country.

Applying the same conservative per-unit commodity cost and per-unit programming cost across each case study country, it costs $850,000 ($600,000 in commodity costs plus $250,000 in programming costs) to distribute 1 million female/internal condoms in each country.



Quantifying expected economic benefits

As outlined in the methodology section, economic benefits include: 1) cost savings to the country's health system realized through not needing to treat the maternal morbidity and HIV and cases averted due to the use of female/internal condoms and 2) economic productivity losses that are avoided by preventing maternal mortality and HIV cases through the use of female/internal condoms.

To calculate cost savings, the authors first projected the maternal morbidity cases averted through distribution of 1 million FCs for each of the four case study countries using Marie Stopes International (MSI)'s Impact 2 model, a peer-reviewed, open-source modeling tool.[9] MSI's Impact 2's outputs include unintended pregnancies averted, maternal deaths, child deaths, and DALYs averted, and the healthcare costs saved for the inputted service provision level. These healthcare costs include antenatal care and delivery care, obstetric complications, unsafe abortion related costs, and newborn interventions. The model is pre-populated with data by country on the prevalence of each complication and average costs in each country for treating specific complications and providing pregnancy-related care. For HIV infections averted, we referenced a peer-reviewed article that quantified the number of HIV infections prevented by female condoms in our case study countries.[10] To calculate the costs that health systems can save by not having to treat these cases, we leveraged the methodology used in the "The Business Case for Female Condoms" report and cross referenced these calculations with other article methodologies (for more information, see Additional Methodology Section A).

The economic benefits of investing in female condoms are substantial. For country governments, investment in FCs will result in direct cost savings to the health system and millions of dollars in productivity losses averted.

The second benefit is the economic productivity losses avoided through the continued workforce participation of adults who prevent HIV infection and maternal mortality through FCs. To calculate this for maternal mortality, we leveraged the conservative assumptions in "The Business Case for Female Condoms" that maternal mortality cases occur at age 38; that the economy loses 20 years of productivity from each woman (age 38-58); and that each woman earns their country's average Gross National Income (GNI) per working-age adult each year. These losses are multiplied by the number of maternal deaths prevented by 1 million FCs in each case study country. To calculate economic impact for HIV cases, we used an approach from a peer-reviewed article on the projected economic productivity of an adult living with HIV with access to antiretroviral therapy (ART) (see Additional Methodology Section B).

On the following page, **Table 1**, demonstrates the total economic benefits of delivering 1 million female condoms in each case study country. The economic benefits of investing in female condoms are substantial. For country governments, investment in FCs will result in direct cost savings to the health system and millions of dollars in productivity losses averted. For donors, investing in FCs translates to more productive economies and less support needed for maternal and child health (MCH) complications and HIV treatment costs in the long term.

Economic Return on Investment (ROI)

Assessing the expected costs of the intervention (programming and commodity costs) relative to the expected economic benefits in each case study country, female condoms provide an excellent return on investment. In Kenya, a $1 investment in female condoms offers $8.48 in economic benefits. In Mozambique, $1 yields $4.22 in economic benefits; in Tanzania, $1 yields $6.67; and in Uganda, $1 yields $7.52.

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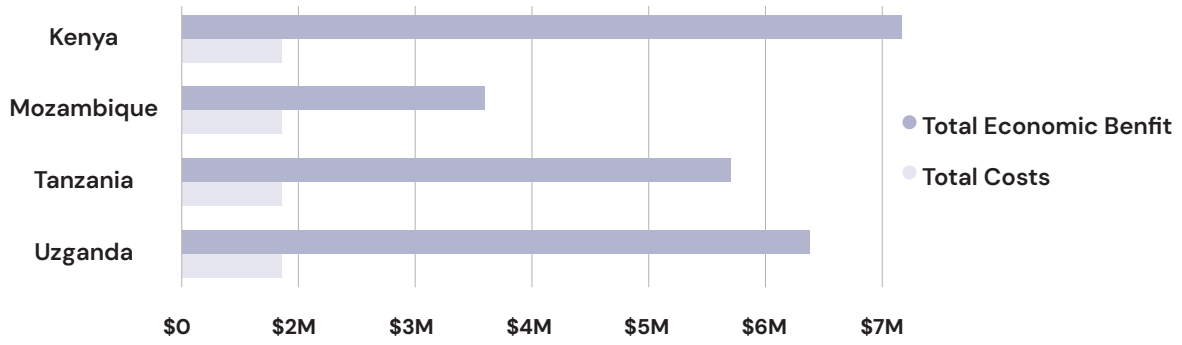
Table 1

1M Female Condoms	Total Cost	Total Economic Benefits	ROI
Kenya	$850,000	$7,203,861	8.48
Mozambique	$850,000	$3,589,567	4.22
Tanzania	$850,000	$5,666,396	6.67
Uganda	$850,000	$6,393,782	7.52

Graph 2

Economic return on investment for 1 Million Female Condoms



In addition to the economic benefits, the health impact of providing 1 million FCs is substantial. Table 2 below summarizes the impact metrics from MSI's Impact 2 Model and the calculations from the peer-reviewed article that quantified the number of HIV infections prevented by FCs (using PSI's DALY calculator).[11]

Table 2

1M Female Condoms	Kenya	Mozambique	Tanzania	Uganda
# of unintended pregnancies averted	2,347	2,347	2,347	2,347
# of HIV infections averted	120	170	140	200
# of maternal deaths averted	7	3	5	4
# of child deaths averted	33	44	42	56
# of unsafe abortions averted	676	853	638	534

Other studies on female condoms' cost-effectiveness: The authors' literature review also highlighted several studies documenting other metrics of cost-effectiveness. One study in 2012 aimed to assess the affordability and relative cost-effectiveness of a US-based intervention to provide female condoms and health education. The results found that distributing 200,000 FCs and health education would cost $414,000, and that 1.13 HIV infections would have to be averted for the program to be cost saving from a societal perspective. The analysis indicated that the intervention averted 23 HIV infections, demonstrating substantial cost savings.[12] Other research examined FC's impact and cost-savings for preventing STIs. One article found that female sex workers in Thailand who had the option of using FCs in situations where male condoms were not used had STI incidence rates that were 24% lower than those using male condoms only.[13] Another study assessed the cost-effectiveness of an intervention to distribute FCs to female sex workers in South Africa. Distributing 6,000 FCs was projected to avert 6 HIV infections, 33 gonorrhea infections, and 38 syphilis infections and "to pay for itself in averted HIV and STI treatment costs."[14]

Additional layers of female condoms' cost-effectiveness

In addition to this analysis demonstrating female condoms' high return on investment, there are numerous studies that demonstrate additional layers of impact and cost-effectiveness above and beyond what is captured in the calculations above.

First and foremost, many studies show that **when female condoms are available, there are higher rates of protected sex than when only male condoms are available.** A systematic review of 137 articles and abstracts and 5 RCTs found that female condom provision increases the rate of protected sex across diverse study populations.[15] The authors created a table (see Annex) summarizing a number of the studies referenced in the systematic review, along with additional articles that detail the findings on the increase in protection rates as a result of female condom provision.

Across the studies summarized, after **the introduction of female condoms, unprotected sex decreased by between 27%-81%.** Study populations ranged from commercial sex workers in Madagascar to US family planning clients. Moreover, the studies found that the female condom is not just a substitute for male condoms; they can be complementary and often contribute to increased use of both types of condoms.[16]

When female condoms are available, there are higher rates of protected sex than when only male condoms are available.

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Furthermore, the systematic review noted that many studies suggest female condoms reach women who are less likely to use other dual protection methods.17 For example, in India, 65% of participating sex workers reported using the female condom when their partner or client did not use a male condom.18 An evaluation in South Africa found that one-third of the women stated that they could use the FC in situations where men refused to use male condoms.19 In Zimbabwe 36% of women who were inconsistent condom users said they could use female condoms more consistently than male condoms because they did not have to rely on the man to wear it.20

Studies also found that female condoms often compare favorably to male condoms. In one study, 80% of women in a South African short-term crossover trial favored the FC1 and FC2 over male condoms.[21] In another South African study, 74% of men said that the FC was "better or much better" than the MC. After 6 months, 97% of women reported that their partners were supportive of using the FC.[22] In Papua New Guinea, 90% of female sex workers reported liking the FC.[23] Users cite advantages over the male condom such as comfort, perceived safety, enhanced pleasure, potential for use during menstruation, increased sense of power for safer sex negotiation, and ability to be used if client/partner does not like or refuses male condoms.[24]

> Female condoms reach women who are less likely to use other dual protection methods.

Importantly, a scoping review found that "lack of availability and access" was the most commonly cited contributing factor for female condom non-use or discontinuation.[25] This points to a critical opportunity to fill a substantial need – if female condoms are made more widely available, increased use and protection could occur at even higher rates and at a larger scale.

Additionally, female condoms can prevent non-consensual condom removal (an act that is more likely to occur with male condoms), in which a sexual partner removes a condom without permission during sex or initiates condomless sex despite having been asked to wear a condom.[26] A 2018 study found that 32% of adult women had experienced non-consensual condom removal.[27]

Conclusion and Recommendations for the Future

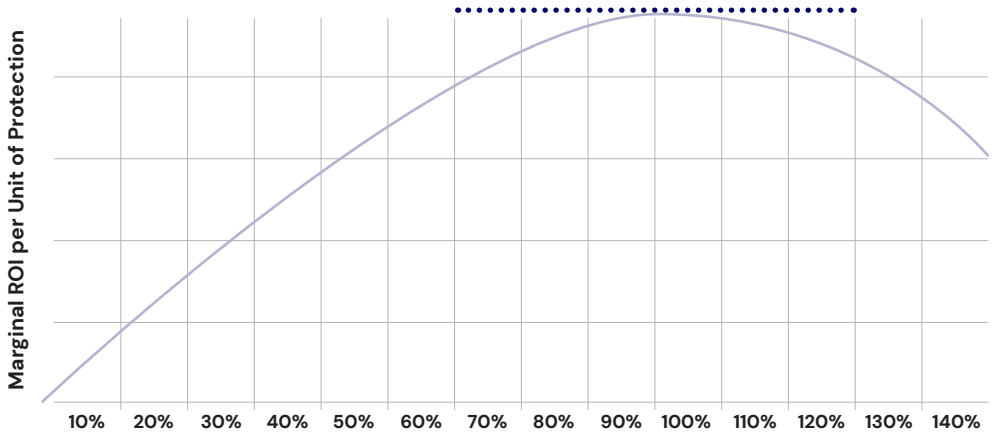
As the only female-controlled contraceptive method that protects against both unintended pregnancy and STIs including HIV, female/internal condoms are essential to achieve both substantial cost savings and widespread impact. Our initial analysis demonstrates that the female condom's effectiveness at preventing maternal morbidity, mortality, and HIV infections makes it a highly cost-effective intervention in and of itself, with a $1 investment in FCs achieving between $4.22 to $8.48 in economic benefits across case study countries.

Beyond these initial benefits, female/internal condoms reach those who otherwise would not be reached and protect risky sex acts that otherwise would not be protected. Although male/external condoms are widely available, there is still a significant proportion of sex acts that remain unprotected, suggesting that male/external condoms alone do not meet the needs of all sexually active individuals, and that male condoms' market reach may be approaching a natural limit. Female/internal condoms are therefore a critical component to address this gap and provide protection to couples who do not consistently use male/external condoms. Especially among high-risk populations, the marginal benefit of protecting these risky sex acts is enormous in terms of HIV infections avoided, lives saved, and long-term economic benefits, including upward economic mobility, higher per capita income, and increased economic growth.[28]

In this environment of reduced resources, we cannot afford to leave such a cost-effective tool on the shelf. We need to deploy funding into proven, efficient solutions to maximize the impact of each dollar. It is therefore essential to increase investment to ensure widespread availability of female/internal condoms for all those who need them, catalyzing far-reaching impact, long term benefits, stronger economies, and substantial, sustainable savings to health systems.

Marginal ROI for Male Condoms

Once 100% of demand for a given protection method (e.g. male condoms) is met, the merginal ROI starts to fall — each additional unit supplied provides less benfit



As illustrated above, when male condoms are fully available and accessible to all those who would use them (100% percent of demand met), increasing investment in male condoms starts to produce diminishing marginal returns. However, because only a small portion of existing and potential future demand for female condoms is currently being met, increasing investment in female condoms would lead to high marginal returns.

Additional Methodology

Section A: To estimate cost savings for HIV infections averted through female/internal condoms, the authors used the methodology referenced in the "The Business Case for Female Condoms" report, which applied the Futures Institute's Future Cost of Anti-Retroviral Therapy model. This assumes that all adults requiring ART will require both first-line and second-line therapy and that costs include "ART, laboratory tests, and end-of-life care, but exclude the treatment of opportunistic infections, for an average total lifetime cost (with 3% discount rate) of $8,935 per adult." We then multiplied the average lifetime treatment cost by the number of cases averted through provision of 1 million FCs in each case study country.

We cross referenced these numbers with an additional methodology used in a peer-reviewed article on the cost-effectiveness of FCs in Sub-Saharan African countries and found similar lifetime treatment costs.[29] This article utilized average ART cost per patient-year in low-income countries and modeled the treatment costs when HIV-infected patients are on treatment for 5 years and for 10 years. For reference, a 2021 report estimated that in the United States, the average lifetime HIV-related medical cost for one person with HIV is $420,285 (2019 US$) and $1,079,999 undiscounted for a median 3-year diagnosis delay and 3% base dropout rate.[30]

Section B: To determine the economic impact of averting HIV cases through female condoms, we used the methodology cited in "The Business Case for Female Condoms" report, which leverages an article from Resch et al, "Economic Returns to Investment in AIDS Treatment in Low- and Middle-Income Countries."[31] The authors assumed that over 20 years, adults living with HIV with access to ART will achieve 75% of the productivity of their HIV-negative counterparts, and over 2 years, they will achieve 10% productivity. Using Uganda as an example, the average GNI per capita in 2023 is $3,040,.[32] so for 20 years, a worker living with HIV would earn $760 less per year than an HIV-negative counterpart. For two years, they would earn $2,736 less pear year. In total, averting one HIV infection in Uganda equates to $20,672 in productivity losses avoided. The losses per HIV case in each case study country are then multiplied by the HIV cases averted through 1 million FCs in each country. This analysis assumes full access and adherence to ART and assumes that adults living with HIV/AIDS remain in the workforce. In reality, many people do not have access to ART, and a 2024 report found that "good ART adherence rates in sub-Saharan African (SSA) regions ranged from 43% to 84%.".[33] This analysis is therefore a conservative estimate of economic productivity losses prevented.

Annex

Studies on increase in protection rates or decrease in unprotected sex due to female condoms

Article Name	Data Point	Effect	Link	Country, Year
Twenty years of the female condom programme in South Africa: past, present, and futurepregnancies averted	The level of unprotected sex (no MC or FC use) declined from 43.3% at baseline to 8.4% at 12 months. At their one-month interview, most women (87%) reported that their partners were supportive of using the FC, and at six months this rose to 97%. Eighty per cent of women at one month felt that FC use placed the woman in charge. At their one-month interview, 58% of men said that the FC was 'better or much better' than the MC, and at 12 months this rose to 74%.	Proportion of unprotected sex acts declined by 34.9 percentage points **The level of unprotected sex declined by 80.6%** Or proportion of protected sex increased from 56.6% to 91.6%	https://journals.co.za/doi/epdf/10.10520/EJC-c8100512a	South Africa, 2017
Temporal trends in sexually transmitted infection prevalence and condom use following introduction of the female condom to Madagascar sex workers	Following six months of male condom distribution, participants used protection in 78% of sex acts with clients. Following female condom introduction, protection at months 12 and 18 rose to 83% and 88%, respectively Aggregate STI prevalence declined from 52% at baseline to 50% at month 6. With the female condom added, STI prevalence dropped to 41% and 40% at months 12 and 18, respectively.	10% increase in protected sex (among commercial sex workers) after 12 months of intervention (FC introduction) Or protected sex increased by 13% Unprotected decreased from 22% to 12%. **Unprotected sex declined by 45%** 11% decrease in STIs after 6 months of FC, 12% decrease after 12 months	https://journals.sagepub.com/doi/10.1258/095646207781147175	Madagascar, 2007
Male-condom and female-condom use among women after counseling in a risk-reduction hierarchy for STD prevention	A US study addressed effectiveness through a 'hierarchy' message, a comprehensive intervention emphasizing male and female condoms as equally effective dual protection methods. Post-intervention, the proportion of protected sex acts was significantly higher in the hierarchy group than in the male-condom group (0.59 versus 0.40)	19% increase in proportion of protected sex acts Protected sex increased by 47.5% Unprotected decreased from 60% to 41% **Unprotected sex declined by 31.7%**	https://pubmed.ncbi.nlm.nih.gov/10987447/	US, 2000
Female Condom Use among Female University Students in KwaZulu-Natal, South Africa: Results of a Randomized Behavioral Trial	We evaluated the efficacy of a two-session (enhanced) cognitive-behavioral intervention (EI) (n = 147) against a one-session control (minimal) educational intervention (MI) (n = 149) to promote female condom (FC) use among female students aged 18-28 at a South African university. Both groups reported significant reductions in the number of vaginal intercourse occasions unprotected by either male or female condoms from baseline to the 2.5- and 5-month follow-up. Specifically, at the 2.5-months follow-up, the number of unprotected vaginal sex acts was 0.53 times lower in the MI group and 0.41 times lower in the EI group relative to baseline; at the 5-month follow-up, it was 0.39 times lower in the MI group and 0.40 times lower in the EI group Percentage of vaginal intercourse occasions protected by female or male condom Baseline: 0.5 Minimal intervention (1 session): 0.79 Enhanced intervention (2 session): 0.85	Protected sex increased from 50% to 85% after two educational sessions Protection increased by 70% Unprotected sex declined from 50% to 15% **Unprotected sex decreased by 70%**	https://pmc.ncbi.nlm.nih.gov/articles/PMC4318787/	South Africa, 2016

Annex Continued

Studies on increase in protection rates or decrease in unprotected sex due to female condoms

Article Name	Data Point	Effect	Link	Country, Year
Long-term use of the female condom among couples at high risk of human immunodeficiency virus infection in Zambia	A 1998 study on 99 Zambian couples in sexually transmitted disease (STD) clinics conducted an intervention promoting female condoms, male condoms, and spermicidal film with a 12-month follow-up. **The total proportion of couples reporting unprotected sex decreased from 42% to 10% by the end of the study period, suggesting that the female condom did affect overall decrease in unprotected sex**	Proportion of unprotected sex declined by 32 percentage points **Unprotected sex decreased by 76%** Protected sex increased from 58% to 90% Protected sex increased by 55%	https://pubmed.ncbi.nlm.nih.gov/9587178/ Cited in https://journals.sagepub.com/doi/10.1258/095646206780071036	Zambia, 1998
Effectiveness of an Intervention Promoting the Female Condom to Patients at Sexually Transmitted Disease Clinics	A study in Alabama of 1159 STD clinic patients involved an intervention with education on female and male condoms found that while the female condom was rarely used exclusively, **alternating use with the male condom resulted in an overall increase of protected sex acts from 38% to 76% immediately after the intervention and only a slight decrease to 66% in the sixth month**	38% increase in proportion of protected sex acts **Protected sex acts doubled or 100% increase** Unprotected declined from 62% to 24% Unprotected sex decreased by 61%	https://pmc.ncbi.nlm.nih.gov/articles/instance/1446137/pdf/10667185.pdf	US, 2000
Acceptability of the Female Condom in Different Social Contexts	The use of the female condom, when offered together with the male condom, increased the practice of safe sex. **The proportion of protected sex at last sexual intercourse increased from 31.2% at the beginning of the study to 65.2% at the end, indicating an overall increase of 34% (protected sex doubled)**	34% increase in proportion of protected sex **Protected sex increased by 108% (more than doubled)** Unprotected sex declined from 68.8% to 34.8% Unprotected sex decreased by 49.4%	https://bvsms.saude.gov.br/bvs/publicacoes/128MinistryHealth.pdf Cited in https://www.unfpa.org/sites/default/files/pub-pdf/female_condom.pdf	Brazil, 2000
Patterns and predictors of female condom use among ethnically diverse women attending family planning clinics	A study in the western US among 238 family planning clients found that by the end of the three-month study period, 17% of reported coital acts were protected by the female condom, and **the overall proportion of protected sex acts in the population increased from 44% at baseline to 59% at the end of the study**	15% increase in proportion of protected sex acts Protected sex increased by 34% Unprotected decreased from 56% to 41% Unprotected sex declined by 27%	https://pubmed.ncbi.nlm.nih.gov/12514450/	US, 2003
Protection against sexually transmitted diseases by granting sex workers in Thailand the choice of using the male or female condom: results from a randomized controlled trial	The sex workers received either a male-condom-only intervention or an intervention including the female condom, introduced to participants as a secondary option to the male condom. **At final follow-up, the authors found a 17% reduction in the mean proportion of unprotected sex acts in the intervention (male-condom and female-condom) group**	17% reduction in the proportion of unprotected sexual acts	https://pubmed.ncbi.nlm.nih.gov/9792386/	Thailand, 1998
A prospective study assessing the effects of introducing the female condom in a sex worker population in Mombasa, Kenya	The proportion of participants reporting consistent condom use with all partners increased from 59.7% (89/149) (table 1) just before female condoms were introduced, to 67.1% (100/149) at the last visit (p=0.04)	**7.4% increase in participants reporting consistent condom use with all partners**	https://pmc.ncbi.nlm.nih.gov/articles/PMC2563858/	Kenya, 2006

[1]High acceptability was documented in studies conducted in diverse settings among male and female FC users, with FCs frequently compared favorably to male condoms. https://pmc.ncbi.nlm.nih.gov/articles/PMC5683136/

[2] https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)00936-9/fulltext

[3] https://www.guttmacher.org/report/adding-it-up-investing-in-sexual-reproductive-health-2019

[4] https://www.unaids.org/sites/default/files/media_asset/2016-prevention-gap-report_en.pdf female cited in https://www.sciencedirect.com/science/article/pii/S0304387821001127#b66

[5] https://www.unfpa.org/sites/default/files/pub-pdf/Final%20UN%20Commission%20Report_14sept2012.pdf

[6] Thurston, Sarah and Forbes, Anna. "The Business Case for Female Condoms." The Equilibres & Populations and Global Health Visions. May 2014. This quantity of 1 million female condoms is an achievable volume for one year of programming in countries that are operating at scale.

[7] This price is based on internal data and historical publicly available data from USAID, UNAIDs, and other academic articles. https://www.ghsupplychain.org/sites/default/files/2024-05/FY23%20C%20and%20C%20report_4APR2024-Final.pdf; https://data.unaids.org/gcwa/gcwa_bg_femalecondom_en.pdf?preview=true; https://pubmed.ncbi.nlm.nih.gov/17053355/

[8] Programming focuses on raising awareness on the availability and benefits of the female condom and providing training to providers, clinical mentors, and other key stakeholders. https://www.pathfinder.org/projects/fc2-education-and-promotion-project-africa/ From the annual Pathfinder programming costs and female condom volumes per country, we extrapolated the cost per unit of programming and then scaled both the per unit commodity cost and programming cost to model the cost of distributing 1 million female condoms.]

[9] https://www.msichoices.org/what-we-do/technical-expertise/impact-2/ Accessed April 2025.

[10] https://pubmed.ncbi.nlm.nih.gov/25784820/ Estimating the hypothetical dual health impact and cost-effectiveness of the Woman's Condom in selected sub-Saharan African countries. This article used the peer-reviewed model, Population Services International DALY calculator, to calculate the impact of providing 100,000 female condoms on the HIV infections and DALYs averted. We scaled the HIV cases averted by country to 1 million FCs for our analysis.

[11] https://pmc.ncbi.nlm.nih.gov/articles/PMC4356704/

[12] Holtgrave DR, Maulsby C, Kharfen M, Jia Y, Wu C, Opoku J, West T, Pappas G (2012) Cost-utility analysis of a female condom promotion program in Washington, DC. AIDS and Behavior, 16(5): 1115-1120 cited in https://researchonline.lshtm.ac.uk/id/eprint/4656941/1/LASH%202016%20Brunton%20report.pdf p. 254.

[13] Fontanet A L, Saba J, Chandelying V, Sakondhavat C, Bhiraleus P., others. 1998. "Protection against Sexually Transmitted Diseases by Granting Sex Workers in Thailand the Choice of Using the Male or Female Condom: Results from a Randomized Controlled Trial." AIDS 12 (14): 1851–59. Cited in https://www.ncbi.nlm.nih.gov/books/NBK525195/

[14] Marseille E, Kahn J G, Billinghurst K, Saba J. 2001. "Cost-Effectiveness of the Female Condom in Preventing HIV and STDs in Commercial Sex Workers in Rural South Africa." Social Science and Medicine 52 (1): 135–48. Cited in https://www.ncbi.nlm.nih.gov/books/NBK525195/

[15] https://journals.sagepub.com/doi/10.1258/095646206780071036

[17] https://journals.sagepub.com/doi/10.1258/095646206780071036 and https://www.researchgate.net/publication/12119003_Intention_to_use_the_female_condom_following_a_mass-marketing_campaign_in_Lusaka_Zambia cited in https://www.hivlawandpolicy.org/sites/default/files/Saving%20Lives%20Now.pdf

[18] https://journals.sagepub.com/doi/10.1258/095646206780071036

[19] https://www.hivlawandpolicy.org/sites/default/files/Saving%20Lives%20Now.pdf

[20] https://pubmed.ncbi.nlm.nih.gov/16254738/ and https://pubmed.ncbi.nlm.nih.gov/18433318/ cited in https://pmc.ncbi.nlm.nih.gov/articles/PMC5683136/

[21] https://www.contraceptionjournal.org/article/S0010-7824(05)00458-0/abstract and https://pmc.ncbi.nlm.nih.gov/articles/PMC5683136/

[22] https://journals.co.za/doi/epdf/10.10520/EJC-c8100512a

[23] United States Agency for International Development/Family Health International Behaviors, Knowledge, Exposure to Interventions. Port Moresby, Papua New Guinea: FHI Papua New Guinea; 2011. Cited in https://pmc.ncbi.nlm.nih.gov/articles/PMC5683136/

[24] https://pmc.ncbi.nlm.nih.gov/articles/PMC5683136/

[25] https://pmc.ncbi.nlm.nih.gov/articles/PMC5683136/

[26] https://istss.org/human-rights-and-policy-stealthing-and-unwanted-pregnancy-policies-to-protect-reproductive-autonomy-of-women-vulnerable-to-non-consensual-condom-removal-katherine-w-bogen-ma/; https://flo.health/menstrual-cycle/sex/sexual-health/female-condoms-complete-guide

[27] https://pmc.ncbi.nlm.nih.gov/articles/PMC11658001/

[28] Increased access to FCs and higher rates of protection also help enable women's empowerment, which is closely linked with broad macroeconomic benefits. See https://www.imf.org/external/pubs/ft/fandd/2017/09/bloom.htm; https://trumpwhitehouse.archives.gov/wp-content/uploads/2020/02/The-W-GDP-Index-Empowering-Women%E2%80%99s-Economic-Activity-through-Addressing-Legal-Barriers.pdf. A recent report found a causal (not just associated) relationship between increased contraceptive access in the US and positive economic outcomes. It found that "Contraceptive access is responsible for 15 percent of the increases in women's labor force participation that occurred from 1970 to 1990." https://iwpr.org/wp-content/uploads/2020/07/Contraception-fact-sheet_final.pdf

[29] https://pmc.ncbi.nlm.nih.gov/articles/PMC4356704/

[30] https://pubmed.ncbi.nlm.nih.gov/33492100/

[31] https://pmc.ncbi.nlm.nih.gov/articles/PMC3187775/#pone.0025310.s008

[32] https://databank.worldbank.org/reports.aspx?source=2&country=KEN

[33] https://pubmed.ncbi.nlm.nih.gov/39466708/#:~:text=Overall%2C%20good%20ART%20adherence%20rates,from%2069%25%20to%2073%25