

REDUCING PREGNANCY AMONG ADOLESCENTS

Across a range of programs, interventions that successfully changed the calculus of costs and benefits of unprotected sexual activity and childbirth delayed pregnancy among adolescents. Some programs directly altered costs and benefits while others shifted perceptions of them.



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KEY RESULTS:

- **Adolescents' sexual behavior can be responsive to information about sexual and reproductive health.** Information that addresses trade-offs related to decisions about sexual activity can be more effective in changing behaviors than simple exhortations to remain abstinent.
- **Programs that enhance life aspirations can lead girls and young women to delay childbearing.** Adolescents who hold optimistic beliefs about their future opportunities may be more likely to avoid risky sexual behaviors and engage in productive economic activities.
- **Subsidizing school can support girls to continue their education, which in turn encourages delays in childbirth.** Schooling may help adolescents better process decisions around childbirth and may shape fertility preferences. More education can also increase adolescents' future earnings, leading them to delay childbirth in order to earn higher wages.
- **Incentives can allow adolescents to delay relationships that lead to childbearing.** Financial incentives may reduce income-related motivations to enter into transactional relationships or to marry at a young age.
- **In contexts in which parents and others influence adolescent females' childbearing outcomes, programs should also involve these decision-makers.**

POLICY ISSUE

Despite a decline in fertility rates over the last few decades, pregnancy and childbirth during adolescence (defined as ages 10 through 19) remains a widespread concern with pervasive negative health, social, and economic outcomes for young mothers and their children. In 2018, 21 million girls and young women aged 15 to 19 in developing regions were expected to become pregnant.¹ A significant share of pregnancies in countries with a high adolescent birth rate are unplanned.² The outcomes associated with adolescent pregnancy carry relevance for policymakers working in public health, social protection, and development more broadly.

In many contexts, pregnant adolescents face poorer access to health care than adult women, which can contribute to worse health outcomes. In particular, many adolescents receive less antenatal care.³ This means they may not learn about preventive health measures or receive treatment for conditions associated with pregnancy complications. At time of birth, pregnant adolescents are less likely than their older counterparts to have the support of a skilled birth attendant or deliver in a health facility.

The cumulative effect of these health care deficits among adolescents during and after pregnancy represents an important public health issue. Adolescents face a higher risk of maternal mortality than women in their twenties⁴ and pregnancy-related complications rank among the leading causes of death in developing countries for adolescent females aged 15–19.⁵ Pregnancy is also associated with higher rates of miscarriage for younger adolescents,⁶ and when adolescents successfully deliver, their babies are more often born premature, are smaller, weigh less, and are more susceptible to neonatal and infant death,⁷ in part due to lower rates of postnatal care. The higher risk of malnourishment among adolescent mothers and their children compounds these public health issues.⁸

On average, adolescent mothers also experience poorer social and economic outcomes. In many contexts, adolescent mothers are more likely to drop out of school and their lower level of educational attainment is associated with worse employment and earnings outcomes than their counterparts.⁹ Descriptive evidence shows they are more likely to face social isolation and experience intimate partner violence than older mothers.¹⁰

Consequently, policymakers must consider the broad welfare and development impacts of adolescent pregnancy. Helping adolescent girls and women delay childbirth can provide benefits to mothers, children, and the communities in which they live.

DEMAND-SIDE FACTORS CONTRIBUTING TO ADOLESCENT PREGNANCY

Figure 1 (see page 3) presents three decisions faced by adolescent females that influence their risk of adolescent pregnancy and highlights key determinants of these choices. This figure emphasizes decisions

made by adolescents and their families; it does not explicitly reference access or supply constraints to delaying pregnancy, such as availability of contraceptives.

Both the broader sociocultural context, such as social norms (coded as shades of yellow), and intrahousehold factors, such as income (coded as shades of green), shape an adolescent female's decisions around marriage, sexual activity, and use of contraception.

Social and cultural factors also determine whether and how other individuals influence these outcomes; an adolescent female's sexual partner(s), as well as her extended family (including parents or in-laws), may affect her choice set and decisions. In turn, the outcomes of these decisions jointly determine the likelihood of pregnancy during adolescence.

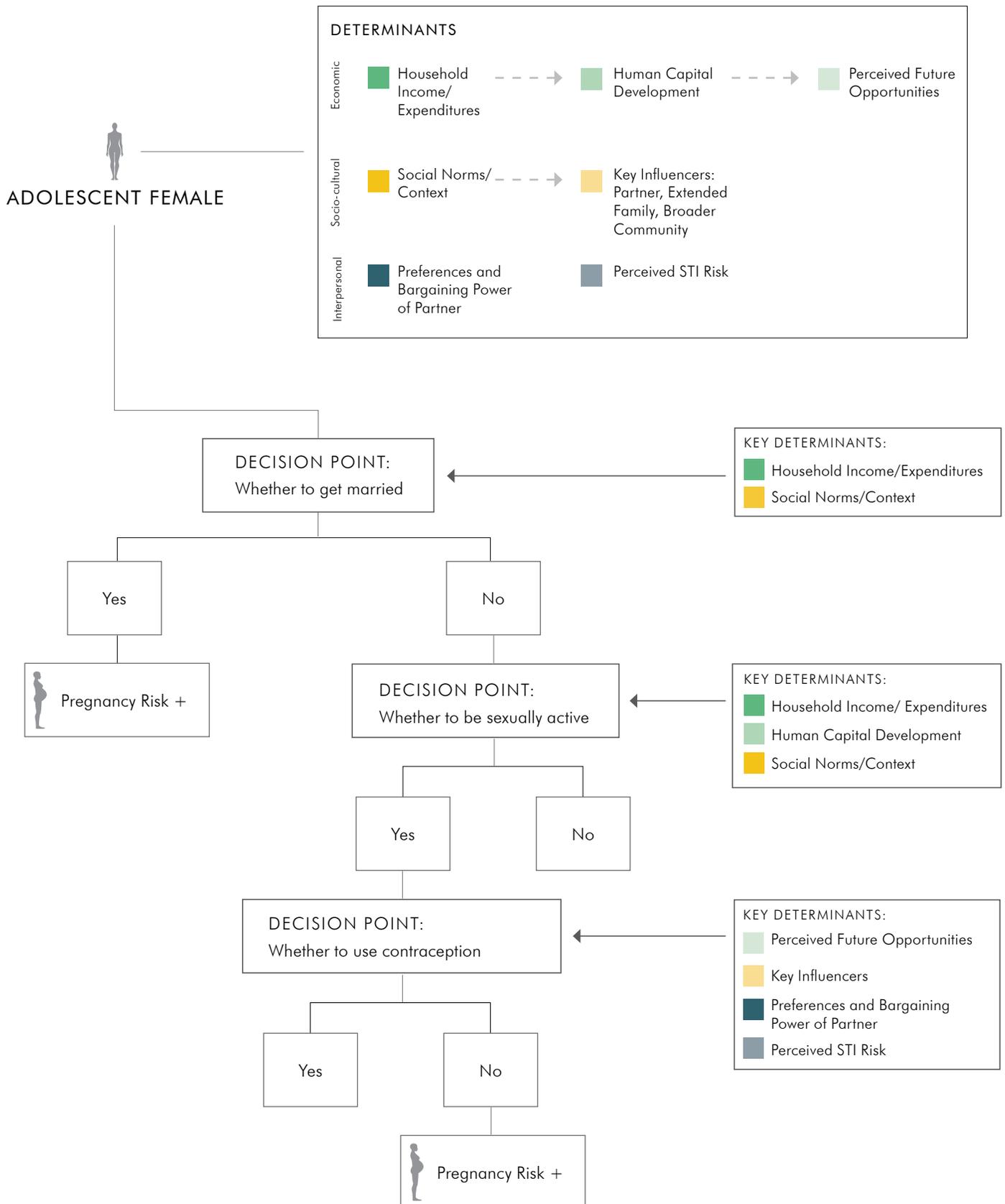
The decision of when to marry hinges significantly on social norms (including who has agency in this decision) and household income and expenditures. Cultural factors, including the norm of dowries in certain countries, are a key determinant of early marriage. Household income can affect timing of marriage, both in contexts where dowries are the norm and in which marriage does not involve dowry payments. Since dowries generally increase with the age of the bride, parents may favor arranging a marriage early for their daughter in order to pay a lower dowry. Even when marriages do not involve dowries, females in relatively disadvantaged households may marry earlier due to a lack of other productive opportunities, such as attending school or working. Or, adolescents may marry to reduce the number of members supported by the household.

Household income also informs decisions around sexual activity. Adolescents in low-income households may enter into (partially) transactional sexual relationships to supplement their income. Moreover, income can influence adolescents' opportunities to develop human capital—that is, to attain education and build skills. With more education, adolescent females may also cognitively process sexual activity decisions more effectively, and coupled with training, can seek out economic opportunities.

Sexually active adolescents, both married and unmarried, face decisions about whether to use contraception and if so, which type. Their choice of whether to use contraception incorporates knowledge and personal attitudes, including: fertility preferences (i.e., the desired age for having the first child, total number of children desired, and the time spacing between children), perceptions of risk of contracting sexually transmitted infections (STIs), and beliefs about social and economic opportunities available to women with and without children. An unmarried female also faces decisions about which type of sexual partner or partners to select, and whether to enter into casual or committed relationships. An adolescent female's partner(s) and relationship status also inform contraception decisions.

POLICY ISSUE

FIGURE 1. CONCEPTUAL MODEL OF DEMAND-SIDE FACTORS THAT INFLUENCE PREGNANCY AND CHILDBIRTH



POLICY ISSUE

CHANNELS TO REDUCE ADOLESCENT PREGNANCY

When making decisions about marriage, sexual activity, and pregnancy, adolescent females and other persons of influence weigh costs and benefits of bearing children. These costs and benefits are a function of the social and economic environment.

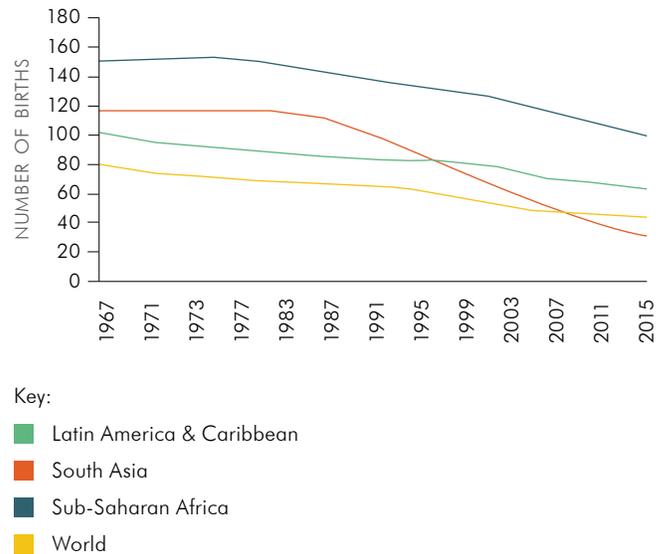
To reduce adolescent pregnancy, interventions can seek to change the costs and benefits of childbirth, either perceived or experienced.

Firstly, adolescents may have misperceptions about childbearing, in terms of underestimating potential risks (i.e., costs), as well as opportunities if they delay childbearing (i.e., benefits). **Providing information** could align an individual's perceptions with an accurate calculus of costs and benefits. This approach assumes that strengthening one's knowledge can shape an individual's attitudes and beliefs, which in turn contribute to changes in behavior. For example, on the cost side, young girls and women may have insufficient or inaccurate knowledge about reproductive health, including the medical risks of bearing children. Providing information on the health risks of engaging in unprotected sexual activity and the biological risks of pregnancy at a young age (see "The Medical Risks of Pregnancy During Adolescence" on the right) may lead girls and young women to consider certain sexual behaviors as more costly and curtail engagement in such practices. On the benefits side, adolescents may not understand the potential return to investment in education or the pursuit of economic opportunities. Sharing information about the economic gains from more education or participating in the labor market can encourage adolescents and their parents to consider the benefits of preventing pregnancy or delaying marriage.

Alternatively, programs can directly alter the material costs of becoming pregnant or benefits to delaying childbirth. **Financial or in-kind incentives** can encourage individuals to change behaviors associated with marriage and childbirth. In many contexts, adolescent females drop out of school and do not work after they marry or have children. Therefore, interventions can seek to keep girls in school (e.g., by lowering costs) or provide skills training to prepare them for the labor market. In contexts where marriage is the usual prequel to sexual activity, another approach could be to provide incentives tied to delaying marriage.

Skills training, including empowerment programs, could also potentially engender behavior change through shaping knowledge, attitudes, and beliefs; or through changing one's cost-benefit calculus; or through both channels. Knowledge sharing, skills development, or both, can potentially encourage female adolescents to pursue choices that help prevent pregnancy.

FIGURE 2. ADOLESCENT FERTILITY RATE (BIRTHS PER 1,000 FEMALES AGED 15–19)



THE MEDICAL RISKS OF PREGNANCY DURING ADOLESCENCE

The medical profession postulates that there are increased biological risks associated with childbearing at a young age. The small size of the pelvis, which is often not fully developed even when a girl reaches her adult height, and low body weight can both make childbearing difficult or dangerous.¹¹ One study that attempted to isolate age from socioeconomic factors found that girls who became pregnant during adolescence were at higher risk of premature birth and having low birthweight babies, even when controlling for other factors that influence medical risks such as education, marital status, and take-up of antenatal care.¹² On average, young mothers experience higher rates of anemia, life-threatening blood loss, infection, seizures, and complicated labor.¹³ All of these factors contribute to a higher risk of maternal death among adolescents and of neonatal death for their babies.

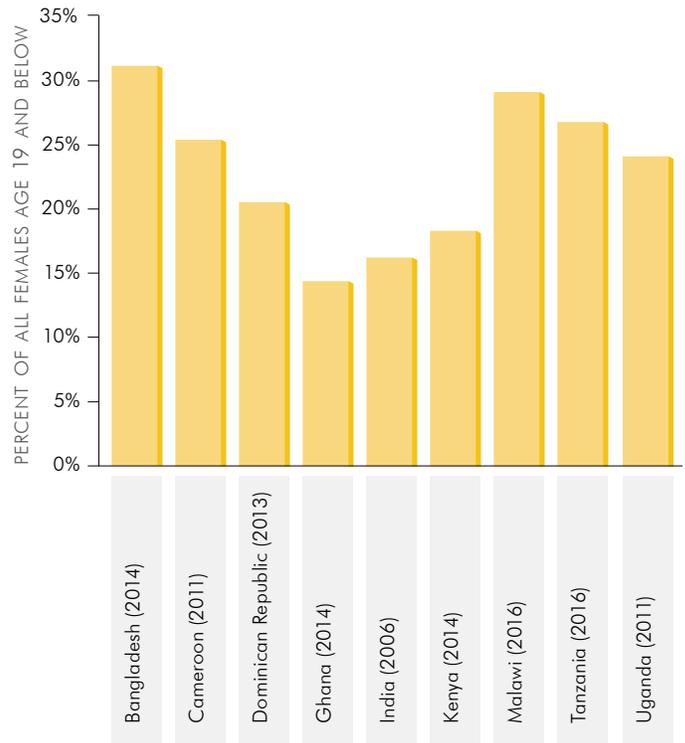
EVALUATIONS

This bulletin features ten randomized evaluations of programs that seek to improve outcomes for adolescent females across nine countries in sub-Saharan Africa, South Asia, and the Caribbean. All included studies measured impacts on adolescent pregnancy, but vary in the type of program or programs evaluated.

Six studies evaluated one or more programs (for a total of seven) that delivered information as a means to change individuals' perceptions of costs and benefits stemming from early childbearing. Three of these programs provided information related to sexual activity, including risk of contracting STIs. Three programs, which focused on empowering female adolescents, included components such as health information, life-skills training, and educational support. One program shared information on employment opportunities, but did not involve any additional skill-building components.

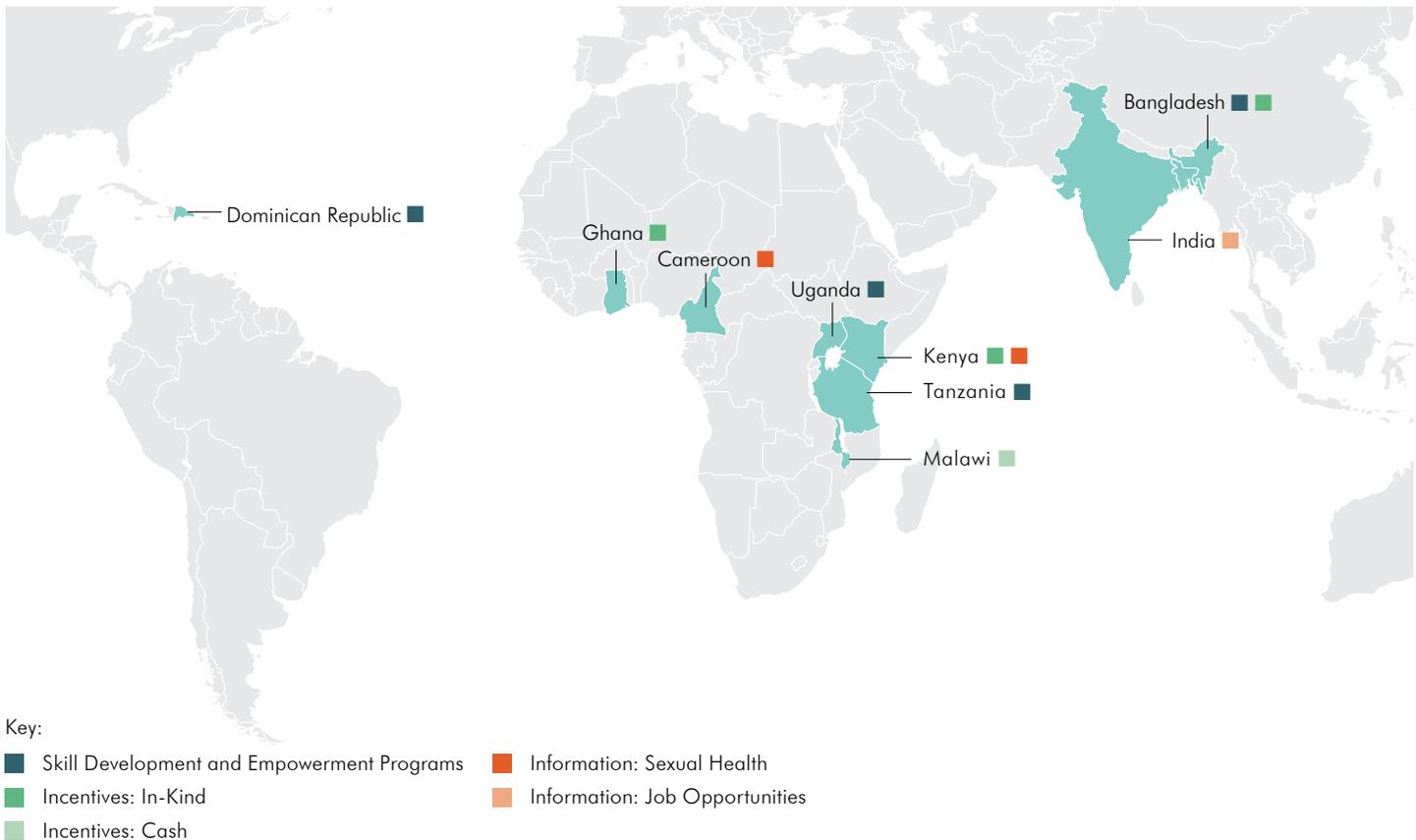
Six studies evaluated programs that changed the actual costs and benefits of pregnancy and childbirth. Most of these emphasized adolescents' human capital development, either through formal education or skill-building. One offered training in vocational skills that could support their employment prospects. Three encouraged girls to stay in school through incentives such as scholarships, free uniforms, and cash transfers. Two programs directly altered the financial costs and benefits of pregnancy and childbirth by providing incentives independently of the educational system.

FIGURE 4. ADOLESCENTS WHO HAVE BEGUN CHILDBEARING



Source: DHS database

FIGURE 3. INTERVENTION TYPES



EVALUATIONS

EVALUATIONS

TABLE 1. EVALUATIONS OVERVIEW

| NUMBER | COUNTRY | STUDY TIMELINE | PROGRAM DURATION | ELIGIBLE PARTICIPANTS | PROGRAM TYPE | PROGRAM GROUPS | IMPACT ON OVERALL PREGNANCY RATE (RELATIVE TO BASELINE) | YEARS UNTIL FOLLOW UP(S) |
|--------|----------|----------------|--|---|---|--|---|--|
| 1.1 | Cameroon | 2010–2011 | One or more sessions during the school year | Eighth-grade females, age 15 on average |  | Quiz: Students took a self-administered quiz on their HIV knowledge; beliefs about sexual behavior of peers, pregnancy, and HIV; and own sexual behavior. | Reduced | One year |
| 1.2 | Cameroon | 2010–2011 | One or more sessions during the school year | Eighth-grade females, age 15 on average |  | Teacher training: One school staff attended a two-day training on HIV prevention education pedagogy. Trained teachers could choose how, if, when, and how frequently to deliver this information to students within their school. | Reduced | One year |
| 1.3 | Cameroon | 2010–2011 | One or more sessions during the school year | Eighth-grade females, age 15 on average |  | Consultant: A trained female professional (who underwent a two-day training on HIV prevention education pedagogy) delivered an hour-long, in-school session with the same message that trained teachers learned. | Reduced | One year |
| 1.4 | Cameroon | 2010–2011 | One or more sessions during the school year | Eighth-grade females, age 15 on average |  | Consultant + relative risk: A trained female professional delivered an hour-long, in-school session on the distribution of HIV infections by age and gender. | Reduced | One year |
| 1.5 | Cameroon | 2010–2011 | One or more sessions during the school year | Eighth-grade females, age 15 on average |  | Quiz + teacher training | Reduced | One year |
| 1.6 | Cameroon | 2010–2011 | One or more sessions during the school year | Eighth-grade females, age 15 on average |  | Quiz + consultant | Reduced | One year |
| 1.7 | Cameroon | 2010–2011 | One or more sessions during the school year | Eighth-grade females, age 15 on average |  | Quiz + consultant + relative risk | Reduced | One year |
| 2 | Uganda | 2008–2012 | Roughly two years | Females, age 14–20 |  | Empowerment and Livelihood for Adolescents (ELA) Program: Life skills and vocational trainings were held at a club five afternoons per week. A female peer mentor led the sessions. | Reduced Reduced | Two years Four years |
| 3.1 | Kenya | 2003–2010 | Two years | Eighth-grade females, age 13 on average |  | Teacher training: Teachers learned about HIV/AIDS and how to teach the national HIV prevention curriculum, which focused on abstinence. | No impact No impact No impact | Three years Five years Seven years |
| 3.2 | Kenya | 2003–2010 | Two years | Eighth-grade females, age 13 on average |  | Free uniforms: Uniforms were distributed for two consecutive years. | Reduced Reduced Reduced | Three years Five years Seven years |
| 3.3 | Kenya | 2003–2010 | Two years | Eighth-grade females, age 13 on average |   | Teacher training + free uniforms | Reduced No impact No impact | Three years Five years Seven years |
| 4.1 | Kenya | 2003–2005 | One hour-long session during the school year | Eighth-grade females, age 15 on average |  | Relative risk information campaign: Students attended an in-school session that delivered information on the distribution of HIV infections by age and gender. | Reduced | Two years |
| 4.2 | Kenya | 2003–2005 | One hour-long session during the school year | Eighth-grade females, age 15 on average |  | Teacher training: Three school staff attended a training on HIV/AIDS and how to teach the national HIV curriculum, which focused on abstinence. | No impact | Two years |

Program Types:  Empowerment  Information  Incentives (cash or in-kind)  Skill development

EVALUATIONS

EVALUATIONS

TABLE 1 (CONTINUED). EVALUATIONS OVERVIEW

| NUMBER | COUNTRY | STUDY TIMELINE | PROGRAM DURATION | ELIGIBLE PARTICIPANTS | PROGRAM TYPE | PROGRAM GROUPS | IMPACT ON OVERALL PREGNANCY RATE (RELATIVE TO BASELINE) | YEARS UNTIL FOLLOW UP(S) |
|--------|--------------------|----------------|---|---|---|--|---|--------------------------|
| 5 | India | 2003–2006 | Three annual sessions lasting 4–6 hours each | Residents of rural communities |  | Job recruiter visits: Recruiters visited villages and delivered information and recruiting sessions about the business process outsourcing (BPO) sector. | Reduced | Three years |
| 6 | Dominican Republic | 2008–2011 | Eight months | Unemployed females living in poor neighborhoods without a high school diploma, age 16–29 |  | Juventud y Empleo: Applicants participated in a youth training program that provided 75 hours of basic- or life-skills training and 150 hours of technical or vocational training over five months, plus a three month internship. | Reduced | 10–14 months |
| 7.1 | Tanzania | 2009–2011 | Roughly two years | Adolescent females, largely between ages 13–19, in communities near BRAC branches |  | Empowerment and Livelihood for Adolescents (ELA) Program: Life-skills and vocational trainings were held at a club five afternoons per week. A female peer mentor led the sessions. Sensitization meetings were held with village elders. | No impact | Two years |
| 7.2 | Tanzania | 2009–2011 | Roughly two years | Adolescent females, largely between ages 13–19, in communities near BRAC branches |  | ELA + microfinance: ELA program was combined with additional offers of small microfinance contracts for older girls, with hands-on coaching in business planning and management. | No impact | Two years |
| 8.1 | Bangladesh | 2007–2017 | Six months | Unmarried females, age 15–17 |  | "Safe Spaces" empowerment groups: Groups met five to six days a week to deliver education support and build members' social competency, including life skills and health knowledge. | No impact | Four and a half years |
| 8.2 | Bangladesh | 2007–2017 | Varied based on individual's age at start | Unmarried females, age 15–17 |  | Cooking oil incentives: Households received US\$16 worth of cooking oil per year, conditional on adolescent daughters being unmarried. Households were eligible until their daughter turned 18, the legal marrying age. | Reduced | Four and a half years |
| 8.3 | Bangladesh | 2007–2017 | Empowerment groups: six months Incentives: varied based on individual's age at start | Unmarried females, age 15–17 |  | "Safe Spaces" empowerment groups + cooking oil incentives | Reduced | Four and a half years |
| 9 | Ghana | 2008–2016 | Four years | Females that qualified for admission to senior high school but had not yet enrolled due to financial constraints, age 17 on average |  | Scholarship package: Students received full tuition and fees for a day student over four years, equivalent to roughly US\$400. | Reduced | Seven years |
| 10.1 | Malawi | 2007–2010 | Two years | Unmarried female students and dropouts, age 13–22 |  | Conditional cash transfers (CCTs): Households received school fees and monthly transfers to both parents and girls, conditional on 80% school attendance. Transfers varied from US\$1–5 for girls and US\$4–10 for parents. | No impact | Two years |
| 10.2 | Malawi | 2007–2010 | Two years | Unmarried female students and dropouts, age 13–22 |  | Unconditional cash transfers (UCTs): Households received monthly transfers to both parents and girls. Transfers varied from US\$1–5 for girls and US\$4–10 for parents. | Reduced | Two years |

Program Types:  Empowerment  Information  Incentives (cash or in-kind)  Skill development

Note: Each evaluation reports additional outcomes that map to the program's theory of change, including: aspirations (2) (5) (6) (7) (10); employment (2) (5) (6) (7) (9) (10); income generation (2) (7) (8) (10); marriage/cohabitation (2) (3) (4) (5) (7) (8) (9) (10); proxies for empowerment (2) (7) (8); school attendance (3) (4) (7) (10); school enrollment (1) (2) (3) (4) (5) (7) (8) (10); STI knowledge (1) (2) (3) (4) (7) (10); and STI rates (3) (4) (7) (10).

RESULTS

INFORMATION: SEXUAL AND REPRODUCTIVE HEALTH

Adolescents' sexual behavior can be responsive to information about sexual and reproductive health.

In Cameroon, researchers tested the impact of providing adolescent students sexual and reproductive health information, such as HIV prevalence rates and guidance on how to protect oneself (1). In conjunction, the research team administered an in-class questionnaire on HIV prevention both to students that did and did not participate in the information interventions (1.1). The in-class questionnaire, administered independently of any additional information, affected some sexual behaviors, such as condom usage, to a similar degree as the information alone (1.2, 1.3). This result suggests that relatively light-touch programs that make sexual health top of mind can encourage girls to consider the risks associated with unprotected sex and to change their behaviors accordingly.

Empowerment programs can also impart information on sexual and reproductive health. For example, in Uganda, girls invited to participate in an empowerment program that delivered health information alongside livelihoods training gained knowledge on pregnancy, as well as other risks associated with unprotected sex, such as HIV (2). Pregnancy rates among participants fell, but the relative impact of the information delivered cannot be disentangled from the impact of other aspects of the program, which included soft skills and vocational training.

Abstinence-only education programs may not be sufficient to reduce adolescent pregnancy.

A body of evidence from randomized evaluations demonstrates that exhortations, such as admonishing adolescents to abstain from sexual activity, do not successfully change individuals' behaviors. In many contexts, abstinence is a "high-cost" behavior for adolescents, and programs that promote it do not help girls and young women think through practical decisions associated with sexual activity such as partner selection, frequency of sexual activity, and use of protection.

In Kenya, researchers evaluated a program that trained school teachers how to deliver the existing abstinence-only HIV prevention curriculum taught in upper primary school (3.1). While HIV knowledge increased, female students largely did not change their sexual behavior to reduce risk of transmission or pregnancy. Importantly, they were no more likely to report abstinence, and sexually active females were no more likely to have used a condom during last intercourse. As expected, reductions in early childbearing did not occur.



PHOTO: SHUTTERSTOCK.COM

Information that addresses trade-offs related to various decisions about sexual activity can be more effective in changing behaviors.

Evidence suggests that programs which provide specific, actionable information are more successful in promoting behavior change than simple exhortations. To be actionable, the costs of switching one's behavior should be low (e.g., moving from unprotected to protected sex) as opposed to high (e.g., moving from sexually active to inactive).

In parts of sub-Saharan Africa, adolescent females may enter into sexual relationships with older males who can offer more financial support than younger partners, either during the course of their relationship or in the event they become pregnant. These cross-generational relationships place the adolescent female partner at greater risk of contracting HIV because prevalence among males in Kenya (and in much of the world) increases with age. In this context, an information campaign that conveyed local HIV prevalence among boys and men by age led to a reduction in adolescent pregnancy by changing girls' partner selection and their decisions of whether to use protection (4.1).

The provision of relative risk information on HIV prevalence to girls in upper primary school led to a decrease in childbearing of 1.5 percentage points (28 percent) in the following twelve months, compared to a 5.4 percent rate of childbirth among adolescent females who did not receive any HIV information. This decrease was driven by a reduction in pregnancies with older partners; the number of births with partners five or more years older fell by 62 percent while the number of births with younger partners did not

RESULTS

change. Among adolescent females who did start childbearing, their partners' ages were, on average, 1.7 years closer to their own compared to an average age gap of 5.9 years among those who did not receive this type of information. This suggests that girls and young women responded to the relative risk information by altering the selection of partners with whom they engaged in unprotected sex. That is, they chose younger partners with a lower likelihood of having HIV or chose to use protection with riskier partners.

Behavior changes resulting from information provision depend on prior beliefs and knowledge. For this reason, providing information on sexual and reproductive health does not necessarily lead to reductions in pregnancy.

In the Kenya study discussed above (4.1), the provision of relative risk information impacted partner selection and childbearing rates because it corrected girls' underestimations of the potential costs associated with unprotected sex with older males. In Cameroon, where researchers tested three school-based HIV prevention programs for girls in the eighth grade, one included the provision of relative risk of HIV by partner's age (1.4). Unlike the evaluation in Kenya, this information did not impact girls' partner selection, in part because adolescents in Cameroon already chose younger partners. Relative to Kenya, sexual relationships between adolescent females and older males are less common in Cameroon. Moreover, absolute rates of HIV among men aged 25–49 are lower and condom usage is more acceptable and regularly practiced in Cameroon than in Kenya. Consequently, the standard HIV education curriculum in Cameroon, which incorporates information on condoms, was sufficient to deter adolescent pregnancy.

INFORMATION: ECONOMIC OPPORTUNITIES

Adolescents' sexual behavior may also be affected by information that does not directly pertain to sexual and reproductive health.

In India, researchers tested the impact of sending recruiters to hold three annual sessions in villages for young women that included information about employment opportunities in call centers, otherwise known as business process outsourcing (BPO) (5). In response, young women delayed childbearing. Girls and women aged 15 to 21 who were exposed to this program were 5.7 percentage points (13 percent) less likely to have given birth over the following three-year period relative to 43 percent of girls and women who were not exposed. Comparing the size of the reduction in fertility to the relatively smaller impact on delayed marriage indicates that some women who married (or had already married) during the study period still chose to delay having a child in order to take advantage of labor market opportunities.

Learning about employment opportunities can also change girls' and young women's career aspirations. Girls and young women in villages visited by recruiters were 10–13 percentage points (43–53 percent) more likely to state an expectation to work when not raising children (5). Additionally, women aged 18 to 24 reported wanting to have 0.35 fewer children in their lifetime, about an 11 percent decrease in the desired number of three children that girls and young women reported in comparison villages.

These recruiter visits also changed parents' expectations related to their daughters' economic opportunities. Parents increased investments in their younger daughters' education and health, leading to higher school enrollment and body mass index (BMI)-for-age scores (a leading indicator of nourishment). Taken together, these results suggest that sharing promising employment prospects can encourage adolescents and their parents to make decisions that facilitate girls' and young women's future participation in the labor market.

SKILLS TRAINING AND EMPOWERMENT PROGRAMS

Programs that build skills and enhance expectations may lead girls and young women to delay childbearing.

In the Dominican Republic, researchers evaluated the impact of a national youth job-training program on childbearing rates (6). Eighteen to 24 months after graduation from the program, adolescent females aged 16 to 19 were 7.8 percentage points (20 percent) less likely to have become pregnant, relative to 39 percent of the comparison group. Researchers posit that the reduction in adolescent pregnancy reflects raised expectations about future opportunities and improvements in soft skills, which in turn encouraged participants to engage in productive economic activities and avoid risky sexual behavior.

Empowerment programs—which commonly include life-skills and livelihoods training—aim to help girls and young women develop greater agency over their bodies and lives. One of the earliest randomized evaluations of an empowerment program took place in Uganda (2). The program was developed by the Bangladesh-based organization, BRAC, which subsequently expanded it to other countries in South Asia and sub-Saharan Africa.

In Uganda, the empowerment program proved highly effective in reducing early childbearing and impacting outcomes related to an adolescent female's control over her body (2). The impacts on other outcomes suggest that the program shifted participants' knowledge and attitudes, which then led to behavior change. The program improved basic knowledge of pregnancy (and HIV) as measured two years later, though this gain deteriorated after another two years. Girls and women also reported a belief that females should start childbearing later.

RESULTS

Adolescents also practiced behaviors that helped them delay pregnancy. Two years later, sexually active females exposed to the empowerment program were 13 percentage points (29 percent) more likely to report consistent condom use than those in villages that did not establish the program (where 45 percent of girls and young women reported regular condom usage). They were also 2.7 percentage points (24 percent) less likely to have any children than females in the comparison group, of which 11.3 percent had at least one child. However, by four years after the program, adolescents females who participated were no more likely to report using condoms and no less likely to have given birth than females who did not participate.

While not formally tested, three program features may have driven these results. Life-skills training may have improved adolescent females' soft skills through sessions on negotiation, rape, and legal rights. Livelihoods training may have supported self-employment and income generation, as economic empowerment likely reinforced girls' ability to maintain control over their bodies. Or, the existence of regular meetings to deliver these trainings may have had a protective effect by providing a safe location for adolescents—especially after school when parents may not yet have returned from work.

However, empowerment programs have not demonstrated consistent impacts on reducing adolescent pregnancy.

Since the evaluation in Uganda (2), researchers conducted additional randomized evaluations of very similar models in Tanzania (7) and Bangladesh (8.1). The positive results that emerged in Uganda have not held in these two contexts. In Tanzania, qualitative research suggests that the contrasting results between the two programs may reflect differences in quality of implementation, which led to a program that did not reflect the original design (see "Bringing Existing Evidence To A New Context" for a framework on how to transfer evidence across contexts). In addition, unlike in Uganda, the Tanzania program did not provide in-kind support for adolescents to pursue economic activities.

Relatedly, in Bangladesh, fewer economic opportunities are available to girls and young women relative to Uganda. The lack of impact in Bangladesh may also reflect a higher level of control that parents exert over girls' and young women's marital and reproductive decisions. Empowerment may be more effective in contexts in which adolescent females generally have more agency in making their decisions surrounding marriage and childbearing.

BRINGING EXISTING EVIDENCE TO A NEW CONTEXT

When can policymakers use existing evidence to determine whether a program implemented successfully elsewhere could be brought to a new context?

Policymakers should neither simply lift results of a study from another context and assume the evaluated program works in their own setting nor ignore all evidence from other contexts. Instead, the first step is to diagnose the local problem using high-quality local qualitative and quantitative descriptive data. Then, search for rigorous global evidence from other contexts that have sought to solve a similar problem. Next, use the local and global evidence as complementary inputs to assess how well the theory of change that motivated the original research is likely to hold in the new context.

For example, in 2013, the positive results from the HIV relative risk information intervention in Kenya (see page 10) caught the attention of Rwandan policymakers. They were interested in determining whether this program would work in their country. J-PAL Africa and the Rwandan government collaborated to answer this question by examining each step in the theory of change.

The theory behind reducing HIV transmission and pregnancy by providing relative risk information assumes existence of three conditions in the local context. First, relationships between girls and older men are common. Second, HIV prevalence is higher among older men than younger men. Third, adolescent females do not realize that HIV prevalence is higher for older men than younger men. Public data revealed that the first two assumptions held true in Rwanda.

To determine whether the third condition held, J-PAL Africa and the Rwanda Biomedical Center (RBC) collected local descriptive data on perceptions of HIV risk among adolescents. The results showed that adolescent girls already understood that HIV risk increases with age, making older men riskier partners. They also greatly overestimated the level of risk. Based on these findings, policymakers chose not to introduce an HIV relative risk information program. In this context, relative risk information on HIV prevalence by age could change girls' perception of costs and benefits of relationships with older men in a direction that potentially would have led to more unprotected sex.

RESULTS

INCENTIVES: EDUCATION SUBSIDIES

Reducing school costs through subsidies encourages increased educational attainment, which in turn can delay childbearing.

Interventions that increase schooling among adolescents might reduce childbearing through different channels. One, mechanically: while in school, girls have less time to have sex. Two, additional schooling can lead to higher wages, which in turn increase the costs of childbearing. Adolescents who become pregnant often drop out of school and therefore forego better future economic opportunities or other returns to schooling. Three, additional schooling may improve adolescents' cognitive ability to process information, leading to choices that better account for long-term impacts. Four, educational attainment may influence childbearing preferences, including desired age of first birth and total number of children.

However, sending adolescents to school incurs costs, and existing evidence shows that student participation is highly sensitive to costs (see J-PAL's policy publication Roll Call). Even when attending school is free, parents often face other expenses, including uniforms, textbooks, and school supplies. Lowering school costs is a proven way to increase enrollment and attendance, and may therefore be effective in delaying childbearing.

In some contexts, education systems charge tuition after primary school, leading to lower enrollment rates among adolescents in high school. In Ghana, researchers randomly awarded scholarships by lottery to students accepted to secondary school (9). Eight years later, at age 25, women offered scholarships were 10.7 percentage points (18 percent) less likely to have ever been pregnant. This reduction was driven by a decline in unplanned pregnancies by unmarried women; students offered scholarships were 11.5 percentage points (20 percent) less likely to have experienced an unwanted pregnancy.

The reduction in childbearing in this study occurred primarily after the scholarship recipients had left secondary school. Thus, this likely stemmed from a combination of the nonmechanical channels mentioned above. Firstly, additional schooling likely helped scholarship winners process their choices and make better decisions. Girls and young women who won scholarships demonstrated gains in learning and adopted preventive health behaviors at a higher rate, including hand-washing with soap, bednet use, and mosquito repellent use. Secondly, some evidence also suggests that additional schooling shaped women's fertility preferences.



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In Kenya, researchers subsidized school costs through the provision of uniforms to upper primary school students (3.2). The subsidy led to a decrease in the rate of adolescent pregnancy by 3 percentage points (17 percent), from 16 percent to 13 percent. It also reduced the marriage rate in a context where most adolescent girls would prefer not to marry and only do so in response to a pregnancy. Additionally, in this context, pregnant students face strong social pressure to leave school. Together, these results suggest that providing free uniforms helped girls avoid dropping out and settling into relationships.

In Malawi, incentives aimed at increasing educational attainment delayed childbirth among adolescents that had previously dropped out of school but had no impact among enrolled female students (10.1). Researchers provided households with monthly cash transfers for two years, conditional on school attendance, which led to more schooling among prior dropouts. At the conclusion of the transfers, recipients that were not enrolled in school at the start of the program were, on average, 8.1 percentage points (10 percent) less likely to have become pregnant compared to adolescents who were not assigned to receive conditional transfers. In contrast, the conditional cash transfer did not lead to delays in pregnancy among females who were enrolled in school at the start of the program, likely because the transfers did not encourage them to pursue additional education relative to the schooling they would have attained in the absence of the transfer.

RESULTS

INCENTIVES: FINANCIAL

Financial incentives can offset the motivation for girls to engage in behaviors that lead to pregnancy.

In contexts in which transactional relationships are common, increasing income can allow adolescents to avoid entering into relationships for economic reasons. In Malawi, unconditional cash transfers (UCTs), which provided daughters and their parents with monthly payments, delayed pregnancy among adolescent recipients (10.2). By the end of the two-year program, adolescents whose households received UCTs were 6.7 percentage points (27 percent) less likely to have ever been pregnant compared with 24.7 percent of adolescents in comparison households. Girls and young women who received the UCT may have been able to avoid transactional relationships or delay marriage while receiving the transfers. By four years after the end of the transfer, recipients of the UCT were no less likely to have ever been pregnant.

In-kind incentives that appropriately consider the context can also mitigate the financial motivations that lead young girls and women to engage in relationships that involve unprotected sex. In South Asia, where early marriage is most common, parents largely determine their daughter's age of marriage and, consequently, age of sexual onset. In this context, a bride's family often makes a dowry payment to the groom's family. Dowries increase with the age of the bride, which creates an incentive to have daughters marry at a younger age. In response to the trade-offs that parents face regarding marriage, researchers designed a program in Bangladesh that provided an in-kind incentive of cooking oil, conditional on girls and young women remaining unmarried (8.2). The value of the incentive was calibrated to offset higher dowries from postponing marriage.

This conditional incentive delayed marriage and childbearing among young women aged 15-17 at the start of the program. They were 6.3 percentage points less likely to marry before 18, a 23 percent drop compared to adolescent females who did not receive the incentive: 27 percent of those females entered into marriage before 18. The provision of cooking oil also reduced the likelihood of pregnancy before age 20 by 2.9 percentage points (13 percent) relative to the girls and young women who were not eligible for the cooking oil, of whom 23 percent became pregnant during adolescence.

Providing financial incentives outside of the education system can help reach out-of-school adolescents.

Although keeping adolescents in school helps delay childbearing, many girls face insurmountable barriers to remaining in school. Delivering programs outside of educational institutions is an important way to reach vulnerable adolescents.

For example, offering cash transfers without any ties to schooling could broaden the reach of programs. In Malawi, unconditional cash transfers (10.2) were more effective in delaying pregnancy over two years than cash transfers conditional on school enrollment (10.1). Among adolescents whose households received unconditional cash transfers, the reduction in childbearing was entirely due to the effect of increased income among girls who had dropped out of school after the start of the evaluation. In the same evaluation, cash transfers conditional on school enrollment encouraged some, but not all, adolescent females to stay in school, meaning the program excluded part of the community (school dropouts).

In Bangladesh, the offers of the conditional cooking oil incentive delayed marriage and, in turn, childbearing, with no difference between those who did and did not attend school (8.2). This result suggests that marriage age, and consequently in this context, childbearing outcomes, were not influenced through increased education, but through the provision of the incentive. It also provides evidence that incentive programs that operate independently of school enrollment can support vulnerable populations.

In some contexts, providing financial incentives to parents may be more effective than providing incentives directly to girls.

Parents hold sway in decisions that inform their daughters' futures, including level of schooling. To test whether giving cash to parents rather than their daughters would be more effective in improving adolescent females' outcomes, researchers in Malawi provided transfers to both and randomly varied the amounts that each received (10). Increasing the amount of cash that parents received through the unconditional transfer led to greater impacts on their daughter's school enrollment rates and whether the daughter married during the study period (10.2). In contrast, giving girls larger amounts did not amplify the transfers' impacts, which underscores the weight of parents' decision-making.

In many settings, parents have significant decision-making authority over their daughters' marital and childbearing decisions. In Bangladesh, the value of the cooking oil incentive to remain unmarried was calibrated to specifically address parents' financial calculations around age of marriage (8.2). The value of the cooking oil equaled the estimated increase in dowry that would result from marrying a daughter at a later age (approximately US\$16 per year). The financial savings offered by the incentive encouraged parents to make decisions around their daughters' future that would be otherwise less desirable or harder to achieve in their absence. The impacts on delayed marriage and childbearing suggest that small incentives can be effective in changing entrenched behaviors in the long run and reducing potentially negative impacts on girls and young women.

FEATURED EVALUATIONS

- (1) Dupas, Pascaline, Elise Huillery, and Juliette Seban. 2018. "Risk information, Risk Salience, and Adolescent Sexual Behavior: Experimental Evidence from Cameroon." *Journal of Economic Behavior & Organization* 145: 151-75. <http://doi.org/10.1016/j.jebo.2017.10.007>.
- (2) Bandiera, Oriana, Niklas Buehren, Robin Burgess, Markus Goldstein, Selim Gulesci, Imran Rasul, and Munshi Sulaiman. "Women's Empowerment in Action: Evidence from a Randomized Control Trial in Africa." Working Paper, 2017.
- (3) Duflo, Esther, Pascaline Dupas, and Michael Kremer. 2015. "Education, HIV, and Early Fertility: Experimental Evidence from Kenya." *American Economic Review* 105 (9): 2757-97. <http://doi.org/10.1257/aer.2012.1607>.
- (4) Dupas, Pascaline. 2011. "Do Teenagers Respond to HIV Risk Information? Evidence from a Field Experiment in Kenya." *American Economic Journal: Applied Economics* 3 (1): 1-34. <http://doi.org/10.1257/app.3.1.1>.
- (5) Jensen, Robert. 2012. "Do Labor Market Opportunities Affect Young Women's Work and Family Decisions? Experimental Evidence from India." *The Quarterly Journal of Economics* 127 (2): 753-92. <http://doi.org/10.1093/qje/qjs002>.
- (6) Ibarraran, Pablo, Laura Ripani, Bibiana Taboada, Juan Miguel Villa, and Brigida Garcia. 2014. "Life Skills, Employability and Training for Disadvantaged Youth: Evidence from a Randomized Evaluation Design." *IZA Journal of Labor & Development* 3 (10): 1-24. <http://doi.org/10.1186/2193-9020-3-10>.

Novella, Rafael, and Laura Ripani. 2016. "Are You (Not) Expecting? The Unforeseen Benefits of Job Training on Teenage Pregnancy." *IZA Journal of Labor & Development* 19 (5): 1-18. <http://doi.org/10.1186/s40175-016-0065-7>.
- (7) Buehren, Niklas, Markus Goldstein, Selim Gulesci, Munshi Sulaiman, and Venus Yam. "Evaluation of Layering Microfinance on an Adolescent Development Program for Girls in Tanzania." World Bank Policy Research Working Paper 7961, Washington, DC, 2017. <http://documents.worldbank.org/curated/en/245071486474542369/Evaluation-of-an-adolescent-development-program-for-girls-in-Tanzania>.
- (8) Buchmann, Nina, Erica Field, Rachel Glennerster, Shahana Nazneen, Svetlana Pimkina, and Iman Sen. "Power vs. Money: Alternative Approaches to Reducing Child Marriage in Bangladesh, a Randomized Control Trial." Working Paper, 2017. https://www.povertyactionlab.org/sites/default/files/publications/100_child-marriage-bangladesh-Apr2017.pdf.
- (9) Duflo, Esther, Pascaline Dupas, and Michael Kremer. "The Impact of Free Secondary Education: Experimental Evidence from Ghana," Working Paper, 2017. <http://economics.mit.edu/files/12682>.
- (10) Baird, Sarah, Ephraim Chirwa, Craig McIntosh, and Berk Özler. 2010. "The Short-Term Impacts of a Schooling Conditional Cash Transfer Program on the Sexual Behavior of Young Women." *Health Economics* 19 (S1): 55-68. <http://doi.org/10.1002/hecc.1569>.

Baird, Sarah, Craig McIntosh, and Berk Özler. 2011. "Cash or Condition? Evidence from a Cash Transfer Experiment." *The Quarterly Journal of Economics* 126 (4): 1709-53. <http://doi.org/10.1093/qje/qjr032>.

ADDITIONAL CITATIONS

- ¹ World Health Organization. 2018. "Adolescent Pregnancy" Accessed June 8, 2018. <http://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy>.
- ² United Nations, Department of Economic and Social Affairs, Population Division. 2013. *Adolescent Fertility since the International Conference on Population and Development (ICPD) in Cairo*. Geneva: United Nations. http://www.un.org/en/development/desa/population/publications/pdf/fertility/Report_Adolescent-Fertility-since-ICPD.pdf.
- ³ Reynolds, Heidi W., Emelita L. Wong, and Heidi Tucker. 2006. "Adolescents' Use of Maternal and Child Health Services in Developing Countries." *International Family Planning Perspectives* 32 (1): 6-16. <http://doi.org/10.1363/iffp.32.006.06>.

Woog, Vanessa, Susheela Singh, Alyssa Browne, and Jesse Philbin. 2015. *Adolescent Women's Need for and Use of Sexual and Reproductive Health Services in Developing Countries*. New York: Guttmacher Institute. http://www.guttmacher.org/sites/default/files/report_pdf/adolescent-srhs-need-developing-countries.pdf.
- ⁴ Nove, Andrea, Zoë Matthews, Sarah Neal, and Alma Virginia Camacho. 2012. "Maternal Mortality in Adolescents Compared with Women of Other Ages: Evidence from 144 Countries." *The Lancet Global Health* 2 (3): 155-164. [http://doi.org/10.1016/S2214-109X\(13\)70179-7](http://doi.org/10.1016/S2214-109X(13)70179-7).
- ⁵ World Health Organization. 2016. *Global Health Estimates 2015 Summary Tables: DALYs, YLLs and YLDs by Cause, Age and Sex by WHO Regional Group and World Bank Income Classification, 2000-2015*. Geneva: World Health Organization. http://www.who.int/healthinfo/global_burden_disease/en/.
- ⁶ Malabarey, Ola T., Jacques Balayla, Stephanie L. Klam, Alon Shrim, and Haim A. Abenheim. 2012. "Pregnancies in Young Adolescent Mothers: A Population-Based Study on 37 Million Births." *Journal of Pediatric and Adolescent Gynecology* 25, (2): 98-102. <http://doi.org/10.1016/j.jpjag.2011.09.004>.
- ⁷ Kozuki, Naoko, Anne CC Lee, Mariangela F Silveira, Ayesha Sania, Joshua P Vogel, Linda Adair, Fernando Barros, Laura E Caulfield, Parul Christian, Wafaie Fawzi, Jean Humphrey, Lieven Huybregts, Aroonsri Mongkolkeha, Robert Ntozini, David Osrin, Dominique Roberfroid, James Tielsch, Anjana Vaidya, Robert E Black, and Joanne Katz. 2013. "The Associations of Parity and Maternal Age with Small-for-Gestational-Age, Preterm, and Neonatal and Infant Mortality: A Meta-Analysis." *BMC Public Health* 13 (3): 1-10. <http://doi.org/10.1186/1471-2458-13-S3-S2>.

Finlay, Jocelyn E., Özaltın, Emre, and David Canning. 2011. "The Association of Maternal Age with Infant Mortality, Child Anthropometric Failure, Diarrhoea and Anaemia for First Births: Evidence from 55 Low- and Middle-Income Countries." *BMJ Open* 1 (2): 1-24. <http://doi.org/10.1136/bmjopen-2011-000226>.

Ramaiya, Astha, Ligia Kiss, Paula Baraitser, Godfrey Mbaruku, and Zoe Hildon. 2014. "A Systematic Review of Risk Factors for Neonatal Mortality in Adolescent Mother's in Sub Saharan Africa." *BMC Research Notes* 7 (750): <http://doi.org/10.1186/1756-0500-7-750>.
- ⁸ Scholl, Theresa O., Mary L. Hediger, and Daniel H. Belsky. 1994. "Prenatal Care and Maternal Health During Adolescent Pregnancy: A Review and Meta-Analysis." *Journal of Adolescent Health* 15 (6): 444-56. [http://doi.org/10.1016/1054-139X\(94\)90491-K](http://doi.org/10.1016/1054-139X(94)90491-K).

Wodon, Quentin, Chata Male, Ada Nayihouba, Adenike Onagoruwa, Aboudrahyme Savadogo, Ali Yedan, Jeff Edmeades, Aslihan Kes, Neetu John, Lydia Murithi, Mara Steinhaus, and Suzanne Petroni. 2017. *Economic Impacts of Child Marriage: Global Synthesis Report*. Washington, D.C.: International Bank for Reconstruction and Development, World Bank and International Center for Research on Women (ICRW).
- ⁹ Williamson, Nancy. 2013. *Motherhood in Childhood: Facing the Challenge of Adolescent Pregnancy*. Geneva: United Nations Population Fund (UNFPA).
- ¹⁰ Jain, Saranga, and Kathleen Kurz. 2007. *New Insights on Preventing Child Marriage: A Global Analysis of Factors and Programs*. Washington, D.C.: International Center for Research on Women (ICRW).

Greene, Margaret, and Thomas Merrick. 2005. *Poverty Reduction: Does Reproductive Health Matter?*. Washington D.C.: World Bank Human Development Network, ed. Health, Nutrition and Population Discussion Papers.
- ¹¹ Scholl, Hediger, and Belsky, 1994.
- ¹² Fraser, Alison M., John E. Brockert, and R.H. Ward. 1995. "Association of Young Maternal Age with Adverse Reproductive Outcomes." *New England Journal of Medicine*, 332 (17): 1113-18. <http://doi.org/10.1056/NEJM199504273321701>.
- ¹³ Conde-Agudelo, Agustin, José M. Belizán, and Cristina Lammers. 2005. "Maternal-Perinatal Morbidity and Mortality Associated with Adolescent Pregnancy in Latin America: Cross-Sectional Study." *American Journal of Obstetrics and Gynecology* 192 (2): 342-49. <http://doi.org/10.1016/j.ajog.2004.10.593>.

The studies featured in this Bulletin were made possible by a number of partners and funders. For specific information on each study, please refer to the academic papers listed above.

POLICY LESSONS

Changing the calculus of costs and benefits of childbirth underlies many successful interventions designed to delay pregnancy among adolescents.

Interventions designed to align female adolescents' perceptions of costs and benefits of unprotected sexual activity with potential outcomes can lead to reductions in childbearing.

- Specific and actionable information about the risk of sexually transmitted infections (STIs) can change behavior, but the success of this information depends on the recipients' prior knowledge and beliefs.
- Expectations about future economic opportunities can encourage forward-thinking decisions to delay childbirth by either girls or their parents.

Alternatively, interventions can directly increase the relative benefits of delaying childbirth, such that girls or parents change their behaviors to prevent pregnancy.

- Encouraging participation in activities that develop human capital (e.g., subsidize education or provide training) can help girls delay pregnancy. Programs implemented outside the education system can help reach out-of-school adolescents.
- Financial or in-kind incentives can offset the motivation for girls to enter into relationships that lead to pregnancy. In contexts where pregnancy often occurs outside of marriage, incentives may reduce the value of partially transactional sexual relationships. In contexts in which childbearing primarily occurs within marriage and where dowries are common, incentives may help households delay marriage of adolescent female members.

For program design and delivery, the population of interest and its context should be considered carefully. For example, whether adolescent pregnancy occurs within or outside of marriage should inform any program. In contexts in which adolescents have limited bargaining power, interventions targeting parents may be effective. Although evidence to date only speaks to the role of parents, this approach may also potentially extend to other decision influencers such as sexual partners and other family members. Even if interventions do not specifically target parents, impacts may be driven by their beliefs or through their actions. Parental expectations about schooling and marriage in particular can be important for their investments in girls' outcomes. Relatedly, changing girls' and young women's beliefs and aspirations could impart a potential mechanism for cross-generational improvements in female empowerment.

Bulletin Author: Rebecca Toole | **Editor:** Thomas Chupein | **Designer:** Amanda Kohn

Suggested Citation: J-PAL Policy Bulletin. 2018. "Reducing Pregnancy Among Adolescents" Cambridge, MA: Abdul Latif Jameel Poverty Action Lab.

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