Risk Information, Risk Salience, and Adolescent Sexual Behavior: Experimental Evidence from Cameroon*

Pascaline Dupas Elise Huillery Juliette Seban

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Abstract

Results from a randomized experiment conducted with teenage schoolgirls in Cameroon suggest that HIV prevention interventions can be effective at reducing the incidence of teen pregnancy in the following 9-12 months by over 25 percent. We find little difference in effectiveness between one-time, one-hour sessions delivered directly to students by specialized consultants and sessions delivered through regular school staff trained over two days by specialized consultants. We also find little difference between the standard "Abstain, Be Faithful, Use Condoms" curriculum and an enriched curriculum that includes information on the heightened risk of cross-generational sex. Lastly, a one-time, one-hour self-administered questionnaire on HIV and sexual behavior has an equally large impact on teen pregnancy. These results suggest that rural teenage schoolgirls' sexual behavior is highly responsive to even small interventions that make the risks of HIV and pregnancy salient. We find no effects among urban schoolgirls, who are more exposed to information and experience much lower rates of teenage pregnancy under the status quo.

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Dupas: Stanford University, NBER, CEPR, BREAD and J-PAL, pdupas@stanford.edu; Huillery: University of Paris-Dauphine and J-PAL, elise.huillery@dauphine.fr; Seban: Sciences Po LIEPP, juliette.seban@sciencespo.fr.

1 Introduction

UNAIDS estimates that 1.8 to 2.4 million people were newly infected with HIV in 2015. The great majority of these new cases are in sub-Saharan Africa. Adolescent girls and young women aged 15–24 years are at particularly high risk of HIV infection, accounting for 20% of new HIV infections among adults globally in 2015, despite accounting for just 11% of the adult population. These same young women are also at risk of early, unwanted pregnancy. Complications during pregnancy and childbirth are the second cause of death for 15-19 year-old girls globally.[1] While some of these young women have little say in whether to enter into early marriage and with whom, many do. 72% of women aged 20-24 in 2014 in West and Central Africa did not marry before they were 18,[2] and in Cameroon 25% of women experienced their first birth out-of-wedlock.[3] What types of intervention can influence the sexual behavior of this group, and reduce their exposure to pregnancy and HIV infection?

Given that the majority of youths are in school until age 15, an obvious way to deliver sexual education and HIV prevention to youths is through schools. And indeed, most countries have adopted a national HIV prevention curriculum that teachers are required to integrate in their classes. But the evidence suggests that implementation of these curricula has been slow. An observational study conducted over 15 sub-Saharan countries between 2007 and 2010 found a very large gap in knowledge between students and their teachers, concluding that teachers lack either motivation or adequate teaching methods (or both) to effectively deliver HIV and sexual education (UNESCO, 2011). Furthermore, evidence on the effectiveness of HIV education is mixed: systematic reviews of the effects of HIV education programs in Sub-Saharan Africa reveals great heterogeneity in effectiveness (Paul-Ebhohimhen, 2008; Gallant, 2004).

One important question that emerges from the literature to date is whether the identity of the information messenger matters. Despite the fact that teacher-led interventions are logistically easier to implement, they can have also some limitations because of teachers' status in relation to pupils or their discomfort in discussing sensitive topics such as condoms or sexual behavior in general (Ross 2006, Gallant 2004), and therefore involvement of outside professionals may be necessary.

A second big subject of debate in the literature concerns the content of HIV prevention curricula. Most curricula in Africa make explicit or implicit reference to all three components of the "ABC" (Abstain, Be Faithful, Use Condoms) approach to prevention. However, because reluctance to discuss condoms is common among school teachers, there is great variation in the extent to which condoms are mentioned. Furthermore, most curricula remain silent on the issue of cross-generational relationships, which usually involve monetary

[1] WHO factsheet, last accessed 18 November 2016 at: http://www.who.int/mediacentre/factsheets/fs364/en/
[2] UNFPA, State of World Population 2013
[3] Cameroon-Development and Health Survey 2004)

transfers from the (older) male to the female partner, even though such relationships have been identified as an important factor in the spread of HIV. Dupas (2011) found that a 45-minute session delivered by an outside facilitator with a focused message on the heightened risk of HIV faced by girls having sex with older partners was effective at reducing unprotected sex among adolescent girls in Kenya, while the regular HIV/AIDS curriculum delivered by trained teachers and focusing on abstinence and faithfulness promotion had no impact. It is unclear what part of this difference comes from the specific relative risk message, and what part could come fom the fact that the trained professionals were well equipped to address students' questions regarding condoms or that HIV information is more credible when delivered by an outside professional.

Finally, there is some debate concerning the form of delivery of the HIV information. There is evidence that a more interactive way of communicating the information (such as feedback to guesses about facts such as HIV prevalence by age groups) can be more effective in increasing pupils' knowledge than providing the same information through a brochure (Datta et al., 2015). How much of this comes from the fact that asking participants to engage with the information increases its salience?

We use a field experiment conducted with teenage girls in 318 junior high schools in Cameroon to study, within one context, how the HIV intervention medium, the identity of the HIV information messenger, and the type of information being provided affect how much information is delivered, retained and acted on. According to UNAIDS, Cameroon is the West and Central African country with the highest rate of HIV prevalence at 4.5% of the 15-49 population in 2015 (5.3% among women and 3.7% among men). We randomized HIV prevention interventions that differed in their delivery mechanism and intensity, as well as content, across schools. In each school, one eighth grade class was targeted for the study.

We consider four interventions. The first (*In-Class Quiz*) was completely "hands-off", and not labeled as an educational intervention: students were simply asked to fill in an anonymous questionnaire with questions on HIV as well as on their own sexual behavior and that of their peers. The questionnaire took about one hour to go through, including the time to introduce it. An outsider came to the school to administer it. The other three interventions were clearly labeled as HIV education programs. Two of them consisted of general information on HIV prevention methods (abstinence, faithfulness and condom use) and the average HIV prevalence at the national level (the "basic message"). A third one mimicked the "sugar daddy risk information" first proposed in Dupas (2011) and included, on top of the basic message, detailed information on HIV prevalence disaggregated by gender and age group and a special module on cross-generational relationships, locally known as relationships with "sponsors", and their contribution to the spread of HIV. The difference between the two "basic message" interventions is that one was delivered through regular school staff which received special training (*Teacher Training*), while the second one was delivered by an outside consultant who did a special visit to the school to deliver the message (*Consultant*). The intervention

that included the sugar daddy module was also delivered by an outside consultant (*Consultant +*). Both interventions by consultants lasted approximately one hour.

We measure the impacts of the four interventions separately, as well as the impacts of the education interventions combined with the *In-Class Quiz*, using self-reported outcomes measured after 9-12 months among a random subset of girls in the targeted classes (N=3,154). We find that all interventions were successful at reducing the incidence of teenage pregnancy during our follow-up period. The magnitude of the effects are relatively large, with a drop of 2.4 to 4.6 percentage points in the likelihood of having started childbearing at the time of the endline, off a mean in the control group of 9.5%, thus a 25-48% reduction. This magnitude is in line with the 28 percent decrease in teen pregnancy in Dupas (2011). The most surprising results is that the most hands-off intervention, the *In-Class Quiz*, was successful, by itself, at reducing the incidence of unprotected sex and hence pregnancy in the following 12 months. The effect of the *In-Class Quiz* does not amplify the effects of the other interventions however – when implemented jointly, the effect is not larger than that of either education intervention alone, suggesting that the Quiz and the education interventions are perfect subsitutes for each other. Finally, the special message on risks associated with older men did not make a difference compared to the basic message.

The finding that all four interventions have impacts that are fairly large in magnitude yet indistinguishable from each other suggests that the sexual behavior of teenage schoolgirls in Cameroon is fairly responsive to any intervenion that makes risks associated with unprotected sex salient, without "demonizing" the behavior – indeed, all four interventions discussed condom use as a key strategy rather than exhorting abstinence. The interventions increased the belief that condoms are very effective, and self-reported sexual behavior shows a more pronounced decrease in the incidence of unprotected sex in the interventions arm compared to the decrease in sexual activity overall.

At the same time, the interventions increased the likelihood that girls report adopting a clear, one-pronged strategy against HIV: abstinence. When asked what their plan is to avoid HIV infection in the coming year, girls in the intervention arms were less likely to report condom use – a strategy that is quite common but not perfect, since close to a third of sexually active girls report not using a condom at their first intercourse – and more likely to report abstinence, and to report *only* abstinence. It is thus possible that the interventions worked in part by making girls home in on a concrete plan with regards to their future sexual behavior. This would be consistent with the literature suggesting that plan-making helps people overcome several psychological barriers to follow through (Gollwitzer and Sheeran 2006). The hypothesized mechanism behind this is the following: forming a concrete plan means forming an association between a specific future situation and the desired behavior (e.g., "When the opportunity to have sex arrives, I will react to it [this way]."")

The lack of effects of the "sugar daddy risk" intervention over and beyond that of the ABC message has two potential implications for the generalizability of the earlier finding of Dupas (2011). Recall that Dupas (2011) compared the sugar daddy risk message with an abstinence-only curriculum – it could be that even in the Kenya context, a more inclusive message that includes condom promotion would have been as effective at reducing teenage pregnancies as was the sugar daddy message. Alternatively, the role of cross-generational sex in fueling the disease may have been less important in Cameroon than Kenya. Indeed, possibly owing to differences in policies with regards to condom promotion between the two countries, condom use by older men was considerably higher in Cameroon at the time of this study than it was in Kenya five years prior. According to the Demographic and Health Surveys, among men aged 25-29 with at least two sexual partners in the past 12 months, the share who used a condom at last intercourse was 52% in Cameroon in early 2011 (about 6 months after the end of our study) vs. only 40% in Kenya in 2008/2009 (4-5 years after the Kenya study). For older age groups, the gap was even larger: 31% vs. 16% for age group 30-39 and 16% vs. 9 % for age group 40-49.

The finding that the simple *In-Class Quiz* had an impact confirms existing evidence that being surveyed can alter behavior. This phenonemon is well-known in marketing research and is coined the "question–behavior effect" (see Dholakia 2010 for a review), but had been rarely explored outside of purchase behaviors until recently. In the health domain, Zwane et al. (2011) describe three health studies in which subjects in lower income countries were randomly assigned to receive a survey about health. They find that being surveyed reguarly about health levels in the household increased the use of water treatment products as well as take-up of medical insurance.[4] In a different context (the overdraft market in the US), Stango and Zinman (2014) find surveys about overdraft fees can successfully make the issue salient to people and affect behavior: people are less likely to incur a fee in the month following a survey, and the effect increases with repeated exposure to surveys. Our results add to this nascent literature and indicate that such priming or salience effects of surveys can be large even with a one-time survey, and can be large for *teenagers*, a population of particular interest in the case of HIV and reproductive health behavior, and whose behavior is often described as particularly short-sighted (Gruber 2001).

Our findings also suggest links between the "planning prompt" psychology literature mentioned above and the "question-behavior" effect literature in marketing. If the mechanism behind the "question-behavior" effect was purely *salience*, one-time surveys would likely not have the type of fairly delayed impacts we see. Alternatively, if the survey acts in part as a prompt to make a plan, then the impact could be longer lasting since the plan once formed can stick. In the health domain, Milkman et al. (2011) show that mailings informing people of where and when they can get a free flu shot increase take-up rate more if the mailing

[4]They also report on two microlending studies in which being surveyed had no effect on borrowing behavior, however.

includes a prompt to write down the date one plans to get vaccinated on. In our case, the *In-Class Quiz* did not specifically ask teenagers to write down their own personal anti-HIV plan, but it did ask them to write down what they thought were the behaviors that can help prevent HIV infection, and it did ask them, right after that, to report on their own behavior. By exposing gaps between desired and actual behavior, the *In-Class Quiz* may have acted as a planning prompt.

A shortcoming of our study is that we have no biomarker data on infection with STIs in our study sample. Our only "biological" outcome is pregnancy, but this may not be a perfect proxy for risky sexual behavior. Duflo et al. (2015) show that programs that reduce pregnancy rates may have no effect on STIs, and programs that may reduce STIs may have no detectable effects on pregnancy rates. What's more, our data on sexual behavior data is self-reported, and therefore possibly subject to reporting biases. More studies using biological outcomes should be carried out to fill this gap.

The paper is organized as follows. Section 2 presents the background on HIV education in Cameroon and the experimental design. Section 3 presents our data, outcomes of interest and empirical strategy. Section 4 present the results on exposure to HIV education and knowledge, dropout and pregnancy, and sexual behavior. Section 5 concludes.

2 Background and Experimental Design

2.1 Background on HIV, Teenage Sexual Behavior and Sex Education in Cameroon-HIV Prevalence in Cameroon

At the onset of this project in 2009, Cameroon was the country with the highest rate of HIV prevalence in the Central and West Africa Region, at 5.3% of the 15-49 population (UNAIDS, 2010). By 2011, this rate had gone down to 4.3% according to the latest Demographic and Health Survey, but this average masks important differences by gender. Indeed, the principal mode of transmission of HIV in Cameroon is heterosexual contact, and as in most of sub-Sarahan Africa, HIV prevalence is significantly higher for women than for men, at 5.6% vs 2.9%. The breakdown by age and gender group is presented in Figure 1. HIV prevalence is more than five times higher among women below the age of 24 than among men below 24. This may be largely attributed to girls becoming sexually active at a younger age as well as physiological differences that make male-to-female transmission more likely than female-to-male transmission (Bertozzi et alii., 2006). In 2006, 14 percent of girls between 15 and 19 years had their first sexual intercourse before the age of 14 in Cameroon (WHO, 2008).

HIV Knowledge and Sexual Behavior Among Teenagers

Column 1 of Table 1 presents summary statistics on self-reported sexual behavior at the onset of the study (Jan-Feb 2010). This data comes from the *In-Class Quiz*, which was digitized for a random subset of girls who had filled it. Quiz respondents were just above 15 years old on average. Just over 22% reported being sexually active. The use of condoms is widespread: 82% of sexually active girls declared having ever used a condom. The average number of partners in the last 12 months, if any, is two.

Awareness about HIV is almost universal (99% declared they heard about HIV). However, knowledge on transmission is quite poor: Only 37% know that mosquitoes do not transmit HIV, and while a majority (55%) mention condoms (unprompted) as a means to prevent HIV infection, only 39% think that condoms are very effective at preventing HIV infection when used correctly. As in Dupas (2011), less than a third of girls are aware that men above 25 have a higher chance of having HIV than men below 25, and virtually none of them consider careful partner choice as a strategy to avoid HIV infection. Despite this being a sample of schoolgirls, some report having ever been pregnant (3.4%) and 1.6% are already married.

Column 2 of Table 1 shows the same variables collected at endline, for girls in the control group. The changes from column 1 to column 2 provide some sense of the transformation in sexual behavior over the time period of the study, absent any specific intervention. Note that the way the information was elicited across the two columns varies as the baseline *Quiz* was self-administered while the endine information comes from both face-to-face administration and self-administration (see Section 3.1). We find no major difference in variable means depending on endline survey administration mode (means in columns 3 and 4 are identical for most outcomes), except, unsurprisingly, for the most sensitive outcomes (condom use, which is higher in face-to-face interviews compared to in self-administered surveys, and having started sexual activity, lower face-to-face). The comparison between columns 1 and 3 suggests that the year we focus on turns out to be an important year for teenage girls: about 17 percent of them initiate sexual activity during that time, and the share who has started chilbearing triples. The great majority of pregnancies are unplanned.

School-Based HIV Education

The government of Cameroon authorized school-based HIV prevention programs in 2004 as HIV was recognized a national priority. As of 2009, HIV/AIDS prevention education had not been integrated into the standard curriculum for either primary or secondary school. Teacher training was part of the governmental strategy for HIV/AIDS prevention education but only 2.6% of schools had trained teachers by 2009. While individual teachers or other school personnel (e.g. counsellors) could take the initiative to discuss about HIV with students, a 2010 survey administered to school staff by the Institute for Research, Socio-economic

Development and Communication (IRESCO) suggests that while most of them had a relatively good knowledge and understanding of HIV, they did not know how to teach this material and felt they needed a special training. In particular, most school staff members were reluctant to talk about condoms, fearing that discussing condoms in the classroom would be akin to encouraging promiscuity, and those who did teach about HIV focused on abstinence education.

Discussions between the research team and the Ministry of Education suggested a high level of interest in understanding how best to introduce HIV prevention in secondary schools. One key question that arose was that of the "messenger" – namely, who should be delivering HIV prevention information? Regular school teachers trained on this issue, or specialized health professionals that could rotate across schools? The experiment was designed in part to answer this question.

2.2 Experimental Design

The study was conducted in partnership with IRESCO, a Cameroon-based non-profit organization specializing in reproductive health and health education.

The experiment involved 318 middle schools. These schools were first assigned, through block-randomization, to one of four training groups: (1) control, (2) teacher training on the regular HIV prevention curriculum, (3) a 60-min HIV session on the regular HIV prevention curriculum delivered by an outside consultant, and (4) a 60-min HIV session on the regular HIV prevention curriculum delivered by an outside consultant, including the "Sugar Daddy Risk Awareness" information from Dupas (2011). We then randomly sampled 1/2 of the schools in each group for an In-Class Self-Administered Quiz on HIV risk and sexual behavior. This cross-randomization generates 7 treatment categories. We describe each component in detail below.

In-Class Self-Administered Quiz (Q, 159 schools) Each school in this group was visited by IRESCO and students in the selected grade 8 class were given a quiz to fill in class. The quiz was self-administered and included 44 questions in total. The modules were: basic demographics (including childbearing history and current pregnancy status), HIV knowledge (beliefs about prevalence by age groups, beliefs about transmission modes, prevention methods), sexual behavior of peers (e.g. "How many girls in your class have a boyfriend?"), beliefs about the risks of pregnancy and HIV infections per unprotected sex act, and own sexual behavior. All students in the selected 8th-grade class were given a chance to fill out the quiz, during a session which took an hour on average to complete, including the introduction and informed consent process. Each question was read aloud by the IRESCO facilitator.

Teacher Training (TT, 80 schools) Each school in this group was invited to send one permanent staff member to a two-day training held in the region capital city. The training was organized by IRESCO and was focused on HIV prevention education pedagogy, providing trainees with ways to talk about HIV and prevention of HIV with students, including a Q&A manual. The training encouraged teachers to promote all modes of avoiding infection (abstinence, faithfulness and condom use). 53% of schools sent a teacher to these trainings (most often a biology teacher), around a quarter sent the after-school facilitator (the person in charge of extra-curricular activities after school and on Wednesday afternoons) and the remainder sent other non-teaching staffs (hall monitors, counselors, directors of studies). 70% of the trainees were men. After the training, the trained facilitators were responsible for holding as many sessions as they wanted in their school, prioritizing the targeted 8th grade class.

Session with a Consultant (C, 79 schools) This treatment was implemented by a trained, female external professional who came to the school just once to deliver the same basic message as in the TT intervention. The training course and materials that was given to the consultants prior to the intervention had exactly the same content as the training course given to the school staff members. The external consultant provided a single session, showed two short videos on abstinence and condom use and facilitated a discussion of these issues among students in the class. In total, the intervention lasted around one hour. In this treatment, the content of the information delivered should be the same as in the TT intervention but the format of the intervention is different in terms of duration, number of sessions, and relation of the messenger to students.

Session with a Consultant with Sugar Daddy risk message (C+, 79 schools) This treatment mirrors the Consultant treatment but in addition to the information delivered in the previous treatment, the consultant provided detailed information on HIV infection rates by gender and age groups, highlighting the risks associated with "sugar daddy" relationships (called "sponsor" relationships in Cameroon) and their responsibility for the cross-generational transmission of HIV. In addition to the two videos on abstinence and condom use as in the Consultant intervention, the consultant also showed a longer video on risks associated with "sponsors". In total, the intervention was planned to have the same duration as in the Consultant group so that both groups differ only in the content of the information but not in the format of the session. This treatment is a replication of the Relative Risk treatment tested with similarly-aged girls in Kenya in 2004-2005 (Dupas, 2011).

Two external consultants, staff of IRESCO, each covered half of the schools in C treatment group and half of the schools in the C+ treatment group. The rationale for having them do both treatments was to

avoid confounding the message difference with the personality difference. A shortcoming of this design is that there appears to have been some contamination of the C intervention with some C+ information, as we will discuss in Section 4.1.

Allocation of the 318 schools into the four training arms was done after stratifying by region, whether the school was a stand-alone junior high school or attached to a senior high school, the school's tertile in terms of performance on the junior high school leaving exam (BEPC), and the school's tertile in terms of student gender ratio. The three education interventions (training the teachers or sending an outside messenger to the schools) had the same total cost: EUR 218 per school for sending an outside messenger and EUR 208 per school for training the teachers, i.e. $300 and $288 respectively in 2016 USD.

2.3 Sampling

The study took place in three French speaking regions of Cameroon, Yaoundé, South and West. Yaoundé is purely urban whereas the South and West regions are mostly rural. In total, these three regions totalized 527 junior high schools (middle schools). We excluded from the sample all confessional schools as well as schools with fewer than 10 girls in 8th grade (our target grade). This left 326 schools out of which we randomly sampled 318. Table A1 provides summary statistics on the schools in our sample.

In each school, one class was randomly selected for the study. This class was specifically targeted by the trained school staff members (in the TT group) and the consultants (in the C and C+ groups). While the consultants implemented the HIV education session only in the selected class in each school, the school staff members were asked to prioritize the selected class but without any restriction regarding the other classes.

In each class selected for the study, 10 girls were chosen at random to form the study sample (for schools with fewer than 10 girls, all girls were enrolled in the study). In terms of the sampling procedure for female students, upon the first visit by the research team to the school, 10 girls were randomly selected from among those listed on the register and present that day. All schools were visited for the first time between January 25 and April 29, 2010. What differed across schools was the purpose of the first visit. For schools sampled for the In-Class Quiz, the first visit was to administer the quiz. For schools in the control and TT groups, a pure sampling visit was conducted. Finally, for schools sampled for a consultant visit, the first visit was for the consultant intervention. We include sampling week fixed effects in the analysis. Overall, the sample contains 3154 girls enrolled in 318 schools selected for the study.

2.4 Timeline

The school year in Cameroon goes from September to June. The In-Class Self-Administered Quiz was conducted between January 25 and February 26, 2010. The trainings in the TT group took place February 15-23, 2010. The consultant visits in the C and C+ groups took place in March/April 2010.

Our estimates of treatment effects are based on an endline survey conducted between January 25 and April 29, 2011, which we describe in the next section. The average gap between the intervention and the follow-up is 57 weeks for the In-Class Quiz, 54 weeks for the Teacher Training, and 49 weeks for both the Consultant and Consultant+ interventions.

3 Data and Empirical Strategy

3.1 Outcomes of Interest

The main source of data is the endline survey. For the survey, we attempted to trace back all sampled girls. If still in school, sampled girls were surveyed on the school premises. If absent from school, they were visited at home. If girls could not be found in person, a relative or a friend was surveyed on a sub-set of objective outcomes (pregnancy history, marital status, school enrolment) that are common knowledge in the community. The questionnaire was administered face-to-face with a female enumerator for girls in half of the schools, randomly chosen, while it was self-administered to girls in the other half of schools.[5] The endline survey measured three types of outcomes considered in the analysis.

Process and Intermediate outcomes: Exposure to HIV education, HIV knowledge, and prevention plans In order to measure the compliance of school staff and consultants with the treatment assignments, a set of verification outcomes was collected. This includes information on exposure to HIV education, and content of HIV education. For instance, we would expect girls in the control group to report lower number of HIV education sessions than girls in the treatment groups, or girls in the C+ group to remember message about relative risk of "sugar daddies" significantly more than girls in other treatment groups. Mostly open-ended questions were used. The endline survey also contained questions on HIV/AIDS-related knowledge (modes of transmission and prevention).

[5]The random assignment of schools to the face-to-face or self-administered version of the survey was (mistakenly) not stratified by treatment status. The resulting assignment is somewhat unbalanced: schools in the Q, QC and C+ groups are 12 to 16 percentage points less likely to have been assigned to the self-administration group, though the differences are not significant at conventional levels (see Table A1, last column). As shown in Table 1, the administration mode had some limited effects on reports for the most sensitive sexual behavior questions, though not on reported childbearing history. The results are entirely robust to including or excluding a control for the survey administration mode.

Mechanism outcomes: Self-Reported Sexual Behavior The follow-up survey included questions on the quantity of sexual activity (occurrence of a sexual activity), as well as quality (characteristics of sexual partners). The self-reported behavior outcomes are only available for girls who could be interviewed directly.

Primary outcome: Pregnancy Self-reported sexual behavior can be unreliable due to the social desirability bias. We consider childbearing as a more objective measure and proxy for risky sexual conduct. Another advantage is that this outcome can be reported without a direct interview, since childbearing history is usually common knowledge in the community.

We also collected information on dropouts. As mentioned above, a history of pregnancy does not preclude girls from staying in school in this context, in contrast with the female students in Kenya studied in Duflo et al. (2015).

3.2 Validation of the Experimental Design

Balance Tests Table A1 presents summary statistics of the schools in the sample, and balance tests in those characteristics across treatment arms. There is some imbalance in the type of schools (the Teacher Training group has more vocational schools) and the student/teacher ratio (it is higher among schools sampled for the Consultant Only (C) intervention). The other pre-treatment characteristics are balanced across treatment arms, so the means are significantly different in 2 out of the 56 tests. The balance checks thus do not reject the assumption that each treatment group is statistically identical to the control group. In the tables of results, we will show the results both including and excluding school-level controls. We find qualitatively similar estimates across specifications, suggesting that the bias introduced by the initial differences between groups does not account for the main results.

Implementation of the randomized assignment Regarding compliance with treatment assignment, a handful of schools did not receive the treatment they were assigned to: 3 schools out of 80 in the TT group had nobody from the school staff attending the training; one school in the control group was used to pre-test the C+ intervention, by error; finally, another school in the control group was visited by a staff member of a neighboring school belonging to the TT group to run an HIV education session. The compliance rate is thus very high, at 98.5%, and we focus on the intention-to-treat estimator.

Attrition Out of 3154 girls in our sample, we obtained information (direct or indirect) for 2907 of them. This constitutes an overall 7.8 % attrition rate (247 girls lost). Part of this comes from the fact that endline data could not be collected at all from three schools (30 girls).

We were able to trace back and conduct an in-person interview with 2732 girls. Therefore the attrition rate for self-reported sexual behavior outcomes is 13.4 % (422 girls lost). The high attrition rate is not entirely surprising as girls are at a highly unsteady age and are likely to move away. Furthermore, our rate remains within the range of attrition rates observed in comparable experimental settings.[6]

In Table A2 we test whether the attrition rate is differential across treatment arms. One coefficient is significant at the 10% level: girls sampled for the *In-Class Quiz Only* treatment were 5.2 percentage points less likely to be surveyed in person (column 4). In the main table of results (Table 4), we show the key outcome results (childbearing) both including and excluding those not surveyed in person. We find similar estimates, suggesting that the bias introduced by the heightened attrition in the in-person survey for the *In-Class Quiz Only* group does not account for the main results.

3.3 Empirical Strategy

We are interested in measuring the impact of the three types of interventions, as well as of the baseline survey itself. The impact of the *In-Class Quiz* and the education interventions can be estimated within a simple regression framework. The equation for each outcome is:

$$Y_{is} = \alpha + \beta Q_s + \mathbf{E}'_s\gamma + \mathbf{QE}'_s\delta + \mathbf{X}'_i\mu + \mathbf{Z}'_s\eta + \varepsilon_{is}, \quad (1)$$

where Y_{is} is a dependent variable for individual i attending school s; Q_s is a dummy variable for schools selected for the *In-Class Quiz* but not for the education interventions (Q only); $\mathbf{E}'_s$ is a vector of dummy variables designating participation of a school in a particular education intervention (TT, C or C+) but not in the *In-Class Quiz*; $\mathbf{QE}'_s$ is a vector of dummy variables for schools selected for both the *In-Class Quiz* and one of the education interventions; $\mathbf{X}'_i$ is a vector of individual-level controls; $\mathbf{Z}'_s$ is a vector of school-level controls including variables used for stratification; and ε_{is} is the error term. The standard errors are clustered at the school level.

In equation (1), β represents the effect of the *In-Class Quiz* alone; γ represents the effect of the education interventions alone; and δ represents the joint effects.

For each outcome, the ordinary least squares (OLS) estimator is reported. For each dependent variable, we also report the mean of the control group, and p-values for the tests that the effects of different types of treatments are the same. We show three specifications: basic controls, basic + school-level controls, basic + school + individual-level controls. The set of basic controls include: region dummies, whether the endline survey was conducted in-person or with a proxy, whether it was randomized to being self-administered or

[6]For example, Godlonton et al. (2012) have a 30% attrition rate among men in Malawi over a 12-month follow-up period.

face-to-face, and the week during which the endline survey was conducted (since the endline period spanned a period of 3 months). The school-level controls include the characteristics shown in Table A1. The individual level controls include age, age squared, and dummies for the education level of the female guardian.[7]. As a robustness check, Table A3 presents the probit estimators for our main outcome: pregnancy.

4 Results

4.1 HIV education exposure

Table 2 presents the results on process outcomes: whether the interventions affected reported exposure to HIV information sessions. Looking first at the Mean for the control group (row 9), the level of HIV education that goes on absent any intervention is non-negligible. Column 1 shows that 28% of students in the control group report having attended at least one formal HIV education session in the previous 12 months where the average total time in HIV education sessions over the year is 40 minutes. These HIV education sessions are held both by school staff and outside consultants, and appear to be comprehensive in their context, covering the "ABCs" (abstinence, be faithful, condoms) as well as HIV transmission information, and in some cases "sponsors".

The first row in Table 2 shows how the *In-Class Quiz*, by itself, was a memorable event for the student. This is particularly interesting because it tells us whether it was perceived by the students as an "intervention". While most of the coefficients on the outcomes in Table 2 are individually not significant at conventional levels, their magnitude is not trivial. In particular, compared to the control group, students exposed to the *Quiz* are 10 percentage points more likely to report having had an HIV education session in the past 12 months (a 35% increase, p-val=0.12), and 12 percentage points (a 67% increase, significant at 5% level) more likely to report having had a session by an external consultant.

The other coefficient estimates in Table 2 show that, reassuringly, both the teacher training and the consultant interventions increased reported exposure to HIV education by a lot. The consultant interventions (be it C or C+) were more memorable than those led by teachers (an extra 36-39 percentage points of students remember the consultants-led sessions, vs. only 22 percentage points for the TT interventions). The treatments covered the ABCs, but as designed, the C+ treatment had a special focus on "sponsors". This special focus did permeate the C interventions however, possibly owing to the fact that the same two women were in charge of implementing the consultant interventions, who had difficulty holding back on the

[7] We do not include more individual-level controls since individual level characteristics were measured at endline and could have been affected by the treatments. Age and maternal education are obvious time invariant characteristics that are safe to include.

"sponsors" message in the schools sampled for the C intervention. As a result, the C intervention had a significant impact on exposure to the sponsors message, though not as high as the C+ intervention.

4.2 Knowledge and Personal HIV prevention plan

Table 3 presents the results on knowledge and personal HIV prevention plans. The first outcome we consider is misperception with regards to whether mosquitoes transmit HIV. Looking at this outcome is interesting because it sheds light on how the *In-Class Quiz* affected students. The coeffcient for the Quiz alone is negative and significant, suggesting that the Quiz had the perverse effect of making students even more confused about this issue: the likelihood that they are correct dropped by close to 7.6 percentage points, a 20% decrease, significant at the 10% level.[8] But those exposed to the *Consultants* (with or without the *Quiz*) were much more likely to be correct than others. This suggests that the Quiz triggered a change in belief – seeing the question about mosquitoes as vectors in the Quiz made them think that it must be true. But once they had the opportunity to meet "an expert" (the outside health professional who came to their school a few weeks after the Quiz to talk about HIV), they were able to ask the question directly to the expert and learned the truth.

Table 3 also shows how the interventions affected beliefs about the age-gradient in HIV risk and condom effectiveness. The C+ intervention (both alone and combined with the Quiz) was successful at increasing the understanding of the relationship between HIV-risk and age. The Teacher Training, Consultant and Consultant+ interventions all increased the perceived effectiveness of condoms.

Columns 4 to 8 of Table 3 focus on what girls report as their personal plan to avoid HIV infection. The specific question they were asked in the endline survey was: "People can do various things to protect themselves from HIV and other sexually transmitted infections. This year, do you plan to protect yourself one way or another?" (yes/no), and then it asked open-endedly: "In which way(s)?" Column 4 of Table 3 shows the number of strategies that students reported. Interestingly, all interventions reduced the number of strategies mentioned: the average is just over 2 in the control group, but it goes down significantly by 0.35 in the intervention groups. The most common strategies mentioned in the control group are condoms (69%) and abstinence (53%). In the treatment groups, students were much more likely to pick one or the other – but not both. As a result, the share of students who mention condoms as a strategy is significantly lower in the intervention arms. The same goes for the other strategies, except for abstinence, which means that the interventions increased the likelihood that students report abstinence as their one, sole strategy. This is confirmed in Column 9 of Table 3, which shows the proportion of girls whose only plan is abstinence:

[8]The Quiz included the question: "According to you, can mosquitoes transmit HIV?". As shown earlier in Table 1, a large majority (63%) of those who answered the question said "yes".

while this proportion is 15% in the control group, it increases by 6 to 10 percentage points in all treatment groups (most differences being significant). We cannot ascertain whether this effect is "real" (a true change in plans), or whether the interventions changed what the respondents thought was the *expected answer* to the HIV prevention plan question. Since the interventions did not have an abstinence focus, there is no reason to think that this result is driven by social desirability bias – if social desirability bias made respondents more likely to report planning abstinence, this would likely have been the case in the control group too.

4.3 Pregnancy

Table 4 presents the results on pregnancy. We consider two pregnancy outcomes: whether a girl reports having ever been pregnant at the time of the endline ("Has started childbearing", which is equivalent to "ever pregnant"), and whether she reports being pregnant at the time of the endline ("currently pregnant"). We find that all interventions decreased the incidence of pregnancy and cannot reject that their impacts are the same (none of the p-values at the bottom of the table are below 0.1). Some of the estimates are noisy, which is not surprising given that we do not have baseline controls and the outcomes of interest are still fairly rare (the control group means are 9.5% for having started chilbearing and 3.6% for currently pregnant). The *Consultant* interventions (C and C+) appear to have a weaker effect on having started childbearing, but a stronger effect on current pregnancies, which may be due to the fact that these interventions took place a bit later, hence only 49 weeks prior to the endline survey on average. Overall, the magnitude of the effects on childbearing is large – of the order of a 25 to 48 percent drop depending on the program – and in line with the 28 percent decrease observed over a similar time period by Dupas (2011) in Kenya.

Table 4 also presents results on dropout. The coefficients are negative for most of the treatment arms, though few are significant, and the magnitude in percentage points is smaller than the results on pregnancy, possibly because some of those currently pregnant have not yet had to dropout. It also appears to be the case that girls who are pregnant or have given birth are not barred from attending school, in contrast to the norms that prevailed in Kenya at the time of Dupas (2011) and Duflo, Dupas and Kremer (2015).[9]

4.4 Sexual Behavior

Consistent with Table 4, Table 5 shows a decrease in the likelihood of having had unprotected sex in the past 12 months for the Q and TT treatments; for the other interventions, the magnitudes are all negative but the results are noisy. For had sex in the last 12 months, again the results are all too noisy but in the right direction.

[9]We also collected information on marital status. Marriage is a very rare outcome in the sample (only 2.2% of girls report being ever married at endline, see Table 1) and we do not see any significant impacts of any of the treatments on marriage.

The interventions did not, however, impact the types of partner chosen. In particular, the likelihood of having had an older partner (over 25) was not systematically reduced by the intervention tailored to target this outcome. In one of the specifications, the impact of the C+ intervention combined with the Quiz is negative – suggesting that the combined treatment decreased the likelihood that girls report having had an older partner, but we do not see the same for the C+ only group, the intervention that is directly comparable with Dupas (2011).

Overall, the fact that the C+ intervention did not have a higher impact on actual pregnancies than the other interventions, and no clear impact on partner choice, suggests that in the Cameroon context, the basic "ABC" message may be sufficient. There is no clear added benefit to the relative risk message focused on sponsors. In fact, the ABC message seems to have already permeated the environment enough that just reminding students of it through an interactive Quiz seems sufficient to make risks salient and deter risky sexual activity for at least 9 months.

4.5 Heterogeneity: Rural vs. Urban

The study took place in two different contexts: the South and West regions are mostly rural while Yaoundé is purely urban. There are stark difference between these two contexts, with much higher rates of teen pregnancy in rural areas. Table 6 presents the treatment effects for the main outcomes of interests, estimated separately for rural and urban areas. Strikingly, all of the results are concentrated in rural areas: we can reproduce all of the earlier results in Panel A (rural), but none when we focus on Yaounde (Panel B). The "first-stage" is itself weaker in Yaounde: respondents do not report significantly higher time exposure to HIV education in treatment groups in Yaounde, except for one of the 7 treatments. There is no decrease in pregnancy in Yaounde, where the base rate of childbearing is only 4% compared to 12% in rural areas. If anything, we see a positive and significant (at 10%) impact on pregnancy for the Consultant Only group – but this is the only significant coefficient on outcomes in Yaounde, suggesting that it may be due to sampling variation (the sample size is smaller for Yaounde since more than two thirds of the sample is rural).

5 Conclusion

We conducted a randomized experiment with teenage schoolgirls in both urban and rural areas of Cameroon. Our results suggest that simple and short HIV prevention interventions can be effective at reducing the incidence of teen pregnancy in rural areas, where teenage pregnancy is common, but not in urban Yaounde, where teenagers are more exposed to information under the status quo and experience much lower rates of unwanted pregnancy.

We find little difference in effectiveness between one-time, one-hour sessions delivered directly to students by specialized consultants and sessions delivered through regular school staff themselves trained over two days by specialized consultants. We also find little difference between the standard "Abstain, Be Faithful, Use Condoms" (ABC) curriculum and an enriched curriculum that includes information on the heightened risk of cross-generational sex. Lastly, a one-time, one-hour self-administered questionnaire on HIV and sexual behavior has an equally large impact on teen pregnancy. These results suggest that rural teenage schoolgirls sexual behavior is highly responsive to even small interventions that make the risks of HIV and pregnancy salient, and in so doing, prompt them to think about their own risk behavior and to make a plan. This is reminiscent of the psychology literature on the importance of plans for follow-through with a desired behavior (Gollwitzer and Sheeran, 2006).

Such interventions can be implemented extremely cheaply, making them highly cost-effective: our interventions all cost about the same (around $300 per class in today's dollars, which amounts to around $13 per female student). With an average of 3 pregnancies averted for 100 students treated, the cost per pregnancy averted is just above $430.

The findings that teenage behavior is responsive to cues is consistent with earlier findings of high responsiveness in Kenya (Dupas 2011), even though in the present context the specific message studied in Dupas (2011) (the higher risk associated with sex with older men, "sugar daddies") does not seem to be particularly important above and beyond the more traditional ABC prevention message, at least in terms of reducing teenage pregnancy and changing self-reported behavior. Many features of the two environments are comparable, including the misinformation among girls of the age gradient in HIV risk, so what can explain the lack of additional impact of the "Sugar Daddy" in the present context? One important difference is that the HIV rate is lower in Cameroon: according to the Demographic and Health surveys, the infection rate among men aged 25-29 was 3 percent in 2011, whereas in Kenya it was 7.3 percent in 2003 and 6.5 percent in 2008/2009. Condom use is also higher among men 25-49 in Cameroon than in Kenya, though cross-generational sex is likely an important factor in the spread of HIV in both countries since the infection rate among younger women is considerably larger than that of younger men in both cases. Our Cameroon results suggest that the simple ABC message could possibly have been as effective at reducing teenage pregnancy in the Kenyan context as the sugar daddy risk message, had it been acceptable (to this day, the official HIV prevention curriculum for primary schools in Kenya do not discuss condoms). Importantly, the intervention impacts could be different in terms of reducing HIV risk, but this is not something we can test: just like Dupas (2011), we have no information on the incidence of HIV or any other sexually transmitted infections in our sample (the sample sizes are too small for there to be any statistical power so it was not worth the very costly task of collecting blood samples from adolescents). Given the large impacts on teenage pregnancy and

the relatively low cost of the interventions, it is important for further replication studies of Dupas (2011), and of our own teacher training and *In-Class Quiz,* to be conducted with the scope to study impacts on HIV.

References

[1] Bertozzi, Stefano, Nancy S. Padian, JenyWegbreit, Lisa M. DeMaria, Becca Feldman, Helene Gayle, Julian Gold, Robert Grant, and Michael T. Isbell (2006). "HIV/AIDS Prevention and Treatment," chapter 18, *Disease Control Priorities in Developing Countries*. 2nd edition. Jamison DT, Breman JG, Measham AR, et al., editors. Washington (DC): World Bank; 2006

[2] Dholakia, Utpal M. (2010). "A critical review of question–behavior effect research," in Naresh K. Malhotra (ed.) *Review of Marketing Research*, Volume 7. Emerald Group Publishing Limited, pp.145 - 197

[3] Duflo, Esther, Pascaline Dupas and Michael Kremer (2015). "Education, HIV and Early Fertility: Experimental Evidence from Kenya". *American Economic Review*.

[4] Dupas, Pascaline (2011). "Do Teenagers respond to HIV Risk Information? Evidence from a field experiment in Kenya." *AEJ: Applied Economics*, 3(1), pp. 1-36.

[5] Gallant, Melanie, and Eleanor Maticka-Tyndale. (2004). "School-Based HIV Prevention Programmes for African Youth." Social Science and Medicine, 58(7): 1337–51.

[6] Gollwitzer Peter M., Parschal Sheeran (2006) Implementation intentions and goal achievement: A meta-analysis of effects and processes. *Advances in Experimental Social Psychology* 38:69–119.

[7] Gruber (2001). *Risky Behavior among Youths: An Economic Analysis*. University of Chicago Press.

[8] Kirby DB, Laris BA, Rolleri LA (2007). "Sex and HIV Education Programs: Their Impact on Sexual Behaviors of Young People throughout the World". Journal of Adolescent Health;40(3):206-17.

[9] Kirby, D. (2000). School-based interventions to preventunprotected sex and HIV among adolescents. In J. L.Peterson, & R. J. DiClemente (Eds.), Handbook of HIVprevention (pp. 83–101). New York: Plenum.

[10] Mavedzenge Sue M. Napierala , Aoife M. Doyle and David A. Ross (2011). "HIV Prevention in Young People in Sub-Saharan Africa: A Systematic Review." *Journal of Adolescent Health*, Volume 49, Issue 6, Decemberbv 2011, Pages 568–586

[11] K.L. Milkman, J. Beshears, J.J. Choi, D. Laibson, and B.C. Madrian (2011). "Using Implementation Intentions Prompts to Enhance Influenza Vaccination Rates". *Proceedings of the National Academy of Sciences*, Vol. 108, 10415-10420.

[12] Paul-Ebhohimhen VA, Poobalan A, van Teijlingen ER (2008). "A systematic review ofschool-based sexual health interventions to prevent STI/HIV in sub-SaharanAfrica." BMC Public Health;8:4.

[13] Ross D, Dick B, Ferguson J. (2006). *Preventing HIV/AIDS in Young People: A systematic review of the evidence from developing countries.* Geneva: WHO, 2006.

[14] Stango, Victor and Jonathan Zinman (2011), "Limited and Varying Consumer Attention: Evidence from Shocks to the Salience of Bank Overdraft Fees," *Review of Financial Studies* 27(4), 990-1030

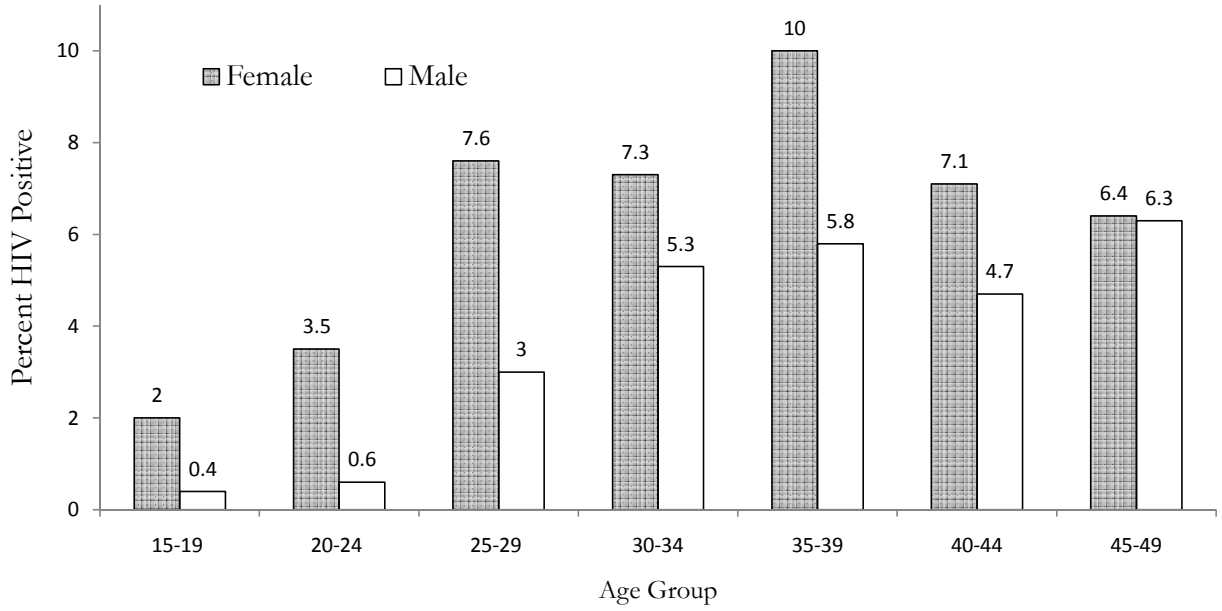
[15] UNAIDS (2010). *Global Report: UNAIDS Report on the global AIDS epidemic 2010.*

[16] UNESCO (2011). "UNESCO's strategy for HIV and AIDS". UNESCO, Paris, France. June 2011.

[17] World Health Organization (WHO). 2008. *Epidemiological Fact Sheet on HIV and AIDS: Cameroon.*

[18] Zwane et al. (2011), Being surveyed can change later behavior and related parameter estimates, *PNAS.*

Figure 1: 2011 HIV Prevalence in Cameroon, by Gender and Age Group



Source: Cameroon DHS 2011 http://www.measuredhs.com/pubs/pdf/PR16/PR16.pdf

Table 1. Summary Statistics: Teenage Sexual Behavior over Study period and by Elicitation Method

	(1) Baseline, In-Class Quiz, Self-Administered (Weeks 4-5, 2010)		(2) Endline, Pure Control Group Only (All) (Weeks 4-17, 2011)		(3) Endline, Pure Control Group Only, Self-Administered		(4) Endline, Pure Control Group Only, Face-to-Face	
	Mean [Std. Dev.]	Obs	Mean [Std. Dev.]	Obs	Mean [Std. Dev.]	Obs	Mean [Std. Dev.]	Obs
Age in years	15.487	1467	16.757	403	16.789	212	16.722	191
	[1.634]		[1.56]		[1.535]		[1.591]	
Ever heard of HIV	0.991	1493	1.000	348	1.000	181	1.000	167
	[0.093]		[0]		[0]		[0]	
Knows mosquitoes do not transmit HIV	0.372	1483	0.440	348	0.459	181	0.419	167
	[0.483]		[0.497]		[0.5]		[0.495]	
Mentions condoms as HIV prevention method	0.549	1492	0.819	348	0.801	181	0.838	167
	[0.498]		[0.386]		[0.4]		[0.369]	
Thinks condoms are very effective	0.394	1479	0.289	343	0.288	177	0.289	166
	[0.489]		[0.454]		[0.454]		[0.455]	
Knows older men are riskier partners in terms of HIV	0.311	1487	0.391	348	0.398	181	0.383	167
	[0.463]		[0.489]		[0.491]		[0.488]	
Mentions careful partner choice as HIV prevention method	0.001	1492	0.023	348	0.022	181	0.024	167
	[0.037]		[0.15]		[0.147]		[0.153]	
Ever had sex	0.222	1488	0.379	367	0.398	196	0.357	171
	[0.416]		[0.486]		[0.491]		[0.48]	
If ever had sex: Ever used a condom / Used a condom at first sex	0.822	332	0.724	123	0.688	64	0.763	59
	[0.383]		[0.449]		[0.467]		[0.429]	
Number of partners in last 12 months, if any	1.959	217	1.253	99	1.286	49	1.220	50
	[2.731]		[0.595]		[0.677]		[0.507]	
Ever pregnant	0.034	1479	0.095	367	0.097	196	0.094	171
	[0.181]		[0.294]		[0.297]		[0.292]	
Ever married	0.016	1471	0.022	367	0.036	195	0.006	172
	[0.127]		[0.146]		[0.187]		[0.076]	
Ever had a partner over the age of 25[a]	0.041	1380						
	[0.197]							
Ever pregnant but did not want to get pregnant			0.075	348	0.077	181	0.072	167
			[0.263]		[0.268]		[0.259]	

Notes: Data from In-Class Quiz administered at baseline for a random subset, and endline survey. In-class Quiz was self-administered. Follow-up survey was administered by a surveyor in half of the schools, and self-administered in the other half, randomly chosen.

[a] Girls were asked to write down the age of the oldest partner they ever had sex with. We use this to back out whether they ever had a partner older than 25.

Table 2. HIV education exposure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Had HIV education at school in past 12 months	Number of HIV education sessions	Total Time (minutes) of HIV education in past 12 months	Had HIV education led by external consultants	Had HIV education led by school staff	Themes covered included condoms	Themes covered included absti-nence	Themes covered included faith-fulness	Themes covered included "spon-sors"	Themes covered included HIV trans-mission	Movies were shown during session	Could ask questions during session	Asked question during session
In-Class Quiz Only (Q)	0.10	0.21	8.10	0.12**	0.03	0.09	0.10	0.11*	0.02	0.07	-0.04	0.10*	0.03
	(0.06)	(0.18)	(12.09)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.04)	(0.06)	(0.04)	(0.06)	(0.03)
Teacher Training Only (TT)	0.22***	1.28***	62.70***	0.02	0.23***	0.19***	0.22***	0.23***	0.07*	0.20***	-0.01	0.23***	0.19***
	(0.06)	(0.42)	(16.33)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.04)	(0.06)	(0.04)	(0.06)	(0.04)
In-Class Quiz + Teacher Training (QTT)	0.22***	0.75***	57.30***	0.09	0.23***	0.20***	0.22***	0.23***	0.01	0.20***	-0.04	0.23***	0.16***
	(0.07)	(0.25)	(15.82)	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.04)	(0.06)	(0.04)	(0.07)	(0.04)
Consultant Only (C)	0.39***	0.50***	56.72***	0.44***	0.06	0.38***	0.40***	0.38***	0.13***	0.37***	0.42***	0.39***	0.22***
	(0.06)	(0.15)	(14.03)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.04)	(0.06)	(0.06)	(0.06)	(0.04)
In-Class Quiz + Consultant (QC)	0.36***	0.61***	53.47***	0.42***	0.10*	0.34***	0.35***	0.34***	0.14***	0.29***	0.46***	0.35***	0.19***
	(0.06)	(0.14)	(12.66)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)	(0.05)	(0.06)	(0.04)
Consultant Plus Only (C+)	0.39***	0.52***	53.05***	0.46***	0.02	0.37***	0.39***	0.39***	0.43***	0.36***	0.57***	0.39***	0.23***
	(0.06)	(0.15)	(13.17)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.04)
In-Class Quiz + Consultant Plus (QC+)	0.38***	0.65***	79.74***	0.43***	0.09	0.37***	0.39***	0.39***	0.35***	0.35***	0.44***	0.38***	0.18***
	(0.06)	(0.14)	(14.46)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.04)
Number of Observations	2,732	2,676	2,618	2,732	2,732	2,732	2,732	2,732	2,732	2,732	2,726	2,731	2,732
Mean of Dep. Var. (Pure Control)	0.28	0.44	40.14	0.18	0.18	0.26	0.26	0.26	0.14	0.25	0.09	0.26	0.10
R-squared	0.17	0.10	0.12	0.21	0.10	0.15	0.16	0.16	0.14	0.14	0.33	0.16	0.08
P-value for the test Q = TT	0.07	0.01	0.00	0.08	0.00	0.11	0.04	0.05	0.20	0.02	0.37	0.04	0.00
P-value for the test Q = C	0.00	0.11	0.00	0.00	0.65	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
P-value for the test Q = C+	0.00	0.09	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-value for the test TT = QTT	0.92	0.31	0.78	0.26	0.91	0.80	0.99	0.94	0.12	0.89	0.34	0.98	0.47
P-value for the test C = QC	0.54	0.45	0.83	0.73	0.47	0.43	0.40	0.43	0.86	0.17	0.55	0.51	0.55
P-value for the test C+ = QC+	0.88	0.38	0.09	0.69	0.22	0.98	0.95	0.90	0.27	0.92	0.06	0.79	0.38

Notes: Data from endline survey. Sample restricted to girls who were administered endline survey in person. Estimates from an OLS regression. * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level. All regressions include region dummies as well as the following school-level controls: Dummy for a private school, Dummy for a vocational school, Dummy for top and middle tercile of ratio student/teacher, Dummy for top and middle tercile of girls' absenteeism rate, Dummy for top and middle tercile of school-level pregnancy-related dropout rate at baseline, Dummy for cycle, Dummy for top and middle tercile of proportion of girls, Dummy for terciles of scores on national middle school exam, Dummy for endline elicitation method (self-administered or face-to-face).

Table 3. HIV knowledge and Personal HIV avoidance plan

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Knows mosquitoes do not transmit HIV	Knows older men are riskier partners in terms of HIV	Thinks condoms are very effective	Personal plan to avoid HIV infection in coming year: Number of strategies listed	Plans to abstain	Plans to limit number of partners	Plans to change how partners will be chosen	Plans to use condoms	Plans to abstain only	Plans to use condoms only
In-Class Quiz Only (Q)	-0.076*	0.030	0.041	-0.350**	0.049	-0.068	-0.020**	-0.131***	0.080**	-0.021
	(0.039)	(0.049)	(0.042)	(0.143)	(0.051)	(0.057)	(0.010)	(0.050)	(0.039)	(0.030)
Teacher Training Only (TT)	0.047	0.040	0.089**	-0.228	0.05	-0.064	-0.016*	-0.125**	0.078*	-0.068**
	(0.044)	(0.047)	(0.045)	(0.178)	(0.047)	(0.065)	(0.009)	(0.059)	(0.045)	(0.030)
In-Class Quiz + Teacher Training (QTT)	0.032	0.075	0.112**	-0.18	0.102**	-0.017	-0.016	-0.112**	0.092**	-0.061
	(0.044)	(0.051)	(0.047)	(0.168)	(0.044)	(0.063)	(0.010)	(0.052)	(0.042)	(0.037)
Consultant Only (C)	0.054	0.038	0.080*	-0.321**	0.116***	-0.093*	-0.016*	-0.127**	0.099**	-0.03
	(0.041)	(0.046)	(0.045)	(0.142)	(0.043)	(0.054)	(0.010)	(0.049)	(0.041)	(0.032)
In-Class Quiz + Consultant (QC)	0.226***	0.006	0.070*	-0.299*	0.076*	-0.061	-0.013	-0.118**	0.084**	-0.054*
	(0.043)	(0.049)	(0.043)	(0.159)	(0.046)	(0.057)	(0.012)	(0.049)	(0.037)	(0.032)
Consultant Plus Only (C+)	0.077**	0.096*	0.122**	-0.323**	0.045	-0.086	-0.004	-0.095**	0.058*	-0.011
	(0.039)	(0.049)	(0.048)	(0.150)	(0.045)	(0.057)	(0.011)	(0.046)	(0.034)	(0.035)
In-Class Quiz + Consultant Plus (QC+)	0.155***	0.099**	0.112***	-0.324**	0.023	-0.061	-0.018*	-0.108**	0.064	-0.023
	(0.047)	(0.046)	(0.040)	(0.148)	(0.045)	(0.053)	(0.009)	(0.047)	(0.039)	(0.032)
Number of Observations	2,731	2,731	2,670	2,732	2,726	2,726	2,726	2,726	2,726	2,726
Mean of Dep. Var. (Pure Control)	0.44	0.39	0.29	2.06	0.53	0.38	0.02	0.69	0.15	0.16
R-squared	0.07	0.03	0.02	0.03	0.04	0.02	0.01	0.04	0.03	0.02
P-value for the test Q = TT	0.01	0.84	0.29	0.39	0.99	0.95	0.50	0.91	0.95	0.05
P-value for the test Q = C	0.00	0.88	0.41	0.78	0.20	0.59	0.54	0.93	0.68	0.83
P-value for the test Q = C+	0.00	0.20	0.10	0.80	0.93	0.71	0.07	0.42	0.53	0.74
P-value for the test TT = QTT	0.76	0.45	0.64	0.76	0.30	0.44	0.98	0.83	0.77	0.79
P-value for the test C = QC	0.00	0.52	0.85	0.86	0.41	0.48	0.69	0.86	0.74	0.33
P-value for the test C+ = QC+	0.12	0.96	0.84	0.99	0.66	0.58	0.10	0.77	0.87	0.71

Notes: Data from endline survey. Sample restricted to girls who were administered endline survey in person. Estimates from an OLS regression. * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level. All regressions include region dummies and the same school-level controls as in Table 2.

Table 4. Childbearing and Dropout

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Has Started childbearing[a]				Currently Pregnant				Dropped out of school			
In-Class Quiz Only (Q)	-0.031	-0.029*	-0.024	-0.032*	-0.013	-0.014	-0.013	-0.019*	-0.001	0.007	0.009	-0.003
	(0.019)	(0.017)	(0.017)	(0.018)	(0.013)	(0.012)	(0.012)	(0.011)	(0.015)	(0.015)	(0.015)	(0.013)
Teacher Training Only (TT)	-0.046**	-0.043**	-0.037**	-0.048**	-0.018	-0.020*	-0.018	-0.018	-0.031*	-0.027*	-0.024	-0.022*
	(0.021)	(0.018)	(0.018)	(0.019)	(0.012)	(0.011)	(0.011)	(0.011)	(0.016)	(0.015)	(0.016)	(0.013)
In-Class Quiz + Teacher Training (QTT)	-0.016	-0.017	-0.012	-0.022	-0.001	-0.002	0.000	-0.004	-0.013	-0.018	-0.015	-0.007
	(0.021)	(0.017)	(0.017)	(0.018)	(0.014)	(0.012)	(0.012)	(0.012)	(0.016)	(0.015)	(0.015)	(0.014)
Consultant Only (C)	-0.033*	-0.033*	-0.031*	-0.024	-0.020*	-0.022*	-0.021*	-0.018	-0.028*	-0.024*	-0.023	-0.015
	(0.020)	(0.018)	(0.017)	(0.018)	(0.012)	(0.011)	(0.011)	(0.011)	(0.016)	(0.014)	(0.014)	(0.013)
In-Class Quiz + Consultant (QC)	-0.036*	-0.031*	-0.026	-0.024	-0.022**	-0.022*	-0.020*	-0.018	-0.021	-0.014	-0.012	-0.005
	(0.019)	(0.018)	(0.017)	(0.017)	(0.011)	(0.011)	(0.011)	(0.011)	(0.015)	(0.014)	(0.015)	(0.013)
Consultant Plus Only (C+)	-0.033	-0.030	-0.026	-0.024	-0.025**	-0.027**	-0.025**	-0.024**	-0.014	-0.014	-0.012	-0.002
	(0.022)	(0.020)	(0.019)	(0.020)	(0.011)	(0.011)	(0.011)	(0.011)	(0.017)	(0.015)	(0.015)	(0.013)
In-Class Quiz + Consultant Plus (QC+)	-0.018	-0.025	-0.026	-0.030	-0.020	-0.022*	-0.022*	-0.023**	-0.016	-0.017	-0.018	-0.011
	(0.027)	(0.020)	(0.020)	(0.020)	(0.012)	(0.012)	(0.012)	(0.012)	(0.017)	(0.016)	(0.016)	(0.014)
Number of Observations	2,892	2,892	2,892	2,732	2,891	2,891	2,891	2,728	2,905	2,905	2,905	2,732
Mean of Dep. Var. (Pure Control)	0.095	0.095	0.095	0.095	0.036	0.036	0.036	0.036	0.071	0.071	0.071	0.071
R-squared	0.115	0.144	0.193	0.181	0.048	0.059	0.071	0.047	0.293	0.305	0.319	0.065
P-value for the test Q = TT	0.385	0.437	0.426	0.360	0.698	0.639	0.638	0.929	0.037	0.021	0.020	0.104
P-value for the test Q = C	0.898	0.829	0.616	0.607	0.526	0.470	0.450	0.890	0.055	0.025	0.016	0.283
P-value for the test Q = C+	0.931	0.965	0.878	0.659	0.248	0.208	0.203	0.532	0.397	0.170	0.155	0.980
P-value for the test TT = QTT	0.101	0.143	0.154	0.138	0.187	0.133	0.130	0.205	0.199	0.511	0.526	0.203
P-value for the test C = QC	0.850	0.908	0.741	0.974	0.861	0.941	0.900	0.995	0.630	0.476	0.385	0.359
P-value for the test C+ = QC+	0.614	0.810	0.994	0.774	0.628	0.633	0.727	0.965	0.894	0.807	0.655	0.482
School-level controls		Y	Y	Y		Y	Y	Y		Y	Y	Y
Individual-level controls			Y	Y			Y	Y			Y	Y
Exclude girls not surveyed in person				Y				Y				Y

Notes: Data from endline survey. Estimates from an OLS regression. * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level. School-level control variables as in Table 2. Individual-level control variables: Dummies for female guardian's education level, age and age squared.

[a] "Has started childbearing" is a dummy equal to 1 if ever pregnant.

Table 5. Sexual behavior

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Had sex in the last 12 months			Had unprotected sex in the last 12 months			Had more than one partner in the last 12 months			Had at least one partner over 25 in the last 12 months[a]		
In-Class Quiz Only (Q)	-0.037	-0.044	-0.035	-0.058*	-0.055*	-0.052**	-0.011	-0.011	-0.009	-0.010	-0.011	-0.009
	(0.041)	(0.039)	(0.034)	(0.029)	(0.028)	(0.026)	(0.019)	(0.018)	(0.018)	(0.008)	(0.009)	(0.008)
Teacher Training Only (TT)	-0.053	-0.058	-0.045	-0.066**	-0.063**	-0.055*	-0.018	-0.012	-0.008	-0.004	-0.004	-0.001
	(0.044)	(0.039)	(0.035)	(0.034)	(0.030)	(0.028)	(0.019)	(0.017)	(0.016)	(0.009)	(0.010)	(0.009)
In-Class Quiz + Teacher Training (QTT)	-0.030	-0.046	-0.034	-0.027	-0.040	-0.029	0.004	0.010	0.012	0.012	0.015	0.016
	(0.042)	(0.038)	(0.032)	(0.036)	(0.033)	(0.031)	(0.020)	(0.019)	(0.019)	(0.011)	(0.012)	(0.011)
Consultant Only (C)	-0.005	-0.010	-0.013	-0.026	-0.031	-0.032	0.013	0.012	0.010	0.007	0.005	0.005
	(0.047)	(0.044)	(0.039)	(0.037)	(0.034)	(0.031)	(0.021)	(0.020)	(0.019)	(0.010)	(0.011)	(0.011)
In-Class Quiz + Consultant (QC)	-0.024	-0.023	-0.009	-0.023	-0.017	-0.009	-0.014	-0.006	-0.004	0.000	0.003	0.002
	(0.042)	(0.038)	(0.034)	(0.034)	(0.032)	(0.029)	(0.017)	(0.016)	(0.015)	(0.013)	(0.014)	(0.013)
Consultant Plus Only (C+)	-0.043	-0.034	-0.029	-0.025	-0.015	-0.011	-0.021	-0.012	-0.011	-0.001	0.003	0.005
	(0.040)	(0.037)	(0.033)	(0.033)	(0.030)	(0.028)	(0.019)	(0.018)	(0.018)	(0.009)	(0.010)	(0.009)
In-Class Quiz + Consultant Plus (QC+)	0.013	0.001	-0.001	-0.012	-0.025	-0.030	0.008	0.013	0.011	-0.013	-0.013	-0.017*
	(0.042)	(0.041)	(0.038)	(0.031)	(0.030)	(0.028)	(0.021)	(0.020)	(0.019)	(0.009)	(0.009)	(0.009)
Number of Observations	2,732	2,732	2,732	2,383	2,383	2,383	2,571	2,571	2,571	2,732	2,732	2,732
Mean of Dep. Var. (Pure Control)	0.284	0.284	0.284	0.172	0.172	0.172	0.056	0.056	0.056	0.020	0.020	0.020
R-squared	0.044	0.078	0.174	0.078	0.110	0.191	0.019	0.031	0.057	0.028	0.038	0.112
P-value for the test Q = TT	0.717	0.739	0.793	0.791	0.787	0.923	0.668	0.970	0.989	0.517	0.395	0.331
P-value for the test Q = C	0.519	0.461	0.581	0.375	0.468	0.494	0.253	0.242	0.320	0.098	0.105	0.145
P-value for the test Q = C+	0.872	0.799	0.854	0.271	0.159	0.112	0.546	0.975	0.894	0.320	0.129	0.100
P-value for the test TT = QTT	0.618	0.782	0.775	0.299	0.492	0.429	0.227	0.215	0.237	0.183	0.144	0.141
P-value for the test C = QC	0.701	0.767	0.936	0.940	0.704	0.492	0.159	0.329	0.418	0.607	0.873	0.840
P-value for the test C+ = QC+	0.193	0.433	0.495	0.701	0.746	0.528	0.128	0.205	0.253	0.194	0.128	0.029
School-level controls		Y	Y		Y	Y		Y	Y		Y	Y
Individual-level controls			Y			Y			Y			Y
Exclude girls not surveyed in person	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Data from endline survey. Estimates from an OLS regression. * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level.
School-level control variables as in Table 2, Individual-level control variables as in Table 4.

[a] Cols 10-12: the dependent variable is based on a question asking girls the age of the oldest partner they had sex wtih in the last 12 months.

Table 6. Heterogeneity by rural/urban

Panel A. Rural	(1) Has endline data	(2) Total Time (minutes) of HIV education in past 12 months	(3) Had HIV education led by external consultants	(4) Has started child-bearing	(5) Currently pregnant	(6) Dropped out	(7) Had sex in the last 12 months	(8) Had unprotected sex in the last 12 months	(9) Had at least one partner over 25 in the last 12 months
In-Class Quiz Only (Q)	-0.045	15.292	0.188**	-0.039*	-0.016	-0.004	-0.041	-0.062*	-0.008
	(0.034)	(14.520)	(0.073)	(0.022)	(0.017)	(0.020)	(0.041)	(0.033)	(0.011)
Teacher Training Only (TT)	0.021	100.224***	0.075	-0.051**	-0.029*	-0.040*	-0.070*	-0.085**	-0.001
	(0.029)	(21.256)	(0.065)	(0.025)	(0.015)	(0.021)	(0.042)	(0.035)	(0.011)
In-Class Quiz + Teacher Training (QTT)	-0.023	84.489***	0.168**	-0.009	0.001	-0.021	-0.043	-0.034	0.026*
	(0.032)	(18.817)	(0.070)	(0.024)	(0.017)	(0.019)	(0.037)	(0.040)	(0.014)
Consultant Only (C)	-0.001	74.191***	0.548***	-0.052**	-0.028*	-0.043**	-0.026	-0.051	0.008
	(0.030)	(15.811)	(0.071)	(0.022)	(0.015)	(0.018)	(0.045)	(0.039)	(0.014)
In-Class Quiz + Consultant (QC)	0.002	83.058***	0.589***	-0.033	-0.028*	-0.021	0.002	-0.025	0.002
	(0.031)	(14.590)	(0.061)	(0.024)	(0.015)	(0.019)	(0.042)	(0.040)	(0.017)
Consultant Plus Only (C+)	-0.019	71.109***	0.592***	-0.039	-0.037**	-0.029	-0.027	-0.025	0.004
	(0.030)	(16.978)	(0.067)	(0.027)	(0.015)	(0.021)	(0.041)	(0.034)	(0.012)
In-Class Quiz + Consultant Plus (QC+)	0.016	95.134***	0.544***	-0.039	-0.021	-0.025	0.008	-0.036	-0.020*
	(0.029)	(19.169)	(0.075)	(0.027)	(0.017)	(0.021)	(0.046)	(0.037)	(0.012)
Number of Observations	2,214	1,813	1,914	2,054	2,053	2,068	1,930	1,656	1,914
Mean of Dep. Var. (Pure Control)	0.93	38.65	0.16	0.12	0.05	0.09	0.34	0.23	0.02
R-squared	0.05	0.13	0.24	0.21	0.07	0.32	0.18	0.19	0.13
Panel B. Urban (Yaounde)									
In-Class Quiz Only (Q)	-0.020	-4.841	0.003	0.017	-0.019	0.011	0.001	-0.011	-0.005
	(0.045)	(18.166)	(0.092)	(0.028)	(0.018)	(0.022)	(0.047)	(0.042)	(0.02)
Teacher Training Only (TT)	0.015	-23.665	-0.100	-0.001	0.000	0.004	0.023	0.037	-0.005
	(0.041)	(14.671)	(0.094)	(0.022)	(0.013)	(0.019)	(0.062)	(0.044)	(0.02)
In-Class Quiz + Teacher Training (QTT)	0.022	4.348	-0.110	-0.004	0.002	0.028	0.009	0.026	-0.02
	(0.052)	(18.326)	(0.101)	(0.019)	(0.015)	(0.020)	(0.057)	(0.039)	(0.02)
Consultant Only (C)	-0.027	21.756	0.231**	0.043*	-0.002	0.020	0.061	0.046	-0.007
	(0.050)	(24.035)	(0.110)	(0.025)	(0.016)	(0.024)	(0.066)	(0.046)	(0.02)
In-Class Quiz + Consultant (QC)	-0.028	-20.881	0.090	0.008	0.004	0.011	-0.021	0.035	-0.011
	(0.042)	(14.845)	(0.088)	(0.020)	(0.016)	(0.021)	(0.049)	(0.036)	(0.02)
Consultant Plus Only (C+)	0.015	13.492	0.200*	0.030	0.003	0.033	-0.039	0.042	-0.006
	(0.044)	(18.680)	(0.104)	(0.023)	(0.016)	(0.021)	(0.058)	(0.044)	(0.02)
In-Class Quiz + Consultant Plus (QC+)	-0.062	36.132**	0.214**	0.015	-0.015	-0.015	-0.003	-0.005	-0.014
	(0.042)	(18.000)	(0.092)	(0.027)	(0.011)	(0.019)	(0.056)	(0.044)	(0.02)
Number of Observations	940	805	818	838	838	837	822	747	818
Mean of Dep. Var. (Pure Control)	0.89	43.02	0.23	0.04	0.02	0.03	0.17	0.06	0.02
R-squared	0.03	0.09	0.14	0.16	0.18	0.37	0.17	0.19	0.09

Notes: Data from endline survey. Estimates from an OLS regression. * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level. Columns 2-8 include school-level and individual-level controls as in Table 4. Columns 7-8: sample restricted to individuals surveyed in person at endline.

Table A1. School Characteristics and Balance check

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Private	Vocational	Attached to High school	Student /teacher ratio	Female/ male ratio	National 8th grade exam pass rate	Girls' Absenteeism rate	Absenteeism due to pregnancy	Urban (Yaounde)	South	Endline survey self-administered
Mean of Dep. Var. (Pure Control)	*0.400*	*0.050*	*0.300*	*22.927*	*0.502*	*0.399*	*0.152*	*0.008*	*0.350*	*0.125*	*0.525*
In-Class Quiz Only (Q)	-0.100	0.100	0.025	0.462	0.002	0.006	0.011	0.001	-0.075	-0.025	-0.125
	(0.105)	(0.067)	(0.105)	(3.059)	(0.022)	(0.038)	(0.032)	(0.006)	(0.104)	(0.071)	(0.111)
Teacher Training Only (TT)	-0.125	0.150**	0.000	0.268	0.020	0.007	0.001	0.001	-0.025	0.000	-0.050
	(0.105)	(0.067)	(0.105)	(3.019)	(0.022)	(0.038)	(0.032)	(0.006)	(0.104)	(0.071)	(0.111)
In-Class Quiz + Teacher Training (QTT)	-0.075	0.025	0.050	3.543	0.005	-0.009	-0.044	0.001	-0.075	-0.050	-0.025
	(0.105)	(0.067)	(0.105)	(3.001)	(0.022)	(0.036)	(0.032)	(0.006)	(0.104)	(0.071)	(0.111)
Consultant Only (C)	-0.100	0.075	0.025	6.310**	-0.020	0.033	0.024	0.007	-0.100	0.050	0.075
	(0.105)	(0.067)	(0.105)	(3.001)	(0.022)	(0.037)	(0.032)	(0.006)	(0.104)	(0.071)	(0.111)
In-Class Quiz + Consultant (QC)	-0.144	0.001	0.008	-1.084	-0.005	0.018	-0.032	-0.002	-0.017	-0.048	-0.166
	(0.106)	(0.068)	(0.106)	(3.019)	(0.022)	(0.036)	(0.032)	(0.006)	(0.105)	(0.072)	(0.112)
Consultant Plus Only (C+)	-0.092	0.027	-0.018	2.485	0.002	0.049	-0.012	0.004	-0.042	-0.048	-0.166
	(0.106)	(0.068)	(0.106)	(3.039)	(0.022)	(0.037)	(0.033)	(0.007)	(0.105)	(0.072)	(0.112)
In-Class Quiz + Consultant Plus (QC+)	-0.025	0.025	0.025	-0.105	0.000	-0.006	-0.002	0.010	-0.025	0.025	0.050
	(0.105)	(0.067)	(0.105)	(3.001)	(0.022)	(0.037)	(0.032)	(0.006)	(0.104)	(0.071)	(0.111)
Number of Observations	318	318	318	311	318	258	314	314	318	318	318
R-squared	0.009	0.027	0.002	0.031	0.011	0.016	0.022	0.017	0.005	0.012	0.031
P-value for the test Q = TT	0.812	0.457	0.812	0.949	0.418	0.975	0.775	0.940	0.631	0.726	0.501
P-value for the test Q = C	1.000	0.710	1.000	0.054	0.325	0.484	0.686	0.375	0.810	0.294	0.073
P-value for the test Q = C+	0.942	0.281	0.685	0.509	0.979	0.273	0.492	0.721	0.755	0.748	0.715
P-value for the test TT = QTT	0.634	0.064	0.634	0.273	0.518	0.671	0.156	0.923	0.631	0.484	0.823
P-value for the test C = QC	0.680	0.276	0.870	0.014	0.494	0.681	0.082	0.155	0.427	0.173	0.032
P-value for the test C+ = QC+	0.524	0.977	0.685	0.389	0.925	0.149	0.767	0.340	0.869	0.309	0.055

Notes: Data from endline survey. Estimates from an OLS regression. * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level.

Table A2. Attrition

	(1)	(2)	(3)	(4)
	Has endline data (in-person or through proxy)		Surveyed in-person at endline	
In-Class Quiz Only (Q)	-0.025	-0.028	-0.045	-0.052*
	(0.028)	(0.027)	(0.029)	(0.028)
Teacher Training Only (TT)	0.033	0.026	0.031	0.018
	(0.023)	(0.024)	(0.026)	(0.025)
In-Class Quiz + Teacher Training (QTT)	0.005	0.003	0.005	0.000
	(0.026)	(0.027)	(0.026)	(0.026)
Consultant Only (C)	0.005	0.004	0.015	0.011
	(0.026)	(0.026)	(0.027)	(0.026)
In-Class Quiz + Consultant (QC)	0.016	0.001	0.004	-0.011
	(0.025)	(0.025)	(0.028)	(0.026)
Consultant Plus Only (C+)	0.009	0.003	0.012	0.000
	(0.027)	(0.026)	(0.029)	(0.029)
In-Class Quiz + Consultant Plus (QC+)	0.006	0.004	-0.004	-0.010
	(0.024)	(0.024)	(0.027)	(0.026)
Number of Observations	3154	3154	3154	3154
Mean of Dep. Var. (Pure Control)	0.913	0.913	0.864	0.864
R-squared	0.009	0.032	0.004	0.020
P-value for the test Q = TT	0.024	0.024	0.008	0.010
P-value for the test Q = C	0.285	0.206	0.041	0.024
P-value for the test Q = C+	0.242	0.221	0.067	0.089
P-value for the test TT = QTT	0.242	0.342	0.314	0.489
P-value for the test C = QC	0.631	0.899	0.711	0.417
P-value for the test C+ = QC+	0.898	0.974	0.581	0.744
School-level controls		Y		Y

Notes: Estimates from an OLS regression. * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level.

Table A3. Pregnancy Outcomes using a Probit specification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Has Started childbearing				Currently Pregnant			
In-Class Quiz Only (Q)	-0.290*	-0.225	-0.140	-0.263	-0.283	-0.231	-0.170	-0.349
	(0.154)	(0.140)	(0.145)	(0.180)	(0.212)	(0.217)	(0.216)	(0.280)
Teacher Training Only (TT)	-0.372**	-0.292*	-0.281*	-0.440**	-0.271	-0.275	-0.275	-0.393
	(0.159)	(0.158)	(0.162)	(0.197)	(0.226)	(0.240)	(0.244)	(0.287)
In-Class Quiz + Teacher Training (QTT)	-0.139	-0.174	-0.121	-0.245	0.000	-0.068	0.004	-0.182
	(0.165)	(0.151)	(0.160)	(0.189)	(0.202)	(0.196)	(0.198)	(0.215)
Consultant Only (C)	-0.253*	-0.208	-0.170	-0.124	-0.401*	-0.434**	-0.430*	-0.416*
	(0.150)	(0.135)	(0.132)	(0.138)	(0.234)	(0.218)	(0.231)	(0.247)
In-Class Quiz + Consultant (QC)	-0.354**	-0.285*	-0.318*	-0.366**	-0.519*	-0.508**	-0.532**	-0.614**
	(0.162)	(0.163)	(0.163)	(0.180)	(0.281)	(0.243)	(0.239)	(0.270)
Consultant Plus Only (C+)	-0.254	-0.198	-0.191	-0.210	-0.560**	-0.570**	-0.593**	-0.704**
	(0.183)	(0.171)	(0.172)	(0.189)	(0.273)	(0.276)	(0.268)	(0.308)
In-Class Quiz + Consultant Plus (QC+)	-0.189	-0.243	-0.276	-0.360**	-0.419*	-0.474*	-0.494*	-0.717**
	(0.179)	(0.155)	(0.172)	(0.182)	(0.226)	(0.264)	(0.266)	(0.337)
Number of Observations	2,892	2,892	2,892	2,700	2,891	2,801	2,645	2,488
Mean of Dep. Var. (Pure Control)	0.095	0.095	0.095	0.095	0.036	0.036	0.036	0.036
P-value for the test Q = TT	0.613	0.674	0.383	0.410	0.963	0.873	0.707	0.900
P-value for the test Q = C	0.809	0.907	0.834	0.415	0.653	0.420	0.327	0.829
P-value for the test Q = C+	0.844	0.878	0.766	0.801	0.346	0.245	0.141	0.319
P-value for the test TT = QTT	0.143	0.467	0.342	0.363	0.248	0.368	0.239	0.412
P-value for the test C = QC	0.531	0.644	0.363	0.154	0.705	0.781	0.710	0.510
P-value for the test C+ = QC+	0.757	0.811	0.655	0.480	0.654	0.779	0.770	0.974
School-level controls		Y	Y	Y		Y	Y	Y
Individual-level controls			Y	Y			Y	Y
Exclude girls not surveyed in person				Y				Y

Notes: Data from endline survey. Estimates from a probit regression. * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level.

School-level control variables as in Table 2.

Individual-level control variables: Dummies for female guardian's education level, age and age squared.