

Better Environment for Education Project Endline Evaluation Report

20 May 2019

Executive Summary

Introduction

Throughout the past two decades, Rwanda has made significant efforts to improve the coverage of education to ensure that all Rwandans have access to quality education through the completion of secondary school. Despite policies to increase access to basic education and increase enrolment rates, dropout remains a key issue, especially in secondary school where female students tend to have lower completion rates than male students.

To promote better educational, social, and economic outcomes for students, CARE Rwanda established the Better Environment for Education (BEE) Project. Operating in the Western Province of Rwanda, the BEE Project provided holistic support—including academic resources, financial literacy training, and sexual and reproductive health education, and leadership training—to students to address obstacles to secondary education. As the BEE project neared its conclusion in 2019, CARE Rwanda commissioned this endline evaluation to assess trends and changes over time in students' knowledge, attitudes, and practices related to the intervention's aims.

Key Findings

Educational Outcomes

Dropout and transition rates of students in the BEE project were similar to the rates observed in the EICV 5. Age was the strongest predictor of educational outcomes, with starkly different educational outcomes for students that were “overaged” versus students that were “on-track” for their age. About 18% of students in the sample dropped out, and two out of three adolescents completed Secondary 3 between baseline and endline and transitioned into upper secondary school. Compared to EICV 5 data, educational outcomes for girls seem better than expected in our sample. This finding aligns with our hypothesis that if the program did have a positive effect on educational outcomes, it will most probably have impacted girls more than boys.

Financial security and economic outcomes

Alongside age, access to basic needs—and, in particular, money for school-related costs—is one of the strongest predictors of educational outcomes. Youth that were not confident in their ability to find money for school fees were also more likely to have dropped out of school; if still enrolled, they were more likely to have been absent in the week prior to the interviews. Conversely, youth that reported having saved money were less likely to have dropped out or to

have missed class. However, the proportion of youth that experience difficulties in accessing finance for education has increased between baseline and endline.

Gender and health-related knowledge, perceptions and behaviour

Changes between baseline and endline on gender and health-related issues paint a mixed picture. Little has changed between baseline and endline on access to information about sexual and reproductive health and general knowledge about sexual and reproductive health and HIV. The period of observation, however, is one in which many adolescents form or change opinions based on their experience and exposure, especially on issues relating to sexual and reproductive health.

Respondents' knowledge of what to do if they or someone they knew experienced violence evolved substantially since baseline. The proportion of respondents that felt they knew who to reach out to increased from 86% at baseline to 92% at endline. During focus groups, both students and teachers mentioned the referral mechanisms and resources available for reporting sexual and gender-based violence as well as other types of violence. The majority of respondents believed that they would be respected if they reported violence. However, when asked about their safety at school, on the way to school, and at home, adolescents overall felt less safe.

Financial literacy and savings

Students savings and participation in income-generating activities increased from baseline to endline. Given that the data from this survey suggests that the ability to save is a very strong predictor of dropout, these findings are particularly important for the objectives of the project. Respondents also felt slightly more empowered at endline to make their own decisions about how to spend their savings. Scores on the financial literacy test, however, dropped between baseline and endline.

Leadership

At endline, more respondents held leadership positions at home or at school and more respondents were involved in youth organizations. This increase was almost entirely due to CARE, with 93% of respondents who were part of a youth organization identifying CARE groups as the group or organization to which they belonged. Respondents gained greater self-confidence between baseline and endline, especially with respect to interacting with others, speaking up in class, and considering the implications of and making decisions.

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1. Introduction

Throughout the past two decades, Rwanda has made significant efforts to improve the coverage of education to ensure that all Rwandans have access to quality education through the completion of secondary school. The first overarching education policy in 2003 introduced free primary education in a first step towards meeting UNESCO's Education for All target and the Millennium Development Goals of achieving universal primary education and gender equality in education. Building on this momentum, Rwanda introduced in 2008 the Nine-Year Basic Education Policy, which guaranteed nine years of free and compulsory education, and expanded it in 2013 to provide universal basic education for 12 years—providing a free education to all Rwandan students through the completion of secondary school.

Despite policies to increase access to basic education and increase enrolment rates, dropout remains a key issue, especially in secondary school. According to the Integrated Household Living Conditions Survey 2016-2017 (EICV5) Thematic Report on Education, 87% of Rwandans have ever attended school. While 22% of students have completed primary school, 6% of male students and at 5% of female students have completed lower secondary school education.

To address these issues and to promote both better social and economic outcomes for students, CARE Rwanda established the Better Environment for Education (BEE) Project. Implemented by CARE Rwanda in the Western province of Rwanda from 2015 to 2019, the BEE Project supports girls from lower socio-economic status to pursue their education up to higher institutions. The main objectives of the project were:

- To reduce the number of girls who drop out from lower secondary school;
- To increase the number of girls who transition from lower to upper secondary education; and
- To increase the number of girls pursuing safe and secure economic opportunities outside the home.

1.1. The BEE Project

The BEE Project provided holistic support—including academic resources, financial literacy training, and sexual and reproductive health education, and leadership training—to students to address some of the obstacles they face when pursuing secondary education. Using a school-based model, the project operated in Ngororero, Nyabihu, Karongi, Rutsiro and Rubavu districts of the Western province of Rwanda. The BEE project reached a total population of 48,853 adolescents—27,321 girls and 21,532 boys—in 146 in lower secondary schools during its three years of implementation. Both boys and girls were provided training and mentorship in almost all areas of the project.

In addition to the BEE project in Western province, CARE also implements a sister project **Safe Schools for Girls (SS4G)**. The SS4G project has the same objectives and implementation strategy as BEE but operates in Kamonyi, Muhanga, Ruhango, Nyanza and Huye districts of Southern province. The SS4G project has reached a total population of 52,007 adolescents -- **30,198** girls and **21,809** boys--in 174 lower secondary schools as of January 2019. The SS4G began in 2015 and is expected to continue through 2020.

Both the BEE and SS4G projects were rolled out through school-based mentors trained by CARE Rwanda to lead school-level project activities, provide individual mentorship to students, and support students to form clubs. The BEE project strategy comprised six main pillars:

I. Mobilization of Student Clubs and Mentorship

The project worked with teachers trained as mentors to mobilize girls and boys to participate in club activities and individual mentoring. 453 female and 247 male mentors were trained to support club activities on a daily basis. Club activities included:

- Financial education and life skills training;
- Mentorship sessions that addressed students' personal barriers to education or behaviours that indicated risk of dropout (irregular attendance, lateness, disruptive behaviour, disconnection from peers, poor academic performance.)
- Group activities to reinforce academic skills, map career paths, build peer support networks, and develop leadership skills.

II. Economic Empowerment Activities

Adapting CARE's village savings and loans (VSL) methodology to a school setting, the BEE project supported students to form savings and loan groups. These groups provided students with an avenue to build and practice financial skills like saving, budgeting, and income-generating or entrepreneurship activities. Once they began saving, students were coached to invest in small income-generating activities that would not disturb their education.

III. Financial support for students in need

The BEE project awarded 200 partial scholarships to students with good attendance and performance but whose families could not afford the costs of school.

IV. School Score Card

School score cards used a participatory process involving both students and school leaders to assess the level of girl-friendliness of schools, empower girls to voice concerns, identify potential solutions, and engage school management to address issues such as sexual harassment, sexual and gender-based violence prevention and response, or a lack of adequate sanitation facilities in schools (particularly for private menstrual management.)

V. **Referral mechanism for SRGBV**

To strengthen the link between schools and the existing referral mechanisms for sexual and gender-based violence, the BEE project provided training to student clubs, parent-teacher committees, and school mentors, linked clubs and schools with existing structures and mechanisms from the government, and better documented a safe and accessible process for referrals and support for cases.

VI. **Boys' engagement**

The BEE project engaged male students to support girls' education and become advocates of girls' education in their families and communities. Boys were involved in both economic empowerment activities and student clubs. Through these activities, they were encouraged to be leaders for gender equality and promote behaviour change among peers.

The intervention aimed to deliver, by leveraging the training provided by each of the above-mentioned pillars of delivery, a holistic approach to address the challenges faced by girls and boys in school. Together, these delivery methods equipped students with stronger academic and 21st century skills, along with the ability to identify personal and school-level problems, come up with solutions through mentorship and groups, and improve financial skills and build their confidence and self-esteem.

1.2 The Evaluation

The main objective of this evaluation is to assess trends and changes over time in students' knowledge, attitudes, and practices related to the BEE Project intervention aims. The indicators of the evaluation include: dropout and repetition, access to financial resources for education, sexual and reproductive health knowledge and access to services, leadership, gender equity, financial literacy, and safety in school and community settings.

From December 2016 and February 2017, CARE Rwanda conducted a baseline study of students in a sample of BEE and SS4G schools. The baseline study collected data from 1,291 students in S1 across both the BEE and SS4G projects, 1,192 heads of households for these students, and 134 teachers. The analysis highlighted the baseline characteristics of the population and outlined the key areas that the interventions could address.

In the fall of 2018, CARE Rwanda commissioned Laterite to conduct an endline evaluation of BEE and a midline evaluation of SS4G. Using data from the baseline evaluation as well as follow up data that Laterite collected in January 2019, this report analyses BEE project results and changes over time in light of the key objectives of the project. Since both the evaluation methodology and the implementation strategy is the same for both the BEE and SS4G projects, our findings in this report consider the entire sample of students participating in the BEE and SS4G Projects. Where relevant, we highlight findings from the sub-sample of students in the BEE

project only or the differences between the students in each of these projects to comment on how the context may influence project outcomes.

2. Study Methodology

This chapter briefly presents the methodology used for this assessment, including the design, sampling strategy, and research instruments. Additional details are included in Annex 1.

2.1. Study Design

The evaluation was designed primarily as a longitudinal study and traced students from baseline to endline to assess how knowledge, attitudes, and practices have changed among students who have been exposed to the BEE programs in their secondary schools. The target population of the evaluation was students in BEE and SS4G schools, with a focus on students in the BEE schools in Western province. The evaluation used a mixed methods design, including surveys and a financial literacy concepts test with students and focus group discussions with both students and teachers.

2.2. Sampling

The sampling strategy used a cluster sampling approach based on the schools that the adolescent participants attended at baseline. The sample included students who were in S1 at the selected BEE and SS4G schools at the time of baseline data collection. Since the follow up data was collected a little over two years after the initial data collection, students who were on track academically are now in S4. Some students, however, have repeated a grade level or dropped out. Many students switched to new schools for their S4 year.

For the baseline evaluation, the final data set included 652 students across 35 BEE schools in 4 districts in the Western province and 639 students from 34 SS4G schools in 5 districts of the Southern Province.

Given budget constraints, it was necessary to select a sub-sample of adolescents from among those interviewed at baseline. The sampling process for the evaluation was done in three steps.

1. Initial sample. During the initial sub-sampling stage, Laterite randomly selected up to fifteen students per school from among the students interviewed for baseline data collection.
2. Tracing. The CARE team traced the school or household locations of the students selected for the sub-sample.
3. Resampling. Because students' current locations were more disperse than expected--more students than expected had dropped out and many students moved schools for their S4 year--it was necessary to re-sampled again, stratified by the student's current location and schooling status.

The final sample selected included 626 students from both the BEE and SS4G projects; however not all students could be located or interviewed in the field. Details on the sample who were ultimately interviewed are included in Chapter 3 and more information about the sampling process is included in Annex 1.

For qualitative research, Laterite purposively selected participants to a range of perspectives. The schools for data collection were selected from among schools with enough project participants in order to ensure the anonymity of responses in this report. School-based mentors assisted with identifying teachers who had participated in the BEE project.

2.3. Data Collection

All interviews and focus group discussions were conducted in-person. Data collection was, for the most part, conducted in schools; however, for students in the sample who had dropped out or were absent from school on the day of data collection, interviews were conducted in their homes. For both interviews and focus group discussions, all efforts were made to ensure the privacy of participating students and teachers.

The research instruments used in this evaluation sought information on indicators of the project objectives. The same instruments, developed by CARE, were used during the baseline and endline evaluations; however, some modules were eliminated from the student survey at endline to shorten the survey duration. Eight focus group discussions with students, one each with female and male students in all four districts where the program is active. Interviews and focus groups with students were complemented by two mixed-gender focus group discussion with teachers. The focus group discussions used semi-structured interview guides and covered topics such as school safety, involvement in school-based activities, knowledge of and access to sexual and reproductive health or gender-based violence services and information.

2.4. Discussion of Limitations

1. **The analysis does not have a control group who did not participate in the intervention against which to compare indicators.** All estimates and descriptive statistics are conducted on a sub-sample of treated students from baseline. As a result, while we have shown changes and trends in students' knowledge, attitudes, and practices from baseline to endline, we cannot confidently attribute the cause of these changes to the BEE program. However, wherever possible, we have used the variable that measures student's knowledge of a CARE trained mentor as a proxy to differentiate students that have participated in some form of CARE training or studied in CARE program schools over the period.
2. **The sample for the analysis is underpowered.** While the expected total sample for the SS4G and BEE midline/endline analysis was around 600 students, high attrition on the field (23.2% for the total sample, 27% for the BEE sample alone) meant that we were underpowered with our final sample of n students (219 for BEE and 234 for SS4G). Along with a smaller sample size, these students were also clustered at the level of their baseline schools. Since we are working with an underpowered sample, it is possible that many significant effects in the sample population go undetected; there might be significant changes in variables between baseline and endline that we were not able to observe during the analysis.
3. **Attrition in the field was higher than anticipated.** While Laterite made every attempt to find and interview the sampled students, accurate tracing data was not available for all students. Furthermore, some students had moved to schools in which Laterite did not have approval to conduct data collection activities. In these cases, we were unable to conduct interviews with the sample students.

To determine whether this attrition was random or not, we compared baseline indicators from students who were sampled and interviewed at endline to the students who were sampled for endline but could not be found on the field (attrition). Although the attrition group was significantly ($p < 0.05$) more likely to be half a year older than the interviewed group, we found no other meaningful differences between the two groups. Details are included in Section 5.6.3.

4. **Because the sample sizes within each project are small, we have limited statistical power to report on effects by project.** Where relevant, we have included disaggregated statistics by project but the margins of error are large.
5. **Challenges in sampling could have introduced bias in the sample.** During the sampling stage for the endline evaluation, along with randomly selecting a sub-sample of students from baseline sample, we had to selectively re-sample students based on their tracing outcomes. As described above, the challenges involved in tracing the current location of students for the endline evaluation along with having to drop some students who had moved schools or dropped out, has the potential to introduce bias in the analysis.

Although the aim was to correct for sampling bias as far as possible by carefully weighing the data against each student's probability of selection at each level of the tracing and sampling process, sampling bias might still exist.

6. **The survey contains questions that measure changes in personal development, knowledge, attitudes, and practices related to education, gender, sexual health, and personal finance for a sample of girls and boys that are in a stage of life that is filled with change and transitions.** Without a comparison group, we cannot determine which changes are the effect of the program and which are the result of an ageing sample and are expected natural changes over time. Students' maturing and expanding their views may interplay with the objectives of the program and isolating a program effect is challenging under this construct.
7. **There are consistencies and inconsistencies in the dataset that suggest that there might be data quality issues either at baseline or endline data collection.** When repeated information was collected at endline for the sampled students, we found inconsistencies among several students on variables like age, self-reported pregnancies, name of the adolescent's guardian etc. While Laterite made all efforts to ensure that the same students were interviewed at endline (confirming location, household information, school name, and obtaining confirmation from the mentor), inconsistencies suggest that data quality could be compromised either at the baseline or endline stage.

3. Survey Demographics

3.1. Adolescents

The final dataset at endline for both BEE and SS4G students included 357 students (212 males and 242 females) from 99 schools and 97 adolescents who had dropped out from nine districts. For the total sample, the average age of students at endline was 17.8 and ranged from 14 to 24 years.

Table 1: Total number of students interviewed in each district.

District	Total No. of Schools	Total No. of Students	Total No. of Dropped Out Students
Nyanza	10	45	13
Huye	7	45	9
Ruhango	12	34	3
Muhanga	15	76	18
Kamonyi	8	41	8
Karongi	17	60	6
Rutsiro	11	66	24
Nyabihu	7	36	4
Ngororero	12	51	12
Total	99	454	97

Out of the total sample, 219 adolescents (97 males and 122 females) were from the BEE program. Among these participants, 172 were students in 52 schools and 47 adolescents had dropped out of school.

Table 2: Number of BEE students interviewed in each district.

District	Total No. of Schools	Total No. of Students	Total No. of Dropped Out Students
Muhanga	4	5	1
Kamonyi	1	1	-
Karongi	17	53	6
Rutsiro	11	42	24

Nyabihu	7	32	4
Ngororero	12	39	12

The age of the BEE adolescent sample ranged from 14 to 23 years, with a mean age of 17.7 years and a mode of 17 years.

4. Survey Findings

4.1. Educational outcomes

In this subsection we study the educational outcomes of students included in the sample. We see that age is the strongest predictor of educational outcomes during the observation period, with older children at a significant disadvantage. The section also compares outcomes by gender and shows that outcomes in terms of dropout and transition into upper secondary are similar for both boys and girls in target areas. We would have anticipated boys to fare slightly better, based on existing evidence from the Rwandan context, including the EICV 5, the MINEDUC Education Statistical Yearbook for 2017¹ and the report on Dropout and Repetition in Basic Education in Rwanda² (Laterite Ltd., 2017).

4.1.1. Dropout rates

All students in the sample were enrolled in Secondary 1 (S1) at baseline; about half of the were above the expected age for S1. Students that start their education on time and progress from one grade to the next without repeating are expected to reach S1 at the age of 13. In the Rwandan context, and this is true of many countries that have experienced a rapid surge in enrolment rates, students are often delayed in their education, having joined late or repeated classes. This leads to a disconnect between age and grade, with a lot of variation in age levels within the same classroom. At baseline, ages in the sample of S1 students in target schools ranged from 11 to 21 years of age. An estimated 54% of students were aged 15 and above; we refer to these students as “overaged” students. The remaining 46% of students were “on-track” with their education.

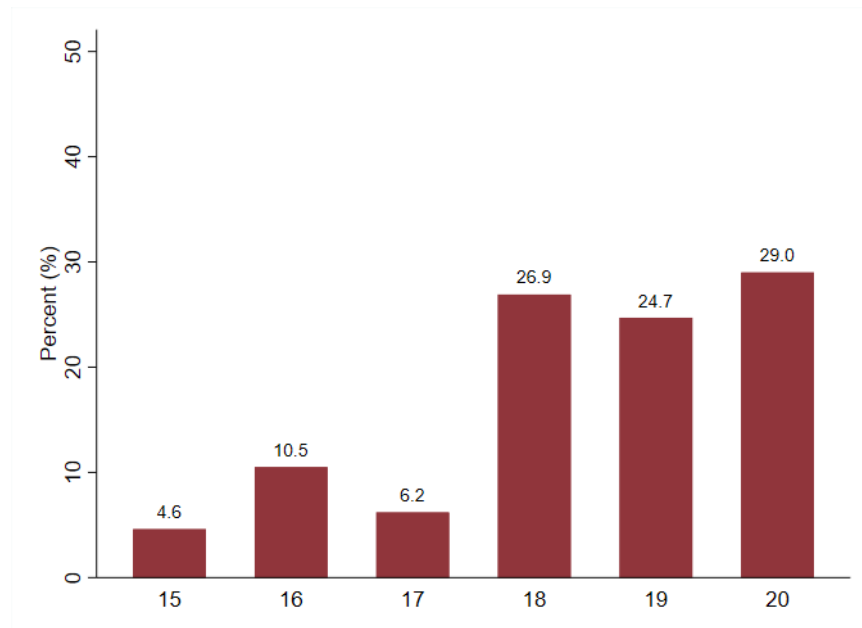
We make this distinction between “overaged” students and “on-track” students, because it helps to explain the diverging trajectories of children between baseline and endline. It also underlines the fact that the sample is heterogeneous and that students in S1 might have a very

¹MINEDUC. 2017, “Rwanda Education Statistical Yearbook”, Retrieved from <http://mineduc.gov.rw/resource/statistics/statistical-year-books/>

²Laterite Ltd. (2017), “Understanding Dropout and Repetition in Rwanda”, UNICEF, MINEDUC Rwanda.

different predisposition to benefit from the program. Evidence from Rwanda shows that over-aging in basic education is associated with higher levels of poverty, learning difficulties and a higher risk of dropout (Laterite Ltd., 2017).

Figure 1: Dropout between baseline and endline (for entire sample), by age at endline



At endline, we observe starkly different educational outcomes for students that were “overaged” at baseline versus students that were “on-track”. Overaged children, which at endline were 18 years old and above (about 3 years after the baseline), were almost 20 percentage points more likely to have dropped out of school, compared to children who at baseline were still “on-track” with their education. The estimated dropout rate was 27.8% for youth aged 18 or above, compared to 7.2% for adolescents below the age of 18 (see Figure 1). Students that have reached the age of 18 are much less likely to make the transition from lower to upper secondary school.

At about 18% on average (with a margin of error of about 4 percentage points), there were no large differences in the dropout rate between the BEE and the SS4G program areas. It is difficult to comment on the dropout rate itself - whether it is higher or lower than expected - since we do not have data to construct a valid comparator. A valid comparison would have required time-series data on the educational status of children three years ago and today. No such dataset currently exists in the Rwanda context.

Instead, as a point of comparison, we propose a simple Markov chain model that takes the composition the baseline sample as a starting point and iteratively applies age - gender and grade - sensitive education transition rates to model how students progress through the education system. We calculate the transition rates - including the promotion, repetition and

dropout rate - by grade, gender and age using EICV 5 data on the 2015 and 2016 schooling years. In this little model, we iteratively apply these transition rates to the students in our sample and observe educational outcomes after 3 years. It is by no means a perfect comparison, since the transition rates apply only to the 2015-2016 and are not specific to the target areas. Nevertheless, this model does provide a useful benchmark of what level of dropout might be considered normal for this target group of students. The model predicts an average dropout rate of about 15.8%: 19% for girls and 12% for boys. This prediction is within the confidence interval of our point estimate and suggests that the dropout rate estimated at endline is within expected values compared to the rest of Rwanda. A slightly higher dropout rate in the target regions is in fact expected, since the most vulnerable regions and schools were targeted by the BEE program.

An interesting fact about dropout rates in program areas is that they were very similar for boys and girls; this is not the case in EICV 5 or other studies on dropout in the Rwandan context (Laterite Ltd., 2017). Evidence from the Rwandan context shows that the schooling trajectories of boys and girls start to diverge around the age of 15. Before the age of 15, girls and boys are equally likely to be enrolled in school; from the age of 15 onwards, girls become more likely to dropout (Laterite Ltd., 2017). We observe no such differences between genders in the sample. The dropout rate for girls was in fact slightly lower on average, at 17.7%, that the dropout rate for boys, at 19.1% (the p-value associated with this difference is 0.97, so the difference is not significant).

If the program was effective in reducing dropout rates, we hypothesize that the effect would have been disproportionately larger for female students.

4.1.2. Completion and repetition rates

We observe similar gender and age patterns when it comes to completion. Controlling for gender and age, we also do not find any significant differences between outcomes in the BEE and SS4G program areas.

We estimate that about two out of three adolescents in the sample completed Secondary 3 between baseline and endline and transitioned into upper secondary school (see Table 3). An estimated 80% of students that were “on-track” with their education at baseline transitioned into upper secondary school during the observation period. This compares to 57% of students that were “overaged”. The difference between the two groups is explained by both higher dropout and repetition rates amongst older children, who are the most vulnerable at this stage of their basic education process.

Table 3: Grade at endline, by gender

Grade	Male	Female	Total
Out of school	19.1%	17.7%	18.3%

S1	0.0%	0.8%	0.4%
S2	2.0%	1.3%	1.6%
S3	12.1%	11.7%	11.9%
S4	66.9%	68.5%	67.8%

In terms of completion and transition into upper secondary school we observe no differences in the sample between girls and boys (see Table 3). This is unexpected. Data from EICV and the MINEDUC Education Statistical Yearbook of 2017 (MINEDUC, 2017) confirm that promotion and transition from lower to upper secondary school tend to be higher for boys than for girls. Our Markov chain model confirms that we would have expected boys to fare better: the model predicts that about 68% of boys should have reached Secondary 4 three years after the baseline (which almost exactly overlaps with the survey), compared to about 56% of girls. At face value, educational outcomes for girls seem better than expected in our sample, even though we do not have a valid counterfactual to test this assumption.

Without making any claim of attribution, this finding aligns with our hypothesis that if the program did have a positive effect on educational outcomes, it will most probably have impacted girls more than boys.

4.1.3. The link between financial security and educational outcomes

Alongside age, we find that access to basic needs - and in particular money for school-related costs - is one of the strongest predictors of educational outcomes.

Youth that were not confident in their ability to find money for school fees were also more likely to have dropped out of school; if still enrolled, they were more likely to have been absent in the week prior to the interviews. Difficult access to school fees at endline is associated with a 17 percentage point increase in the dropout rate (controlling for age, gender and location). Difficult access to school fees is also a strong determinant of absenteeism. Absenteeism at endline was highest on average for children that had been absent as well in the week prior to data collection at baseline (+20 percentage points) and that had expressed difficulties in accessing schooling fees either at baseline or endline (+20 to 25 percentage points). The size of the estimated coefficients reveals just how important financial issues are in the context of education. This is very much in line with findings from the Dropout and Repetition Report (Laterite Ltd., 2017), which shows that despite free access to secondary education under the 12 years of basic education policy, costs associated with secondary schooling remain a barrier for adolescents in Rwanda.

Additional evidence of the link between the financial situation of respondents and their educational outcomes is provided by their ability to save. Children that reported having saved money over the past 12 months, were 12 percentage points less likely to have dropped out of school; they were 17.5 percentage points less likely to have missed class over the past month; and they were 13 percentage points more likely to say that if they needed money for schooling fees they would be able to find these fees.

The proportion of children that experience difficulties in accessing finance for education has increased between baseline and endline. When asked if they thought they could get money for school fees if needed, 48% of students at endline said “yes” compared to an estimated 60% at baseline. Similarly, 21% of respondents were confident that they could easily access money to pay for school supplies at endline, compared to 45% at baseline. Respondents at the highest risk were those that reported difficulties in paying school fees at baseline and female students. On average, we estimate that female students were 10 percentage points more likely to report not being able to get money to pay for school fees if needed it. The p-value associated with this coefficient is 0.07 (controlling for baseline values, age, location and the previous question to control for anchoring). This provides us with a relatively high level of confidence in the assessment that female students were more at risk of not being able to pay for their schooling. This increase in the difficulty of getting money to pay their schooling fees between baseline and endline, is most probably related to the increased costs of education as students progress from one level to the next.

During focus group discussions, both students and teachers suggested that poverty and economic hardship were principal reasons why students drop out or are absent from school. For some students, a lack of supplies or even unfulfilled basic needs--like not having eaten or not having enough money to purchase menstrual pads--discourage them from attending class. For others, household responsibilities or opportunities to earn money are prioritized over school attendance. Teachers noted the need to sensitize parents to the importance of consistent school attendance.

“One may also drop out due to different challenges such as poverty in a family where one can lack school fees or scholastic materials.”

- **Male student, Nyabihu**

“There are cases of those who drop out because they got temporary jobs and fail to resist that temptation of earning.”

- **Male student, Karongi**

“The reason why girls are absent in class may be due to poverty, as we have mentioned earlier, in their families. It is possible that the girls are the ones doing all the house chores, and this may cause them to be absent from school at times.”

- **Teacher, Nyabihu**

"I would like to talk about the parents who make their children drop out because it is the cause for most drop out cases nowadays. For instance, it is in the season for cultivating and the parents decide that their child should drop out and help them in agriculture."

- **Teacher, Karongi**

4.2. Understanding the structure of outcome variables on perceptions, knowledge and behaviour

Before delving into the other outcome metrics - including metrics on gender and reproductive health, knowledge and perception of GBV and early marriage, leadership and financial literacy - it is useful to first focus on the structure of these variables and how they behave over time. Understanding these dynamics will help put some of the trends we observe into context.

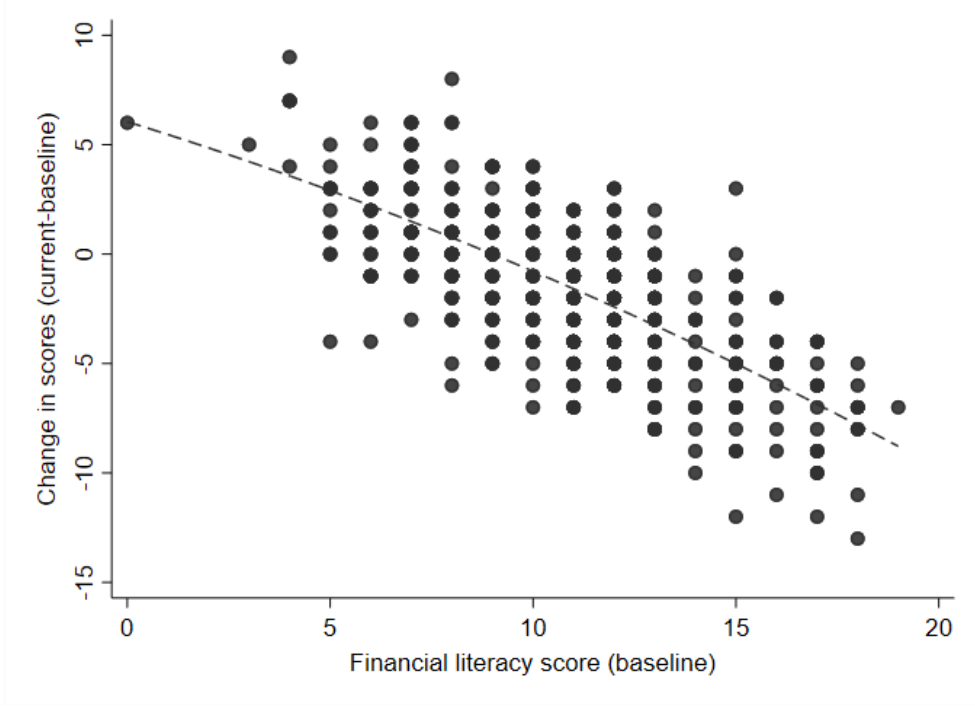
4.2.1. Dynamics over time

Most of the metrics used in this tracer study are derived from binary variables, Likert scales or composite scores (for example the financial literacy score). These put a hard cap on the maximum score or the number of "correct" responses that participants can achieve. By construction, respondents with a low starting score - or those who start off with many incorrect responses - have more room for improvement, since they are further away from the maximum. This is not the case for respondents that start with high scores or many "correct" responses; their scope for improvement - in both absolute and percentage terms - is more limited. While respondents at different starting points will have more or less room for improvement, we do not anticipate a high starting score to indicate that a participant will perform worse at endline; similarly, we would not anticipate a low starting score to indicate that a participant will do much better at endline. Yet that is what we observe in practice.

In this study we observe that baseline scores are strongly predictive of trends over time: students with high scores or a high proportion of correct responses at baseline, see their scores decrease on average; whereas students with low scores or many incorrect responses at baseline see their scores increase. We refer to this as "mean reversion". We show this with two sets of data, namely financial literacy and leadership questions, but we have verified that the same holds true for other variables or sets of variables in this survey.

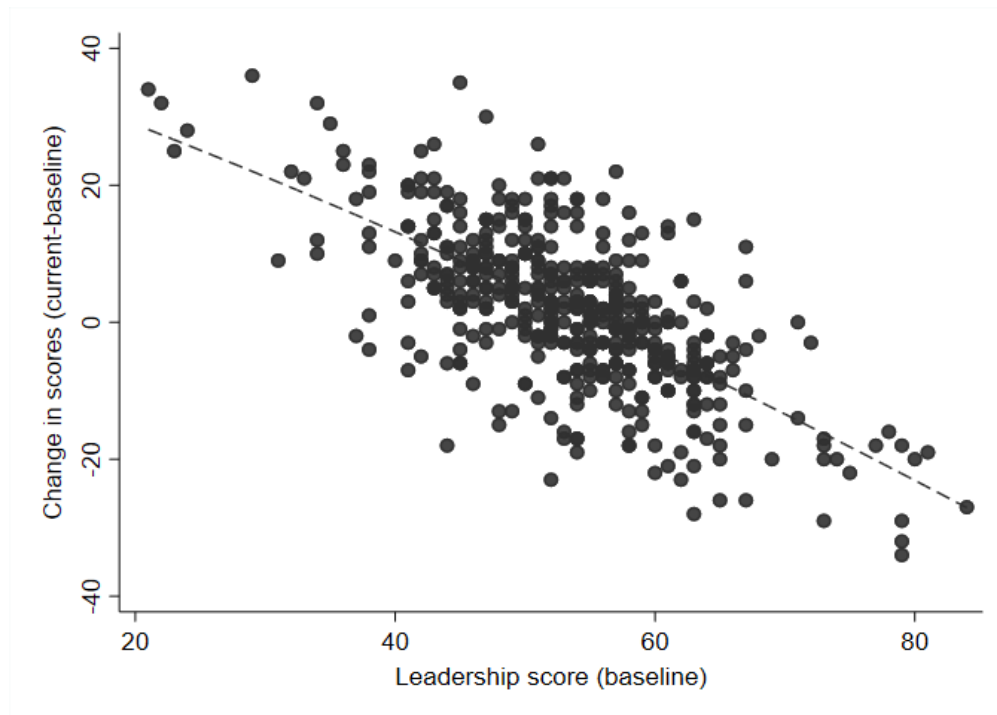
Starting with financial literacy scores, we find that baseline values explain 60% of the change observed between baseline and endline. Students were asked a number of questions to test their level of financial literacy. Students with the lowest scores at baseline experienced the largest increase in financial literacy; whereas students with the highest scores at baseline experienced the largest decrease in scores (see Figure 2).

Figure 2: Change in financial literacy scores between endline and baseline, by score at baseline.



We observe the same pattern when calculating a score applied to the leadership questions, with baseline scores explaining about 50% of the change between baseline and endline. Again, students with a high score at baseline experienced a decrease in their leadership score on average, while students with a low starting point experienced an increase. The strength of the association is evident from the graph in Figure 3.

Figure 3: Change in leadership scores between endline and baseline, by score at baseline



Mean reversion could either indicate that the metrics selected for this study were not effective in this context or that there were measurement errors:

- **Quality of the metrics:** Potential reasons why the selected metrics might not have been very effective in this context include: the fact that adolescents might not have understood the questions or answered whatever came top of mind, changed their mind on these issues or lost interest given the length of the survey and the battery of questions asked. Issues related to understanding and patience will have been more of a concern at baseline when survey participants were three years younger and in their early teens.
- **Measurement error:** Potential reasons that might have led to measurement error include differences in the training of enumerators at baseline and endline, differences in survey protocols between the two rounds of data collection or for example differences in the conditions with which the surveys were conducted (at baseline, adolescent and teacher surveys were conducted in their schools, whereas at endline survey conditions were tied to the educational status and location of the participants, with many having moved schools or dropped out of school).

Our data cannot explain why student's leadership scores might have reduced between these data-points. However, it is possible that, as they become more aware of their rights, and consequently of the limitations posed by social and gender norms, their self-reported leadership scores would decrease.

These patterns have important implications for the analysis:

- First of all, they imply that we cannot study change over time without first controlling for the lagged value at baseline. Controlling for the lag will account for the variation that is explained by the baseline value.
- Second, they imply that any hypothetical program effect is trumped by a potential mix of measurement error or random variation in how adolescents responded to these kinds of questions. If the treatment effect had been larger than the noise, then we would not have seen negative change for the highest performers at baseline.
- Third, it makes the interpretation of the results even more difficult. There is no counterfactual to compare results against; adolescents in the sample are three years older - during a period of life in which a lot of changes, especially opinions and behaviour; and third, the baseline itself provides little additional informational value, since the resulting autocorrelation between baseline and endline values is low.

4.2.2. Anchoring

In this survey, adolescents are asked a battery of questions. Often, the options available to the respondents are repeated from one question to the next. For example, in the leadership series, respondents are asked more than 20 consecutive questions about leadership related statements. They have to respond by one of four options: rarely, sometimes, most of the time or almost always. Valid questions to ask are whether this creates anchoring, and whether a respondent's answer to one question affects his or her response to the next question. In some cases, it is natural that respondents answer consecutive questions in a similar way, since these questions might be conceptually related; however, this is not always the case.

The leadership module offers a good set of questions for us to test whether there is anchoring in consecutive questions. As can be seen in Table 4 consecutive questions in the leadership module sometimes ask about similar issues and are conceptually related, sometimes less so.

Table 4: Leadership questions.

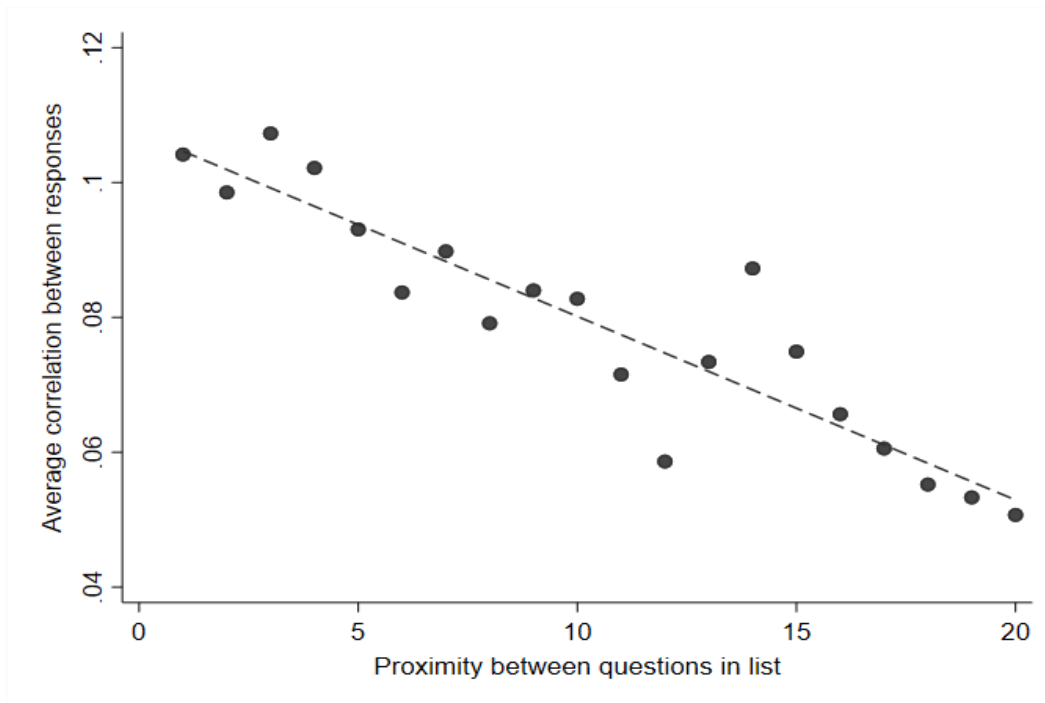
Order	Question
1	G4. I like to try new activities that I know how to do.
2	G5. My friends ask me for advice.
3	G6. I recognize when people have different skills to contribute to a task
4	G7. I am comfortable when my teacher asks me to answer a question.
5	G8. I contribute ideas to discussions at home even if they are different from others
6	G9. I ask questions at school when I do not understand something.
7	G10. I can describe my thoughts to others

8	G11. The things I do set a good example for my peers.
9	G12. I consider possible outcomes of my decisions before making them.
10	G13. I accept responsibility for the outcome my decisions.
11	G14. I recognize when choices I make today can affect my life in the future
12	G15. I can show what is important to me with my actions.
13	G16. If someone does not understand me, I try to find a different way of saying
14	G17. I encourage others to join together to help my community.
15	G18. I cooperate with others to get things done at home.
16	G19. If someone treats me unfairly at school, I am comfortable telling an adult
17	G20. I am willing to work hard to achieve my dreams.
18	G21. I am better able to finish a task when I plan ahead.
19	G22. When I have the opportunity, I can organize my peers to do an activity
20	G23. I am interested in being a leader.
21	G24. I try to understand the cause of a problem before trying to solve it

To test whether there is anchoring, we compare the correlation levels between all pairs of variables to the order in which they were asked. Correlation levels between pairs of variables is measured using Goodman and Kruskal's lambda, which works well for categorical variables. For each variable in Table 4, we then run a simple linear regression to test whether the distance between variables in the list - in terms of the order in which they were asked - is associated to their degree of correlation.

We find that the order in which questions are asked matters and that survey participants are more likely to respond to consecutive questions in the same way. For all 21 questions, we observe a negative association between pair-wise correlation and the distance between variables in the list. In most cases this association has a very low p-value, even though we are working with a small sample of variables, which suggests that we can have confidence in our assessment. The strength of this association can be seen in Figure 4.

Figure 4: Correlation between question in leadership module, based on the proximity between questions in terms of the order they were asked



The implications of anchoring for the analysis are the following:

- In regression analysis it will be useful to control for the preceding question, in order to capture some of the variation due to anchoring;
- It is important to remember that responses to questions embed information about the previous questions;
- If scores are created based on consecutive questions with the same structure/options, anchoring will artificially increase the spread/variation between respondents.

4.3. Gender and health-related knowledge, perceptions and behaviour

Changes between baseline and endline on gender and health related issues paint a mixed picture. Little has changed between baseline and endline on access to information about sexual and reproductive health and general knowledge about sexual and reproductive health and HIV. Respondents at endline were less confident in their ability to enforce safe sexual practices and were more likely to believe that dropping out of school in order to get married was ok. However, there was a large increase in awareness about the availability and accessibility of sexual and reproductive health services (SRH). Youth expressed more confidence in seeking help if needed and felt they knew whom to reach out to in case they needed support.

There are many reasons why caution is required in the interpretation of these results. The period of observation is a period of major change for adolescents, during which opinions and perceptions are formed and transformed through experience and greater exposure, especially on issues relating to sexual and reproductive health. Moreover, some of the responses to

questions might have reflected respondents' perceptions of reality rather than their own opinion. For example, girls that agreed with the statement that "the female sexual partner is responsible for protection" might have been reflecting about how things are as opposed to what they think is right or wrong. Attributing positive or negative changes to the BEE program, without a valid counterfactual, is therefore not possible. Falling into the trap of attribution would also lead to bias, attributing the positive changes to the program, and the negative changes to age and the passing of time.

4.3.1. Access to information about sexual and reproductive health

On aggregate, evidence from the endline survey shows little change in access to information about sexual and reproductive health in treatment areas.

At endline slightly more respondents had access to information about their bodily changes during adolescence than at baseline. The proportion of students who reported getting information about bodily changes increased from 85% at baseline to 90% at endline. The largest increase in access to information was for male respondents. At baseline male students were 16 percentage points less likely to have received information about bodily changes compared to girls; a small difference between boys and girls still persists at endline, but at 6 percentage points, this difference was much smaller. There were a few large shifts in the sources from where respondents would get information about bodily changes. The role of teachers reduced significantly: at baseline about 54% of respondents said they received information from their teachers, compared to 24% at endline. Radio also became less important: 34% of respondents at baseline received information about their bodily changes from the radio, compared to 24% at endline. Parents (59% at both baseline and endline) and school (41% at both baseline and endline) remained the main sources of information about changes to the body.

The proportion of respondents that had received information about sex, HIV/AIDs, STIs or family planning remained constant over time. When asked if the respondents had received information about sex, HIV/AIDs, STIs or family planning, 87.4% respondents at endline reported they had, compared to 86.6% at baseline. Female students were more likely to have received information about these issues at baseline, but at endline we do not observe any large differences between genders.

We also observe no differences in the proportion of respondents that visited a health facility or hospital in the past twelve months for services related to sexual and reproductive health. At baseline 18.8% of respondents reported having visited a facility, compared to 18.2% at endline. There were significant differences ($p < 0.05$) between genders both at baseline and endline. At both baseline and endline, girls were significantly less likely to have visited a health facility compared to boys.

Focus group discussions suggest that one thing holding adolescents and young adults back from seeking more information about issues relating to their sexual and reproductive health was embarrassment. Students discussed the main challenges they face in accessing information about sexual and reproductive health, accessing healthcare services for sexual and reproductive health, or visiting health centres. The example below show that respondents felt that intimate matters were better dealt with in very private settings:

“Someone may go to the health centre seeking for a certain service, and then finds other people in the health worker’s room who are not part of the health team as it is not the first-time s/he visited the health centre. Sometimes one may not feel comfortable to talk about his/her reproductive life, but instead decide to leave without being served. Thus, that’s a challenge since someone has to speak only to the person in charge as to get help. This is because it is confidential information that must be discussed by the patient and the health worker only. So, when someone finds other people in the room, he feels uncomfortable. So, I think that’s a challenge.”

- **Female Student, Karongi**

With training, teachers are willing to provide students with information on sexual and reproductive health. However, both students and teachers generally agreed that parents should be the main source of information.

“For me personally the most trustworthy source is from parents. And secondly is from school thanks to some courses they give them. There are some courses that incorporate sexual reproductive health.”

- **Teacher, Nyabihu**

Students agreed that school-based mentors and clubs created through the BEE project offered safe spaces and trustworthy information about sexual and reproductive health. Having dedicated people with whom to discuss concerns confidentially helps to address students’ embarrassment.

“There are times when we are studying reproduction and I feel shy to tell my teacher that I have never had wet dreams because there are girls in the class. But, when we are just boys, I feel comfortable to talk about it.”

- **Male Student, Nyabihu**

“Here might also be a girl who reaches 16 years old when she has not yet had her menstruation periods. So, she becomes afraid to say it in class because they may laugh at her. In that case, one can reach out to the teacher after class and seek support.”

- **Male Student, Nyabihu**

“It could be that they need detailed information on sexual reproductive health. In this case, they can get it from peer groups where they can ask and learn from each other. However, there should be a mentor/advisor to help them with some clarifications on things they might not understand. If possible, a nurse/doctor should also be invited to support the mentor/advisor with some technical terms that he/she couldn't explain, for instance.”

- **Teacher, Karongi**

4.3.2. Knowledge about Adolescent Sexual and Reproductive Health (SRH)

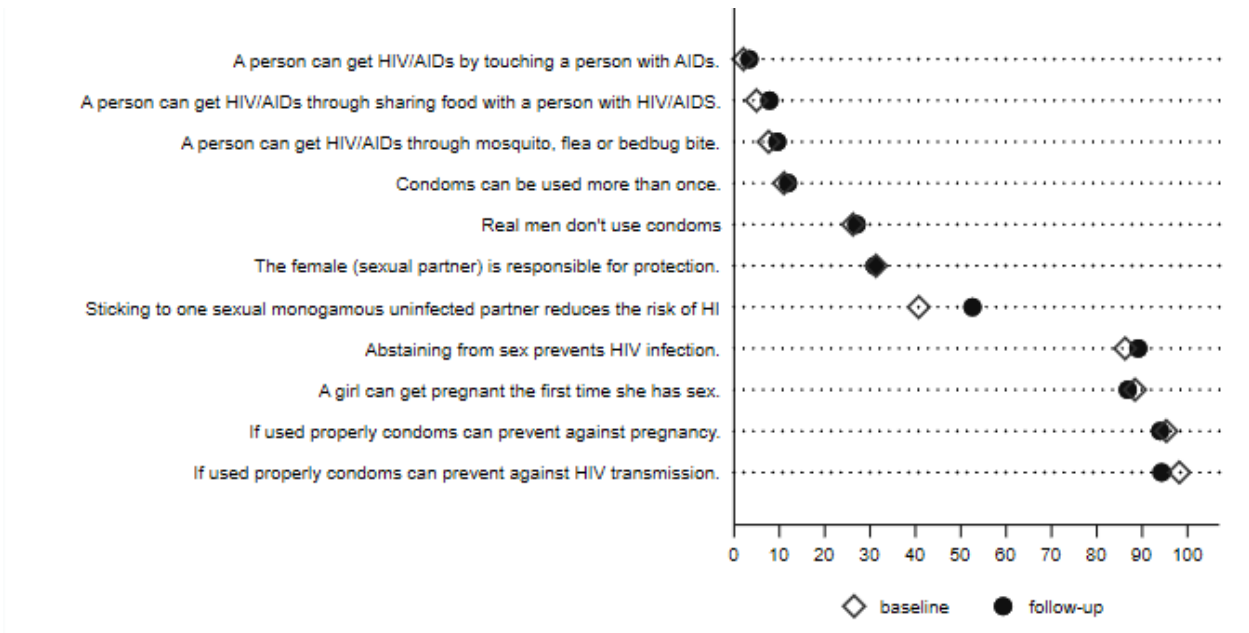
This section consisted of questions about adolescents' knowledge and attitudes about gender roles and their knowledge and access to sexual and reproductive health services. Questions asked revolved around adolescents' knowledge and behaviour related to SRH and safe sex practices, and confidence and ease of access to SRH services and information in their local communities.

The proportion of youth reporting having had sexual intercourse increased during the observation period, with differences between genders; use of condoms amongst participants that have had sexual intercourse remained low. At endline about 10% of adolescents reported having ever had sexual intercourse, compared to 3% at baseline. Male adolescents were about 11 percentage points more likely to report having had sexual intercourse at least once before. Use of condoms during the last sexual encounter remained low at 35%; sample sizes (at N=44) are too small to look at differences over time, over age, or by gender. Only one respondent reported having used another means of contraception, in this case emergency contraceptive pills. Pregnancy rates remained very low at endline, with only 1.6% of female adolescents reporting ever having been pregnant.

As was the case at baseline, the vast majority of respondents said they would use a condom if they ever had sexual intercourse before marriage; at endline, however, more respondents felt they knew where to get a contraceptive method if they needed one. An estimated 99% of respondents predicted that they would use a condom if they ever had sexual intercourse before marriage. This figure is slightly higher than at baseline, where 95% had anticipated using a condom. The proportion of respondents that knew where to get contraceptive methods if they needed any increased from 73% at baseline, to 89% at endline. Data patterns suggest this difference is age-related. At baseline, being 15 or older was associated with a 15-percentage point increase in the proportion of students that had knowledge about where to find contraceptive methods. Three years later, with the entire sample now aged 15 or above, we do not observe any differences anymore between ages. There are also no detectable differences by program location, gender, knowledge or educational status.

We do not observe large changes on average in knowledge about HIV and reproductive health between baseline and endline. Questions relating to knowledge and reproductive health were captured in a sub-module consisting of eleven questions (outlined in table A2.4 in Annex 2). Figure 5 compares responses at baseline and endline on the selected questions. Patterns at baseline and endline are very similar, except on one statement - "Sticking to one sexual monogamous uninfected partner, reduces the risk of HIV" - where the proportion of respondents that responded positively increased from an estimated 41% at baseline, to about 53% at endline. On this question, the difference between baseline and endline appears to be almost entirely explained by an increase in the proportion of female students who responded "yes". At baseline, female students were about 15 percentage points less likely to agree with the statement that "Sticking to one sexual monogamous uninfected partner than male students, reduces the risk of HIV". At endline, we observe a much smaller difference on this question between genders (about 5 percentage points); this difference has a high p-value of 0.45, which indicates that it might be due to random noise.

Figure 5: Knowledge about HIV and reproductive health



On questions relating to knowledge about HIV and reproductive health certain gender discrepancies were accentuated between baseline and endline. At endline female students were almost 15 percentage points more likely to agree with the statement that "the female sexual partner is responsible for protection", compared to a much smaller difference of 6 percentage points at baseline. Female respondents at endline were about 10 percentage points more likely to agree with the statement that "real men do not use condoms"; this compares to about 7 percentage points at baseline. They were also 10 percentage points more likely to believe that "condoms can be used more than once", compared to differences between genders of about 4 percentage points at baseline (See Fig. 6 below). These patterns suggest that some gender

stereotypes might have been reinforced over time. It is important to note however that caution is required in the interpretation of these findings, since responses to these questions might have reflected less a personal view and more of a reflection on the reality that some men do not like to use condoms or that the burden of protection might disproportionately fall on the female.

Figure 6.1: Questions about HIV and reproductive health with negative change in scores (Girls only)

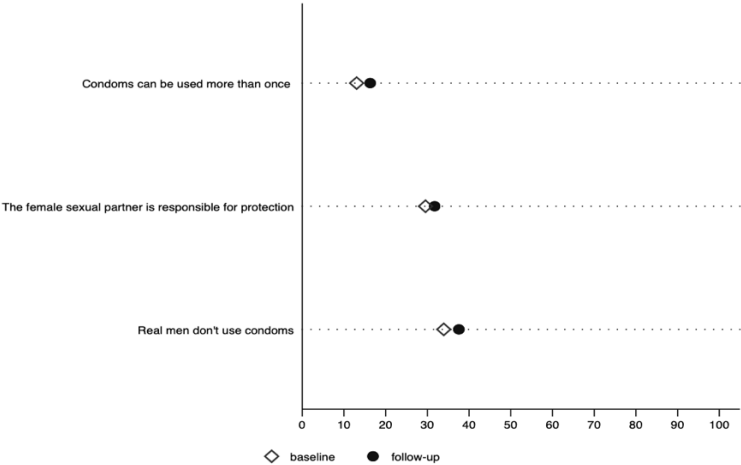
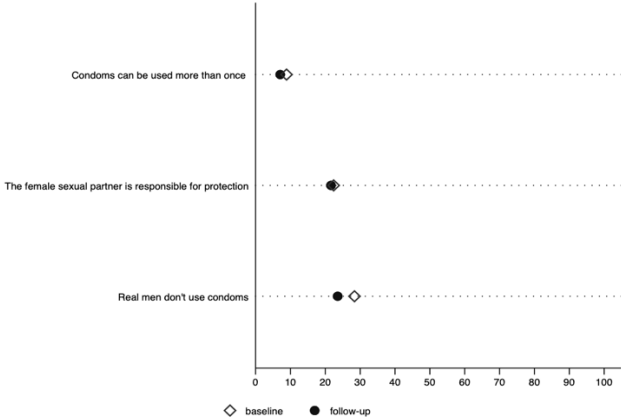


Figure 6.2: Questions about HIV and reproductive health with negative change in scores (Boys only)



Since peers tend to share information about sexual and reproductive health and experiences, their informal discussions can also spread or reinforce misinformation. Students said that when they have questions about SRH, they feel most comfortable asking their parents and friends before consulting mentors or health professionals. As teachers explained:

“Adolescents mostly get information about sexual reproductive health from the groups they belong in. There is what we call “peer groups”, which is what they use to communicate such information; one who has a problem ask his/her peer and the information circulate. However, most of this circulating information is not true”

- **Teacher, Karongi**

“Another source where they get information is from group discussions when they are together with their friends... Older ones teach younger one’s new things about reproductive health even before having their first period for girls.”

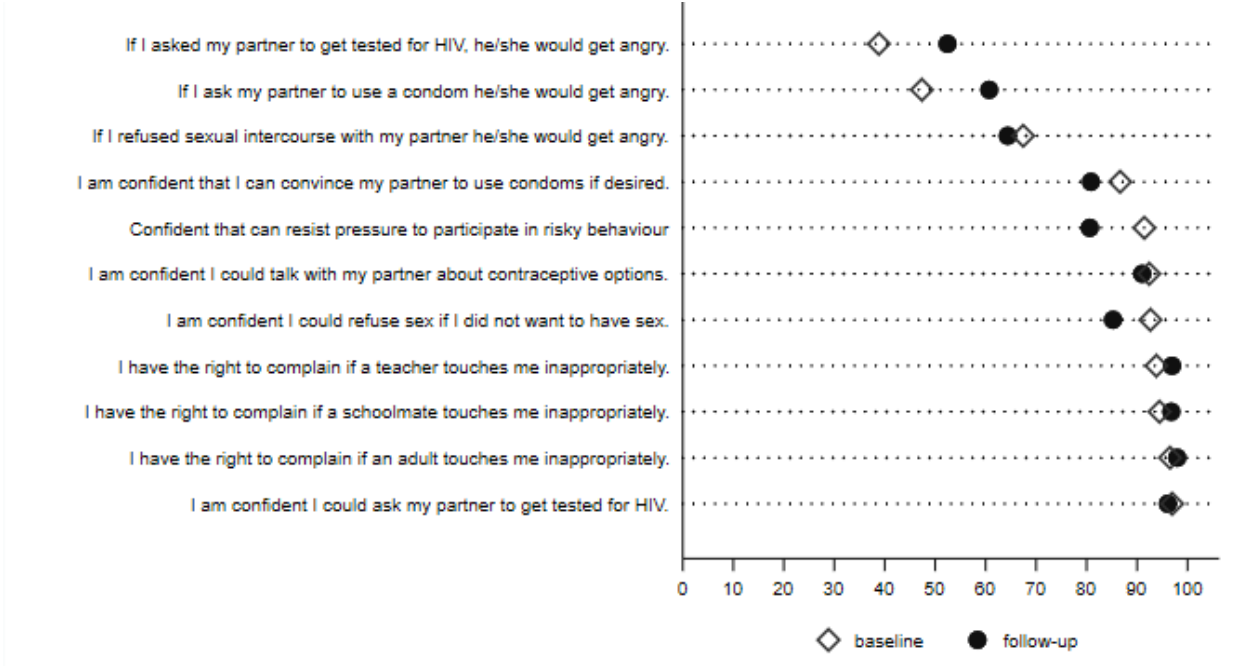
- **Teacher, Nyabihu**

4.3.3. Confidence with respect to Adolescent Sexual Reproductive Health (SRH) issues

Evidence suggests that respondents did not gain confidence in their ability to convince their partners to practice safe sex during the observation period, but they did gain more confidence in accessing protection and SRH services.

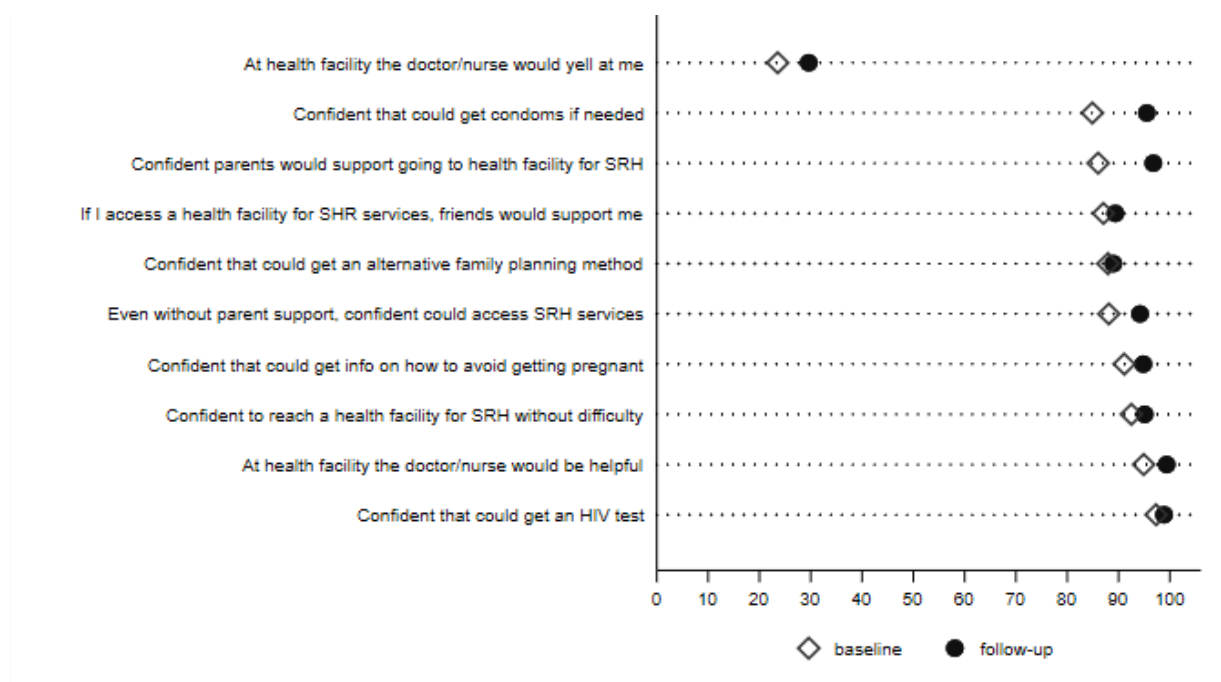
The confidence that respondents expressed in their ability to convince their partners to practice safe sex reduced between baseline and endline. At endline respondents were less confident on average about their ability to refuse sexual intercourse if they did not desire so, to resist pressure to participate in risky behaviour and to convince their partners to use a condom (see Figure 6). They also expressed greater agreement with the statements that if they were to ask their partners to get tested for HIV or to use a condom, that their partners would get angry. We do not observe large gender, age or location effects at either baseline or endline.

Figure 7: Confidence to convince partners to practice safe sex and report misbehaviour



At endline respondents did however express greater confidence in their ability to access SHR services at medical facilities. At endline, respondents were significantly more confident that they could acquire condoms if needed, that their parents would support them if they went to a health facility for SHR services and that even if their parents did not support them, they would still be able to seek care without difficulty (see Figure 8). In the context of this sample, increased perceptions of access to medical services were not strongly associated with gender, age or location patterns.

Figure 8: Confidence related to sexual and reproductive health issues and access to services*



**note, variable labels have been shortened to fit the graph*

When discussing the challenges associated with visiting health facilities for SRH services, students suggested geographic and finance obstacles rather than embarrassment, discrimination, or social stigma. Common challenges included far distances to health centres, not being able to afford transportation, not having Mutuelles or other insurance to cover costs, or long wait times to see a service provider. Students were generally confident that, if they could access the facility and see a service provider, they could receive care without difficulty.

4.3.4. Adolescent Knowledge and Perceptions of GBV

Perceptions of what to do in the case of violence, whether sexual, physical or other, has evolved substantially since baseline.

A greater proportion of respondents at endline knew who to reach out to for support if somebody they knew had experienced gender-based violence. The proportion of respondents that felt they knew who to reach out to increased from 86% at baseline to 92% at endline. The increase was largest in BEE program areas (+10 percentage points, compared to +1.5 percentage points in SS4G program areas). This difference cannot be attributed to the greater success of the program in one area versus the other, since both programs are operating in different Districts. This might therefore be a District effect. More than half of the respondents at endline identified local authorities (62%) and the police (52%) as the main potential providers of support in this situation. Parents (42%) and doctors at health facilities (41%) were also frequently mentioned. Other choices included “headmaster” (17%), “friends” (12%), “neighbours/other adult community members” (8%), and “mentor” (7%).

There was an even greater increase in the proportion of students who knew who they could reach out if they themselves experienced different types of violence, including physical, psychological, sexual or economic violence. Table 5 shows that by endline the proportion of students who were able to identify someone to reach out to in the case of physical violence and economic violence increased by almost 40 percentage points; the proportion of students who could identify someone in the case of physical violence increased by 35 percentage points. A high proportion of students at baseline already knew whom to reach out to in the case of sexual violence, so the increase on that metric was much smaller at 2 percentage points. On these metrics we also observe a slightly larger increase in BEE areas compared to SS4G program areas.

Table 5: Responses to - "Do you know who you can reach out to for support if you or someone you know experiences gender-based violence?"

Variable Name	Question Label	Baseline	Endline
C4e1	Physical Violence	51.1%	89.2%
C4e2	Psychological Violence	22.9%	67.6%
C4e3	Sexual Violence	93.9%	96.0%
C4e4	Economic Violence	17.6%	68.7%

These findings are supported by the focus group discussions surrounding GBV. During focus groups both male and female students in BEE schools mentioned being aware of reporting mechanisms for GBV. Students explained that they could report to any authority figures, such as parents, school leaders, village leaders, sector and cell offices, and the police.

"In addition, I can tell my parents, and if I am with the authorities, I can tell them too. Or any other person who might be around and able to rescue me from that GBV."

- Female Student, Nyabihu

"Gender-based violence cases can be reported to the person in charge of the sector office even in the district office."

- Male Student, Nyabihu

"I can tell the authority nearby or request for a mobile phone to call the police."

- Male Student, Rutsiro

Teachers too are aware of mechanisms and referral systems for reporting GBV. They explained, however, that the referral mechanisms mean that they do not often see the outcome of reporting cases or know how to follow up appropriately.

“The method we use is to report to our supervisors who then take the case to another level. Maybe it is not such an effective mechanism, but it is all we can do given that we have many other responsibilities. The problem with this method is that we never get feedback.”

- **Teacher, Karongi**

“When it happens at schools, the police intervene and conduct an investigation of the actions and after they take the people involved and bring them to justice in court. In the mean time for us, we actually don’t have information regarding the case except hearing some people saying some things because the police do not come back to give us feedback about the case so that we know who did what to whom and how the case was handled. We only make assumptions that if someone doesn’t show up to work, it means that they are guilty or that the police took him.”

- **Teacher, Nyabihu**

The survey also asked students how they would expect to be treated when reporting a case of GBV; on these metrics we observe little change between baseline and endline. At endline 72% of respondents believed that they would be respected compared to 79% at baseline. Remaining respondents felt they would either be ignored or would get themselves into trouble. When disaggregated by gender at baseline, significant differences could be observed between girls and boys, with girls more commonly answering that they would get into trouble or be ignored compared to boys; however, this difference was not observed at endline. Students that had dropped out of school and those still in school did not have significant differences in their opinions at endline either.

In focus groups, students’ opinions of the prevalence of GBV in their communities and among their peers were notably mixed; however, teachers agreed that GBV is an on ongoing issue. Teachers explained that GBV affects students both personally as potential victims and by the conflict it causes in their homes and communities.

“There are many GBV cases indeed. We are aware of this especially because of the adolescent groups here. Sometimes a student talks to you about their case and you realize that they are being victimized by someone who should be taking care of them instead.”

- **Teacher, Karongi**

“Yes, there are some cases in this community, most especially in homes between spouses because women are not respected in a way that a man can go on and drink beers and ignore all his responsibilities.”

- **Teacher, Nyabihu**

“We focused on early pregnancies, but there are other evidences of GBV cases at school. For instance, poor performance/participation in class. There are times when you talk to the student who is not performing well and find out that it is because of a GBV case they experience at home. For example, some students mention that their parents fight every night.”

- **Teacher, Karongi**

4.3.5. School Safety

When asked about their safety at school, on the way to school, and at home, adolescents overall felt less safe. The proportion of students who said they almost always feel safe at school fell from 30% at baseline to 20.7% at endline, though a greater proportion (23.6%) of students in the BEE project reported almost always feeling safe. The proportion of students who said they almost always feel safe on the way to school fell from 26.8% at baseline to 16.5% at endline. When asked if students felt safe at home, the proportion of students who said they almost always do fell from 31% at baseline to 16% at endline. Likewise, the proportions of students who reported rarely feeling safe at school, on the way to school, and at home increased. There are no significant differences though between male and female students’ perceptions of safety.

The students from BEE schools who participated in focus groups, however, agreed that they felt safe at school. Both female and male students said that they believed that teachers and school administrators helped to maintain a safe environment and were available to support students should they feel unsafe. Teachers also suggested that school rules and codes of conduct help to create a safe environment for students.

The establishment of a code of conduct for teachers is one tool that the BEE project promoted to create safer school environments for students. According to teachers, the code of conduct encourages professional ethics and positive teaching behaviours, such as treating others with respect and fairness, avoiding favouritism, and doing the job well. The code of conduct also explains the recourse when teachers violate the code. Teachers in the focus groups at BEE schools cited examples of how they live the code of conduct including acting respectably and as role models in their communities, not discriminating against certain students, and not being alone in a private space with students of the opposite gender.

4.3.6. Perceptions about Early Marriages

With the passing of time - between baseline and endline - **a greater number of respondents felt that it was normal for girls or boys to drop out of school in order to get married.** At baseline 46% of respondents agreed that it was ok for girls to get married, compared to 67% at endline;

similarly endline was associated with a 25 percentage point increase in the proportion of respondents that agreed that it was ok for boys to drop out of school to get married, from 34% at baseline to 59% at endline. There were no significant differences by gender on these questions and no major differences between the BEE and SS4G locations. Age was also not a very strong predictor of opinions on this question at either baseline or endline. There was also virtually no difference on this question between respondents that were in school and out of school, with out-of-school youth 3 percentage points less likely to agree with the statement that it was ok for girls to drop out; and equally likely to agree that it was ok for boys to drop out. The fact that dropout is not a strong predictor of perceptions on this question is not necessarily unexpected; as demonstrated in focus group discussions, youth adjust their opinions and expectations for themselves by observing the experience of others.

Discussions with students at BEE schools show that students have experience interacting with students that have dropped out of school to get married or heard stories of the consequences of such decisions. The general consensus seemed to be that early marriages were not ideal but occurred in their communities.

"Girls who experience early marriages are the ones who dropped out of school mostly."

- Female student, Ngororero

"Here at school, a girl can have a boyfriend, the boyfriend can tell her that he has a wealthy family that can support him in everything he does, and the boy proposes to the girl for marriage and the girl is convinced and decides to drop out of school. That is when she starts to live with consequences of getting married at an earlier age."

- Female student, Nyabihu

While students participating in focus groups agreed that early marriage was not desirable, they conceded that poverty or pregnancy could influence adolescents to choose early marriage.

"There are also some girls who come from poor families. So, since they can't even get food from home, they decide to get married in order to escape poverty from their homes."

- Female student, Karongi

"So, what happens is that sometimes a girl may come from school and meets someone who misleads her in sexual activity. Then, the girl may get pregnant and decided to get married instead of having conflicts with her parents."

- Female student, Karongi

4.4. Financial literacy and savings

A key component of the BEE project was to build students’ financial literacy and encourage their participating in savings groups or income-generating activities. Improving students’ financial security and resilience has the potential to reduce the financial obstacles that could contribute to drop out and poor performance in school.

4.4.1. Savings

More respondents saved money at endline than at baseline. On average the proportion of respondents that had saved some money over the past twelve months increased from 40% at baseline to 73% at endline. Girls experienced a much larger increase in the savings rate than boys. The proportion of girls that had saved some money over the past twelve months was 26% at baseline, compared to 69% at endline (+43 percentage points); the proportion of boys who saved increased from 50% at baseline to 78% at endline (+28 percentage points). At endline the frequency with which respondents were saving had also increased, with about 41% putting some money aside more than 2 times a week, compared to 28% at baseline.

There are differences in the sources of income for female and male respondents, with male youth more likely to be engaged in an economic activity. At endline, the largest source of income for female respondents remained the family and in particular the mother (28% received some money from the mother compared to 14% of boys); girls were also more likely to have received money from the father (17% of girls, compared to 7% of boys). Male respondents were much more likely to mention economic activities as their main source of income. The largest source of income for boys was “working for others” (51% compared to 21% for girls) and raising or selling livestock (35% for boys, compared to 10% for girls). At endline 52% of youth reported being engaged in activities that generate income, compared to 44% at baseline. At both baseline and endline female respondents were 14 percentage points less likely to be engaged in an economic activity.

Respondents felt slightly more empowered at endline to make their own decisions about how to spend their savings. When asked who made the decisions about how to spend their savings, 68% of adolescents at baseline responded that they make these decisions on their own. This proportion grew to 77% at endline. The main items youth chose to spend their savings on are livestock (69%), clothes (53%), shoes (32%) and to pay for things related to school (30%). There are some differences between genders as can be seen in Table 6.

Table 6: What do you spend your savings on (choose all that apply).

Variable Name	Question Label	Male	Female
e9_1	To pay for clothes	51.0%	55.8%

e9_2	To pay for food	6.4%	0.3%
e9_3	To pay for things related to school	32.2%	27.0%
e9_4	To buy school uniforms	4.6%	2.5%
e9_5	To pay for school fees	2.5%	0.7%
e9_6	To pay for my own business	4.7%	0.0%
e9_7	To pay for medical expenses	1.3%	0.0%
e9_8	To support my family	6.8%	5.2%
e9_9	Livestock	73.4%	65.4%
e9_10	Shoes	20.9%	42.6%
e9_11	I have not yet spent any of my savings	51.0%	55.8%

During qualitative interviews some students linked their improved financial literacy and ability to save to the BEE program. Focus group discussions with students at endline highlight various discussions around good savings practices, understanding the need for savings, and training available in their schools regarding the management of savings and income-generating activities.

"People from CARE talked to the teachers about it then they came to us. They created groups in which we had discussions encouraging us to save. Later, we started doing it when we knew what we were doing."

- Male Student, Karongi

"On the radio, they teach us ways of savings, how to save whether it is the income or money we have gotten from other different places."

- Female Student, Nyabihu

"During holidays we can use money from the saving groups and buy like a domestic animal, and when we are about to start school, and there is no money at home to help us prepare for school, we can then sell it and then get money to buy books, pens, shoes, school uniforms, etc."

- Female Student, Karongi

"Thank you. Truth is, I now understand fully the importance of saving. However, I had this friend who did not understand that saving is of any importance and I showed him how one can start saving small and achieve many things in the long run. When he was convinced, then decided to start saving."

- **Male Student, Ngororero**

"We were taught by educators and other people who came here, I guess they are from CARE. They would also come for one day to teach the educators, who would then come the following day. They would help us to form groups and teach us through those groups."

- **Female Student, Karongi**

Data from this survey suggests that the ability to save is a very strong predictor of dropout, reinforcing the narrative presented above linking the financial situation of respondents to educational outcomes. Children that had dropped out of school were 20 percentage points less likely to have saved money over the past twelve months. These findings show that targeting increased savings might be an effective way to keep children at school, thereby justifying the theory of change employed by CARE and BEE in the delivery of this program.

Teachers in both focus groups agreed that learning to save was an important life skill for students to learn. Participating in income-generating activities, forming savings groups, and saving small amounts where possible provide an important resource for students.

"The boys and girls or adolescents here use different ways of saving which are collecting money as a group and lending it to one individual in the group in alternating ways for personal development projects like buying livestock and farming This help them in their everyday endeavours."

- **Teacher, Nyabihu**

"Let us say that this adolescent invested 3000 to buy a chicken and it eventually lay 6 small chickens. By chance, 4 or 5 small chickens could survive and grow up. So, when the time comes and the owner faces a problem, he or she could sell one small chicken and solve it."

- **Teacher, Karongi**

"Another source where they get information is from group discussions when they are together with their friends... Older ones teach younger one's new things about reproductive health even before having their first period for girls."

- **Teacher, Nyabihu**

4.4.2. Adolescent Financial Literacy Score

At both baseline and endline students were tested on their financial literacy and their understanding of basic financial concepts.

Financial literacy scores dropped between baseline and endline, in particular for female respondents. There were 21 questions in the financial literacy module. At baseline the average proportion of correct responses on these questions was 51%, compared to 44% at endline. The drop in financial literacy scores was largest for female respondents (-9 percentage points between baseline and endline, compared to about 4 percentage points for boys). The financial literacy score had no bearing on saving patterns and does not appear to be linked to whether respondents were engaged in an income generating activity or not.

We prefer not to place a large weight on these findings since there were differences in the administration of this test between baseline and endline and since we observe a lot of reversal along the mean. Changes in the test administration protocol may have affected student performance. While at baseline the test was administered with a 30-minute time limit, endline administration reduced this limit to 20 minutes.

4.5. Leadership

Students at both endline and baseline were asked questions about leadership roles and youth leadership positions. We observe large changes in leadership patterns between baseline and endline. For the overall sample of 454 students, the baseline (weighted) mean **YLI Index score** of 2.57 increased to 2.64 at the follow-up evaluation. **For the BEE sub-sample only, this change was from 2.56 to 2.62 at endline.** The YLI score showed a much higher improvement over the waves for girls compared to boys in the sample (See Fig. A2.1 in Annex 2).

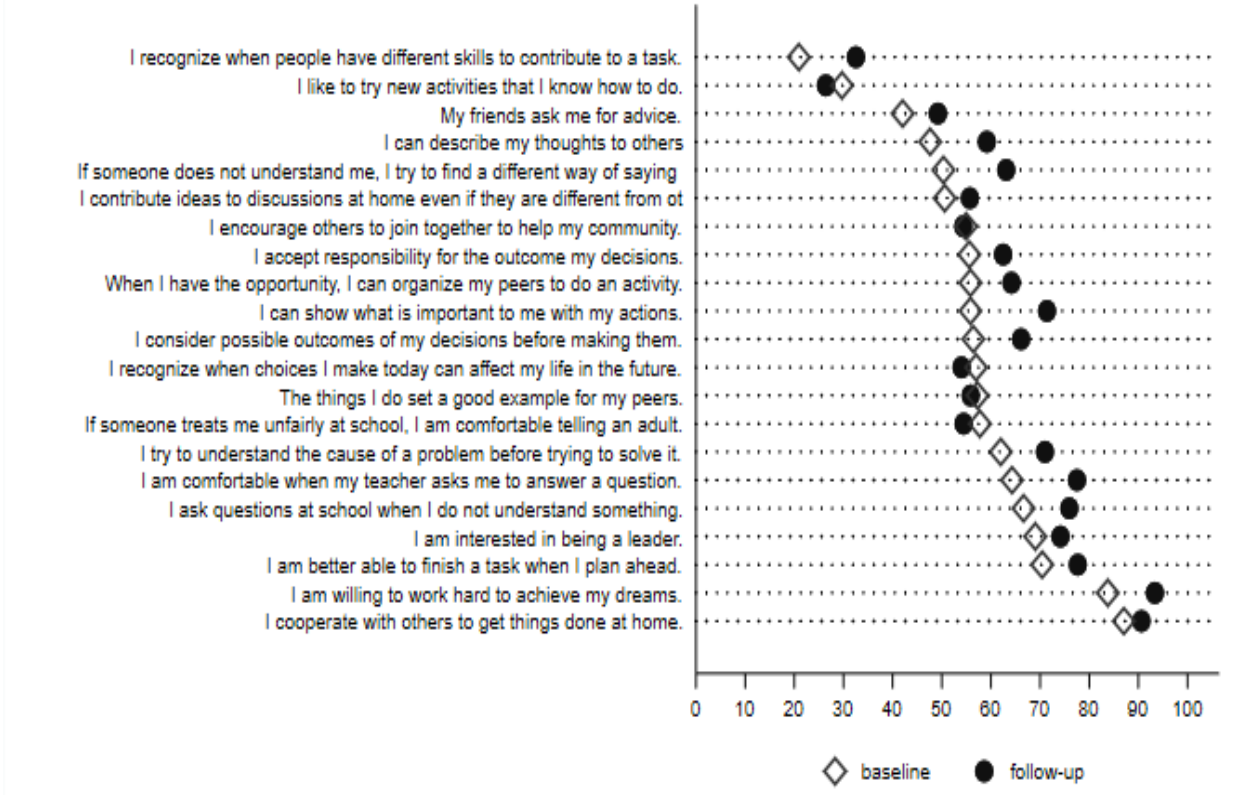
At endline, more respondents held leadership positions at home or at school. When asked if they currently held any leadership positions at home or school, 37% of students at endline answered that they did, compared to 20% at baseline. We do not observe large differences by gender, age or location at either baseline or endline. The most common leadership roles that these students held were “Chief of class” or “Class monitor”. Responses disaggregated by gender can be seen in Figure A2.2.

When asked if they were involved in any youth organisations, 63% of respondents at endline said “yes” compared to only 32% at baseline. Both male and female students were significantly more likely to be involved in youth organisations at endline compared to baseline. This increase was almost entirely due to CARE, with 93% of respondents who were part of a youth organization identifying CARE groups as the group/organization they belonged to.

Along with questions about leadership roles, adolescents were asked questions from the Youth Leadership Index (YLI). This scale was designed by CARE to measure changes in self-perceptions of leadership among young people, specifically aged 10-17 years. The YLI consists of questions that ask young people about their self-confidence, decision-making, problem solving and organizational skills, their sense of voice, and their ability to motivate others. The YLI also measures cooperation, diligence, independent thinking, personal responsibility, and leadership interests. All the component questions of this scale are listed in Table A2.3 in Annex 2.

Responses to YLI questions show that respondents gained greater self-confidence between baseline and endline. Figure 9 depicts responses to each of the YLI questions at baseline and endline, focusing on the percentage of respondents that agreed or strongly agreed with the statement. The largest improvements between baseline and endline centred on improved self-confidence with respect to interacting with others, speaking up in class, and considering the implications of and making decisions.

Figure 9: Responses on to YLI questions at baseline and endline (% of respondents who agreed with statement)



During focus group discussions, both male and female students in the BEE project schools spoke often about equality in opportunity for men and women.

“If a girl has self-confidence and it is her goal to be leader, there is nothing else that would stop her from being one. She starts from lower levels where she is elected to lead in schools then she pursues courses about leadership after her graduation and she eventually achieve her goal.”
 - **Male Student, Ngororero**

“Girls have opportunities to be leaders because of gender promotion; it is not like in the past where girls were denied admission in schools and leadership schools. Today, a girl has every right to be a leader if she wants. You can study

law and campaign for any position; be it school Head Teacher or even the president of the country. I mean, we know of countries who are leading by female presidents, so it is very possible."

- **Female Student, Ngororero**

"Personally, I think the government gave both men and women equal opportunities. In leadership positions, there are both men and women."

- **Female Student, Karongi**

Teachers also shared that these perceptions of equal treatment and opportunity are central to their teaching code of conduct. Teachers unanimously responded that they do not discriminate against or differentiate between male and female students.

"In all of the combinations we have here at school, they include boys as well as girls. And even when it comes to performance in class, girls perform well as boys."

- **Teacher, Nyabihu**

"What I know about gender-sensitive teaching methods is that we have study groups in class that consist of both boys and girls. In terms of gender, we make sure that both girls and boys get to speak."

- **Teacher, Karongi**

Students have been encouraged to take up their own leadership roles outside of the teaching environment as well. Examples of leadership roles that students in BEE schools hold include holding officer positions in their savings groups, being elected to represent children and youth in the cell, and leading dance troupes or sports teams.

5. Conclusion

The Better Environment for Education Project was designed to promote better educational, social, and economic outcomes for students, with the specific objectives of (1) reducing the number of girls who drop out, (2) increasing the number of girls who transition from lower to upper secondary education, and (3) increasing the number of girls pursuing safe and secure economic opportunities outside the home. Through school-based support—including academic resources, financial literacy training, and sexual and reproductive health education, and leadership training—the BEE project aimed to empower students to address obstacles to secondary education.

The endline evaluation of the BEE project observed notable changes in adolescent perspectives, actions, and experiences during the implementation of the program. Though dropout rates were similar to those observed in national-level data collection, significant differences were observed when comparing overaged students to students who were on-track academically for their age. Likewise students who were on-track for their age were also more likely to transition to upper secondary school. Compared to national data, the educational outcomes for girls were better than expected in our sample. If the project had a positive effect on educational outcomes, it will most probably have impacted girls more than boys. These observations provide valuable insight for targeting and supporting students who are at greatest risk of dropping out and who could benefit most from BEE interventions.

Like age, access to financial resources predicts educational outcomes like dropout and transition. Students who were not confident in their ability to find money for school fees were also more likely to have dropped out of school or to have been absent in the week prior to the interviews. Focus group discussions supported this finding. Both students and teachers in BEE schools suggested that inadequate financial resources to pay fee or buy supplies and the competing desire for adolescents to work—and thus earn income—instead of attending school were key reasons why students were absent or dropped out. Teachers and students also noted that income-generating activities and saving groups build students' financial security, independence, and ability to problem solve. The emphasis of the BEE project on expanding students' financial literacy, savings, and participation in income-generation activities can likely support progress on all three objectives of the project.

Students' expanded leadership and extracurricular participation are likely the result of the BEE project. Over time, more respondents held leadership positions at home or at school and more respondents were involved in youth organizations, the vast majority of whom belonged to a group organized by CARE. Focus group discussions highlighted peer-to-peer support as an important resource for adolescents, especially during this period of their lives that is characterized by change, choices, uncertainty, and complex personal and social challenges. Encouraging peer associations can help students to build leadership skills and practice healthy

inter-personal relationships; however, there is a need to offer mentorship and training from trustworthy adults in order to address misinformation—for example, related to sexual and reproductive health—and to teach new skills.

Annex 1: Sampling and Data Collection Procedures

Roles and Responsibilities

The endline evaluation of the BEE program required that roles and responsibilities be shared between CARE and Laterite.

CARE was responsible for:

- Developing instruments;
- Providing the baseline data;
- Tracing adolescents interviewed at baseline;
- Securing local authorities' approvals; and
- Securing school leaders' consent for adolescents below 18 within selected schools.

Laterite's main roles consisted of:

- Sampling study participants (adolescents and teachers) for both qualitative and quantitative data collection;
- Obtaining a survey visa from the National Institute of Statistics (NISR) and a research ethics approval from the Rwanda National Ethics Committee (RNEC);
- Coding research instruments in SurveyCTO and reviewing translations;
- Recruiting and training the data collection team;
- Coordinating and implementing qualitative and quantitative field surveys activities;
- Monitoring, cleaning and analysing the data; and
- Drafting the final report.

Sampling Process

Sub-sampling for Tracing

Since this study was designed as a longitudinal evaluation, the cohort of students interviewed during the baseline was traced, and a sub-sample from among them was selected as the sample for the endline evaluation. The sample of 652 baseline students was clustered by the school they attended at baseline. For the endline tracing exercise, up to 15 students were randomly selected from each of these schools. If schools had less than 15 students who participated in the baseline evaluation, then all students were included in the tracing sub-sample. Laterite also dropped 20 students from four schools with less than 7 students surveyed during the baseline evaluation. This resulted in a total of 413 BEE students to be traced at endline. Table A1.1 below outlines

the baseline schools and the number of students selected for tracing at endline from these schools.

Table A1.1: Sub-sample for tracing by Baseline School

District	School	Number of Students
Karongi	GS BUBAZI	15
Karongi	GS GISAYURA	8
Karongi	GS KIBIRIZI	15
Karongi	GS MUBUGA	15
Karongi	GS MUNIGI	14
Karongi	GS NYABUBARE	8
Karongi	GS NYARUBUYE	15
Karongi	GS CYINAMA	15
Karongi	GS SHOBA MURAMBA	14
Ngororero	GS BUNGWE	10
Ngororero	GS GITWA	15
Ngororero	GS KAJINGE	7
Ngororero	GS KANOGO	15
Ngororero	GS MUHORORO	15
Ngororero	GS NGURUGUNZU	14
Nyabihu	GS GIHIRA	15
Nyabihu	GS MUKAMIRA	15
Nyabihu	GS RUBARE	14
Nyabihu	GS RUSUSA	15
Nyabihu	GS VUGANYANA	11
Nyabihu	GS CYUMBA	8
Nyabihu	GS KAREBA	13
Nyabihu	GS KORA CATH.	14
Rutsiro	GS BITENGA B	15
Rutsiro	GS BUSHAKA	10
Rutsiro	GS KABEZA	13
Rutsiro	GS KABITOVU	15
Rutsiro	GS KIGARAMA	15
Rutsiro	GS MUSHUBATI	15
Rutsiro	GS RUGOTE	15
Rutsiro	GS RWAMIKO	15
Total		413

Outcome of the tracing exercise

CARE Rwanda traced all students who participated in the baseline evaluation and was sampled for tracing. However, since tracing was completed in December 2018, students who had taken

national exams were still waiting on their final school placement. Once S4 school information was available, CARE updated the final placement of students for only those students included in the selected sub-sample. For their S4 year, many students had moved to new schools. Many of these schools were not a part of the baseline evaluation and some schools were not located in the districts in which data collection was planned. The outcome of the tracing exercise is summarized in Table A1.2 below.

Table A1.2: Outcome of the tracing exercise

Outcome	Number of Students
At the same school	137
Moved to another school included in the baseline evaluation	21
Moved to a school not in the baseline but within the target districts	124
Moved to a school outside the target districts	27
Dropped out	75
Not currently in school	19
Could not be traced	10
Total	413

Re-sampling using tracing outcomes

Following the tracing of the sub-sample into their new schools, Laterite observed that students were in many more schools than anticipated. In addition, there were fewer sampled students per school, and some students had moved to schools outside the area of the evaluation. To ensure adequate representation of different profiles of students—for example, students who moved schools or students who had dropped out—while completing data collection within the time and budget constraints, Laterite reselected the sample from among the traced students and weighted accordingly in the analysis. The final sample of 300 students for endline data collection is described in Table A1.3 below.

Table A1.3: Final Sample of Adolescent Students for the BEE Quantitative Survey by District and Current School

District	School	Number of Students
	Es Mubuga St Alphonse	1
	Es Rubengera	5
	Es Rugabano	3
	Es Urumuri	1
	Gs Bubazi	3
	Gs Cyinama	6
	Gs Gahengeri	1
	Gs Gisayura	2

Karongi	Gs Kibirizi	3
	Gs Mangi	5
	Gs Mubuga	4
	Gs Munigi	8
	Gs Nyabikeri	3
	Gs Nyarubuye	17
	Gs Ruragwe	2
	Gs Shoba Muramba	3
	Gs St Joseph Birambo	2
	Gs St Joseph Kinama	1
	Gs St Michel Mubuga	4
	Ttc Rubengera	3
	Dropped out	9
Still at home	2	
Karongi Total		88
Ngororer o	Adec Ruhanga	3
	Aperwa Nyange	4
	Asipad Ngororero	3
	Eav Kivumu	3
	Es Kamashi	7
	Gs Bungwe	6
	Gs Ibuka Kabaya	1
	Gs Kajinge	3
	Gs Kanogo	4
	Gs Kinanira	4
	Gs Muhororo	10
	Gs Ngurugunzu	3
	Gs Ruhunga	1
	Gs Vuganyana	1
	Hindiro Tvt School	2
	Dropped out	15
	Still at home	4
Ngororero Total		74
Nyabihu	Aparpe	5
	Gs Cyumba	1
	Gs Gihira	8
	Gs Gitebe	7
	Gs Jenda	4
	Gs Kareba	6
	Gs Mukamira	11
	Gs St Pierre Jomba	2
	Dropped out	4
	Still at home	1
Nyabihu Total		49
Rutsiro	Gs Bitenga B	15
	Gs Boneza	3

Gs Bumba	2
Gs Bushaka	6
Gs Congonile	4
Gs Kabeza	1
Gs Kigarama	10
Gs Murunda	4
Gs Mushubati	7
Gs Nyamyumba	1
Gs Rugote	4
Gs Rwamiko	11
Dropped out	17
Still at home	4
Rutsiro Total	89

Qualitative Sample

Qualitative data collection was conducted in one school in each of the four districts. Schools were selected from among those with at least six female students and six male students who participated in the baseline evaluation to ensure an adequate size for focus group discussions.

Table A1.4: Schools selected for focus group discussions with adolescent students

District	School
Karongi	GS NYARUBUYE
Ngororero	GS MUHORORO
Nyabihu	GS MUKAMIRA
Rutsiro	GS BITENGA B

Laterite enlisted the assistance of school-based mentors with updating the list of teachers who participated in the BEE program in the baseline schools. For qualitative data collection, Laterite selected two schools in the Western province with eight or more teachers.

Table A1.5 : Teachers qualitative sample

District	School
Karongi	GS NYARUBUYE
Nyabihu	GS MUKAMIRA

Team Structure

For the BEE endline data collection, Laterite trained a team of two field supervisors, 31 enumerators, four moderators, and four notetakers. All data collection with students was conducted by interviewers of the same gender.

Pilot

Laterite tested qualitative and quantitative research instruments and associated administration protocols in four schools in Kamonyi District on February 12th, 2019.

The main objectives of the pilot were:

- Testing aspects of field surveying such as interview length and administration protocols;
- Collecting feedback from the team on surveys and administration protocols, including understandability and relevance of questions, unclear translations, coding errors; and
- Familiarizing enumerators with the data collection setting.

Table A1.6: Pilot Schools and Surveys Completed

District	School	Adolescent surveys	Finance tests	Teacher surveys	Adolescent FGDs	Teacher FGDs
Kamonyi	GS Gatizo	53	53	8	2	1
Kamonyi	GS Ruyenzi	53	53	2	2	1
Kamonyi	GS St Paul Kirwa	63	63	7	2	1
Kamonyi	GS Ste Therese Kabasare	39	39	5	2	1

Data Collection Protocols

Laterite conducted qualitative and quantitative data collection activities from February 18 to March 1, 2019. As much as possible, surveys with students and teachers were administered in schools. In order to interview students who had dropped out, were not currently enrolled, or were absent from school, interviews were scheduled on the weekends at students' homes. Tracing and interviewing students who were not in school was a critical component of the evaluation since reducing dropout is a key outcome of the program. All focus group discussions were conducted in schools with the sampled students and teachers who were available on the day that data collection was scheduled.

To ensure respondent privacy during both qualitative and quantitative data collection, enumerators secured quiet locations in schools or homes for interviews.

For students in school and under 18 years of age, school leaders provided written consent. For out-of-school students under 18, enumerators sought parental consent. Prior to the start of interviews, enumerators secured students' assent to participate. Students aged 18 years or older and all teachers consented themselves.

Quantitative data collection

All quantitative data collection was collected electronically using tablets and questionnaires programmed with SurveyCTO, an ODK-based data collection software. Teacher surveys were administered individually and face-to-face by enumerators of the same gender. The student survey was divided into two parts for efficiency. The first part covered seven main sections: demographics, gender and power assessment, sexual and reproductive health, basic needs, financial literacy, leadership, and school environment. This part of the survey was administered on an individual basis by an enumerator of the same gender as the student. The second part consisted of a test on financial concept. This part was administered on paper and in a group setting. Ahead of starting the test, enumerators explained the instructions. After thirty minutes, enumerators collected students' paper tests and entered data into SurveyCTO.

Qualitative data collection

Focus group discussions had six to ten participants each. Focus groups with students were segregated by gender while focus groups with teachers were mixed gender. The focus groups were conducted in Kinyarwanda and led by a moderator who administered questions according to the interview guide and probed for further details when needed. Focus groups were audio-recorded and had a note-taker present. The notes and audio were used to generate verbatim transcripts, which were then translated into English.

Completed versus expected surveys

During data collection, 83 students could not be interviewed because they moved outside the targeted districts, enrolled in schools at which Laterite did not have approval to conduct research, or could not be located.

Table A1.7: Completed vs expected surveys

Surveys	Student surveys	Adolescent FGDs	Teacher FGDs
Expected	302	8	2
Completed	219	8	2
Missing	83	-	-

From the 83 students who could not be interviewed:

- 3 students moved outside the country (Malawi, Uganda and DRC);
- 16 students dropped out of school and are living outside targeted areas;
- 36 students moved to schools that were included in the approval applications;
- 28 students could not be located.

Strategies used by Laterite to minimize attrition included:

- Contacting guardians to confirm the schooling status of students and request, if needed, additional information related to students' school or household location. Many guardians' phone numbers, however, were either missing from tracing data or offline.
- Requesting additional details from school authorities or other students for students who had dropped out or moved to different schools.
- Visiting villages and requesting directions to guardians' homes from village leaders or residents. Village names, however, were not known for all out-of-school students.

Data Cleaning

Laterite's in-house data analysts undertook data cleaning for the endline dataset at Laterite offices at Rwanda. The data cleaning procedures were all done using STATA 15. The steps in data cleaning included:

- Labelling all variables by executing a SurveyCTO generated do-file;
- Dropping all test/mock data by looking at the enumerator ID and submission date;
- Cross-checking enumerator, school, teacher and student IDs;
- Cross-checking and resolving any cases of duplicate submissions;
- Merging Finance Test dataset into the adolescent dataset;
- Labelling and cleaning baseline variables to maintain survey association;
- Merging baseline and endline datasets into a master adolescent and teacher dataset, both in wide and long format;
- Checking and reviewing outliers;
- Translating "Other, specified" options and enumerator comments into English;
- Reviewing enumerator comments and making any necessary corrections to the dataset;
- Anonymizing the dataset by removing any directly personally identifiable information of participants;
- Collapsing and calculating module-wise indices;
- Dropping variables with no information or redundant information (e.g. confirmation questions and enumerator information);

- Sub-setting the adolescent dataset into SS4G and BEE datasets.
- Coding and resolving any missing values; and
- Calculating summary statistics.

Quantitative Analysis

The quantitative analysis plan for the endline evaluation of CARE Better Environment for Education (BEE) project included the following processes:

- Correctly assessing weights;
- Comparing indicators for each module against baseline by looking at descriptive statistics of each variable across waves;
- Module-wise baseline-endline comparison of each variable using matched-pairs t-tests;
- Module-wise baseline-endline comparison of each variable using survey weighted regressions; and
- Analysis of attrition by comparing the characteristics of the participants lost to follow up against the expected endline sample.

Assignment of Weights

The endline evaluation of the BEE project included tracing a sub-sample of the total number of students that were interviewed during the baseline evaluation. Out of a total of 146 program schools for BEE, 34 were selected for the baseline evaluation. Within these sample schools, the CARE baseline evaluation team selected a sample of students in S1 for the baseline sample. Out of the 1291 students interviewed in total (for both SS4G and BEE projects) at baseline, 652 students were from BEE schools.

For the midline/endline evaluation, Laterite's team sub-sampled from the total 1291 students (from both SS4G & BEE projects), a sample of up to 15 students per school for tracing and dropped any schools with 6 or fewer students in them. CARE Rwanda team conducted a tracing exercise for this sub-sample of 862 students over December 2018 and traced 857 out of them. In order to survey around 600 students for midline/endline, the traced sample was further re-sampled on the basis of their status after tracing. The outcomes of the tracing exercise were as follows:

- 300 students were still enrolled at the same 58 schools as during baseline;
- 149 students had dropped out 57 baseline schools;
- 29 students from 19 baseline schools could not be traced;
- 32 students from 23 baseline schools were still at home and one student was sick;
- 51 students had moved within 15 within-sample baseline schools;
- 247 students moved to 128 new schools outside the baseline schools; and
- 45 students moved to 41 schools that were outside the study sample areas.

The second stage of sampling was undertaken by pooling together the traced sample for both SS4G and BEE schools (total 857 students) and sampling randomly from this group based on the student's current status as determined by the tracing exercise. Since it was not possible to interview those outside sample areas or those that could not be traced, these students were dropped from the total sample (74). All of the students in the original schools (351) were sampled for endline. In order to not bias our sample against dropped out students, we randomly selected 90 (60%) of the total SS4G and BEE students who had dropped out. Along with this, we randomly sampled 20 (63%) students who had finished S3 had not been enrolled in their new school for the upcoming year (students that were still at home as of the tracing period). Out of the remaining 247 students that had moved to new schools that were outside the baseline sample schools, we used the following selection criteria. We selected randomly:

- 133 (100%) students in new schools with 3 or more traced baseline students
- 20 (53%) students in new schools with 2 traced baseline students (randomly selected 10 schools)
- 20 (26%) students in new schools with 1 traced baseline student (randomly selected 20 schools)

At each stage of this sampling process, we assigned weights to the students based on their specific probability of being selected into the sample. Then, these individual weights were multiplied with each other and inverted to assign the sampling probability weights for our dataset sample. We then ran the analysis using survey-weighted estimates to control as much as possible for the sampling bias that the process described above could have introduced.

Analysis of Attrition

From among those students randomly sampled and traced for endline, those students we could not locate on the field constitute attrition in this endline study. Out of the total endline sample of 302 students, Laterite interviewed 219 adolescents. 83 adolescents could not be interviewed for the following reasons:

- 3 students moved outside the country (Malawi, Uganda and DRC);
- 16 students dropped out of school and are living outside targeted areas;
- 36 students moved to schools that were included in the approval applications;
- 28 students could not be located.

In order to determine whether this attrition was random or not, the baseline adolescent dataset was subset into two groups: one for students that were sampled and interviewed at endline, and another for those students who were sampled for endline but could not be found on the field (attrition).

The two sub-samples were then compared on their responses at baseline on a number of outcome and indicator variables. Although the attrition group was significantly ($p < 0.05$) more likely to be half a year older than the interviewed group, there was found to be no other meaningful statistically significant differences between the two groups at baseline.

Annex 2: Tables & Figures

Table A2.1: Key Indicators - **BEE** Program Sample ONLY. All statistics are weighted.

Variable of interest	Baseline (N)	Endline (N)	varname
Retention, completion and transition rates among cohort students.			
Proportion of students that have dropped out	0%	16.6% (N=219)	still_in_school
Proportion of students that have dropped out and re-enrolled	7.2% (N=218)	11.2% (N=217)	h10
Proportion of students that have had to repeat a class	58.5% (N=219)	73.3% (N=218)	h1
Proportion of students who have been absent from class in the past month	29.9% (N=219)	29.3% (N=172)	h4
Student knowledge of financial management and business practices.			
Mean score on financial literacy quiz	10.8 (N=219)	9.2 (N=219)	finlit_score
Amount of savings and use of savings.			
Proportion of students that have saved money in the past 12 months	38.2% (N=218)	76% (N=219)	e2
Changes in perceptions of leadership.			
Mean score on leadership abilities index	2.56 (N=219)	2.62 (N=219)	g4thrug24mean
Changes in student perceptions of gender equality.			
Score to the question - At home, both boys and girls should ask permission to go play with their friends. (1- Disagree Strongly to 4- Agree Strongly)	3.92 (N=219)	3.94 (N=219)	b1c
Pregnancy rate among cohort students.			

Proportion of female students who have experienced a pregnancy	1.3% (N=123)	1.8% (N=122)	c2i
Changes in student attitudes and practices toward sexual health and gender-based violence.			
Proportion students who report being able to address sexual health issues and make decisions. (% that agreed with at least 3/5 of the statements)	91.3% (N=218)	96.2% (N=219)	c5p - c5u
Proportion of students who are sexually active	3.7% (N=219)	9% (N=219)	c2a
Proportion of students who used a condom or other contraceptive method during their last sexual encounter	17.6% (N=10)	20.6% (N=22)	c2c
Proportion of students who would use a condom if they had sex before marriage	93.6% (N=207)	98.8% (N=195)	c2f
Proportion of students who know how and where to access sexual and reproductive health services. (Mean Score 1-4)	3.57 (N=219)	3.74 (N=219)	c3a -c3g
Mean sexual health knowledge score	8.03 (N=219)	8.42 (N=219)	c5a - c5j
Students with knowledge of GBV reporting mechanisms. (Mean Score: 1=Yes & 2= No)	1.61 (N=219)	1.2 (N=219)	c4e1 - c4e5

Table A2.2: Key Indicators - Full Sample (**BEE & SS4G**). All statistics are weighted.

Variable of interest	Baseline (N)	Endline (N)	varname
Retention, completion and transition rates among cohort students.			
Proportion of students that have dropped out	0%	18.3% (N=454)	still_in_school
Proportion of students that have dropped out and re-enrolled	8.1% (N=453)	12.8% (N=449)	h10
Proportion of students that have had to repeat a class	59.4% (N=454)	74.5% (N=452)	h1
Proportion of students who have been absent from class in	29.6%	33.3%	h4

the past month	(N=454)	(N=357)	
Student knowledge of financial management and business practices.			
Mean score on financial literacy quiz	10.7 (N=454)	9.23 (N=454)	finlit_score
Amount of savings and use of savings.			
Proportion of students that have saved money in the past 12 months	37.2% (N=452)	72.8% (N=454)	e2
Changes in perceptions of leadership.			
Mean score on leadership abilities index	2.57 (N=452)	2.64 (N=454)	g4thrug24mean
Changes in student perceptions of gender equality.			
Score to the question - At home, both boys and girls should ask permission to go play with their friends. (1- Disagree Strongly to 4- Agree Strongly)	3.93 (N=454)	3.93 (N=454)	b1c
Pregnancy rate among cohort students.			
Proportion of female students who have experienced a pregnancy	2.7% (N=243)	1.6% (N=241)	c2i
Changes in student attitudes and practices toward sexual health and gender-based violence.			
Proportion students who report being able to address sexual health issues and make decisions. (% that agreed with at least ⅔ of the statements)	93.9% (N=454)	94.8% (N=454)	c5p - c5u
Proportion of students who are sexually active	3.38% (N=454)	10% (N=454)	c2a
Proportion of students who used a condom or other contraceptive method during their last sexual encounter	24.4% (N=19)	35.2% (N=43)	c2c
Proportion of students who would use a condom if they had sex before marriage	95.2% (N=428)	98.9% (N=409)	c2f
Proportion of students who know how and where to access sexual and reproductive health services. (Mean Score 1-4)	3.66 (N=442)	3.71 (N=446)	c3a - c3g

(Note: Dropped observations where at least one variable is missing or unanswered)			
Mean sexual health knowledge score	8.18 (N=454)	8.31 (N=451)	c5a - c5j
Students with knowledge of GBV reporting mechanisms. (Mean Score: 1=Yes & 2= No)	1.62 (N=454)	1.25 (N=219)	c4e1 - c4e5

Table A2.3: Questions in the Youth Leadership Index (YLI)

Variable Name	Question Label
G4	G4. I like to try new activities that I know how to do.
G5	G5. My friends ask me for advice.
G6	G6. I recognize when people have different skills to contribute to a task.
G7	G7. I am comfortable when my teacher asks me to answer a question.
G8	G8. I contribute ideas to discussions at home even if they are different from others' ideas.
G9	G9. I ask questions at school when I do not understand something.
G10	G10. I can describe my thoughts to others
G11	G11. The things I do set a good example for my peers.
G12	G12. I consider possible outcomes of my decisions before making them.
G13	G13. I accept responsibility for the outcome of my decisions.
G14	G14. I recognize when choices I make today can affect my life in the future.
G15	G15. I can show what is important to me with my actions.
G16	G16. If someone does not understand me, I try to find a different way of saying what is on my mind.
G17	G17. I encourage others to join together to help my community.
G18	G18. I cooperate with others to get things done at home.
G19	G19. If someone treats me unfairly at school, I am comfortable telling an adult.
G20	G20. I am willing to work hard to achieve my dreams.
G21	G21. I am better able to finish a task when I plan ahead.
G22	G22. When I have the opportunity, I can organize my peers to do an activity.
G23	G23. I am interested in being a leader.

G24	G24. I try to understand the cause of a problem before trying to solve it.
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Table A2.4: Statements on SRH – Adolescent Survey

SRH Statement	Correct Answer
C5a. A girl can get pregnant the first time she has sex.	True
C5b. Condoms can be used more than once.	False
C5c. If used properly condoms can prevent against pregnancy.	True
C5d. If used properly condoms can prevent against HIV transmission.	True
C5e. A person who looks strong & health can have HIV/AIDs.	True
C5f. A person can get HIV/AIDs through mosquito, flea or bedbug bite.	False
C5g. A person can get HIV/AIDs through sharing food with a person with HIV/AIDs.	False
C5h. A person can get HIV/AIDs by touching a person with AIDs.	False
C5i. Sticking to one sexual monogamous uninfected partner reduces the risk of HIV infection.	True
C5j. Abstaining from sex prevents HIV infection.	True

Figure A2.1 Comparison of weighted mean YLI scores between genders.

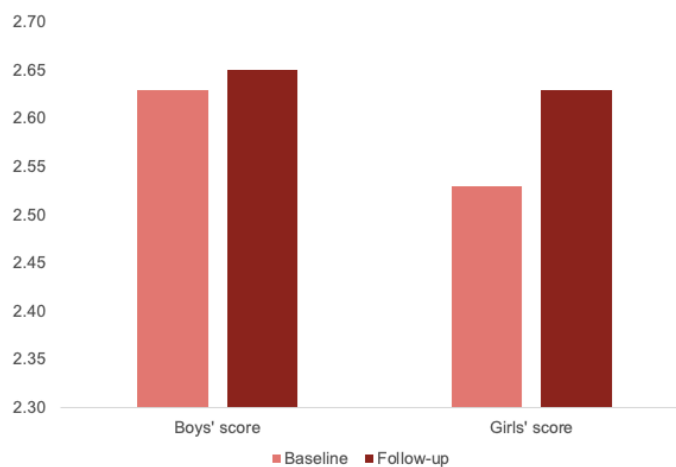


Figure A2.2 Proportion of boys and girls occupying leadership positions.

