Pre-Analysis Plan
CHOICES: Evaluation of Interventions for Young Adolescents and their Parents to Transform Gender Norms in Somalia

Niklas Buehren, Sreelakshmi Papineni and Munshi Sulaiman*

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Abstract

This document pre-specifies the analysis plan for the randomized controlled trial (RCT) evaluation of CHOICES: gender norms training for young adolescents (girls and boys 10-14years) in Somalia. CHOICES is a training program implemented by Save the Children that aims to change adolescents' attitudes and practices around gender biases, and thereby influence social norms. The impact evaluation will study the effect of the CHOICES program on adolescents, as well as the marginal impact of Save the Children's Engaging Men and Boys (EMB) sessions that involved training the parents of CHOICES adolescents. Baseline data collection and randomization were completed in June 2018, and the midline survey was completed between February 2019 and October 2019. The endline survey data collection and lab-in-the-field experimental games is planned to begin in October 2020. This plan outlines the hypotheses to be tested and specifications to be used in the analysis. The research team had not accessed any of the endline and games data at the time this document was finalized.

*Buehren (nbuehren@worldbank.org) and Papineni (spapineni@worldbank.org) are from the World Bank. Sulaiman (munshi.sulaiman@brac.net) is from BRAC International. Rajdev Brar (rbrar@worldbank.org) at the World Bank to provide research assistance and Yahya Abdillahi (yahya.abdillahi@savethechildren.org) at Save the Children to provide field assistance.

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1 Introduction

The CHOICES training program is a component of Save the Children's CHANGES (Challenging Harmful Attitudes and Norms for Gender Equality and Empowerment) program in Somalia.[1] CHANGES is a multi-component community project that has the overall goal of empowering women and girls, thereby decreasing gender inequalities and reducing harmful practices, especially female genital mutilation (FGM) and child, early and forced child marriage (CEFM). It is implemented in 13 districts in Somalia and covers all of the country's major regions.

This impact evaluation examines the effects of providing CHOICES training to adolescents (girls and boys ages 10-14 years) as well as the marginal effect of sensitizing parents through Engaging Men and Boys (EMB) sessions. CHOICES aims to encourage the development of positive, mutually-respectful gender attitudes and behaviors among adolescents and work towards greater gender equality in the home.[2] In the CHOICES curriculum, adolescents participate in ten 2-hour sessions over three months where they are engaged in interactive, developmentally-appropriate, exploratory activities involving dialogue about their notions of respect, communication, fairness and their dreams for the future. The goal of the EMB training is to promote gender equality by engaging men and women in community discussions on various topics, such as gender norms, fatherhood, violence, and child marriage.[3]

The pre-analysis plan is outlined as follows: Section 2 briefly states the motivation for the study, Section 3 outlines the research questions of interest and the hypotheses to be tested, Section 4 describes the sources of data to be used for analyses, and Section 5 covers the study's sample and study design. Section 6 outlines the empirical strategy that will be used to analyze data, and Section 7 describes the outcomes of interest.

2 Motivation of the study

Somalia was rated as the fourth worst country in the world on the UNDP's Global Gender Inequality Index in 2012, scoring 0.776 (where one denotes complete inequality). Women and girls in Somalia are subjected to systematic discrimination and exclusion in various spheres of life. Due to deeply entrenched traditional views, patriarchal, religious and cultural practices persist, including: FGM, son-preference, polygamy, wife inheritance, and CEFM. Questioning well-established gender-related attitudes and behaviors is particularly difficult due to the prevailing culture that supports more restrictive gender roles for females. The situation of Somali woman and girls is especially dire and presents concerns for their fair treatment, access to justice, and overall human rights.

This impact evaluation will test the effectiveness of CHOICES within a highly conservative, traditional society such as Somalia and understand the ways in which it can transform gender attitudes and

[1] CHANGES in Somalia is a project supported by the UK Department for International Development (DfID) and Norad under the Social Norm and Participation (SNaP) program. The CHANGES program is implemented by a consortium led by Save the Children in partnership with Care International and International Rescue Committee (IRC).

[2] The CHOICES training was developed by Save the Children, and the curriculum has since been adapted for over 10 countries as diverse as Egypt, Bangladesh, and Bolivia. The CHOICES model has also been strengthened with complementary activities which expand the spheres of influence into the families and wider communities (programs called VOICES and PROMISES). For a full description of modules for the CHOICES intervention, refer to Appendix C.

[3] For a full description of modules for the EMB intervention, refer to Appendix C.

norms. An important contribution of this research for the CHOICES programming will be to assess if the effects persist beyond an immediate effect after the training. In addition, a better understanding of how the CHOICES training combines with the EMB intervention will help enlighten how the project can better achieve its longer-run goals of a reduction in FGM and CEFM rates. The evaluation of the CHOICES program will help strengthen the evidence base on interventions that tackle social norms which are perceived as decisive markers of future labor market and reproductive health decisions for women and thus play a critical role in empowering women to reach their full human potential.

3 Research questions and hypotheses

3.1 Research questions

The research questions we expect to be able to answer in the time-frame of the evaluation are:

- How does taking part in CHOICES influence gender-equitable attitudes and behaviors for very young adolescents (10-14 years of age at the time of the start of the intervention)?
- Does any shift in attitudes occur across all or part of the following domains: education, marriage, aspirations, division of chores, and relationships?
- Do the effects of the CHOICES program on gender attitudes differ for boys and girls?
- Do any impacts on attitudes or behaviors persist at least one year after the training ends?
- How does the participation of adult family members in EMB sessions influence the effects of CHOICES training on attitudes and behavior of very young adolescents?
- What are the changes in attitudes towards gender equality, FGM and CEFM among adult primary caregivers who attend the EMB training?

The study will focus on identifying the level of awareness, attitudes, perceptions and behavior of the study participants for the following areas:

- Discrimination against girls, based on gender: including mobility, ability to express opinions, access to education, access to work, ability to choose a spouse
- Social image of boys: change in attitudes around what it means to be a boy in terms of not being able to show emotions, not being able to help girls, gendered division of labor
- Violence: attitudes towards gender-based violence
- Social norms to cover a range of domains including: early marriage, FGM, women working outside of the household, and violence against women
- Education: a girl's right to an education and achieve progress
- Social support: brother's helping his sister to achieve her dreams, caring about his sister's welfare, loving and honoring her the same way he honors his mother

The behavior of adolescents could change because of a shift in their view on gender equality or if they have better skills to negotiate and communicate with others. Some of the behavioral changes we expect to see in the evaluation time-frame would be: expression of affection for sisters and boy's support to their sisters, and time spent on various activities considered feminine/masculine.

In addition, we supplement measures from the quantitative survey with a lab-in-the-field experiment that intends to measure real-time behavioral decisions made by adolescent study participants through

the use of experimental games. The games will measure social conformity, capabilities, risk aversion, and competitiveness of study participants. These experiments will supplement quantitative data and help to be confirm whether results are driven by social desirability bias rather than actual changes in attitudes. The games will be played in groups that are composed of either all boys, all girls, or mixed gender groups.[4]. Individual responses from session participants will be collected in private by enumerators. Sweets will be offered as rewards to the games to help elicit a child's true preference as best as possible.

- Social conformity: What impact does gender have on the likelihood to conform? Are girls more likely to conform if the other team members are all girls? Are boys more likely to conform if the other team members are boys?
- Confidence in own capabilities: Do girls and/or boys underestimate their own capabilities in a ball throwing exercise? Does being in a mixed group versus single gender group effect estimation of capabilities for girls and/or boys?
- Risk raking: Are girls less/more likely to choose a riskier option than boys?
- Leadership and deputy: Are girls less/more likely to be chosen to lead than boys? Does the gender of the selected leader and deputy impact conformity of other team members of the same gender and/or of the opposite gender?
- Willingness to compete : Are girls less/more willing to compete than boys? Does providing knowledge of the gender of the competitor change their willingness to compete?
- CHOICES treatment: Does participation in the CHOICES training have any influence on any of the above outcomes?

3.2 Hypotheses

Hypothesis 1a: CHOICES training will shift adolescents' attitudes on gender from discriminatory (against females) towards more egalitarian views across a number of domains: education, women's role, marriage, masculinity and decision-making in the household.
Hypothesis 1b: EMB sessions will shift adults' attitudes on gender from discriminatory (against females) towards more egalitarian views.
Hypothesis 2: CHOICES training will raise girls' aspirations in professional work, education, marriage, and fertility.
We hypothesize that the CHOICES training will increase the likelihood of girls aspiring to pursue professional work, attain higher levels of education, marry at a later age, and have fewer children.
Hypothesis 3a: CHOICES training will increase adolescents' gender-equitable behavior.
We will specifically examine changes across the sharing of household chores, allocation of time for various activities, educational attainment, marital status, fertility status, and FGM status.
Hypothesis 3b: CHOICES adolescents who also have an adult in their household who attends EMB sessions will experience a marginally positive impact on their gender-equitable behaviors relative to CHOICES adolescents who did not have an adult attend EMB sessions.
Hypothesis 4: CHOICES training will shift perceived social norms of marriage and women working outside the household.

[4]Details on the games experiments are in Appendix A and details on group gender composition are in Figure 2 in Appendix A.

4 Data sources

The main source of data are quantitative surveys administered to adolescents and adults in their household. These surveys will be completed at three points in time: one baseline, two follow-up surveys (midline and endline). Data will be collected in private from each respondent and informed consent from respondents and guardians will be collected before the survey begins.[5] We will use administrative data from the program implementer's monitoring and evaluation activities to serve as a robustness check for program participation. We will also use the lab-in-the-field experimental games to supplement the endline data.

4.1 Quantitative survey instruments

The quantitative surveys include a child module, adult module and household module. The adolescents are administered the child module and an adult respondent (typically the child's mother and/or father) answers the adult and household modules.

In the baseline survey, we collected data on the personal characteristics of the adolescents (demographics, education, health), but the main focus is on their attitudes towards gender norms (particularly on the role of women and in the distribution of household tasks), and psycho-social well-being and aspirations. We also collected data on the quality of the relationship with their parents, time use, household chores, and opinions on marriage. Adults were asked about their own marriage history, decision-making and attitude towards intimate partner violence (IPV), gender perceptions (gender attitudes and gender roles), behavioral characteristics (conformism, risk preferences), aspirations for their children, and opinions on FGM and early marriage. The baseline household module included: a household listing, demographics, food security, household assets and consumption module.

The first follow-up survey (midline) was conducted when approximately half of those assigned to CHOICES training had completed training. Similar to the baseline, the first follow-up survey included a child, adult, and household module. The questionnaire was similar to the baseline questionnaire, but the following were added to the child module: questions on perception of community's emphasis on certain traits (such as being a leader, talking about feelings), self-reported participation in the CHOICES training, individual beliefs and community norms about a women working, and a module to capture social desirability bias. The SDQ's 3-point Likert scale was changed to agree/disagree options to minimize the number of times scales were changed as we are working with adolescents. The adult module included additional questions on time use, household chores, norms, and a module to capture social desirability bias.

The second follow-up survey (endline) will be conducted after CHOICES training and EMB sessions have been completed. Similar to the baseline and first follow-up survey, the second follow-up will have child, adult, and household modules and capture. At the time of the second follow-up, we expect that some of the older adolescents may have married, had children, and girls may have started their menstrual cycle. Thus, we added questions on marital, fertility, and menstruation status in the child module. For both adolescents and adults, we include generalized self-efficacy questions in the second follow-up. In the adult module, we include questions on expectations of fertility, marriage,

[5]The survey tools were transformed into a mobile compatible version using Open Data Kit (ODK) to enable enumeration teams to collect data more efficiently and effectively.

and FGM plus self-reported participation in EMB or other CHANGES training programs in the adult module.

The coronavirus (COVID-19) pandemic reached Somalia in March 2020 and the country went into lockdown for a few months. In July 2020 most of the government restrictions in Somalia had been lifted and schools reopened in August 2020. Questions on the impact on the COVID-19 pandemic have been added to the child and adult modules in the second follow-up. Due to media reports of a rise in FGM and child marriage in Somalia during the government-enforced lockdown, we also include questions of the timing of FGM and marriage (UNFPA Somalia, 2020).

4.2 Lab-in-the-field experimental games

Lab-in-the-field experiments will be conducted to supplement survey data. Two games sessions will be held per community in the study sample. Each games session will consist of 20 adolescents (10 girls and 10 boys) and the session will be conducted at a similar time to the second follow-up survey data collection. Each session will have four teams, each with different gender compositions (all boys, all girls, majority boys, majority girls), and teams will include both CHOICES control group and treatment group participants in each session. The games will first conduct a pre-game private interview where all adolescents are asked to choose if they agree or disagree with 3 gender attitudes statements and play two line-match games in private. In order to measure social conformity, we will conduct a "line-up statement" game in teams based on the psychologist Asch's conformity line game, which is used as a benchmark for social conformity measures (Asch, 1951).[6]. In order to measure capabilities, risk taking behaviour and competitiveness we utilize a series of ball bucket throw games. Full details on the lab-in-the-field experiments are in Appendix A.

5 Sample and Study Design

This study uses a randomized control trial (RCT) design to measure impacts of the CHOICES and EMB program, and to explore the pathways of the observed changes. Figure 1 summarizes the impact evaluation design. We completed a census activity in order to establish a sampling frame for the project and estimate program take-up.[7] A baseline survey was conducted on a random sample of adolescents selected from eligible households listed in the census. Households could be randomly assigned into one of the following three groups:

- T1: Children in household invited to participate in CHOICES training only
- T2: Children in household invited to participate in CHOICES training + adult household members invited to participate in EMB sessions
- C: Control group: children are not invited to CHOICES training + no household member invited to participate in EMB sessions

[6]Note that unlike the classic Asch experiment, we do not have primed subjects (i.e. actors) but instead have 2 lines of equal size where there is a 50-50 chance of picking one of the correct answers. We will measure if participants change their pre-game answers to a set of attitude questions to ones that are more conformist to their group. We will only be able to speculate on the type of influence that might be occurring (e.g. normative social influence [altering your behavior to fit in with the group] or informational social influence [change your behavior as you assume others are better informed] or perceptual error [really believed the group gave the correct answer]

[7]Full details of the sampling strategy are in Appendix D.

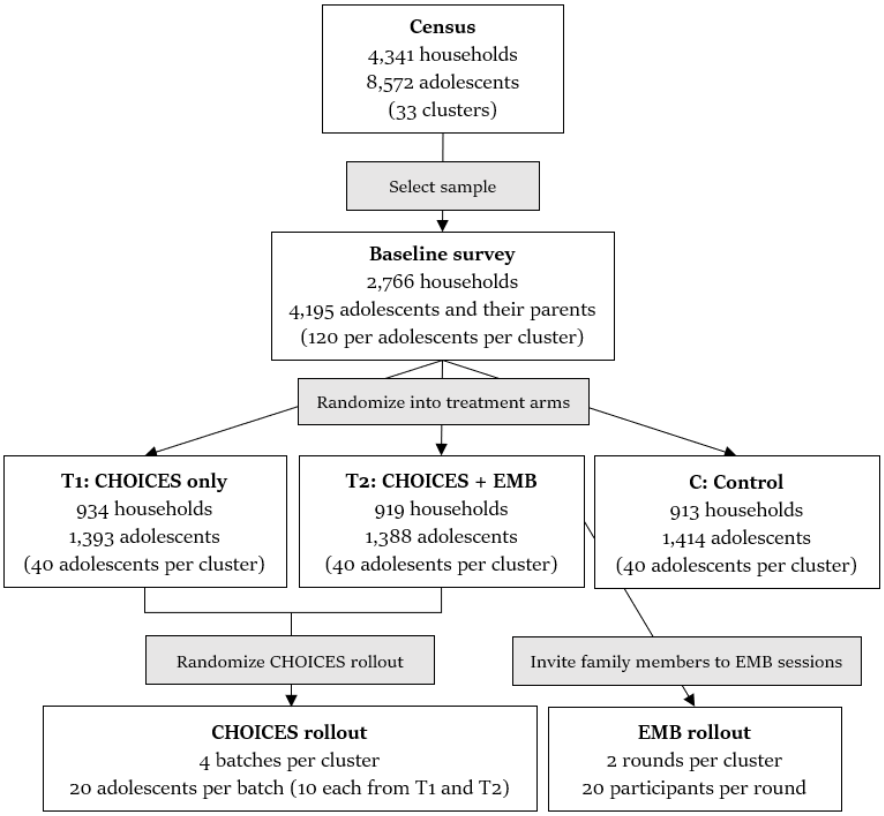

Figure 1: Study design

In a census listing, data from 8,572 children were collected across the six study districts in Somaliland and Puntland. For the study 4,195 adolescents aged 10-14 years old from 2,766 households were then randomly selected to be part of the study based on statistical power calculations. The randomization was completed at the household level which resulted in 2,781 adolescents being randomly assigned to participate in CHOICES discussions: 1,393 of these adolescents were only assigned to the CHOICES intervention (T1), and 1,388 of these adolescents were assigned to the CHOICES intervention *and* their parents were invited to participate in the EMB sessions. Finally, 1,414 adolescents were not assigned to receive the CHOICES interventions and therefore form the control group. Baseline data was completed from 3,237 adolescent across 2,393 households.

6 Empirical strategy for CHOICES

6.1 Econometric specification: Main impact evaluation

Randomization of the CHOICES treatment across households allows estimation of the overall effect of the program by comparing outcomes for adolescents in treatment and control households. Our analysis will use an analysis of covariance (ANCOVA) estimator to assess the impact of the CHOICES

training and any marginal impacts of EMB on outcomes of interest for which we have both baseline and follow-up data.[8] We estimate the treatment impact for adolescents in the following:

$$Y_{1i} = \beta_0 + \beta_1 CHOICES_i + \beta_2 CHOICESEMB_i + \beta_3 Y_{0i} + \beta_4 X'_{0i} + \lambda_d + \varepsilon_i \quad (1)$$

Y_{1i} is the outcome variable for the adolescent respondent i measured post-treatment, and Y_{0i} is the baseline value of the outcome variable. $CHOICES$ is a treatment dummy for being randomly assigned to receive the CHOICES training, and $CHOICESEMB$ is a treatment dummy for being randomly assigned to receive the CHOICES training and an adult in their household to receive the EMB training. β_1 and β_2 will measure the treatment effects relative to the control group (i.e. those who were not assigned to receive CHOICES training). X'_{0i} is a vector of baseline controls, λ_d are district-level fixed effects, and ε_i is the error term. Standard errors are clustered at the community level. We will also report the estimates and significance for $\beta_1 = \beta_2$ to test the null hypothesis that there is no difference in the effect of the $CHOICES$ and $CHOICESEMB$.

For those outcome variables that were only collected post-treatment during follow-up surveys, such as current marital and fertility status of adolescents, we will rely on the random assignment of treatment status and use ordinary least squares (OLS) estimation as outlined in equation 2 to compare outcomes for treatment and control groups.

$$Y_{1i} = \beta_0 + \beta_1 CHOICES_i + \beta_2 CHOICESEMB_i + \beta_3 X'_{0i} + \lambda_d + \varepsilon_i \quad (2)$$

Equation 1 and equation 2 will provide the intention-to-treat (ITT) estimates, which is the effect of being assigned to attend the CHOICES training sessions among the sample.

Baseline controls: We will include a set of baseline characteristics that are unbalanced across treatment and control groups at baseline and a set of demographic variables. The list below has possible control variables:

- Household head male
- Presence of adult with formal education in household
- Household type
- Multiple adolescents in the household who could have received the program
- Demographic characteristics of the adolescent

Additionally, we will use a social desirability bias index[9] to see if there are differential responses by enumerator characteristics and respondent characteristics on the likelihood of responding with a socially desirable answer (e.g. if male adolescents are more likely to respond with more socially desirable responses to female enumerators). If this is the case, we will include enumerator gender fixed effects in the regression.

[8] The ANCOVA estimator typically has more statistical power than a difference-in-differences estimator (McKenzie, 2012).

[9] We use the 13-item social desirability scale, which Reynolds (1982) shows is a viable substitute for the 33-item Marlowe-Crowne scale

6.2 Heterogeneous effects

For the heterogeneity analysis we will look at the distribution of effects for different subgroups. We aim to examine whether some individuals exhibit different outcomes to the CHOICES training and/or EMB sessions and the mechanism of possible differences in impacts. We want to see if CHOICES impacts children's gender perceptions and behaviors, whether EMB impacts adults' gender perceptions and behaviors, and the interaction between adult and adolescent's outcomes. For example, we want to see if having an adult in your household attend EMB has any marginal impact on a child's ability to make behavioral changes after attending CHOICES.

We will estimate heterogeneous treatment effects by interacting treatment status with the outcome of interest in equation 1 (for outcome variables collected at both baseline and follow-up) and equation 2 (for outcome variables collected only at follow-up). To test interaction effect, we will utilize multiple variable regression analyses and include the product of centered variables as interaction term (Aiken West, 1991). We will predominantly include baseline variables as moderators. If baseline variables are not available to test moderating effects of interest, we will need to argue theoretically and show statistically that the moderator is stable over time.

For analysis on adolescent-level outcomes, we will analyze heterogeneous effects along a number of dimensions:

- Adolescent's gender
- Adolescent's age categories
- Adolescent has siblings of same and opposite gender and birth order ranking
- Parental gender attitudes at baseline
- Relationship with parents at baseline
- Adolescent's circle of influence (size of friend circle)
- Adolescent's schooling was impacted by COVID-19 pandemic
- Adolescent's locus of control
- Adult's Conformity Index at baseline

Similar to the adolescent-level outcomes, for adult-level outcomes, we are interested in analyzing the heterogeneous effects by adult's gender, decision-making power of the female and wealth status at baseline.

6.3 Accounting for multiple inference

Our survey instrument included several questions related to a single behavior or dimension, therefore we account for multiple hypothesis testing in the following ways:

1. Index: We aggregate the primary outcome variable into an index or composite variable. We use outcome variable indices for several outcome variables including the main Gender Equitable Index. These indices combine multiple measures to reduce the total number of tests conducted. In general, if variables have comparable scales, we can take a simple average. Alternatively, we can compute the average standardized effects where we divide each variable by its standard deviation and take the average of these normalized variables (Kling et al., 2007) or else, normalize the values and do a principal component analysis with them to construct the index (Anderson, 2008).

2. Q-values: We can adjust the statistical test for each hypothesis. One of the ways to do this is to follow the approach proposed by Benjamini and Hochberg (1995) who proposed a method for controlling the false discovery rate (FDR). The B-H Q-values are the name given to the adjusted p-values found using an optimized FDR approach.

6.4 Threat to internal validity: Partial compliance

In addition to estimating the ITT effect measured in equation 1 and equation 2, we will also estimate the treatment-on-the-treated (TOT) effect using instrumental variable (IV) estimation to estimate the local average treatment effect (LATE). The LATE can be interpreted as the average treatment effect (ATE) for compliers (i.e. those assigned to the treatment group who actually attend CHOICES training and those in the control group who do not receive treatment). We will instrument attendance in CHOICES training with the random assignment to the treatment groups. This estimate will enable us to control for non-compliance with treatment assignment as not everyone who is offered to attend the CHOICES training will attend.

$$Y_{1i} = \beta_0 + \beta_1 AttendedCHOICES_i + \beta_2 AttendedCHOICESEMB_i + \beta_3 X'_{0i} + \lambda_d + \varepsilon_i \quad (3)$$

$AttendedCHOICES$ and $AttendedCHOICESEMB$ are dummy variables indicating whether the adolescent attended any CHOICES training sessions, respectively. All other variables are the same as in equation 1, with standard errors clustered at the community level. We will utilize data from the implementing partner's training attendance lists for this variable. We use the assignment to training as an instrument for attending the CHOICES training session. The first stage IV regressions are:

$$AttendedCHOICES_i = \gamma_0 + \gamma_1 AssignedCHOICES_i + \gamma_3 X'_{0i} + \lambda_d + \varepsilon_i \quad (4)$$

$$AttendedCHOICESEMB_i = \gamma_0 + \gamma_1 AssignedCHOICESEMB_i + \gamma_3 X'_{0i} + \lambda_d + \varepsilon_i \quad (5)$$

We will use the predicted values from these regressions in the second stage IV regression, which is specified in equation 6.

$$Y_{1i} = \beta_0 + \beta_1 Attended\widehat{CHOICES}_i + \beta_2 Attended\widehat{CHOICESEMB}_i + \beta_3 X'_{0i} + \lambda_d + \varepsilon_i \quad (6)$$

The LATE is only valid under the assumption that the very act of being invited to CHOICES training has no impact on attitudes or behaviours even if you do not end up attending the training. Since for most adolescents this assumption is likely to hold true we will estimate the LATE in addition to the ITT.

6.5 Threat to internal validity: Survey attrition

We investigate attrition, or the failure to collect data for individuals who were part of the original sample (reasons could include the individual cannot be found or refuses to participate), to see if may generate bias and/or affect the study's statistical power. If attrition is random, it does not introduce bias but it affects power. If attrition is non-random (i.e. correlated with treatment), it may generate a bias. We will test whether survey attrition is related to treatment status using the following equation:

$$A_i = \beta_0 + \beta_1 Treatment_i + \beta_2 X'_{0i} + \lambda_d + \varepsilon_i \tag{7}$$

A_i represents whether individual i attrited from the study, $Treatment$ is a dummy variable indicating assignment to CHOICES training. Thus, β_1 will reflect whether assignment to treatment significantly affects the likelihood of an individual attriting. X'_{0i} is the standard set of baseline controls. λ_d are district-level fixed effects, and ε_i is the error term. Standard errors will be clustered at the community level.

Additionally, we will test for the joint effect of the coefficient on the interactions to see if attrition is differential across treatment arms. If treatment status does not affect survey attrition at the 5 percent significance level, we will not adjust the estimates for attrition. If treatment status does have a statistically significant effect on survey attrition, we will test the robustness of our results using Lee bounds (Lee, 2009) and Inverse Probability Weighting which, in effect, re-weights the selected sample in order to make it representative of the population.

6.6 Missing values

No imputation for missing data from item non-response at follow-up will be performed. We will check whether item non-response is correlated with treatment status following the same procedures as for survey attrition, and if it is, construct bounds for our treatment estimates that are robust to this.

6.7 Outliers

For variables measured as a value, such as household income, we will use winsorized versions of these variables at the 99th percentile. Where appropriate, we will apply the inverse hyperbolic sine (IHS) transformation to variables measured as a value.

6.8 Empirical strategy: Lab-in-the-field experimental games

We will analyze the individual-level data collected during the lab-in-the-field experiments using OLS estimation as outlined in equation 8.

$$Y_i = \beta_0 + \beta_1 CHOICES_i + \beta_2 Female_i + \beta_3 CHOICES * Female_i + \beta_4 X'_{0i} + \lambda_S + \varepsilon_i \quad (8)$$

Y_i is the outcome variable of interest, β_1 will measure the treatment effect of CHOICES assignment as compared to the control group for boys and $\beta_2 + \beta_3$ will measure the marginal effect for girls. X'_{0i} is a vector of baseline controls, λ_s are district-level fixed effects, and ε_i is the error term. Standard errors are clustered at the team level.[10] We will include controls for demographic characteristics and 3 dummy variables for the mixed gender and single gender group team compositions in the regressions.

7 Outcomes

The primary outcomes this study will look at are:

1. Gender attitudes
2. Individual belief vs. perceived community norm on: marriage, women working outside the household
3. Aspirations: education, marriage, work, fertility
4. Behaviors: Time use, household chores, and current marital, fertility, and educational status
5. Relationship quality with parents and siblings
6. Socioemotional skills
7. Games outcomes: Conformity, risk aversion, competitiveness, and identity of leader/deputy

Below we will briefly discuss the primary outcomes. The full set of outcomes, along with descriptions and details on construction, are in Appendix E.

7.1 Gender attitudes

In order to investigate whether CHOICES/EMB had an impact on gender attitudes of adolescents and adults, we will use a Gender Equitable Index and associated sub-indices. Adolescents and adults will be asked if they agree or disagree with 14 statements – some gender-regressive and some gender-progressive. The Gender Equitable Index reflects the number of gender-progress statements the respondent agrees with and ranges from 0 (representing discriminatory gender attitudes) to 1 (representing egalitarian gender attitudes). Using the these statements, we will also create sub-indices on attitudes towards masculinity, education, and women's role.

For both adolescents and adults, we will also look at attitudes towards education's impact on marital prospects and attitudes towards decision-making between spouses. Finally, for adults, we will examine attitudes towards adolescent's education based on child's age/gender, and attitudes towards

[10] There are 4 types of teams: All girls, all boys, mixed with majority girls, and mixed with majority boys

education's impact on bride price. Descriptions and details on the construction of each outcome variable are in Section E.1 (and in Section E.2 for outcomes only measured for adults).

Note that additional attitudes (such as attitudes towards women working outside the home and towards marriage) are included in Section 7.2 as they are compared with perceived social norm.

7.2 Individual beliefs vs. Perceived social norms

We will compare individual's beliefs with the perceived social norm in the community across a number of domains, namely: marriage, women working outside of the household, violence against women, and FGM. Details on construction of variables are in Appendix E.3 (and Appendix E.4 for outcomes only measured for adults).

Marriage: We will compare the adolescent's opinion on whether the suitable age for a girl is below 18years of age with the adolescent's perception of the community norm (number of families in the community, of 10, in the community that will marry their daughters before 18years of age). We will also do this comparison for adults.

We will also compare the adolescent's opinion on whether or not a girl can continue her education after marriage with the adolescent's perception of the community norm (number of families in the community, out of 10, that will tell a 15year old girl to get married if a) she is in school, and b) if she is not in school.

Women working outside of the household: For both adolescents and adults, we will compare the respondent's opinion on whether women can go out of the household for work with their perception on the community's acceptability of the same (number of people in the community, of 10, who will speak badly about a woman who works outside the home).

Violence against women: We will compare whether adults believe a woman should tolerate violence to keep her family together with adults' perception of the social norm (number of people in the community, of 10, who think a woman should tolerate violence in order to keep her family together). Note that we do not ask this to adolescents due to the sensitive nature of the topic.

FGM: To investigate adults' belief on FGM, we investigate whether female adolescent is circumcised, and if not, whether the adult wants the female adolescent to be circumcised. We will compare this with the adult's perception of the social norm (number of people in the community, of 10, who think it is important for a girl to be circumcised). As above, we do not ask this to adolescents due to the sensitive nature of the topic.

7.3 Aspirations

We will investigate aspirations of adolescents in the following dimensions: education, marriage, work, and fertility. Where applicable, we will also investigation the aspirations adults have on children in these dimensions. Details of outcomes are in Section E.5 (and in Section E.6 for outcomes only measured for adults).

Educational aspirations: We will examine whether adolescents aspire to study up to university and also whether adults aspire for the adolescents to study up to university.

Marital aspirations: We will examine adolescents' ideal age at marriage and unmarried adolescents' expected age of marriage. We will also look at which age adults state they will arrange for the adolescent to be married. Additionally, we will examine whether adult's expect to marry their sons/daughters to families that are wealthier than their own.

Work aspirations: We will examine what adolescents state they want to be in their life, whether they want to work for earning income when they grow up, and what type of work they think they will do when they are 25years old.

Fertility aspirations: We will examine the desired number of children for each adolescent. To gauge gender preference of children, we will also see if adolescents state they will have more children if the desired number of children are all girls.

7.4 Behavior

To investigate whether the CHOICES training and EMB sessions translate into behavioral changes, we will investigate time spent on various tasks by adolescents and household chores they engage in. We will also look at adolescents' current educational status and female adolescents' FGM status. Seeing as some of the adolescents who were aged 10-14years at the start of the program may now be married and may even have children, we will also investigate adolescent's marital and fertility status. The lab-in-the-field experimental games are also designed to capture how the CHOICES intervention might have influenced adolescents' behavior.

Additionally, we will examine potential consequences of the coronavirus pandemic on FGM and child marriage as increases in FGM and child marriage rates due to the lockdown have been reported (The Guardian, 2020). The coronavirus pandemic reached Somalia in March 2020 and the 2nd follow-up survey is scheduled to start in September/October 2020. Plan International reported a dramatic increase in Somalia's FGM rate due to the lockdown. Details on adolescent-level (adult-level) outcomes are in Appendix E.7 (Appendix E.9), and outcomes gauging the impact of COVID-19 are in Appendix E.8.

To investigate whether there are changes in behaviours in completion of household tasks for both adolescents and adults, we will look at: the time spent on various household activities on a typical day in the last week, and whether respondent engaged in various household chores in the past 0-7days.

Educational attainment/status: We are interested in investigating whether adolescents are currently enrolled in school, and, if so, what grade they are currently attending and how many days they attended school in the past week. We also investigate the impact the coronavirus pandemic may have had on educational attainment of adolescents; specifically, if they were enrolled in school before the pandemic started, if their school closed because of the pandemic, whether they participated in learning activities while their schools were closed, and whether their school is still closed. We also investigate whether female children continue going to school while they are menstruating.

Marital status: We investigate adolescents' current marital status. For those who are currently married, we examine the age of the adolescent at the time of marriage, as well as the age of the adolescent's spouse at the time of marriage. For adolescents that are married, we ask adults if the child was married before or after March 2020, and if so, if they always planned to have the child

married at this age (or if they planned to get the child married at a later age but it was easier to do it now because of lockdown due to the coronavirus pandemic).

FGM status: For each female adolescent in the household, we ask adults whether the adolescent is circumcised. If so, we see if she was circumcised after March 2020, who performed the circumcision, and whether the lockdown influenced the timing of the circumcision.

Fertility status and agency: We are interested in whether those adolescents who are in child-bearing age are pregnant or have any children, and if so, how many. For female adolescents who are currently pregnant, we are also interested in asking if they actually wanted to be pregnant at that time. In terms of agency, we are interested in seeing who children state primarily gets to decide how many children they have in their life. Finally, we are interested in seeing whether adolescents state female partners in their marriages is either the sole or joint decision-maker in the decision of how many children the couple will have.

7.5 Relationship quality with parents and siblings

Perception of parents relationship: We will analyze the relationship of adolescents with their mother and with their father. Since this is collected in the child module, it will be the relationship of the adolescent and parents from the perspective of the adolescent. For each adolescent, we will ask 14 statements regarding their relationship with each parent. All statements and details on the construction of this variable are in Appendix E.10.

Pasquali et al. (2012) citing Musitu et al. (2008), state the dimensions of parental affection (responsiveness) and parental control (demandingness) are sufficient in explaining variability of parental behavior in relation to the socialization of the children. These 2 dimensions will allow us to classify perspectives on parents in the 4 following types: authoritative (high control and affection), authoritarian (high control and low affection), uninvolved (low control and low affection), and permissive (low control and high affection) styles (Rothrauff et al., 2009).

Relationship quality with siblings: We will also examine the adolescent's relation with their sibling of the opposite gender by asking if they have let their sibling know that they care for them and whether they have spoken to their parents about their sibling's well-being during the past month. We are particularly interested in seeing if boy adolescents are more likely to let their sisters know they care for them and more likely to discuss their sister's well-being with their parents, but we will examine this for both sibling combinations.

7.6 Socioemotional skills and emotional health

To examine the impact of CHOICES/EMB on socioemotional skills and mental/emotional health, we will look at scores from a modified Strengths and Difficulties Questionnaire (SDQ), Children's Hope Scale (CHS), and the Generalized Self-Efficacy Scale (GES). Further details on the construction of outcome variables are in Appendix E.11.

Strengths and Difficulties Questionnaire: The SDQ is a behavioral screening questionnaire consisting of 25 statements - 10 attributes of which would be described as strengths, 14 as difficulties, and 1 neutral - developed by Goodman (1997).[11] These statements will construct 5 sub-scales: emotional

[11] Note that the SDQ is traditionally asked on a 3-point Likert scale (strongly disagree, disagree, agree). Seeing as

problems, conduct problems, hyperactivity/inattention, peer relationship problems, and pro-social behaviour. The total number of difficulties will also be examined.

Generalized Self-Efficacy Scale: The GSE is a psychometric scale developed by Schwarzer and Jerusalem (1995) that measures respondent's belief that they can cope with difficult situations in life. The GSE scale consists of 10 statements that measure respondents' perceived ability to cope with difficult situations in life and ranges from 10 to 40, with higher scores indicating higher self-efficacy. We will investigate the GSE for both adolescents and adults.

Children's Hope Scale: The CHS is six-item scale developed by Snyder et al. (1997) that measures a child's perception that their goals can be met. We will look at the CHS Total Score, as well as Agency Thinking Score and Pathway Thinking Score. Agency thoughts captures the child's perception on their ability to take action towards a goal, and pathways thoughts shed led on the child's perceived capacity to find a way towards that goal. The CHS Total Score ranges from 0 to 36, with higher scores representing higher hope levels. The Pathway (Agency) Thinking Score ranges from 0 and 18, with higher scores representing higher levels of pathway thinking (agency thinking).

7.7 Outcomes of lab-in-the-field experiment games

From the lab-in-the-field experiment games, we will examine adolescents' social conformity, estimation of individual capabilities, risk aversion, competitiveness, as well as the identity of the leader and deputy chosen by the group. Details on these outcomes are in Appendix A.

7.7.1 Social conformity

The 5 team members will be randomly lined up in a row to sequentially answer 3 gender attitudes statements and 2 line match games. We are interested in the change from the response made in a private one-on-one setting to the response when they are in a public group setting. We will examine whether the CHOICES intervention impacts the likelihood of a person to conform in a group setting. Our hypothesis is that some children are inclined to switch their response in a public setting versus a private setting and the CHOICES training makes them less likely to switch i.e. they are less likely to try to be conformist in a public setting having been assigned to the CHOICES treatment.

Our outcome measure of conformity will include a dummy variable that indicates the adolescent changed their answer in a group setting from what they stated in private (for 3 statements and 2 line games). We analyze the data collected at the individual level whereby we include the change in responses from private to public for the children in the second to fifth position in the row as the outcome variable. We want to see if someone in the 2nd to 5th position changes their opinion from private to public based on the responses of children in the preceding position(s). In the regression we will include an interaction term with the treatment dummy for whether 50 percent or more of the public responses in the preceding positions in the row are the same/different as n's private response. We will control for the position number (2-5) in the regressions. We will test if the CHOICES treatment is more/less likely to change their response based on the mode of the public responses in

we are working with adolescents and want to minimize the number of times scales are changed within the instrument, in the follow-up survey the scale is simply agree/disagree.

the preceding positions and examine whether this is the same for both boys and girls.[12]

As a robustness check we will also examine whether our results are a function of the position you play the game. We analysis conformity by running four separate regressions for each individual position from 2-5 and examine how the results might change depending on how we take the responses of the preceding positions into consideration (for example: n-1, n-mode or n-any). In our main analysis the response of the child in the first position is used only as a control for the 2-5 positions' responses.

Each gender statement and line match game will be analyzed separately since adolescents may be more or less likely to conform in earlier/later statements. For example, perhaps conformity decreases over each statement round (some kids conform in statement 1 and become less likely to conform by later statements), or the opposite could be true that conformity increases over time (herd behaviour) a few conform in the first few statements and by the end, children are all giving the same answers in the group. In the 3 gender attitudes statements we will examine the likelihood of switching private to public response for the child in position 1 and control for the social desirability index collected in the main quantitative survey at endline. Those who change their response in position 1 might be inclined to do so because of social desirability bias reasons, for example by claiming a more gender progressive response to a statement in a group rather than in private or vice versa. Our main measure of willingness to conform in a group will therefore be based on the line match games which should not be subject to social desirability bias.

In the first line match game we will not have any primed subjects (i.e. actors) but instead we will have 2 lines of equal size where there is 50-50 of picking one of the correct answers. Therefore we expect that if an adolescent changes their private answer to one that is more conformist to the group (even if both answers are correct) that is still measured as conformity. The Asch experiments showed that conformity increases when other members of the group are of a higher social status so we will examine whether our measure of conformity changes with the confederates game when the leader and deputy are primed to answer an incorrect answer in a second line match game.

7.7.2 Individual capabilities

Actual capability is measured by a variable 0-5 that counts how many balls were successfully thrown into the bucket during the practice round. To examine beliefs in their own capabilities we will create measures to understand if the adolescent matches, overestimates or underestimates their own capabilities by creating a variable if their guess response is the same, higher or lower to the number of shots successfully made in the practice round. We are interested in whether there is a gender difference and whether the CHOICES intervention influences their assessment of their own capabilities i.e. are they more likely to guess accurately?

7.7.3 Risk aversion

Willingness to take risk is measured by a variable that will be standardized in an index of 1, 2 or 3 depending on which position the adolescent chooses to throw the ball from in the Risk ball bucket throw. The furthest position (position 3) is considered more risk loving and 1 is more risk averse. We will also examine the level of risk taken in relation to the observed capabilities in the previous

[12]For the children in the odd positions the mode will be taken to be when 50 percent or more of the public responses in the preceding positions are the same/different as n's private response.

practice round. We are interested in whether there is a gender difference and whether the CHOICES intervention influences risk taking behavior.

7.7.4 Competitiveness

Willingness to compete is measured by a variable equal to 1 if the adolescent chooses the tournament option and 0 if they choose the piece-rate option. Does willingness to compete change when the gender of their competition is revealed? We will measure this by creating a variable that codes if there is any change from piece-rate to tournament and vice-versa and how that interacts with gender. We will run a multinomial logit regression to examine the different categories of outcomes.

7.7.5 Leader and deputy identity

Our main question is whether CHOICES influences the likelihood that the gender of leader or deputy is female. The outcomes are dummy variables for leader is female equal to 1 and 0 if male; and leader or deputy is female equal to 1 and 0 if male. The gender choice of the leader and deputy will be based on small group level analysis where we restrict the sample only to the mixed gender teams (those teams comprised of both female and male adolescents). When both genders are available in a group what gender does the team choose to lead?

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Appendices

A Lab-in-the-field experimental games

There will be 2 game sessions in each of the 33 clusters in the study sample. For each session, 20 adolescents from the CHOICES impact evaluation sample will be invited to a predetermined site (community center or local school). The session will have 10 boys and 10 girls from a mix of CHOICES, CHOICES+EMB treatment and control groups.[13]

As participants enter the session room, enumerators will validate names from a list of potential participants in order to ensure that boys and girls in the session are study participants. With each team of 5 adolescents assigned one enumerator, there will be a total of 4 enumerators per session.

Team determination round

Adolescents will first be randomly assigned into one of 4 teams (red, yellow, blue, green). There will be 2 sacks named B and G. Sack B contains 5 red balls, 3 green balls and 2 blue balls. Sack G will contain 5 yellow balls, 2 green balls and 3 blue balls. Boys will pick a ball from sack B and girls will pick a ball from sack G. The color of the ball the adolescent picks is the team they will be in for the entire session. The gender-composition of the groups is shown in Figure 2. For the remainder of the session, adolescents will stay in their assigned teams.

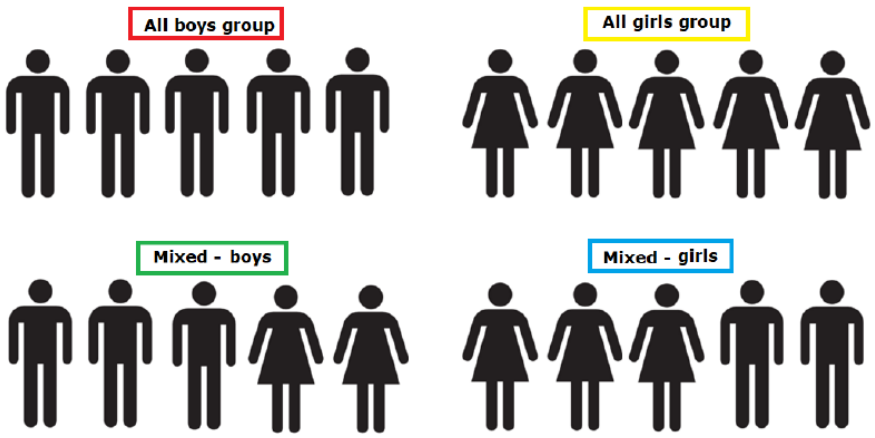

Figure 2: Team composition for lab-in-the-field experiments

[13] We decided to have mixed treatment and control groups to address potential criticism that adolescents who attended CHOICES training together could know each other from before the games session and thereby exhibit peer effects.

Registration and private responses

Each enumerator will register the 5 adolescents in their team by recording their name, gender, and age. In private, adolescents will choose if they agree or disagree with 3 statements aimed at capturing their gender attitudes and 2 line matches. The gender attitudes statements and line matches are:

- Statement 1: It is more important for a girl to help at home than spend time studying.
- Statement 2: It is okay for a man to hit his wife if she disagrees with him.
- Statement 3: Boys should have more free time than girls.
- Line game 1: Which line matches the line on the left? Choose one from A, B, C or D. Image of the lines is in Figure 3.
- Line game 2: Which line matches the line on the left? Choose one from A, B, C or D. Image of the lines is in Figure 4.

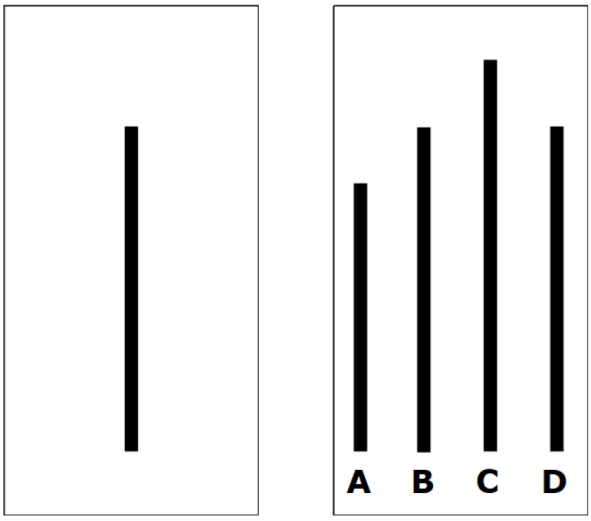

Figure 3: Lines used for line game 1 (line-up statement game)

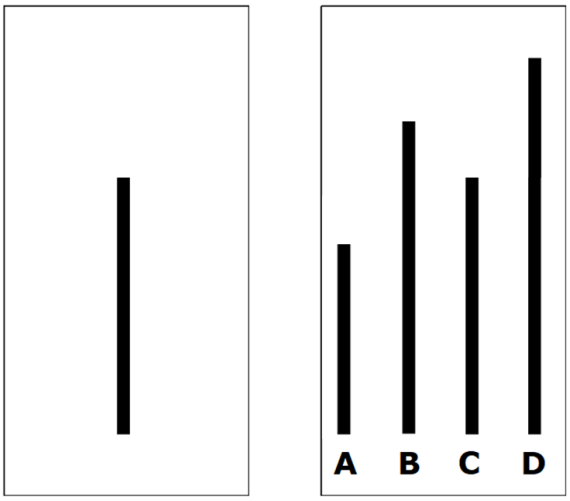

Figure 4: Lines used for line game 2 (confederates line game)

Leadership and deputy role assignment

Within each team, adolescents will discuss among themselves and select a leader and a deputy from their team.

Line-up statement game

Adolescents will sit in a random order generated automatically on the digital questionnaire. They will then be asked whether they agree or disagree with each statement read out by the enumerator. They will change seating position after each statement and sit in a new order generated by the digital questionnaire. The adolescents will be instructed to answer quickly without discussing answers with other team members.

- Statement 1: It is more important for a girl to help at home than spend time studying.
- Statement 2: It is okay for a man to hit his wife if she disagrees with him.
- Statement 3: Boys should have more free time than girls.
- Line game 1: Which line matches the line on the left? Choose one from A, B, C or D. Image of the lines is in Figure 3.

Ball bucket throws

This activity entails throwing a ball into a bucket underarm from a distance. A series of games will be played to measure different aspects of the adolescent's behavior.

Round 1: Practice

- Adolescents will be asked how many successful shots out of 5 they think they can throw during a practice round from a specified distance (2.25 meters from the bucket). They will be told that they will win 1 sweet for every successful shot into the bucket and 2 extra sweets if they accurately guess the number of shots they will actually make.
- Each adolescent will give their estimate of their capability (0-5 shots) to the enumerator privately. The enumerator will try to shield other team members from hearing answers of an adolescent as best as possible.
- Adolescents will throw in a random order that is automatically-generated in the digital questionnaire.
- Before throwing, the adolescents will be told that they will not actually get 2 extra sweets if they match the number that they guessed, but instead if they throw *at least* the number they guessed.[14]
- Adolescent 1 to 5 will each throw 5 times in the practice round and the number of shots will be recorded by the enumerator.

Round 2: Risk

- In this round, adolescents will have one attempt to throw the ball in the bucket from 3 different positions. Position 1 is 1.25meters from the bucket; position 2 is 2.25 meters from the bucket and position 3 is 3.25meters from the bucket.
- Enumerator will hold up the laminated picture indicating the number of sweets that can be won in each position. Adolescents will get 1 sweet if they successfully throw from position 1, 2 sweets from position 2, and 3 sweets from position 3. If adolescents do not have any successful throws, they will not win any sweets.
- Adolescent will then tell the enumerator in private what position they would like to throw from (position 1, 2, or 3).
- Adolescent 1 to 5 will throw in a randomly-generated order from the position they choose. They will only be allowed to throw one time, and if successful with their shot, then the adolescent will get the appropriate number of sweets for the position they chose to throw from.

Round 3: Compete

- The enumerator will inform the adolescents that they will be randomly matched with a member of a different team in this round. Adolescents will get 3 attempts to throw the ball from position 2 (fixed) into the bucket and can choose from two options: (a) 1 sweet per successful shot, regardless of the performance of the participant from another team with whom you are matched (piece-rate) or (b) 3 sweets per successful shot if you successfully outperform the other participant (tournament). If the adolescent scores the same as the other participant, they will not receive any sweets.
- Adolescents will tell the enumerator in private if they want to play piece-rate or tournament.
- Before starting the throws, adolescents will be asked if they want to change their decision based on new information on the gender of who they will be competing with. They will pick a ball from a sack that has 3 purple balls and 3 orange balls. If they draw a purple ball, they will be told they are matched with a random girl in the other team, and if they are holding an orange ball they will be told they are matched with a random boy from the other team. They

[14]This is to ensure that we have a better measure of their ability (during pilot sessions we found adolescents were actively trying to miss when they made the number of shots that they had guessed).

are then asked if they would like to change their response (i.e. play piece rate or tournament) with this new information.

Confederates line game

- The leader and deputy from all 4 teams will be called to leave the room, where they will be instructed to give answer A (incorrect answer) to a new line match game (line game 2).
- The leader and deputy will return to the group and will be seated in position 1 and 2 of a row of seats with the three other team members seated in a random order following them. The order of seating for the three members will be automatically randomized on the tablet.
- In this order, adolescents will be asked one after the other: "Which line matches the line on the left? Choose one from A, B, C or D?" Image of the lines is in Figure 4.

B Modules of CHOICES training intervention

The CHOICES training curriculum has been adapted for Somalia and while the adaption of the curriculum is still ongoing and therefore subject to change, the twelve module objectives are:

1. Raise awareness about society's perspectives and expectations of boys and girls and resulting lifestyle differences.
2. Raise awareness of time use differences between boys and girls and of broader societal expectations regarding gender roles and the challenges they pose.
3. Enable children to explore their thoughts about their own future life options and about future life options for the opposite sex.
4. Teach children the importance of having hope and encouraging hope in others.
5. Understanding how mutual respect sharing are essential foundations for a home where people feel cared for, loved, and are productive members.
6. Make children aware of each other's hopes and dreams and empower children to be mutually encouraging in the pursuit of their hopes and dreams. Understand how self-esteem affects the pursuit of hopes and dreams.
7. Raise awareness of societal expectations that create conformity and enable gender inequality. Teach children how to take a stand against situations fostering gender inequality.
8. Identify characteristics of respectable, model males and females. Understand that respect is earned and not given.
9. Instilling importance of actively showing caring actions to others as a means of encouragement and companionship.
10. Encouraging kids to think about their life options beyond what is traditionally accepted. Helping kids to think through what steps they would take to make some life changes.
11. Clarify misconceptions about social expectations and individual abilities and practice talking through difficult issues and situations.
12. Validate participants' new commitment to each other and support for specific behavior.

C Modules of EMB training intervention

The EMB curriculum involves a series of nine community dialogues sessions, including one final session to agree on actions. The nine module objectives are:

1. Gender Norms: To identity the differences between rules of behaviour for men and for women and to understand how profoundly these gender rules affect their lives.
2. Fatherhood: To reflect upon the influence that fathers or other male authority figures have had on the participants while they were growing up.
3. Power: To explore how power can be used in positive and negative ways, to learn how to use power positively, and to reflect on how power is divided between men and women. The session intends to create awareness about gender and social expectations.
4. Household work: To become aware of the different tasks and roles men and women do/share in the household and discuss if and how those roles could be exchanged.
5. Violence 1: To discuss how violence affects our everyday lives and how to stop the cycle of violence in our lives and our communities.
6. Violence 2: To better understand the many ways in which women's (and men's) lives are limited by male violence and/or the threat of men's violence, especially sexual violence.
7. Child, early and forced marriage: To explore and discuss the community belief towards early marriage and its relationship with girls' education and future opportunities in life.
8. Female genital mutilation/cutting: To reflect on the practice of FGM/C, what are the consequences of this practice for girls and women and why it still exists.
9. Action planning: To mobilise the community into action against harmful social norms that affect them. To support the group to develop an action plan that will be re-visited after 6 months.

D Sampling strategy and intended beneficiaries

Based on data from a community mapping exercise the project sites for the overall CHANGES project included many communities (urban, peri-urban, rural or IDPs). The CHOICES impact evaluation covers 6 targeted districts: Hargeisa, Burao, Erigavo and Badhan from Somaliland; and Galkayo and Galdogob from Puntland. For the impact evaluation exercise, we selected 35 communities from six of the project districts. The 35 impact evaluation sites were selected based on accessibility, feasibility of implementing an experimental design and population size.

All children aged between 10 and 14 years are considered eligible for the CHOICES intervention. Although the age bracket is suggestive rather than a strict criterion, it is generally observed that having children of a very diverse age group in a training may lead to younger children having less active participation. Therefore, for the research design, we adhered to the 10-14 age cut-off. The participants included both school enrolled and out-of-school children. In essence, any adolescent in this age range who was interested in participating and had the consent of their parents was eligible to participate in CHOICES training and the study. For the households assigned to the CHOICES+EMB treatment arm, the biological parents of the CHOICES children were to be invited to attend an EMB session if they were living in the household. If biological parents were not in the household then the male and female primary caregiver in the household would be invited.

The CHOICES impact evaluation involves household level randomization. In order to build the CHOICES sample, we conducted a census of approximately 400 households located within specified boundaries in the targeted communities to list all the children aged 10-14 years. During the listing stage the project team started with 37 communities but dropped 4 communities that were decided by the implementing partner not to include for CHOICES which left with 33 communities. After the household listing exercise the implementing partner dropped 5 communities which had too few adolescents i.e. if less than 80 VYAs listed. Then 5 of the larger communities were divided into 2 clusters: Daami B, October IDP, Bacadweyn, Waaberi and Statehouse. This was done based on geography. Approximately 100 households were dropped for having GPS coordinates further away on the map (either GPS was wrong or community name incorrectly collected) and 50 household dropped if did not give consent at census for the survey. The final number of clusters for the study was 33 (i.e. 28 communities where 5 communities were split into 2 clusters). Consistent with estimates, from the census, 8,572 children aged 10-14 years from 4,341 households were listed from 33 clusters across the 6 districts. The census also collected information on the children's willingness to participate in the CHOICES training to estimate program take-up.

A random sample of 4,195 very young adolescents were selected using Stata from the eligible households in the census for the baseline survey. Baseline sample consisted of 4,195 VYAs (2,108 boys and 2087 girls) from 2,766 households across 33 clusters with 132 VYAs per cluster (we factored in approximately 10% attrition at baseline). There were six clusters with less than 132 VYAs but they were included in the study since we expect take-up to be fairly high. The randomization was stratified on the sex of the child and there could be more than one child per household. We ensure that all children sampled within a household would receive the same treatment. The CHOICES+EMB arm would also be randomized at the household level where more than one set of parents could be invited to the training. A household level randomization ensured that children within a household were not assigned to different treatments within a single household which would have consequences for spillovers and contamination.

We randomly divided the households into three groups, with 40 children in each group per cluster. Seeing as the plan was to have approximately 4,195 children to participate in the baseline, 120 children were selected from each of the 33 clusters for the baseline survey.

E Details on outcome variables

E.1 Gender attitudes: Outcomes for adolescents (and adults)

Category	Outcome	Description	Construction
Gender attitudes*	Gender Equitable Index (0 to 1) 0 = Discriminatory gender attitudes to 1= Egalitarian gender attitudes	Number of gender-progressive statements respondent agrees with, divided by number of statements	1. In a family, girls and boys should get the same amount to eat no matter how much food there is. (q3.2 in child module, q3.2 in adult module) 2†. Girls should be honored with bride price rather than investing in her education. (q3.3, q3.3) 3†. The most important aspiration for a girl is to be a mother and take care of her family. (q3.4, q3.4) 4†. The most important aspiration for a boy is to do well in school and succeed professionally. (q3.5, q3.5) 5†. The more successful the boy is in his profession, the more he has to pay as bride price. (q3.6, q3.6) 6. Boys as well as girls should be responsible for carrying wood and water. (q3.7, q3.7) 7†. It is okay for a man to hit his wife if she disagrees with him. (q3.8, q3.8) 8†. A woman should be obedient to her husband in order to keep her family together. (q3.9, q3.9) 9†. If a family can only afford for one child to go to school, it should be the boy. (q3.16, q3.15) 10†. Dowry is more important for the family's esteem rather than having educated daughter. (q3.17, q3.16) 11†. Girls who spend their time studying rather than helping their mothers will not be the ideal wives. (q3.18, q3.17) 12†. A boy who shows his affection to his sister is weak. (q3.20, q3.19) 13†. Boys should have more free time than girls. (q3.21, q3.20) 14†. It is more important for a girl to help at home and learn household activities than to spend time studying. (q3.22, q3.21) *Possible responses: disagree (0), agree (1)* *† marks statements that will be reversed to convert to a gender-progressive attitude*
Statements 9, 13, 14 will also be used to check for consistency, as they are asked for the opposite gender later in the survey (in q4.10 [q6.18], q4.8 [q6.16], q4.9 [q6.17] in child [adult] module, respectively *Sub-index on masculinity norms consists of statements: 4, 5, 6, 7, 8, 12* *Sub-index on education consists of statements: 2, 4, 9, 10, 11, 14* *Sub-index on women's role consists of statements: 3, 6, 11, 14*			
Attitudes towards education's impact on marital prospectives*	Respondent states girls should attain higher education so they find better husbands	Yes or no (binary variable)	Girls should attain higher education so they find better husbands (q3.14a in child module, q3.26 in adult module)
	Respondent states boys should attain higher education so they find better wives	Yes or no (binary variable)	Boys should attain higher education so they find better wives (q3.14b in child module, q3.27 in adult module)
Attitudes towards decision-making between spouses*	Respondent states husband will make final decision if husband and wife disagree	Yes or no (binary variable)	When you get married, if your wife and you disagree, you will make the final decision. (q3.10 in child module) When you get married, if your husband and you disagree, your husband willmake the final decision. (q3.11) If your wife and you disagree, you would make the final decision. (q3.10 in adult module) If your husband and you disagree, you would make the final decision. (q3.11)
** marks categories for which outcomes will also measured for adults* *Note: Additional gender attitudes towards women working outside the home, marriage, violence against women, and FGM are included in the "Individual belief versus Perceived Community norm" section*			

E.2 Gender attitudes: Outcomes for adults only

Category	Outcome	Description	Variables
Adult's attitudes towards adolescent's education based on age/gender	Age: Adult states older sibling should go to school over younger sibling (regardless of gender)	Yes or no (binary variable)	If there is an older brother and younger sister in a household, and only one can go to school, who should go? (q3.28 in adult module) 1 if adult states older brother [older sister] should go to school over younger sister [younger brother] if only one can afford to go to school, 0 otherwise
	Gender: Adult states brother should go to school over sister (regardless of age)	Yes or no (binary variable)	If there is an older sister and younger brother in a household, and only one can go to school, who should go? (q3.29 in adult module) 1 if adult states older [younger] brother should go to school over younger [older] sister if only one can afford to go to school, 0 otherwise
Adult's attitudes towards education's impact on bride price	Adult states primary education increases girl's bride price	Yes or no (binary variable)	Does primary education affect a girl's bride price? (q6.28 in adult module) 1 if adult states education increases girl's bride price, 0 otherwise
	Adult states secondary education increases girl's bride price	Yes or no (binary variable)	Does secondary education affect a girl's bride price? (q6.29) 1 if adult states education increases girl's bride price, 0 otherwise
	Adult states university education increases girl's bride price	Yes or no (binary variable)	Does university education affect a girl's bride price? (q6.30) 1 if adult states education increases girl's bride price, 0 otherwise
			Possible options: Yes it increases her bride price because she is more qualified; *Yes it increases her bride price for another reason;* *Yes it decreases her bride price because she gets older;* *Yes it decreases her bride price for another reason;* *No it does not change her bride price*

E.3 Individual beliefs vs. Perceived social norms: Outcomes for adolescents (and adults)

Category	Outcome	Description	Variable
Suitable age for marriage for boys and girls as per adolescents and adults	Suitable age for marriage for a boy	Age (integer)	In your opinion, what is the suitable age for marriage for a girl? (q8.1 in child module, q6.7a in adult module)
	Suitable age for marriage for a girl	Age (integer)	In your opinion, what is the suitable age for marriage for a boy? (q8.2 in child module, q6.8a in adult module)
Marriage as per adolescents and adults	Individual belief: Adolescent states that the suitable age of marriage for a girl is below 18years of age	Yes or no (binary variable)	In your opinion, what is the suitable age for marriage for a girl? (q8.1 in child module, q6.7a in adult module)
	Perceived social norm: Number of families (of 10) in community who think it is important for a girl to be married before she is 18years of age	Number out of 10 (integer)	Out of 10 people in this community, how many think it is important for a girl to be married before she is 18 years old? (q6.9 in adult module) (only asked to adults)
	Perceived social norm: Number of families (of 10) with young daughters in community who will marry their daughters before 18years of age	Number out of 10 (integer)	When you think of 10 families in this community with young daughters, how many of them do you think will marry their daughters before they are 18? (q8.12 in child module, q6.14 in adult module)
Marriage as per adolescents	Adolescent states a girl should choose her husband herself	Yes or no (binary variable)	What is better - a girl should herself choose her husband, or her family members should choose for her? (q8.11 in child module) 1 if adolescent states "self" or "self with parents", 0 otherwise *Possible options: Self, parents, self with parents, relatives, others, don't know*
	Perceived social norm: Adolescent makes the decision regarding marriage	Yes or no (binary variable)	Who usually makes the decision about girls getting married? (q8.3 in child module) Who usually makes the decision about boys getting married? (q8.4 in child module) *Possible options: Father, mother, the girl/boy herself, grandparents, father and mother jointly, proposed husband, other family member*
	Individual belief: Adolescent believes a girl can continue her education after marriage	Yes or no (binary variable)	A girl can continue her education after marriage. (q3.14c)
	Perceived social norm: Number of people (of 10) in community who will tell a 15yo girl to get married if she is not in school	Number out of 10 (integer)	Out of 10 people in the community who know her, how many will tell her (15yo girl) about marriage if she is NOT in school? (q8.16)
	Perceived social norm: Number of people (of 10) in community who will tell a 15yo girl to get married if she is school	Number out of 10 (integer)	Out of 10 people in the community who know her, how many will tell her (15yo girl) about marriage if she is in school? (q8.17)
Women working outside household as per adolescents and adults	Individual belief: Respondent believes women can go out of the home for work	Yes or no (binary variable)	People have different opinions about women going out to work. Some people feel that women in your village should not work outside the home to earn money and they should only look after their families, while others say that there is nothing wrong if women go out for work to earn money. What is your opinion? (q3.29 in child module, q3.22 in adult module)
	Perceived social norm: Number of people (of 10) in community who will speak badly about a woman who works outside the home, according to adolescent	Number out of 10 (integer)	Out of 10 people in this community, how many do you think would speak badly of a woman who works outside the home? (q3.30 in child module, q3.23 in adult module)
Community emphasis on encouraging adolescents of their gender as per adolescents	Adolescents feel the community places the right amount of emphasis in: encouraging them to be a leaders	Yes or no (binary variable)	Would you say in this community there is too much emphasis or too little emphasis these days on ... encouraging you to be leaders, or is it about right? (q4.4) encouraging you to talk about their feelings when sad or upset, or is it about right? (q4.5) encouraging you to stand up for themselves, or is it about right? (q4.6) encouraging you to do well in school, or is it about right? (q4.7) *Possible responses: Too little emphasis (1), right amount of emphasis (2), too much emphasis (3)*
	Adolescents feel the community places the right amount of emphasis in: encouraging them to talk about their feelings when they are sad/upset	Yes or no (binary variable)	
	Adolescents feel the community places the right amount of emphasis in: encouraging them to stand up for themselves	Yes or no (binary variable)	
	Adolescents feel the community places the right amount of emphasis in: encouraging them to do well in school	Yes or no (binary variable)	

E.4 Individual beliefs vs. Perceived social norms: Outcomes for adults only

Category	Outcome	Description	Variables
Oldest and youngest age boys and girls should be married as per adults	Youngest age a boy should be married	Age (integer)	What is the youngest age at which a girl should be married? (q6.15a in adult module)
	Youngest age a girl should be married	Age (integer)	What is the oldest age by which a girl should be married? (q6_15b)
	Oldest age a boy should be married	Age (integer)	What is the youngest age at which a boy should be married? (q6.15c)
	Oldest age a girl should be married	Age (integer)	What is the oldest age by which a boy should be married? (q6.15d)
FGM as per adult	Adult requires adolescent boy's bride to be circumcised	Yes or no (binary variable)	When the boy gets married, would you require that the bride is circumcised? (asked for each male child; q5.13.1-q5.13.5 in adult module)
	Adult wants adolescent girl to be circumcised (for those not already circumcised)	Yes or no (binary variable)	Would you want her to be circumcised? (asked for each female child who is not circumcised; q5.10.1-q5.10.6 in adult module)
	Perceived social norm: Average age of circumcision in community	Age (integer)	At what age do most girls typically undergo circumcision in this community? (q6.2 in adult module)
	Individual belief: Female adolescent is circumcised or adult wants uncircumcised female adolescent to be circumcised	Yes or no (binary)	For each female child: Is she circumcised? (q5.9.1-q5.9-6 in adult module) If not, would you want her to be? (q5.10.1-q5.10.6)
	Perceived social norm: Number of people (of 10) in community who think it is important for a girl to be circumcised	Number out of 10 (integer)	Out of 10 people in this community, how many think it is important for girls to be circumcised? (q6.3 in adult module)
Violence against women as per adult	Index of acceptability of violence against women in the household 0= not acceptable in any situation 1= acceptable in all stated situations	Number of statements adult states a man is justified in hitting or beating his wife in, divided by number of statements	I will now ask you about what people may experience in their relationships. Sometimes a husband is annoyed or angered by things that his wife does. In your opinion, is a husband justified in hitting or beating his wife in the following situations. Is it okay to hit his wife . . . ... if she goes out without telling him? (q2.6 in adult module) ... if she neglects the children? (q2.7) I ... if she argues with him? (q2.8) ... if she refuses to have sex with him? (q2.9) ... if she burns the food? (q2.10) ... if she gets her daughter circumcised but he doesn't want? (q2.11) ... if she refuses to have her daughter circumcised but he wants? (q2.12)
	Individual belief: A woman should tolerate violence to keep family together	Yes or no (binary)	A woman should tolerate violence in order to keep her family together. (q3.24 in adult module)
	Perceived social norm: Number of people (of 10) in community who think a woman should tolerate violence to keep her family together, according to adult	Number out of 10 (integer)	Out of 10 people in this community, how many think a woman should tolerate violence to keep her family together (q3.25 in adult module)
Marriage as per adults	Perceived social norm: Average age of girls at marriage in community	Age (integer)	At what age do most of the girls get married in your community? (q6.6. in adult module)
	Once a girl is promised for marriage, other characteristics of the groom do not matter	Yes or no (binary variable)	If a girl is promised for marriage, how much do other characteristics of the groom (such as education, his family's wealth) matter? (q6.23 in adult module) If a boy is promised for marriage, how much do other characteristics of the bride (such as education, his family's wealth) matter? (q6.24 in adult module)
	Once a boy is promised for marriage, other characteristics of the groom do not matter	Yes or no (binary variable)	*Possible options: Not at all - once a girl is promised for marriage, she must fulfill the marriage regardless of other characteristics of the groom; Somewhat- a girl may be promised for marriage, but other characteristics of the groom matter too; More - even if a girl is promised for marriage, other characteristics of the groom matter more*

E.5 Aspirations: Outcomes for adolescents (and adults)

Category	Outcome	Description	Variables
Educational aspirations of adolescents	Adolescent wants to study up to university	Yes or no (binary variable)	How far do you want to study? (q7.8 in child module) 1 if respondent states university 0 if respondent states education level between below primary and complete secondary
Marital aspirations of adolescents	Adolescent's ideal age for marriage	Age (integer)	If it were up to you, what age would you ideally want to get married at? (q7.11a)
	Adolescent's expected age of marriage	Age (integer)	At what age do you think you will get married? (q7.11)
Work aspirations of adolescents	Adolescent wants a professional job	Yes or no (binary variable)	What do you want to be in your life? (q7.7 in child module) 1 if respondent states professional (teacher, doctor, engineer, etc.), politician, leader (religious/traditional) 0 if respondent states father, mother, labourer, farmer, animal herder, business man/woman/merchant, other
	Adolescent thinks they will be a professional when they are 25years old	Yes or no (binary variable)	What type of work do you think you will do when you are 25years old? (q7.10) 1 if respondent states professional (ie. teacher, doctor, engineer), government service, private service 0 if respondent states farming, labour work-locally, labour work-migration, livestock, business, other
	Adolescent wants to work for earning income when they grow up	Yes or no (binary variable)	Do you want to work for earning income when you grow up? (q7.9)
Fertility aspirations of adolescents	Desired number of children	Number of desired children (integer)	How many children would you like to have after you are married? - for those not married (q7.12 in child module) How many children would you like to have in total? - for those married (q9b.5a)
	Adolescent would have more than desired number of children if all children are girls	Yes or no (binary variable)	Would you like to have more child if all desired number of children are girls? (q7.13 [q9b.5a] for unmarried [married] adolescents) Would you like to have more children if all desired number of children are girls? (q9.13 [q9b.6b] for unmarried [married] adolescents)

E.6 Aspirations: Outcomes for adults only

Category	Outcome	Description	Variables
Education aspirations of adults for adolescents	Adult wants adolescent to study up to university	Yes or no (binary variable)	Up to which class do you want child to be studying? (asked for each child; q5.7.1-q5.7.6 in adult module)
Marriage aspirations of adults for adolescents	Age at which adult states they will arrange adolescent to be married	Age (integer)	At what age will you arrange for your child to be married? (asked for each unmarried child; q5.4.1-q5.4.6 in adult module)
	Adult believes family of son's spouse should be wealthier than their family	Yes or no (binary variable)	On a ladder with the 1st step as the poorest and 6th step the wealthiest, on which step is your family on today? (q6.25)
	Adult believes family of daughter's spouse should be wealthier than their family	Yes or no (binary variable)	On a ladder with the 1st step as the poorest and 6th step the wealthiest, on which step should the family of your daughter's spouse be? (q6.26) On a ladder with the 1st step as the poorest and 6th step the wealthiest, on which step should the family of your son's spouse be? (q6.27)

E.7 Behaviors: Outcomes for adolescents (and adults)

Category	Outcome	Description	Variables
Time use (measured using a picture wheel where 24 pebbles are shared across different activities)*	Respondent's time spent on each activity in hours	Time spent on a typical day (in hours)	Asleep (q6.1 in child module) Care for others (younger children, ill household members) (q6.2) Domestic tasks (fetching water, firewood, cleaning, cooking, washing, shopping, etc.) (q6.3) Tasks on family farm, cattle herding, other family business, shepherding (not just farming) (q6.4) Paid (remunerated) work or activities outside of household or for someone not in the household (q6.5) At school (including travelling) (q6.6) Studying outside of school time (at home, extra tuition) (q6.7) Play time, prayers, general leisure (q6.8) Asleep (q7.1 in adult module) Care for others (younger children, ill household members) (q7.2) Domestic tasks (fetching water, firewood, cleaning, cooking, washing, shopping, etc.) (q7.3) Tasks on non-farm business activities (including time spent sewing, crop processing selling or cooking) (q7.4) Paid (remunerated) work or activities outside of household or for someone not in the household (q7.5) Task on family farm, home garden, cattle herding, shepherding or fishing (q7.6) Shopping or getting services (including health services) (q7.7) Prayer and leisure (including selfcare and hobbies) (q7.8)
Household chores*	Respondent engaged in activity in the past 0-7days	Yes or no (binary variable)	Cooking (q6a.1 in child module, q8.1 in adult module) Washing clothes (q6a.2, q8.2) Fetching firewood (q6a.3, q8.3) Cleaning the house (q6a.4, q8.4) Washing dishes (q6a.5 q8.5) Buying food items (q6a.6, q8.6) Tending family livestock (q6a.7, q8.7) Farming activities (q6a.8, q8.8)
Educational attainment/status of adolescents	Adolescent is currently in school	Yes or no (binary variable)	Are you currently enrolled in school? (q2.5 in child module)
	Adolescent's level of school	Grade 1 to Grade 10	Which grade are you currently attending? (q2.6) Grade 1 to Grade 10
	Number of days adolescent went to school last week	Total number (integer)	How many days in the last week did you go to school? (q2.7)
Impact of menstruation on schooling of adolescents	Age of female adolescent at first period	Age at first period (integer)	At what age did you have your first period? (q9b.10 in child module)
	Female adolescent misses some or all classes when she has her period	Yes or no (binary variable)	During your period, do you continue to go to school? (q9b.11)
Marital status of adolescents	Adolescent is currently married	Yes or no (binary variable)	What is your current marital status? (q7.11 in child module)
	Age of currently-married adolescent at marriage	Age at marriage (integer)	For those married: How old were you when you got married? If polygamous: Age when first got married (q9b.2 in child module)
	Age of currently-married adolescent's spouse at marriage	Age of spouse at marriage (integer)	For those married: How old was your spouse when you got married? If multiple spouses: age of first spouse when got married. (q9.b3)

** marks categories for which outcomes will also measured for adults*

Category	Outcome	Description	Variables
Fertility status and agency of adolescent	Married adolescent has children	Yes or no (binary variable)	Do you have children? (q9.4 in child module)
	Number of children married adolescent has	Total number of children (integer)	How many children do you have? (q9b.5)
	Married adolescent is currently pregnant	Yes or no (binary variable)	Pregnancy status (q9b.6)
	Married and pregnant adolescent wanted to be pregnant at the time they got pregnant	Yes or no (binary variable)	When you got pregnant, did you want to be pregnant at that time, would you have liked to wait for some time, or did you not want to be pregnant at all? (q9b.9)
	Married adolescents currently doing something or are you currently using a method to delay or avoid pregnancy	Yes or no (binary variable)	Are you currently doing something or are you currently using a method to delay or avoid pregnancy? (q9b.9)
	Female partner in marriage is (joint or sole) decision-maker in deciding number of children the couple will have	Yes or no (binary variable)	Who will primarily get to decided how many children you have in your life? (q8b.8) 1 if respondent states "My decision alone" or "Joint decision with partner" 0 if respondent states "My partner's decision alone", "My family's decision", "My partner's family decision", "Other"
FGM status of female adolescent as per adult	Female adolescent is circumcised	Yes or no (binary variable)	Is she circumcised (Asked for each girl; q5.9.1-q5.9.6 in adult module)
	Circumcision was performed by a health professional	Yes or no (binary variable)	Who performed the circumcision? (Asked for each girl; q5.9.1b-q5.9.6b in adult module)*Possible options: Doctor, nurse/midwife, other health professional, traditional circumcisor, traditional birth attendant, other, don't know*

E.8 Behaviors: Impact of covid-19 on outcomes

Category	Outcome	Description	Variables
Impact of covid on schooling of adolescents	Adolescent enrolled in school before coronavirus	Yes or no (binary variable)	Were you enrolled in school before the coronavirus/covid19? (q2.7a in child module)
	Adolescent's school closed because of coronavirus	Yes or no (binary variable)	Was your school closed because of the coronavirus? (q2.7b)
	Adolescent participated in educational/learning activities when schools were closed	Yes or no (binary variable)	Did you participate in education or learning activities when the schools were closed? (q2.7c)
	Adolescent's school still closed because of coronavirus	Yes or no (binary variable)	Is your school still closed? (q2.7d)
Impact of covid on adolescent's marriage timing as per adult	Adolescent's married after March 2020	Yes or no (binary variable)	Was your child married after March 2020? (q5.4.1b in adult module)
	Adolescent's marriage timing influenced by covid lockdown (marriage done earlier because lockdown made it easier)	Yes or no (binary variable)	Which of the following statements is most true? (Q5.4.1C in adult module) 1 if respondent states "Planned to get child married at a later age but easier to do it now because of the lockdown" 0 if respondent states "Always planned to get child married at this age"
Impact of covid on FGM timing/status as per adult	Adolescent circumcised after March 2020	Yes or no (binary variable)	Was she circumcised after March 2020? (asked for each girl; q5.9.1a-q5.9.6a in adult module)
	Adolescent's FGM timing/status influenced by covid lockdown (FGM done earlier because lockdown made it easier)	Yes or no (binary variable)	Which of the following statements is most true? (q5.9.1c-q5.9.6c in adult module) 1 if respondent states "Planned to get her circumcised later but it was easier to do it now because she is home due to lockdown" or "Planned to get her circumcised earlier but it was easier to do it now because she is home due to lockdown" or "Never planned to get her circumcised but decided to do it because she is home due to lockdown" 0 if respondent states "Always planned to get her circumcised at this age"

E.9 Behaviors: Outcomes for adults only

Category	Outcome	Description	Variables
Decision-making in household by adults	Female adult is (sole or partial) decision-maker about her health care	Yes or no (binary)	Who usually makes decisions about health care for yourself? (q2.1 in adult module)
	Female adult is (sole or partial) decision-maker about major household purchases	Yes or no (binary)	Who usually makes decisions about making major household purchases? (q2.2)
	Female adult is (sole or partial) decision-maker about purchases for daily household needs	Yes or no (binary)	Who usually makes decisions about making purchases for daily household needs? (q2.3)
	Female adult is (sole or partial) decision-maker about visits to family or relatives	Yes or no (binary)	Who usually makes decisions about visits to your family or relatives? (q2.4)

E.10 Relationship quality: Outcomes for adolescents

Category	Outcome	Description	Variable
Adolescent's perception of relationship with parents	Adolescent's perception of relationship quality with mother	Following Pasquali et al. (2012), we will test whether the data is suited for factor analysis using the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test. The use Horn's criterion (parallel analysis) to identify the number of components to extract.	Becomes happy when she sees me coming back from school or a trip (q9.1 for relationship with mother, q9.15 for relationship with father) Spends a lot of time with me (q9.2, q9.16) She keeps reminding me of things I am not supposed to do (q9.3, q9.17) Tries to be my "friend" rather than a "boss" (q9.4, q9.18) She would like me to stay home more so that she can take care of me (q9.5, q9.19) She wants to know exactly where I am and what I am doing when I am not home (q9.6, q9.20) Reassures me when I am afraid (q9.7, q9.21) Punishes me severely (q9.8, q9.22)
	Adolescent's perception of relationship quality with father	Classify perspectives on parents into: authoritative (high control and affection), authoritarian (high control and low affection), uninvolved (low control and low affection), and permissive (low control and high affection) styles	Believes she has to punish me to correct me and make me a better person (q9.9, q9.23) Tries to cheer me up when I am sad (q9.10, q9.24) Punishes me when I do not obey (q9.11, q9.25) She is always telling me how I am supposed to behave (q9.12, q9.26) If I do something wrong, she will not trust me for a while (q9.13, q9.27) Likes to discuss things with me and listens to my ideas and opinions (q9.14, 9.28) ** marks responses that will be reverse-scored* *Possible responses: disagree (0), agree (1)*
	Adolescents have spoken to parents about importance of education for girls (for their own education if adolescent is girl, for sister for adolescent boys with sister)	Yes or no (binary)	Have you ever told your parents that it is important for your sisters to continue studying? (q3.31) - for boys with sisters Have you ever told your parents that it is important for you to continue studying? (q3.32) - for girls
Relationship quality with siblings of opposite gender	Adolescent can mention on thing they did last week to let their sibling (of the opposite gender) know they care for them in the past week	Yes or no (binary)	Can you mention one thing that you did last week to let your sister know you care for them? (q3.30a) - for boys with sisters Can you mention one thing that you did last week to let your brother know you care for them? (q3.30b) - for girls with brothers
	Adolescent has spoken to parents about the well-being of their sibling (of the opposite gender) in the past month	Yes or no (binary)	Have you talked to your parents about your sister's wellbeing during the last month? (q3.29a) - for boys with sisters Have you talked to your parents about your brother's wellbeing during the last month? (q3.29b) - for girls with brothers

E.11 Socioemotional skills and mental/emotional health: Outcomes for adolescents (and adults)

Category	Outcome	Description	Variables
Modified Strengths and Difficulties Questionnaire	Total difficulties score (0 to 40) Sub-indices: emotional problems, conduct problems, hyperactivity, peer problems, prosocial behavior	5 sub-scales: emotional problems (emo), conduct problems (con), hyperactivity (hyp), peer problems (pee), prosocial behavior (pro) To calculate each sub-scale, sum number of statements that respondent agrees with Total difficulties score= emotional problems scale + conduct problems scale + hyperactivity scale + peer problems scale	(pro) I try to be nice to other people. I care about their feelings (q5.1 in child module) (hyp) I am restless, I cannot stay still for long (q5.2) (emo) I get a lot of headaches, stomach-aches or sickness (q5.3) (pro) I usually share with others (food, games, pens etc.) (q5.4) (con) I get very angry and often lose my temper (q5.5) (pee) I am usually on my own. I generally play alone or keep to myself (q5.6) (con)$† I usually do as I am told (q5.7) (emo) I worry a lot (q5.8) (pro) I am helpful if someone is hurt, upset or feeling ill (q5.9) (hyp) I am constantly fidgeting or squirming (q5.10) (pee)† I have one good friend or more (q5.11) (con) I fight a lot. I can make other people do what I want (q5.12) (emo) I am often unhappy, down-hearted or tearful (q5.13) (pee)† Other people my age generally like me (q5.14) (hyp) I am easily distracted, I find it difficult to concentrate (q5.15) (emo) I am nervous in new situations. I easily lose confidence (q5.16) (pro) I am kind to younger children (q5.17) (con) I am often accused of lying or cheating (q5.18) (pee) Other children or young people pick on me or bully me (q5.19) (pro) I often volunteer to help others (parents, teachers, children) (q5.20) (hyp)† I think before I do things (q5.21) (con) I take things that are not mine from home, school or elsewhere (q5.22) (pee) I get on better with adults than with people my own age (q5.23) (emo) I have many fears, I am easily scared (q5.24) (hyp)† I finish the work I'm doing. My attention is good (q5.25) *Possible responses: disagree (0), agree (1)* *† marks modified-SDQ statements that are reverse-scored (agree becomes 0, disagree becomes 1)*
Children's Hope Scale	Children's Hope Scale Total Score (6 to 36) Higher score indicates more hope Agency Thinking Score (3 to 18) Higher score indicates more agency Pathways Thinking Score (3 to 18) Higher score indicates more pathways	Children's Hope Scale Total Score: Sum of responses from 1 to 6 for each statement Agency Thinking Score: Sum of responses from 1 to 6 for odd statements Pathways Thinking Score: Sum of responses from 1 to 6 for even statements	1. think I am doing pretty well (q7.1 in child module) 2. I can think of many ways to get the things in life that are most important to me. (q7.2) 3. I am doing just as well as other kids my age (q7.3) 4. When I have a problem, I can come up with lots of ways to solve it (q7.4) 5. I think the things I have done in the past will help me in the future (q7.5) 6. Even when others want to quit, I know that I can find ways to solve the problem (q7.6) *Possible responses: Never (1), A little of the time (2), Some of the time (3), A lot of the time (4), Most of the time (5), All of the time (6)*
Generalized Self-Efficacy*	Generalized Self-Efficacy Scale Higher score indicating higher self-efficacy	Sum of responses from 1 to 4 for all 10 statements (GSE index will be standardized)	1. I can always solve difficult problems if I try hard enough. (gse1 from both child and adult module) 2. If someone is against me, I can find means and ways to get what I want. (gse2) 3. It is easy for me to stick to my aims and accomplish my goals. (gse3) 4. I am confident that I could deal appropriately with unexpected events. (gse4) 5. Thanks to my skillful and creative thinking, I know how to handle unforeseen situations. (gse5) 6. I solve most problems if I put in the necessary effort. (gse6) 7. I can remain calm when I am facing difficulties because I can rely on my abilities to cope. (gse7) 8. When I am faced/confronted with a problem, I can usually find several solutions. (gse8) 9. If I am in trouble, I can usually think of a solution. (gse9) 10. I can usually handle whatever comes my way. (gse10) *Possible responses: Not at all true (1), Hardly true (2), Moderately true (3), Exactly true (4)*

** marks categories for which outcomes will also measured for adults*

E.12 Lab-in-the-field experimental games: Outcomes for adolescents

Category	Outcome	Description	Variables
Leader/deputy gender	Mixed-gender group chose a female leader	Yes or no (binary variable)	Who among your team should be the leader? Merged with gender of adolescent selected from roster (c_gender) (from games questionnaire)
	Mixed-gender group choses a female leader and/or deputy	Yes or no (binary variable)	Who among your team should be the deputy? Merged with gender of adolescent selected from roster (c_gender) (from games questionnaire)
Conformity	Adolescent in positions 2 to 5 changes their public response from their previously-stated private response to the most-common response in positions preceding them in the line-up (for 3 gender attitudes statements and 2 line match games) Adolescent changes their public response from their previously-stated private response	1 if adolescent's response in positions 2-5 made in private is different from public response and public response is the most-common response in group 0 if adolescent's response in private is same as public response or private response is different from public response but not the most-common response in group, 1 if adolescent's response in private is different from public response, 0 if adolescent's response in private is equal to public response	Based on private and public responses: Statement 1: It is more important for a girl to help at home than spend time studying. Statement 2: It is okay for a man to hit his wife if she disagrees with him. Statement 3: Boys should have more free time than girls. Line for line-up game: Which line matches the line on the left? (Image with 4 lines, with B and D matching line on the left) Choose one from A, B, C or D. Line for confederates game: Which line matches the line on the left? (Image with 4 lines, with C matching line on the left) Choose one from A, B, C or D.
	Adolescent changed their pick for confederates line game to match leader/deputy response	1 if adolescent's response in positions 3 to 5 matches leader/deputy response 0 if adolescent's response does not match leader/deputy response	
	Self-reported conformity index for adolescents 0= low conformity 1= high conformity	Sum of responses from 1 to 4 for all 3 statements, divided by 12	This person believes that people should follow rules [sharciga] at all times, even when no-one is watching. Think about how much this person is or is not like you. (q4.1 in games questionnaire) It is important to this person to always behave well and avoid doing anything people say is wrong. Think about how much this person is or is not like you. (q4.2 in games questionnaire) It is important for this person to be polite to other people all the time and never annoy others. (q4.3 in games questionnaire) *Possible responses (after reverse scoring): Not at all like me (0), little like me (1), somewhat like me (3), very much like me (4)*
Social desirability bias	Adolescent gives socially desirable answer	Adolescent who is in first position for each gender attitudes statement changes their response in public from their previously-stated private response	Based on private and public responses: Statement 1: It is more important for a girl to help at home than spend time studying. Statement 2: It is okay for a man to hit his wife if she disagrees with him. Statement 3: Boys should have more free time than girls.
Adolescent's actual capability	Adolescent actual ability in throwing a ball into a bucket (0-5)	Actual number of successful shots out of 5 successfully thrown in the practice round	Number of successful shots out of 5 for child X (ball_prac_chX in games data)
Adolescent's assessment of own capabilities	Adolescent's guess on the number of successful ball throws they think they can make is the same, higher, or lower than the actual number of successful ball throws (in ball bucket throw game)	Equal Estimate = 1 if number of estimated successful shots equals the actual number of successful shots, 0 otherwise Lower estimate than actual = 1 if number of estimated successful shots is lower than the actual number of successful shots, 0 otherwise Higher estimate than actual = 1 if number of estimated successful shots is higher than the actual number of successful shots, 0 otherwise	Number of successful shots out of 5 child X thinks they can throw (ball_prac_X in games data) Number of successful shots out of 5 for child X (ball_prac_chX in games data)
Adolescent's risk aversion	Adolescent's willingness to take risk	Willingness to take risk is measured by the position the adolescent choses to throw from in the risk ball bucket throw, with the furthest position (position 3) considered as the least risk averse and the closest position (position 1) as the most risk averse	From which position would you like to throw- 1, 2, or 3? (ball_risk_X in games data)
Adolescent's risk aversion	Adolescent's risk return payoff	If risky throw was successful or not (Yes =1; No = 0)	Risky throw is successful? (ball_risk_X in games data)
Adolescent's willingness to compete	Adolescent's willingness to compete	Willingness to compete = 1 if adolescent chooses tournament option, 0 if chooses the piece-rate option	Do you choose to play piece rate or tournament? (ball_comp_Xa) Purple or orange ball drawn from the sack? (ball_comp_Xb)
	Adolescent's willingness to compete changes after gender of competitor is revealed	Change in willingness to compete = 1 if adolescent changes from their choice to play piece-rate or tournament after the gender of their competitor is revealed	Since you are holding a purple ball, you will be matched with a random girl in the other team. With this information you may change your answer if you wish. Do you choose to play piece rate or tournament? (ball_comp_Xc_1) Since you are holding a purple ball, you will be matched with a random girl in the other team. With this information you may change your answer if you wish. Do you choose to play piece rate or tournament? (ball_comp_Xc_2)