Summary Report

ADOLESCENTS 360 OUTCOME EVALUATION IN ETHIOPIA

August 2021

Authors: Catarina Krug, Christian Bottomley, James Hargreaves, Aoife Doyle and Melissa Neuman (London School of Hygiene and Tropical Medicine)

Source of image: Adolescents 360 website

Acknowledgements

We are very grateful for the cooperation of all the A360 Consortium organizations in providing us with the information required to develop the study protocols for the outcome evaluation. We would also like to thank the study participants and MMA who conducted the data collection in Ethiopia.

Disclaimer

The views within this document are entirely those of the outcome evaluation team. They do not represent those of any of the individuals and organizations referred to in the report.

Contents

List of Figures

List of Acronyms

A360	Adolescents 360
BCC	Behavior Change Communication
BMGF	Bill & Melinda Gates Foundation
CAR	Contraceptive acceptance rate
CIFF	Children's Investment Fund Foundation
DHS	Demographic and Health Survey
FP2020	Family planning 2020
HMIS	Health Management Information System
IEC	Information, Education and Communication
LARC	Long-acting reversible contraceptive
LMIC	Low- and Middle-Income Countries
LSHTM	London School of Hygiene and Tropical Medicine
mCPR	Modern contraceptive prevalence rate
ODA	Oromia Development Association
OR	Odds ratio
PMA2020	Performance Monitoring for Action 2020
PPE	Personal protective equipment
PSI	Population Services International
SNNP	Southern Nations, Nationalities and Peoples
WHO	World Health Organization

Executive Summary

Introduction

Around half of adolescent pregnancies in low- and middle-income countries (LMICs) are unintended, contributing to 3.9 million unsafe abortions per year, among girls aged 15–19 years old (WHO, 2020). Ensuring access to sexual and reproductive healthcare services, including for family planning, is critical to reduce newborn, child and maternal mortality (Bearinger et al., 2007, UN, 2015). Using modern contraception specifically, increases girls' and women's empowerment in terms of mobility and decision-making power, and brings greater educational and employment opportunities (Alano and Hanson, 2018). However, adolescent girls face a variety of barriers in obtaining and using modern contraception (WHO, 2020, Chandra-Mouli et al., 2014).

In Ethiopia, 37% of married adolescent girls use modern contraceptive methods according to the Demographic and Health Survey (DHS, 2019). There is large regional variation, with use of modern contraceptive methods by married women aged 15–49 years old varying from 3% in Ethiopia Somali, 13% in Afar, 39% in Oromia and 48% in Addis Ababa (DHS, 2019).

Adolescents 360

The Adolescents 360 (A360) program developed the 'Smart Start' intervention in Ethiopia. This intervention aimed to increase use of voluntary modern contraception among sexually active married girls aged 15–19 years old in four Ethiopian regions: Amhara, Oromia, Southern Nations, Nationalities and Peoples (SNNP) and Tigray (A360, 2020). The program combined human-centered design (IOS, 2010, Kling and Star, 1998, Bjögvinsson et al., 2012, Norman, 2016) with adolescent developmental science, cultural anthropology and social marketing (IOS, 2010).

Smart Start used financial planning as an entry point to discuss contraception with newly married couples. It leveraged the nationwide Health Extension Worker network, supported by a Smart Start team, the Women's Development Army[1] (Damtew et al., 2018) and Youth Champions[2] (Punton and Wallach, 2020). Health Extension Workers and Smart Start Navigators were trained to host conversations and provide services in an approachable way for rural, married, adolescent girls and their husbands, using a visual discussion guide. Smart Start also engaged with community leaders through *kick-off meetings* (Punton and Wallach, 2020).

The external evaluation of the Smart Start intervention comprised a process evaluation, an outcome evaluation and a cost-effectiveness study. In this report, we focus on the outcome evaluation in Ethiopia. Our primary aim was to evaluate the effectiveness of the Smart Start intervention in increasing the modern contraceptive prevalence rate (mCPR) among girls aged 15–19 years in study sites. Our secondary aims were to:

(1) Evaluate the effectiveness of the Smart Start intervention in changing secondary outcomes aligned with the A360 Theory of Change **(Figure 1:)**;

(2) Examine data on modern contraceptive use available from other sources for the time period 2015–2018 to assess whether changes in mCPR in A360 communities (2017–2020) reflect the overall trend in mCPR, or whether mCPR appears to have increased more than would be expected during this time period; and

[1] The Women's Development Army were introduced by the Ethiopian Government to help the Health Extension Program providing basic health services and bridging the gap between the community and health facilities.

[2] Youth Champions were young girls particularly enthusiastic about A360 that were identified by Smart Start Navigators and Health Extension Workers and invited to take up the champion role. They helped to spread the word about the program among other young people voluntarily and without any compensation or formal training. There were generally one or two Youth Champions per kebele.

(3) Quantify the association between the respondents' self-reported exposure to A360 and primary and secondary outcomes.

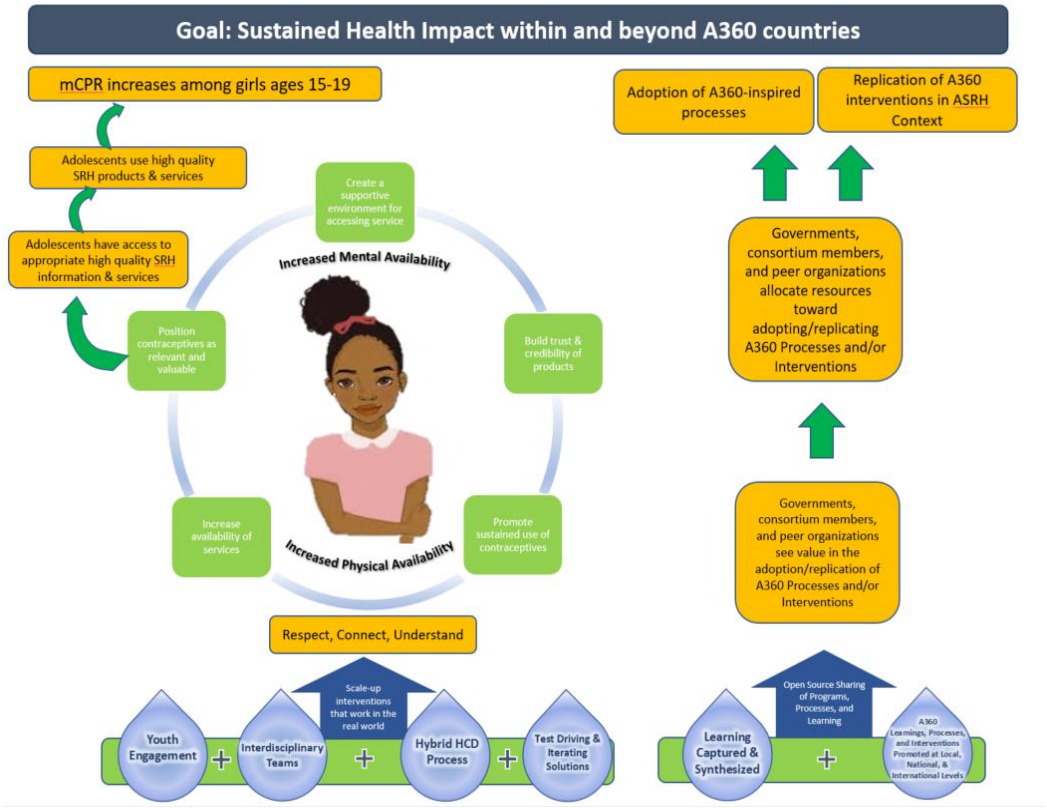


Figure 1: Adolescents 360 Theory of Change[3]

Methods

We used a before-and-after cross-sectional evaluation design. We targeted adolescent girls aged 15–19 years old that were married or living as married at the time of the survey. Baseline and endline population-based surveys were conducted with eligible girls residing in selected woredas in Oromia Region. Baseline surveys were conducted between 8 September 2017 and 17 October 2017 and endline surveys were conducted between 13 November 2020 and 3 December 2020.

In the primary analysis, the impact of Smart Start on each outcome was assessed by quantifying changes between the baseline and endline surveys. Specifically, linear regression models were fitted to obtain the average kebele-level difference between endline and baseline. We adjusted for pre-defined confounding factors as trends in mCPR might be influenced by changing characteristics of the study populations. The factors adjusted for were age, education level, number of living children, religion and wealth quintile, averaged at the kebele level.

In a secondary analysis, data on modern contraceptive use available from other sources for the period 2015–2018 was examined to assess whether changes in mCPR in A360 communities (2015–2018) reflected the overall trend in mCPR, or whether mCPR appeared to have increased more than would be expected during this period. Results on mCPR were interpreted in the light of trend estimates, but no statistical comparison between survey data and secondary data was conducted.

Further, the impact of Smart Start was assessed through self-reported exposure to the Smart Start program in the endline surveys. Logistic regression models were used for binary outcomes, and linear

[3] Source: Slide deck "A360 Evaluation Key findings from the Process Evaluation, 2019", March 2020.

regression models for continuous outcomes. Regression models included a set of pre-defined confounders, the same as described above.

Results

Implementation

The A360 interventions (Smart Start) were implemented as follows:

- In Fentale woreda: from April 2018, the intervention program was delivered over a period of 31 months in total.
- In Ada'a woreda: from June 2018, the program was implemented for 29 months.
- In Lome and Wara Jarso woredas: from August 2018, the program was implemented for 27 months.[4]

Implementation was conducted in a staggered way across kebeles and by the end of 2020 all kebeles were expected to have received the intervention.[5]

Characteristics of adolescent girls

In baseline and endline surveys, most survey respondents were 18 or 19 years old and around half of them had only had a primary level education. Orthodox Christian was the most common religion.

Primary outcome

Our findings indicate that the mCPR among married girls aged 15–19 years old across all selected woredas in Oromia Region increased by 5.1% (95%CI: 0.7–9.5) from baseline to endline, after adjusting for confounding variables. mCPR was 63.8% (95%CI: 56.6–71.0) at baseline and 68.4% (95%CI: 61.8–74.9) at endline, corresponding to an increase of 5.2% (95% CI: -0.3% to 10.7%) in the unadjusted model.

The secondary data analysis of trends in Ethiopia did not show a clear trend in modern contraceptive use between 2015 and 2018 at national level (PMA2020 population-based surveys).

Secondary outcomes

Figure 2: shows a summary of the results. There was evidence of an increase over time in seven outcomes associated with A360 Theory of Change components as follows: proportion of modern contraceptive users using a long-acting reversible contraceptive (LARC); knowledge (i.e. awareness) of where to obtain health services; knowledge of modern contraceptive products; the girls' views on the benefits of modern contraception (i.e. benefit 1; **Figure 2:A**); attitudes, self-efficacy and community acceptance towards the use of modern contraceptives (**Figure 2:B**).

The association between self-reported exposure to Adolescents 360 and primary and secondary outcomes

Self-reported exposure to A360 was 23.6% (95%CI: 18.0–30.3). The secondary analyses showed evidence that the subset of married adolescent girls who reported exposure to A360 had higher mCPR than those who reported no exposure.[6]

[4] Start dates were defined using PSI reports and monitoring data. PSI revised and confirmed these start dates with the outcome evaluation team on 9 February 2021.

[5] Source of information: Document entitled "A360 OE site mapping" shared by Mathew Wilson, PSI, on 12/11/2020.

[6] Odds Ratio: 2.1; 95%CI: 1.3-3.3

Self-reported exposure to A360 was also associated with past use (in the last 12 months) of a modern contraceptive method, reduced unmet need, increased knowledge (i.e. awareness) of contraceptive products and the girls' views on the benefits of contraception (i.e. benefit 2; **Figure 3A**), as well as attitudes towards the use of modern contraceptives (**Figure 3B**).

Discussion and Conclusion

Our findings indicate that the delivery of the Smart Start program was associated with a 5.1% population level (95%CI: 0.7% to 9.5%) increase in modern contraceptive use among married girls aged 15–19 years old across four woredas in Oromia Region, Ethiopia. In implementation woredas, approximately 24% of married adolescent girls reported exposure to A360 interventions, and there was some evidence that this subset of married adolescent girls had greater mCPR than those who reported no exposure to the interventions. This change in mCPR was driven by a large increase in one woreda (Wara Jarso). The interventions also affected some, but not all, secondary outcomes.

The study design did not include a comparison group and consequently, mCPR could have increased over time for reasons other than the A360 intervention itself. The alternative explanations for an increase in mCPR include a time trend in modern contraceptive use, other competing interventions and residual confounding.[7] The change between baseline and endline surveys within the implementation woredas was larger than overall trends in mCPR in Ethiopia, using a secondary dataset between 2015 and 2018 (PMA2020), but this dataset is not directly comparable to our target population. Moreover, the association between some of the outcomes and self-reported exposure to A360 strengthen the validity of our findings. Therefore, based on our data, even in the absence of comparison groups, the proposed association between A360 interventions and improvements in mCPR[8] is plausible.

The triangulation with trends in contraceptive use over time and self-reported exposure analysis was an important component of this outcome evaluation, which strengthened the possible inferences drawn from the study findings. Other components of the A360 program such as the monitoring and evaluation data collected by the A360 program implementers, and the accompanying process evaluation, complement and aid interpretation of the findings presented here. Notably the A360 process evaluation used a theory-based methodology to evaluate how the A360 approach and solutions were operationalized and experienced by participants. These findings provide a more nuanced representation of the A360 program in it's entirely. The full report from the process evaluation and a final summative report, which triangulates findings from across the evaluation, is available on the Itad Website.

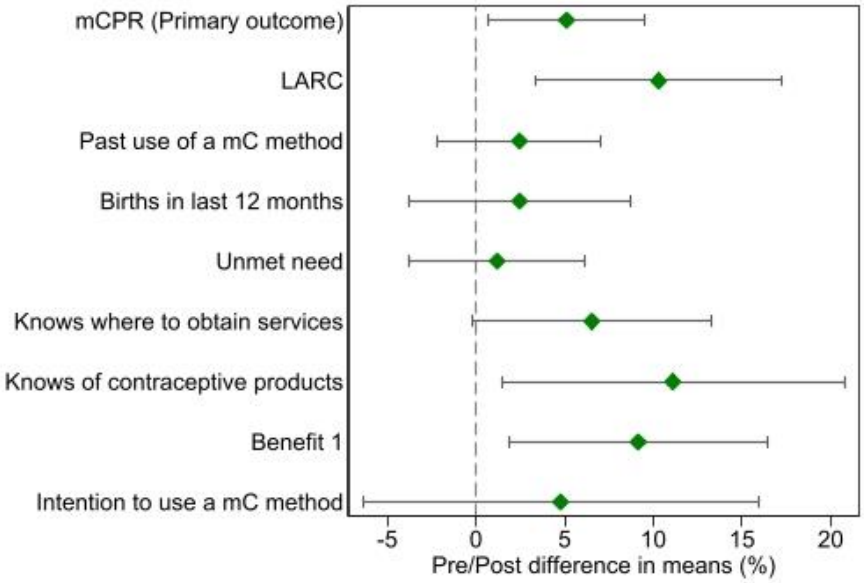
[7] Analysis was adjusted for known confounders and factors imbalanced between baseline and endline populations, nevertheless, observed changes in mCPR and secondary outcomes might be due to other factors that we did not measure in our surveys, e.g. residual confounding.

[8] As well as improvements in awareness of modern contraceptive products and attitudes towards the use of modern contraceptives.

Figure 2: Pre- post-intervention difference in means for binary (Figure 2A) and continuous outcomes (Figure 2B)

Note: Results of linear regression models adjusted for pre-defined confounding factors – age, religion, education level, number of living children and wealth quintile; except associations with births in the last 12 months, which were not adjusted for number of living children.

Figure 2A



Abbreviations:
mCPR, modern contraceptive prevalence rate
LARC, long-acting reversible contraception
mC, modern contraceptive
Benefit 1, % agreeing with statement 'Using modern contraception can allow a girl to complete her education, find a better job, and have a better life'

Figure 2B

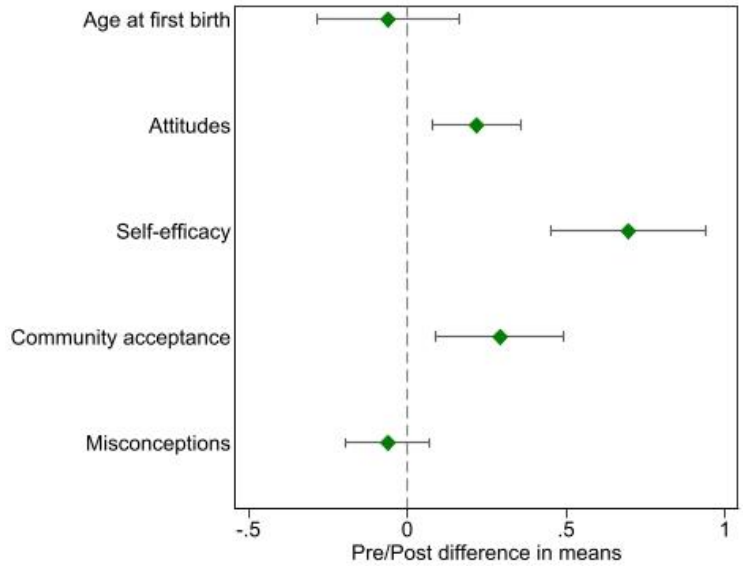
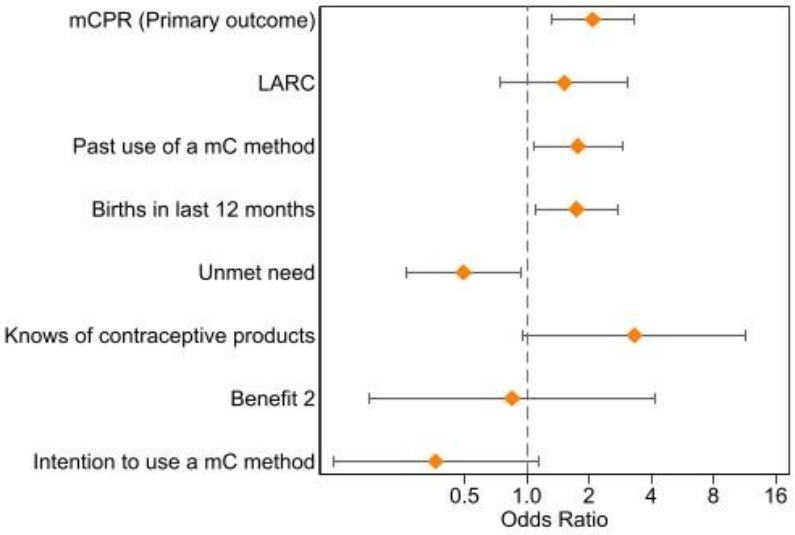


Figure 3: Associations between self-reported exposure and binary outcomes (odds ratios; Figure 3A) and between self-reported exposure and continuous outcomes (exposed/non-exposed difference in means; Figure 3B)

Note 1: Results of logistic (Figure 3A) and linear regression models (Figure 3B) adjusted for pre-defined confounding factors – age, religion, education level, number of living children and wealth quintile; except associations with births in last 12 months, which were not adjusted for number of living children.

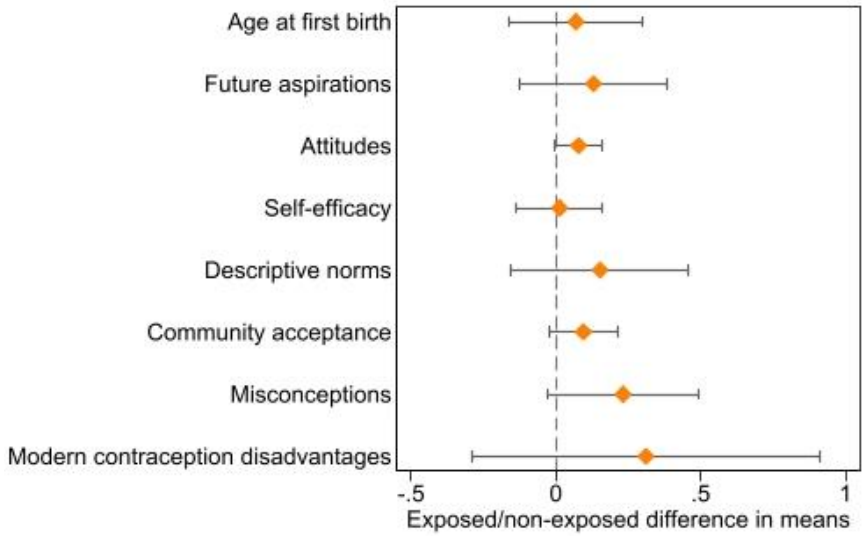
Figure 3A



Abbreviations:
mCPR, modern contraceptive prevalence rate
LARC, long-acting reversible contraception
mC, modern contraceptive
Benefit 2, % agreeing with statement 'Using modern contraception can support a girl to achieve her life goals'

Note 2:
It was not possible to calculate the association between 'Knows where to obtain services' and exposure, or between 'Benefit 1' and exposure due to paucity of data.

Figure 3B



Adolescents 360 Outcome Evaluation in Ethiopia

Summary report

1 Introduction to the program and the evaluation

1.1 Background

Around half of adolescent pregnancies in LMICs are unintended, contributing to 3.9 million unsafe abortions per year among girls aged 15–19 years old (WHO, 2020). Ensuring access to sexual and reproductive healthcare services, including for family planning, is a critical factor in reducing newborn, child and maternal mortality (Bearinger et al., 2007, UN, 2015). Using modern contraception specifically increases girls' and women's empowerment in terms mobility and decision-making power, it brings greater educational and employment opportunities, and it creates peace and stability in their lives (Alano and Hanson, 2018). However, adolescent girls face a variety of barriers in obtaining and using modern contraception. These may be divided into demand-side (or user-side) and supply-side (or provision-side) factors (WHO, 2011, McCleary-Sills et al., 2014, Chandra-Mouli et al., 2017). User-side barriers are related to adolescent girls' knowledge, attitudes, practices and behaviors. Provision-side barriers are those related to the service delivery system.

In Ethiopia, 37% of married adolescent girls use modern contraceptive methods (DHS, 2019). There is large regional variation, with use of modern contraceptive methods by married women aged 15–49 years old varying from 3% in Ethiopia Somali, 13% in Afar, 39% in Oromia and 48% in Addis Ababa (DHS, 2019). Ethiopia is a patriarchal society, prioritizing boys in both nutrition and education, preventing girls from improving their sexual and reproductive health (Gates, 2014, Sida, 2003, UNFPA, 2008, GI, 2014). Social norms are therefore an important barrier in obtaining modern contraception (Berhane et al., 2019).

Successful interventions aimed at adolescents stress the importance of involving adolescents in the planning process (Gottschalk and Ortayli, 2014). Since sexual and reproductive health outcomes are determined by a variety of factors (Viner et al., 2012), interventions should be multicomponent and should respond to the differing needs of different groups of adolescents (e.g. married vs unmarried, sexually active vs not sexually active, in-school vs out-of-school). There is no "one-size fits-all" answer when it comes to the effectiveness of an intervention (Haberland et al., 2018).

1.2 Adolescents 360 Intervention

Adolescents 360 (A360) was an initiative to increase the voluntary use of modern contraception among sexually active girls aged 15–19 years old in Ethiopia, Nigeria and Tanzania (Atchison et al., 2018). It used a multidisciplinary approach to design and scale up programs that brought together social marketing, human-centered design, developmental neuroscience, sociocultural anthropology and youth engagement. Funding for A360 came from the Bill and Melinda Gates Foundation (BMGF) and the Children's Investment Fund Foundation (CIFF). Population Services International (PSI) led the implementation of A360 in Ethiopia. Program implementation was accompanied by a monitoring and evaluation component to examine process level indicators such as the number of girls reached.

The A360 program included demand-side and supply-side elements. User-side elements included community engagement and the involvement of husbands/partners. Provision-side elements of A360 included outreach activities and the provision of free contraception.

The Adolescents 360 (A360) program developed the 'Smart Start' program in Ethiopia (Cutherell and Cole, 2019). This intervention used financial planning as an entry point to discuss contraception with newly married couples. It leveraged the nationwide Health Extension Worker network, supported by a Smart Start team, the Women's Development Army[9] (Damtew et al., 2018) and Youth Champions[10] (Punton and Wallach, 2020). Health Extension Workers and Smart Start Navigators were trained to host conversations and provide services in an approachable way for rural, married, adolescent girls and their husbands, using a visual discussion guide. Smart Start also engaged with community leaders through *kick-off* meetings (Punton and Wallach, 2020). Smart Start was implemented in four regions in Ethiopia: Amhara, Oromia, SNNP and Tigray (**Figure 4:**) (A360, 2020).

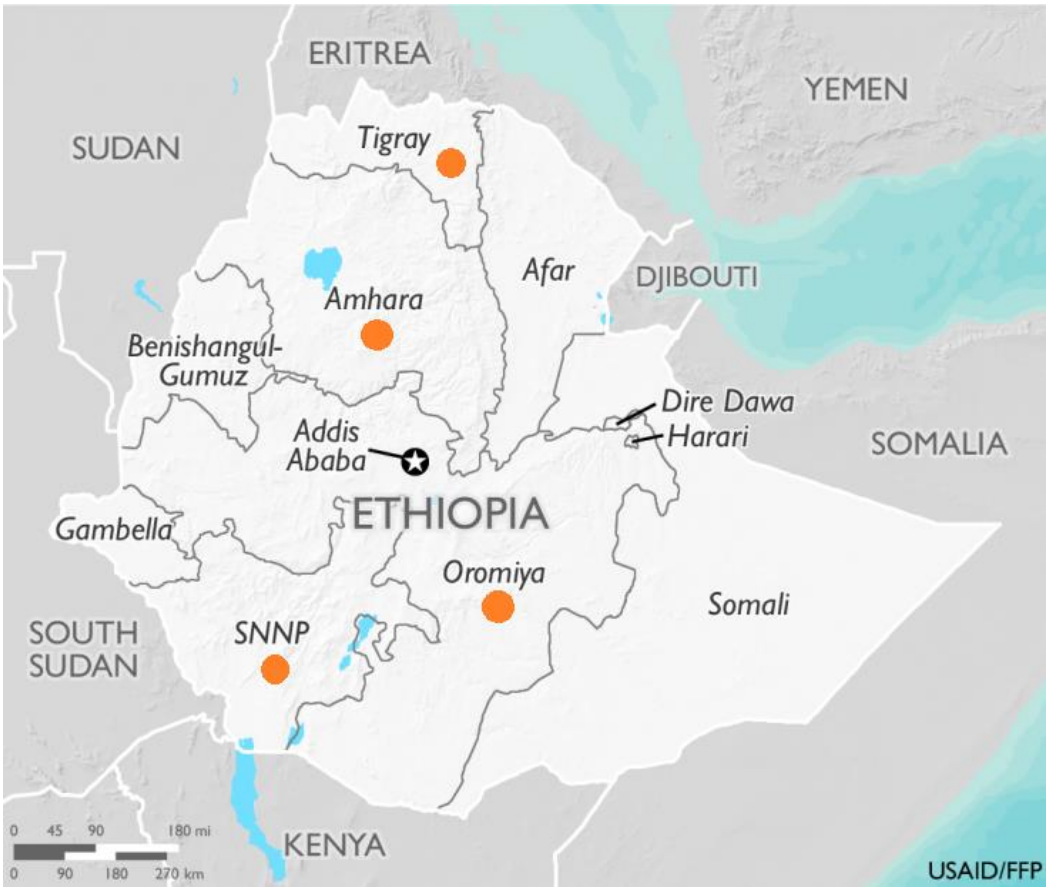


Figure 4: **Map of Ethiopia, showing the regions where Smart Start (orange dots) interventions were implemented.**

1.3 Conceptual framework

The A360 project was underpinned by a Theory of Change (**Figure 5**), which elaborated the theoretical causal pathways through which the project intended to affect change, and it was the central framework for analysis and interpretation of outcome evaluation data (Itad and the London School of Hygiene and Tropical Medicine (LSHTM), 2016).

[9] The Women's Development Army was introduced by the Ethiopian Government to help the Health Extension Program providing basic health services and bridging the gap between the community and health facilities.

[10] Youth Champions were girls who were particularly enthusiastic about A360 that were identified by Smart Start Navigators and Health Extension Workers and invited to take up the champion role. They helped to spread the word about the program among other young people voluntarily and without any compensation or formal training. There were generally one or two Youth Champions per kebele.

1.4 Hypothesis and aims

Our primary hypothesis was that the intervention would lead to an increase in the modern contraceptive prevalence rate (**mCPR**) over time greater than the increase that would have been expected to occur in the absence of the intervention. Accordingly, our primary aim was to evaluate the effectiveness of Smart Start in increasing mCPR among married 15–19-year-old girls. Our secondary aims aligned with the A360 Theory of Change (**Figure 5**) and are presented in Error! Reference source not found..

To strengthen the validity of our findings, we also aimed to:

(1) Examine data on modern contraceptive use available from other sources for the time period 2015–2018 to assess whether changes in mCPR in A360 communities (during the period 2017–2020) reflect the overall trend in mCPR, or whether mCPR appears to have increased more than would be expected during this time period; and

(2) Quantify the association between the respondents' self-reported exposure to Smart Start and the primary and secondary outcomes.

1.5 Structure of the report

The external evaluation of the A360 intervention comprised a process evaluation led by Itad, an outcome evaluation led by London School of Hygiene and Tropical Medicine (LSHTM), and a cost effectiveness study led by Avenir Health. This report presents key findings and insights emerging from the outcome evaluation in Ethiopia. The target audiences are BMGF, CIFF, and the PSI-led consortium that implements the A360 program.

We start by presenting a summary of the methods used for the outcome evaluation that is supported by several appendices. The methods are followed by the results section, which is organized as: 3.1 evaluation setting, 3.2 adolescent girls' characteristics, 3.3 main outcome, 3.4 secondary outcomes subdivided into Theory of Change components, as shown in Error! Reference source not found. and 3.9 association between self-reported exposure to A360 and primary and secondary outcomes. The report ends with a short discussion and conclusion.

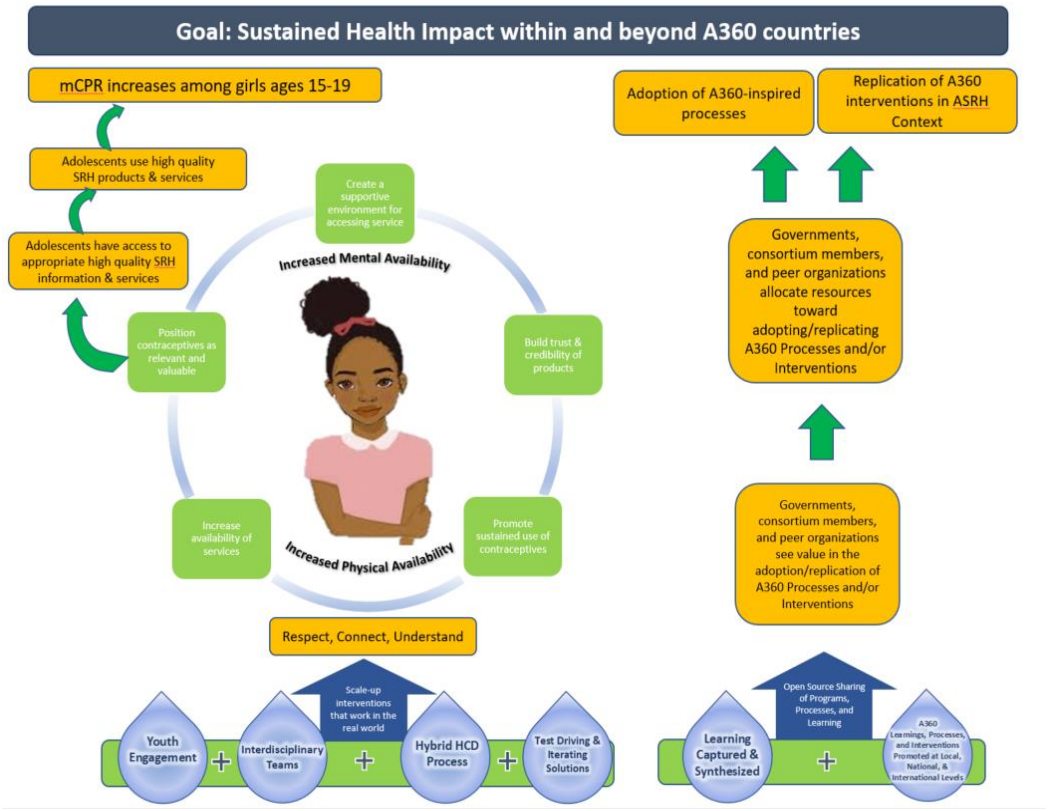


Figure 5: Adolescents 360 Theory of Change[11]

Table 1: Adolescents 360 Theory of Change and the outcome evaluation components

A360 Theory of Change	Outcome Evaluation Components
Adolescents use high quality sexual and reproductive health products and services	mCPR (primary outcome) Proportion of current modern contraceptive users who are using a LARC Use of modern contraceptive in the last 12 months Age at first birth Age-specific fertility rate Unmet need for modern contraception
Adolescent girls have access to appropriate high quality sexual and reproductive health information and services	Awareness of contraceptive products Awareness of where to obtain health services
Contraception positioned as relevant and valuable for adolescent girls	Future aspirations Benefits of modern contraception Intention to use a modern method
Supportive environment for adolescent girls to access services created	Attitudes towards the use of modern contraceptives to prevent unintended pregnancies Self-efficacy to use modern contraceptives Perception of the behavior of girls in the community in relation to contraceptives (Descriptive norms) Community acceptance and social support for adolescent girls to adopt healthy sexual and reproductive health behaviors, including use of modern contraceptives
Trust and credibility of family planning products	Misconceptions about modern contraceptives Modern contraceptives disadvantages

[11] Source: Slide deck "A360 Evaluation Key findings from the Process Evaluation, 2019", March 2020.

Family planning services available for adolescent girls	Not measured [1]
Adolescent girls sustain use	Not measured [1]

[1] We had to remove questions on the detailed use of contraceptives at endline to reduce the length of the questionnaire due to the COVID-19 pandemic (see **Appendix A** for more detail).

2 Methods

2.1 Evaluation setting

The intervention was evaluated in Oromia Region. Study regions and woredas were selected by PSI. Oromia Region was selected because of its relatively low rate of mCPR when compared with other regions in Ethiopia, (DHS 2011, 24.9%) and as it stood out as having the highest unmet need for contraception (29.9%) when compared with other regions (DHS, 2011). Out of 21 Administrative Zones within Oromia Region, four woredas pertaining to two Administrative Zones were selected for the outcome evaluation: Fentale, Ada'a and Lome woredas in East Shewa Administrative Zone (which has 12 woredas), and Wara Jarso in North Shewa Administrative Zone (which has 14 woredas). PSI tracked other sexual and reproductive health interventions in study areas, which we aim to summarize in this report. The methodology used in the outcome evaluation is described in detail in Atchison et al. (2018) and in **Appendix A**.

2.2 Design and instrumentation

We used a before-and-after cross-sectional evaluation design. We targeted adolescent girls aged 15-19 years old who were married or living as married at the time of the survey. Eligible girls were identified using a cluster sampling design. At baseline, a probability sample of 57 kebeles out of 104 kebeles was selected from across the four study woredas, with probability proportional to population size. Within the selected kebele, all households were visited and a questionnaire given to all eligible girls. At endline, we interviewed eligible girls living in the 57 kebeles that were included at baseline. Although the design meant that it was possible that in each site the same households and individuals could be included in baseline and endline surveys, no attempt was made to trace individuals or households from baseline to endline.

An external firm (MMA) collected baseline population-based survey data between 8 September 2017 and 17 October 2017 and endline survey data between 13 November 2020 and 3 December 2020. Data collection followed strict protocols and was closely supervised by the outcome evaluation lead and in-country team members.

Questionnaires were adapted from the Demographic and Health Survey (DHS, 2013) and Family Planning 2020 (FP2020) survey instruments and were pre-tested for comprehension, flow, appropriateness and feasibility of implementation. At baseline, questionnaires were administered face-to-face, whereas at endline, the first part was administered face-to-face and the second part by phone (see **Appendix A** for details) due to COVID-19 related restrictions on data collection. Individual, informed consent, and where required, parental/guardian consent was obtained from all participants before conducting the interviews.

We also interviewed a sample of husbands of the girls interviewed. Girls were required to consent to their husband being interviewed, and this secondary population is potentially not representative of the whole population of husbands. Results are presented in **Appendix G**.

The study was approved by the Oromia Health Bureau Research Ethical Review Committee on 28 October 2020 (reference number BEF0/AHBTFH/1-16/3089) and by the LSHTM ethics committee (reference number 14145 - 01c) on 3 November 2020. The final study designs were discussed and agreed upon with BMGF and CIFF, with the sizes of surveys in each location constrained by the budget available.

2.3 Outcome measures

The primary study outcome was mCPR, defined as the proportion of fecund and sexually active[12] girls who reported using modern contraception at the time of the surveys. We also described the prevalence of

[12] Fecund girls: those who have started menstruating, are not pregnant and do not report that they are infertile. Sexually active girls: those who report having sexual intercourse in the last 12 months.

modern contraceptives using the DHS definition to allow direct comparison with other studies that have used the DHS definition (**Appendix E**).

To better understand the pathways through which the A360 program could affect mCPR, the secondary outcomes described in Error! Reference source not found. were also measured. At baseline, the details of A360 interventions were not fully known (Atchison et al., 2018). Therefore, at endline, to better capture specific components of the A360 intervention, we added questions on future aspirations, benefits of modern contraception, descriptive norms and modern contraceptive disadvantages. The addition of these questions represented a minor deviation from the published protocol (Atchison et al., 2018). A summary of the categorization of secondary outcomes is provided in **Table 1;** detailed information is provided in **Appendix A**.

Table 1 Description of secondary outcomes, by Adolescents 360 Theory of Change components

Theory of Change component 1: Adolescents use high quality sexual and reproductive health products and services
• **Outcome 1**: Proportion of current modern contraceptive users who were using long-acting reversible contraception among sexually active girls (in the last 12 months).
• **Outcome 2**: Use of modern contraceptive 12 months before the survey among sexually active girls.
• **Outcome 3**: Age at first birth among girls who gave birth.
• **Outcome 4**: Births in last 12 months: Adolescent girls were divided into two categories, those who had given birth in the 12 months before the survey, and those who had not.
• **Outcome 5**: Unmet need for modern contraception[1] among sexually active girls (in the last 12 months).
Theory of Change component 2: Adolescent girls have access to appropriate high quality sexual and reproductive health information and services
• **Outcome 6**: Awareness of contraceptive products: sexually active girls (in the last 12 months) were divided into two categories, those who answered 'Yes' to the question 'Have you ever heard of contraceptives?' and those who did not.
• **Outcome 7**: Awareness of where to obtain health services: sexually active girls (in the last 12 months) who were not currently using a contraceptive method (traditional or modern) but intended to use one in the future, were divided into two categories: those who answered 'Yes' to the question 'Do you know of a place where or person from whom you would feel comfortable getting family planning services and products to delay or avoid getting pregnant?' and those who did not.
Theory of Change component 3: Contraception positioned as relevant and valuable for adolescent girls
• **Outcome 8**: Future aspirations index (0-10), created using four statements presented to girls who heard of contraceptives: 'I have goals for my life' (2 strongly agree, 1 agree, 0 disagree or strongly disagree), 'I believe I have some tools to help me achieve my goals for my life' (2 strongly agree, 1 agree, 0 disagree or strongly disagree), 'I have little control over the things that happen to me' (0 strongly agree or agree, 1 disagree, 2 strongly disagree), and 'I believe preventing unintended pregnancy is important to help me achieve my goals for life' (4 strongly agree, 3 agree, 0 disagree or strongly disagree); greater scores were more desirable than lower scores.
• **Outcome 9**: Benefit 1 of modern contraception: girls who had heard of contraceptives were divided into two categories, those who agreed with the sentence 'Using modern contraception can allow an adolescent girl to complete her education, find a better job and have a better life', and those who disagreed.
• **Outcome 10**: Benefit 2 of modern contraception: girls who heard of contraceptives were divided into two categories, those who agreed with the sentence 'Using modern contraception can allow a girl to achieve her life goals', and those who disagreed.
• **Outcome 11**: Intention to use a modern method: sexually active girls (in the last 12 months) who were not using a modern method at the time of the survey were divided into two categories, those who intended to use a method, and those who did not.
Theory of Change component 4: Supportive environment for adolescent girls to access services created

• **Outcome 12**: Attitudes index (0-2; towards the use of modern contraceptives), created using two questions among girls who heard of contraceptives; 'Do you approve or disapprove of married couples using a modern contraceptive method to avoid or delay pregnancy?' (1 approve, 0 disapprove) and 'Do you approve or disapprove of couples who are not married using a modern contraceptive method to avoid or delay pregnancy?' (1 approve, 0 disapprove); greater scores were more desirable than lower scores.
• **Outcome 13**: Self-efficacy index (0-4; to use modern contraceptives)created using four statements presented to girls who had heard of contraceptives: whether she felt able to start a conversation with her partner about contraception (1 agree, 0 disagree), felt able to use a method of contraception even if her partner did not want her to (1 agree, 0 disagree), felt able to obtain information on contraception services and products if she needed to (1 agree, 0 disagree), and felt able to obtain a contraception method if she decided to use one (1 agree, 0 disagree); greater scores were more desirable than lower scores.
• **Outcome 14**: Descriptive norms index (0-6) created using three questions presented to girls who had heard of contraceptives: 'How many married girls aged 15-19 years old in your community do you believe discuss using a method of contraception with their boyfriend or partner/husband or partner?' (2 most of them, 2 less than half of them, 0 none of them), 'How many married girls aged 15-19 years old in your community do you believe use contraceptive methods?' (2 most of them, 1 less than half of them, 0 none of them) and 'How many married girls aged 15-19 years old in your community do you believe use contraceptive methods in secrecy from their husband or partner?' (2 most of them, 1 less than half of them, 0 none of them); greater scores were more desirable than lower scores.
• **Outcome 15**: Community acceptance index (0-2) created using two questions presented to sexually active girls (in the last 12 months) who had heard of contraceptives; 'Does your husband approve or disapprove of girls your age using a modern contraceptive method to avoid or delay pregnancy?' (1 approve, 0 disapprove) and 'Does your community as a whole approve or disapprove of girls your age using a modern contraceptive method to avoid or delay pregnancy?' (1 approve, 0 disapprove); greater scores were more desirable than lower scores.
Theory of Change component 5: Trust and credibility of family planning products
• **Outcome 16**: Misconceptions index (0-3; about contraceptives) created using three variables presented to sexually active girls (in the last 12 months) who had heard of contraceptives; 'Some modern contraception can stop an adolescent woman from ever being pregnant again even after she stops using it' (0 agree, 1 disagree), 'If a modern contraception changes an adolescent woman's menstrual bleeding, it is bad for her health and can harm her womb' (0 agree, 1 disagree) and 'Some modern contraceptives can make adolescent women permanently fat' (0 agree, 1 disagree); greater scores were more desirable than lower scores.
• **Outcome 17**: Modern contraceptives disadvantages index (0-7), created using the number of disadvantages/negative consequences of using modern contraceptive methods mentioned by girls who heard of contraceptives; greater scores were less desirable than lower scores.
Theory of Change component 6: Family planning services available for adolescent girls
• n/a
Theory of Change component 7: Adolescent girls sustain use
• n/a

[1] The sum of unmet need for spacing and unmet need for limiting. Unmet need for spacing includes pregnant women whose pregnancy was mistimed, fecund women who are non-pregnant, who are not using any modern method of contraception, and say they want to wait two or more years for their first/next birth, and postpartum amenorrheic women, who are not using any modern method of contraception, and say at the time they became pregnant they had wanted to delay pregnancy. Unmet need for limiting refers to pregnant women whose pregnancy was unwanted, fecund women who are non-pregnant, who are not using any modern method of contraception, and want no more children; and postpartum amenorrheic women, who are not using any modern method of contraception, and say at the time they became pregnant they had not wanted any more children.

2.4 Statistical analysis

The impact of Smart Start on each outcome was assessed primarily by quantifying changes between baseline and endline. To conduct the primary analysis, first the mCPR rate was calculated for each kebele in the baseline and endline surveys, then the change over time was estimated by regressing the kebele rates on time ('0' baseline and '1' endline). In this model, the coefficient associated with time represents the average kebele-level difference between endline and baseline, i.e. there is an increase over time if the regression coefficient is above 0, and a decrease over time if the regression coefficient is below 0. We adjusted for pre-defined confounding factors, as trends in mCPR might be influenced by changing characteristics of the study populations. The factors adjusted for were age, education level, living children, religion[13] and wealth quintile[14] averaged at the kebele level. We also adjusted for kebele, to account for variation in mCPR between kebeles.

Detailed information about the regression models used and statistical power of the study is provided in **Appendix A**. We used p=0.05 as the cut-off for statistical significance in the analysis of mCPR. For the secondary outcomes 'multiple testing' is an issue[15] (Dohoo et al., 2009), and we have therefore been more cautious in our interpretation of the analysis of these outcomes. The results of the outcome analyses were described in terms of the strength of evidence of effect by size rather than by statistical significance. Ethiopia data was analyzed by accounting for sampling weights (details in **Appendix A**). We conducted all the analysis in Stata 16.

2.4.1 Analysis of trends in modern contraceptive use

In a secondary analysis, data on modern contraceptive use available from other sources for the time period 2015–2018 was examined to assess whether changes in mCPR in A360 communities (in the period of the intervention, 2017–2020) reflected the overall trend in mCPR, or whether mCPR appears to have increased more than would have been expected during this time period. This was done because study outcomes were measured in intervention areas only and there was no comparison group, so observed changes in mCPR could be due to secular trends or other influences (Atchison et al., 2018).

Data analyses were conducted in July 2020. **Appendix A** describes the main datasets on modern contraceptive use in Ethiopia in terms of aim, methodology, as well as their quality and availability. After evaluating all datasets, we decided to estimate trends in modern contraceptive use using the Performance Monitoring for Action 2020 (PMA2020) dataset. PMA2020 was launched in 2013 to monitor the progress of the FP2020 initiative (Horton and Peterson, 2012) and is implemented at the national level in Ethiopia. PMA2020 conducted multiple surveys asking questions on fertility, contraceptive use and other related measures. We analyzed PMA2020 datasets from 2015 (round 3) to 2018 (round 6). We used the same mCPR definition used in the outcome evaluation. We focused on women aged 15–49 years old, for greater precision in estimates (i.e. smaller 95%CI), as PMA2020 surveys only have a small sample of married girls aged 15-19 years old.

2.4.2 Association between self-reported exposure to A360 and primary and secondary outcomes

Finally, the impact of Smart Start was assessed through self-reported exposure to Smart Start in endline surveys. Respondents were coded as self-reporting exposure to Smart Start if they fell within at least one of three categories: (1) had heard about Smart Start and recognized at least one of two images related to

[13] Age ranged from 15–19 years old; education was categorized into '1' secondary or technical/ vocational and '0' primary or no education; living children was categorised into '1' respondents with at least one child, and '0' for no living children; religion was categorized into '1' Orthodox and '0' Protestant, Catholic, Muslim, Traditional, or no religion.

[14] Wealth Quintile was derived from a series of questions using the 'Ethiopia Equity Tool' available at www.equitytool.org/ethiopia. In summary, if the population of interest is predominantly urban, results are compared to other urban dwellers for interpretation, by generating urban wealth quintiles. If the population of interest lives in rural areas, or a mix of urban and rural areas, results are compared to the national results to understand how relatively wealthy or poor they are in comparison to the whole country, by calculating national wealth quintiles. Wealth quintiles range from poorest (1st and 2nd quintiles) to richest (4th and 5th quintiles).

[15] 'Multiple testing' issues arise when one dataset is used to respond to several questions/hypothesis. The greater the number of hypotheses being tested, the greater the likelihood to produce Type I error (i.e. rejection of a null hypothesis that is actually true).

the intervention; (2) had heard about Smart Start and the *goal card*; or (3) had heard about Smart Start and had a *goal card*. A summary of questions is presented in **Table 3**, and detailed information about the categorization of exposure measures is provided in **Appendix B**.

The association with self-reported exposure to Smart Start was evaluated using data from intervention areas at endline. In addition to exposure status ('0' not exposed and '1' exposed), the regression models included kebeles and a set of pre-defined confounders, the same as has been described above. For modern contraceptive use (and other binary outcomes), we used logistic regression models. The analysis calculates the ratio of the odds of mCPR among exposed and the odds of mCPR among non-exposed to obtain an odds ratio (OR); the association is positive if OR > 1, and negative association if OR <1. For continuous outcomes, such as future aspirations index score, the difference in the mean score between girls who had been exposed to A360 and girls who had not been exposed was calculated using linear regression models. The association is positive if the difference is above zero and negative if it is below zero.

Table 2: Defining exposure to Smart Start based on exposure questions

Question	Exposure Questions	Exposed	Not exposed
1	Have you ever heard of 'Smart Start'?	Answers "Yes" to Q1 and "Yes" to Q2/Q3/Q4/Q5	Answers "Yes" to Q1 but not to Q2/Q3/Q4/Q5
2	Have you ever seen any of these images? (Fig 1)	Answers "Yes" to Q2 and "Yes" to Q1	
3	Have you ever seen any of these images? (Fig 2)	Answers "Yes" to Q3 and "Yes" to Q1	
4a	Have you heard about or seen a 'goal card'?	Answers "Yes" to Q4a, disagrees with Q4b and answers "Yes" to Q1	or Answers "No", "Don't know" or does not respond to Q1
4b	Please tell me if you 'agree' or 'disagree' with the following statement "I heard about the 'goal card' but I do not know what it is"		
5	Do you have a 'goal card'?	Answers "Yes" to Q5 and "Yes" to Q1	

Figure 6: Image presented to endline survey respondents

Figure 7: Image presented to endline survey respondents

3 Results

3.1 Evaluation setting

Smart Start was in place for 31 months in Fentale woreda, 29 months in Ada'a woreda and 27 months in Lome and Wara Jarso woredas.

3.1.1 Implementation

The A360 interventions (Smart Start) were implemented as follows:

- In Fentale woreda: from April 2018, the intervention program was delivered in different kebeles within the woreda over a period of 31 months in total.
- In Ada'a woreda: from June 2018, for a total of 29 months.
- In Lome and Wara Jarso woredas: from August 2018, for a total of 27 months.[16]

Implementation was conducted in a staggered way across kebeles, and by the end of 2020 all kebeles were expected to have received the intervention.[17] [18]

3.1.2 Similar interventions in study areas

The before-and-after design cannot control for the presence of other events which are not part of the A360 intervention but which could affect mCPR (Robson et al., 2001, Penfold and Zhang, 2013), such as other sexual and reproductive health interventions occurring in our study sites (i.e. competing interventions). Oromia Development Association (ODA) in association with The David and Lucile Packard Foundation, developed a sexual and reproductive health program aimed at reducing early marriage in the Oromia region of Ethiopia. It was a school-based program delivered by trained teachers (Jackson et al., 2017).[17]

In Fentale woreda, ODA targeted girls aged 15-19 years old. It used Behavior Change Communication (BCC) and Information, Education and Communication (IEC). The program also included community engagement, referral linkage to facilitate the provision of contraceptive methods at health centers, as well as the training of staff from health centers for youth-friendly sexual and reproductive health services.[17]

In Lome woreda, ODA developed school-based learning activities to empower girls and boys aged 12–15 years old (primary; grade 5 to grade 8) by providing relevant sexual and reproductive health awareness (Kaba and Adugna, 2020). The program included game-based learning activities focused on menstrual hygiene and the management of the concerns of schoolgirls, and it had been in place since 2009 (Kaba and Adugna, 2020, Kaba and Geletu, 2020).[17]

In Wara Jarso and in Ada'a woredas, we are not aware of any additional interventions which were targeting adolescent girls besides A360.[17]

[16] Start dates were defined using PSI reports and monitoring data. PSI revised and confirmed these start dates with the outcome evaluation team on 9 February 2021.

[17] 'Specifically, all kebeles in Fentale received the interventions by May 2019, in Ada'a by January 2020, in Lome by December 2020 and in Wara Jarso by May 2020'. Source of information: Document entitled "A360 OE site mapping" shared by Mathew Wilson, PSI, on 12/11/2020.

[18] Source of information: Document entitled "A360 OE site mapping" shared by Mathew Wilson, PSI, on 12/11/2020.

3.2 Characteristics of adolescent girl respondents

Most survey respondents were 18 or 19 years old, and around half of them had primary education only. Orthodox Christian was the most common religion.

At baseline, most survey respondents were 18 years old (41%), did not have any children (50%) and had primary education only (55%). The proportion of respondents who were 18 or 19 years old increased from 68% to 73% from baseline to endline. At endline, there was also greater proportion of respondents with one child (48% versus 44%). Orthodox Christianity remained the most common religion among respondents, followed by Protestant Christianity and Islam. The proportion of respondents in the lowest wealth quintile was slightly lower at endline than at baseline (22% [95%CI: 14–32] versus 33% [95%CI: 23–44]). The proportion of respondents without mobile phone access was also lower at endline than at baseline (19% [95%CI: 15–28] versus 40% [95%CI: 31–50]; Error! Reference source not found. in **Appendix C**).

The proportion of married girls in Ethiopia who reported being sexually active in the last 12 months was similar between baseline (99%, 95%CI: 94–100) and endline (96%, 95%CI: 90–100), however, the proportion of girls who had sex within the month prior to the survey decreased from 91% to 76% (Error! Reference source not found. in **Appendix C**). At endline, there was also a lower proportion of girls who were pregnant at the time of the survey (11.7% versus 17.7%; Error! Reference source not found. in **Appendix C**).

3.3 Main outcome – Modern contraceptive use

Overall, the regression analysis adjusted for confounding factors showed a 5.1% (95%CI: 0.7% to 9.5%) absolute increase in mCPR between baseline and endline surveys.

below presents mCPR results aggregated by kebele.[19] The mCPR was 63.8% (95%CI: 56.6–71.0) at baseline and 68.4% (95%CI: 61.8–74.9) at endline. The regression model adjusted for confounding variables showed evidence of a change in mCPR over time: a 5.1% absolute increase between baseline and endline surveys (95%CI: 0.7% to 9.5%; p-value: 0.03; Error! Reference source not found.). This result was driven by changes in Wara Jarso woreda, where mCPR increased by 12.4% (95%CI: 1.3% to 23.6%; p-value 0.03). In the other woredas there was no evidence of a change (95%CI includes 0; Error! Reference source not found.).

The main reasons for not using a method of contraception included wanting a child/wanting another child (Wara Jarso 29.6%; Lome 18.0%; Ada'a 43.4%; Fentale 21.7%), breastfeeding (Wara Jarso 28.2%; Lome 33.3%; Ada'a 32.4%; Fentale 25.9%) and having recently had a baby (Wara Jarso 7.4%; Lome 7.5%; Ada'a 14.1%; Fentale 11.7%). Opposition by the respondent (0.5%) or their partner (6.6%) to the use of contraception and fear of side effects (2.1%) were not common reasons reported for not using contraception.

[19] Kebele-level analysis was done for simplicity and greater robustness. Note that robustness is achieved when statistics are resistant to errors in the results or data is drawn from a varied range of probability distributions that are little affected by outliers or departures from model assumptions.

Table 3: Descriptive results: Contraceptive use (95%CI) at the kebele-level by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Baseline	Endline	Difference[1] (%)
Overall	63.8 (56.6 to 71.0)	68.4 (61.8 to 74.9)	4.6 (3.9 to 5.2)
Woreda in East Shewa Administrative Zone			
Wara Jarso	73.8 (69.6 to 78.0)	83.4 (74.4 to 92.4)	9.6 (4.8 to 14.4)
Woredas in North Shewa Administrative Zone			
Lome	82.6 (74.3 to 90.8)	77.1 (67.5 to 86.6)	-5.5 (-4.2 to 4.8)
Ada'a	66.4 (50.5 to 82.2)	76.2 (70.0 to 82.5)	9.9 (0.3 to 19.8)
Fentale	18.6 (0.3 to 36.8)	25.6 (10.6 to 40.5)	7.0 (3.7 to 10.3)

[1]Difference between endline and baseline mCPR.

Table 4: Analytical results: the relationship between contraceptive use (95%CI) at the kebele-level and time by woreda in Oromia Region, Ethiopia, unadjusted and adjusted for confounders

	Unadjusted for confounders		Adjusted for confounders[1]	
	Difference[2] (%)	P-value	Difference[2] (%)	P-value
Overall	5.2 (-0.3 to 10.7)	0.07	5.1 (0.7 to 9.5)	0.03
Woreda in East Shewa Administrative Zone				
Wara Jarso	9.6 (0.3 to 18.9)	0.05	12.4 (1.3 to 23.6)	0.03
Woredas in North Shewa Administrative Zone				
Lome	-5.4 (-14.3 to 3.5)	0.22	-0.5 (-7.5 to 6.5)	0.88
Ada'a	12.6 (-5.8 to 31.0)	0.16	5.6 (-4.4 to 15.6)	0.25
Fentale	7.0 (-3.9 to 17.9)	0.18	-5.3 (-12.7 to 2.1)	0.14

[1]Age, wealth quintile, education, living children and religion.

[2]Difference between endline and baseline mCPR.

3.3.1 Analysis of trends in modern contraceptive use

The secondary data analysis of trends in Ethiopia did not show a clear trend in modern contraceptive use between 2015 and 2018 at national level (PMA2020 population-based surveys). **Figure 8:** describes modern contraceptive use among women aged 15-49 years old in Ethiopia in 2015-2018. There seems to be an upward trend in mCPR, but the 95% confidence interval for mCPR estimates overlap, showing that it did not differ between years.

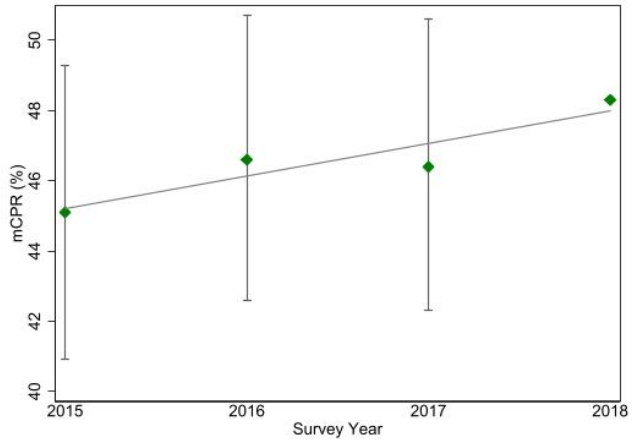


Figure 8: Secondary dataset (PMA2020) – Modern contraceptive use among married and unmarried women aged 15-49 years in Ethiopia between 2015-2018 using A360 outcome evaluation definition.

Note: Values are weighted for sampling weights.

3.4 Adolescents use high quality sexual and reproductive health products and services

Smart Start was designed to provide high quality sexual and reproductive health products and services to adolescent girls, through initiatives such as outreach activities and the provision of free on-the-spot contraception in all A360 settings. To assess the impact on this component of the Theory of Change, we measured the main outcome, mCPR, and a variety of indicators, including age at first birth and unmet need for modern contraception (see Error! Reference source not found. for the full list of outcomes).

The proportion of LARC users increased by 10% (95%CI: 3-17) in absolute value from baseline to endline.

There was no evidence of change in modern contraceptive use in the last 12 months, age at first birth, age-specific fertility rates, or in unmet need.

3.4.1 Proportion of long-acting reversible contraceptive users among all modern contraceptive users

Table 2 (**Appendix C**) presents mCPR results at the individual level,[20] as well as method mix. Increase in use of modern methods over time was driven by a rise in implant use. Accordingly, the proportion of girls currently using a long-acting reversible contraceptive (LARC; includes implants and intra-uterine devices) increased from 16.2 (95%CI: 11.8-21.7) to 24.8 (95%CI: 19.7–30.7; **Table 2**). The regression models showed strong evidence of a 10% kebele-average increase in the proportion of LARC users over time (95%CI: 3-17; p-value: 0.004; Error! Reference source not found. in **Appendix C**).

3.4.2 Use of a modern contraceptive method within last 12 months

There was no evidence of an effect of Smart Start on the use of modern contraceptive methods in the past 12 months (Coefficient: 0.02; 95%CI: -0.02 to 0.07; Error! Reference source not found. in **Appendix C**).

3.4.3 Age at first birth, age-specific fertility rate and unmet need for modern contraception

Median (range) age at first birth remained at 16 years old (15–17 years old) and age specific fertility rates remained around 245 live births per 1,000 girls per year, at baseline and endline surveys (Error! Reference source not found. **and** Error! Reference source not found. in **Appendix C**).

Unmet need for modern contraception was 21% at baseline (95%CI: 16.4-25.4) and 20% at endline (16.1–23.6; Error! Reference source not found. in **Appendix C**). There were therefore no important changes over time (Coefficient: 0.01; 95%CI: -0.04 to 0.06; Error! Reference source not found. in **Appendix C**).

3.5 Adolescent girls have access to appropriate high quality sexual and reproductive health information and services

[20] Note that these estimates are individual-level estimates, i.e. mCPR calculated as all eligible girls who use a modern method divided by all eligible girls. These individual-level estimates are different from kebele-level estimates presented in

; i.e. average mCPR estimates for all sampled kebeles within a woreda, or for all kebeles within Oromia. See **Appendix F** for details on why individual and kebele-level mCPR differs.

A360 was designed to provide greater access to appropriate high-quality sexual and reproductive health information and services through outreach activities or through the provision of free on-the-spot contraception, in all A360 settings. To assess the impact on this component of the Theory of Change, we measured the girls' awareness of contraceptive products and their knowledge of where to obtain health services.

The proportion of adolescent girls surveyed who had heard of contraception increased by 11% in absolute value (95%CI: 1-21) from baseline to endline surveys. At baseline, the main sources of information about modern contraception were community health workers, traditional birth attendants and community midwives. At endline, 90% of adolescent girls surveyed had heard of contraception (95%CI: 86-93) and hospitals/health centers/clinics were the main sources of information.

Respondents' awareness of where to obtain health services increased by 7% (95%CI: 0-13) from baseline to endline. At endline, this proportion was 94% (95%CI: 83-98).

3.5.1 Knowledge of contraceptive methods

At baseline, the majority of adolescent girls surveyed had heard of contraception (Error! Reference source not found. in **Appendix C**). Final regression models showed evidence of an 11% kebele-average increase over time (95%CI: 1–21; p-value: 0.03; Error! Reference source not found. in **Appendix C**) in the proportion of girls who had ever heard of modern contraception. At endline, the proportion was 90% (95%CI: 86-93), and hospitals/health centers/clinics were the main sources of information, whereas at baseline, community health workers, traditional birth attendants and community midwives were equally important sources of information. Teachers, friends/peers and neighbors also became a less important source of information over time (Error! Reference source not found. in **Appendix C**).

3.5.2 Awareness of where to obtain health services

At baseline, 88% (95%CI: 82–93) of respondents who intended to use a contraceptive method but were not currently using one, knew where to obtain health services (Error! Reference source not found. in **Appendix C**). Final regression models showed weak evidence of a 7% kebele-average increase in this outcome from baseline to endline (95%CI: 0-13; p-value: 0.06; Error! Reference source not found. in **Appendix C**). At endline, the proportion of respondents who knew where to obtain health services was 94% (95%CI: 83-98). Health centers/clinics were the sources mentioned most often, followed by health extension workers (and community health workers) and hospitals (Error! Reference source not found. in **Appendix C**).

3.6 Contraception positioned as relevant and valuable for adolescent girls

A360 was designed to position contraception as relevant and valuable for adolescent girls, mainly through discussions about contraception with newly married couples. To assess the impact on this component of the Theory of Change, we measured the girls' future aspirations, their agreement with statements about the benefits of modern contraception and their intention to use a modern method of contraception in the future.

The future aspirations index was highest in Wara Jarso (Index: 5.7; 95%CI: 5.6-5.9) and Ada´a (5.8; 5.4-6.2), where an average of 32% of respondents strongly agreed

with the statement "I believe preventing unintended pregnancy is important to help me achieve my goals for life."

At endline, the proportion of adolescent girls agreeing with the benefits-of-contraceptives statement "Using modern contraception can allow an adolescent girl to complete her education, find a better job and have a better life", increased by 9% (95%CI: 2-16) compared to baseline.

Intention to use modern contraception remained unchanged over time.

3.6.1 Girl's future aspirations

Girls' future aspirations were assessed at endline only.[21] The future aspirations index was highest in Wara Jarso (Index: 5.7; 95%CI: 5.6-5.9) and Ada´a (Index: 5.8; 95%CI: 5.4-6.2), where an average of 32% of respondents strongly agreed with statements "I have goals for my life," "I believe I have some tools to help me achieve my goals for my life" and "I believe preventing unintended pregnancy is important to help me achieve my goals for life." The future aspiration index was lowest in Fentale (5.1; 4.8-5.4; Error! Reference source not found. in **Appendix C**).

3.6.2 Benefits of contraceptive methods

The proportion of girls who agreed with the statement "Using modern contraception can allow an adolescent girl to complete her education, find a better job and have a better life" increased over time in Lome (from 86% to 100%) and in Ada´a (from 87% to 99%), and it stagnated in Wara Jarso (average 97%) and Fentale (average 79%; Error! Reference source not found. in **Appendix C**). Accordingly, the final regression model showed a kebele-average 9% increase over time in the proportion of adolescent girls agreeing with the benefits statement (95%CI: 2-16; p-value: 0.01; Error! Reference source not found. in **Appendix C)**.

At endline, most girls (95.3% [95%CI: 91.3-97.5]) agreed with the sentence "Using modern contraception can allow a girl to achieve her life goals". This sentence was not included in the baseline surveys (Error! Reference source not found. in **Appendix C**).

3.6.3 Intention to use modern contraception

Intention to use modern contraception among non-users, remained constant over time (Error! Reference source not found. **and 22** in **Appendix C**).

3.7 Supportive environment for adolescent girls to access services

A360 was designed to provide a supportive environment for adolescent girls to access services by involving key influencers such as their husbands in the program, and through community engagement. To assess the impact on this component of the Theory of Change, we measured a variety of indicators, including girls' attitudes and self-efficacy towards the use of modern contraceptives to prevent unintended pregnancies and girls' views of their communities' acceptance of modern contraception (see Error! Reference source not found. for full list of outcomes).

[21] As mentioned in the methods section, we slightly modified the baseline surveys at endline, to better capture specific components of A360 intervention by adding questions on future aspirations, the benefit of modern contraception statements, descriptive norms and modern contraceptive disadvantages.

Approval for the use of modern contraceptives by married couples remained unchanged, whereas approval for the use of modern contraceptives by unmarried couples increased over time. This led to a 0.22 increase in the score relating to adolescent girls' attitudes toward modern contraception over time (95%CI: 0.08-0.36).

There was a rise in community approval of contraceptive use from 51% at baseline to 79% at endline, according to the girls' own views, which contributed to a 0.29 greater community acceptance score over time across all woredas (95%CI: 0.09-0.49).

The Self-efficacy index score also increased from 3.00 at baseline to 3.70 at endline.

3.7.1 Attitudes towards using contraceptive methods

At baseline and endline, there was widespread approval for married couples to use modern contraceptives, with almost 100% approval ratings in Wara Jarso and Ada´a woredas. At baseline, the levels of approval of unmarried couples using modern contraceptives was somewhat lower than those of married couples. At endline, the scores relating to the approval of unmarried couples using modern contraceptives increased, and the rise was particularly important in Lome (from 52% to 79%) and Fentale woredas (from 40% to 68%; Error! Reference source not found. in **Appendix C**). Indeed, the final regression model showed that the score relating to adolescent girls' attitudes toward modern contraception increased by 0.22 over time (95%CI: 0.08-0.36; p-value: 0.003; Error! Reference source not found. in **Appendix C**).

3.7.2 Self-efficacy to access and use contraceptive methods

Baseline and endline surveys assessed adolescent girls' self-efficacy in their ability to access and use family planning methods. Self-efficacy increased over time in all woredas, particularly in Fentale woreda, where the self-efficacy index score increased from 2.1 to 3.5 (Error! Reference source not found. in **Appendix C**). Specifically, there was a 0.70 increase in the self-efficacy index score from baseline to endline (95%CI: 0.45-0.94; p-value<0.001; Error! Reference source not found. in **Appendix C**).

3.7.3 Treatment by family planning providers

From baseline to endline, health center/clinics, (proportion [95%CI]: 63% [54-71] baseline, 54% [47-62] endline) as well as community health workers and health extension workers (27% [21-34] baseline, 38% [31-45] endline) remained the most important sources of modern contraceptive methods, whereas hospitals (5% [3-8] baseline, 5% [3-7] endline) and pharmacies (2% [1-5] baseline, 1% [0-3] endline) remained less important sources (table not shown).

Current modern contraceptive users were asked whether they were treated respectfully the last time they obtained a modern contraceptive method. The majority of girls (94%) said that they had been treated respectfully at both baseline and endline, and there were no changes over time (Error! Reference source not found. in **Appendix C**).

3.7.4 Descriptive norms

At endline, we assessed descriptive norms regarding modern contraception by asking respondents about what they thought girls aged 15-19 years old in their community were doing in relation to contraception. Wara Jarso and Ada´a woredas had the highest descriptive norms index, as an average of 20% of

respondents believed that most girls aged 15-19 years old discussed using contraception with their partner, 29% of respondents believed that most girls were using contraceptive methods, and only 9% believed that most girls were keeping their use of contraceptive methods secret from their husband/partner. Fentale woreda had the lowest descriptive norms index score (Error! Reference source not found. in **Appendix C**).

3.7.5 Community acceptance and social support for adolescent girls to adopt healthy sexual and reproductive health behaviors, including use of modern contraceptives

At both baseline and endline, most adolescent girls answered that the decision on whether or not to use contraceptives was made together with their husband. In Fentale woreda, there was a notable decrease (from 39% to 10%) in the proportion of girls' answering that the decision was mostly their husband's (Error! Reference source not found. in **Appendix C**).

Based on the girls' responses, husband/partner approval of contraceptive use remained constant over time (at around 75%), whereas community approval of contraceptive use increased from 51% to 79% (Error! Reference source not found. in **Appendix C**). Indeed, the final regression model showed that the community acceptance score, created using the girls' own views about husband/partner and community approval, increased by 0.29 over time (95%CI: 0.09-0.49; p-value=0.005; Error! Reference source not found. in **Appendix C**).

3.8 Trust and credibility of family planning products

A360 was designed to improve trust in and credibility of family planning products, through discussions about contraception with newly married couples. To assess the impact on this component of the Theory of Change, we measured girls' misconceptions about modern contraceptives and their own views about what they perceive to be the main disadvantages of modern contraceptives.

Misconceptions about modern contraceptives were widespread at baseline and endline. Complications or side effects were the main modern contraception disadvantage reported, followed by modern contraceptives not working sometimes.

3.8.1 Misconceptions and modern contraceptive disadvantages

Respondents were asked whether they agreed with the following misconceptions related to contraception use: (1) "some modern contraception can stop a girl from ever being pregnant again even after she stops using it"; (2) "if a modern contraceptive changes a girl's menstrual bleeding, it's bad for her health and can harm her womb"; and (3) "some modern contraceptives can make adolescent girls permanently fat." Misconceptions about modern contraceptives were widespread at baseline and endline (Error! Reference source not found. in **Appendix C**), and they did not change over time (Coefficient: -0.06; 95%CI: -0.19 to 0.07; p-value: 0.354; Error! Reference source not found. in **Appendix C**).

At endline, respondents were also asked to list the disadvantages or potential negative consequences of contraceptive use. A large proportion of participants mentioned there were no disadvantages (38%), particularly in Ada´a woreda (57%). For those who believed that there were disadvantages, complications or side effects were the main disadvantages mentioned (by 33% of participants), along with modern contraceptives sometimes not working (mentioned by 33% of participants; Error! Reference source not found. in **Appendix C**).

3.9 The association between self-reported exposure to Adolescents 360 and primary and secondary outcomes

Overall, self-reported exposure to A360 was 23.6%.

Respondents who reported A360 exposure had higher mCPR (OR: 2.1; 95%CI: 1.3-3.3) and lower unmet need (OR: 0.49; 95%CI: 0.26-0.94).

Self-reported exposure to A360 was 23.6% (95%CI: 18.0-30.3). It was greatest in Lome (58.7%, 45.2-71.0), followed by Ada'a (24.4%, 17.0-33.7), Fentale (13.1%, 5.2-29.2) and Wara Jarso (8.3%, 4.8-13.9).

Self-reported exposure to A360 and its association with sociodemographic factors and mCPR is presented in detail in **Appendix B**. Girls exposed to A360 had twice the odds to be currently using a modern contraceptive method compared to girls not exposed to Smart Start (OR: 2.09; 95%CI: 1.32-3.29). There was slightly weaker evidence of an association between exposure to A360 and use of a modern contraceptive method within the last 12 months (OR: 1.77; 95%CI: 1.08-2.92), and no evidence of an association between exposure to A360 and use of a LARC (OR: 1.52; 95%CI: 0.75-3.08; **Appendix B**).

There was evidence of 50% lower odds of unmet need in girls exposed to A360 than in girls not exposed to A360 (OR: 0.49; 95%CI: 0.26-0.94; p-value: 0.03; Error! Reference source not found. in **Appendix C**), and weak evidence of an attitudes' index score 0.20 greater in girls exposed to A360 than in girls not exposed to A360 (95%CI: 0.10-0.30; p-value: 0.06; Error! Reference source not found. in **Appendix C**). Furthermore, there was weak evidence amongst girls exposed to A360 of a greater awareness of contraceptive products (OR: 3.33; 95%CI: 0.96-11.48; p-value: 0.06; Error! Reference source not found. in **Appendix C**) and of where to obtain health services (unadjusted OR: 1.73; 95%CI not available; Error! Reference source not found. in **Appendix C**). Finally, there was weak evidence amongst girls exposed to A360 of lower misconceptions about modern contraception (Coefficient: 0.23; 95%CI: -0.03 to 0.49; p-value: 0.08; Error! Reference source not found. in **Appendix C**)

On the other hand, there was evidence that girls exposed to A360 had greater odds of having given birth within the past 12 months than girls not exposed (OR: 1.74; 95%CI: 1.11-2.74; p-value: 0.02; Error! Reference source not found. in **Appendix C**).

4 Discussion

4.1 Major findings

Our findings indicate that the delivery of the Smart Start intervention was associated with a 5.1% population level increase (95%CI: 0.7% to 9.5%) in modern contraceptive use among married girls aged 15-19 years old, across four woredas in Oromia Region, Ethiopia. The change between baseline and endline surveys within the implementation woredas was larger than overall trends in mCPR in Ethiopia, when comparing a secondary dataset between 2015 and 2018 (PMA 2020); however this dataset is not directly comparable to our target population. Almost all baseline secondary outcomes aligned with the A360 Theory of Change changed in the desired direction after the two-year Smart Start implementation, and some of these were associated with self-reported exposure to Smart Start.

Our primary hypothesis was that the intervention would lead to an increase in mCPR over time greater than the increase that would have been expected to occur in the absence of the intervention. Accordingly, our primary aim was to evaluate the effectiveness of the A360 intervention in increasing mCPR among married girls aged 15-19 years old. Our findings indicate the delivery of the A360 program was associated with a 5.1% population level increase (95%CI: 0.7% to 9.5%) in modern contraceptive use among married girls aged 15-19 years old, across four woredas in Oromia Region, Ethiopia. The analysis of trends in modern contraceptive use, looking at the data from PMA2020, did not show a clear trend between 2015 and 2018. This suggests that the increase in mCPR that we observed in this study is not likely to be explained by ongoing trends in mCPR in this population. Notably, the largest change in mCPR was seen in a woreda (Wara Jarso) that had slightly shorter implementation times, and lower reported exposure to A360 compared to other woredas.

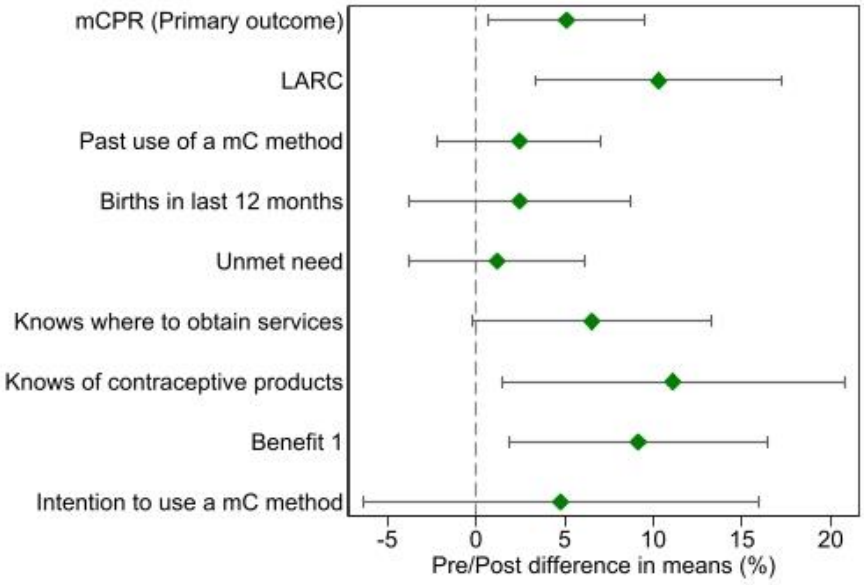
Secondly, we aimed to evaluate the effectiveness of A360 interventions in changing secondary outcomes aligned with the A360 Theory of Change. **Figure 9**: shows a summary of the results obtained in Ethiopia. The following baseline secondary outcomes changed in the hypothesized direction after two years of A360 implementation: proportion of modern contraceptive users using a LARC; knowledge (i.e. awareness) of where to obtain health services and of modern contraceptive products; the girls' views on the benefits of modern contraception (i.e. benefit 1; **Figure 9**:**A**); and attitudes, self-efficacy and community acceptance towards the use of modern contraceptives (**Figure 9**:**B**). The absence of changes in six secondary outcomes should be noted: prior use (in the last 12 months) of a modern contraceptive method, births in the last 12 months, unmet need, intention to use a modern method of contraception, (**Figure 9**:**A**), age at first birth, and misconceptions about modern contraceptives (**Figure 9**:**B**).

Further, we hypothesized that respondents who reported being exposed to A360 were more likely to use modern contraceptives compared to respondents that reported no exposure. In implementation woredas, approximately 24% (95%CI: 18-30) of married adolescent girls reported exposure to A360 interventions, and there was some evidence that this subset of married adolescent girls were more likely to use modern contraceptives than those who reported no exposure. As shown in **Figure 10:**, self-reported exposure to A360 was also associated with two secondary outcomes that increased over time: knowledge, i.e. awareness, of contraceptive products, (**Figure 10:A)**, and attitudes towards the use of modern contraceptives, (**Figure 10:B**); and four secondary outcomes that did not change over time: past use of a modern contraceptive, unmet need, the girls' views on the benefits of contraception, i.e. benefit 2, and misconceptions about modern contraception. Finally, some outcomes that changed over time were not associated with self-reported exposure: the proportion of modern contraceptive users using a LARC, self-efficacy and community acceptance towards the use of modern contraceptives. The observed change over time in these outcomes could have been caused by underlying time trends, or by competing interventions that were ongoing in the study woredas during the course of A360 implementation.

Figure 9: Pre- post-intervention difference in means for binary (Figure 7A) and continuous outcomes (Figure 7B)

Note: Results of linear regression models adjusted for pre-defined confounding factors: age, religion, education level, number of living children and wealth quintile; except associations with births in the last 12 months, which were not adjusted for number of living children.

Figure 7A



Abbreviations:
mCPR: modern contraceptive prevalence rate
LARC: long-acting reversible contraception
mC: modern contraceptive
Benefit 1: % agreeing with statement 'Using modern contraception can allow a girl to complete her education, find a better job, and have a better life'.

Figure 7B

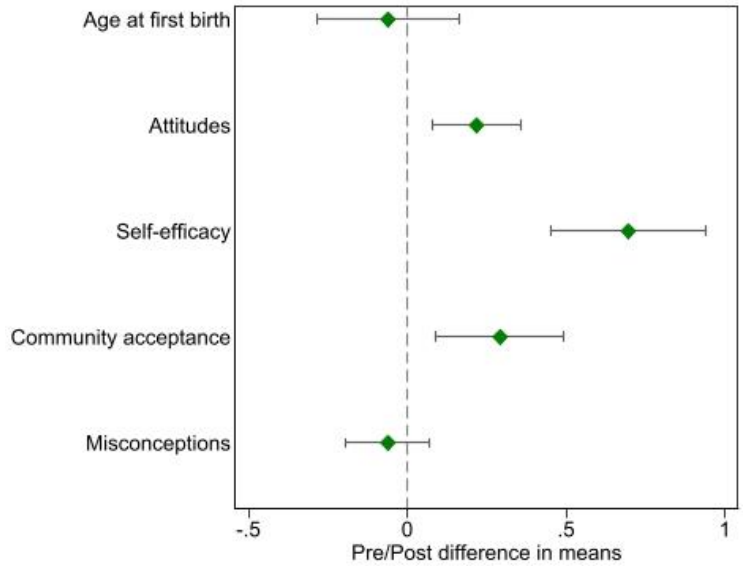
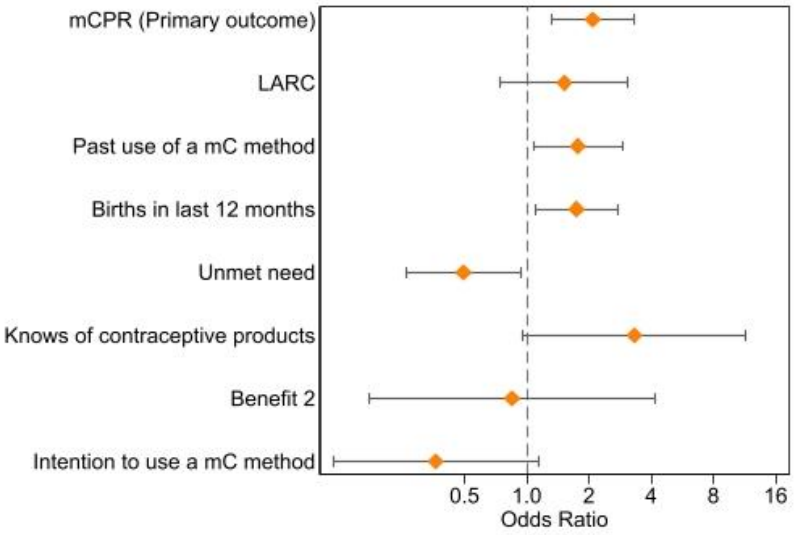


Figure 10: Associations between self-reported exposure and binary outcomes (odds ratios; Figure 8A) and between self-reported exposure and continuous outcomes (exposed/non-exposed difference in means; Figure 8B)

Note 1: Results of logistic (Figure 8A) and linear regression models (Figure 8B) adjusted for pre-defined confounding factors: age, religion, education level, number of living children and wealth quintile; except associations with births in the last 12 months, which were not adjusted for number of living children.

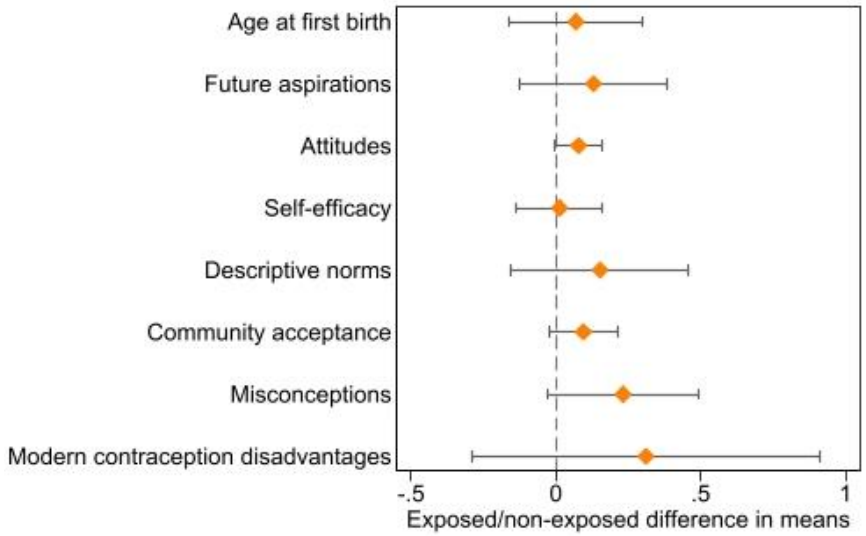
Figure 8A



Abbreviations:
mCPR: modern contraceptive prevalence rate
LARC: long-acting reversible contraception
mC: modern contraceptive
Benefit 2: % agreeing with statement 'Using modern contraception can support a girl to achieve her life goals'

Note 2:
It was not possible to calculate the association between "knows where to obtain services' and exposure, or between 'Benefit 1' and exposure due to paucity of data."

Figure 8B



4.2 Strengths

Our study was designed to rigorously examine the population effects of A360 in the selected woredas in Ethiopia. The following factors strengthened the internal and external validity of our study:

- We used a before-and-after cross-sectional evaluation design, with collection of comparable data before and after intervention implementation.
- Participants were representative of married adolescent girls in the selected woredas.
- We analyzed trends in modern contraceptive use over time, using secondary data sources.
- We collected data on self-reported exposure to A360 at endline to look at the association between individual-level engagement with the A360 intervention, and use of modern contraception.

4.3 Limitations

We identified several potential limitations to this study. We have grouped these as 'limitations associated with the lack of a comparison group' and 'other limitations'.

Lack of comparison group

The findings of this report should be interpreted in conjunction with its limitations. The lack of comparison groups in quasi-experimental designs can lead to threats to internal validity,[22] and could consequently be a threat to causal inference (Shadish et al., 2002, Marsden and Torgerson, 2012). One such issue is that mCPR could have increased over time for reasons other than the A360 intervention itself. The alternative explanations for an increase in mCPR include a time trend in modern contraceptive use (i.e. maturation), other competing interventions ongoing in the study woredas during the course of A360 implementation, or changes in instrumentation (Marsden and Torgerson, 2012, Shadish et al., 2002, Robson et al., 2001, Penfold and Zhang, 2013). We discuss each of these threats to internal validity below.

Secular time trends in modern contraceptive use

Secular trends are a threat to internal validity, as the apparent change in the outcome of interest could be due more to the intervention group changing naturally, than to the intervention itself (Marsden and Torgerson, 2012, Shadish et al., 2002, Robson et al., 2001). To minimize this threat to validity, mCPR data available from other sources covering 2015–2018 was examined to assess whether changes in mCPR in A360 communities between 2017 and 2020 reflect background changes in mCPR, or whether mCPR appears to have increased more than would have been expected during this period, as a likely result of A360. The available data gives a broad indication as to whether mCPR was increasing, static or decreasing in the region where our study was situated.

The analysis of PMA2020 data on modern contraceptive use between 2015 and 2018 did not show a clear trend. Nevertheless, we should consider that there are limitations in using this dataset to estimate trends in mCPR in our target population. PMA2020 is not directly comparable to our target population, for example, PMA2020 refers to women aged 15–49 years old, whereas our target population were married adolescent girls. These two populations differ in many factors, including number of children and education. PMA2020 data reflects national level data, but there are large local variations (Error! Reference source not found. in **Appendix D**), this data is therefore hard to interpret in line with A360.

Competing interventions

The before-and-after design cannot control for the presence of other events which are not part of the Smart Start intervention but which could affect mCPR (Robson et al., 2001, Penfold and Zhang, 2013), such as other sexual and reproductive health interventions occurring in our study sites (i.e. competing

[22] Internal validity, in this case, refers to being able to make unbiased inferences about the association between mCPR and A360 in the source population of married adolescent girls aged 15-19 years old living in outcome evaluation woredas.

interventions). As mentioned in the Results section (Section 3.1.2), anecdotal data shows that other sexual and reproductive health programs were in place during the implementation of A360. According to PSI,[23] the ODA program was ongoing in Fentale and Lome woredas during the course of the A360 implementation process. In Fentale, the program targeted the same age groups as A360, and since it was a school-based intervention it reached both married and unmarried girls. Therefore, any improvements observed over time in this woreda in primary or secondary outcomes could be associated with the ODA program as well as Smart Start. Other woredas were unlikely to be affected; In Lome woreda, the ODA program had minimal overlap with the target age group (11-15 in ODA and 15-19 in Smart Start) and therefore the 'contamination' of the ODA intervention on the results of Smart Start is unlikely. We are not aware of any additional interventions which were targeting adolescent girls besides Smart Start in Wara Jarso and in Ada'a woredas.

Changes in instrumentation

The mode of baseline and endline surveys was slightly different (details in **Appendix A**) due to modifications to reduce the risk of COVID-19 transmission. Changes at endline included the use of personal protective equipment (PPE) such as face masks and having the second section of the questionnaire administered by phone.

While it is plausible that use of PPE during the endline surveys may have induced selection or information bias, we do not believe this is the case. Selection bias happens when the study group is not representative of the source population (Dohoo et al., 2009), and selection bias may have been a problem in our study if there were lower response rates due to the use of PPE. However, this is unlikely to have affected our results since response rates were high at both baseline and endline (see Error! Reference source not found. in **Appendix C**). Information bias may occur due to misclassification (categorical variable) of sexual activity or use of contraceptives. If there was information bias due to the use of PPE, we would expect girls to report lower levels of sexual activity at endline, and this could also lead to selection bias. As a result, those included in the calculation of mCPR (who report being sexually active) could also be more likely to use contraceptives compared to the target population (i.e. less afraid of talking about sex/contraception). This would increase mCPR. Since the proportion of married girls in Ethiopia who reported being sexually active in the last 12 months was similar between baseline (99%, 95%CI: 94–100) and endline (96%, 95%CI: 90–100; Error! Reference source not found. in **Appendix C**), information bias is unlikely. It would also be concerning if using PPE at endline made girls report equal levels of sexual activity but lower levels of contraceptive use; this would then lead to a decrease in mCPR and a null effect. Since we observed an increase in mCPR over time, this bias in reporting is unlikely to have happened.

The second section of the questionnaire was collected by phone, but interviewers were usually able to see the interviewee from afar which would address any issues related to this method of interviewing. The order of questions changed slightly, which may have affected the girls' responses. However, we believe that this is unlikely to affect the outcome measurement because the order of very personal questions did not change.

Other limitations

- We relied on respondent self-reporting to measure modern contraceptive use, sexual activity and exposure to the program; these outcomes are therefore subject to information bias. Since both the use of contraceptives and sexual activity are sensitive topics, girls may not have wished to report accurately on their contraception use or sexual activity. To minimize misclassification due to self-reporting impacting the evaluation findings, we used identical question sequences for very personal questions at baseline and endline surveys and provided extensive interviewer training. Furthermore, as much as possible, all interviews were conducted in privacy, and away from husband and other adults.

[23] Source of information: Document entitled "A360 OE site mapping" shared by Mathew Wilson, PSI, on 12/11/2020.

- Due to resource constraints, we decided to focus on a limited number of geographical areas,[24] so while our findings may apply to the selected woredas, they may not be generalizable to other areas of Ethiopia where A360 was implemented.
- Baseline and endline samples were not entirely comparable in terms of sociodemographic factors, including wealth quintile and mobile phone ownership. While we adjusted for the factors which were imbalanced between baseline and endline, the adjustment for these may have been insufficient, and there may be some residual confounding.
- Finally, it is important to consider that our study had limited power to detect the effects of the intervention on some secondary outcomes. **Figure 9:** suggests that there were some differences between baseline and endline in 'Past use of a mC method' in the hypothesized direction, but the 95% confidence interval is too wide.

4.4 The association between self-reported exposure to Adolescents 360 and primary and secondary outcomes

By triangulating the main study findings with self-reported exposure data, we were able to strengthen the possible inferences. We hypothesized that respondents who reported being exposed to A360 (i.e. had heard about the A360 program, and/or recognized images associated with the intervention, and/or had heard about the *goal card*; see **Appendix B** for details) were more likely to use modern contraceptives compared to respondents that reported no exposure. To test this hypothesis, we conducted a secondary analysis on the association between the respondents' self-reported exposure to A360 and primary and secondary outcomes. Unfortunately, due to the low level of self-reported exposure, we were not able to quantify the effect of greater or lower participation in program activities, as initially planned. This would have allowed us to further explore the effect of A360 exposure on the outcomes of interest.

Self-reported exposure to A360 was 23.6% (95%CI: 18.0–30.3). The secondary analysis showed some evidence that the subset of married adolescent girls who self-reported exposure to A360 used more modern contraceptive methods than those who did not self-report exposure to A360 (OR: 2.1; 95%CI: 1.3–3.3). Some evidence suggests that this was aligned with other effects along the Theory of Change, supporting the idea that the intervention worked as intended when it reached the target population. **Figure 10:** suggests that there were some differences between baseline and endline in the hypothesized direction, but the 95% confidence intervals are too wide e.g. 'LARC', 'Age at first birth', 'Future aspirations', 'Descriptive norms' and 'Community acceptance'. It is therefore important to consider that our study had limited power to detect associations between self-reported exposure and some secondary outcomes.

The secondary analysis also showed some evidence for a positive association between having given birth in the past 12 months and reporting exposure to A360, so the program was perhaps more efficient in influencing the lives of girls who had previously given birth, compared to girls in the community more generally. This hypothesis is supported by A360 monitoring data that showed two times greater odds of adoption of a method for girls with children than for those of girls without children (Punton and Wallach, 2020).

The measure of exposure used by the outcome evaluation was defined by asking respondents about particular aspects of the Smart Start intervention, which is detailed in the methods section and in **Appendix B**. The measure of exposure used by PSI was calculated by dividing the number of girls aged 15–19 years old reached by A360 by the total number of girls aged 15–19 years old in A360 areas (obtained from national survey data, PSI (2019)).

[24] There were several meetings about study design and at each stage BMGF and CIFF (the donors) were consulted.

4.5 Potential impact of COVID-19 pandemic

The endline surveys of our outcome evaluation were conducted in late 2020, approximately one year after the start of the COVID-19 pandemic. The COVID-19 pandemic is unlikely to have affected the evaluation findings. Even though some studies in Ethiopia showed limited availability of family planning services and products due to COVID-19, endline survey data, A360 monitoring data (collected by the implementers) and Health Management Information System (HMIS) service data, show that the effects of the pandemic were minimal.

Three studies conducted in Ethiopia showed a decrease in family planning visits and method distribution (Belay et al., 2020, Kassie et al., 2021) or a partial interruption of family planning services due to COVID-19 (Assefa et al., 2021). One study, from Kassie et al. (2021), used family planning service data from 31 health centers and four hospitals randomly selected in Bench Sheko, Sheka, Keffa and West Omo Zone in the SNNP Region, Ethiopia. Data from between March and June 2020 was compared to the same months of 2019. There was a mean (SD) of 3,991.3 (442.8) family planning visits in 2020 compared to 4,744.5 (189) in 2019: a 16% decrease. This decrease varied by zone (minimum 12% and maximum 48%) and by health facility (higher reduction in hospitals than in health centers). There was a reported decrease of LARC use (-6% for implants, and -1% for intra-uterine device) and in injectable use (-2%), and an increase in daily pills (+5%) and in emergency contraception (+4%).

Another study, from Belay et al. (2020), used the family planning unit registry of one hospital in Addis Ababa, Ethiopia, to extract family planning service provision data. Data from between March and May 2020 was compared to the same months of 2019. There were 268 family planning visits in 2020 compared to 368 in 2019, a 27% decrease. There was also a decrease in the distribution of family planning methods, particularly of LARCs (-40% for implants, -63% for intra-uterine devices). The decrease in family planning services and method distribution was attributed to the COVID-19 pandemic.

Accordingly, in the study of Assefa et al. (2021), 300 healthcare providers were interviewed by phone, between July and November 2020, in Addis Ababa. Half of these healthcare providers (53%; 158/300) reported that there was no interruption of family planning services; whereas 40% (121/300) reported partial interruption due to COVID-19 and 7% (21/300) reported complete interruption. Community members were also interviewed: 300 adults residing in Addis Ababa (urban), and 300 adults residing in Kersa (rural), an area 400km East of Addis Ababa. Among community members in Addis Ababa, only 10% (18/185) reported having difficulty accessing family planning services, and 17% (39/224) in Kersa reported the same.

The results from these three studies may be applicable to health facilities in study sites, but we should consider that: (1) Kassie et al. (2021) and Belay et al. (2020) studies focus on the general population of family planning clients, which may not be representative of adolescent girls; (2) they focus on geographical areas distinct to OE geographical areas, and thus may not be comparable to the health facilities of our study sites; (3) the study from Belay et al. (2020) has data from only one hospital, and our results show that only a small proportion of endline respondents (5%; 95%CI: 3-7) obtained their contraceptive methods at the hospital.

If family planning services were indeed affected by COVID-19, we should have been able to capture it in our data through the changes made in endline surveys and list of secondary outcomes. The main changes included (1) adding COVID-19 related options as possible responses to a question on the reasons the respondent was not using a method; (2) adding COVID-19 related options as possible responses to a question on the reasons why the respondent stopped using a contraceptive method; (3) adding “use in the past 12 months” to the list of secondary outcomes. None of the respondents chose the COVID-19 related options in the survey data, which differs from the results of the three studies above. If girls had indeed started using a modern method of contraception, but then stopped during the COVID-19 pandemic (e.g. for fear of getting COVID-19 in health facilities or because their preferred method was unavailable), then we would have seen a greater impact of A360 on “use in the past 12 months” compared to the impact of A360 on current use of a modern method (mCPR). We did not see a greater impact of A360 on

use of a modern method within the past 12 months compared to mCPR, in fact, surprisingly, there was no impact at all of A360 on use in the past 12 months.[25] Accordingly, in woredas selected for the outcome evaluation A360 (**Figure 14:** in **Appendix D**, trend analysis), Health Management Information System (**HMIS**) records show an increase in adolescents' contraception acceptance rate (CAR) from 27% between March and June 2019 to 39% between March and June 2020.

Finally, the COVID-19 pandemic affected the intervention implementation, but this is unlikely to have negatively affected the outcome evaluation. Changes made to implementation due to COVID-19 are detailed in the process evaluation report (Punton and Wallach, 2020). In summary, mobilization activities were reduced, community meetings were reduced to a maximum capacity of four people, and counselling (both in clinic and in house) was adapted to incorporate safety measures. Nevertheless, PSI monitoring data published in A360 Monthly Snapshot (PSI, 2020a, PSI, 2020b) show that in regions where the Smart Start program was implemented (including Oromia Region), the number of girls reached per month was around 1,300; it dropped by almost half at the start of the pandemic for one month (April 2020), and recovered again in the following months. Therefore, since the number of girls reached by A360 was only affected for one month (i.e. a very small proportion of the implementation time), we believe that the changes made to implementation due to COVID-19 are unlikely to have negatively affected the outcome evaluation's ability to detect the effect (if any) of A360. Nevertheless, the process evaluation report (Punton and Wallach, 2020) mentioned that field team members reported a decrease in the availability of contraceptives, particularly implants and injectables, which could have led to more method discontinuation by adolescent girls during the pandemic than before.

4.6 Differences in mCPR between woredas selected for the Outcome Evaluation

Wara Jarso was the woreda with the greatest increase in mCPR over time, and Fentale was the one with lowest increase. Differences in the degree of change in mCPR may have been due to differences in the populations of adolescent girls in each of the woredas. Girls were generally less educated and poorer in Fentale than in Wara Jarso, and Fentale's main religion was Islam compared to Orthodox Christianity in Wara Jarso. Other reasons may include greater support to Smart Start activities from the Ministry of Health and the Women's Development Army in Wara Jarso than in other woredas.

As shown in our results (Error! Reference source not found.), Wara Jarso was the woreda with the greatest increase in mCPR over time, and Fentale was the one with the lowest increase. The population of adolescent girls in Fentale has several characteristics that could make it challenging to observe the effect of A360 on mCPR. For instance, Fentale woreda had the greatest proportion of girls without formal education (57%), whereas Wara Jarso had the lowest (21%); and there is a negative association between education and mCPR (Olika et al., 2021). Fentale also had the greatest proportion of girls following Islam (76%), whereas Orthodox Christianity was the main religion in other woredas (92% in Wara Jarso); and there is a negative association between Islam and mCPR (Ahinkorah, 2020). Finally, adolescent girls were generally poorer in Fentale (58% in lowest wealth quintile) than in Wara Jarso woreda (7% in lowest wealth quintile); and again, there is a negative association between lower wealth and mCPR (Ahinkorah, 2020).

These differences in sociodemographic factors could also indicate greater differences in social norms, which is a significant barrier to the use of modern contraceptives among adolescent girls (Berhane et al., 2019). In fact, the population of adolescent girls in Fentale reported a lower future aspirations index and lower intention to use a modern method **(**Error! Reference source not found. in **Appendix C**); lower approval of modern methods (Error! Reference source not found. in **Appendix C**); lower quality of services (Error! Reference source not found. in **Appendix C**); lower descriptive norms (Error! Reference source not

[25] This may be explained by the fact that at baseline, around 7% of adolescent girls used a modern method in the 12 months before the survey, but then discontinued the method, whereas at endline, only around 3% did so. This led to greater similarity for the proportion who used a modern method within the last 12 months between baseline and endline compared to mCPR at baseline and endline.

found. in **Appendix C**); and lower community approval (Error! Reference source not found. in **Appendix C**) than in other woredas.

Nevertheless, Fentale woreda was the study site with longest implementation time (31 months), and the place where all kebeles first received A360 activities (May 2019), compared to Wara Jarso (27 months; 100% kebeles covered in May 2020). Self-reported exposure to Smart Start was slightly greater in Fentale (13.1%; 95%CI: 5.2-29.2) than in Wara Jarso (8.3%; 95%CI: 4.8-13.9). This exposure was also reflected in the proportion of modern contraceptive users who had community health workers and health extension workers as their sources of modern contraceptive methods, which increased from 18% to 45% in Fentale. These results perhaps reflect the integration of Smart Start into the Health Extension Program, using health extension workers as Smart Start mobilizers (Punton and Wallach, 2020). Lome is an industrial area, with many private clinics available to provide services in the community; it may be that services were received in private clinics rather than through Smart Start in Lome, leading to a reduced impact of the intervention on mCPR despite exposure. In Wara Jarso, the proportion of modern contraceptive users who had community health workers and health extension workers as their sources of modern contraceptive methods, only increased by 6% (from 20% to 26%).

There are other reasons why Wara Jarso may have had a greater increase in mCPR compared to other areas. According to the PSI team[26] other possible explanations for these findings are:

- Wara Jarso had a zonal health department and woreda health offices that were very responsive and supportive, with officials from the Ministry of Health providing timely supervision.
- There were lower security issues compared to other woredas.
- Contraceptive methods were generally available (no stock-outs).
- In contrast to other woredas, Wara Jarso contains mostly rural kebeles (versus urban kebeles), therefore there were not a lot of alternative sources of sexual and reproductive health services besides the health posts where A360 program was implemented (such as private clinics and health centers).
- As mentioned in the introduction, the Women's Development Army and Youth Champions supported Health Extension Workers and Smart Start Navigators by identifying and referring adolescents to places where they could receive contraceptive services. In Wara Jarso, the engagement with the Women's Development Army and Youth Champions was 'better' and more 'sustainable' compared to that of other woredas.

Finally, Wara Jarso already had a higher mCPR at baseline compared to other woredas (Error! Reference source not found.) so perhaps it had greater background trends compared to other woredas. It is important to consider, however, that our study was not powered to detect the effects of the intervention at individual woredas.

4.7 A360 in the context of sexual and reproductive health best practices

The A360 interventions included essential components for a successful change in demand and acceptance of modern contraception as well as in sexual and reproductive health behaviors. These included community engagement (Kesterton and de Mello, 2010, WHO, 2011), the use of outreach activities (McCleary-Sills et al., 2014, Denno et al., 2012, Mwaikambo et al., 2011), provision of contraception for free and on-the-spot (Brieger et al., 2001, WHO, 2011), and the involvement of husbands (WHO, 2011). The findings in this outcome evaluation, such as greater community acceptance of contraceptive products over time, align with A360 activities

[26] Source of information: Document with answers to outcome evaluation team questions shared by Abednego Musau, PSI, on 03/03/2021.

Engaging the community is often included in adolescents' sexual and reproductive health interventions, and it is a recommended practice (WHO, 2011). A360 collaborated with local governments to ensure their support of A360 and the integration of A360 activities into the existing health systems. Communities were engaged with directly, through sensitization meetings when moving to a new area, and informally, through Health Extension Workers and Smart Start navigators. These activities were reflected in the Smart Start process evaluation and outcome evaluation findings. In the process evaluation, there were reports of a supportive local government and of a change from a 'silent movement' where Smart Start was presented as a financial planning program, to A360 being more openly presented as a sexual and reproductive health program (due to community sensitization i.e. '*kick off*' meetings) (Punton and Wallach, 2020). In the current report, we also observed that the girls' views on community acceptance of contraceptive products increased over time (**Table 20** in **Appendix C**). Although community engagement is a very important factor in increasing the demand for and acceptance of contraceptive products (Ross et al., 2006), there is weak evidence of an effect of community engagement on contraceptive use (Kesterton and de Mello, 2010, WHO, 2011).

Outreach activities happen when health services are delivered in the community (out of facilities) by clinical or non-clinical personnel (McCleary-Sills et al., 2014, Denno et al., 2015). These may happen in places like schools, youth centers, workplaces, door-to-door, on the streets or other such settings (Denno et al., 2015). Outreach activities may reach members of marginalized populations, such as adolescents who dropped out of school. In Smart Start, outreach was mainly done by Health Extension Workers, with support from the Smart Start team, the Women's Development Army (Damtew et al., 2018) and Youth Champions (Punton and Wallach, 2020). Outreach services help to overcome barriers such as a lack of awareness of services, inconvenient locations, operating hours or wait times, which improves access to contraceptive services. Indeed, in the current report, we observed that girls' awareness of where to obtain sexual and reproductive health services increased over time (**Table 20** in **Appendix C**), and Health Extension Workers were mentioned by one third of girls as a source of services (**Table 12** in **Appendix C**). This may have resulted from the A360 program. There is some evidence to suggest that outreach activities improve access to services and provide better contraceptive and fertility-related outcomes (McCleary-Sills et al., 2014, Denno et al., 2012, Mwaikambo et al., 2011).

During Smart Start activities, contraceptives were available on-the-spot, for free. Contraception cost is a barrier to use, therefore making them available for free is a way to increase access in populations with lower resources. There is some evidence that giving condoms for free leads to increased use (Brieger et al., 2001, WHO, 2011), but there is less evidence that reducing non-condom method costs affects use of those other methods (WHO, 2011). In a study by Meuwissen et al. (2006) participants received vouchers that could be used for free contraceptive services and methods. Voucher recipients reported increased knowledge and use of services and contraceptives.

Finally, involvement of husbands/partners is important in interventions targeting adolescent girl, when trying to reduce barriers to accessing contraception (WHO, 2011). However, due to limited studies, there is no evidence that this involvement leads to behavioral change among adolescent girls (WHO, 2011). In Smart Start, activities generally targeted couples, which may have led to better views from husbands on the benefits of contraception (Error! Reference source not found. in **Appendix G**), and more discussions between the girls and their husbands about modern contraception (Error! Reference source not found. in **Appendix G**).

5 Conclusions

Our findings indicate that the delivery of the A360 program was associated with a 5.1% population level (95%CI: 0.7% to 9.5%) increase in modern contraceptive use among married girls aged 15-19 years old across four woredas in Oromia Region, Ethiopia. In the implementation woredas, approximately 24% of married adolescent girls reported exposure to A360 interventions, and there was some evidence that this subset of married adolescent girls had higher mCPR than those who reported no exposure. Nevertheless, the largest change in mCPR was seen in a woreda (Wara Jarso) that had slightly shorter implementation times and lower reported exposure to A360 compared to other woredas, suggesting that other factors (e.g. changes in social norms) may have contributed to mCPR increases.

The study design did not include a comparison group, and consequently it is plausible that mCPR could have increased over time for reasons other than the A360 intervention itself. The alternative explanations for an increase in mCPR include a time trend in modern contraceptive use, other competing interventions and residual confounding.[27] The change between baseline and endline surveys within the implementation woredas was larger than overall trends in mCPR in Ethiopia, when using a secondary dataset between 2015 and 2018 (PMA2020), but this dataset is not directly comparable to our target population. Moreover, the association between some of the outcomes and self-reported exposure to A360, strengthens the validity of our findings. Therefore, based on our data and even in the absence of comparison groups, the proposed association between A360 interventions and improvements in mCPR[28] is plausible.

The triangulation with trends in contraceptive use over time and self-reported exposure analysis was an important component of this outcome evaluation, which strengthened the inference possible from the study findings. There are other components of the A360 program such as the monitoring and evaluation data collected by the A360 program implementers, and an accompanying process evaluation, that shed more light on the context and process of the intervention. It is important to note that the results from the outcome evaluation presented here should be considered alongside findings from the process evaluation, which provide a more nuanced representation of the A360 program in it's entirely. The full report from the process evaluation and a final summative report, which triangulates findings from across the evaluation, is available on the Itad Website.

[27] Analysis was adjusted for known confounders and factors imbalanced between baseline and endline populations, nevertheless, observed changes in mCPR and secondary outcomes might be due to other factors that we did not measure in our surveys, i.e. residual confounding.

[28] As well as improvements in awareness of modern contraceptive products and attitudes towards the use of modern contraceptives.

References

A360. 2020. *Country Solutions - Ethiopia* [Online]. Available: http://dev-psi-a360.pantheonsite.io/countries/ethiopia/ [Accessed November 2020].

AHINKORAH, B. O. 2020. Predictors of modern contraceptive use among adolescent girls and young women in sub-Saharan Africa: a mixed effects multilevel analysis of data from 29 demographic and health surveys. *Contraception and reproductive medicine,* 5**,** 1-12.

ALANO, A. & HANSON, L. 2018. Women's perception about contraceptive use benefits towards empowerment: A phenomenological study in Southern Ethiopia. *PloS one,* 13**,** e0203432.

ASSEFA, N., SIÉ, A., WANG, D., KORTE, M. L., HEMLER, E. C., ABDULLAHI, Y. Y., LANKOANDE, B., MILLOGO, O., CHUKWU, A. & WORKNEH, F. 2021. Reported Barriers to Healthcare Access and Service Disruptions Caused by COVID-19 in Burkina Faso, Ethiopia, and Nigeria: A Telephone Survey. *The American Journal of Tropical Medicine and Hygiene,* 1.

ATCHISON, C. J., MULHERN, E., KAPIGA, S., NSANYA, M. K., CRAWFORD, E. E., MUSSA, M., BOTTOMLEY, C., HARGREAVES, J. R. & DOYLE, A. M. 2018. Evaluating the impact of an intervention to increase uptake of modern contraceptives among adolescent girls (15–19 years) in Nigeria, Ethiopia and Tanzania: the Adolescents 360 quasi-experimental study protocol. *BMJ open,* 8**,** e021834.

BEARINGER, L. H., SIEVING, R. E., FERGUSON, J. & SHARMA, V. 2007. Global perspectives on the sexual and reproductive health of adolescents: patterns, prevention, and potential. *The lancet,* 369**,** 1220-1231.

BELAY, L., HURISA, T., ABAS, F., DABA, M., ABEBE, B., NIGATU, B. & PRAGER, S. 2020. Effect of Covid-19 pandemic on safe abortion and contraceptive services and mitigation measures: a case study from a tertiary facility in Ethiopia. *Ethiopian Journal of Reproductive Health,* 12**,** 6-6.

BERHANE, Y., WORKU, A., TEWAHIDO, D., FASIL, N., GULEMA, H., TADESSE, A. W. & ABDELMENAN, S. 2019. Adolescent Girls' Agency Significantly Correlates With Favorable Social Norms in Ethiopia—Implications for Improving Sexual and Reproductive Health of Young Adolescents. *Journal of adolescent health,* 64**,** S52-S59.

BJÖGVINSSON, E., EHN, P. & HILLGREN, P.-A. 2012. Design things and design thinking: Contemporary participatory design challenges. *Design issues,* 28**,** 101-116.

BRIEGER, W. R., DELANO, G. E., LANE, C. G., OLADEPO, O. & OYEDIRAN, K. A. 2001. West African Youth Initiative: outcome of a reproductive health education program. *Journal of Adolescent Health,* 29**,** 436-446.

CHANDRA-MOULI, V., MCCARRAHER, D. R., PHILLIPS, S. J., WILLIAMSON, N. E. & HAINSWORTH, G. 2014. Contraception for adolescents in low and middle income countries: needs, barriers, and access. *Reproductive health,* 11**,** 1.

CHANDRA-MOULI, V., PARAMESHWAR, P. S., PARRY, M., LANE, C., HAINSWORTH, G., WONG, S., MENARD-FREEMAN, L., SCOTT, B., SULLIVAN, E. & KEMPLAY, M. 2017. A never-before opportunity to strengthen investment and action on adolescent contraception, and what we must do to make full use of it. *Reproductive health,* 14**,** 85.

CUTHERELL, M. & COLE, C. 2019. Supporting Scalable, Youth-Powered Programming at the Community Level in Ethiopia: The Case of Smart Start. Washington, DC: Population Services International.

DAMTEW, Z. A., KARIM, A. M., CHEKAGN, C. T., ZEMICHAEL, N. F., YIHUN, B., WILLEY, B. A. & BETEMARIAM, W. 2018. Correlates of the Women's Development Army strategy implementation strength with household reproductive, maternal, newborn and child healthcare practices: a cross-sectional study in four regions of Ethiopia. *BMC pregnancy and childbirth,* 18**,** 5-17.

DENNO, D. M., CHANDRA-MOULI, V. & OSMAN, M. 2012. Reaching Youth With Out-of-Facility HIV and Reproductive Health Services: A Systematic Review. *Journal of Adolescent Health,* 51**,** 106-121.

DENNO, D. M., HOOPES, A. J. & CHANDRA-MOULI, V. 2015. Effective strategies to provide adolescent sexual and reproductive health services and to increase demand and community support. *Journal of adolescent health,* 56**,** S22-S41.

DHS 2011. Ethiopia Demographic and Health Survey.

DHS 2013. Nigeria Demographic and Health Survey.

DHS 2019. Ethiopia: Mini Demographic and Health Survey.

DOHOO, I., MARTIN, S. & STRYHN, H. 2009. Veterinary epidemiologic research. VER. *Inc., Charlottetown, PE, Canada*.

GATES, M. F. 2014. Putting women and girls at the center of development. *Science,* 345**,** 1273-1275.

GI, G. I. 2014. *Sexual and reproductive health of young women in Ethiopia* [Online]. Available: https://www.guttmacher.org/fact-sheet/sexual-andreproductive-health-young-women-ethiopia [Accessed 13/07/2021].

GOTTSCHALK, L. B. & ORTAYLI, N. 2014. Interventions to improve adolescents' contraceptive behaviors in low-and middle-income countries: a review of the evidence base. *Contraception,* 90**,** 211-225.

HABERLAND, N. A., MCCARTHY, K. J. & BRADY, M. 2018. A systematic review of adolescent girl program implementation in low-and middle-income countries: Evidence gaps and insights. *Journal of Adolescent Health,* 63**,** 18-31.

HORTON, R. & PETERSON, H. B. 2012. The rebirth of family planning. *The Lancet,* 380**,** 77.

IOS 2010. *Ergonomics of Human-system Interaction: Part 210: Human-centred Design for Interactive Systems,* Geneva, International Organization for Standardization.

ITAD & LSHTM 2016. Adolescents 360 Evaluation: Inception Report. Itad.

JACKSON, E., MCDOUGAL, L. & RAJ, A. 2017. *Community Experiences with a School-Based Intervention to Delay Marriage among Girls in Oromia Region, Ethiopia* [Online]. San Diego, CA: Center on Gender Equity and Health (GEH), University of California, San Diego School of Medicine. Available: https://gehweb.ucsd.edu/wp-content/uploads/2019/04/raj_mcdougapackard-pb-oda_ethiopia_9_12_17.pdf [Accessed].

KABA, M. & ADUGNA, Z. 2020. SCHOOL LEVEL MENSTRUAL HYGIENE MANAGEMENT IN OROMIA REGION OF ETHIOPIA. *Ethiopian Journal of Reproductive Health,* 12**,** 7-7.

KABA, M. & GELETU, Z. A. 2020. Mensural Hygiene Management in Schools of Oromia Region, Ethiopia.

KASSIE, A., WALE, A. & YISMAW, W. 2021. Impact of Coronavirus Diseases-2019 (COVID-19) on Utilization and Outcome of Reproductive, Maternal, and Newborn Health Services at Governmental Health Facilities in South West Ethiopia, 2020: Comparative Cross-Sectional Study. *International Journal of Women's Health,* 13**,** 479.

KESTERTON, A. J. & DE MELLO, M. C. 2010. Generating demand and community support for sexual and reproductive health services for young people: A review of the Literature and Programs. *Reproductive health,* 7**,** 25.

KLING, R. & STAR, S. L. 1998. Human centered systems in the perspective of organizational and social informatics. *ACM SIGCAS Computers and Society,* 28**,** 22-29.

MARSDEN, E. & TORGERSON, C. J. 2012. Single group, pre-and post-test research designs: Some methodological concerns. *Oxford Review of Education,* 38**,** 583-616.

MCCLEARY-SILLS, A. W., STOEBENAU, K. & HOLLINGWORTH, G. 2014. Understanding the Adolescent Family Planning Evidence Base. *Washington DC: ICRW*.

MEUWISSEN, L. E., GORTER, A. C. & KNOTTNERUS, A. J. 2006. Impact of accessible sexual and reproductive health care on poor and underserved adolescents in Managua, Nicaragua: a quasi-experimental intervention study. *Journal of Adolescent Health,* 38**,** 56. e1-56. e9.

MWAIKAMBO, L., SPEIZER, I. S., SCHURMANN, A., MORGAN, G. & FIKREE, F. 2011. What works in family planning interventions: a systematic review. *Studies in family planning,* 42**,** 67-82.

NORMAN, D. A. 2016. When you come to a fork in the road, take it: The future of design. *She Ji: The Journal of Design, Economics, and Innovation,* 2**,** 343-348.

OLIKA, A. K., KITILA, S. B., TERFA, Y. B. & OLIKA, A. K. 2021. Contraceptive use among sexually active female adolescents in Ethiopia: trends and determinants from national demographic and health surveys. *Reproductive Health,* 18**,** 1-11.

PENFOLD, R. B. & ZHANG, F. 2013. Use of interrupted time series analysis in evaluating health care quality improvements. *Academic pediatrics,* 13**,** S38-S44.

PSI, P. S. I. 2019. A360 Monthly Report Interpretation Guide. *Updated August 2019.*

PSI, P. S. I. 2020a. A360 Monthly Snapshot. *May 2020.*

PSI, P. S. I. 2020b. A360 Monthly Snapshot. *Sep 2020.*

PUNTON, M. & WALLACH, S. 2020. A360 Process Evaluation Final Report. *Supplementary Annex: A360 Process Evaluation Final Report.* Itad.

ROBSON, L., SHANNON, H., GOLDENHAR, L. & HALE, A. 2001. Before-and-after design: A simple evaluation design. *Guide to Evaluating the Effectiveness of Strategies for Preventing Work Injuries: How to Show Whether a Safety Intervention Really Works.* Druid Hills: Centers for Disease Control and Prevention.

ROSS, D. A., DICK, B., FERGUSON, J. & ORGANIZATION, W. H. 2006. *Preventing HIV/AIDS in young people: a systematic review of the evidence from developing countries*, World Health Organization.

SHADISH, W. R., COOK, T. D. & CAMPBELL, D. T. 2002. Quasi-experimental designs that either lack a control group or lack pretest observations on the outcome. *In:* SHADISH, W. R. & COOK, T. D. (eds.) *Experimental and quasi-experimental designs for generalized causal inference.* Boston, MA: Houghton Mifflin Company.

SIDA. 2003. *A profile on gender relations: Towards gender equality in Ethiopia.* [Online]. Available: https://www.sida.se/contentassets/54d269b9567243f0861deacae205859a/towards-gender-equality-in-ethiopia_470.pdf [Accessed 13/07/2021].

UN. 2015. *The Unites Nations 2030 agenda for sustainable development* [Online]. New York: United Nations. Available: https://www.un.org/sustainabledevelopment/development-agenda/ [Accessed 25-05-2021].

UNFPA, E. S. O. P. S. 2008. *Gender inequality and women's empowerment: In-depth analysis of the Ethiopian demographic and health survey 2005.* [Online]. Available: https://www.itacaddis.org/docs/2013_09_24_08_13_27_Gender%20profile%20UNFPA%202008.pdf [Accessed 13/07/2021].

VINER, R. M., OZER, E. M., DENNY, S., MARMOT, M., RESNICK, M., FATUSI, A. & CURRIE, C. 2012. Adolescence and the social determinants of health. *The Lancet,* 379**,** 1641-1652.

WHO 2011. WHO Guidelines on Preventing Early Pregnancy and Poor Reproductive Outcomes Among Adolescents in Developing Countries. Geneva.

WHO. 2020. *World Health Organization* [Online]. Available: https://www.who.int/en/news-room/fact-sheets/detail/adolescent-pregnancy [Accessed 20/10/2020 2020].

Appendix A: Methodology details

[See additional document available on Itad website]

Appendix B: A360 Outcome evaluation exploratory results

[See additional document available on Itad website]

Appendix C: Report tables

Response rates

Table 5: Reasons for non-response and response rates among adolescent girls by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada's		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Eligible girls aged 15-19 identified	430	366	286	271	312	266	254	273	1,282	1,176
Interviewed for face-to-face	417	366	270	271	263	266	248	273	1,198	1,176
Reasons for non-response for face-to-face surveys	13	0	16	0	49	0	6	0	84	0
Girl not in eligible age range	0	0	1	0	0	0	1	0	2	0
Girl absent or unavailable	9	0	4	0	9	0	1	0	23	0
Girl did not give consent	3	0	0	0	2	0	0	0	5	0
Reason not recorded	1	0	11	0	38	0	4	0	54	0
Face-to-face response rate	97%	100%	94%	100%	84%	100%	98%	100%	93%	100%
Interviewed for face-to-face but not to phone surveys	-	31	-	0	-	5	-	2	-	38
Reasons for non-response for phone surveys	-	0	-	0	-	0	-	0	-	0
Respondent never used telephone thus refused phone interview	-	0	-	0	-	0	-	1	-	1
Reason unknown (Girls not included for mobile interview)	-	31	-	0	-	5	-	1	-	37
Phone response rate	-	92%	-	100%	-	98%	-	99%	-	97%

Characteristics of adolescent girls

Table 6: Descriptive results: Percentage distribution of adolescent girls by woreda in Oromia Region, Ethiopia, according to selected characteristics, baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
	n=417	n=366	n=270	n=271	n=263	n=266	n=248	n=273	n=1,198	n=1,176
Age (years)										
15	6.3	1.1	5.7	3.0	2.1	1.9	2.4	5.5	4.3	2.7
16	9.3	4.6	5.1	8.9	8.0	4.9	5.5	12.5	7.1	7.5
17	17.7	12.0	18.2	21.8	21.5	15.8	23.6	20.1	20.1	17.0
18	37.0	45.6	45.7	47.2	38.2	30.5	44.2	43.2	41.0	42.0
19	29.7	36.6	25.4	19.2	30.3	47.0	24.3	18.7	27.4	30.8
Number of living children										
No children	55.5	49.7	49.3	39.9	43.2	34.5	48.3	48.3	49.9	44.5
1 child	37.4	44.7	46.1	52.1	51.9	54.9	43.1	44.6	43.5	48.1
2 children	6.8	5.0	4.3	7.7	4.4	10.3	8.6	7.2	6.3	7.2
3 or more children	0.2	0.6	0.3	0.2	0.5	0.3	0	0	0.2	0.3
Education level										
No education	18.2	21.3	21.0	19.9	21.5	16.2	61.7	57.1	31.4	28.1
Primary	59.0	51.4	70.9	70.5	67.3	69.2	28.8	28.6	54.7	54.5
Secondary	22.3	25.4	8.0	9.6	11.3	14.7	9.4	12.1	13.7	16.2
Technical/ vocational	0.5	1.6	0.2	0	0	0	0.2	2.2	0.2	1.0
Don’t know	0	0	0	0	0	0	0	0	0	0
No response	0	0.3	0	0	0	0	0	0	0	0.1
Religion										
Orthodox Christian	92.9	92.1	77.6	74.9	91.6	92.9	7.5	16.8	65.9	70.8
Protestant	5.6	6.6	19.4	24.0	8.0	5.6	1.5	4.8	7.8	9.9

	Wara Jarso		Lome		Ada'a		Fentale		Total	
Muslim	0.1	0	2.0	0.4	0	0	88.0	75.8	24.7	17.7
Traditional	1.1	1.4	1.0	0.7	0.4	1.5	3.1	1.8	1.5	1.4
No religion	0.2	0	0	0	0	0	0	0	0.1	0
Wealth quintile										
Lowest Quintile	24.6	7.3	8.9	3.4	14	5.7	71.7	58.4	32.8	21.7
Second Quintile	15.5	13.3	11.2	7.8	15.3	13	8.9	14.3	12.7	12.4
Middle Quintile	11.5	18.8	14.0	16.9	21.8	17.4	7.5	6.5	12.8	14.4
Fourth Quintile	12.8	31.8	27.5	34.2	29.8	34.7	1.5	6.6	15.7	25.2
Highest Quintile	35.6	28.8	38.4	37.8	19.1	29.2	10.3	14.1	25.9	26.3
Mobile phone access										
Owns smartphone	5.1	6.3	4.5	21.0	4.3	9.4	1.8	10.6	3.9	11.4
Owns non-smart mobile phone	47.2	52.2	35.4	28.0	44.2	30.5	5.9	17.2	32.7	33.6
Accesses mobile phone at least once a week	14.8	13.7	15.8	30.6	20.1	35.0	9.4	22.3	14.5	24.4
Accesses mobile phone less than once a week	6.4	7.7	10.3	10.3	5.9	9.4	11.3	16.8	8.5	10.8
No mobile phone access	26.5	20.2	34.1	10.0	25.5	15.8	71.1	29.3	40.2	19.0
Don’t know	0	0	0	0	0	0	0	0	0	0
No response	0	0	0	0	0	0	0.5	3.7	0.1	0.9

Table 7: Descriptive results: Sexuality of adolescent girl respondents (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada's		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Timing of last intercourse (%)	n=417	n=366	n=270	n=271	n=263	n=266	n=248	n=273	n=1,198	n=1,176
Within last month	88.4 (84.1-91.7)	67.5 (58.5-75.3)	96.6 (94.6-97.8)	82.3 (77.1-86.5)	93.2 (89.7-95.6)	78.9 (71.4-84.9)	87.7 (79.9-92.8)	76.6 (68.4-83.1)	90.8 (88.0-93.1)	75.6 (71.9-79.0)
Within last 12 months	10.5 (7.5-14.6)	22.1 (16.8-28.5)	3.0 (1.6-5.5)	17.7 (13.5-22.9)	6.8 (4.4-10.4)	19.2 (14.1-25.5)	10.2 (5.7-17.5)	22.3 (16.2-30.0)	8.1 (6.1-10.8)	20.5 (17.7-23.6)
More than 12 months	1.0 (0.3-3.3)	10.4 (5.8-18.0)	0.5 (0.1-2.8)	0 (0-0)	1.1 (0.3-4.5)	1.1 (0.3-4.5)	2.0 (0.7-5.6)	1.1 (0.2-5.3)	1.0 (0.5-2.1)	3.7 (2.2-6.2)
Never had sex	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0.4 (0.1-2.6)	0.4 (0.1-2.6)	0 (0-0)	0 (0-0)	0 (0-0)	0.1 (0.0-0.6)
No response	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0.4 (0.1-2.7)	0.4 (0.1-2.7)	0.2 (0.0-1.1)	0 (0-0)	0 (0-0)	0.1 (0.0-0.6)
	n=417	n=366	n=270	n=269	n=263	n=265	n=247	n=269	n=1,197	n=1,169
Median (IQR) age at first sexual intercourse	16 (15-17)	16 (15-17)	16 (15-17)	16 (15-16)	16 (15-17)	16 (15-17)	16 (16-17)	16 (15-17)	16 (15-17)	16 (15-17)

Table 8: Descriptive results: Fertility of adolescent girl respondents (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada's		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Currently pregnant (%)	n=417	n=366	n=270	n=271	n=263	n=266	n=248	n=273	n=1,198	n=1,176
Yes	11.6 (9.0 - 14.8)	10.1 (6.7-15.0)	13.5 (9.7-18.5)	12.5 (9.4-16.5)	20.6 (15.2-27.2)	12.4 (7.9-18.9)	26.0 (20.4-32.5)	12.5 (7.1-20.8)	17.7 (14.5-21.3)	11.7 (9.4-14.5)
No	87.2 (83.9-89.9)	89.1 (84.2-92.6)	85.1 (79.7-89.3)	87.5 (83.5-90.6)	78.3 (71.6-83.8)	86.5 (80.4-90.9)	72.9 (66.0-78.9)	86.8 (78.8-92.1)	81.2 (77.4-84.4)	87.6 (84.9-89.9)
Don't know	1.2 (0.5-3.0)	0.8 (0.1-6.2)	1.4 (0.5-3.8)	0 (0-0)	1.1 (0.4-3.4)	1.1 (0.4-3.0)	1.1 (0.3-3.5)	0.7 (0.2-2.8)	1.2 (0.7-2.0)	0.7 (0.3-1.7)
Ever been pregnant (%)	n=417	n=366	n=270	n=271	n=263	n=266	n=248	n=273	n=1,198	n=1,176
Yes	56.3 (48.4-63.8)	62.6 (53.8-70.6)	65.4 (57.6-72.4)	70.8 (61.9-78.5)	76.7 (70.0-82.3)	76.3 (68.9-82.4)	79.1 (71.8-84.9)	69.2 (62.8-75.0)	68.3 (62.9-73.2)	69.1 (65.1-72.9)
No[1]	43.6 (36.1-51.5)	32.8 (24.6-42.2)	34.7 (27.7-42.4)	28.0 (20.8-36.6)	23.3 (17.7-30.0)	16.5 (12.0-22.4)	20.9 (15.1-28.2)	29.7 (24.3-35.7)	31.7 (26.8-37.0)	27.3 (23.7-31.2)
No response	0.1 (0.0-0.9)	4.6 (1.9-11.0)	0 (0-0)	1.1 (0.2-7.4)	0 (0-0)	7.1 (3.6-13.8)	0 (0-0)	1.1 (0.3-4.5)	0.04 (0.01-0.30)	3.6 (2.2-5.8)
Ever given birth (%)	n=417	n=366	n=270	n=271	n=263	n=266	n=248	n=273	n=1,198	n=1,176
Yes	45.6 (37.2-54.1)	55.5 (46.4-64.2)	51.3 (40.8-61.7)	59.4 (48.4-69.5)	57.1 (50.0-63.9)	66.9 (58.9-74.0)	53.9 (44.4-63.1)	57.1 (45.2-68.3)	51.2 (46.3-56.1)	59.4 (54.3-64.2)
No	54.4 (45.9-62.8)	44.5 (35.8-53.6)	48.7 (38.4-59.2)	40.6 (30.5-51.6)	42.9 (36.1-50.0)	33.1 (26.0-41.1)	46.2 (37.0-55.6)	42.9 (31.7-54.8)	48.8 (43.9-53.7)	40.6 (35.8-45.7)
	n=191	n=203	n=136	n=161	n=149	n=178	n=134	n=156	n=610	n=698
Median (IQR) age at first birth	17 (16-18)	17 (16-18)	17 (16-18)	17 (16-18)	17 (16-18)	17 (16-18)	17.5 (16.5-18)	17 (16-18)	17 (16-18)	17 (16-18)
Age-specific fertility rates (per 1,000)	n=417	n=366	n=270	n=271	n=263	n=266	n=248	n=273	n=1,198	n=1,176
15-19	200.2 (171.6-232.3)	229.5 (172.9-298.0)	216.4 (177.1-261.7)	243.5 (191.2-304.8)	236.4 (191.7-287.9)	255.6 (198.6-322.5)	327.1 (279.5-378.7)	252.7 (188.8-329.6)	245.4 (217.2-276.0)	244.0 (213.5-277.4)

[1]"No" and "Don't know" options combined since the "No" option was wrongly categorized as "Don't know" due to technical issue with electronic tabs during the field level data collection. IQR, interquartile range

Main outcome – modern contraceptive use

Table 9: Table 2 Descriptive results: Contraceptive use (95%CI) at the individual-level by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso	Wara Jarso	Lome	Lome	Ada'a	Ada'a	Fentale	Fentale	Total	Total
	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline
No. of girls [1]	331	260	197	201	178	206	141	190	847	857
Any method	74.6 (70.4-78.3)	78.8 (68.1-86.7)	77.3 (70.4-83.0)	74.1 (64.8-81.7)	72.8 (63.6-80.4)	76.2 (69.9-81.6)	13.8 (6.0-28.7)	28.9 (14.2-50.1)	61.7 (51.3-71.2)	66.0 (59.3-72.2)
Any modern method [2]	74.2 (69.9-78.0)	78.8 (68.1-86.7)	77.3 (70.4-83.0)	73.6 (63.9-81.5)	72.8 (63.6-80.4)	76.2 (69.9-81.6)	12.8 (5.0-28.9)	28.9 (14.2-50.1)	61.3 (50.8-71.0)	65.9 (59.1-72.1)
Modern method										
Implant	3.7 (2.0-6.8)	8.8 (4.5-16.6)	21.1 (12.6-33.0)	23.9 (16.7-32.9)	15.6 (11.1-21.6)	20.9 (14.8-28.6)	2.1 (0.5-7.9)	12.1 (5.4-25.0)	9.5 (6.3-14.0)	16.0 (12.5-20.1)
Intra-uterine device	0.9 (0.3-3.0)	0 (0-0)	0 (0-0)	0.5 (0.1-3.4)	0.4 (0.1-2.9)	0.5 (0.1-3.5)	0 (0-0)	0.5 (0.1-4.2)	0.4 (0.2-1.2)	0.4 (0.1-1.1)
Injectables	64.6 (57.9-70.8)	68.8 (59.3-77.0)	52.5 (42.9-61.9)	41.8 (29.4-55.3)	50.5 (40.3-60.7)	51.5 (43.5-59.3)	8.4 (3.0-21.4)	11.1 (5.8-19.9)	47.1 (38.4-56.1)	45.5 (39.7-51.5)
Daily pills	3.8 (1.0-13.4)	0.8 (0.2-3.1)	3.2 (1.7-6.1)	6.0 (3.4-10.3)	4.4 (1.6-11.6)	2.9 (1.3-6.3)	1.2 (0.3-4.7)	1.1 (0.3-3.2)	3.2 (1.6-6.3)	2.6 (1.7-3.8)
Emergency pills	0.2 (0.0-1.1)	0 (0-0)	0.6 (0.1-4.2)	0 (0-0)	0 (0-0)	0 (0-0)	0.3 (0.0-2.0)	1.6 (0.4-5.9)	0.2 (0.1-0.9)	0.4 (0.1-1.4)
Male condom	0 (0-0)	0 (0-0)	0 (0-0)	0.5 (0.1-4.0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0.1 (0.0-0.9)
Other modern method	0.9 (0.2-3.3)	0.4 (0.1-2.7)	0 (0-0)	1.0 (0.3-3.7)	1.9 (0.6-5.7)	0.5 (0.1-3.9)	0.8 (0.1-4.9)	2.6 (0.9-7.7)	0.2 (0.0-1.3)	1.1 (0.5-2.3)
LARC[3]	6.3 (3.7-10.5)	11.2 (5.9-20.2)	27.3 (16.6-41.4)	33.1 (20.8-48.2)	22.0 (14.5-32.0)	28.0 (20.5-37.1)	16.4 (8.5-29.2)	43.6 (25.1-64.1)	16.2 (11.8-21.7)	24.8 (19.7-30.7)
Any traditional method	0.4 (0.1-1.7)	0 (0-0)	0 (0-0)	0.5 (0.1-3.4)	0 (0-0)	0 (0-0)	1.0 (0.2-6.0)	0 (0-0)	0.4 (0.1-1.3)	0.1 (0.0-0.9)
Not currently using	25.4 (21.7-29.6)	21.2 (13.3-31.9)	22.7 (17.0-29.6)	25.4 (18.1-34.3)	27.2 (19.6-36.5)	23.3 (18.2-29.4)	85.4 (71.0-93.3)	70.5 (50.2-85.1)	38.1 (28.8-48.4)	33.6 (27.6-40.2)
Don't know	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
No response	0 (0-0)	0 (0-0)	0 (0-0)	0.5 (0.1-3.4)	0 (0-0)	0.5 (0.1-3.5)	0.82 (0.13-4.9)	0.5 (0.1-3.4)	0.2 (0.0-1.3)	0.4 (0.1-1.1)
Use within past 12 months	82.5 (78.4-85.9)	78.8 (68.1-86.7)	81.9 (74.9-87.2)	79.7 (69.3-87.2)	81.9 (69.3-90.1)	81.6 (75.9-86.1)	18.0 (8.8-33.3)	29.5 (14.2-51.5)	68.3 (60.9-74.8)	68.8 (61.9-75.0)

[1]Excludes girls who are infecund and currently pregnant.

[2]Modern methods include female sterilization, male sterilization, contraceptive pill (oral contraceptives), intra-uterine device, injectables (Depo-Provera), implants (Norplant), female condom, male condom, diaphragm, contraceptive foam and contraceptive jelly, LAM, SDM, cycle beads.

[3]LARC, % of Long-Acting Reversible Contraceptive users among all modern contraceptive users, which includes implant and intra-uterine device.

Secondary outcomes – descriptive results

Adolescents use high quality sexual and reproductive health products and services

Table 10: Descriptive results: Fertility preferences and unmet need of adolescent girl respondents (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada's		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Planning status of most recent birth (%)	n=191	n=134	n=136	n=120	n=149	n=118	n=134	n=115	n=610	n=487
Wanted then	64.0 (54.6-72.4)	59.7 (48.8-69.7)	63.4 (53.6-72.2)	46.7 (27.8-66.6)	72.6 (64.3-79.6)	66.9 (55.4-76.8)	78.2 (64.1-87.7)	57.4 (48.4-65.9)	69.8 (63.4-75.5)	57.7 (50.7-64.4)
Wanted later	32.2 (23.9-41.8)	32.8 (24.7-42.2)	30.8 (20.8-42.9)	49.2 (28.5-70.1)	25.8 (18.6-34.7)	29.7 (18.3-44.2)	16.8 (9.1-29.1)	37.4 (27.0-49.1)	26.1 (20.7-32.4)	37.2 (30.0-45.0)
Wanted no more	3.8 (1.0-13.9)	7.5 (4.6-12.0)	5.8 (2.2-14.9)	4.2 (1.5-11.2)	1.6 (0.40-5.9)	3.4 (1.0-11.0)	5.0 (1.3-17.6)	5.2 (2.0-13.1)	4.1 (2.1-7.9)	5.1 (3.4-7.8)
Unmet need for modern contraception (%) [1]	n=377	n=304	n=237	n=236	n=230	n=239	n=200	n=223	n=1,044	n=1,002
No unmet need	81.6 (79.2-83.7)	82.2 (73.8-88.4)	87.6 (82.4-91.5)	80.5 (68.9-88.5)	89.9 (85.2-93.2)	87.4 (81.7-91.6)	61.9 (53.7-69.4)	70.4 (64.2-75.9)	79.5 (74.6-83.6)	80.4 (76.4-83.9)
Unmet need for spacing [2]	16.3 (13.9-18.9)	17.4 (11.2-26.1)	11.4 (8.0-16.0)	19.1 (11.3-30.4)	9.6 (6.2-14.5)	10.9 (7.1-16.4)	37.6 (30.1-45.8)	25.6 (20.1-31.9)	19.4 (15.1-24.4)	18.1 (14.7-22.0)
Unmet need for limiting [3]	2.2 (1.1-4.2)	0.3 (0.0-2.3)	1.0 (0.3-3.2)	0.4 (0.1-2.9)	0.6 (0.1-4.1)	1.7 (0.6-4.8)	0.5 (0.1-2.2)	4.0 (2.2-7.4)	1.2 (0.7-2.1)	1.5 (0.8-2.7)
Total unmet need	18.5 (16.3-20.8)	17.8 (11.6-26.2)	12.4 (8.5-17.6)	19.5 (11.5-31.1)	10.1 (6.8-14.9)	12.6 (8.4-18.3)	38.1 (30.6-46.3)	29.6 (24.1-35.8)	20.5 (16.4-25.4)	19.6 (16.1-23.6)

[1] Total number of adolescent girls aged 15-19 years old who are fecund and sexually active (sex in the past year), or postpartum amenorrheic or pregnant.

[2] Unmet need for spacing includes pregnant women whose pregnancy was mistimed; fecund women who are non-pregnant, who are not using any modern method of contraception, and say they want to wait two or more years for their first/next birth; and postpartum amenorrheic women, who are not using any modern method of contraception, and say at the time they became pregnant they had wanted to delay pregnancy.

[3] Unmet need for limiting refers to pregnant women whose pregnancy was unwanted; fecund women who are non-pregnant, who are not using any modern method of contraception, and want no more children; and postpartum amenorrheic women, who are not using any modern method of contraception, and say at the time they became pregnant they had not wanted any more children.

Adolescent girls have access to appropriate high quality sexual and reproductive health information and services

Table 11: Descriptive results: adolescent girls' knowledge of contraceptive methods (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Ever heard of contraception	**n=417**	**n=366**	**n=270**	**n=271**	**n=263**	**n=266**	**n=248**	**n=273**	**n=1,198**	**n=1,176**
Yes	93.0 (90.2-95.1)	92.9 (87.6-96.0)	95.5 (92.2-97.5)	99.1 (96.6-99.8)	94.9 (90.7-97.3)	90.2 (86.2-93.1)	79.9 (67.4-88.5)	81.3 (71.8-88.2)	90.3 (85.9-93.4)	90.1 (86.2-93.0)
No	6.6 (4.5-9.4)	4.7 (2.6-8.3)	3.6 (1.8-6.8)	0.9 (0.3-3.4)	4.1 (1.9-8.7)	6.1 (3.6-10.2)	12.5 (8.7-17.8)	14.8 (9.6-22.2)	7.1 (5.3-9.4)	7.3 (5.0-10.5)
Don't know	0.4 (0.1-1.2)	2.4 (1.0-6.0)	0.9 (0.2-3.3)	0 (0-0)	1.0 (0.2-3.8)	3.7 (1.7-8.0)	7.5 (2.6-20.1)	3.9 (1.6-9.4)	2.6 (1.0-6.4)	2.6 (1.5-4.4)
No response	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Contraception information source in past 12 months (%)	**n=373**	**n=304**	**n=260**	**n=268**	**n=249**	**n=221**	**n=203**	**n=228**	**n=1,085**	**n=1,021**
Hospital/health center/clinic	28.4 (19.8-38.8)	55.3 (47.8-62.6)	12.5 (7.8-19.5)	65.4 (53.6-75.6)	21.6 (15.3-29.7)	50.4 (42.1-58.8)	16.0 (10.2-24.2)	61.3 (47.0-74.0)	20.4 (16.1-25.5)	58.7 (53.0-64.1)
CHW/TBA/community midwife	28.6 (21.0-37.6)	35.2 (27.2-44.2)	32.8 (24.2-42.7)	50.9 (39.7-62.1)	24.3 (17.7-32.5)	26.8 (17.8-38.3)	41.0 (34.8-47.5)	29.1 (23.5-35.4)	31.8 (27.3-36.6)	35.7 (31.0-40.7)
Radio	16.6 (9.6-27.3)	18.4 (11.5-28.1)	33.7 (23.5-45.5)	25.8 (18.2-35.3)	18.2 (12.9-25.0)	20.0 (12.7-30.0)	14.3 (10.2-19.6)	14.7 (8.7-24.0)	20.2 (15.9-25.4)	19.4 (15.4-24.2)
Friends/peers	32.8 (25.8-40.7)	16.4 (11.5-22.7)	17.4 (12.4-23.9)	10.4 (6.3-16.7)	25.6 (18.8-33.8)	14.6 (9.2-22.2)	15.5 (10.9-21.6)	6.0 (2.1-15.4)	23.6 (19.7-28.0)	11.5 (8.7-15.0)
Neighbors	21.2 (15.4-28.5)	5.8 (4.3-7.9)	31.2 (23.0-40.8)	13.5 (9.0-19.7)	19.9 (12.8-29.5)	14.1 (9.3-20.8)	22.6 (12.6-37.2)	11.3 (8.2-15.4)	23.6 (19.1-28.7)	10.8 (8.9-13.0)
Television	8.7 (4.0-17.7)	8.2 (4.4-14.8)	6.0 (2.9-12.1)	8.9 (4.6-16.6)	1.9 (0.8-4.2)	12.1 (6.0-22.8)	6.0 (1.6-20.7)	6.4 (3.2-12.2)	6.1 (3.6-10.2)	8.6 (6.1-11.9)
Teachers	20.9 (16.1-26.8)	5.5 (3.3-9.0)	16.8 (13.1-21.4)	8.8 (4.7-16.0)	15.1 (11.1-20.1)	6.8 (4.7-9.9)	15.2 (9.0-24.5)	4.9 (1.8-12.4)	17.4 (14.6-20.7)	6.4 (4.5-8.9)
Parent/guardian	10.1 (5.1-18.8)	10.1 (5.7-17.2)	8.9 (5.5-13.9)	5.5 (2.4-11.9)	13.7 (7.9-22.7)	7.7 (5.1-11.6)	3.1 (2.1-4.5)	1.9 (0.4-8.4)	8.8 (6.1-12.5)	6.1 (4.1-9.0)
Spouse/partner	9.4 (5.9-14.7)	6.8 (4.0-11.2)	8.5 (4.6-15.1)	7.5 (4.3-12.6)	6.6 (3.6-11.8)	6.6 (3.5-12.2)	3.2 (1.2-8.2)	2.6 (1.1-5.6)	7.1 (5.1-9.8)	5.7 (4.2-7.6)

Pharmacy/chemist	0 (0-0)	0.6 (0.1-4.4)	0.4 (0.1-3.2)	2.2 (1.0-4.7)	0 (0-0)	0.4 (0.1-3.1)	0 (0-0)	0.6 (0.1-2.4)	0.1 (0.0-0.7)	1.0 (0.5-1.9)

[1]Among girls who had heard of contraception, and at endline, among girls who answered the phone survey, i.e. had been sexually active in the last 12 months

CHW, Community health worker, TBA, traditional birth attendant

Table 12: Descriptive results: awareness of where to obtain health services in girls who have the intention to use contraception (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Aware of where to obtain health services [1]	**n=78**	**n=33**	**n=34**	**n=49**	**n=43**	**n=35**	**n=45**	**n=62**	**n=200**	**n=179**
Yes	81.2 (68.8-89.4)	89.5 (67.5-97.2)	88.5 (72.6-95.7)	97.3 (82.9-99.6)	95.3 (79.3-99.0)	100.0	92.4 (76.1-97.8)	90.5 (67.7-97.7)	88.3 (81.8-92.7)	93.5 (83.2-97.7)
No	18.8 (10.6-31.2)	10.5 (2.8-32.4)	11.5 (4.3-27.4)	2.7 (0.4-17.1)	4.8 (0.9-20.7)	0 (0-0)	7.6 (2.1-23.9)	9.6 (2.3-32.4)	11.7 (7.3-18.2)	6.5 (2.3-16.8)
Source of method mentioned [2]	**n=65**	**n=29**	**n=29**	**n=48**	**n=41**	**n=35**	**n=42**	**n=57**	**n=177**	**n=169**
Hospital	21.8 (11.2-38.2)	34.6 (11.3-68.9)	19.2 (10.8-31.8)	21.2 (16.8-26.4)	18.2 (8.8-34.0)	2.8 (0.3-19.1)	23.4 (14.1-36.2)	14.3 (7.5-25.4)	21.2 (15.4-28.5)	17.3 (11.2-25.8)
Health center/clinic	57.4 (37.8-74.9)	38.1 (17.0-64.9)	47.2 (31.6-63.4)	39.8 (20.0-63.7)	53.8 (36.7-70.1)	57.3 (37.2-75.3)	26.9 (11.9-50.0)	53.7 (38.1-68.6)	45.5 (34.5-56.9)	48.3 (37.7-59.0)
CHW/HEW	19.4 (10.0-34.3)	20 (7.4-43.8)	33.6 (20.9-49.2)	37.7 (18.0-62.4)	24.8 (11.0-46.8)	37.7 (23.3-54.6)	46.9 (25.7-69.2)	23.3 (15.8-33.0)	31.4 (22.2-42.3)	28.9 (21.3-37.9)
Other	0 (0-0)	0 (0-0)	0 (0-0)	1.3 (0.2-10.1)	0 (0-0)	0 (0-0)	2.9 (0.5-15.5)	2.2 (0.3-12.8)	0.9 (0.1-6.0)	1.3 (0.3-5.5)
No response	1.4 (0.2-9.7)	0 (0-0)	0 (0-0)	0 (0-0)	3.2 (0.5-17.4)	2.2 (0.3-15.7)	0 (0-0)	6.5 (0.9-33.6)	1.1 (0.3-4.4)	3.1 (0.5-15.8)
Don't know	0 (0-0)	7.3 (1.3-31.6)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	1.1 (0.2-5.1)

[1]Among girls who were not using a method but had the intention to use one at the time of the survey, and at endline, among girls who answered the phone survey. [2]Among girls who were aware of where to obtain health services.

CHW, Community health worker, TBA, traditional birth attendant

Contraception positioned as relevant and valuable for adolescent girls

Table 13: Descriptive results: Benefits of contraception and adolescent girl's future aspirations and intention to use a modern contraceptive method (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Benefits of contraception [1]	**n=385**	**n=334**	**n=260**	**n=268**	**n=251**	**n=241**	**n=203**	**n=229**	**n=1,099**	**n=1,072**
Using modern contraception can allow a girl to complete her education, find a better job, and have a better life	96.5 (93.7-98.1)	98.2 (95.2-99.3)	85.8 (80.2-90.1)	99.5 (97.7-99.9)	86.7 (75.6-93.2)	99.4 (97.5-99.8)	71.5 (58.4-81.8)	86.1 (75.3-92.6)	86.1 (80.7-90.1)	95.3 (91.3-97.5)
Using modern contraception can support a girl to achieve her life goals	NA	95.9 (90.6-98.3)	NA	100.0	NA	95.7 (92.2-97.7)	NA	88.0 (76.4-94.3)	NA	94.6 (90.9-96.8)
		n=335		**n=271**		**n=261**		**n=271**		**n=1138**
Future aspirations, index (0-9) [2]	NA	5.7 (5.6-5.9)	NA	5.4 (5.3-5.6)	NA	5.8 (5.4-6.2)	NA	5.1 (4.8-5.4)	NA	5.5 (5.3-5.6)
Future aspirations, components										
I have goals for my life [3]	NA	34.1 (29.7-38.9)	NA	19.5 (15.0-25.0)	NA	38.9 (26.8-52.6)	NA	24.9 (17.9-33.6)	NA	28.9 (24.9-33.3)
I believe I have some tools to help me achieve my goals for my life [3]	NA	32.0 (28.0-36.2)	NA	21.1 (16.5-26.6)	NA	31.9 (21.0-45.2)	NA	21.5 (15.9-28.4)	NA	26.2 (22.8-30.0)
I have little control over the things that happen to me [4]	NA	0.1 (0.0-1.2)	NA	0 (0-0)	NA	0.3 (0.0-2.1)	NA	0 (0-0)	NA	0.1 (0.0-0.4)
I believe preventing unintended pregnancy is important to help me achieve my goals for life [3]	NA	29.8 (25.3-34.8)	NA	19.3 (15.2-24.1)	NA	28.1 (17.3-42.3)	NA	15.7 (8.9-26.4)	NA	22.7 (19.0-26.9)
Future intention to use modern contraception [5]	**n=89**	**n=50**	**n=44**	**n=53**	**n=46**	**n=47**	**n=108**	**n=102**	**n=287**	**n=252**
Yes	93.9 (86.8-97.3)	68.3 (47.1-84)	76.9 (65.3-85.5)	92.4 (84.3-96.5)	92.4 (76.3-97.9)	73.3 (60.8-82.9)	40.9 (29.5-53.4)	55.9 (41.8-69.2)	65.7 (52.7-76.6)	66.9 (57.3-75.3)

No	4.9 (2.2-10.9)	26.1 (12.5-46.8)	20.0 (11.6-32.1)	7.6 (3.5-15.7)	5.3 (0.9-24.8)	26.7 (17.1-39.2)	56.0 (43.2-68.2)	41.9 (28.9-56.1)	31.8 (21.3-44.7)	31.1 (23.2-40.2)
No response	1.2 (0.2-7.9)	5.5 (2.3-13.0)	3.1 (0.4-19.7)	0 (0-0)	2.3 (0.3-16.4)	0 (0-0)	3.1 (0.9-9.9)	2.2 (0.4-10.7)	2.5 (1.0-5.9)	2.0 (0.7-5.6)

[1]Girls who heard about modern contraceptives were read a number of statements representing benefits of contraception. They were asked whether or not they agreed with the statements. [2] Girls who responded to the phone survey were read a number of statements on their aspirations. They were asked whether or not they agreed with the statements. [3]Strongly agrees. [4]Strongly disagrees. [5]Among girls who were not using a modern method at the time of the survey and girls who, at endline, responded to the phone survey. NA = not applicable.

Supportive environment for adolescent girls to access services.

Table 14: Descriptive results: Attitudes and self-efficacy of adolescent girls towards contraceptive use (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
	n=385	n=334	n=260	n=268	n=251	n=241	n=203	n=229	n=1,099	n=1,072
Attitudes, index (0-2) [1]	1.6 (1.5-1.7)	1.7 (1.6-1.8)	1.4 (1.2-1.6)	1.8 (1.7-1.8)	1.7 (1.6-1.7)	1.7 (1.7-1.8)	1.1 (0.9-1.3)	1.5 (1.3-1.7)	1.5 (1.4-1.5)	1.7 (1.6-1.7)
Attitudes, components [2]										
Married couples using a modern contraceptive method to avoid or delay pregnancy	99.5 (97.6-99.9)	96.1 (91.7-98.2)	91.1 (82.4-95.7)	96.6 (90.8-98.8)	100.0	93.4 (89.7-95.8)	71.2 (60.8-79.8)	82.7 (68.5-91.3)	90.8 (85.2-94.4)	92 (87.6-94.9)
Couples who are not married using a modern contraceptive method to avoid or delay pregnancy	63.2 (54.7-71.0)	73.1 (69.6-76.4)	52.3 (39.1-65.2)	79.3 (69.4-86.6)	66.0 (58.0-73.2)	77.6 (72.5-82.0)	39.8 (31.8-48.4)	68.0 (53.5-79.6)	55.6 (49.3-61.8)	73.9 (69.4-78.0)
	n=331	n=323	n=197	n=271	n=178	n=254	n=141	n=232	n=847	n=1080
Self-efficacy, index (0-4) [3, 4]	3.4 (3.4-3.5)	3.7 (3.6-3.8)	3.2 (3.0-3.4)	3.9 (3.8-4.0)	3.3 (3.2-3.4)	3.8 (3.7-3.9)	2.1 (1.6-2.5)	3.5 (3.1-3.8)	3.0 (2.8-3.1)	3.7 (3.6-3.8)
Self-efficacy, components [5]										
I feel able to start a conversation with my husband/partner about contraception	94.7 (91.3-96.8)	91.8 (86.4-95.2)	92.6 (84.3-96.7)	97.8 (95.3-99.0)	98.4 (93.6-99.6)	93.5 (87.5-96.7)	55.5 (36.1-73.3)	86.6 (76.7-92.7)	86.4 (77.5-92.1)	92.0 (88.7-94.4)
I feel able to obtain information on contraception services and products if I need to	94.4 (90.0-96.9)	92.9 (87.2-96.2)	87.1 (83.1-90.3)	97.8 (94.9-99.1)	95.3 (90.2-97.8)	94.6 (91.5-96.5)	58.3 (47.7-68.2)	87.0 (74.7-93.8)	85.1 (78.7-89.8)	92.7 (89.0-95.2)
I feel able to obtain a contraception method if I decided to use one	92.8 (89.4-95.2)	93.7 (89.4-96.3)	88.6 (81.1-93.4)	97.6 (94.3-99.0)	91.4 (83.4-95.7)	96.6 (93.2-98.3)	53.0 (42.0-63.7)	86.6 (74.0-93.6)	83.0 (75.7-88.4)	93.1 (89.3-95.7)

I feel able to use a method of contraception even if my husband/partner doesn't want me to	62.5 (57.8-67.0)	92.7 (89.1-95.2)	51.0 (38.0-63.8)	95.9 (91.1-98.1)	45.9 (36.7-55.3)	96.1 (93.2-97.7)	25.9 (16.8-37.7)	86.0 (75.8-92.2)	49.0 (42.4-55.5)	92.2 (88.8-94.6)

[1]Among girls who had heard about modern contraceptives. [2]Proportion of respondents who approved. [3]Among girls who had heard about modern contraceptives. At endline, respondents were those who responded to the phone survey, who have been sexually active in the last 12 months. At baseline, we restricted the interviews to girls who had been sexually active in the last 12 months, for comparability with endline population. [4]Respondents were read a number of statements related to self-efficacy. They were asked whether or not they agreed with the statements. [5]Proportions who agreed with statements.

Table 15: Descriptive results: treatment by provider on adolescent girl's last visit (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Treated respectfully by provider on last visit [1]	n=242	n=205	n=153	n=148	n=132	n=157	n=32	n=55	n=559	n=565
Yes	96.1 (93.1-97.8)	92.4 (84.3-96.5)	91.6 (86.6-94.8)	98.1 (94.5-99.4)	95.4 (90.0-97.9)	97.4 (94.1-98.9)	81.0 (57.0-93.2)	82.3 (71.3-89.6)	94.0 (91.6-95.7)	93.9 (90.8-96.0)
No	2.5 (1.0-6.1)	7.6 (3.5-15.7)	3.3 (1.5-7.1)	1.5 (0.5-4.7)	3.9 (2.0-7.6)	1.8 (0.7-4.9)	16.9 (6.3-37.9)	16.2 (8.6-28.5)	3.7 (2.4-5.7)	5.7 (3.6-8.8)
Don't know/ Can't remember	0.21 (0.0-1.6)	0 (0-0)	5.1 (2.9-9.0)	0 (0-0)	0 (0-0)	0 (0-0)	2.1 (0.3-12.9)	0 (0-0)	1.7 (0.9-3.2)	0 (0-0)
No response	1.2 (0.3-4.3)	0 (0-0)	0 (0-0)	0.4 (0.1-2.5)	0.75 (0.1-4.2)	0.7 (0.1-5.5)	0 (0-0)	1.5 (0.2-10.7)	0.7 (0.2-2.1)	0.5 (0.1-1.5)

[1] Current modern contraceptive users were asked whether the last time they obtained a modern contraceptive method they felt like they were treated respectfully.

Table 16: Descriptive results: Descriptive norms on modern contraception according to adolescent girls (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at endline (2020)

	Wara Jarso	Lome	Ada'a	Fentale	Total
	n=305	n=268	n=238	n=228	n=1,039
Descriptive norms, index (0-6) [1,2]	2.9 (2.5-3.2)	2.4 (2.2-2.6)	2.8 (2.5-3.1)	1.4 (0.9-1.9)	2.3 (2.1-2.5)
Descriptive norms, components					
How many girls aged 15-19 years in your community do you believe discuss using a method of contraception with their husband/partner	17.7 (14.0-22.0)	15.6 (11.0-21.0)	21.7 (16.9-27.6)	7.9 (5.6-11.0)	15.1 (12.8-17.0)
How many girls aged 15-19 years in your community do you believe use contraceptive methods	22.8 (16.9-29.0)	23.1 (17.0-30.0)	35.2 (26.1-45.0)	5.9 (3.3-10.0)	20.3 (16.6-24.0)
How many girls aged 15-19 years in your community do you believe use contraceptive methods in secrecy from their husband/partner or family	10.5 (7.8-14.0)	6.7 (4.4-10.2)	7.3 (3.7-13.7)	2.0 (0.8-5.0)	6.5 (4.9-8.5)

[1]Among girls who had heard about modern contraceptives and girls who responded to the phone survey. [2]Respondents were asked about their views regarding married girls aged 15-19 years old. They were asked whether they thought the statement applied to most girls, less than half, or none. [3]Proportions who answered that the statement applied to most girls.

Note: Girls were not asked about descriptive norms at baseline (2017).

Table 17: Descriptive results: respondents' influencers of adolescent girls (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Decision making – partner [1]	n=385	n=323	n=260	n=271	n=251	n=254	n=203	n=232	n=1,099	n=1,080
We will decide together	86.2 (81.6-89.8)	79.9 (73.3-85.2)	64.6 (54.5-73.5)	72.6 (64.6-79.4)	87.9 (83.1-91.5)	85.2 (80.0-89.2)	46.4 (36.3-56.8)	47.9 (40.4-55.5)	72.0 (66.9-76.6)	70.0 (64.8-74.8)
Mainly my husband/partner decision	10.9 (7.6-15.4)	6.7 (3.8-11.7)	14.4 (8.7-22.9)	14.2 (10.4-19.1)	7.7 (4.8-12.2)	2.5 (1.0-6.3)	6.4 (3.2-12.2)	38.8 (29.7-48.8)	9.9 (7.6-13.0)	16.9 (12.6-22.1)
Mainly my decision	2.1 (0.7-6.4)	10.1 (6.7-15.0)	20.1 (14.3-27.4)	13.2 (8.4-20.2)	4.4 (2.6-7.2)	10.2 (6.6-15.5)	43.9 (35.5-52.6)	11.3 (6.7-18.5)	16.8 (12.5-22.1)	11.2 (8.8-14.0)
No response	0.8 (0.3-2.6)	3.3 (1.5-6.9)	1.0 (0.2-3.9)	0 (0-0)	0 (0-0)	2.1 (1.0-4.5)	3.4 (1.8-6.1)	2.0 (0.7-5.5)	1.3 (0.8-2.1)	1.9 (1.2-3.2)
Decision making – other[2]	n=385	n=323	n=260	n=271	n=251	n=254	n=203	n=232	n=1,099	n=1,080
No one	90.8 (86.4-93.9)	80.9 (64.9-90.7)	84.1 (78.0-88.8)	93.2 (88.9-95.9)	96.1 (89.9-98.6)	89.7 (84.9-93.0)	71.8 (55.3-83.9)	75.2 (63.3-84.2)	85.7 (81.9-88.8)	83.8 (77.7-88.5)
Mother	2.2 (0.9-4.9)	3.2 (0.7-14.2)	3.6 (1.4-8.6)	1.8 (0.7-4.4)	0.4 (0.0-2.9)	2.9 (1.3-6.3)	3.1 (0.7-13.4)	4.5 (2.2-9.1)	2.4 (1.3-4.3)	3.2 (1.8-5.7)
Father	0.6 (0.1-2.6)	1.1 (0.3-3.4)	0 (0-0)	1.0 (0.3-3.1)	0 (0-0)	0.4 (0.0-2.5)	0.2 (0.0-1.6)	8.5 (3.0-21.6)	0.3 (0.1-0.9)	3.0 (1.3-7.1)
Mother-in-law	0.4 (0.1-1.8)	0.2 (0.0-1.8)	4.9 (2.6-8.9)	1.1 (0.3-3.3)	1.1 (0.2-7.7)	0.7 (0.2-2.6)	6.4 (2.0-18.5)	0 (0-0)	3 (1.7-5.4)	0.5 (0.2-1.0)
Father-in-law	2.5 (1.3-4.8)	6.0 (2.4-14.1)	1.9 (0.5-6.3)	0.5 (0.1-3.4)	0 (0-0)	0.5 (0.1-3.4)	6.9 (2.4-18.3)	1.8 (0.9-3.6)	2.9 (1.5-5.8)	2.4 (1.2-4.9)
Sister	0.5 (0.1-4.0)	0.6 (0.1-2.2)	1.9 (0.7-4.8)	1.4 (0.5-3.9)	0 (0-0)	1.5 (0.5-4.1)	1.6 (0.5-4.6)	0.6 (0.1-2.9)	1.0 (0.5-1.9)	0.9 (0.5-1.7)
Other	2.5 (1.5-4.1)	3.5 (1.7-7.0)	2.5 (1.3-4.6)	0.5 (0.1-3.7)	2.4 (0.7-7.6)	1.4 (0.6-3.5)	4.4 (1.9-9.6)	6.5 (3.2-12.9)	2.9 (1.9-4.4)	3.3 (2.0-5.4)
No response	0.6 (0.1-2.6)	1.9 (0.7-4.6)	1.1 (0.2-5.0)	0.4 (0.1-3.2)	0 (0-0)	1.6 (0.7-3.7)	5.7 (2.7-11.7)	2.9 (1.4-5.7)	1.8 (1.1-3)	1.8 (1.1-3)

[1]Measured through the question "Who will decide whether you use a method of family planning? Would you say that it will be mainly your decision, mainly your husband/partner's decision, or you will decide together?"

[2]Measured through the question "Who else will influence your decision to use a method of family planning?"

Table 18: Descriptive results: Influencers' approval of adolescent girls using a modern contraceptive method to avoid or delay pregnancy, according to the respondent (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia, at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
Approval – husband [1]	n=414	n=323	n=269	n=271	n=263	n=254	n=240	n=232	n=1,186	n=1,080
Yes	85.6 (80.6-89.5)	79.4 (70.4-86.2)	80.7 (70.9-87.7)	90.2 (84.7-93.9)	92.4 (85.4-96.2)	82.6 (73.7-89.0)	34.5 (20.1-52.5)	66.2 (51.4-78.4)	71.9 (64.5-78.3)	78.7 (72.9-83.6)
No	9.3 (5.7-14.9)	10.4 (7.5-14.3)	9.9 (5.9-16.1)	7.1 (3.9-12.7)	3 (1.6-5.6)	5.6 (2.8-11.0)	41.4 (33.5-49.7)	17.5 (11.6-25.4)	17.0 (12.8-22.2)	10.7 (8.3-13.8)
Don't know	5.1 (2.8-9.1)	6.7 (3.4-12.8)	9.0 (5.2-15.3)	2.7 (1.2-6.0)	4.5 (1.7-11.3)	10.1 (6.1-16.3)	23.0 (12.2-39.1)	12.5 (7.5-19.9)	10.7 (7.3-15.4)	8.1 (5.9-11.1)
No response	0 (0-0)	2.3 (1.2-4.3)	0.5 (0.1-2.9)	0 (0-0)	0 (0-0)	1.3 (0.5-3.4)	1.2 (0.3-4.4)	1.4 (0.2-9.6)	0.4 (0.1-1.3)	1.3 (0.6-2.7)
Approval – community [1]	n=414	n=323	n=269	n=271	n=263	n=254	n=240	n=232	n=1,186	n=1,080
Yes	68.9 (58.8-77.5)	82.5 (70.6-90.2)	50.2 (39.3-61.1)	85.1 (77.4-90.5)	66.6 (52.6-78.2)	86.9 (76.0-93.3)	19.7 (11.8-31.0)	64.6 (54.6-73.5)	51.1 (43.6-58.5)	78.8 (73.1-83.6)
No	10.9 (7.2-16.0)	5.8 (2.9-11.5)	14.8 (11.7-18.5)	13.6 (8.0-22.0)	7.6 (3.0-18.0)	1.5 (0.5-4.8)	50.7 (40.2-61.2)	22.1 (17.8-27.0)	22.0 (16.4-28.7)	11.5 (8.5-15.2)
Not applicable	20.2 (12.8-30.5)	9.1 (4.7-16.8)	34.4 (24.0-46.7)	1.4 (0.6-3.4)	25.8 (16.4-38.1)	10.3 (5-20)	28.5 (18.1-41.9)	10.1 (6.5-15.4)	26.6 (21.4-32.5)	7.8 (5.6-10.8)
Don't know	0 (0-0)	1.3 (0.4-3.8)	0.6 (0.1-4.2)	0 (0-0)	0 (0-0)	0.9 (0.2-3.8)	1.0 (0.3-3.1)	1.8 (0.7-4.8)	0.4 (0.1-1.2)	1.1 (0.6-2.0)
No response	0 (0-0)	1.3 (0.5-3.6)	0 (0-0)	0 (0-0)	0 (0-0)	0.4 (0.1-2.8)	0 (0-0)	1.4 (0.2-9.6)	0 (0-0)	0.9 (0.3-2.4)
Community acceptance, index (0-2) [2]	1.5 (1.4-1.7)	1.6 (1.4-1.8)	1.3 (1.1-1.5)	1.8 (1.7-1.8)	1.6 (1.4-1.8)	1.7 (1.5-1.9)	0.5 (0.3-0.8)	1.3 (1.1-1.5)	1.2 (1.1-1.4)	1.6 (1.5-1.7)

[1]Measured through the question "Does your partner/community approve or disapprove of girls your age using a modern contraceptive method to avoid or delay pregnancy?"

[2]Community acceptance towards the use of modern contraceptives was assessed through questions on both partners/husbands acceptance and community approval of adolescent girls using a modern contraceptive method to avoid or delay pregnancy.

Trust and credibility of family planning products

Table 19: Descriptive results: misconceptions about modern contraception and disadvantages of modern contraceptive methods according to adolescent girls (Estimate, 95% Confidence Interval) by woreda in Oromia Region, Ethiopia at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
	n=385	n=305	n=260	n=268	n=251	n=238	n=203	n=228	n=1,099	n=1,039
Misconception about modern contraception, index (0-3) [1,2]	1.4 (1.2-1.6)	1.3 (1.1-1.4)	1.1 (0.9-1.2)	1.3 (1.1-1.6)	1.6 (1.4-1.7)	1.3 (1.2-1.5)	1.2 (1.0-1.3)	1.2 (0.8-1.6)	1.3 (1.2-1.4)	1.3 (1.1-1.4)
Misconception about modern contraception, components [3]										
Some modern contraception can stop a girl from ever being pregnant again even after she stops using it	26.7 (21.5-32.6)	50.7 (42.3-59.1)	35.2 (27.6-43.7)	53.3 (46.5-60.0)	19.3 (12.8-28.0)	56.0 (49.3-62.5)	24.7 (14.9-38.2)	46.0 (32.6-59.9)	26.7 (22.5-31.4)	50.9 (45.9-56)
If a modern contraception changes a girl's menstrual bleeding, it's bad for her health and can harm her womb	58.2 (50.0-65.9)	37.4 (32.2-42.9)	61.4 (50.5-71.3)	38.6 (29.5-48.7)	48.8 (42.4-55.2)	37.9 (30.9-45.3)	42.9 (33.4-52.8)	37.0 (25.4-50.3)	53.3 (48.1-58.4)	37.7 (33.0-42.6)
Some modern contraceptives can make adolescent girls permanently fat	47.4 (37.0-57.9)	37.1 (30.5-44.0)	55.1 (46.1-63.7)	42.4 (34.9-50.3)	48.7 (41.4-56.1)	39.5 (34.3-45.0)	36.2 (28.2-45.1)	35.3 (22.9-50.0)	46.6 (40.9-52.4)	38.3 (33.4-43.3)
Disadvantages of modern contraceptives [1,4]		n=305		n=268		n=238		n=228		n=1,039
Does not work sometimes	NA	32.3 (21.5-45.5)	NA	35.5 (26.3-46.1)	NA	21.5 (13.6-32.4)	NA	39.8 (24.8-57.0)	NA	33.3 (27.0-40.2)
Complications/ side effects	NA	24.5 (14.3-38.6)	NA	47.0 (39.3-54.9)	NA	24.6 (18.7-31.6)	NA	34.7 (22.0-50.2)	NA	32.9 (27.4-38.8)
Against religious beliefs	NA	12.9 (9.0-18.2)	NA	23.2 (16.4-31.8)	NA	12.9 (7.4-21.8)	NA	23.6 (14.7-35.6)	NA	18.5 (14.8-22.8)
Uncomfortable to use	NA	11.8 (7.9-17.1)	NA	24.5 (14.0-39.4)	NA	12.6 (7.7-20.0)	NA	21.6 (11.0-38.1)	NA	17.8 (13.2-23.6)
Family opposition	NA	14.5 (10.7-19.3)	NA	17.5 (8.1-33.9)	NA	15.7 (11.0-21.9)	NA	17.6 (9.1-31.5)	NA	16.4 (12.2-21.6)
Others [5]	NA	26.6 (21.0-33.0)	NA	31.8 (17.1-51.2)	NA	25.8 (18.7-34.5)	NA	35.4 (19.5-55.3)	NA	30.3 (23.6-37.9)
None	NA	46.1 (34.3-58.3)	NA	31.6 (23.6-40.8)	NA	56.5 (46.6-65.9)	NA	23.4 (12.4-39.7)	NA	38.0 (32.1-44.2)
Don't know	NA	1.2 (0.4-3.7)	NA	2.1 (1.0-4.3)	NA	0 (0-0)	NA	0 (0-0)	NA	0.8 (0.4-1.6)

[1]Among girls who heard about modern contraceptives and girls who responded to the phone survey. [2]Respondents were read a number of statements representing common misconceptions about contraception in Ethiopia. They were asked whether they agreed or disagreed with the statements. [3]Proportions who disagreed with statements. [4]Respondents were asked to mention disadvantages. [5]Include family opposition, embarrassing to buy, causes problems with family members, costly/expensive, against cultural beliefs, embarrassing to use.

Secondary outcomes – analytical results

Table 20: Analytical results: the relationship between primary outcomes and time in Oromia Region, Ethiopia, adjusted for confounders

A360 ToC	Outcomes	Time effect, Coefficient (95%CI)[1]	p-value	n
Adolescents use high quality sexual and reproductive health products and services				
	Proportion of current modern contraceptive users using a LARC	0.10 (0.03, 0.17)	0.004	109
	Use of a modern method in last 12 months	0.02 (-0.02, 0.07)	0.290	112
	Age at first birth	-0.06 (-0.29, 0.16)	0.590	111
	Birth in last 12 months	0.02 (-0.04, 0.09)	0.436	114
	Unmet need	0.01 (-0.04, 0.06)	0.626	114
Adolescent girls have access to appropriate high quality sexual and reproductive health information and services				
	Awareness of contraceptive products	0.11 (0.01, 0.21)	0.025	114
	Awareness of where to obtain health services	0.07 (0.00, 0.13)	0.058	35
Contraception positioned as relevant and valuable for adolescent girls				
	Benefit 1 of modern contraception	0.09 (0.02, 0.16)	0.014	113
	Intention to use a method	0.05 (-0.06, 0.16)	0.393	100
Supportive environment for adolescent girls to access services created				
	Attitudes	0.22 (0.08, 0.36)	0.003	113
	Self-efficacy	0.70 (0.45, 0.94)	<0.001	114
	Community acceptance	0.29 (0.09, 0.49)	0.005	114
Trust and credibility of family planning products				
	Misconceptions about modern contraceptives	-0.06 (-0.19, 0.07)	0.354	113

A360 ToC, Adolescents 360 Theory of Change, mCPR, modern contraceptive prevalence rate, LARC, long-acting reversible contraception, n, number of observations used in the regression model

[1] kebele-level estimates adjusted for age, religion, education level, number of living children, wealth quintile. Results of a linear regression model.

Note: The model with birth in the last 12 months as an outcome was not adjusted for number of living children.

Descriptive and analytical results for the association between self-reported exposure to A360 and primary and secondary outcomes

Table 21: Descriptive and analytic relationship between binary outcomes and self-reported exposure, adjusted for confounders

A360 ToC	Outcomes	Descriptive results			Analytic results		
		Odds of outcome among not exposed (n/n)	**Odds of outcome among exposed (n/n)**	**OR**	**Exposure effect, OR (95%CI)[1]**	**p-value**	**n**
Adolescents use high quality sexual and reproductive health products and services							
	mCPR	1.56 (388/249)	4.43 (177/40)	2.84	2.09 (1.32, 3.29)	0.002	801
	Proportion of current modern contraceptive users using a LARC	0.26 (80/308)	0.51 (60/117)	1.96	1.52 (0.75, 3.08)	0.240	482
	Use of a modern method in last 12 months	1.84 (411/223)	5.58 (184/33)	3.03	1.77 (1.08, 2.92)	0.026	759
	Birth in last 12 months	0.31 (202/659)	0.38 (78/207)	1.23	1.74 (1.11, 2.74)	0.018	1,089
	Unmet need	0.27 (160/584)	0.16 (34/217)	0.59	0.49 (0.26, 0.94)	0.033	845
Adolescent girls have access to appropriate high quality sexual and reproductive health information and services							
	Awareness of contraceptive products	8.06 (766/95)	46.50 (279/6)	5.77	3.33 (0.96, 11.48)	0.057	768
	Awareness of where to obtain health services	15.67 (141/9)	27.00 (27/1)	1.73	- [2]	-	-
Contraception positioned as relevant and valuable for adolescent girls							
	Benefit 1 of modern contraception	33.05 (727/22)	278.00 (278/1)	8.42	- [3]	-	-
	Benefit 2 of modern contraception	23.39 (725/31)	54.80 (274/5)	2.35	0.85 (0.17, 4.21)	0.830	397
	Intention to use a method	2.50 (150/60)	3.63 (29/8)	1.45	0.36 (0.12, 1.14)	0.214	168

A360 ToC, Adolescents 360 Theory of Change, mCPR, modern contraceptive prevalence rate, LARC, long-acting reversible contraception, OR, odds ratio, n, number of observations used in the regression model

[1] Results of a logistic regression model adjusted for age, religion, education level, number of living children, wealth quintile.

[2]Not possible to calculate because of sparse data. [2]Not possible to calculate because of sparse data.

Table 22: Descriptive and analytic relationship between continuous outcomes and self-reported exposure, adjusted for confounders

A360 ToC	Outcomes	Descriptive results			Analytic results		
		Mean outcome among not exposed (95%CI)	**Mean outcome among exposed (95%CI)**	**Difference[3]**	**Exposure effect, Coefficient (95%CI)[4]**	**p-value**	**n**
Adolescents use high quality sexual and reproductive health products and services							
	Age at first birth	16.85 (16.66, 17.04)	16.91 (16.69, 17.13)	0.06	0.07 (-0.16, 0.30)	0.542	652
Contraception positioned as relevant and valuable for adolescent girls							
	Aspirations index score (0-9)[1]	5.44 (5.25, 5.63)	5.58 (5.40, 5.75)	0.14	0.13 (-0.13, 0.39)	0.312	1,111
Supportive environment for adolescent girls to access services created							
	Attitudes index score (0-2)[1]	1.62 (1.52, 1.71)	1.77 (1.70, 1.83)	0.17	0.08 (0.00, 0.16)	0.061	1,011
	Self-efficacy index score (0-4)[1]	3.65 (3.51, 3.79)	3.86 (3.78, 3.94)	0.21	0.01 (-0.14, 0.16)	0.871	1,050
	Descriptive norms index score (0-6)[1]	2.24 (1.98, 2.50)	2.51 (2.26, 2.76)	0.27	0.15 (-0.15, 0.46)	0.321	1,019
	Community acceptance index score (0-2)[1]	1.50 (1.39, 1.62)	1.78 (1.68, 1.87)	0.28	0.10 (-0.02, 0.21)	0.113	1,050
Trust and credibility of family planning products							
	Misconceptions about modern contraceptives index score (0-3)[1]	1.24 (1.09, 1.39)	1.35 (1.13, 1.56)	0.11	0.23 (-0.03, 0.49)	0.079	1,019
	Disadvantages of contraceptives index score (0-7)[2]	1.57 (1.12, 2.01)	2.65 (1.94, 3.35)	1.08	0.31 (-0.29, 0.91)	0.305	1,059

A360 ToC, Adolescents 360 Theory of Change, n, number of observations used in the regression model

[1] Higher scores are more desirable than lower scores.

[2] Higher scores are less desirable than lower scores (i.e. a greater number of disadvantages mentioned).

[3] The mean outcome among exposed minus the mean outcome among those not exposed.

[4] Results of a linear regression model adjusted for age, religion, education level, number of living children, wealth quintile.

Appendix D: Trend analysis

DHS and PMA2020 datasets

Table 23: Secondary datasets: Modern contraceptive use[1] among sexually active fecund women aged 15-49 years old in Ethiopia between 2015-2018 using A360 outcome evaluation definition*

	2015	2016		2017	2018
Survey	**PMA2020**	**PMA2020**	**DHS**	**PMA2020**	**PMA2020**
All women aged 15-49 years	45.1 (40.9-49.3)	46.6 (42.6-50.7)	46.8 (44.3-49.4)	46.4 (42.3-50.6)	48.3
Marital status					
All married women aged 15-49	47.6 (43.0-52.3)	49.2 (45.0-53.4)	48.8 (46.1-51.5)	48.6 (44.3-53.0)	51.0
All unmarried women aged 15-49	28.8 (23.6-34.7)	28.4 (22.7-35.0)	29.8 (24.9-35.1)	31.5 (25.8- 37.8)	29.0
Region					
1. Tigray	36.8 (30.9-43.2)	40.4 (31.4-50.0)	47.3 (42.2-52.5)	37.6 (31.2-44.5)	42.2
2. Afar	31.9 (12.6-60.5)	19.7 (5.1-52.7)	17.5 (12.1-24.6)	22.9 (5.8-58.8)	9.9
3. Amhara	53.0 (45.8-60.0)	59.1 (53.0-64.8)	56.6 (52.2-60.9)	58.4 (52.7-63.9)	56.2
4. Oromia	40.5 (33.3-48.0)	38.8 (31.5-46.7)	42.1 (36.7-47.7)	38.7 (31.7-46.3)	42.6
5. Ethiopia Somali	7.2 (0.8-42.9)	17.5 (7.0-37.5)	2.2 (1.0-4.7)	15.3 (6.9-30.5)	21.7
6. Benishangul Gumuz	33.5 (11.3-66.7)	28.4 (11.1-55.8)	41.4 (33.5-49.8)	53.6 (42.1-64.7)	51.4
7. SNNPR	47.3 (35.0-60.0)	50.6 (40.1-61.1)	50.8 (44.8-56.8)	49.2 (36.1-62.4)	54.0
8. Gambella	57.4 (0-100)	45.1 (0.4-99.5)	43.8 (35.7-52.2)	64.6 (36.5-85.3)	48.4
9. Harari	32.7 (0-100)	34.6 (0-100)	39.3 (33.5-45.3)	33.7 (0-100)	36.9
10. Addis Ababa	56.1 (49.2-62.7)	54.4 (48.6- 60.2)	47.9 (43.6-52.2)	46.8 (41.3 - 52.3)	44.4
11. Dire Dawa	39.4 (0-100)	51.3 (0-100)	32.4 (26.6-38.9)	16.2 (0-99.9)	46.0

*Values are weighted for sampling weights.[1]In PMA2020, modern methods are female sterilization, IUD, injectables, implant, pill, male condom, female condom, LAM, and standard days method; traditional methods are withdrawal and the rhythm method. In DHS, modern methods are female sterilization, IUD, injectables, implant, pill, male condom, LAM, standard days method and emergency contraception (Note that the female condom is not included but emergency contraception is, compared to PMA2020); traditional methods are withdrawal and periodic abstinence (Note that rhythm method is not included but periodic abstinence is).

Table 24: Secondary datasets: description of girls aged 15-19 years old in Ethiopia between 2015-2018*

	2015	2016		2017	2018
Survey	**PMA2020**	**PMA2020**	**DHS**	**PMA2020**	**PMA2020**
	1,841	1,763	3,498	1,827	1,775
Marital status					
Married, n	346	290	664	348	266
Married, proportion (95%CI)	22.8 (19.0-27.0)	20.67 (17.2-24.7)	17.4 (15.2-19.9)	22.8 (19.1-27.0)	18.1
Age at first union, mean (SE)	15.8 (0.1)	15.7 (0.2)	15.5 (0.1)	15.6 (0.1)	15.6
Had first union by age 18 years, proportion (95%CI)[1]	93.1 (87.8-96.2)	94.5 (90.7-96.8)	87.1 (82.0-90.9)	94.9	93.5
Had sex, proportion (95%CI)	28.4 (24.3-32.9)	26.7 (22.9-30.8)	23.3 (20.1-26.9)	30.6 (26.2-35.4)	24.6
Had first sexual intercourse by age 15 years, proportion (95%CI)	19.0 (25.4-13.8)	24.7 (32.8-18.1)	25.5 (21.3-30.2)	23.3 (29.4-18.2)	19.3
Age at first sexual intercourse, mean (SE)	16.5 (0.1)	16.4 (0.1)	15.5 (0.1)	16.6 (0.1)	16.8
Had sex in the past year, proportion (95%CI)	27.4 (23.4-31.9)	25.4 (21.6-29.5)	21.0 (18.5-23.8)	29.3 (25.0-34.1)	23.5
Had sex in the past 4 weeks, proportion (95%CI)	21.7 (18.0-26.0)	20.0 (16.8-23.7)	16.2 (14.0-18.8)	23.4 (19.6-27.6)	17.2
Pregnant, proportion (95%CI)	4.0 (2.7-5.7)	2.9 (2.0-4.1)	3.0 (2.2-4.9)	5.1 (3.7-6.8)	3.2
Had sex in the past year and is fecund, proportion (95%CI)	18.3 (15.3-21.8)	18.4 (15.2-22.1)	16.2 (14.0-18.8)	20.7 (17.1-24.8)	16.5
Contraceptive use (any modern[2]), mCPR (95%CI)					
All women	40.7 (32.2-49.7)	36.3 (26.7-47.0)	43.6 (37.4-50.1)	43.7 (35.7-52.1)	38.1
All married women	44.8 (34.4-55.6)	41.2 (29.2-54.3)	46.5 (39.3-53.9)[3]	49.8	45.9
Contraceptive use (any traditional[2]), tCPR (95%CI)					
All women	2.1 (0.6-6.9)	3.0 (1.1-8.3)	0.5 (0.1-2.1)	0.1 (0.0-0.6)	1.8
All married women	2.7 (0.7-9.7)	3.4 (1.0-11.0)	0.0 (0.0-0.1)[3]	0.1	2.1

*Proportions and means are weighted for sampling weights. [1]Among those who are married. [2]Using A360 outcome evaluation definition; i.e. Among those who are both sexually active and fecund. In PMA2020, modern methods are female sterilization, IUD, injectables, implant, pill, male condom, female condom, LAM, and standard days method; traditional methods are withdrawal and rhythm method. in DHS, modern methods are female sterilization, IUD, injectables, implant, pill, male condom, LAM, standard days method and emergency contraception (note that the female condom is not included but emergency contraception is, compared to PMA2020); traditional methods are withdrawal and periodic abstinence (note that rhythm method is not included but periodic abstinence is). [3]Among whose who are both sexually active (n=609) and fecund (n=404), which is 386; [4]Among whose who are both sexually active (n=176) and fecund (n=2,465), which is 147.

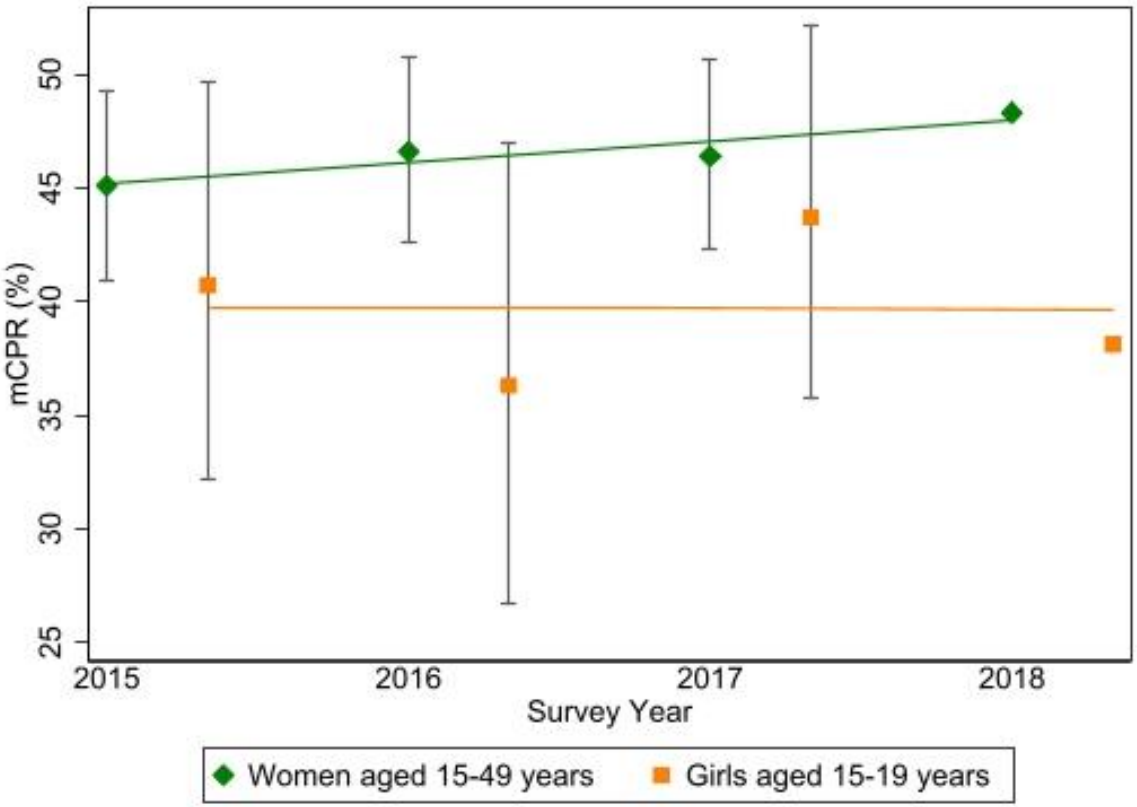


Figure 11: **Secondary dataset, PMA2020 – Modern contraceptive use among married and unmarried women aged 15-49 years old (green) and among married and unmarried adolescent girls (orange) in Ethiopia between 2015 and 2018.**

Note: Values are weighted for sampling weights

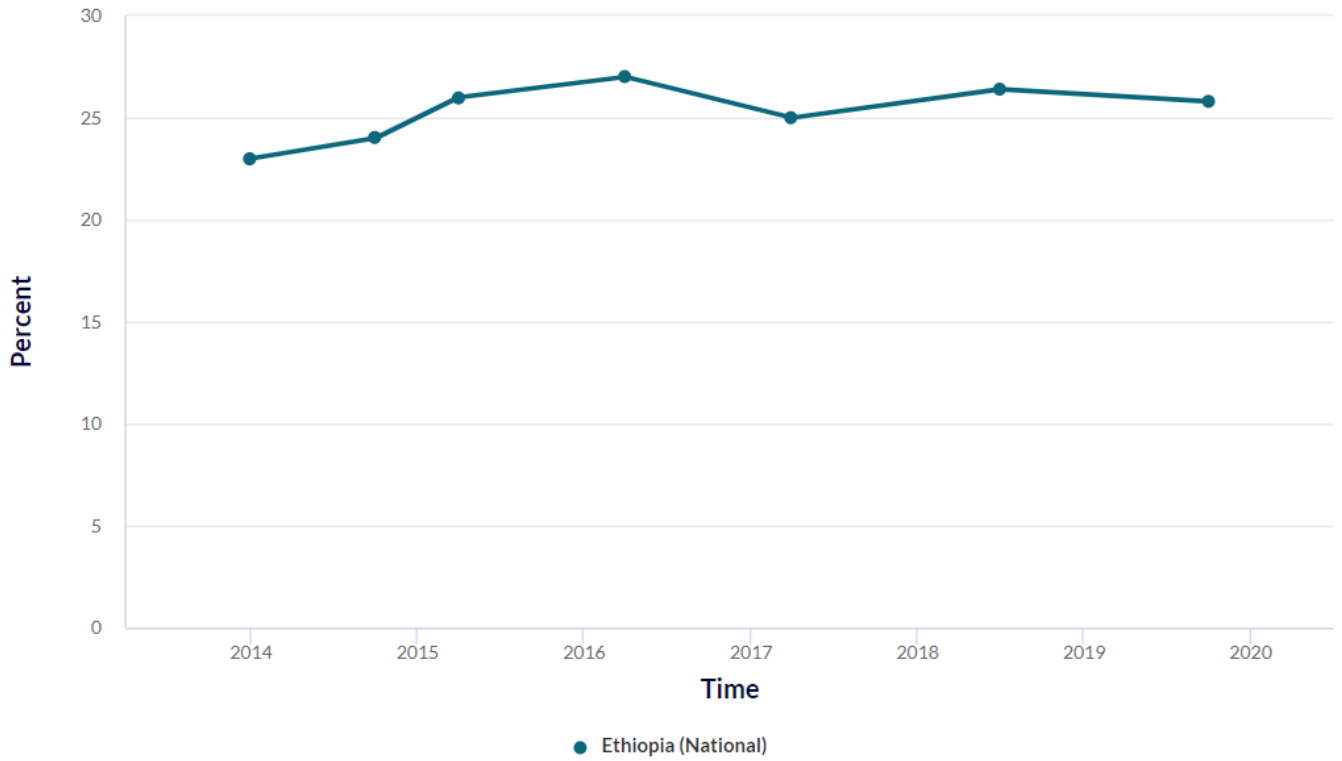


Figure 12: Secondary dataset, PMA2020 datalab – Current use of any modern contraceptive method (married and unmarried women aged 15-49 years) in Ethiopia between 2014-2020 using PMA2020 definition

Attribution: PMA, Johns Hopkins University, Addis Ababa University, School of Public Health – 07/08/2021

Obtained from: https://datalab.pmadata.org/DATA?indicators%5B4%5D=4&regions%5B255%5D=255

Note: We also used the PMA2020 datalab platform to extract time trends in mCPR over time among women aged 15–49 years old, using PMA2020's own definition. PMA2020's definition of mCPR differs from our definition because all married women are included in the calculation, whereas in our definition only sexually active women are considered. Consequently, mCPR estimates may not match between our analysis of PMA2020 data and estimates extracted from PMA2020 datalab.

HMIS dataset

The change between 2018 and 2020 within woredas where A360 occurred was larger than overall trends in mCPR in woredas where A360 did not occur during the same time period (HMIS facility-level dataset).

Error! Reference source not found. and **Figure 13**: below describe girls aged 15–19 years old in Ethiopia in terms of the contraceptive acceptance rate (CAR)[29] from 2018–2020 in A360 outcome evaluation woredas, whereas **Table 3** and **Figure 12** describe data from 104 woredas where Adolescents 360 was not implemented (Oromia, SNNP, Amhara and SNNP Regions). In outcome evaluation sites there was a 7% increase in CAR between 2018 and 2020 (particularly due to a marked increase in Wara Jarso, **Figure 13**:), whereas in areas where A360 was not implemented there was an increase of 1% in CAR over time. Nevertheless, the 'baseline' value in 2018 was 5% greater in A360 areas (31%; Error! Reference source not found.) than in non-A360 woredas (26%; **Table 3**).

Table 25: Secondary dataset, HMIS – Contraceptive acceptance rate of adolescent girls aged 15-19 years visiting health facilities in four woredas selected for Adolescents 360 outcome evaluation (Oromia Region), Ethiopia

A360 woredas selected for the outcome evaluation in Oromia Region[1]	2018	2019	2020[2]
Jan–Apr	29%	35%	37%
May–Aug	31%	34%	40%
Sep–Dec	35%	40%	-
All months (Jan–Dec)	31%	35%	38%

[1] Data from 40 health facilities in Ada'a, 22 health facilities in Fentale, 54 health facilities in Lome and 43 health facilities in Wara Jarso woreda.

[2] Data was shared in July 2020, so figures are from January to June 2020.

Table 3 Secondary dataset, HMIS – Contraceptive acceptance rate of adolescent girls aged 15–19 years visiting health facilities in 104 woredas where Adolescents 360 did not happen (Oromia, SNNP, Amhara and SNNP Regions), Ethiopia

Other woredas in Oromia, SNNP, Amhara and SNNP Regions[1]	2018	2019	2020[2]
Jan–Apr	20%	29%	27%
May–Aug	29%	30%	26%
Sep–Dec	30%	28%	-
All months (Jan–Dec)	26%	29%	27%

[1] Data from 3271 health facilities from 104 woredas where Adolescents 360 was not present.

[2] Data was shared in July 2020, so figures are from January to June 2020.

Note: Data was not disaggregated by region

[29] For details on this definition, see **Appendix A**

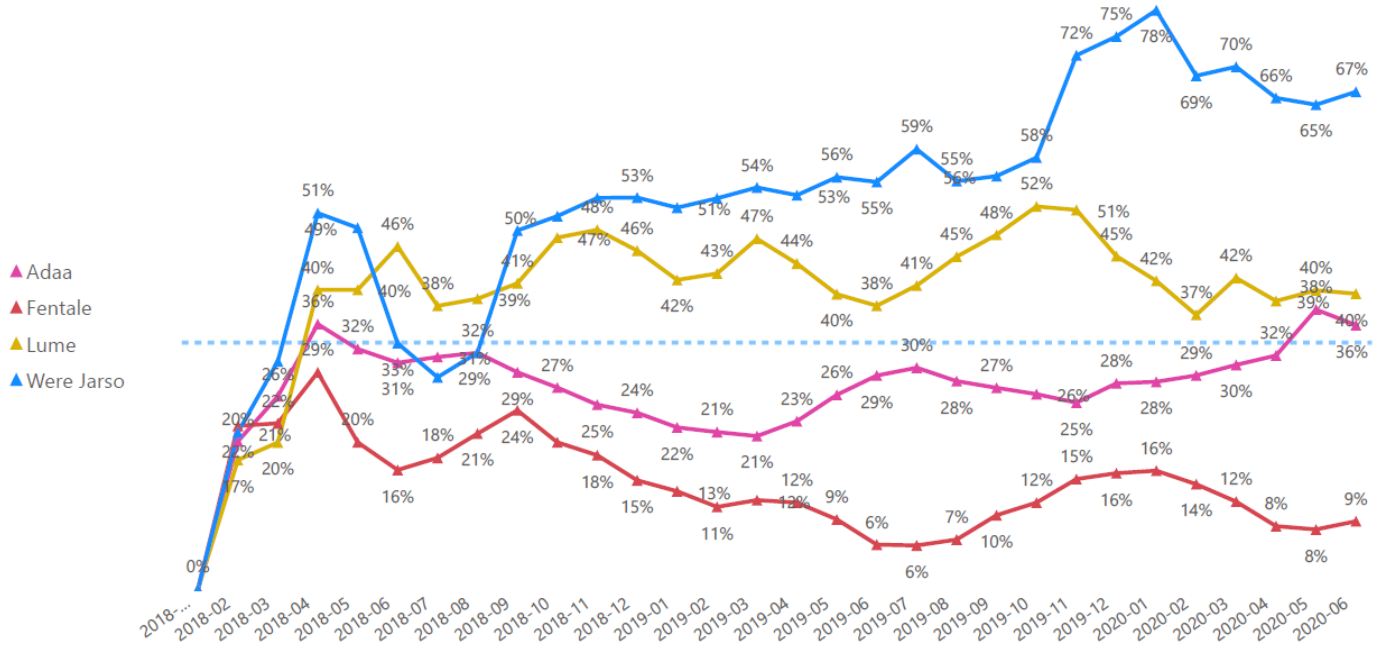


Figure 13: Secondary dataset, HMIS: Monthly contraceptive acceptance rate among non-pregnant adolescent girls aged 15–19 years old in woredas selected for the Adolescent 360 outcome evaluation, Oromia Region, Ethiopia

Note: Data from 40 health facilities in Ada'a, 22 health facilities in Fentale, 54 health facilities in Lome and 43 health facilities in Wara Jarso woreda.

Data analyzed by Ali Karim (BMGF) and shared in July 2020.

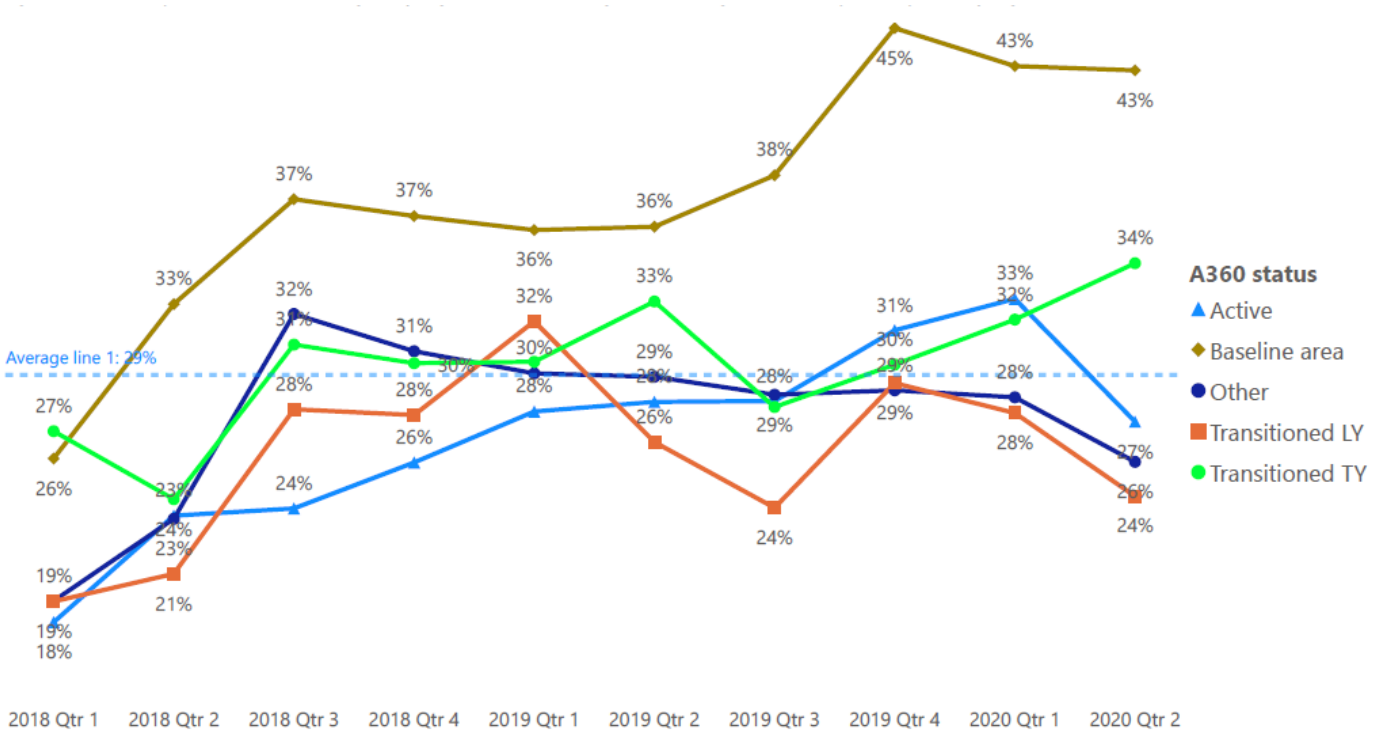


Figure 14: Secondary dataset, HMIS: Monthly contraceptive acceptance rate among non-pregnant adolescent girls aged 15–19 years old in woredas disaggregated by Adolescents 360 status, Ethiopia

Note: Adolescents 360 status are the following: Active, 16 woredas where Adolescents 360 is still active (710 health facilities); Baseline area, Four woredas where the Adolescents 360 outcome evaluation was conducted (159 health facilities); Other, 104 woredas where Adolescents 360 did not occur, within intervention zones (3271 health facilities); Transitioned LY, Seven Adolescents 360 woredas that transitioned to the regional health bureaus in 2019 (307 health facilities); Transitioned TY, Six Adolescents 360 woredas that transitioned to the regional health bureaus in 2020 (151 health facilities).

Data analyzed by Ali Karim (BMGF) and shared in July 2020.

Appendix E: DHS mCPR definition and results table

[See document attached]

Appendix F: Variation between individual level mCPR and kebele level mCPR

In **Table 27** below, individual mCPR is compared to kebele level mCPR for each study woreda. The two calculations differ very little for Wara Jarso, the largest woreda, and differ by around 5 percentage points for the other three woredas, at baseline. At endline, the two calculations are more comparable, except for Lome, which has a 74% mCPR at the individual level and a 77% mCPR as the kebele-average estimate. The change is due to larger differences in mCPR between kebeles of a same woreda.

Table 26: Individual versus kebele level mCPR at the woreda level in Ethiopia, in baseline and endline surveys

	Baseline surveys				Endline surveys			
Woreda	**Modern contraceptive users**	**Denominator[1]**	**Individual level mCPR[2]**	**kebele level mCPR[3]**	**Modern contraceptive users**	**Denominator[1]**	**Individual level mCPR[2]**	**kebele level mCPR[3]**
Wara Jarso	242	331	0.73	0.73	205	260	0.79	0.80
Lome	153	197	0.78	0.82	148	200	0.74	0.77
Ada'a	132	178	0.74	0.69	157	205	0.77	0.77
Fentale	32	140	0.23	0.28	55	189	0.29	0.30

[1] Number of girls who are sexually active and fecund in the woreda

[2] Calculated by dividing Modern contraceptive users by the denominator

[3] Average mCPR across all kebeles in each woreda

Appendix G: Co-habiting adults results

Overall, husbands' attitudes, beliefs and misconceptions remained constant over time, but their views on the benefits of contraception improved. A slightly greater proportion of respondents reported having discussed family planning with the adolescent girl in their household at endline (70%) versus baseline (64%).

Characteristics of co-habiting adults

Error! Reference source not found. describes the background characteristics of husbands that were surveyed in the study woredas.

Benefits of contraceptive methods

Similarly to the girls' views, the proportion of husbands of adolescent girls who agreed with the statement "Using modern contraception can allow an adolescent girl to complete her education, find a better job and have a better life" increased over time in Lome (from 87% to 99%), in Ada´a (from 89% to 97%) and in Fentale (from 63% to 89%), and it stagnated in Wara Jarso (average 94%; Error! Reference source not found.).

At endline, most of the husbands of adolescent girls that were surveyed agreed with the sentence "Using modern contraception can allow a girl to achieve her life goals." This sentence was not included in the baseline surveys (Error! Reference source not found.).

Attitudes towards using contraceptive methods

Similar to the girls' views (Error! Reference source not found. in **Appendix C**), the proportion of husbands/partners surveyed who approved of unmarried couples using modern contraceptives remained constant (around 77%). The proportion who approved of married couples using modern contraceptives also remained constant (around 89%; Error! Reference source not found.).

Beliefs towards self-efficacy of adolescent girls to access and use contraceptive methods

Beliefs towards self-efficacy of adolescent girls remained constant over time. Nevertheless, the proportion of respondents who reported having discussed family planning with the adolescent girl in their household within the six months before the survey increased slightly over time, from 64% (95%CI: 53–73) to 70% (95%CI: 61–78; Error! Reference source not found.).

Descriptive norms

At endline, we assessed descriptive norms regarding modern contraception by asking respondents about what they thought the behavior of girls aged 15–19 years old in the community was in relation to contraceptives. As among adolescent girls, Wara Jarso and Ada'a had the highest descriptive norms, whereas Fentale had the lowest (Error! Reference source not found.).

Misconceptions about modern contraceptives and modern contraceptive disadvantages

Misconceptions about modern contraceptives remained approximately constant over time, with only a slight increase in the proportion of respondents who agreed with the misconception sentence "If a

modern contraception changes a girl's menstrual bleeding, it's bad for her health and can harm her womb."

Modern contraception disadvantages mentioned by co-habitant adults followed the same patterns as those mentioned by adolescent girls (Error! Reference source not found.).

Descriptive tables for co-habiting adults

Background characteristics

Table 27: Descriptive results - Percentage distribution of husbands of adolescent girls by woreda, according to selected characteristics, baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
	n=54	n=40	n=31	n=37	n=33	n=51	n=24	n=32	n=142	n=160
Age (years)										
15-19	13.7	0.0	3.3	3.2	2.9	1.9	5.0	11.3	7.4	4.3
20-24	49.8	36.4	38.5	37.2	42.3	37.1	63.1	42.7	49.0	38.5
25-29	34.4	47.3	48.7	38.5	51.3	49.5	31.9	36.7	40.5	43.0
30-34	1.0	14.5	3.9	21.1	3.4	7.8	0.0	4.7	1.9	11.6
35-39	0.0	1.9	2.4	0.0	0.0	1.5	0.0	4.6	0.5	2.1
40-44	0.0	0.0	3.3	0.0	0.0	2.2	0.0	0.0	0.7	0.6
Education level										
No education	18.7	9.5	20.4	19.0	26.2	19.3	33.1	31.8	23.8	20.3
Primary	30.9	49.0	52.1	61.4	56.5	58.4	50.6	52.4	44.9	55.2
Secondary	42.2	28.1	25.5	18.0	15.6	22.3	9.0	4.1	25.9	17.7
Technical	5.4	10.8	1.9	0.0	1.7	0.0	4.4	8.1	3.7	4.8
Higher/University	2.7	2.6	0.0	1.6	0.0	0.0	2.9	3.6	1.7	2.0
Religion										
Orthodox	91.8	93.4	82.2	87.1	93.3	95.7	11.0	8.4	71.6	69.4
Protestant	8.2	6.6	12.1	9.7	6.7	2.5	0.0	0.0	6.9	4.4
Muslim	0.0	0.0	1.5	0.0	0.0	0.0	89.0	91.6	20.6	25.0
Waqefeta (Traditional)	0.0	0.0	4.2	3.2	0.0	1.8	0.0	0.0	0.9	1.2

Contraception positioned as relevant and valuable

Table 28: Descriptive results - Benefits of contraception (Estimate, 95% Confidence Interval) by woreda at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
	n=50	**n=37**	**n=30**	**n=37**	**n=33**	**n=47**	**n=23**	**n=24**	**n=136**	**n=145**
Benefits of contraception [1]										
Using modern contraception can allow a girl to complete her education, find a better job, and have a better life	96.0 (76.3-99.5)	91.3 (71.3-97.8)	87.1 (68.6-95.4)	98.7 (90.4-99.8)	89.3 (73.6-96.1)	96.8 (87.6-99.2)	63.4 (49.4-75.5)	88.6 (64.9-97)	85.2 (76.9-90.8)	94.1 (87.6-97.3)
Using modern contraception can support a girl to achieve her life goals	-	96.7 (86-99.3)	-	98.7 (90.4-99.8)	-	92.1 (78.3-97.4)	-	95.3 (69.3-99.4)	-	95.7 (90.4-98.1)

[1]Respondents were read a number of statements representing benefits of contraception. They were asked whether or not they agreed with the statements.

Supportive environment for adolescent girls to access services

Table 29: Descriptive results - Attitudes and beliefs of husbands of adolescent girls surveyed (Estimate, 95% Confidence Interval) by woreda at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		Total	
	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline
Attitudes [1]	n=50	n=37	n=30	n=37	n=33	n=47	n=23	n=24	n=136	n=145
Married adolescent girls aged 15-19 years old using a modern contraception method to avoid or delay pregnancy	97.0 (80.9-99.6)	87.2 (74.5-94.1)	97.1 (79.9-99.7)	93.8 (79.4-98.3)	100.0	97.1 (82.1-99.6)	68.0 (54.1-79.3)	65.9 (44.5-82.3)	91.0 (83.3-95.3)	87.0 (78.5-92.4)
Unmarried sexually active adolescent girls aged 15-19 years old using a modern contraception method to avoid or delay pregnancy	80.5 (65.6-90.0)	91.7 (78.8-97.1)	77.2 (61.1-88.0)	89.7 (68.0-97.3)	76.6 (56.9-89.1)	93.9 (77.2-98.6)	48.8 (34.6-63.2)	47.5 (30.6-65.0)	71.7 (62.6-79.3)	82.2 (72.7-89.0)
Beliefs [2, 3]										
It is acceptable for an adolescent girl to start a conversation with her husband about contraception	100.0	93.2 (80.5-97.9)	94.0 (79.8-98.4)	100.0	100.0	95.3 (83.4-98.8)	80.1 (65.5-89.6)	80.7 (48.8-94.7)	94.1 (87.5-97.3)	92.8 (83.5-97.0)
It is acceptable for an adolescent girl to obtain information on contraception services and products if she needs to	98.3 (88.7-99.8)	87.5 (65.4-96.3)	95.3 (83.6-98.8)	100.0	89.4 (74.4-96.1)	93.3 (81.3-97.8)	80.5 (63.9-90.6)	76.0 (48.1-91.5)	91.7 (85.4-95.5)	89.8 (80.4-95.0)
It is acceptable for an adolescent girl to obtain a contraception method if she decides to use one	94.8 (80.8-98.8)	95.2 (81.6-98.9)	88.9 (76.2-95.3)	96.5 (78.2-99.5)	93.1 (76.6-98.2)	94.6 (67.6-99.3)	72.8 (52.4-86.7)	76.0 (48.1-91.5)	88.1 (80.1-93.2)	91.2 (81.6-96.1)
It is acceptable for an adolescent girl to use a method of contraception even if her husband/partner doesn't want her to	56.7 (39.6-72.4)	83.3 (63.9-93.3)	54.3 (28.8-77.8)	66.9 (45.2-83.1)	46.2 (27.2-66.4)	69.3 (52.0-82.5)	50.9 (39.2-62.5)	38.1 (19.4-61.2)	52.7 (42.9-62.4)	65.5 (54.2-75.3)
Discussed using a method with girl in the past 6 months										
Yes	70.8 (50.9-85.0)	83.6 (65.7-93.1)	62.5 (48.5-74.6)	63.1 (46.2-77.3)	88.9 (76.1-95.3)	89.3 (77.7-95.3)	32.7 (16.9-53.7)	36.9 (17.1-62.3)	63.9 (53.4-73.2)	69.8 (60.6-77.6)
No	29.2 (15.0-49.1)	16.4 (6.9-34.2)	37.5 (25.4-51.5)	36.9 (22.7-53.7)	11.1 (4.7-23.9)	10.7 (4.7-22.3)	67.3 (46.3-83.1)	63.2 (37.8-82.9)	36.1 (26.8-46.6)	30.2 (22.4-39.4)

[1]Proportion of respondents who approved.

[2]Respondents were read a number of statements related to girls' self-efficacy. They were asked whether or not they agreed with the statements.

[3]Proportions who agreed with statement.

Table 30: Descriptive results - Descriptive norms of co-habiting adult respondents surveyed (Estimate, 95% Confidence Interval) by woreda at endline (2020)

	Wara Jarso	Lome	Ada'a	Fentale	Total
	n=37	n=37	n=47	n=24	n=145
Descriptive norms[1,2]					
How many (un)married girls aged 15-19 years old in your community do you believe discuss using a method of contraception with their partner?	21.1 (9.1-41.8)	15.4 (6.1-33.8)	22.9 (13.5-36.0)	10.1 (3.3-27.0)	17.8 (12.1-25.2)
How many (un)married girls aged 15-19 years old in your community do you believe use contraceptive methods?	33.7 (14.4-60.6)	26.0 (16.2-38.9)	31.3 (20.7-44.2)	10.1 (3.3-27.0)	25.9 (18.9-34.5)

[1]Respondents were asked about their views regarding married girls aged 15-19 years old. They were asked whether they thought the statement applied to most girls, less than half or none.
[2]Proportions who answered that the statement applied to most girls.
Note: Respondents were not asked about descriptive norms at baseline (2017).

Trust and credibility of family planning products

Table 31: Descriptive results - Misconceptions about modern contraception and disadvantages of modern contraceptive methods according to husbands of adolescent girls surveyed (Estimate, 95% Confidence Interval) by woreda at baseline (2017) and endline (2020)

	Wara Jarso		Lome		Ada'a		Fentale		**Total**	
	Baseline	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**	**Baseline**	**Endline**
	n=50	n=37	n=30	n=37	n=49	n=47	n=23	n=24	n=136	n=145
Misconception about modern contraception, components [1,2]										
Some modern contraception can stop a girl from ever being pregnant again even after she stops using it	31.9 (16.9-51.9)	43.6 (24.1-65.3)	31.8 (19.6-47.2)	57.5 (45.5-68.6)	33.2 (21.8-46.9)	61.2 (44.5-75.6)	25.0 (9.5-51.4)	18.9 (9.0-35.5)	30.6 (22.4-40.2)	46.6 (37.7-55.8)
If a modern contraception changes a girl's menstrual bleeding, it's bad for her health and can harm her womb	43.7 (29.2-59.4)	54.7 (37.5-70.9)	39.3 (17.1-67.1)	61.3 (47.2-73.7)	37.0 (23.0-53.5)	58.9 (38.2-75.4)	30.1 (13.5-54.3)	53.3 (36.8-69.1)	38.2 (28.8-48.6)	57.0 (48.3-65.3)
Some modern contraceptives can make adolescent girls permanently fat	41.0 (26.1-57.8)	44.1 (33.4-55.4)	51.7 (36.6-66.5)	60.6 (44.0-75.2)	55.0 (32.6-75.6)	53.2 (37.6-68.2)	39.1 (15.2-69.7)	51.2 (25.2-76.5)	45.8 (35.5-56.5)	52.4 (43.5-61.1)
Disadvantages of modern contraceptives [3]										
None	-	44.3 (25.7-64.6)	-	27.5 (14.2-46.5)	-	39.1 (30.1-49.1)	-	24.3 (10.7-46.1)	-	34.2 (26.3-43.1)
Complications/ side effects	-	15.6 (7.7-29.1)	-	39.9 (20.0-63.7)	-	29.8 (20.3-41.4)	-	37.8 (25.3-52.0)	-	30.5 (23.3-38.8)
Does not work sometimes	-	19.1 (9.9-33.8)	-	40.1 (27.6-54.0)	-	12.7 (6.8-22.6)	-	45.5 (28.2-63.9)	-	28.5 (22.1-35.9)
Against religious beliefs	-	14.6 (6.2-30.9)	-	23.7 (11.0-43.9)	-	19.6 (11.7-30.9)	-	35.6 (22.3-51.5)	-	22.9 (16.7-30.4)
Uncomfortable to use	-	8.2 (2.8-21.6)	-	30.3 (17.6-47.0)	-	9.5 (4.1-20.4)	-	16.6 (3.1-55.1)	-	16.1 (9.9-25.0)
Causes problems in couple	-	4.3 (0.9-17.7)	-	12.1 (5.7-23.7)	-	2.8 (0.4-17.7)	-	1.5 (0.2-12.7)	-	5.3 (2.8-9.9)
Others [4]	-	24.5 (13.1-41.1)	-	44.2 (25.4-64.8)	-	35.5 (28.0-43.8)	-	36.6 (24.3-50.8)	-	35.2 (28.2-42.9)
Don't know	-	17.0 (6.8-36.5)	-	0 (0-0)	-	8.4 (3.3-19.5)	-	0 (0-0)	-	6.6 (3.5-12.0)

[1]Respondents were read a number of statements representing common misconceptions about contraception in Ethiopia. They were asked whether they agreed or disagreed with the statement. [2]Proportions who agreed with the statements. [3]Respondents were asked to mention disadvantages. [4]Include family opposition, embarrassing to buy, causes problems with family members, costly/expensive, against cultural beliefs, embarrassing to use.

Front cover image: Adolescents 360 website

Itad is a global organisation. Our strategy, monitoring, evaluation and learning services work to make international development more effective. We generate evidence on important issues – from malnutrition to migration – to support our partners to make informed decisions and improve lives.

Itad.com @ItadLtd mail@itad.com

Itad Ltd
Preece House
Davigdor Road Hove,
East Sussex UK
BN3 1RE

+44 (0) 1273 765250

Itad Inc
c/o Open Gov Hub
1100 13th St NW, Suite 800
Washington, DC, 20005
United States

+1 (301) 814 1492