

The Malawi Priorities Project

Cost-Benefit Analysis of Interventions to Boost Girls' Secondary Education and Reduce Early Child Marriage in Malawi - Technical Report

National Planning Commission Report with technical assistance from the Copenhagen Consensus Center and the African Institute for Development Policy



Child Marriage (contributed the overall message, and interventions on community dialogues, education promotion, conditional cash transfers for schooling, marriage survivor program)

Brad Wong, Ph.D., Chief Economist, Copenhagen Consensus Center

Cyandra Carvalho, M.A, Project Manager, Copenhagen Consensus Center

Eva Weissmann, M.A., M.P.H., Independent Health Economist

Mark Radin, Ph.D., Candidate, University of North Carolina at Chapel Hill

Justin Trevor Hamela, MSSc, Deputy Director of Child Affairs, Ministry of Gender, Community Development, and Social Welfare

Linly Kufeyani, Msc, Economist, National Planning Commission

Secondary Education (contributed the overall message, and interventions on community dialogues, education promotion, conditional cash transfers for schooling, marriage survivor program)

Christopher Cotton, Ph.D., Director of Research, Limestone Analytics, Jarislowsky-Deutsch Chair in Economic and Financial Policy, Queen's University, Canada

Ngeyi Kanyongolo, Ph.D., Senior Lecturer, University of Malawi

Bahman Kashi, Ph.D., Founder and President, Limestone Analytics, Adjunct Professor of Economics, Queen's University, Canada

Jay MacKinnon, M.A., Associate, Limestone Analytics

Ardyn Nordstrom, M.A., Associate, Limestone Analytics, Ph.D. Candidate, Queen's University, Canada

Lindsay Wallace, M.A., MPA, Director of Strategic Operations, Limestone Analytics

Ivy Chauya, National Planning Commission

© 2021 National Planning Commission (Malawi), Copenhagen Consensus Center and the African Institute for Development Policy (AFIDEP)

www.copenhagenconsensus.com

www.npc.mw

www.afidep.org

This work has been produced as a part of the Malawi Priorities project.

Some rights reserved



This work is available under the Creative Commons Attribution 4.0 International license (CC BY 4.0). Under the Creative Commons Attribution license, you are free to copy, distribute, transmit, and adapt this work, including for commercial purposes, under the following conditions:

Attribution

Please cite the work as follows: National Planning Commission, #PAPER TITLE#, Malawi Priorities, National Planning Commission (Malawi), Copenhagen Consensus Center (USA) and African Institute for Development Policy (Malawi), 2021.

Third-party-content

Copenhagen Consensus Center does not necessarily own each component of the content contained within the work. If you wish to re-use a component of the work, it is your responsibility to determine whether permission is needed for that re-use and to obtain permission from the copyright owner. Examples of components can include, but are not limited to, tables, figures, or images.

Cover Image: ©Global Partnership for Education/Evan Rogers

Malawi Priorities: Background

Malawi Priorities is a research-based collaborative project implemented by the National Planning Commission (NPC) with technical assistance from the African Institute for Development Policy (AFIDEP), and the Copenhagen Consensus Center (CCC) to identify and promote the most effective interventions that address Malawi's development challenges and support the attainment of its development aspirations. The project seeks to provide the government with a systematic process to help prioritize the most effective policy solutions so as to maximize social, environmental and economic benefits on every kwacha invested. Cost-benefit analysis is the primary analytical tool adopted by the project. Cost-benefit analysis will be applied to 20-30 research questions of national importance. Research will take place over the course of 2020 and 2021.

Research questions were drawn from the NPC's existing research agenda, developed in September 2019 after extensive consultation with academics, think tanks, the private sector and government. This sub-set was then augmented, based on input from NPC, an Academic Advisory Group (AAG) of leading scholars within Malawi, and existing literature, particularly previous cost-benefit analyses conducted by the Copenhagen Consensus Center. The research agenda was validated and prioritized by a Reference Group of 25 prominent, senior stakeholders. The selection of interventions was informed by numerous consultations across the Malawian policy space, and one academic and two sector experts provide peer review on all analyses.

Cost-benefit analyses in Malawi Priorities consider the social, economic and environmental impacts that accrue to all of Malawian society. This represents a wider scope than financial cost-benefit analysis, which considers only the flow of money, or private cost-benefit analysis, which considers the perspective of only one party. All benefit-cost ratios (BCRs) reported within the Malawi Priorities project are comparable.

The cost-benefit analysis considered in the project is premised on an injection of new money available to decision makers, that can be spent on expanding existing programs (e.g. new beneficiaries, additional program features) or implementing new programs. Results should not be interpreted as reflections on past efforts or the benefits of reallocating existing funds.

Inquiries about the research should be directed to Salim Mapila at salim@npc.mw.

Acknowledgements

The authors would like to thank and acknowledge advisors including Dr. Steve Sharra, Christine Veverka, David Onundo, Esme Kadzimir, Dr. Elizabeth Meke, Masaki Watabe (UNFPA), Juliana Lunguzi (UNFPA), Rose Kamanga (UNFPA), Malla Mabona (UNICEF), Habiba Osman (UNWomen), Lusungu Jonazi (UNWomen), Amy Scott (USAID), Premilla Bartlett (USAID), Dr. Sarah Baird, Ms. Dina Gumulira, Mr. Dambo, and the participants of the Malawi Social Protection Cluster meeting on April 12, 2021, for their feedback and review of this report.

Contents

1. INTRODUCTION AND CONTEXT	5
1.1 Education Sector Context..	10
1.2 The Context of Child Marriage	13
1.3. The intersection of Child Marriage and Secondary Education	12
2. RESEARCH CONTEXT AND INTERVENTION SELECTION CHOICE	6
2.1 Research Process and Intervention Selection	6
3. WELFARE IMPACT OF INCREASED EDUCATION AND AVOIDED CHILD MARRIAGE	8
3.1. Increased Education	9
3.2. Reduced fertility leading to fewer maternal deaths and obstetric fistula	10
3.3. Reduced fertility leading to fewer child deaths	12
3.4 Intimate Partner Violence ...	13
3.5. Reduced fertility leading to demographic benefits	10
3.6 Non-estimated Benefits - Labor Force Participation	12
3.7 Non-estimated Benefits - Intangible Benefits	13
4. COST-BENEFIT ANALYSIS OF INTERVENTIONS RELATED TO SCHOOLING AND CHILD MARRIAGE	10
4.1 Costing Principles	10
4.2 Impact and Benefit Estimation Principles	12
4.3 Summary of Findings	13
5. SENSITIVITY ANALYSES ON CHILD MARRIAGE EFFECT SIZES	15
6. CONCLUSION	18
7. REFERENCES	18
8. ANNEX 1: CHILD MARRIAGE INTERVENTION SCOPING	18

1. Introduction and Context

As in many African countries, the prevalence of child marriage in Malawi and the lack of secondary school options are closely related. Being married at a young age forces girls out of school, while simultaneously the lack of education options enables and encourages early marriage (Wodon et al. 2018). Malawi has a serious challenge with both, exacerbating these interdependent issues. Many children in Malawi do not attain secondary school education. Net enrolment is estimated to be only 16% for boys and girls as of 2017, a figure which compares poorly to the vast number of children enrolled in primary school (almost 90%) (UNICEF, 2019). Furthermore, the lack of secondary education attainment is worse for girls than boys. Malawian girls are married early at an alarmingly high rate – with statistics over much of the last decade showing prevalence rates of early marriage above 40%. Lack of secondary schooling is highly correlated with child marriage - approximately 65% of women with no formal education were child brides, compared with 5% of women who attended secondary school or higher levels of education. (National Strategy, 2018).

The causes of this unfortunate situation are multi-faceted. One key constraint is the lack of secondary schools. UNICEF reports that there are only 1,411 secondary schools compared to 6,065 primary schools. Another challenge is lack of labour market opportunities for Malawian girls which disincentivizes investment in girls' education. Cultural norms of course, also play a factor, in addition to cultural practices which also play a part in normalizing early marriage and early sexual debut. Among female dropouts, 43% drop out of school because of either marriage or pregnancy while no boys were reported to have dropped out due to marriage or their partner's pregnancy (LGPI, 2017). Household or employment responsibilities also affect girls roughly twice as much as boys (LGPI, 2017).

Not attaining secondary education deprives Malawian youth of learning opportunities that would generate increased income once they enter the labour force. A Mincer analysis conducted on IHS4 survey data in anticipation of this paper notes that one year of schooling in Malawi increases wages by 11% on average (Turkson, Wong and Dubosse, 2020). Being married early is associated with a raft of negative outcomes besides lack of education - including higher incidence of domestic violence, increased risk of early childbearing (which in turn increases the risk of maternal and neonatal mortality and morbidity, as well as low birth weight) and reduced autonomy in household decision making.

The first contribution of this paper is to estimate the welfare impacts of an avoided case of child marriage in Malawi. Drawing upon the framework described in Wodon et al. (2018) the results suggest that each **case of child marriage avoided** results in:

- MWK 99,000 of social and economic benefits from avoided maternal mortality, child mortality, obstetric fistula and intimate partner violence
- Up to MWK 860,000 in economic benefits from extra years of education (this varies by intervention)
- MWK 8,156,000 in GDP per capita benefits from reduced fertility that generates a demographic benefit

As illustrated by the welfare impacts listed above, the greatest welfare gain is associated with the demographic benefit, which we estimate using a macro-economic simulation model linking fertility pathways to increases in GDP per capita (Karra et al. 2017). The large gain from the demographic benefit is because the macroeconomic model links fertility reduction to decades of productivity gains from the mother, her remaining children, as well as broader society due to more savings and stock of physical capital. The fact that Malawi is expected to be a fast-growing country in the medium term (Riahi et al. 2017) also contributes to the large demographic benefits, as the gains essentially compound upon a baseline of high expected growth. The results highlight that the strongest economic argument for avoiding child marriage in Malawi is likely the economic growth story from avoided fertility.

The second contribution of this paper is to conduct cost-benefit analyses of multiple interventions that increase secondary enrolment, reduce child marriage or both. Based on substantial sector expert consultation, and a review of existing policies and literature, this paper examines the social and economic return-on-investment of six interventions:

1. Increasing the number of secondary schools for girls
2. Education promotion
3. Community dialogues to prevent child marriage
4. Cash or asset transfers for girls, conditional on school enrolment
5. Child marriage survivor program to rehabilitate annulled child marriages including scholarships to return to school
6. Sexual and reproductive health and female empowerment programs

Evidence for the interventions is drawn from Malawi and international experience, notably Tanzania and Bangladesh. For each intervention we present the benefits, costs, and benefit-cost ratios (BCRs) of two broad scenarios. The first accounts for welfare impacts from avoided maternal mortality, avoided neonatal mortality, avoided obstetric fistula, decreased intimate partner violence and increased education of girls. The second scenario includes the impacts of the first scenario, but includes wider demographic benefits stemming from a reduction in lifetime total fertility that accompanies avoiding early marriages. We present results of both scenarios since the evidence base and estimation approach for the demographic benefits is less precise than the benefits of the first

scenario. Additionally, it is possible there may be some double counting between education benefits and demographic benefits.

The results indicate that under the scenario without demographic benefits the BCRs for all interventions lie between 1-3, with increasing the number of secondary schools having the largest BCR of 2.7, at an 8% discount rate. The intervention with the lowest BCR in scenario 1 is conditional cash transfers, where benefits and costs are approximately equal for a BCR of 1.

When turning to the second scenario, the inclusion of the demographic benefit boosts the BCRs across the board, with one substantial jump for community dialogues. Here the BCR jumps from 1.4 to 114. The remaining interventions yield BCRs roughly between 3 and 10. The incredibly large jump for community dialogues is driven by the fact that this intervention has by far the lowest cost per birth avoided at MWK 199,675 an order of magnitude more cost-effective than the next intervention along this particular dimension. The reason for this low cost is that the intervention has a low programmatic cost per girl (MWK 7550) and has no effect on girls' education (according to the best available evidence) meaning that large opportunity costs of schooling are avoided.

We stress one important caveat to this result. The evidence base for community dialogues is limited and heterogenous. The existing evidence comes from three experiments conducted by the Population Council in Burkina Faso, Tanzania and Ethiopia. In these studies, the impact of the intervention on child marriage was a reduction of 67%, 26% and 0% respectively. In this study we adopt the central estimate of 26%, but clearly the limited evidence base suggests a wide range is possible.

The main policy implication from this paper is that decision makers should consider rolling out community dialogues across Malawi since the expected return on investment is very high. However, given the heterogeneity in possible outcomes, we suggest trialling the intervention in several representative communities, ideally under rigorous monitoring and evaluation approaches such as a randomized control trial. At the conclusion of the trial, an updated cost-benefit analysis could be undertaken to inform whether it should be scaled up further.

Focusing on the expected value, community dialogues are likely to be the most effective use of marginal societal resources to address child marriage from a cost-benefit perspective. This holds true even if one believes that the demographic benefit is only 7% as large as estimated in this paper or that community dialogues reduce child marriage by only 3% instead of the assumed 26%. An additional policy implication is that community dialogues may be one of the cheapest ways to deploy extra resources to reduce fertility. Another paper in the Malawi Priorities series focusing on post-partum counselling estimates a cost per birth avoided at MWK 530,000 yielding a BCR of 37 (NPC, Radin et al., 2021). That paper canvassed a number of interventions and noted that family planning programs had proliferated in recent years leading to fewer options for fertility reduction via standard programs. From an education perspective the results suggest that building new secondary schools is the most cost-effective way to ensure girls gain additional years of schooling, relative to other demand driven programs such as cash transfers and promotion. This is likely because of the large shortage of available secondary schools which renders demand generation programs relatively ineffective.

1.1 Education Sector Context

1.1.1 Challenges in the Education Sector

This section provides context on the education sector in Malawi. Though the education sector receives a relatively high proportion of the government budget, youth in Malawi are failing to progress to secondary school in large numbers and consistently do poorly compared to other SACMEQ countries on literacy and mathematics. The main barriers to improving secondary education in Malawi, include:

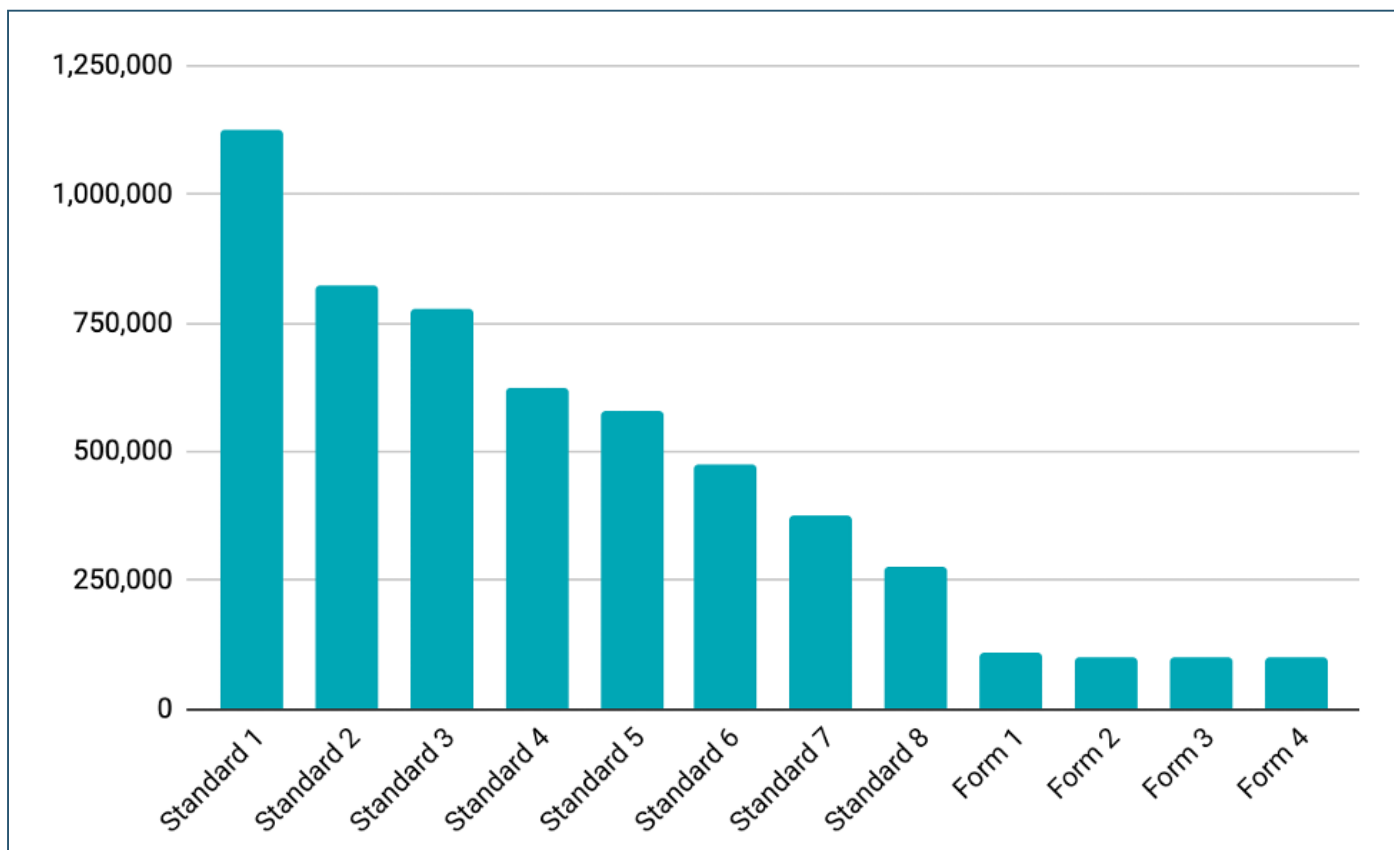
- Infrastructure challenges
- Teaching quality and quantity
- Limited demand for skilled labor
- Traditional gender norms and early marriage

These barriers have significant impacts on education outcomes and informed the choice of interventions. Malawi has made great strides in primary education, with 88% of students (87% of boys and 89% of girls) enrolled in primary education in 2017 (UNICEF, 2019). However, enrollment rates decrease significantly at the secondary school level. Only 38% of children transitioned from primary to secondary education in 2018: 41% of boys and 36% of girls (UNICEF, 2019). Net enrolment is estimated to be only 16% for boys and girls as of 2017, with the limited number of secondary schools being cited as one of the primary challenges limiting enrolment in Malawi (UNICEF, 2019).

At the secondary school level, the small number of schools is a major barrier to participation rates: while there are 6,065 primary schools, there are only 1,411 secondary schools across the country (UNICEF, 2019). This contributes to long distances to school, which is a common reason for students to drop out of school. Partly owing to this, enrollment declines significantly in secondary school, as shown in the following figure. Financial barriers still exist for families, who are expected to provide supplies and uniforms, as well as tuition fees for secondary school students. This is a particularly significant barrier given that more than half of the country lives below the poverty line. In response to this, the government announced in 2018 that tuition would be made free at the secondary school level (UNICEF, 2019).

The number of teachers is an important constraint in the Malawi education system. However, there is also evidence that the effectiveness of current teachers could also be improved. Evidence from the Quality Service Delivery survey delivered by the World Bank and the United Kingdom's Department for International Development (DFID), as well as the World Bank's School surveys, found that teachers did not have the knowledge necessary to teach problem solving and critical reading skills above a standard 6 level (Ravishankar, 2016). This is supported by the finding that 48% of teachers in Malawi are not professionally qualified to teach (Mkandawire, Luo,

Figure 1.1: Enrollment in Primary and Secondary Schools, 2017 (Source UNICEF, 2019)



and Maulidi, 2018). This likely contributes to 75% of students reporting they do not feel like they learned much in class. Teachers also reported an average of 20 full days absent and in 2014 across the academic year which is relatively low compared to similar contexts. On average, teachers spend less than four hours teaching per day and spend approximately 20% of instructional time off-task (Ravishankar et al., 2016).

A more structural barrier to secondary education is the limited demand for skilled labour that students face after leaving formal education. Like many sub-Saharan African (SSA) countries, Malawi's youth experience high unemployment and underemployment, and there is relatively little demand for skills that students would gain through formal education, even at a secondary education level (Fox et al., 2020). Together, this means that there are low returns to completing formal secondary education.

At the same time, the opportunity cost is also relatively high for youth who enter the Malawi labour market, meaning they incur indirect costs in the form of foregone earnings when they attend school. These indirect costs are substantial in the case of Malawi (Mussa, 2016), which presents an incentive for many youth to leave the formal education system. While investments in secondary education are essential for Malawian youth, these points together suggest that education alone are not sufficient to achieve wide-scale improvements in livelihoods for Malawi's young population. These investments should be complemented by investments into increased job creation through industrialization and youth employment initiatives which will increase the returns that students can expect to gain if they complete secondary school.

1.2 The Context of Child Marriage

1.2.1. Prevalence and trends of child marriage

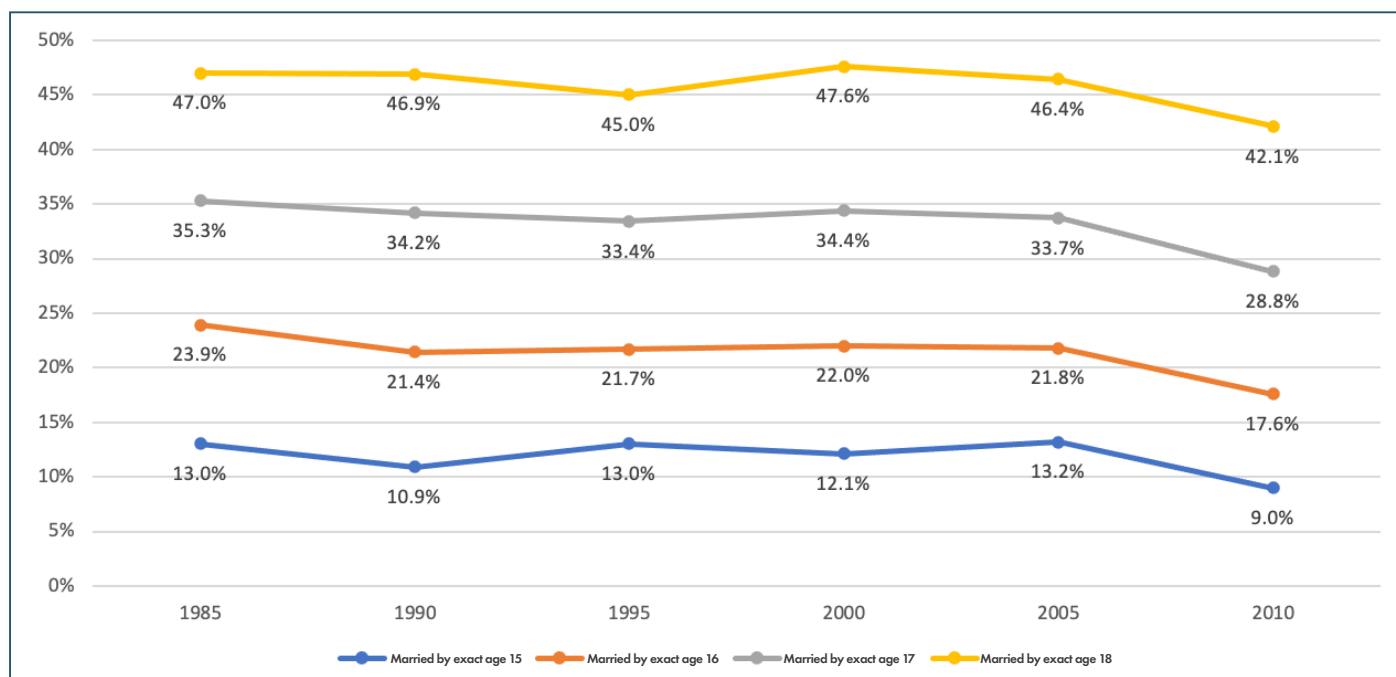
Official datasets related to child marriage in Malawi paint marginally divergent pictures of how child marriage has evolved within the country over the past two decades. While all prior data show a fairly stagnant picture of marriage in children under the age of 18 hovering in between 40 and 55% over the past 20 years with a slow decline in average rates of ECM, more recent data presents a less clear-cut picture.

Certain reports suggest that at present, approximately 42-49% of women in Malawi are married before their 18th birthday. Of this figure, approximately 12% are married when they are only 15. Based on this data, Malawi has one of the highest prevalence rates of child marriage, even compared against the regional average of 37% in Sub-Saharan Africa. Globally, it ranked 13th on the list of countries with the highest prevalence of child marriage (National Strategy, 2018). The rate of child marriage is 7 times higher among girls than boys, with 12% of girls being married before they are 15 compared with only 1.2% for boys (National Strategy, 2018). Within the adolescent group of 15-19, about 29% begun having children, especially in rural areas where education facilities are poor, resulting in school dropouts. Teenage pregnancy is higher in rural areas where 31% of women age 15-19 begun childbearing, compared with 21% in urban areas (National Strategy, 2018).

When determining child marriage rates, the most complete and representative data is from Demographic and Health Surveys. Within these surveys it is typical to examine the marriage patterns of the 20-24 age group since all of these women have passed through age 18, and one can determine for sure if they were married early or not. For the latest DHS survey conducted in 2015, the data show that

42.1% of women aged 20-24 were married by age 18. We adopt this figure as the baseline child marriage rate for this analysis. Those who were married early and aged 20-24 in 2015 were married sometime between 3-7 years previously. These rates are therefore reflective of the situation in 2008 to 2012. Unfortunately, no more recent representative data is publicly available since, at the time of writing, the 2020 DHS is yet to be released. Nevertheless, this number matches numbers cited in other national documents such as the National Strategy and UNICEF's Budget Scoping Exercise; and was validated in discussions with sector experts in the field.

Figure 1.2: Malawi - Age at Marriage 15-19 year olds (Source: DHS)



The most common manifestations of child marriage in Malawi are: 1) planned marriages that occur as a result of teenage pregnancies, and 2) forced child marriages which occur as a result of cultural puberty-based rites of passage which can act as catalysts to child marriage. (UN Women Multi-country Analysis) While poverty is considered one of the primary factors influencing child marriage, reports show that child marriage and teen pregnancy often exacerbate the individual poverty cycle, further reducing a girl's access to social and economic mobility.

1.2.2 Covid as an Exacerbating Factor

The Covid-19 pandemic has seen Malawi lose valuable ground in its effort to eliminate child marriage. "Reports from District Social Welfare Officers across the country indicated that cases of child marriages and teenage pregnancies were increasing from the time of the outbreak of the Covid-19 pandemic in March 2020. For instance, the Blantyre Social Welfare Office reported that 89 cases of child marriages were recorded in May 2020 alone, which was more than the average monthly figure of 40 cases prior to the period.

Media reports paint an even more desperate picture in other districts of the country. They reported over 1,700 and 12,000 cases of child marriage in Mangochi and Phalombe, respectively."¹ A second Rapid Assessment conducted by the Protection Cluster within Malawi found records of "13,000 cases of child marriages and over 40,000 cases of teen pregnancies" since the start of the pandemic. A report released by the Ministry of Gender, Community Development and Social Welfare in September of 2020 suggested that "cases of child marriages and teenage pregnancies have increased during the Covid-19 period. For the districts covered in this study, the cumulative figures for these teenage pregnancies is 44,874 and those for child marriages is 12,995. Covid-19 has worsened a problem that was already there as figures show that cases of child marriages and teenage pregnancies were already high." The report also notes that while the southern region districts have larger numbers of cases of child marriages and teenage pregnancies, some selected districts in the central and northern regions also show equally high figures. Noting that these figures were collected prior to the more significant school closures associated with Malawi's Covid peak in January of 2021, sector experts on the ground anticipate that the issue of child marriage and its interaction with secondary schooling will resurface dramatically in the years following the emergence of Covid in Malawi.

1.3. The intersection of Child Marriage and Secondary Education

Early marriage and motherhood are both leading risk factors for girls' not completing secondary school as parents, schools, and communities may not provide support for these girls to return to school after becoming mothers. (World Bank Malawi Economic Monitor, 2018) Nguyen and Wodon (2014) specifically estimate that each year of early marriage is associated with a 5.7 percentage points (pp) decrease in the probability a girl is literate, and a decrease in the probability of completing secondary school of 3.5 pp.

Within Malawi, girls are twice as likely as boys to drop out of school because they need to help with household work: 22% of girls who dropped out did so because of household responsibilities, compared to only 11% of boys. A further 7.6% of girls dropped out because of the need to work, compared with only 4% of boys. Most importantly, among female dropouts, 43% drop out of school because of either marriage or pregnancy. No boys were reported to have dropped out due to marriage or their partner's pregnancy. (LGPI, 2017)

¹ Correspondence with Justin Trevor Hamela, Child Marriage Focal Point, MOGWSW – Presentation on: A Rapid Assessment Study Of Teenage Pregnancies And Child Marriages During COVID 19 In Malawi

In Malawi, nearly 66% of women with no formal education were child brides, compared with 5% of women who attended secondary school or higher levels of education (National Strategy, 2018). Additionally, 54% of 15-19 year olds with no education begun child-bearing compared with 32% of those in the same age group who attained primary education, and 19% of those who attained secondary education (National Strategy, 2018). While the legal age for marriage in Malawi is 18, not 19, this point demonstrates the strong link between education and overall fertility rates and early child-bearing within Malawi.

When considering gender-specific threats that can hinder girl's access to education, fears relating to the safety and security of children travelling to school revealed an aspect of the disparities between girls' and boys' access to education. In response to the question "Why is the child not safe going to school?" within the LGPI respondents saw 0.7% of boys and 7% of girls as not being safe going to school due to fear of rape; a further 23.7% of boys and 32.3% of girls were considered unsafe due to having "no adult to walk with the child [to school]". These perceptions speak to the dynamic between child marriage and education within Malawi, wherein even in the absence of child marriage or pregnancy, its possibility alone still impacts the likelihood of a girl being kept home from school (LGPI, 2017).

2. Research Context and Intervention Selection Choice

The Malawi National Planning Commission (NPC), with technical support from the African Institute for Development Policy, and the Copenhagen Consensus Center (CCC) are implementing the Malawi Priorities project across 2020 and 2021. The Project is a research and advocacy exercise to identify the most effective ways to address the nation's challenges using the framework of cost-benefit analysis. The aim is to inform both short and long term development priorities for the country, acknowledging that there are insufficient resources to address all of Malawi's challenges and that maximizing outcomes requires careful, evidence-based consideration of the costs and benefits of all policies.

The starting point of all research questions is the NPC's existing research agenda, structured around the six thematic areas of Sustainable Agriculture, Sustainable Economic Development, Human Capital and Social Development, Sustainable Environment, Demography, Governance, Peace, and Security, and Human Capital and Social Development. The NPC's research agenda was developed by the Commission in September 2019 after extensive consultation with academics, think tanks, the private sector and government.

Consequently, the Commission's research agenda, *prima facie*, contains questions of national importance. As a first step, Malawi Priorities drew questions from the NPC research agenda that could be answered using a cost-benefit methodology. Then, additional research questions were added based on input from NPC, an Academic Advisory Group (AAG) of leading scholars within Malawi, and existing literature, particularly previous cost-benefit analyses conducted by the Copenhagen Consensus Center. This process of identifying research questions for investigation generated a total of 38 potential research questions across all 6 thematic areas. The research agenda was validated and prioritized by a Reference Group of 25 prominent, senior stakeholders from government, civil society and the private sector. The outcomes of the Reference Group exercise were used to inform which research questions to prioritize and which interventions to focus on within those 38 potential research questions. The validation process finished in July 2020.

2.1 Research Process and Intervention Selection

In September 2020, one research team began an investigation into reducing dropouts in secondary education, a topic which scored 4.6 out of 5 when rated by the project's Reference Group. To start the research process, the research team consulted with experts on Malawi education quality to identify the main barriers to education in the context, and to get insights into possible solutions. This included interviews with experts from University of Malawi, USAID Malawi and the Centre for Educational Research and Technology at the University of Malawi. After consulting with these experts, the research team conducted a thorough review of the academic and grey literature to identify or confirm the existing barriers and gaps in the education sector. This also included a review of the evidence base for the performance of interventions that have tried to address these gaps in similar contexts or within Malawi.

During the process of this research on secondary school, along with several other research streams in the Malawi Priorities project – including nutrition, HIV and AIDS, maternal and neonatal mortality and family planning, the cross-cutting issue of child marriage arose as a contributing factor in exacerbating the magnitude of these other challenges. This, along with a broader awareness of child marriage as a worsening issue during the COVID-19 pandemic, compelled the NPC to carve out a separate research stream on addressing child marriage in November 2020. This investigation was started by a separate research team. Given the close interaction between child marriage and education outcomes – in particular the circular nature of impacts – the two research stream findings were merged into this one report.

Both research teams used a number of criteria to screen and select a subset of interventions to include in the feasibility analysis.

Sector expert priority: The intervention is identified by sector experts as important and relevant to the local context. Experts can provide input through several channels: the Reference Group questionnaire, inferences from the NPC research agenda, the academic advisory group, and during individual interviews. Notably, while child marriage was not included in the NPC's initial research agenda, it was later added to the agenda due to its recurring emergence in discussions with Secondary Education sector experts and in the Reference Group Questionnaire.

High benefit-cost ratio or cost-effectiveness in similar previous research: The purpose of the Malawi Priorities project is ultimately to identify interventions for which benefits significantly outweigh costs. Based on the economic literature, particularly previous research conducted by the Copenhagen Consensus Center, benefit-cost ratios of above 15 are among the top quintile of BCRs across all interventions. Due consideration is given to contextual differences between previous research and the current situation in Malawi in determining the effect of this criterion.

Addresses a problem of sufficient size: some interventions can be considered highly effective but only address a small target population or part of a given problem, limiting the overall benefits of the approach. To avoid focusing on solutions that target only small sub-populations, each intervention must have the potential to be scaled and address a problem that is significant.

Significant gap in current levels of intervention coverage: all analyses conducted for Malawi Priorities focus on marginal benefits and costs. Therefore, if an intervention already has high coverage rates, then additional resources provided towards that intervention might have reduced effectiveness or could suffer from the 'small-size' problem.

Availability of crucial data or credible knowledge of impact: due to time and resource constraints, all analyses conducted by Malawi Priorities are based on secondary data. No primary research, such as field experiments or trials, is conducted. Therefore, each intervention is constrained by the available data. In many cases, one key constraint is the lack of knowledge concerning the impact of a given intervention. It is typical to formally deal with uncertainty via sensitivity analyses. However, in some cases, the uncertainty is so great that it precludes the analysis of the intervention at all.

The following table summarizes the intervention selection process and feasibility analysis of both teams. In total 21 interventions were identified and screened, with six being chosen for further cost-benefit analysis. Most interventions were screened out due to lack of data.

Based on the selection criteria summarized in Table 1, the research team identified 6 programs as priority interventions for further cost-benefit analysis. These programs are:

1. Increasing the number secondary schools for girls
2. Education promotion
3. Community dialogues to prevent child marriage
4. Cash or asset transfers for girls, conditional on school enrolment
5. Child marriage survivor program to rehabilitate child marriages through annulment and scholarships to return to school
6. Sexual and reproductive health and female empowerment programs

These programs address many of the priorities of sector experts in Malawi, have adequate data availability, and address significant gaps in the existing coverage so they have the largest potential for impact. The following describes each intervention and the existing evidence base upon which we conducted a cost-benefit analysis. While we tried to include as much evidence from Malawi as possible in this analysis, we were limited to programs for which both cost and primary impact data were available. We thus decided to include examples from other countries, adapting costs to the Malawian context.

The following describes the interventions, the chosen parameter values for the base case, and how they compare to the wider literature. In many cases, the possible range of parameter values from the literature is wide. These are tested in sensitivity analyses in Section 5.

Intervention 1: Increasing the number of girls secondary schools

The intervention aims at increasing secondary schooling capacity in Malawi through the construction of additional schools, and the hiring of additional teachers. The analysis in this report is based on a program that constructs classrooms for an additional 100,000 girls per year; with an expected lifespan of these classrooms of 20 years, this program could reach a total of 2 million girls. Total costs of this program also include additional teacher salaries and auxiliary fees. Expected benefits consist mainly of an increase in school attendance and education attainment, which translates into higher lifetime earnings. This analysis is based on historical experience of building schools in Malawi, and the impacts of additional learning on wages.

A handful of studies have estimated the impacts of building schools using experimental or quasi-experimental methods. All have demonstrated that building schools, where they do not already exist, causes large jumps in education enrolment. Duflo (2001) reports that a large-scale Indonesian program of school construction during 1973 and 1974, contributed to primary school enrolment rates jumping from 69 percentage points to 84 percentage points by 1978. Burde and Linden (2013) show that a school construction program in Afghanistan led to girls' enrolment jumping 52 percentage points, and 35 percentage points for boys. Ingwersen et al. (2019) analyse evidence on the long term impact of "girl-friendly" schools – using data from the Bright school construction program in Burkina Faso. There was a 33.8pp increase in completion of primary school, and transition to secondary school increased by 32.8pp. Additionally, the probability of getting married and having a child declined by 9.8% and 5.9%, compared to girls not in the program. Bagby et al. (2016) documented a three-year follow-up impact evaluation of the IMAGINE school construction project, in Niger reporting that it had a positive impact for girls on both enrollment - which improved by 11.8pp and on attendance - which improved by 10.6pp.

Therefore, for the intervention on building more girl schools, we assume that marginal increases in capacity fully subsumes those that would otherwise not attend secondary school, given the large shortage of infrastructure. We then reduce this by 10% based on Ministry of Education Statistics that show that, conditional on attending school, one in ten girls repeat or drop out. This leads to an increase in schooling of 0.9 years per girl.

Intervention 2: Community Dialogues

Addressing cultural norms through community dialogues was one prominent method highlighted by sector experts as important in the Malawian context. There have been several such initiatives already conducted such as the Chief's Wives' Initiative in which stations were supported with lunch allowances and fuel to engage chiefs' wives in 8 districts on child protection issues and related laws. Each chief's wife was responsible for the protection of 300 girls in her area of jurisdiction. The pilot districts include Karonga, Chitipa, Kasungu, Lilongwe, Balaka, Zomba, Mulanje and Blantyre.

Numerous programs pertaining to child marriage in Malawi center around the use of community dialogues, such as the Chiefs' Wives programs, Traditional Leaders' programs, and the Barber Shop Toolkit program. However, data for these programs was unavailable, or

Table 1: Selection criteria (✓ = chosen for further CBA)

Interventions Covered	Sector expert priority	BCR or Cost Effectiveness	Addresses a problem of sufficient size	Gap in current coverage	Availability of data	Recommended Priority
Education Infrastructure and Services						
Increasing number of secondary schools	Yes	Moderate	Yes	High	High	✓
Girls' hostels	Yes	Unknown	Yes	High	Low	X
Hygiene infrastructure in schools	Yes	Moderate	Yes	Moderate	Low	X
In-school guidance counsellor	No	Unknown	Yes	High	Low	X
Education Promotion and Incentives						
Education promotion and school supplies	Yes	Moderate	Yes	Moderate	Moderate	✓
Conditional Cash or Asset Transfer	No	Moderate	Yes	High	High	✓
Scholarships	No	Moderate	Yes	High	Low	X
Interventions Aiming to Change Cultural Norms						
Community Dialogues	Yes	Moderate	Yes	Unknown	Moderate	✓
Barber-Shop Toolkit	No	Unknown	Yes	Low	Low	X
Mothers' groups	No	Unknown	Yes	Low	Low	X
Chief's Wives Initiative	Yes	Unknown	Yes	Low	Low	X
Traditional Leaders Forum	Yes	Unknown	Yes	Low	Low	X
Programs targeting initiation ceremonies						
Mass media sensitization	No	Unknown	Yes	High	Low	X
ECM Interventions Directly Targeting Youth						
Child Marriage Survivor Program	Yes	Unknown	Yes	High	Moderate	✓
Extra-curricular associations and youth centers	Yes	Unknown	Yes	Low	Low	X
Psycho-social counselling	No	Unknown	Yes	Low	Low	X
Youth entrepreneurship programs	Yes	Unknown	Yes	Low	Low	X
Child protection communities and case workers	Yes	Unknown	Yes	High	Low	X
SRH Promotion						
Girl Empowerment and SRH Campaigns	No	High	Yes	Moderate	Moderate	✓
Sanitary Napkin Production	No	Unknown	No	Low	Low	X

unusable for the purposes of the cost-benefit analysis. The importance of community-based programming, however, was underscored numerous times by sector experts working in the field as a key component to eliminating child marriage within Malawi during the research gathering phase of the report. As such, the authors sought out a program which involved similar methods and utilized similar logic models to effect an impact. Among the available models, the Population Council's Community Dialogues model was both similar, and had the necessary data set to support a cost benefit analysis.

The Population Council program was implemented in three countries: Burkina Faso, Ethiopia, and Tanzania (Erulkar et al. 2017). The intervention included community sensitization on the harmful effects of child marriage and attempts to address social norms surrounding the practice. A facilitator's guide developed to standardize messaging on the importance of girls' education and the negative impacts of child marriage was distributed and community and religious leaders were trained at the beginning of the project to facilitate discussions and deliver messages during monthly village meetings or weekly religious services. In addition, project staff disseminated messages on market days. The program was found to reduce incidence of child marriage by 67% in Burkina Faso, by 26% in Tanzania and was found to have essentially no impact in Ethiopia. For this analysis we draw from the median country, Tanzania, though acknowledge the large heterogeneity of results. There were no impacts on education attainment. No other studies on community dialogues were identified.

Intervention 3: Education promotion and school supplies

Promoting education to parents can help boost enrolments by informing parents about the value of education. The cost-benefit analysis was modelled on another program implemented by the Population Council in three African countries. The intervention includes the promotion of schooling to unmarried girls aged 12 to 17. Girls who registered for schooling promotion received school materials with the agreement from girls and their families that they would remain unmarried and in-school for the two-year duration of the pilot. Girls were given the choice of receiving a school uniform or school supplies, which included 12 exercise books, five pens, two pencils, and one mathematical set. Registered girls received supplies once at the beginning of the school year. In addition, school-going girls were encouraged to attend "Smart Girls' Clubs," which were after-school tutoring and life skills clubs set up by the project. Among the existing programs within Malawi, this intervention is most closely aligned with National Girl Guides Clubs as well as other conditional asset transfer programs. The intervention increased enrolment by 30%. Applied to a 16pp net enrolment rate for girls in Malawi, the intervention would therefore boost average enrolment by 5pp. The intervention had minimal effect on child marriage for those aged 15 to 17 with a statistically insignificant reduction of 1% (or 0.4pp). We adopt these parameter estimates for the cost-benefit analysis.

Kalamar et al. (2016) undertook a literature review for effective interventions to reduce child marriage. Among the studies rated high quality and which took place in sub-Saharan African, countries, they observed that the provision of school uniforms and other supplies in Kenya and Zimbabwe were effective for school enrollment but not for child marriage. In the former, Duflo et al (2014) conducted a large randomized evaluation involving 328 schools in Western Kenya. While there were several policies being tested, the one of interest here is the Education Subsidy program, which subsidized the cost of uniforms over the last three years of primary school. The experiment increased the number of girls in school by 3.1pp – a smaller but statistically similar effect to the one we adopt from the Population Council. The Kenyan experiment reduced early marriage by 2.6pp, which is substantially higher than what we adopt from the Population Council study.

In the latter study, Hallfors et al. (2015) likewise offered school supplies to girls. After 2 years, there was an 82% reduction in school dropout, 64% after five years. Overall, beneficiaries attained 0.68 extra years of schooling on average at 5 year follow up. On a per year basis this equates to 0.14 additional years of schooling, a substantially larger impact than what we adopt from the Population Council. In terms of child marriage the odds ratio of getting married was 0.37, or a reduction in marriage by 12.7pp. This is also substantially larger than the value we adopt from the Population Council. However, it should be noted that the treatment and control groups consisted of orphan girls which may not be representative of the entire school-girl population.

In alignment with the findings on the impact of education support on child marriage, Koski et al (2018) undertook a systematic review on the impacts of eliminating tuition fees in sub-Saharan Africa and found no evidence that the removal of tuition fees had an impact on child marriage rates in Malawi. This points to the fact that child marriage is not just a resource-driven phenomenon and requires a deeper interaction with the community to uncover the motivations of all stakeholders.

Intervention 4: Conditional Cash (or Asset) Transfer for School Enrolment

Conditional cash (or asset) transfers to boost school enrolment have been frequently used across the developing world for decades, originally pioneered in Latin America. In recent cases, conditional cash programs have also included a requirement for girls to remain unmarried.

The cost-benefit analysis is based on a randomized evaluation of a conditional cash transfer (CCT) program for girls in Malawi carried out between 2007 and 2008. The study took place in southern Malawi's Zomba district in both the large urban center, Zomba city, and many surrounding rural and semi-rural villages. Girls and their families were given monthly stipends over the course of two school years based on school attendance. The money was distributed on a monthly basis, \$10 a month for a total of \$100 per school year, 30% of which went to the schoolgirl and 70% of which went to her parent/guardian. \$10/month at the time of the study represented roughly 15% of total monthly household consumption in the households participating in the study, which places this program in the middle-to-high end of the range of relative transfer sizes for conditional cash transfer programs. In addition to the transfers to the household, secondary school fees were paid directly to the schools upon confirmation of enrollment. The results indicate that 44% more girls who were out of school subsequently re-joined school, and 40% of dropouts did not remain unmarried due to the intervention. For a net enrolment rate of 16pp and a marriage prevalence of 42pp, this implies an increase in enrolment equivalent to 37pp and a reduction in child marriage by 37%.

The enrolment impact is substantially larger than the results of a meta-analysis showing that secondary conditional cash transfers increase enrolment by 14% (7pp) (Garcia and Saavedra, 2017). Indeed, the Malawi study has the highest enrolment impacts of all reviewed studies. However, the baseline level of enrolment in the meta-analysis is much higher than in Malawi (16pp in Malawi vs. 51pp in the Garcia and Saavedra sample) suggesting substantially more room for improvement in the Malawian context. Additionally, the magnitude of the transfer – \$100, represented a very large proportion (~33%) of GDP per capita at the time of the program. Regarding the impacts on child marriage, the chosen effect size is directionally consistent with other findings and is also towards the higher end of impacts from CCTs (Molhotra and Elnakib (2021)).

Intervention 5: Child Marriage Survivors Program

In exploring the types of programming related to the elimination of child marriage in Malawi, one program stood apart as the only program which focused on the recovery and rehabilitation of girls following the annulment of a child marriage – the Marriage Survivor Program. As the program was only recently established, and is fairly unique, it lacked significant data sources or a close comparator globally. However, noting that programs which focused on the rehabilitation of girls from annulled child marriages was highlighted as a significant gap repeatedly by sector experts in the field, as well as literature which suggested rehabilitation as a critical aspect in addressing child marriage, the authors attempted to locate any data available on the program and used such data to construct the cost benefit analysis.

This analysis is based on an existing program within Malawi which focuses on targeting child marriage survivors – those who have had marriages annulled or cancelled. The program has been rolled out to 720 child marriage survivors and includes the provision of 15 workshops and approximately USD 200 in scholarship money per girl per year, plus bicycles for 520 of the girls to assist with reaching schools (Makoka and Chilemba, 2021). The total cost of the intervention for 720 girls was USD 433,399 for a cost per girl of USD 602. The cost-benefit analysis assumes an increase in scale to 10,000 girls.

Bearing in mind that the program is new, much of the data provided was collected and reported through a direct midterm program evaluation, and through correspondence with Trevor Hamela, Deputy Director for Child Affairs, MoGCDSW, who oversees the program. While this meant that the evidence available by which to assess the program was less concrete than that of other programs, the authors chose to include the analysis in this report due to its unique focus on rehabilitation, and in order to provide the sector with a comparative perspective of the program alongside those with more established results. It was assumed the dissolution of child marriages would prevent 71% of girls from giving births early and also would encourage them to return to school. The remaining 29% of girls are assumed to already be pregnant, in line with teenage pregnancy rates. They would also be supported to return to school. As with the school capacity intervention the assumption is 0.9 years of additional schooling per girl.

Intervention 6: Girls Empowerment and SRH Program

Providing sexual and reproductive health information can reduce the rate of teenage pregnancies, a major factor in child marriages. This intervention effect is drawn from several sources, since the evidence base is quite diverse. For education impacts, we draw from a program implemented in Bangladesh (Buchmann et al. 2018). The intervention includes an empowerment and SRH program that encourages girls to delay marriage / childbirth and spend more time attending school. The adolescent empowerment program identified “safe spaces” where girls could meet, socialize, and receive educational support and social competency training, which included training on life skills and nutritional and reproductive health knowledge. Girls who participated completed an additional 2.4 months of schooling, though there were no demonstrated impacts on pregnancy and early marriage.

However, this null result is not supported by other studies. Mehra et al. (2018) analysed a community-based intervention which included age and life skill-based educational sessions, focusing on SRHR (sexual and reproductive health and rights) in 2 states of India. The intervention showed a significant effect towards decrease in the number of early marriages (Adj OR 2.25, CI 1.28–3.94), of early pregnancies (Adj OR 3.00, CI 1.06–8.43) and increase in the number of school retentions (Adj OR 2.96, CI 2.02–4.34). Bandiera et al. (2020) evaluated a multifaceted policy intervention in Uganda, which simultaneously provided adolescent girls with vocational training and information on sex, reproduction and marriage. The program had a significant impact with results 4 years post intervention indicating that girls exposed to the program experienced a 62% reduction in teenage marriage rates and a 26% reduction in the probability of having a child. Daniel and Nanda (2012) studied the effect of reproductive health communication on age at marriage in rural India. The median age at marriage for girls in the intervention arm was 2.6 years higher (22.0 vs. 19.4) and the adjusted relative risk of marriage was 44% lower than in the comparison group. For this cost-benefit analysis we adopt a parameter estimate of 13% reduction in pregnancy, half of the effect from Bandiera et al. (2020) since that experiment also included a vocational education component which is not included in this intervention specification. This parameter choice is tested in sensitivity analyses.

3. Welfare impact of Increased Education and Avoided Child Marriage

Before turning to the cost-benefit analysis, we describe the evidence and welfare impacts of several categories of benefit associated with increased education and avoided child marriage. This draws upon the framework of Wodon et al. (2015), and the actual economic assessment provided by Wodon et al. (2018). A summary of welfare impacts from additional education and avoided child marriage are noted in Table 2, and described in more detail below.

Table 2: Welfare impacts

Type of Impact	Value in 2021	Estimation Methodology
Education	One year of secondary school education increases lifetime earnings by MWK 957,000. For interventions reducing child marriage, the maximum schooling gain is 0.9 years for a welfare gain of MWK 860,000	Mincer analysis conducted on IHS4 data shows earnings increase by 11.1% for each additional year of schooling, yearly income is MWK 500,000. 8% discount rate applied.
Lifetime fertility	One avoided child marriage reduces expected total fertility by 0.35 (no direct welfare gain; only flow-on gains to other benefits below)	Regression analysis conducted on DHS data as reported in Wodon et al. (2018) shows 8% reduction in TFR. Current TFR is 4.4 per woman. $8\% \times 4.4 = 0.35$
Maternal mortality	One avoided child marriage avoids 0.0013 maternal deaths; welfare value = MWK 13,374	Fewer births means fewer deaths in birth. Maternal mortality rate (374 per 100,000) \times 0.35 births avoided
Child mortality	One avoided child marriage avoids 0.0071 child deaths; welfare value = MWK 85,450	Assumes 0.5 births are delayed to above age 18. Early births have an elevated mortality risk of 1.4 percentage points as reported in Wodon et al. (2018).
Obstetric fistula	One avoided child marriage avoids 0.0011 obstetric fistulas; welfare value = MWK 1,723	0.3% of women who deliver experience OBF complications, with early births having an elevated risk ratio of 1.06 (Kalalni-Phiri, 2010). DALYs lost from OBF are assumed to be 8.53.
Intimate partner violence	One avoided child marriage avoids 0.26 days lost to IPV per year for the working life; welfare value = MWK 6,662	24% of women experience physical or sexual violence every year, resulting in 22 productive or leisure days lost. Being married early increases risk of IPV by 4.8% (Wodon et al. 2018).
Demographic benefit	One avoided child marriage increases GDP per capita by MWK 0.02 in 2030; MWK 0.05 in 2050; welfare value = MWK 8,156,000	Based on model described in Karra et al. (2017) where a reduction in population of 209,000 leads to 2.88% boost to GDP per capita by 2025. One child marriage avoided is assumed to permanently reduce the population by 0.35. Proportionate response to GDP per capita, with 8% discount rate applied.

3.1. Increased Education

Early marriage and pregnancy are cited as key causes for girls to drop out of school in Malawi. By delaying marriages and pregnancies, girls will typically complete more months or years of secondary school. Several of the programs included in this analysis lead to increased educational attainment. The additional years of schooling anticipated for beneficiaries were converted to expected lifetime earnings (LTE) via a Mincer estimate of returns to schooling in Malawi conducted by Copenhagen Consensus in anticipation of this exercise (Turkson, Wong and Dubosse, 2020). That analysis shows that each year of additional schooling increases earnings by 11.1%, and that mean income for junior secondary school graduates is approximately MWK 503,000 in 2021.

We define the benefits each year as the estimated income for a girl receiving the intervention minus the estimated income a girl in the program would have received without the education benefit of the program. This is the annual education benefit we expect girls to receive from having been induced to study longer by each intervention. This gives us the benefit per eligible girl in any given year. The annual benefit is defined as the above term multiplied by the total number of girls reached by the program.

Note that wage premiums are based on wages of those in the labor force with monetized wages. The assumption behind Mincer

equations and our estimates is that education increases productivity as much for women not earning a wage (including those working in the household) as it does for women working for a wage outside the household.

Our estimates of the returns to education are based on a standard Mincer equation which compares earnings for those women in the workforce with different levels of education. Two key assumptions are necessary for this to reflect the gains to the economy of increases in education. First, it assumes the high wages of those women who are more educated are the result only of their education and not due to unobservable factors (such as motivation) which may be correlated with higher than average education. Second, it assumes that women who are not in the workforce but have had more education have an equal increase in productivity in the work they do at home as those who are in the workforce. If there is selection of more able or more motivated women into education or if education raises productivity less for those not in the labor force, then our estimates will overestimate the Net Present Value of all the programs discussed here.

3.2. Reduced fertility leading to fewer maternal deaths and obstetric fistula

Child marriage contributes to higher total fertility in a society as women who marry earlier tend to both have children earlier and give birth to more children over their lifetime than if they had married later. Using DHS survey data, and controlling for a range of other factors, Wodon et al. (2018) note that Malawian women who marry after age 18 have 8% less children on average than those who marry before age 18. At current fertility rates this translates to 0.35 fewer children on average from avoided child marriage.

Fewer births mean fewer maternal deaths. Regarding maternal mortality, we do not assign any risk reduction due to later birth. Nove et al. (2014) estimated maternal mortality ratios for women aged 15–19 years in a large number of African and Asian countries and compared these ratios to the ratios observed for women in other five-year age groups. Findings did not suggest that there are systematically higher levels of maternal mortality among mothers ages 15-19 in comparison to mothers ages 20-24. However, each averted pregnancy means averting a potential risk of dying during pregnancy and childbirth. With 374 Malawian women dying per 100,000 live births, that risk is not insignificant (World Bank Indicators). Avoided deaths are valued by multiplying life years lost by the value-of-statistical-life-year. The Malawi Priorities project follows the recommendations of Robinson et al. (2019). In the base year the VSLY equals approximately MWK 180,000 or 0.6 of GDP per capita.

Among the most serious childbirth injuries, obstetric fistula is characterized as a hole between the birth canal and bladder and/or rectum. This injury is most often caused due to prolonged, obstructed labour and a lack of access to timely, high-quality medical treatment. In addition to the immediate pain and trauma associated with obstetric fistula, women may experience leakage of urine, faeces, or both. Such a condition can often lead to chronic medical problems, social isolation, and depression, as well as increased poverty. It is estimated that presently, hundreds of thousands of women are living with fistula in the Caribbean, Latin America, the Arab States, Asia, and Sub-Saharan Africa.

Approximately 0.3% of women in Malawi will experience obstetric fistula complication as a result of their pregnancy. If a woman gives birth under 18, that risk is increased (OR 1.06) (Kalilani-Phiri 2010). Based on study of teenage pregnancy in Uganda, which has a similar life expectancy to Malawi, a fistula leads to the loss of 8.53 disability-adjusted life-years (Epiu I et al. 2018).

3.3. Reduced fertility leading to fewer child deaths

The negative impacts of early childbirth are stronger when it comes to child/under-five health and mortality. In two studies carried out by Onagoruwa and Wodon (2017c, 2017d) for 15 countries, the authors found that, for a child born to a mother younger than 18, controlling for a wide range of other factors, the risk of under-five mortality increased on average by 3.5 percentage points, while the risk of under-five stunting increased by 6.3 percentage points. For Malawi, the risk of a child dying before it reaches its 5th birthday increased by 1.4 percentage points when the mother was under 18. No effect on the risk of stunting was observed in Malawi.

The welfare impact of avoided child mortality requires careful thought especially around which avoided deaths count as benefits. In the above exposition we note that child marriage reduces lifetime fertility by 0.35 births. Because these births never happen in the 'with intervention' scenarios, we do not include them in the universe of births for which child mortality can be avoided. We instead assume that for each child marriage avoided 0.5 births per girl that would have occurred before 18 are delayed to the period after 18, reducing overall child mortality risk. This figure is based on the simple correlations between fertility and marriage status before and after age 18, which shows that girls who are married early have 0.85 more births (without controlling for girl characteristics). From this figure we subtract the 0.35 births that do not occur and assume the remaining are delayed. Child mortality is valued in a similar way to maternal mortality, except of course that children have greater life expectancy than mothers.

3.4 Intimate Partner Violence

A number of studies have demonstrated that the most common form of violence experienced by women globally is intimate partner violence (UN, 2006; WHO, 2013). While an estimated 30% of all women globally have experienced some form of intimate partner violence (IPV), the prevalence of IPV varies widely, with only 4% of women over 15 in high-income countries having reported incidences compared to 28% in sub-Saharan Africa (Devries et al, 2013).

The main welfare impact of avoiding IPV in this model is productivity loss. Following Raghavendra et al. (2019) we assume that 25 days are lost each year to those who experience IPV for women living in rural areas, and 10 days for women living in urban areas. Based on population splits of 86% rural and 14% urban, and DHS data that notes 25% of rural women experienced IPV in the last year compared to 21% of urban women, the average lost days per women experiencing IPV is therefore 22 days per year. Savadogo and Wodon (2017a) estimate that eliminating child marriage in Malawi would reduce IPV by 4.8%. The value of avoided IPV from later marriage is this 4.8% effect multiplied by productivity lost from 22 days per year over the lifetime.

Not included in this benefit calculation are other impacts for which evidence is less clear for Malawi. Women who have suffered IPV are likely to suffer poorer health outcomes than non-abused women (Hoeffler and Fearon, 2015). Surveys indicate that they may struggle with daily activities, suffer from pain, memory loss, dizziness and vaginal discharge, in addition to higher levels of emotional distress, suicidal thoughts and suicidal attempts (Ellsberg et al 2008). The WHO (2013) also concludes that IPV can increase a woman's likelihood of having a low-birth weight baby by as much as 16%. "In some regions they are 1.5 times more likely to acquire HIV and 1.6 times more likely to have syphilis when compared to women who do not suffer partner violence. In addition there are long-term consequences for the next generation that witnessed the violence. Daughters are more likely to be abused by their partners and their sons are more likely to become abusers themselves." (Hoeffler and Fearon, 2015; Hindin et al, 2008; WDR, 2012).

3.5. Reduced fertility leading to demographic benefits

Since Malthus first introduced a narrative on the negative impact of continued population growth on economic outcomes, scholars have continued to revisit this question. Ashraf et al. 2013 review the literature exploring the relationship between population growth or fertility and economic growth, concluding that reduced fertility leads to higher incomes. Specifically, Ashraf et al. (2013) suggested that reduced fertility increases economic growth by: 1) an increase in fixed resources per population due to a lower population (Malthus effect), 2) a capital shallowing effect due to the reduction in the capital to worker ratio (Solow effect), 3) an increase in income per worker holding productivity constant but spread across fewer people (dependency effect), 4) an increase in savings due to an increase proportion of the population of working age involved in economic activity (life-cycle saving effect), 5) an increase in the experience of the overall workforce as a larger proportion of workers are now older and have a work history (experience effect), 6) an increase in labor force participation as older workers are more likely to participate in the labor force thereby increasing productivity (life-cycle labor supply effect), 7) reduction in time spent child rearing that is reallocated to productive activities (childcare effect), and 8) increased investment in children as there are now fewer children (child-quality effect). Karra et al. (2017) build on the Ashraf et al. (2013) approach and assume that there are additional economic impacts from improved child health, increased savings rate due to population age structure, and further increased reductions in fertility. We assume that these numerous channels demonstrate the large impact of fertility declines on economic growth. Therefore, programs that lead to fertility declines, such as those that reduce or eliminate child marriages, are likely to lead to improved economic conditions for the entire population.

To estimate the size of the impact of the reduced fertility on economic growth, we use results from a model presented in Karra et al. (2017) that is an updated version of Ashraf et al. (2013) and incorporates both a high and low productivity sectors that is reflective of the economic opportunities in countries such as Malawi. Karra et al. (2017) describes the model and applies it to Nigeria. We were provided the same simulation model for Malawi² and use this to estimate the increase in GDP per capita as a linear function of the number of births reduced by interventions addressing child marriages. Specifically, by 2025, 207,000 avoided births lead to an increase in GDP per capita of 2.9%.

We also note that using our benefit estimation approach has the potential to lead to double counting as part of the demographic dividend is derived from education benefits to both mothers and children. However, due to the complexity of the model presented in Karra et al. (2017) we were unable to disentangle the benefits.

3.6 Non-estimated Benefits - Labor Force Participation

The relationship between child marriage and labor force participation is complex. Child marriage tends to lead to lower educational attainment and higher fertility. These are often-cited factors affecting women's labor force participation and the nature of their employment. Yet while in some countries a higher education is associated with a higher likelihood of working (in part due to higher opportunity costs of not working), in other countries this is not the case. Specifically, in middle income countries, secondary and post-secondary education is often associated with higher participation in the labor force (Cameron et al. 2001; Mammen and Paxson 2000). But in low-income countries where labor markets tend to be informal and many women must work simply for the household to survive, impacts may be less salient. In comparison to broader gender roles that affect labor force participation, child marriage itself may not have a large direct impact on whether women work or not and the type of job held, even if there may be indirect effects at work.

Indirect effects of child marriage on labor force participation may work through several channels, but they may not necessarily be large. Women who marry early may have lower agency, limiting their bargaining power in the households, including and possibly with regards to the decision to enter the labor force. Through its impact on educational attainment, child marriage may affect labor force participation by reducing the opportunity cost of not working. In addition, through higher fertility and thereby a higher domestic workload, child marriage may affect the number of hours worked by women, although not necessarily whether they work or not and the type of job held. Note that in some cases, the direct and indirect (through fertility and educational attainment) effects of marriage may work in opposite directions, thereby compensating each other. Overall, the impact of child marriage on labor force participation may be positive or negative, and small or large depending on the country or community. Assessing the direction and magnitude of the impact must be done empirically.

Regression analysis based on Demographic and Health Survey data suggests in many cases that controlling for other factors, child marriage may not affect labor force participation much. Table 5.4 provides estimates of the marginal impact of child marriage on labor force participation controlling for other factors that could affect labor force participation using the 2011 DHS. In most countries (Bangladesh is an exception), marrying as a child versus marrying later appears to increase the likelihood of labor force participation as an adult. The same is true when considering work with payments in cash. In other words, reducing child marriage could lead (in terms of direct effect) to a reduction instead of an increase in women's labor force participation, including in terms of work with cash earnings.

²We thank Mahesh Karra for providing these results.

Based on a study by Savagado and Wodon (2017b), ending child marriage in Malawi, unlike in many other countries, was estimated to actually lead to a 0.21 percentage point reduction in labor force participation and a reduction in the likelihood of working with positive earnings of 0.22 points.

3.7 Non-estimated Benefits - Intangible Benefits

Beyond the tangible benefits related to health and education, the eradication of child marriage also presents a ripple effect of intangible benefits. These benefits focus on human rights and equality outcomes related to the elimination child marriage, with benefits expressed primarily in improvements regarding girls' and women's autonomy, equality, civic engagement, mobility, agency, and decision making - particularly within the household. While these represent benefits in and of themselves, their broader impact can also be tied to an assumed reduction in the emotional and psychological traumas associated with such their counterparts - lack of autonomy, agency, equality, mobility, and isolation.

While much of this discourse is tied to rights-based approaches to ending child marriage, their outcomes undoubtedly contribute to the overall quantifiable benefits as well. There remain few models at present, however, which are able to accurately depict the value of these. As such, they have not been included in the calculations, but it is critical to note that were they to be included in the analysis, they are likely to improve the BCRs of child marriage interventions further.

4. Cost-Benefit Analysis of Interventions Related to Schooling and Child Marriage

4.1 Costing Principles

Costs are reported in 2019 Malawian Kwacha. Data from older years are inflated based on Malawi GDP deflators as provided by the World Bank's Economic Indicator database. (World Bank, 2020) The cost of programs targeting early marriage in other countries were translated to the Malawian context by using program costs in the local currency for the original program year (e.g. 2009), inflating these costs using local inflation to 2019 local currency units and then converting them to 2019 Malawi Kwacha using GDP per capita PPP ratios.

Across the interventions five categories of cost were identified, namely:

- Infrastructure costs
- Program and administrative costs
- Transfers
- Additional costs of schooling
- Opportunity costs of schooling

Infrastructure costs represent the costs of constructing large physical assets and were only relevant for the intervention on building schools.

Program and administrative costs represent the primary costs associated with implementing and managing the intervention. Transfers are not included in this cost category. Program and administrative costs were obtained from the organizations running the programs, academic reports where programs were described, or inferred from other academic literature.

Transfers are the monetary value of cash or gifts in-kind provided to beneficiaries. This cost category was relevant for conditional cash transfers, education promotion, and the survivors program. Transfer costs were obtained from the organizations running the programs, academic reports where programs were described, or inferred from other academic literature. Transfers are also considered a benefit when estimating benefit-cost ratios.

Additional schooling costs represent the direct costs of schooling for girls who remain enrolled in school due to the intervention and otherwise would have dropped out. Additional schooling costs equal approximately MWK 100,000 per student per year (MWK 81,970 for teachers and MWK 19,753 for auxiliary costs). The annual salary of a teacher is MWK 2,206,499 (Ravishankar et al. 2016). To attain the cost per student this figure was divided by the secondary school pupil teacher ratio of 26.9 (Ministry of Education, 2018). Auxiliary costs were obtained from the Ministry of Education (2018).

Opportunity costs of schooling represent the foregone earnings for girls who remain enrolled in school due to the intervention and otherwise would have dropped out. They are estimated as MWK 270,000 per student per year (Mussa, 2016).

4.2 Impact and Benefit Estimation Principles

The impacts of the interventions were drawn from program data or academic literature. For two interventions (education promotion and community dialogues) the related study reported effects both on early marriage reduction and education attainment (Erulkar et al. 2017), which we adopted to estimate the welfare benefits of avoided marriage and increased income from schooling. For another two interventions, conditional cash transfers and empowerment with SRH campaign, the studies reported increases in schooling obtained and reductions in pregnancies. We use the latter to determine the non-schooling welfare impacts directly rather than indirectly through avoided child marriage estimates (Buchmann et al. 2018; Baird et al. 2009). See Section 2 for further details.

For the intervention on building more girl schools, we assume that marginal increases in capacity fully subsumes those that would otherwise not attend secondary school, given the large shortage of infrastructure. We then reduce this by 10% based on Ministry of Education Statistics that show that, conditional on attending school, one in ten girls repeat or drop out. This leads to an increase in schooling of 0.9 years per girl. For the marriage effect, we adopt the estimate from Wodon et al. (2018) which shows that for Malawi, each year of schooling leads to 3.5pp reduction in early marriage, or 12% against current levels.

Section 3 describes the estimation approach for the benefit streams that flow from avoided child marriage and increased schooling. Another benefit stream is the benefit of received transfers either in cash or as bicycles, which appear as both a benefit and a cost in the interventions where this is relevant.

4.3 Summary of Findings

Table 3 presents summaries of costs for the interventions. Costs per girl targeted or supported varied substantially from a low of

MWK 7,549 for community dialogues to a high of MWK 539,837 for the marriage survivor program. One notable feature is that for all interventions, except community dialogues, the direct and opportunity costs of additional schooling represent a majority of intervention cost.

The low cost of community dialogues is primarily a function of the fact that it demonstrated no impacts on schooling, thereby not generating second order education costs. Another likely reason is its relative simplicity. The intervention provided only standardized messages and light training to identifiable community leaders, leveraging their substantial community networks and social capital. This compares to the other programs that require more complex and intensive programming for construction of infrastructure, provision of transfers or empowerment of girls.

The marriage survivor program has the highest total program cost per girl supported. This is likely because support of actual beneficiaries requires engagement with a much wider universe of potential beneficiaries. The costs of identifying and investigating potential beneficiaries are embedded into the final cost per girl supported. Furthermore, these costs were drawn from a pilot project, which may not be representative of the unit costs at scale.

Table 3: Costs summary for hypothetical program targeting 100,000 girls per year (10,000 girls supported for marriage survivor program)

	Increased Schooling Capacity	Community Dialogue	Education Promotion	Conditional Cash Transfer	Marriage Survivor Program	Girl Empowerment and SRH campaign
Infrastructure Costs (A)	14,814	0	0	0	0	0
Program and Administrative Costs (B)	1,724	7,549	9,059	10,302	269,027	37,750
Transfers (C)	0	0	6,039	79,244	179,421	0
Total Program Costs (D = A + B + C)	16,538	7,549	15,099	89,546	448,448	37,750
Additional Schooling Costs (E)	49,848	0	4,874	13,195	91,389	18,278
Cost to Government (F = D + E)	66,387	7,549	19,973	102,741	539,837	56,028
Opportunity Cost of Schooling (G)	150,445	0	12,970	100,320	243,181	48,636
Total Cost (F + G)	216,831	7,549	32,942	203,061	783,018	104,664

All figures in MWK per girl targeted using an 8% discount rate

Cost and benefit results are presented in Table 4, including benefit-cost ratios with and without the demographic dividend, as well as cost-effectiveness figures for additional years attained, child marriages and births avoided.

The results show that the benefit-cost ratio of all interventions, without the demographic benefit, fall within a relatively narrow range of 1-3. Building secondary girls schools has the highest BCR in this scenario with 2.7, and this intervention also is the least costly in terms of generating additional years of schooling.

When considering demographic benefits, BCRs of all interventions increase across the board, with community dialogues having the greatest jump to 114. This large jump is because the intervention is very inexpensive, and has a relatively large impact on avoided births. Since the demographic benefit is tied exclusively to the reduction in population, interventions that can most inexpensively reduce births see the greatest jump in BCRs under this scenario.

Table 4: Costs and Benefits Summary for hypothetical program targeting 100,000 girls per year (10,000 girls supported for marriage survivor program)

	Increased Schooling Capacity	Community Dialogue	Education Promotion	Conditional Cash Transfer	Marriage Survivor Program	Girl Empowerment and SRH campaign
Country where evidence was drawn	Malawi	Tanzania	Tanzania	Malawi	Malawi	Bangladesh
Cost to Government per Girl Targeted (MWK)	66,387	7,549	13,933	102,741	539,837	56,028
Opportunity Cost of Schooling per Girl Targeted (MWK)	150,445	0	12,970	100,320	243,181	48,636
Effect on Early Marriage (% drop)	-12%	-26%	-1%	-34%	-100%	-1%
Increase in Schooling (years per girl)	0.90	-	0.05	0.37	0.90	0.18
Cost per additional year of schooling attained (MWK)	240,923	Infinite	686,302	580,176	783,018	805,108
Cost per child marriage avoided (MWK)	6,960,083	69,133	7,843,447	561,537	783,018	10,776,215
Cost per birth avoided (MWK)	20,102,513	199,675	22,653,896	2,778,618	3,185,290	2,776,233
Total Annualized Cost (millions MWK)	44,169	755	3,294	20,306	7,830	10,466
Total Annualized Benefit (millions MWK), non-demographic benefits	119,145	1,084	4,901	20,945	10,726	16,708
Total Annualized Demographic Benefits (MWK millions)	29,327	85,883	3,304	165,981	55,842	85,637
BCR without demographic benefit	2.7	1.4	1.5	1.0	1.4	1.6
BCR with demographic benefit	3.4	114	2.5	9.2	8.5	9.8

Below we present intervention specific information on costs, impacts and benefits.

4.3.1 Intervention 1: Building secondary schools for 100,000 girls

Classrooms were assumed to cost MWK 18,900,000 with an estimated capacity of 64 girls per classroom (Arup, 2009). Program and administrative costs for construction were assumed to be 12% of infrastructure costs following a World Bank appraisal document which involved construction of schools in Malawi, among other interventions (World Bank, 2016).

Over an assumed 20-year life span of the schools, the annualized cost is estimated at MWK 44,169 million at an 8% discount rate. The annualized benefits of the intervention over a 20-year period, covering 100,000 girls a year, were estimated to be MWK 119,145 million, made up almost entirely of increased lifetime earnings due to the additional 0.9 years of schooling. Due to the additional schooling, we also expect 4,000 child marriages, 1,370 births, 5 maternal deaths, 28 child deaths, 4 cases of obstetric fistula and 1,012 days of lost productivity from IPV averted per year. The relationship between additional schooling and marriage is drawn from Wodon et al. (2018), which reports a 3.7 percentage point reduction in child marriage for each year of schooling attained in Malawi. The annualized demographic benefit is estimated at MWK 29.3 billion per year. The benefit-cost ratio for this intervention comes out to 2.7. Adding the Demographic Benefit brings the BCR of this intervention to 3.4.

4.3.2 Intervention 2: Community Dialogue

As there were no impact estimates available yet for the Malawi Chiefs' Wives' Initiative and only limited cost data, the analysis was carried out drawing from the Tanzanian Community Dialogue and Sensitization program, which most closely resembled this Malawian program. The costs, after adjusting to Malawi price levels and updated to 2019 Kwacha is estimated to be MWK 755 million or about MWK 7,500 per beneficiary. The costs incurred were for the initial training of the community and religious leaders, for food and refreshments provided at monthly village meetings and weekly religious services. The cost of time for participants is not included as an extra cost, since the provided food and refreshments served as an incentive for participation essentially covering opportunity costs of

involvement, and many of the community meetings were not additional (e.g. religious meetings that would have happened even without the intervention).

The Tanzanian study found a 26% reduction in early child marriages. Applied to a target population of 100,000 girls in the Malawi context, this would translate to 10,920 child marriages, 3,781 births, 14 maternal deaths, 77 child deaths, 12 cases of obstetric fistula and almost 2,800 days of lost productivity from IPV averted per year. The Tanzania program found no statistically significant change in school attendance or attainment so we also assume no education benefit from the intervention. The welfare gains of these benefits are MWK 1,084 million, which is 1.4 times higher than the cost. However, the demographic benefit is substantial at MWK 85,883 million. The benefit-cost ratio for this intervention is 1.4 without demographic benefits or 114 with the demographic benefit.

4.3.3 Intervention 3: Educational Promotion

The programmatic cost for this intervention is drawn from the Population Council's educational promotion program in Tanzania (Erulkar et al. 2017). Costs are equal to 2019 MWK 15,099, of which MWK 6,039 is a transfer, the market price of a school uniform in Malawi. For a program reaching 100,000 girls, the total annualized cost is MWK 3,294 million with approximately 46% of the cost for programmatic elements and the remaining 54% the direct and indirect costs of additional schooling.

The program resulted in a 1% decrease in the number of girls getting married early and a 30% increase in their probability of staying in school. Applied to a target population of 100,000 girls in the Malawi context, this would translate to 420 child marriages, 145 births, 0.5 maternal deaths, 3 child deaths, 0.5 cases of obstetric fistula and 107 days of lost productivity from IPV averted per year. The education annualized benefits equal MWK 4,901 million from 5,000 extra school years attained and the demographic benefits are MWK 3,304 million. The benefit-cost ratio for this intervention is 1.5 without the demographic benefit or 2.5 with the demographic benefit.

4.3.4 Intervention 4: Conditional cash transfer for schooling

Costs and benefits are drawn from the Malawian Zomba Cash Transfer program where girls who were out of school at baseline were found to be 35% more likely to be in school, 40% less likely to get married early, 30% less likely to become pregnant than girls in the comparison group (Baird et al. 2009).

Applying these impacts to 100,000 girls and assuming that 16% of girls are enrolled in secondary school (Ministry of Education, 2020) suggests that an extra 37,000 girls would be in school due to a cash transfer program. It would also lead to a reduction of 14,112 early marriages and 7,308 births, translating to 27 maternal deaths, 100 child deaths, 23 cases of obstetric fistula and 3,611 days of lost productivity from IPV averted per year. The education annualized benefits equal MWK 20.9 billion from 37,000 extra school years attained and the demographic benefits are MWK 166 billion. The benefit-cost ratio for this intervention is 1.0 without the demographic benefit or 9.2 with the demographic benefit.

The transfer costs of this intervention are MWK 149,000 per beneficiary who remains in school for the transfer (the 16,000 already in school plus 37,000 who are incentivized by the program) following Baird et al. (2009). The program and administrative costs of the intervention are assumed to be 13% of the transfer. This figure is the median administrative cost-to-transfer ratio from 9 CCTs with administrative cost information identified in the meta-analysis by Garcia and Saavedra (2017).

4.3.5 Intervention 5: Marriage Survivor Program

Unlike the other interventions which aim to prevent child marriage, this intervention is restorative – aiming to provide sufficient support to return to school. The evaluation report from the pilot notes a cost per girl of USD 602 or MWK 466,000 (Makoka and Chilemba, 2021). Discussions with administrators of this program noted a scholarship cost of around MWK 155,000. The cost of a bicycle was assumed to equal USD 45 or MWK 33,500 following a bicycle transfer program in India (Muralidharan and Prakash, 2017).

It was assumed the dissolution of their child marriages would prevent 77% of girls from giving birth early and also would encourage them to return to school. The remaining 23% of girls are assumed to already be pregnant, in line with teenage pregnancy rates. They would also be supported to return to school. As with the school capacity intervention the assumption is 0.9 years of additional schooling per girl. The total cost of the intervention is therefore MWK 7,830 million per year with around two thirds for programmatic costs and one third for additional schooling.

Applied to a target population of 10,000 girls married early, this would translate to 10,000 child marriages, 2,458 births, 9 maternal deaths, 71 child deaths, 8 cases of obstetric fistula and 2,559 days of lost productivity from IPV averted per year. The education annualized benefits equal MWK 10.7 billion from 9,000 extra school years attained and the demographic benefits are MWK 55.8 billion. The benefit-cost ratio for this intervention is 1.4 without the demographic benefit or 8.5 with the demographic benefit.

4.2.6 Intervention 6: Girl Empowerment and SRH Campaigns

An empowerment program that encourages girls to delay marriage and childbirth and to spend more time attending school is assumed to increase secondary schooling by 0.18 years (just over 2 months) and a reduction in teenage pregnancies of 13%. Due to lack of data, we impute avoided child marriages avoided using correlations between education attainment and early marriage prevalence from Wodon et al. (2018). Cost estimates were based on a clustered randomized trial in Bangladesh which was overseen by The Abdul Latif Jameel Poverty Action Lab (Buchman et al., 2018). Adjusted to Malawi price levels, the costs of the intervention for one year, again assuming a coverage of 100,000 girls, were estimated at MWK 10,596 million, 36% to program costs and the remaining to direct and indirect costs of extra schooling. The cost of the program was a combination of empowerment clubs, which required booking community "safe spaces", staff, and program overhead.

Applied to a target population of 100,000 girls in the Malawi context, this would translate to 971 child marriages, 3,370 births, 14 maternal deaths, 53 child deaths, 12 cases of obstetric fistula and 249 days of lost productivity from IPV averted per year. The education annualized benefits equal MWK 16.7 billion from 18,000 extra school years attained and the demographic benefits are MWK 86 billion. The benefit-cost ratio for this intervention is 1.6 without the demographic benefit or 9.8 with the demographic benefit.

5. Sensitivity Analyses on Child Marriage Effect Sizes

To test the sensitivity of results to the assumptions, we present the results varying the model's parameters around one of the key areas of uncertainty: the chosen effect size for avoided child marriage. As described previously, these have been drawn from a study or studies that we assess as the best available evidence for that intervention. However, in many cases the evidence base is highly heterogenous, and it is important to test the impact of the chosen effect sizes. Additionally, the vast majority of the benefit is derived from the child marriage parameter, in particular its flow on effects to demographic dividend. In each case we choose high and low ranges based on the broader literature. In some cases, the base parameter is towards the high end of the range, in other cases the low end.

Table 5: Low, base and high parameter values for sensitivity analyses of intervention effects on child marriage

Intervention	Low	Base	High
Secondary schools for girls	10%	12%	20%
Community dialogues	0%	26%	65%
Education promotion	1%	1%	30%
Conditional cash transfer for schooling	15%	37%	40%
Marriage survivor program	50%	100%	100%
Empowerment, SRH program*	0%	13%	26%

* For empowerment and SRH program, the parameter tested is % reduction in pregnancies not child marriage

Table 6: BCRs based on changing effect sizes, with demographic dividend

Intervention	Low	Base	High
Secondary schools for girls	3.2	3.4	3.7
Community dialogues	0.0	114	293
Education promotion	2.5	2.5	31.9
Conditional cash transfer for schooling	4.7	9.2	10.9
Marriage survivor program	4.9	8.5	8.5
Empowerment, SRH program	1.5	9.8	18.0

The results from the sensitivity analysis show that the greatest uncertainty lies around the community dialogues intervention, where, as discussed, the expected and upper end BCR is very high, but the low end is potentially zero. This indicates that Malawi decision makers should first pilot this program before engaging in a wide-scale roll out. Additionally, some of the interventions demonstrate significant upside, such as the education promotion and empowerment and SRH programs. If Malawi decision makers are considering a secondary intervention to support community dialogues, then empowerment programs might be preferable given their substantially higher upsides. As with community dialogues, pilot programs may be an appropriate way to test the on-the-ground impacts in Malawi.

6. Conclusion

As established earlier in this paper, Malawi's secondary education system suffers from perennially low gross enrollment rates. Child marriage plays a key role in this dynamic, with 43% of female dropouts being attributed to either marriage or pregnancy. A lack of secondary education deprives Malawian youth of learning opportunities that would generate increased income once they enter the labour force. It also impacts health outcomes of women and children, increases the risk of domestic violence, and increases national fertility rates.

Based on substantial sector expert consultation, and a review of existing policies and literature, this paper examined the social and economic return-on-investment of six interventions:

1. Increasing the number of secondary schools for girls
2. Education promotion
3. Community dialogues to prevent child marriage
4. Cash or asset transfers for girls, conditional on school enrolment
5. Child marriage survivor program to rehabilitate annulled child marriages including scholarships to return to school
6. Sexual and reproductive health and female empowerment programs

The results indicated that in a scenario without the demographic benefit considered the BCRs for all interventions remain in the fair range, with BCRs between 1-3. Taking this approach, education promotion and increasing the number of secondary schools generate the largest BCR of 2.7, at an 8% discount rate. Using the same approach, Conditional Cash Transfers appear to produce the lowest BCR, with benefits and costs at approximately equal levels, generating a BCR of 1.

With inclusion of the demographic benefit however, the analysis reveals an additional layer of impact which boosts BCRs of all interventions in varying degrees. Among these, the most substantial change is found in the Community Dialogues wherein the BCR jumps from 1.4 to 114. The remaining interventions yield BCRs roughly between 3 and 10. As illustrated in the findings, the significant demographic benefit ascribed to the Community Dialogues program is primarily driven by: the low cost per beneficiary; and the lack of effect on girls' education, which meant that the significant opportunity costs of schooling were avoided in this intervention. This finding additionally echoes the perceptions of sector experts who, in initial discussions, anecdotally identified the two key commonalities of successful programs as those that: i) targeted the community level; and ii) responded to the multi-pronged socio-cultural nature of child marriage.

The policy implications emerging from this paper are trifold. At the outset, the primary policy implication from this report is that community dialogues are likely to be the most effective use of marginal societal resources from a cost-benefit perspective. This holds true even if one believes that the demographic benefit is only 7% as large as estimated in this paper. Additionally, community dialogues may be one of the cheapest ways to deploy extra resources to reduce fertility. However, as noted in the sensitivity analysis and literature review, the potential range of impacts is very large. If decision makers decide to adopt this intervention, it would be worth considering a pilot program first to test real world impacts in the Malawian context.

From an education perspective, building new secondary schools is the most cost-effective way to ensure girls gain additional years of schooling, given that the large shortage of available secondary schools is likely to render demand generation programs relatively ineffective. Lastly, this report expands the discourse surrounding child marriage - growing it beyond the conventional dialogues related to a purely rights-based approach and inserts a significant evidence base tying the elimination of child marriage to a growth in human capital, urbanization, and industrialization.

7. References

- Abramsky, Tanya, et al. (2016) "The Impact of SASA!, A Community Mobilisation Intervention, on Women's Experiences of Intimate Partner Violence: Secondary Findings from a Cluster Randomised Trial in Kampala, Uganda." *Journal of Epidemiology and Community Health*, vol. 70, no. 8, 12 Feb. 2016, pp. 818–825, www.ncbi.nlm.nih.gov/pmc/articles/PMC4975800/, 10.1136/jech-2015-206665. Accessed 24 Nov. 2019.
- Bagby, Emilie, Anca Dumitrescu, Cara Orfield, and Matt Sloan. "Niger IMAGINE long-term evaluation." Washington, DC: Mathematica Policy Research (2016). <https://www.eccnetwork.net/sites/default/files/media/file/finalreport%20ner%20imagine%20eng%20jun16.pdf> Accessed 20th May, 2021.
- Baird S et al. (2009) The Short-Term Impacts of a Schooling Conditional Cash Transfer Program on the Sexual Behavior of Young Women. <https://openknowledge.worldbank.org/bitstream/handle/10986/4281/WPS5089.pdf?sequence=1&isAllowed=y>
- Baird, S., McIntosh, C. & Ozler, B., 2011. Cash or Condition: Evidence from the Cash Transfer Programme. *Quarterly Journal of Economics*, pp. 1709-1753
- Bandiera O, Buehren N., Burgess R., et al. 2020, Women's empowerment in action: Evidence from a randomized control trial in Africa, *American Economic Journal: Applied Economics*, 12(1), p210-259
- Buchmann, N. et al. (2018) Power vs Money: Alternative Approaches to Reducing Child Marriage in Bangladesh, a Randomized Control Trial
- Buchmann, Nina, Erica Field, Rachel Glennerster, Shahana Nazneen, Svetlana Pimkina, and Iman Sen. "Power vs money: Alternative approaches to reducing child marriage in Bangladesh, a randomized control trial." Unpublished Manuscript (2017). <https://www.povertyactionlab.org/sites/default/files/research-paper/Power-vs-Money-Working-Paper.pdf>. Accessed 21st May, 2021.
- Budget Scoping on Programmes and Interventions to END CHILD MARRIAGE IN MALAWI Acknowledgements. Dec. 2019.
- Duflo E, Dupas P, Kremer M. Education, HIV and early fertility: Experimental evidence from Western Kenya. Cambridge, MA: National Bureau of Economic Research; 2014
- Epiu I et al. (2018) Estimating the cost and cost-effectiveness for obstetric fistula repair in hospitals in Uganda: a low income country. *Health Policy and Planning*, 33, 2018, 999–1008
- Erulkar A, Medhin G, Weissman E. (2017) "The Impact and Cost of Child Marriage Prevention in Rural Tanzania," Addis Ababa: Population Council.
- Erulkar A, Medhin G, Weissman E. (2017) "The Impact and Cost of Child Marriage Prevention in Ethiopia," Addis Ababa: Population Council (unpublished)
- Erulkar A, Medhin G, Weissman E. (2017) "The Impact and Cost of Child Marriage Prevention in Rural Burkina Faso," Addis Ababa: Population Council.
- Erulkar, Annabel, Girmay Medhin, Eva Weissman, Gisele Kabore, and Julien Ouedraogo. "Designing and Evaluating Scalable Child Marriage Prevention Programs in Burkina Faso and Tanzania: A Quasi-Experiment and Costing Study." *Global Health: Science and Practice* 8, no. 1 (2020): 68-81. https://www.ghspjournal.org/content/8/1/68?utm_source=TrendMD&utm_medium=cpc&utm_campaign=Global_Health%253A_Science_and_Practice_TrendMD_0 Accessed 20th May, 2021.
- F. Dake, L. Natali, G. Angeles, et al. Cash transfers, early marriage, and fertility in Malawi and Zambia *Stud Fam Plann*, 49 (2018), pp. 295-317
- Fearon, J. and Hoeffler, A. (2009) 'Benefits and Costs of the Conflict and Violence Targets for the Post-2015 Development Agenda', p. 65.
- García, S. and Saavedra, J. E. (2017) 'Educational Impacts and Cost-Effectiveness of Conditional Cash Transfer Programs in Developing Countries: A Meta-Analysis', *Review of Educational Research*, 87(5), pp. 921–965. doi: 10.3102/0034654317723008.
- Hallfors DD, Cho H, Rusakaniko S, et al. The impact of school subsidies on HIV-related outcomes among adolescent female orphans. *J Adolesc Health* 2015;56:79e84.
- Hindin, M. & Fatusi, O., 2014. *Exploration of Young People's Sexual and Reproductive Health Assessment Practices*, s.l.: Johns Hopkins University.
- Ingwersen, Nicholas, Harounan Kazianga, Leigh L. Linden, Arif Mamun, Ali Protik, and Matthew Sloan. The Long-Term Impacts of Girl-Friendly Schools: Evidence from the Bright School Construction Program in Burkina Faso. No. w25994. National Bureau

- of Economic Research, 2019. https://www.nber.org/system/files/working_papers/w25994/w25994.pdf Accessed 18th May, 2021.
- Kalilani-Phiri LV. (2010) Prevalence of obstetric fistula in Malawi. *International Journal of Gynecology and Obstetrics*. Volume 109, Issue 3. <https://doi.org/10.1016/j.ijgo.2009.12.019>
 - Kalamar, A.M., Lee-Rife, S & Hindin, M.J. 2016. Interventions to prevent child marriage among young people in low- and middle-income countries: A systematic review of the published and gray literature. *Journal of Adolescent Health*, pp. S16-S21.
 - Koski A, Strumpf EC, Kaufman JS, Frank J, Heymann J, Nandi A (2018) The impact of eliminating primary school tuition fees on child marriage in sub-Saharan Africa: A quasi-experimental evaluation of policy changes in 8 countries. *PLoS ONE* 13(5): e0197928. <https://doi.org/10.1371/journal.pone.0197928>
 - Makoka D., Chilemba, P, 2021, End of Project Evaluation for the IBSA Project: Eliminating Child Marriages in Malawi and Zambia and Offering Scholarships to Child Marriage Survivors – Pilot Project, UN WOMENA
 - Malhotra, A. and Elnakib, S. (2021). 20 Years of the Evidence Base on What Works to Prevent Child Marriage: A Systematic Review, *Journal of Adolescent Health*, Volume 68, Issue 5, 2021, Pages 847-862, ISSN 1054-139X, <https://doi.org/10.1016/j.jadohealth.2020.11.017>.
 - Multi-Country Analytical Study of Legislation, Policies, Interventions and Cultural Practices on Child Marriage in Africa. UN Women, 2018.
 - Muralidharan, K. and Prakash, N. (2017) 'Cycling to School: Increasing Secondary School Enrollment for Girls in India', *American Economic Journal: Applied Economics*, 9(3), pp. 321–350. doi: 10.1257/app.20160004.
 - Muriaas, Ragnhild L., et al. (2018) "Why the Gender of Traditional Authorities Matters: Intersectionality and Women's Rights Advocacy in Malawi." *Comparative Political Studies*, vol. 52, no. 12, 28 May 2018, pp. 1881–1924, 10.1177/0010414018774369. Accessed 6 Oct. 2020.
 - National Strategy on Ending Child Marriage. 2018, Government of Malawi
 - Nove, A., Z. Matthews, S. Neal, and A. V. Camacho. (2014) Maternal mortality in adolescents compared with women of other ages: evidence from 144 countries, *The Lancet Global Health* 2(3): 155-64.
 - Onagoruwa. A. O. and Q. Wodon. (2017c) Impact of Early childbirth on Under-five Mortality across Multiple Countries. *Education Global Practice*. Washington, DC: The World Bank.
 - Onagoruwa. A. O. and Q. Wodon. (2017d) Impact of Early childbirth on Under-five Malnutrition across Multiple Countries. *Education Global Practice*. Washington, DC: The World Bank.
 - Savadogo, A. and Q. Wodon. (2017a) Impact of Child Marriage on Intimate Partner Violence across Multiple Countries. *Education Global Practice*. Washington, DC: The World Bank.
 - Savadogo. A. and Q. Wodon. (2017b) Impact of Child Marriage on Women's Labor Force Participation across Multiple Countries. *Education Global Practice*. Washington, DC: The World Bank.
 - Self, Andrew, et al. (2018) "Youth Accessing Reproductive Health Services in Malawi: Drivers, Barriers, and Suggestions from the Perspectives of Youth and Parents." *Reproductive Health*, vol. 15, no. 1, 19 June 2018, 10.1186/s12978-018-0549-9. Accessed 14 Aug. 2019.
 - Steinhaus, Mara, et al. (2019) "Measuring Social Norms Related to Child Marriage Among Adult Decision-Makers of Young Girls in Phalombe and Thyolo, Malawi." *Journal of Adolescent Health*, vol. 64, no. 4, Apr. 2019, pp. S37–S44, 10.1016/j.jadohealth.2018.12.019. Accessed 19 Apr. 2020.
 - "The Local Governance Performance Index (LGPI) in Malawi: Selected Findings on Gender." CMI - Chr. Michelsen Institute, Feb. 2017, www.cmi.no/publications/6188-the-local-governance-performance-index-lgpi-in. Accessed 6 Oct. 2020.
 - Walker, Judith-Ann. (2012) "Early Marriage in Africa — Trends, Harmful Effects and Interventions." *African Journal of Reproductive Health / La Revue Africaine de La Santé Reproductive*, vol. 16, no. 2, 2012, pp. 231–240, www.jstor.org/stable/23318031?seq=1. Accessed 6 Oct. 2020.
 - World Bank (2016) Project appraisal document on a proposed grant in the amount of \$44.9m to the Republic of Malawi for a Malawi Education Sector Improvement Project, World Bank Project Appraisal Document PAD1515, <http://documents1.worldbank.org/curated/en/479181512713342254/pdf/PAD1515-PAD-P154185-PUBLIC.pdf>
 - World Bank Indicators <https://data.worldbank.org/indicator/SH.STA.MMRT?locations=MW>
 - World Bank Economic Indicator Database <https://data.worldbank.org/indicator/NY.GDP.DEFL.ZS>
 - WORKSHOP REPORT Learning Event on Ending Child Marriages in Malawi. 2019.
 - Yaya, Sanni, et al. (2019) "Prevalence of Child Marriage and Its Impact on Fertility Outcomes in 34 Sub-Saharan African Countries." *BMC International Health and Human Rights*, vol. 19, no. 1, Dec. 2019, 10.1186/s12914-019-0219-1. Accessed 6 Oct. 2020.

ANNEX 1: Child Marriage Intervention Scoping

Interventions need to cover child marriage as a dynamic, not an incident. This means that interventions must engage communities throughout the timeline of a child marriage, beginning with prevention measures which seek to dissuade families from seeing child marriage as an option, to enforcement measures which seek to stop or annul illegal child marriages where and when they do take place, to mitigation measures which seek to support girls after they are returned from a child marriage with due regard to possible new dependents and dependencies that may have emerged from the marriage.

While singular interventions are able to achieve a degree of impact, sector experts agreed that singular interventions would likely have significantly less impact in comparison with those that targeted multiple areas of influence.

Accordingly, for the purposes of this analysis, we have grouped the interventions along the following lines, to get a stronger sense of the efficacy of different modalities in lowering instances of teen pregnancy and early or child marriage. Note that while these have been grouped separately, organizations may also choose to add two or three components together in order to further amplify the success of a program.

The following is a 'long list' of individual interventions that can address Child Marriage. The list was compiled based on findings in the literature and sector expert conversations regarding child marriage.

Table 1: Potential interventions to address child marriage (bold black = interventions discussed within this analysis)

Area	Intervention
Bolstering Law Enforcement (Enabling Legal and Policy Environment)	Birth registration and national identity registration
	Funding of District Council and/or Child Development and Social Welfare Technical Working Groups to lessen resource challenges
	Child Marriage Survivor Program
	National Child Protection Case Management Mechanisms
SRH Services (SRH)	SASA approach
	Sanitary Napkin Production
	Basic SRH Educational Program
	Dispensation of contraceptives
Gatekeepers of Cultural Norms (Behaviour Change)	Barbershop Toolkit
	Annulment of unions and withdrawal of children from existing marriages
	Community Dialogues
	Programs targeting Initiation Ceremonies and Counsellors of said ceremonies
	Traditional Leaders Forum
	Programs targeting Hyenas
	Traditional Authorities Workshops and Programs
Enacting of targeted bylaws (i.e.: Banning the practicing of gulewamkulu)	
Direct targeting-centred Approaches	Psycho-social counselling
	Small-scale entrepreneurship programs
	Extra-curricular Youth Networks or Associations (i.e.: Girl Guides Club)
	Youth Community Centres
	Conditional Financial Incentives
	Conditional Asset Transfers
	Children's Corners

CBO-Strengthening Approaches	Small and Micro Grants Policies
	Trainer the Trainer Capacity Building
	Learning and Development Capacity Building
	Community Child Protection Workers (case identification, referral, management)
	Community Child Protection Committees (systematic recording and following up on CM cases)
	Mothers Groups
	Community Sensitization Programs (Media based)
Education Ecosystem (Access to Education)	ASPIRE Program (USAID)
	Education Promotion Programming
	Funds supporting the readmission of girls to school following pregnancy or child marriage
	SEEDS program (USAID)
	Increased School Creation
	Parent-teacher Interventions
	Real Fathers Program
	Building schools in rural areas
	Scholarships
	Mentorship Programs
	In-school Guidance Counsellor or similar
	Conditional Cash Transfers
	Bursaries
Construction of Girls Hostels	

Given the features of Malawi's Child Marriage challenge documented above, several baskets of interventions warrant further investigation:

Intervention Basket 1: SRH Services

A grouping of interventions which focuses on improving access to SRH Services, such as Family Planning services, sanitary napkin dispensation, dispelling of sexual myths and harmful traditional practices, as well as support and awareness within and following teen pregnancies and/or child marriages. Interventions which engage at this level can result in improved sexual and reproductive health among girls under the age of 18, both in the context of preventing child marriage and teen pregnancy, as well as assisting those who are in child marriages or have undergone a teen pregnancy. An example of this approach may be found in the SASA program, which is presently delivered by a few international organizations in Malawi, including Plan International. Would include:

- SASA (Start, Awareness, Support, Action) approach as implemented by Plan International
- Sanitary Napkin Production
- Dispensation of contraceptives
- Basic SRH Educational Program

Intervention considered within overall Selection Process as representative of this basket: Basic SRH Educational Program

Intervention Basket 2: Gatekeepers of Cultural Norms (GoCN)

A network of inter-dependent activities which focuses on behavioral change and improving social adoption rates. These activities target or engage with: Traditional Authorities (traditional leaders forum, Chiefs vowing to fight early marriages in their areas of jurisdiction) initiation ceremonies, a traditional leaders forum, initiators of rite of passage ceremonies, hyenas, and smaller-scale community leaders (such as through the barbershop toolbox). Interventions which engage at this level can result in the institution of bylaws which target regionally-specific local cultural practices, such as instituting by-laws banning the practices of gulewamkulu (masquerade) naked dancers that allowed the harassment of women and girls during ceremonies. This would include:

- Barbershop Toolkit
- Annulment of unions and withdrawal of children from existing marriages
- Programs targeting Initiation Ceremonies and Counsellors of said ceremonies
- Traditional Leaders Forum
- Traditional Authorities Workshops and Programs

Intervention considered within overall Selection Process as representative of this basket: Community Dialogues

Intervention Basket 3: Direct targeting-centred Approaches

A combination of activities which target areas of social and civic engagement among youth. Activities in this bucket work toward the creation of youth-based community formation, such as youth groups, the creation of youth community centers, and youth-based program provision (economic, SRH, civic engagement, educational). Interventions which engage at this level can result in improved economic and educational outcomes, as well as stronger peer-to-peer support mechanisms for girls under the age of 18. An example of such an approach may be found in Girls Guides clubs across Malawi and small-scale entrepreneurship programs provided as part of a broader UNWomen program. Would include:

- Small-scale entrepreneurship programs
- Extra-curricular Youth Networks or Associations (i.e.: Girl Guides Club)
- Youth Community Centers

Intervention considered within overall Selection Process as representative of this basket: Conditional Financial Incentives and Conditional Asset Transfers

Intervention Basket 4: CBO-Strengthening Approaches

An umbrella group for activities which target improving the scope, depth, breadth, and/or capacities of local grassroots programming. Activities in this bucket would include micro or small-scale loans, grants, and subsidies, train-the-trainer approaches, or investments within the L&D cycles of small organizations. Would include:

- Small and Micro Grants Policies
- Trainer the Trainer Capacity Building
- Mothers Groups
- Community Sensitization Programs (Media based)

Intervention considered within overall Selection Process as representative of this basket: None, due to insufficient cost and impact data

Intervention Basket 5: Education

A grouping of interventions which are delivered through learning and educational institutions but may go beyond the classroom to facilitate a wrap-around support for adolescent and teen girls, improving their likelihood of staying in school longer. Examples of activities which would fall within this bucket include scholarships, bursaries, provision of school infrastructure, counselling, mentorship programs, and parent-teacher committees. In addition to expected increased long-term productivity related to educational years, interventions in this area also incur benefits related to lowered fertility rates as well as lowered risk of SRH complications related to early pregnancy such as fistula, abortions, and mortality. An example of this approach may be found in the ASPIRE program, which was delivered by USAID, and provided the foundation for the SEEDS program, which is has recently begun. Would include:

- ASPIRE Program (USAID)
- SEEDS program (USAID)
- Real Fathers Program
- Building schools in rural areas
- Scholarships
- Construction of Girls Hostels

Intervention considered within overall Selection Process as representative of this basket: Education Promotion Programming and Increased School Creation

Other areas that will not be considered further in this analysis:

- Bolstering Law enforcement mechanisms
- Policy development and advocacy initiatives for greater legal reform
- Compliance and monitoring of international commitments surrounding child marriage

