



Review article

20 Years of the Evidence Base on What Works to Prevent Child Marriage: A Systematic Review

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A B S T R A C T

Purpose: This review assesses evaluations published from 2000 to 2019 to shed light on what approaches work, especially at scale and sustainably, to prevent child marriage in low- and middle-income countries.

Methods: We conducted a search of electronic databases and gray literature and evaluated the methodological quality and risk of bias of included studies.

Results: A total of 30 studies met the inclusion criteria. Interventions that support girls' schooling through cash or in-kind transfers show the clearest pattern of success in preventing child marriage, with 8 of 10 medium-high quality studies showing positive results. Although limited in number, five studies on favorable job markets and targeted life skills and livelihoods training show consistent positive results. Comparatively, asset or cash transfers conditional on delaying marriage show success only among two of four evaluations, and the three studies on unconditional cash transfers for poverty mitigation show no effect. Findings also show a low success rate for multi-component interventions with positive results in only one of eight medium-high quality studies. Further, single component interventions were much more likely to be at scale and sustainable than multicomponent interventions.

Conclusions: These results indicate that enhancement of girls' own human capital and opportunities is the most compelling pathway to delaying marriage. In contrast, low rates of success, scale-up, and sustainability of multicomponent programs requires reconsideration of this approach.

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IMPLICATIONS AND
CONTRIBUTION

This review supports global efforts to meet the Sustainable Development Goal 5.3.1 target of ending child marriage by providing evidence on what works, highlighting the relative effectiveness, scale, and sustainability of interventions that enhance girls' human capital and opportunities through schooling, skills, and employment. There is not strong evidence for the effectiveness, scale or sustainability of multi-component programs.

Child marriage, defined by the United Nations as a marriage or informal union under age 18 years and a manifestation of gender inequality, results in lifelong negative consequences for the health, well-being, and rights of millions of adolescent girls [1–7]. It is closely associated with high rates of early pregnancies, maternal

and child mortality or morbidity, and intimate partner violence during adolescence and with intergenerational poverty, poor health, and disempowerment for married girls and their children over the longer term [8–10]. Globally, the prevalence of child marriage among boys is just one sixth that among girls, with 5–20 times more girls married as children compared with boys in different countries. The range of sexual, reproductive, maternal, social, and economic consequences for girls are also much more severe than for boys [7,11].

Recent data indicate that one in five—or 12 million—girls are married as children annually, and 650 million women and girls

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currently alive were child brides [12–14]. Although child marriages occur across the globe, 90% of the burden is in low- and middle-income countries (LMICs). The highest prevalence is in Sub-Saharan Africa (SSA) at 37%, followed by South Asia at 30%, but South Asia is home to the largest number of child brides, a distinction that will soon belong to SSA with a growing population and slower declines in child marriage rates [15].

In 2016, the elimination of child marriage by 2030 became an international commitment under goal 5 on gender equality in the Sustainable Development Goals (SDGs), leading to a rapid increase in policy and programmatic efforts to end the practice. Data, tracking, and accountability mechanisms for measuring progress on the indicator for SDG target 5.3.1—the proportion of women aged 20–24 years married or in union before age 18 years—have also multiplied [16]. Despite this expansion, there is a well-acknowledged concern that progress to match the scope of the problem remains elusive. A 2018 trend analysis by United Nations Children's Fund (UNICEF) indicates that while globally the rate of child marriage has declined from 25% to 21% in the last decade, many high prevalence countries have seen stagnation, and even increases. Dauntingly, progress would have to increase 12-fold in the remaining 10 years of the SDGs to achieve target 5.3.1 by 2030 [13].

This monumental task puts pressure on the global community to deliver on effective interventions and policies at scale, generating strong interest in a more systematic understanding of both the effectiveness and reach of child marriage programs [17,18]. Recent reviews and convenings on the issue have especially articulated the need to understand whether the many comprehensive or “multicomponent” programs addressing child marriage are resulting in later marriages among significantly large numbers of girls or whether some of the more targeted or “single-component” interventions are more effective and expansive. A 2018–2019 evaluation and review of the first phase of the Global Programme on Child Marriage coordinated by UNICEF and the United Nations Fund for Population Activities (UNFPA) articulated this as a priority concern for moving forward with its Phase 2 efforts. The question also emerged as a central theme at a 2019 international convening of experts by World Health Organization, UNICEF, and Girls Not Brides and is echoed in several recent policy and research reviews on child marriage [11,17,19].

Clearer evidence on the effectiveness of multicomponent versus specific single-component interventions is critically important for policy makers, donors, and advocates, as they struggle to urgently and efficiently support governments in realizing commitments to end child marriage within the SDG time frame, especially through the implementation of National Action Plans on child marriage adopted by a growing number of countries in the last 5 years [20]. The resources, capacity, alliances, and coordination required to implement multicomponent interventions spanning a range of sectors and ministries are likely to be very different from those required to implement specific single-component interventions with fewer stakeholders, but possibly different challenges [19].

Lack of clarity on which interventions are effective is in part because of the limited evidence base available from previous analyses. Historically, evaluations of programs with child marriage prevention as an outcome have been limited in number and quality, with a significant increase only after 2015 [21,22]. Two earlier systematic reviews have contributed substantially to our understanding, but although both confirmed that programmatic efforts *can* delay marriage, both also concluded with equivocal

findings regarding the success rates of any given type of intervention [23,24]. In their 2012 systematic review, Lee-Rife et al. used relatively generous selection criteria to examine 23 evaluations published between 1991 and 2010, 12 of which were low quality. They concluded that although both horizontal (or multicomponent) as well as more focused vertical (or single-component) interventions showed some promise, neither category demonstrated clear positive results [24]. The second review in 2016 by Kalamar et al. used stricter selection criteria, thus limiting itself to only 11 higher quality evaluations from 2000 to 2015, which permitted sparse representation for any given intervention category. They concluded that every type of intervention had positive, negative, and mixed results [23].

A second reason for the gap between the existing evidence and the expressed needs of the field is that few impact evaluations or evidence reviews have incorporated a focus on scale and sustainability [23–25]. However, as an estimated 120 million girls are at risk of child marriage over the next decade, policy makers are looking for recommendations on programs that are not only effective but can consistently reach hundreds of thousands or millions of girls in the most affected countries. Given the wide variation in population size across countries, even if we define scale conservatively as reaching 25% of the population at risk (still far from the target of elimination), a rough estimation shows us that a smaller country such as Zambia with approximately 500,000 girls at risk over the next 10 years would have to reach at least 125,000 girls, whereas a larger country such as Bangladesh with approximately 9 million girls at risk would have to reach at least 2.25 million girls.

A third challenge to clearer, more actionable recommendations from the existing evidence base has been the ambiguity and inconsistency in the conceptual framing of child marriage programs, making it difficult to classify interventions in discreet categories. In particular, there is only an implicit distinction between three common approaches to child marriage prevention—personal empowerment, social norm change, and structural shifts—because several interventions overlap across these approaches and have multiple pathways to change. For example, a significant share of programs aims to prevent child marriage by empowering girls while also engaging families and communities for social norm change [26–29]. They typically include some combination of exposure to information, skills, social networks, safe spaces, etc. for the girls so that they are more capable, have more self-confidence, and are able to negotiate later marriages. Generally, empowerment approaches are delivered in conjunction with communication or mobilization campaigns to change family and community attitudes toward child marriage [30–33]. However, several of these programs also include access to education or job skills as part of personal empowerment strategies. And yet, programs focusing more exclusively on schooling or employment would generally be considered structural interventions that increase girls' human capital or opportunities, by making schooling or work viable alternatives to marriage—a very different classification and pathway to change.

Of course, with a large literature documenting the strong and consistent inverse relationship between girls' education and child marriage across almost every context, it is likely that education—especially at the secondary level—could delay marriage through multiple pathways. Being in school could simply preclude marriage as schooling and marriage are seen as mutually exclusive in most societies. Another path could be through girls acquiring skills, confidence, friends, and nondomestic options and opportunities. A critical mass of girls going to school could also result in

social norm change, as families start considering adolescent school girls as children rather than as marriageable adults [34–38]. Thus, education has the potential to be simultaneously a structural, empowerment, and norm change intervention, its promise often depending on the level and quality of schooling. It is also important to note that most evaluated interventions on education's effect on delaying marriage have been limited to cash transfers or other subsidies for school attendance, thus aiming to increase demand for education among girls and their families [39]. Supply-side education interventions—such as more secondary schools, female teachers, better transport, or curricula—remain largely untested for their impact on child marriage prevention [11].

Other structural interventions may also operate through multiple pathways, making it difficult to classify them in only one category. For example, asset transfers as a reward for girls marrying later may structurally improve economic options while normatively also increasing the value of unmarried daughters to families. Thus, a single intervention working through multiple pathways could potentially have as much or even stronger impact compared with multiple interventions that work through single pathways. From a policy and implementation perspective, moreover, the ambiguous theoretical distinctions between intervention approaches may be both confusing and of secondary importance compared with clarity on each intervention's content and effectiveness.

It is with the aim of providing greater clarity for policymakers and implementers on the effectiveness of specific interventions that in this article, we undertake a systematic review of evaluations on child marriage prevention in LMICs published between 2000 and 2019. By incorporating 16 additional evaluated interventions—13 published since 2016—we are able to go beyond previous reviews and cover a total of 30 evaluations, allowing us to undertake a more fine-tuned analysis of intervention categories and their effectiveness. Several of these are multiarm studies that examine the comparative impact of different interventions. Thus, we are able to unpack and classify single- and multi-component interventions in more nuanced rather than broad categories. In addition, we include scale and sustainability of interventions as key dimensions in our analysis to make the findings more directly relevant to the expressed needs of program and policy actors. Overall, our findings move the field closer to a clearer understanding of whether specific multi-component or single-component interventions have been more successful in preventing child marriage sustainably, and at scale.

The main research question guiding our review is, “What interventions are effective in delaying age at marriage or reducing child marriage incidence among girls aged 10–24 years as assessed in experimental and quasi-experimental studies?”

Methods

Data sources

This review builds on a comprehensive scoping review of studies published between January 2000 and July 2019 and generating evidence on child marriage in LMICs, from which we focus on only those studies that evaluated the impact of interventions to prevent child marriage. As the literature—especially before 2015—often refers to child marriage and early marriage interchangeably, we follow previous systematic reviews in including studies on child or early marriage prevention. A prespecified research protocol that describes the review aims and methods for both the published and gray literature was followed and is available on request from the authors. We developed a broad search strategy to maintain breadth of

coverage, using a combination of keywords to search a total of eight electronic databases: PubMed, EMBASE, Cochrane, PsycINFO, CINAHL, Popline, Sociological Abstracts, and Econlit. The PubMed search strategy is presented as follows:

((Child(tiab) AND Marriage*(tiab)) OR (adolescen*(tiab) AND marriage*(tiab)) OR (Early(tiab) AND Marriage*(tiab)) OR “Child Marriage”(tiab) OR “Early Marriage”(tiab) OR “Forced marriage”(tiab) OR “child bride”(tiab) OR “Adolescent marriage”(tiab)) AND (“2000”[PDAT]: “2019”[PDAT])

To ensure comprehensiveness of the search, we additionally mapped gray literature through a web-based search of UN and nongovernmental organizations (NGOs) engaged in research or interventions on child marriage. We also handsearched the literature based on identified citations in the published and gray literature for additional titles. We followed the PRISMA guidelines for the reporting of systematic reviews and meta-analyses.

Inclusion/exclusion criteria

Articles were included if the following criteria were met: (1) article evaluated the impact of one or more interventions to prevent child marriage or delay marriage among 10- to 24-year-old girls; (2) evaluation study included at least one quantitative behavioral measure of the impact of the intervention(s) on child marriage prevention. Quantitative measures needed to capture child marriage by either examining entry into marriage among girls under age 18 years or by examining marriage before the age of 18 years among older women (such as women aged 20–24 years); (3) evaluation used an experimental or quasi-experimental evaluation design; (4) article was published in the English language; and (5) article was published between January 1, 2000, and July 30, 2019.

Data extraction

The search results were exported into Covidence and Endnote reference manager software, and duplicates were removed. Given the large number of studies, titles and abstracts were screened by one of the authors in close and frequent consultation with the other author, and candidate articles for full-text review were reviewed by both authors to ascertain their eligibility for inclusion. Disagreements about inclusion were resolved through discussion between the two reviewers. Data extraction was carried out by both reviewers using a standardized template that included the following domains: intervention and evaluation dates, intervention objective, intervention content including whether the intervention was multicomponent or single component or multiarm, study design, sampling method, sample size, analysis, attrition, and key findings (Data extraction template available in [Supplemental Table 2](#)). Detailed information on the outcome was extracted, and when available, adjusted estimates were reported instead of crude estimates. Where studies lacked necessary details, we made an effort to contact authors, requesting additional information. However, this was not possible for all studies, given that many publications described interventions that took place many years before the date of publication.

Quality assessment

We conducted a quality assessment that included both an assessment of methodological quality and risk of bias. Building on an existing risk of bias tool [40], we assessed the quality of included studies using a scoring system based on the following

domains: (1) study design, attrition, and sample size; (2) selection bias, measurement of exposure, spillover/contamination; (3) estimation techniques and confounding; and (4) outcome measurement and clarity of reporting. Studies were given a score ranging from 1 to 12 and were subsequently classified into low (score below 7), medium (score of seven–9) and high (score above 9) quality. The two authors independently assessed the quality of each study. Where discrepancies or conflicts arose, the decision was resolved through discussion among the reviewers. [Supplemental Table 1](#) outlines the results of the assessment.

Analysis

We analyzed the included studies on both intervention and evaluation characteristics:

1. The intervention location, implementer(s), period, purpose, content, reach, and sustainability.
2. The evaluation publication year, evaluator(s), study period, design, methodology, quality, outcome measure(s) on child marriage prevention, results, and direction of findings. Although most studies included other behavioral and attitudinal outcomes—such as school retention, pregnancy prevention, self-efficacy, negotiation, etc.—lack of comparability in such outcomes across studies precluded an analysis of any additional outcomes.

As the variation in outcome measures on child marriage reduction used across studies did not permit the assessment of study results using a common measure, we analyzed findings on whether programs showed a positive, mixed, null, or negative effect. We considered a study as demonstrating a positive impact if its results found the intervention to successfully prevent early or child marriage and were statistically significant ($p < .05$). In addition, we conducted a sensitivity analysis excluding studies that were rated as low quality and noted the effects this had on the overall findings. In view of the heterogeneity in intervention design and delivery—specifically with respect to intervention duration and intensity—as well as participant characteristics and diversity in outcome measures, it was not possible to undertake a full meta-analysis.

Results

Study selection

Our search yielded a total of 3,556 records: 3,254 from electronic databases and 302 from handsearching and a scan of the gray literature. After removing 1,267 duplicates, 1,987 publications were screened on title and abstract, of which 61 articles were retained for full-text assessment. The reasons for excluding full-text articles are listed in [Figure 1](#). In total, we included 34 studies published between 2000 and 2019, covering 30 distinct evaluations of child marriage prevention programs implemented in LMICs.

Study characteristics

[Table 1](#) provides a summary description of the characteristics of the included studies, whereas [Table 2](#) provides more specifics on the interventions. Both tables are organized first by the two broad categories of interest: multicomponent (11 studies) and single component (including 10 program interventions and two

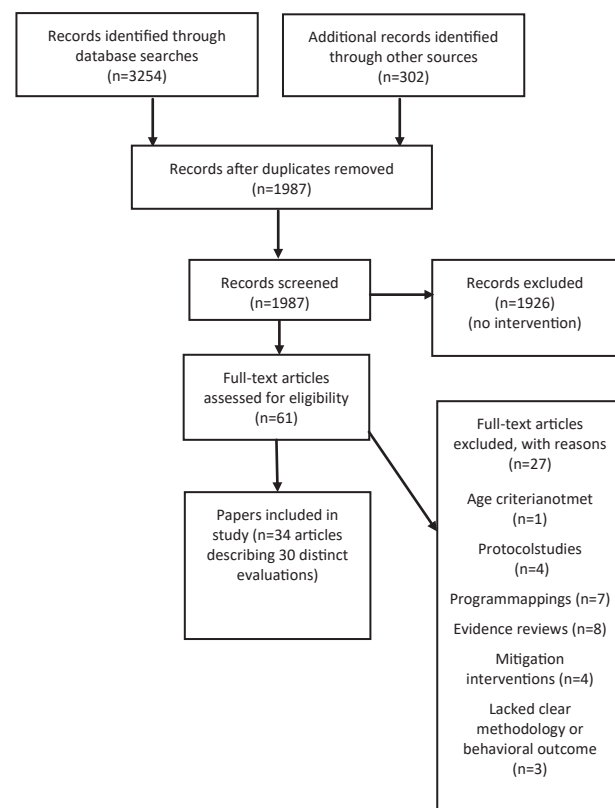


Figure 1. PRISMA flow diagram.

macro policies) (12 studies). They also include a third category of seven multiarm studies, which evaluated both multi- and single-component interventions. It is noteworthy that these studies—published largely since 2015—were undertaken with a deliberate interest in untangling the potential unbundled impact of bundled interventions. Single-component evaluations are also weighted toward more recent publication (7/12 since 2014). In contrast, a significant majority of multicomponent studies (8/11) were published from 2000 to 2012, reflecting the early wave of interest in comprehensive child marriage interventions. Earlier studies are also more likely to cover South Asia, whereas later studies have a greater focus on SSA, with the growing concerns about high rates and burden in that region.

[Table 1](#) shows that most of the multicomponent (8/11) and single-component (8/12) studies used a quasi-experimental design with cluster randomized controlled trials (RCTs) a less frequent occurrence. Four of the seven multiarm studies, on the other hand, were RCTs, with the remaining three using a quasi-experimental approach. Multicomponent studies were much more likely to be low quality (7/11), whereas there were no low-quality single-component studies and only one low-quality multiarm study.

[Table 1](#) also outlines the different outcome measures studies use to assess the impact on early or child marriage: (1) incidence of marriage before age 18 years, (2) incidence of ever marriage among girls and young women, and (3) mean/median age of marriage. To assess program effects on the incidence of marriage before age 18 years or ever marriage, studies used several analytic measures, most frequently odds ratios, risk ratios, and hazard rates/ratios or compared proportions married across

Table 1

Evaluation studies with child or early marriage prevention as an outcome, 2000–2019; Key characteristics by type of intervention: multicomponent, single component, and multiarm

Study and location	Intervention reach and participants	Sustainability	Evaluation design	Evaluation quality	Evaluation CM outcome measure(s)	Results
Multicomponent						
CEDPA, 2001, India [41]	10,000 F, 12–24 years	Not sustained	Quasi-experimental post-only retro data	Low	Relative risk of marriage <18 years F, 12–24 years	Positive RR comparing nonparticipants to participants = 1.35
Mathur, Mehta, & Malhotra, 2004, Nepal [30]	<1,000 F and M, 14–21 years	Not sustained	Quasi-experimental pre-post case and control	Low	Proportion F 14–21 who married	Mixed Significant difference between participants and nonparticipants in urban areas (23.6% vs. 14.6%) NS difference in prop in rural areas
Kanesnathan et al., 2008, India [42]	12,000 F and M 14–24 years	Not sustained	Quasi-experimental pre-post case and control	High	Percent F 14–24 married <18 years; mean age at marriage	Null 60% married <18 years at baseline compared with 40% at endline (NS). Mean of 15.9 at baseline vs. 17.8 at endline (NS).
Shahnaz et al., 2008, Bangladesh [43]	30,000–40,000 Female 10–24 years	Sustained	Quasi-experimental pre-post case and control	Low	Odds of marriage F 10–22 in 2 years from baseline to endline	Positive Logit coefficient = $-.385$ (participants vs. nonparticipants)
UNICEF, 2008; Diop, Moreau, Benga, 2008, Senegal [44,45]	6,000–9,000 F and M adults	Not sustained	Quasi-experimental post only	Low	Percent F 20–24 married <18 years	Null 81% married <18 years in trt villages compared with 80% in control.
Erulkar and Muthengi, 2009, Ethiopia [33]	420 F, 10–19 years	Not sustained	Quasi-experimental pre-post case and control	Medium	Hazard of marriage F 10–14 and 15–19 married in 2 years from baseline to endline	Mixed 10–14 years: HR comparing participants to nonparticipants = .1 (Sig) 15–19 years: HR = 2.4 (Sig)
Amin et al., 2011, Bangladesh [31]	15,000 F 13–22 years	Not sustained	Quasi-experimental Pre-post and Matched participants, nonparticipants	Low	Odds of marriage F 13–22 in 2 years from baseline to endline	Null OR comparing participants to nonparticipants = 1.04 (NS)
Daniel & Nanda, 2012, India [46]	17,000 F 15–19 years	Unknown	Quasi-experimental post only	Low	Hazard of marriage F 15–19 married in 5 years from program to endline; median age@marriage	Positive HR comparing participants and nonparticipants = .56 (Sig); Median age of marriage 22 years among participants vs. 19.4 nonparticipants (Sig)
Stark et al., 2018, Ethiopia [47]	986 F 13–19 years	Not sustained	Cluster RCT treatment and control	Low	Odds of marriage F 13–19 years during 1 year of intervention	Null OR comparing participants and nonparticipants = .72 (NS)
Stark et al., 2018, DRC [48]	869 F 10–14 years	Not sustained	Cluster RCT treatment and control	Medium	Odds of marriage F 13–14 years during 1 year of intervention	Null OR comparing participants and nonparticipants = 1.24 (NS)
Bandiera et al., 2018, Uganda [49]	50,000 F 14–20 years	Sustained	Cluster RCT treatment and control	Medium	Likelihood of marriage F 14–20 years married in 2 and 4 years of intervention	Positive Midline: 6.9% less likely to be married Endline: 8% less likely to be married

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Table 1
Continued

Study and location	Intervention reach and participants	Sustainability	Evaluation design	Evaluation quality	Evaluation CM outcome measure(s)	Results
Single component						
Angrist et al., 2003, Colombia [50]	125,000 F and M 13–17 years	Unknown	Quasi-experimental lottery winners and losers	Medium	Probability 13–17 years F and M marry in 1- to 4-year program exposure	Positive Participants 1.1 pp less likely to be married or cohabitating compared with nonparticipants (Sig)
Pande et al., 2006, India [51]	440, F 12–19 years	Unknown	Quasi-experimental pre-post case and control	Medium	Median age at marriage; Percent F 12–19 years marrying <18 years;	Positive 1-year increase in median age in trt compared with no change in control 18.9% decrease in marriage <18 years in trt versus no significant decrease in control
Gulemetova, 2011, Mexico [52]	Millions M and F school age	Sustained	Quasi-experimental treatment versus in waiting	High	Hazard of marriage F 13–19 years marry in 2- to 8-year program exposure	Positive Instantaneous hazard rate of marriage lowered (hazard coefficient = $-.76$ Sig)
Alam, Baez, Del Carpio, 2011, Pakistan [53]	150,000 Middle school age girls	Sustained	Quasi-experimental treatment versus control	High	Probability F 15–19 years married; up to 4-year program exposure; age at marriage	Positive No effect on probability of marriage, but delayed age at marriage by 1.2–1.5 years (Sig)
Jensen, 2012, India [54]	4,000 F 15–21 years	Sustained	Cluster RCT 160 study and control villages	High	Likelihood of marriage F 15–21 years in 3 years of intervention	Positive 5.1% lower likelihood of marriage for program participants (Sig)
Heath and Mobarek, 2014, Bangladesh [55]	2+ million young female workers	Sustained	Quasi-experimental 60 study and control villages	High	Hazard of marriage girls 12–18 years up to 7-year exposure	Positive A 28% lower hazard of marriage for girls in garment proximate villages
Hallfors et al., 2015, Zimbabwe [56]	328 F avg 12 years in Grade 6	Unknown	Cluster RCT 25 primary schools; five waves	Medium	Odds of marriage F average age 12 in 5-year program exposure	Positive Odds of marriage was .37 lower for intervention participants compared with controls after 5 years
Handa et al., 2015, Kenya [57]	150,000 Poor households	Unknown	Cluster RCT 28 treatment vs. in waiting locations	High	Likelihood of marriage F 12–24 years in 1- to 4-year program exposure	Null Girls 2 pp less likely to marry in treatment group (NS).
Nanda et al., 2016, India [58]	50,000 F born 1994–1997	Sustained	Quasi-experimental Matched beneficiaries and nonbeneficiaries—post only	Medium	Probability of F 18 being married and marrying before 18 years	Null Proportion of girls married <18 years not different between participants and nonparticipants. (probit = .61 NS)
Dake et al., 2018, Malawi and Zambia [59]	380,000+ poor households	Sustained	Cluster RCT 29 clusters in Malawi, 92 Zambia	High	Probability F and M 14–21 years marry in 2- to 3-year program exposure	Null No effect on risk of ever marriage in Malawi ($-.00428$ NS) or Zambia ($.0117$ NS).
Koski et al., 2018, 8 African countries [60]	Million+ F and M primary school children	Sustained	Quasi-experimental Cohorts pre and post fee elimination	Medium	Odds of marriage <15 and <18 years F 15–49 years w/prog exposure	Mixed Sig 2% decline in marriage <15 years; Not Sig decline marriage <18 - variable effect by country

Table 1
Continued

Study and location	Intervention reach and participants	Sustainability	Evaluation design	Evaluation quality	Evaluation CM outcome measure(s)	Results
Hahn et al., 2018, Bangladesh [61]	Million+ F in grades 6–10	Sustained	Quasi-experimental Cohorts before and after stipend	High	Delay in entry to 1st marriage—F 6–14 years as they age to 23–31 w/2 and 5-year program exposure	Positive 5-year stipend: first marriage delayed by .57 years; 2-year stipend, first marriage delayed by .34 years
Multiarms Duflo, Dupas, and Kremer, 2015, Kenya [62]	19,300 F and M 13–20 years	Not sustained	Cluster RCT 328 schools randomized into three arms	High	Likelihood of marriage M and F 13–20 years in 3, 5, 7 years of program	Mixed by arm At 3 years: CCT-schl: 2.6pp less likely to be married (Sig) HIV ed: Null Multicomp: Null
Baird, McIntosh, and Ozler, 2016, 2011, 2009, Malawi [63–65]	1,000–2,000 F 13–22 years	Not sustained	Cluster RCT 88 treatment and 88 control areas	High	Likelihood of marriage F 13–22 in two program exp and 2-year postprogram	Mixed by arm CCT school: 11%–16% less likely to be ever married whereas 2 years earlier there had been no effect. UCT: earlier effect to delay marriage is gone.
Amin et al., 2016; 2018 Bangladesh [66,67]	11,609 F 12–18 years	Not sustained	Cluster RCT 72 intervention and 24 control communities	High	Hazard of marriage <18 years at 18-month intervention F 12–18 years	Positive all arms Adjusted HR of marriage <18 decreased in all arms about equally (.70 livelihoods; .72 gender; .75 education) program impact stronger for <16
Erulkar, Medhin & Weissman, 2017, Ethiopia [39]	<10,000 F 12–17 years	Not sustained	Quasi-experimental pre and post but no control	Low	Risk of ever marriage girls 12–14 and 15–17 in 28 months of program	Mixed all arms For 12–14 Community dialog RR: .42 (Sig) Education arm RR: .09 (Sig) For 15–17 CCT Asset RR: .57 (Sig) Comprehensive arm RR: .38 (Sig) Other arms null.
Erulkar et al., 2017, Tanzania [68]	<10,000 F 12–17 years	Not sustained	Quasi-experimental pre-post case and control	Medium	Risk of ever marriage girls 12–14 and 15–17 in 28 months of program	Mixed by arm For 12–14 Multicomp RR: .33 (Sig) For 15–19 CCT asset RR: .52 (Sig) All other arms null.
Erulkar et al., 2017, Burkina Faso [69]	<10,000 12–17 F years	Not sustained	Quasi-experimental pre-post case and control	Medium	Risk of ever marriage girls 15–17 in 28 months of program	Mixed by arm For 15–17 Community dialog RR: .33 (Sig) All other arms null.
Buchmann et al., 2018, Bangladesh [70]	46,000 F 10–19 years	Unknown	Cluster RCT 460 communities randomized into four arms	High	Likelihood of marriage <18 years girls 15–17 in 2.5-year program exposure and 4.5 post program	Mixed by arm CCT incentive: girls 21% less likely to be married <18 years (Sig) Empowerment: null Comprehensive: null

CCT = conditional cash transfer; F = female; HR = hazard ratio; M = male; NS = nonsignificant; OR = odds ratio; RCT = randomized controlled trial; RR = risk ratio; Sig = significant; UCT unconditional cash transfer.

Table 2

Specifics on interventions evaluated in studies with child marriage prevention as an outcome, 2000–2019; multicomponent, single component, and multiarm

Study, location, quality, results	Intervention specifics
Multicomponent	
CEDPA, 2001, India [38], <i>low quality; positive results</i>	Better Life Options Program, 1989–1999, NGO run, Evaluated 1996–1999 by NGO Aim of empowering girls through holistic approach Girls: life skills, family life education, asset-building, leadership skills, link with formal/alternative education, vocational skills. Community: leaders, parents mobilized through advocacy and involvement. Services: provider training on youth-friendly SRH
Mathur, Mehta & Malhotra, 2004, Nepal [23], <i>low quality; mixed results</i>	Youth Participation Program, 2000–2003, NGO–Research Institute run; Evaluated 1999–2003 by Research Institute Aim of empowering youth for better ASRH through participatory approach Girls and boys: peer education and counseling, youth groups/clubs, safe spaces, livelihoods training Community: adult education, task forces, community mobilization, IEC campaigns; Services: provider training on youth-friendly SRH; teacher training on ASRH information and support
Kanesnathan et al., 2008, India [71], <i>high quality; null results</i>	DISHA Program 2005–2006, Research Inst-NGO run; Evaluated 2005–2007 by Research Institute Aim of empowering youth through integrated approach to ASRH Girls and boys: Life skills, youth groups, and safe spaces; peer education, counseling on SRH; income generation training and credit/savings links; youth as contraceptive depot holders Community: community sensitization; adult groups and adult-youth groups; IEC campaigns Services: provider training on youth-friendly SRH services
Shahnaz et al., 2008, Bangladesh [72], <i>low quality; positive results</i>	ELA Program 2005–2007, NGO run; Evaluated 2005–2007 by Research Institute Aim to empower girls on multiple fronts—combine microfinance with skills and enabling environment Girls: savings and loan groups; skills training on income generation; safe spaces—life skills, socializing, reading, play; Community: Parent and community mobilization and sensitization; Services: microfinance
UNICEF; Diop, Moreau, Benga 2008, Senegal [73,39], <i>low quality; null results</i>	Tostan Program 1996–1999, NGO-UN run; Evaluated 2006 by Research Institute Aim to improve health, abandonment of FGM and child marriage Community: multimodule course mostly for adult women but eventually also men—on human rights and responsibilities problem solving, hygiene, health; mobilization of women and men's groups; community pledge ceremonies for not undertaking FGM, child marriage
Erulkar and Muthengi, 2009, Ethiopia [26], <i>med quality; mixed results</i>	Berhane Hewan Program 2004–06, Research Inst-NGO run; Evaluated 2004–2006 by Research Institute Empower girls through multiple ways to reduce child marriage; support married girls Girls: School materials for in-school and returning girls; Nonformal education, mentors, girls groups for out of school girls; Health/FP referrals; cost of card for FP services Family: econ incentive (goat) end of 2 years if girl not married; Community: awareness raising and consultation
Amin et al., 2011, Bangladesh [24], <i>low quality; null results</i>	Kishori Abhijan Program 2001–2003, NGO-UN run; Evaluated 2001–2003 by Research Institute Aim to empower adolescent girls—lower school dropout, raise economic activity, and age at marriage Girls: Life skills—self-esteem, leadership, gender roles/rights, health; Kishori clubs as safe spaces; Livelihoods training (vocational skills, teacher training); Community: engage parents, mobilize communities Services: microcredit
Daniel and Nanda, 2012, India [55], <i>low quality; positive results</i>	Prachar Program 2002–2006, NGO run; Evaluated 2008–2009 by NGO Aim to raise age at marriage, delay 1st birth, increase spacing to 2nd birth Girls and boys: Life skills 3 hours/day for 5 days—delayed marriage, spacing, SRH, STIs, spousal negotiation, decisions. Community: BCC for community and youth mobilization, infotainment parties, awareness raising, IEC, community leaders, parents, influential
Stark et al., 2018, Ethiopia [56], <i>low quality; null results</i>	COMPASS Program 2015–2016, Academic-NGO run, Evaluated 2015–2016 by Academics Aim to prevent violence among adolescent girls in conflict settings Girls: 30 weekly life skills sessions—communication, SRH, GBV; safe spaces Families: 8 monthly caregiver discussion groups to improve understanding, support, attitudes
Stark et al., 2018, DRC [57], <i>medium quality; null results</i>	COMPASS Program 2015–2016, Academic-NGO run, Evaluated 2015–2016 by Academics Aim to prevent violence among adolescent girls in conflict settings Girls: 32 weekly 1- to 2-hour life skills sessions from mentors, networking Families: 10 monthly discussion groups of parent/caregiver to improve understanding, support, attitudes.
Bandiera et al., 2018, Uganda [59], <i>med quality; positive results</i>	ELA Program 2008, NGO-Research Institute run; Evaluated 2010–2012 Res Institute/Academics Aim to empower girls by relaxing multiple human capital constraints Girls: ELA clubs as safe spaces; “hard” vocational skills for small-scale income generation (tailoring, poultry computing), financial literacy; “soft” life skills on SRH, menstruation, negotiation, conflict, leadership.
Single component	
Angrist et al., 2003, Colombia [74], <i>medium quality; positive results</i>	PACES Program, 1993–1998 +, Government run; Evaluated 1998–1999 by Academics Aim to increase secondary schooling for poor boys and girls CCT—Education; vouchers worth 1/2 private secondary school fees given at grade 6 and renewed through 11th grade conditional on academic performance warranting promotion to next grade

Table 2
Continued

Study, location, quality, results	Intervention specifics
Pande et al., 2006, India [75], <i>medium quality; positive results</i>	Life Skills Program, 1998–1999, NGO-Research Inst run; Evaluated 1996–2005 by Research Institute Aim to keep in engaged in alternative activity to marriage; provide skills. Life skills: 225 hours, 1-year course—developed and implemented with community consultation; used locally drawn workers to teach with profiles mapped against Government social workers for potential scale-up
Gulemetova, 2011, Mexico [40], <i>high quality; positive results</i>	Oportunidades Program (pre)2002–2004+, Government run; Evaluated 2010 by Academics Aim to improve human capital of families in poverty CCT—Education school subsidy for kids in 3–12 grades conditional on 85% attendance and grade progress; cash to moms for Grades 3–9; adolescents in Grades 10–12; higher subsidy for girls to encourage girls' education.
Alam, Baez, Del Carpio, 2011, Pakistan [63], <i>high quality; positive results</i>	Female School Stipend Program (pre)2003–2006+, Government Run; Evaluated 2011 by Academics Aim to improve girls middle school completion and entry to secondary education CCT—Education female stipends of \$10 per quarter to cover costs for middle school (Grades 6–8) up to 3 years; conditional on 80% attendance
Jensen, 2012, India [32], <i>high quality; positive results</i>	BPO Recruitment Support 2003–2006, Research Inst-NGO run; Evaluated in 2012 by Academics Aim to increase job opportunities to improve female early life outcomes Job Market Access: Recruiting services for young women to get call center jobs; three coaching sessions (5 hours) in 14 months; 3-year placement support.
Heath and Mobarek, 2014, Bangladesh [42], <i>high quality; positive results</i>	Garment Factory Access 1990–2004+ Government-implemented Macro Policy; Evaluated in 2009 by Academics Aim to improve economic opportunities Job Market Access: Girls growing up in villages with access to growing number of garment factories; access assessed by commuting distant to a factory from natal village
Hallfors et al., 2015, Zimbabwe [41], <i>medium quality; positive results</i>	Structural HIV Prevention Program 2007–12, Research Institute run; Evaluated 2008–2012 by Academics Aim to improve HIV-related outcomes for girls through school subsidies CCT—Education 5 years of costs for fees, uniforms, supplies, school-based female “helper” to girls entering Grade 6 conditional on staying in school
Handa et al., 2015, Kenya [43], <i>high quality; positive results</i>	OVC Social Cash Transfer Program 2007–14 Government run; Evaluated 2007–2011 Academics Aim to provide social protection to vulnerable households with orphans UCT-poverty —Monthly cash 1,500–2,000 Ksh (~20% hh expenses) to ultrapoor households with at least one orphan/vulnerable child aged <18 years
Nanda et al., 2016, India [46], <i>medium quality; null results</i>	ABAD (Our Daughter Our Wealth) Program 1994–1998 Government Run; Evaluated 2015 by Research Inst Aim to improve value of girls, prevent sex selection, delay marriage Conditional Asset transfer —Rs 500 cash at birth of girl plus Rs 25,000 bond in her name cashable at age 18 years—provided she stays unmarried. Effect assessed 18 years later on female cohorts that benefited at birth.
Dake et al., 2018, Malawi & Zambia [34], <i>high quality; null results</i>	Social Cash Transfer Programs 2011–2017 Zambia; 2006–2020 Malawi Govt run Evaluated Zambia: 2011–2013; Malawi: 2013–2015 by Research Institute Aim to support ultrapoor, labor-constrained households on basic needs UCT-poverty —cash to households equal to approximately 20% of consumption. Malawi: bimonthly transfer: 2,000–4,800 Kwacha (US \$5.80–\$13.30). Zambia—bimonthly transfer of 120 kwacha (US \$24); effect assessed on girls 14–21 years.
Koski et al., 2018, 8 African countries [52], <i>medium quality; mixed results</i>	Primary school fee elimination 1995–2002 Govt macro policy; Evaluated 2016–2017 by Academics Aim to increase primary school enrollment School fee elimination 1995–2002 at primary level in eight African countries vis a vis eight control countries, which acted later. Effect assessed on cohorts that experienced fee reduction
Hahn et al., 2018, Bangladesh [58], <i>high quality; positive results</i>	Female Secondary School Stipend Program 1994–2001+ Government run; Evaluated 2015–2016 by Academics Aim to improve 6–10 grade completion, labor market options, delay marriage CCT-education —annual stipend of \$18 for Grade 6 to \$45 for Grade 10 conditional on 75% attendance, passing test scores, staying unmarried. Fees paid directly to school; amount for other costs in girl's bank account.
Multiarms Baird, McIntosh & Ozler, 2009, 2011, and 2016, Malawi [33,44,45], <i>high quality; mixed results</i>	Zomba Cash Transfer Program 2007–2009 Academic-NGO run; Evaluated 2007–2016 by Academics Aim to improve human capital accumulation, related life experiences especially for girls Arm 1: CCT-education —school fees and \$10 subsidy 10 months per year for 2 years conditional on 80% school attendance to girls who were school dropouts at baseline (age 13–22 years) Arm 2: UCT-equivalent cash , no condition—girls aged 13–22 years in school at baseline

(continued on next page)

Table 2
Continued

Study, location, quality, results	Intervention specifics
Duflo, Dupas, & Kremer, 2015, Kenya [69], <i>high quality; mixed results</i>	School Subsidy & HIV Education Program 2003–2004 Academic-Govt run; Evaluated 2003–2010 by Academics Aim to test policy instruments to reduce early pregnancy and STI risk Arm 1. CCT—Education uniforms for up to 2 years (worth \$12) for Grades 6–7 conditional on staying in school Arm 2. HIV Education —Abstinence-only teacher training for government programs in schools Arm 3. Multicomponent (Arms 1 and 2)
Amin et al., 2016; 2018, Bangladesh [47,48], <i>high quality; positive results</i>	Balika Program 2014–2015 Research Institute-NGO run; Evaluated 2014–2015 by Research Institute Aim to delay age at marriage and empower girls Arm 1: Education support —tutoring for in-school girls; computing or financial training for out-of-school girls Arm 2: Gender rights awareness training Arm 3: Livelihoods training in computers, servicing, first aid, photography
Erulkar Medhin and Weissman, 2017, Ethiopia [49], <i>low quality; mixed results</i>	Berhane Hewan Phase 2 2013–2014 Research Institute-NGO-Government run; Evaluated 2013–2014 Research Institute Aim to prevent child marriage and empower girls Arm 1: Community dialog —weekly discussion groups—harms of child marriage Arm 2: CCT-Education school supplies condition staying in school, not marry Arm 3: Conditional Asset Transfer —two chickens per year conditional on not marrying and staying in school Arm 4: Multicomponent —all three arms combined No control site as it was compromised
Erulkar et al., 2017, Tanzania [50], <i>medium quality; mixed results</i>	Berhane Hewan Replication 2013–2014 Research Institute-NGO-Govt run; Evaluated 2013–2014 by Research Institute Aim to prevent child marriage and empower girls Arm 1: Community sensitization —discussions and info on harms of marriage, at village meetings, events Arm 2: CCT-Education —school supplies condition staying in school, not marry Arm 3: Conditional Asset Transfer —livestock at the end of intervention conditional on not marrying and staying in school Arm 4: Multicomponent —all three arms combined
Erulkar et al., 2017 Burkina Faso [51], <i>med quality; mixed results</i>	Berhane Hewan Replication 2013–2014 Research Institute-NGO-Govt run; Evaluated 2013–2014 by Research Institute Aim to prevent child marriage Aim to prevent child marriage and empower girls Arm 1: Community dialog —weekly discussion groups—harms of child marriage Arm 2: CCT-Education school supplies condition staying in school, not marry Arm 2: Multicomponent —2 arms combined
Buchmann et al., 2018, Bangladesh [54], <i>high quality; mixed results</i>	Kishori Kontha (pre) 2008–2010 Academic-NGO run; Evaluated 1995–2002 by Academics Aim to reduce child marriage, teen childbearing, increase education < Arm 1: Rights-based life skills training —6 months, 5–6 days 2 hours/day—life skills, literacy, numeracy, SRH, communication, safe spaces, social activities Arm 2: Conditional Asset transfer : cooking oil worth \$16 per year, conditional on girls not marrying till 18 years Arm 3: Multicomponent —Arms 1 and 2

treatment and nontreatment groups. Others examined program effects through comparing mean/median age at marriage, examining whether the intervention succeeded in delaying entry into marriage. This is important to note because although some programs had no effect on reducing child marriage incidence, they were successful in delaying age of entry into marriage.

As studies often do not provide information on the percentage of girls at risk of child marriage in the contexts where the intervention was implemented, we used a reach of 25,000 participants as a conservative threshold for scale. Table 1 shows that only 2 of the 11 multicomponent interventions met this threshold, and only one of the seven multiarm programs did so. In contrast, 9 of the 12 single-component interventions reached 25,000 or more participants, with eight of these nine programs reaching several hundred thousand or even millions of participants. Similarly, the single-component programs show a better sustainability record (8/12) than the multicomponent (2/11) and multiarm (1/7) programs. Table 2 clarifies the reason for this

pattern: although all the multicomponent and multiarm programs were designed and implemented by NGOs and/or research organizations, 9 of the 12 single-component programs or policies were implemented by governments. In fact, the only two multicomponent programs that reached more than 25,000 participants were exceptional in being implemented by BRAC, the world's largest NGO.

Table 2 shows that multicomponent interventions covered in our analysis go back to the early 1990s. A multipath approach to empowering girls was the focus in seven programs. Six of these programs include life skills, safe spaces or adolescent clubs, and vocational training or livelihood skills for girls as core components. Five programs—all in Asia—were very comprehensive in also including multiple family and community mobilization activities along with a service component of either teacher or health provider training or access to microcredit. The Berhane Hewan program in Ethiopia used a slightly different multipath combination of formal and nonformal schooling support to girls,

Table 3A

Results from 11 multicomponent intervention evaluations on preventing child marriage: by intervention focus

Multicomponent study	Country	Result	Summary
Girl's empowerment focus			
CEDPA 2001	India	Positive	Positive: 3 of 7 Positive medium- to high-quality studies:1 of 3
Mathur et al., 2004	India	Mixed	
Kanesthasan et al., 2006 (Q)	India	Null	
Shahnaz & Karim, 2008 (S)	Bangladesh	Positive	
Erulkar & Muthengi, 2009 (Q)	Ethiopia	Mixed	
Amin et al., 2011	Bangladesh	Null	
Bandiera et al., 2018 (Q) (S)	Uganda	Positive	
Other programmatic focus			
UNICEF, 2008	Senegal	Null	Positive: 1 of 4 Positive medium- to high-quality studies:0 of 1
Daniel and Nanda, 2012	India	Positive	
Stark et al., 2018a	Ethiopia	Null	
Stark et al., 2018b (Q)	DRC	Null	
Positive results all studies: 4 of 11; Positive results all medium- and high-quality studies: 1 of 4			

Q = medium- or high-quality studies; S = scale criterion of interventions with 25,000 or more participants.

asset transfer of livestock conditional on girls not marrying, health service vouchers, and parental and community mobilization. Four other multicomponent programs had narrower goals and used fewer components, from targeting the abandonment of female genital mutilation and child marriage through community education and village pledge events in Senegal, to combining life skills and parental engagement to reduce gender-based violence among girls in humanitarian settings in Africa. The Prachar program in India used limited sexual and reproductive health education sessions in combination with behavioral change communication activities with adolescents and communities to delay marriage and childbearing.

As indicated by Table 2, single-component programs in our review also go back to the early 1990s, with the most common intervention (5/12) being some type of conditional cash or in-kind transfer for school attendance. Four of these programs were implemented by governments, two each in Latin America and Asia, whereas the one in Africa was a Research-NGO partnership. The main motivation of the government programs was to improve the school success and human capital of children living in poverty—especially girls—with delayed marriage as a potential secondary outcome. The smaller scale conditional cash transfer (CCT) for school program in Zimbabwe aimed to reduce

HIV risk for orphaned girls through school retention and delayed sexual debut. The programs in Asia and Africa focused specifically on girls to address gender disparities, whereas those in Latin America covered both boys and girls. In Mexico, all schooling levels were included, but subsidies were higher for girls in secondary school. The Colombia, Bangladesh, and Zimbabwe interventions were for secondary school, whereas the Pakistan intervention was for primary school.

Three of the other single-component studies also used cash or asset transfers but differently. Unconditional cash transfer (UCT) programs in Kenya, Malawi, and Zambia were government efforts at mitigating poverty and providing a safety net of approximately 20% monthly income to ultrapoor families in the context of HIV/AIDS in Africa. These programs were not intended to delay marriage, but evaluators considered improved welfare a potential path for positive adolescent outcomes. An Indian state government's long-term conditional asset transfer program, on the other hand, aimed to prevent both male-favored sex selection and child marriage by depositing a bond at a girl's birth and making it cashable 18 years later if she remained unmarried.

Two single component studies examined the impact of macro policies increasing access for young women to call center jobs in

Table 3B

Results from 12 single component intervention evaluations on preventing child marriage: by intervention type

Single Component Study	Country	Types of cash or asset transfers			Other interventions		
		CCT school support	UCT poverty alleviation	Asset transfer condition not marry	Job market access	Rights/life skills	School fee elimination
Angrist et al., 2003 (Q) (S)	Colombia	Positive				Positive	
Pande et al., 2006 (Q)	India						
Gulemetova 2011, (Q) (S)	Mexico						
Alam et al. 2011, (Q) (S)	Pakistan	Positive					
Jensen, 2012 (Q)	India				Positive		
Heath & Mobarek, 2014 (Q) (S)	Bangladesh				Positive		
Hallfors et al., 2015 (Q)	Zimbabwe	Positive					
Handa et al., 2015 (Q) (S)	Kenya		Null				
Nanda et al., 2016 (Q) (S)	India			Null			
Dake et al., 2018 (Q) (S)	Malawi, Zambia		Null				
Koski et al., 2018 (Q) (S)	8 African countries						Mixed
Hahn et al., 2018 (Q) (S)	Bangladesh	Positive					
Results 12 Studies: 8 Positive; 1 Mixed; 3 Null							
(All Medium-High Quality)							
Positive Results by Intervention		5 of 5	0 of 2	0 of 1	2 of 2	1 of 1	0 of 1

CCT = conditional cash transfer; Q = medium- or high-quality studies; S = scale criterion of interventions with 25,000 or more participants; UCT = unconditional cash transfer.

Table 3C

Results from seven multiarm intervention evaluations, by intervention arm

Multiarm Study	Country	Multicomponent		Types of cash or asset transfers			Other Interventions			
		Multipath girls' empowerment	Other approaches	CCT school support	UCT poverty Alleviation	Asset transfer condition not marrying	Livelihood skills	Gender rights training; Rights/ life skills	Community mobilization	Abstinence-only teacher training
Dufllo et al., 2015 (Q)	Kenya		Negative	Positive						Null
Baird et al., 2016 (Q)	Malawi			Positive	Mixed					
Amin et al., 2016 (Q)	Bangladesh			Positive			Positive	Positive		
Erulkar et al., 2016a	Ethiopia	Mixed		Mixed		Mixed			Mixed	
Erulkar et al., 2016b (Q)	Tanzania	Mixed		Null		Positive			Null	
Erulkar et al., 2016c (Q)	Burkina Faso	Null		Null		Negative			Positive	
Buchmann et al., 2018 (Q) (S)	Bangladesh	Null				Positive		Null		
Positive results per arm all seven studies		0 of 4	0 of 1	3 of 6	0 of 1	2 of 4	1 of 1	1 of 2	1 of 3	0 of 1
Positive results per arm medium- to high-quality studies		0 of 3	0 of 1	3 of 5	0 of 1	2 of 3	1 of 1	1 of 2	1 of 2	0 of 1

CCT = conditional cash transfer; Q = medium- or high-quality studies; S = scale criterion of interventions with 25,000 or more participants; UCT = unconditional cash transfer.

India and garment sector jobs in Bangladesh. The increased economic opportunity resulting from government policy action could be expected to delay marriage by shifting girls' and parental aspirations toward an attractive alternative to early marriage. Both studies considered the proximity of girls' and young women's homes to call centers and factories, but the India study also provided job placement support. Another study examined government policy action on eliminating primary school fees in eight African countries, with the main aim of not delaying marriage but facilitating basic education for all children. However, evaluators explored the policy action as a potential catalyst for preventing child marriage.

Among the seven multiarm studies, the most common intervention arm (5/7) was also a conditional cash or in-kind subsidy for girls to attend school. In the context of HIV/AIDS and improving adolescent life outcomes, one study in Malawi compared this arm with an arm on UCTs, whereas another in Kenya compared it with abstinence-only training for teachers and also tested the impact of the two components combined. Three of the multiarm studies in Africa tried to unpack the Berhane Hewan multicomponent approach previously tried in Ethiopia by testing separately the impact of conditional schooling support to girls in Ethiopia, Burkina Faso, and Tanzania. Two of these studies—in Ethiopia and Tanzania—also tested asset transfers conditional on a girl not marrying. Although these programs in Africa used livestock as the asset, the Kishori Kontha program in Bangladesh conditioned the transfer of cooking oil as an asset conditional on girls not marrying.

The two multiarm studies in Bangladesh tested the stand-alone impact of some type of a gender rights or rights-focused life skills training curriculum on preventing child marriage. One of these studies also tested this intervention in combination with asset transfers as a multicomponent arm. The evaluation of the Balika program only tested stand-alone interventions; in addition to a gender rights training arm, it also included arms on livelihood skills and on education support to girls through tutoring, computer, or financial skills. The three Berhane Hewan replication programs in Tanzania, Ethiopia, and Burkina Faso each tested community mobilization as a separate arm and also had an arm with all components bundled together.

Impact on child marriage

In Tables 3A–C, we present findings from the 30 studies with regard to impact on child and early marriage prevention, separately for multicomponent, single component, and multiarm interventions, and by subcategories within these groupings.

Because the content and theory of change for multicomponent programs using a multipath approach to empowering girls is likely to differ from multicomponent programs using other approaches, in Table 3A, we examine the findings for the seven girls' empowerment-focused multicomponent studies separately from the four studies on bundled interventions with other approaches. Only three of the seven empowerment-focused multicomponent interventions show positive findings; two studies show mixed results, and two studies show no effect. When we eliminate the four low-quality studies in this group, we are left with only one out of three studies with positive findings. This intervention—the ELA program in Uganda—also meets our threshold for scale in reaching more than 25,000 participants. Of the four multicomponent studies with other approaches, only one—the Prachar program in India—has positive results. But as this study is low quality, there are no studies with a positive effect in this subgroup once the sensitivity analysis is applied.

In Table 3B, we turn to single-component interventions, and keeping in mind the important differences in the structure, content, and pathways to change among the different types of cash transfer programs, we first examine the results for conditional cash or in-kind transfer programs supporting girls' schooling. These aim to provide an alternative to marriage and build long-term human capital. All five of the programs in this subcategory show positive results. Moreover, four of these programs—two in Latin America and two in Asia—were government-run interventions that more than meet our criteria for scale. In contrast, both the studies of government-run UCT programs in Africa show no effect. The one long-term asset transfer program conditional on delaying marriage till 18 years and run by a state government in India, also shows no effect.

Looking next at the two studies assessing the impact of favorable job markets presented by call centers in India and the garment industry in Bangladesh, both show positive effects and also meet the scale criteria. The study in India on the stand-alone impact of life skills in delaying child marriage also has positive

Table 4

Consolidated success rate of evaluations to prevent child and early marriage from multicomponent, single component, and multiarm studies by specific intervention type and evaluation quality

Grouped intervention categories	Specific intervention type	Share of positive findings in all studies in category	Share of positive findings in medium- to high-quality studies
Multicomponent	1. Multipath approach to girls' empowerment	3 of 11	1 of 6
	2. Other bundled approaches	1 of 5	0 of 2
Single component	3. Conditional cash or kind transfer for schooling support	8 of 11	8 of 10
Cash or asset	4. Asset transfer conditional on delayed marriage	2 of 5	2 of 4
Transfer	5. Unconditional cash transfer for poverty alleviation	0 of 3	0 of 3
Single component	6. Female job opportunities or livelihood skills training	3 of 3	3 of 3
Economic opportunity or skills	7. Gender rights/life skills training	2 of 3	2 of 3
Single component	8. Community mobilization	1 of 3	1 of 2
Other	9. School fee elimination	0 of 1	0 of 1
Interventions	10. Abstinence-only education	0 of 1	0 of 1

findings but does not meet the scale threshold. (However, the life skills program was eventually scaled up in an adapted version with the Maharashtra government.) The one study on school fee elimination across multiple countries in Africa was at scale and sustained but shows mixed effects. As there were no low-quality studies among the single-component evaluations, the findings in Table 3B are robust against our sensitivity analysis.

In Table 3C, we review the results from the seven multiarm studies. We first consider the five studies with multicomponent arms, four of which took a multipath approach to girls' empowerment. None of these arms showed positive results, with two studies in Ethiopia and Tanzania showing mixed results. In the fifth study in Kenya which took a different approach, the multicomponent intervention arm actually increased early marriage. Moreover, in all four medium-high quality multiarm studies that tested a combination of single and multicomponent arms, the single-component arms performed better than the multicomponent arms.

Conditional cash or in-kind support for girls' schooling was the most common intervention tested across six of the seven multiarm studies: three studies had positive results, one mixed results, and two showed no impact. With sensitivity analysis, the ratio improves to three of five studies with positive results for this intervention arm. Four studies included arms on the impact of asset transfers conditional on girls not marrying, with a diversity of results: two positive, one mixed, and one negative where child marriage increased. Sensitivity analysis also improves these results, with two of three positive findings, one for the Berhane Hewan replication in Tanzania, and one for the Kishori Kontha program in Bangladesh. The latter is also the only successful intervention to meet our scale criteria within all multiarm studies.

The Kishori Kontha evaluation in Bangladesh found no effect for its stand-alone rights-focused life skills arm, but the Balika evaluation found a positive effect for both its gender rights training and livelihoods training arms. The stand-alone community mobilization interventions in the three Berhane Hewan program replications in Africa found no consistent results: one positive, one null, and one mixed. The Kenya study with an arm on abstinence-only training for teachers found no impact.

Table 4 consolidates findings on success rates from evaluation arms in multiarm studies with evaluation findings for similar interventions in the multicomponent and single-component studies. As such, it provides a comprehensive summary of success rates for different subcategories of interventions across all studies, both with and without sensitivity analysis. The table

consolidates results from 11 evaluations of multipath girls' empowerment-focused multicomponent interventions—a number large enough to assess a clear pattern on findings. The overall success rate for these interventions is only 3 in 11, and because almost half the evaluations in this category are low quality, sensitivity analysis leaves us with a success rate of only one in six. Multicomponent interventions with other approaches perform even more poorly, with an overall success rate of only one in five, and with sensitivity analysis further down to zero positive results from two studies.

Among single-component interventions, the impact of CCTs for education on child marriage prevention is also assessed in 11 evaluations and demonstrates a much higher success rate of 8 in 11, improving to 8 in 10 with the elimination of one low-quality evaluation. Although most other single-component interventions have too few evaluations to provide the critical mass for determining a clear pattern, female labor market opportunities and livelihood skills show some promise with all three high-quality studies showing a positive impact. Similarly, with a success rate of 2 in 3, there may be promise in gender rights and life skills trainings as stand-alone interventions. In contrast, 0 of 3 positive findings for UCT programs suggests that this approach may be less promising in addressing child marriage.

Discussion

In summary, with a critical mass of 30 evaluations over the last 20 years, we are able to reach clearer conclusions on what works to delay marriage than it has been possible in the past. With 16 studies not covered by past reviews (13 published since 2016), our analysis covers a broader range of interventions, evaluation methodologies, and a higher share of more rigorous evaluations, allowing for more substantiated findings. Especially helpful is the increased share of single-component and multiarm studies, which allow for greater specificity in comparing program or policy strategies, as well as a higher share of large-scale, government-delivered programs and policies, allowing for a more deliberate analysis of the reach and sustainability of different approaches.

We see the most definitive pattern of success in preventing child marriage among interventions that supported girls' school attendance and progress through cash or in-kind transfers, with 8 out of 11 studies showing positive results, and sensitivity analysis increasing this ratio to 8 out of 10. Because of the larger cumulative pool of evaluations, we were able to differentiate the results for CCTs on school support from the impact of other

“economic incentive” interventions most often conflated together in the literature on child marriage prevention. Comparatively, we find that asset transfer interventions with delayed marriage as a condition show only a 50% rate of success. Given the variations in context, design, and rigor of the five studies evaluating this approach, further understanding and evidence is needed for more definitive results on when an asset transfer might work and when it might not. For example, in the India study where the girls and families had to wait 18 years before receiving the transfer, part of the reason for the lack of effect was that secular declines in child marriage across the state had already overridden any effect the program could have. In the Berhane Hewan replication in Africa, the asset transfer of livestock was a strong enough incentive in some settings, but not in others, whereas cooking oil in Bangladesh seemed to be a good enough incentive for girls and their families to keep them single.

We also find that the three evaluations of UCTs intended for poverty mitigation—all in SSA—show null results. In many ways, this is not surprising because the programs were intended to alleviate extreme poverty rather than delay marriage. It is possible that the cash households received was spent on basic needs or other priorities rather than providing sufficient advantage to girls for their marriage to become undesirable. In their multiround study comparing CCTs for school support with UCTs for household economic support, Baird et al. posit that with UCTs, “when the cash runs out,” there has been no value added for girls, whereas with the CCT, staying in school is forging a different life trajectory for them [63]. Thus clearly, all cash or asset transfers cannot be considered together in assessing their impact on child marriage.

These results suggest that supporting girls' schooling through cash or in-kind transfers is proving to be in fact the most successful channel for delaying their marriage among the programs evaluated to date and by far more effective than economically supporting their families or motivating them through cash or in-kind incentives. That enhancement of girls' own human capital is a compelling pathway to delaying marriage is also supported by a high share of positive results among the few studies that assessed an exclusive focus on life skills, livelihoods, and gender rights training for girls.

In addition, the very large positive effects in two studies on favorable job markets for women in India and Bangladesh provide some indication that not just investment in, but the visible promise of economic opportunities for girls in early adulthood, is important in delaying marriage. Heath and Mobarek note, for example, that by their estimates, the impact of the presence of garment factories in Bangladesh is many times larger in delaying marriage than even the massive government-supported female secondary school stipend program [55].

Besides their effectiveness, targeted interventions that enhance girls' human capital and their employment opportunities should also be attractive for advocates and practitioners because a more significant share of them operate at scale. For example, four of the eight programs with positive results on CCTs for school support were large-scale government implemented efforts, reaching many thousands and millions of girls. Similarly, macro policies supporting female employment in the garment industry in Bangladesh or the outsourcing boom in India also affected girls and young women in very large numbers. From the available evidence, these two intervention approaches demonstrate a combination of success as well as scale and sustainability more extensively than any other category of interventions.

With a critical mass of studies now available on multicomponent interventions, our analysis also highlights the low success rate of comprehensive programs in preventing child marriage. Our findings show that most multicomponent programs that try to empower girls through multiple pathways are not successful in preventing child marriage, with only 3 of 11 programs demonstrating positive results, and only one out of six higher quality evaluations doing so. Multicomponent programs that do not take the empowerment approach are even less successful. As these programs are rarely at scale or sustained, these findings raise important questions regarding continued advocacy for and investment in this approach, especially for those in the global community who are struggling to accelerate action toward achieving the SDG target 5.3.1 within the next 10 years.

Although limited in number, the results from multiarm studies are particularly interesting in this regard as they often show the single components of bundled programs to be more effective than the combination. It is possible that the stand-alone interventions are more intense, or of longer duration, or implemented at higher quality. A few studies mention the challenge of setting up and fully delivering integrated interventions within the typical 2- to 3-year period available to most programs [30,42]. There are also some hints in studies that the uptake of stand-alone interventions may be higher, given the demands of multifaceted programs on girls' and their families' time [69]. More systematic documentation and analysis of implementation processes are needed to better understand why multicomponent programs are not succeeding at higher rates. Equally, a larger pool of multiarm studies might be more conclusive in establishing that single—and perhaps the strongest—interventions from the comprehensive programs might be the better option.

In considering school-focused CCTs and possibly female-centered employment policies as the logical priority based on our findings, it will be important to explore how child marriage prevention might be integrated as a central rather than peripheral focus in such interventions and policies. For example, in working with the education sector, factors such as targeting of primary versus secondary school, private versus public schools, just girls or both girls and boys, would be important considerations, as successful interventions to date span all these parameters. Moreover, the success of demand-side interventions to promote girls' schooling through cash and in-kind support begs the question of the potential positive effects of supply-side interventions for girls' schooling, such as more secondary schools or female teachers, better curricula and skills, or more accessible transportation. While education sectors in many countries are certainly implementing such initiatives, currently, no evaluations examine the impact on child marriage of these supply-side interventions to promote girls' schooling outcomes, a gap that would be important for researchers and advocates to address.

Our review should be considered in light of some limitations. Although broad, our search strategy may have missed some evaluations, especially those published in languages other than English. Second, despite tapping all available sources, we were constrained both by space considerations and by inconsistency in details available for each study to integrate all the parameters that would be desirable for an even more comprehensive analysis. Several studies did not provide sufficient information regarding implementation science questions, which warrant consideration, including information on intervention dosage and intensity, fidelity, unintended consequences, and, importantly, cost and cost-effectiveness. Only a few studies reported

unintended or negative results, which could not be assessed systematically.

In addition, the variability of outcome measures and age groups of participants made it difficult to make quantitative comparisons across studies, limiting conclusions about the magnitude of the impact of child marriage interventions. Several studies examined probability or proportion of marriage among girls under age 18 years who have not completed time at risk, and thus, there is a strong possibility that child marriage prevalence was underestimated because of right censoring. Most included evaluations relied on retrospective self-reporting of age at marriage, and there is a possibility of measurement error, including recall and social desirability bias, especially in places where child marriage is illegal.

Space considerations constrain us from an analysis of other behavioral outcomes closely related to child marriage that several studies included—such as school retention or pregnancy reduction as well as results on nonbehavioral outcomes such as knowledge and attitudes, which may be related to child marriage results indirectly and over the long term.

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Supplementary Data

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