What Works to Prevent Child Marriage: A Review of the Evidence

Susan Lee-Rife, Anju Malhotra, Ann Warner, and Allison McGonagle Glinski

This article reviews 23 child marriage prevention programs carried out in low-income countries and employing a range of programmatic approaches and evaluation strategies. We document the types of child marriage programs that have been implemented, assess how they have been evaluated, describe the main limitations of these evaluations, summarize the evaluation results, and make recommendations to improve future prevention efforts. The evidence suggests that programs offering incentives and attempting to empower girls can be effective in preventing child marriage and can foster change relatively quickly. Methodological limitations of the reviewed studies, however, underscore that more needs to be learned about how the programs prevent child marriage and whether impact is sustained beyond program implementation. (STUDIES IN FAMILY PLANNING 2012; 43[4]: 287–303)

National and international communities are increasingly recognizing child marriage—marriage before the age of 18[1]—as a serious problem: as a violation of girls' human rights and as a hindrance to national development outcomes. As more program, policy, donor, and advocacy constituencies pledge commitment, resources, and action to address this problem, examining past efforts and how well they have worked becomes increasingly important. Until recently, finding model solutions to address child marriage has been a challenge because many programs have not been well documented and even fewer have been evaluated. The intensification of efforts during the past 20 years, however, and greater focus on evaluation have yielded a large enough body of work to begin assessing which approaches work in the prevention of child marriage.

This article offers a systematic review of documented evaluations of child marriage prevention programs in low-income countries. The review has four main objectives. First, it documents the types of child marriage interventions being implemented and evaluated. Second, it assesses how these interventions are being evaluated and describes some of the main limitations. Third, it summarizes what these evaluations reveal about the programs that work. And, finally, it identifies patterns in these programmatic responses and evaluations, and makes recommendations to bolster existing efforts. Through this effort, we hope to improve program and evaluation efforts to ensure that they aid in reducing the incidence of child marriage among the large number of girls at risk in the next generation.

Background

Child marriage is a significant challenge facing girls and their families throughout the developing world. The latest international estimates indicate that, worldwide, more than 60 million women aged 20–24 were married before they reached 18 (UNICEF 2007). The extent of child marriage varies substantially between countries, with the highest rates found in West Africa, followed by South Asia, North Africa/Middle East, and Latin America (Clifton and Frost 2011). As the data from the illustrative sample of countries in Table 1 suggest, the countries with the highest percentage of women aged 20–24 who report having been married before age 18 are not the same countries in which the largest number of girls are vulnerable to this practice. When considering the number of girls aged 10–19 across various countries, more girls are at risk of child marriage in India than in most other countries combined. Given population size and significant rates

Susan Lee-Rife is an independent consultant and at the time of the study was Social Demographer, Ann Warner is Senior Gender and Policy Specialist, and Allison McGonagle Glinski is Gender and Development Specialist, International Center for Research on Women, 1120 20th Street NW, Suite 500 North, Washington, DC 20036. Anju Malhotra is Principal Adviser, Gender and Rights, UNICEF, New York, NY. E-mail: susan@susanleerife.com.

Table 1 Percentage of women aged 20–24 who were married before age 18 and number of girls aged 10–19 in an illustrative sample of countries

Country	Percentage of women aged 20–24 married before age 18[a]	Girls aged 10–19[b]
Mali	70.6	1,525,000
Bangladesh	66.2	15,503,000
Ethiopia	49.2	8,937,000
Uganda	46.3	3,455,000
India	44.5	113,560,000
Nigeria	39.4	15,282,000
Indonesia	22.0	21,523,000
Egypt	16.6	7,920,000

[a] Based on Demographic and Health Surveys conducted between 2004 and 2008 (MEASURE DHS StatCompiler).
[b] Data reflect population size in 2005 (United Nations 2011).

of child marriage in Bangladesh and India as well as in Afghanistan and Nepal (not shown), approximately half the girls who are affected by child marriage live in South Asia (UNICEF 2007).

Child marriage has begun to decline in some parts of the world, in large part because of improving socioeconomic conditions and demographic change. The pace of this change, however, has been slow. For example, in 34 of 55 low-income countries with comparable data from two recent surveys, no significant change in the percentage of women aged 20–24 married by age 18 was indicated, and only 5 countries experienced a decrease of more than 10 percentage points (UNICEF 2007). A more active and concerted approach to prevention is needed to help the vast number of girls who are still at risk of child marriage around the world and to mitigate the negative consequences.

Considerable research has identified a number of root causes, or key drivers, of child marriage. Whereas these drivers take on context-specific forms, poverty is a common impetus. When daughters marry, parents are relieved of the economic responsibility of rearing them and sometimes receive economic benefits in the form of bridewealth. Families may be motivated to marry their daughters early to avoid the rising cost of dowry or the decreasing value of bridewealth that results as a girl ages (younger girls are more likely to be virgins and, therefore, have a higher value to the husband's family) or to avoid the risk that a girl will be unable to find a suitable spouse later in life. Moreover, the high value placed on female virginity can encourage families to marry their daughters as children; the sooner she is married, the sooner she is safe from nonmarital sexual activity or a nonmarital pregnancy. In some contexts, girls who remain unmarried for too long face scrutiny regarding their sexual purity and may risk damage to their and their family's reputation. Furthermore, traditional gender norms and lack of mean-

ingful alternatives to marriage can make envisioning a different path for girls and their families difficult. Finally, in many contexts families use marriage among children to forge strategic alliances with other families or clans (UNICEF 2001; Bott et al. 2003; Mathur, Greene, and Malhotra 2003). All of the programs reviewed in this study address at least one of these key drivers of child marriage.

The negative consequences of child marriage are considerable for girls, their families, their communities, and ultimately their countries. At the individual level, child marriage deprives girls of basic human rights and marks an abrupt end to childhood, bringing on a rapid transition to adulthood and forcing girls to take on adult roles and responsibilities before they are developmentally ready (UNICEF 2001 and 2005; Mathur, Greene, and Malhotra 2003; Jain and Kurz 2007). Moreover, because child marriage in most societies is quickly followed by childbearing, the risk of maternal mortality and morbidity and infant mortality increases (UNICEF 2001 and 2005; Bott et al. 2003; Mathur, Greene, and Malhotra 2003; Save the Children 2004; Mensch, Singh, and Casterline 2005). Young married girls are also at greater risk of intimate partner violence (IPV) (Santhya et al. 2010) and HIV / AIDS (Clark 2004). Child marriage is negatively associated with girls' education as well. Although the direction of causality in this relationship likely runs in both directions, the evidence is strong that girls with low levels of schooling are more likely to be married early, and child marriage typically puts an end to a girl's education (Jejeebhoy 1995; Mathur, Greene, and Malhotra 2003; Mensch, Singh, and Casterline 2005). Lack of education and restricted access to peers limit a child bride's support systems; without skills, mobility, and connections, her ability to overcome poverty for herself, her children, and her family is hindered (Preston-Whyte et al. 1990; Singh 1998; Zabin and Kiragu 1998).

Of importance to national governments, social and economic development are hindered by child marriage. Girls whose education and human capital acquisition are interrupted by marriage are less able to contribute to the growth and development of their countries. National and international indicators regarding maternal health, education, food security, poverty eradication, HIV / AIDS, and gender equality are all negatively associated with high rates of child marriage. In fact, child marriage undermines the achievement of each of the eight Millennium Development Goals and targets to reduce poverty worldwide (UNICEF 2006; IPPF 2007; Hervish and Feldman-Jacobs 2011).

In recognition of these key links, child marriage interventions have increased significantly in the past two decades, with many following the 1994 United Nations

International Conference on Population and Development and the 1995 International Conference on Women. More recently, interest in preventing child marriage has resulted from increasing recognition of the importance of girls and women in development efforts. Several organizations have published illustrative reviews of child marriage prevention initiatives and have highlighted promising programmatic approaches (for example, see USAID 2009; Hervish and Feldman-Jacobs 2011). Comprehensive reviews to assess the quantity and quality of existing programs have been more limited, however. The International Center for Research on Women (ICRW) undertook one such effort in 2007 and identified 66 programs in 30 countries (Jain and Kurz 2007). A follow-up review that focused solely on India identified 58 program and policy initiatives related to child marriage there (Mukherjee et al. 2009). All of these reviews noted the lack of evaluation among these efforts (Jain and Kurz 2007; Mukherjee et al. 2008; Hervish and Feldman-Jacobs 2011). For example, Jain and Kurz (2007) found that only 10 percent of the programs identified in their scan had been evaluated. Even fewer have been evaluated using rigorous methodologies or have included sufficient information concerning the evaluation process for others to assess the merits of the findings. Consequently, although we have learned more about the types of programs that exist, we know little about the success of these efforts. Given the urgency of the issue and the scarce resources available to address it, focusing efforts and resources on programs that are most likely to work is essential.

To address this gap, the World Health Organization (WHO) in 2009 commissioned this review of evaluated child marriage prevention programs as part of a larger effort to understand which interventions reduce pregnancy and poor pregnancy outcomes among adolescent girls in developing countries (WHO 2012). This article identifies and characterizes the evaluations of child marriage prevention programs, systematically analyzing their strategies, methods, results, shortcomings, and omissions in an effort to consolidate and assess the evidence base of preventing child marriage. Based on this review, we provide analysis of what has worked and offer recommendations for strengthening future efforts.

Methodology

For this review, we sought studies of deliberate program interventions or policies that had documented measurement of change in behavior, knowledge, or attitudes related to child marriage among relevant stakeholders, such as girls at risk of child marriage, parents, and religious or community leaders. In our search of international and regional databases, we used search terms that would enable us to identify evaluated interventions that sought to influence political leaders/planners at any level, focused on influencing community and family norms, offered economic incentives to families, attempted to inform and empower adolescents, increased understanding of the value of girls' education, and/or expanded girls' education or livelihood opportunities. Our database searches identified peer-reviewed articles and nonpeer-reviewed "gray literature." Additional evaluations from the "gray literature" were identified by examining literature reviews, reviews of existing programs, and other materials; conducting a general online search; and querying websites and staff of organizations known to work in child marriage prevention. The formal database search included articles published anytime before August 2010, and our informal search continued until May 2011. In total, we identified 23 programs for inclusion. Information on and the evaluation of some of the programs appeared in more than one article, resulting in 34 articles included in the review.

We abstracted key information from each study, including program and study objectives, theory of change, target population, intervention type and design, evaluation design, outcome indicators, and findings. When further information was needed, we attempted to communicate with the implementing organizations' study authors or staff members. Contact information was not always available and contacted individuals did not always respond; thus, such communication occurred only in a few instances.

The 23 programs described in the 34 included articles were implemented between 1973 and 2009, with several continuing through the present. Evaluations were published between 1991 and 2011. Much of the program activity is recent: 13 of the programs (more than half) were initiated in the last decade. Seven programs were initiated in the 1990s, coinciding with the United Nations conferences mentioned above, whereas only 3 programs were active before the 1990s. Reflecting this implementation pattern, 21 of the 34 studies were published in 2006 or later. Only 5 of the studies were published in peer-reviewed journals and only 8 were identified through the initial database search; the remainder were located through other methods. These patterns of implementation and publication help elucidate why so little information on the success of child marriage prevention programs is available.

Because our search identified so few evaluated interventions, we included all of the identified studies in our analysis and considered the body of evidence as a whole, regardless of the rigor of the intervention design

or the evaluation methodology.[2] Given the current lack of knowledge concerning what works to prevent child marriage, we believed that the field would benefit most from this inclusive approach. Because of this wide range in degree of rigor, however, we further ranked the design and evaluation of the programs into the following three tiers of methodological quality.

High Rigor. To be included in this group, the program design must have used randomization (at the individual or group level) to make assignments into intervention and comparison groups to ensure their comparability before program implementation and/or used statistical controls in the analysis to account for selection bias, and measured at least one outcome before and after the intervention. In addition, the evaluation analysis must have included multivariate comparisons between program and control groups/individuals, controlled for selection bias and/or potentially confounding variables if necessary, and reported results of statistical significance tests. Four studies met these criteria.

Medium Rigor. To be included in this group, the program design must have included a comparison group and the evaluation had to employ both baseline and endline data or some other analytic strategy to assess change over time (for example, life table analysis). The comparison groups in these studies were typically not randomly selected or the groups had other issues of comparability that were not or could not be resolved in the analysis. These studies used different techniques to help ensure that any observed changes could be attributed to the program itself, but not to the degree of the most rigorous studies. Many of these studies made only bivariate comparisons and/or did not typically report results from statistical significance tests. Seven studies met these criteria.

Low Rigor. Studies in this group included those that measured outcomes only at one point in time and often only among program participants, as well as observational studies (those in which the assignment of subjects into intervention and control groups is outside the control of the investigator), studies with small sample sizes, and studies that provided insufficient information for us to make a complete assessment. Twelve studies were included in this category.

Biases and Limitations

Several types of bias are likely to have influenced our findings. Although neither publication in a journal nor peer review was required for inclusion, publication bias likely resulted from the fact that the evaluation efforts had to be: documented; written in or translated into English, French, or Spanish; and either indexed in one of the searched databases, listed on a website indexed by Google, or known to staff at an organization working to address child marriage. In addition, interventions are more likely to be published or documented in the gray literature if they are successful, and interventions funded or implemented by international donors or nongovernmental organizations are more likely to be evaluated and documented. Reporting bias may also be present within the reviewed studies—that is, selective reporting of results may have favored the assessment that the intervention was effective. We were further hindered by the limited information contained in study documents. Articles published in peer-reviewed journals were constrained by word limits, and reports published in the gray literature often targeted nonresearch audiences and thus contained limited technical information regarding the study and evaluation design and the program objectives. Because our assessments were often entirely based on the available documentation, they may not reflect program activities completely or accurately. Furthermore, the range of methodologies in the studies precluded the pooling of data for a meta-analysis (Armstrong, Waters, and Doyle 2008). Because of these limitations, we can say little regarding what fails to work to prevent child marriage.

Findings

Program Objectives and Approaches

We first examined the stated objectives described in the 23 reviewed programs and analyzed the approaches employed in achieving them. Initially, we attempted to deduce the degree of intentionality in targeting child marriage prevention based on stated program objectives, activities, and measured outcomes described in program documents and, if necessary and possible, through contact with program staff. Notable variation existed among the programs in degree of intentionality: only 4 of the 23 programs addressed child marriage prevention as a primary objective, whereas 13 included it as one of several objectives, and 6 addressed objectives related to child marriage less explicitly than the other programs (see Table 2, "Centrality of objective" column). We refer to these 6 programs as having a "peripheral" focus on child marriage. The peripherally focused programs—all of which were implemented in contexts in which child marriage is prevalent—targeted change in one or more of the key drivers of child marriage (for example, poverty, gender norms). The program activities and/or the explicit measurement of attitudes or behaviors related to child marriage in the baseline and endline evaluation of the peripherally focused programs suggest that their designers anticipated that the program would influence child marriage.

Table 2 Evaluations of child marriage prevention programs, 1973–2009

Country/Program/Years	Study	Program approaches					Centrality of objective	Rigor of program design and evaluation	Evaluation results		Method	Evaluation strategy	
		1 Empowerment	2 Community	3 Schooling	4 Economic	5 Legal/policy			Knowledge/attitudes	Behavior		Use of control group	Availability of comparison data
Afghanistan													
Community-Based Rural Livelihoods Programme 2003–06	Gandhi and Krijnen 2006	Primary	Primary	Primary	—	Primary	Peripheral	Low	Positive	Positive	Qualitative (interviews)	No	Endline only
Bangladesh													
Adolescent Reproductive and Sexual Health (ARSH)/KAISHAR 2002–08	Save the Children 2009a and 2009b	Primary	Primary	Secondary	—	—	One of several	Low	—	Mixed	Quasi-experimental; mixed methods	No	Baseline and endline
Adolescent Reproductive Health Education Intervention 1995–99	Rashid 2003; Rashid et al. 1999	Primary	—	—	—	—	One of several	Low	Positive	—	Qualitative (focus groups, open-ended interviews)	No	Endline only
BRAC Adolescent Development Program 1993–2009	Nawaz and Ahmed 2009	Primary	—	Primary	—	—	Peripheral	Low	Positive	—	Quasi-experimental; mixed methods	No	Baseline and endline
ELA Centers 2005–07	Shahnaz and Karim 2008	Primary	Secondary	—	Primary	—	One of several	Medium	No change	Positive	Quasi-experimental; mixed methods	Yes	Baseline and endline
Female Secondary School Scholarship Program 1994–96	Arends-Kuenning and Amin 2000; Amin and Sedgh 1998	—	Primary	Primary	Primary	—	One of several	Low	—	Positive	Observational; quantitative	No	Baseline and endline
Gender Quality Action Learning (GQAL) program 2005–06	Alim 2007	—	Primary	—	—	—	Peripheral	Low	Mixed	—	Quasi-experimental; mixed methods	No	Baseline and endline
Kishori Abhijan 2001–03	Amin and Suran 2005; Amin 2007	Primary	Secondary	Secondary	Primary	Secondary	One of several	Medium	—	Mixed	Quasi-experimental; mixed methods	Yes	Baseline and endline
Egypt													
Ishraq 2001–04	Brady et al. 2007	Primary	Secondary	Primary	—	—	One of several	Medium	Mixed	Positive	Quasi-experimental; mixed methods	Yes	Baseline and endline
New Horizons 1999–2002	NSCE 2003; CEDPA 2005 and 2006b	Primary	Secondary	—	—	—	One of several	Low	Mixed	—	Qualitative (focus groups, open-ended interviews)	Yes	Endline only
Ethiopia													
Berhane Hewan 2004–06	Erulkar and Muthengi 2007 and 2009	Primary	Primary	Primary	Primary	—	Primary	High	No change	Mixed	Quasi-experimental; quantitative	Yes	Baseline and endline
Early Marriage Evaluation Study (EMES) 2002–07	Gage 2009	Primary	Primary	Primary	Secondary	Primary	One of several	Low	Mixed	No change	Observational; quantitative	Yes	Endline only

(continued)

Table 2 (continued)

Country/Program/Years	Study	Program approaches							Evaluation results		Method	Evaluation strategy	
		1 Empower-ment	2 Community	3 Schooling	4 Economic	5 Legal/policy	Centrality of objective	Rigor of program design and evaluation	Knowl-edge/attitudes	Behavior		Use of control group	Availability of comparison data
India													
Development Initiative Supporting Healthy Adolescents (DISHA) 2005–07	Kanesathasan et al. 2008	Primary	Primary	Secondary	Secondary	—	One of several	Medium	Positive	Positive	Quasi-experimental; mixed methods	Yes	Baseline and endline
Maharashtra Life Skills Program 1998–99	Pande et al. 2006	Primary	Primary	—	—	—	Primary	High	—	Positive	Experimental; mixed methods	Yes	Baseline and endline
PRACHAR 2002–05	Rahman and Daniel 2010; Wilder, Masilamani, and Daniel 2005	Primary	Primary	—	—	—	One of several	Medium	—	Positive	Quasi-experimental; quantitative	Yes	Endline only
Tubewell Intervention 1973–82	Srivastava, Saxena, and Mathur 1991	—	Secondary	—	Primary	—	Peripheral	Medium	—	Positive	Quasi-experimental; quantitative	Yes	Baseline and endline
Better Life Options Program 1989–99	CEDPA 2001 and 2006a	Primary	Primary	Secondary	—	—	One of several	Low	—	Positive	Quasi-experimental; quantitative	Yes	Endline only
Indonesia													
Indonesia's Marriage Law; passed in 1974	Cammack, Young, and Heaton 1996	—	—	—	—	Primary	Primary	Low	—	No change	Observational; quantitative	No	Retrospective survey data
Kenya													
School-Based HIV/AIDS Prevention Program 2002–05	Duflo et al. 2006	Primary	Secondary	Primary	Primary	—	Peripheral	High	—	Mixed	Experimental; mixed methods	Yes	Baseline and endline
Malawi													
Zomba Cash Transfer Program 2007–09	Baird et al. 2010; Baird, McIntosh, and Ozler 2011	—	—	Primary	Primary	—	Peripheral	High	—	Mixed	Experimental; quantitative	Yes	Baseline and endline
Nepal													
Adolescent Participatory Project 1998–2003	Mathur, Mehta, and Malhotra 2004	Primary	Primary	Primary	Secondary	—	One of several	Medium	—	Mixed	Quasi-experimental; mixed methods	Yes	Baseline and endline
Senegal													
Tostan 1991–2002	Diop et al. 2004; UNICEF 2008	Primary	Primary	—	—	—	One of several	Low	Positive	Mixed	Quasi-experimental; mixed methods	Yes	Endline only
Yemen													
Integrated Action on Poverty and Early Marriage 2005–08	Pedersen, Mukred, and Qaid 2008	Primary	Primary	—	Primary	Primary	Primary	Low	Positive	—	Qualitative (interviews, focus groups)	No	Endline only

Notes: Programs were evaluated for specific intervention periods. Evaluations were published between 1991 and 2011.   — = Not applicable.

Two of the four most rigorous studies had child marriage prevention as a primary objective and the remaining two targeted child marriage peripherally. Among the seven moderately rigorous studies, all but one included child marriage prevention among several other objectives and the remaining study addressed child marriage peripherally.

We assessed the approaches that each of the programs used to achieve its objectives. The 23 programs employed one or more of five main approaches to change behaviors, knowledge, and/or attitudes related to child marriage. For more information regarding these approaches, see the 2011 study by Malhotra and colleagues. The five approaches are as follows.

Approach 1: Empowering Girls with Information, Skills, and Support Networks

Eighteen of the 23 programs included as a primary approach efforts to reach girls at risk of child marriage directly, focusing on training in life skills and vocational and livelihoods skills, sharing information, creating safe spaces, and developing support networks. The main rationale behind these interventions is that increasing young girls' knowledge about themselves, their world, and their options and ending their social and economic isolation will enable them to act and advocate for themselves more successfully. A related rationale is that girls with more human and social capital will aspire to jobs and enterprises as alternatives to marriage. Also, the girls may be viewed differently by parents and community members, making it less acceptable for them to marry at young ages and thus helping to change child marriage norms. These activities may, at least for the duration of the program, serve as socially acceptable alternatives to marriage, something often lacking in communities where child marriage is prevalent.

Approach 2: Educating and Mobilizing Parents and Community Members

Thirteen of the programs had as a primary approach and six had as a secondary approach a focus on changing social norms among parents and community members regarding child marriage. Because social norms are a key driver of child marriage and because parents and other family and community members are often the primary marriage decisionmakers, many interventions attempt to influence their attitudes toward the practice and increase their knowledge of its negative consequences. This approach usually accompanies other approaches described here, especially Approach 1.

Approach 3: Enhancing the Accessibility and Quality of Formal Schooling for Girls

Nine of the programs included as a primary approach and four as a secondary approach the attempt to improve opportunities for girls to attend and stay in school, or invest in the content or quality of their education. Such programs focused on preparing and supporting school enrollment or re-enrollment and providing cash, scholarships, uniforms, and supplies as incentives for enrolling and/or remaining in school. Schooling may be protective against marriage for several reasons. First, in many countries, schooling and marriage are viewed as incompatible activities; girls are often required—in practice and often in policy—to leave school upon marriage, and many parents are willing to postpone marriage so their daughters can attain a higher level of education (Bajracharya and Amin 2010; Lindstrom and Brambila Paz 2001). Second, being in school may reinforce the norm that girls are children rather than marriageable adults. Third, better quality and secondary education may make the returns on human capital investment in girls more apparent and justifiable for both parents and society. Moreover, schooling helps girls develop social networks and acquire skills and information, enabling them to gain autonomy and better communicate and negotiate their interests.

Approach 4: Offering Economic Support and Incentives for Girls and Their Families

Eight of the programs provided as a primary approach and three as a secondary approach economic incentives to girls and their families and/or attempted to increase economic opportunities to offset the costs of bearing and rearing girls and to change norms that proscribe girls' economic participation. Programs employing this approach adopted at least one of the following two strategies: cash and noncash incentives, subsidies, loans, and scholarships to families or girls; and microfinance and related training to support income generation by adolescent girls.

Approach 5: Fostering an Enabling Legal and Policy Framework

Three programs focused on legal and policy environments as a primary approach and one employed this as a secondary approach. The legal and policy environment can be instrumental in changing individual behavior and can signal—or even foster—shifts in norms away from child marriage. Interventions using this approach typically include the establishment or reform of the legal minimum age of marriage, and direct advocacy and awareness-raising among government officials for new

policy initiatives and/or enforcement of child marriage laws and policies, as well as raising awareness among community members of the negative consequences of child marriage and the existence of or necessity for laws prohibiting it.

Twenty of the interventions employed multiple approaches. Eighteen of the programs employed more than one primary approach and four used four different primary approaches simultaneously. Consequently, the total number of programs employing a given approach does not equal 23, the number of programs reviewed. Most commonly, the programs combined as primary approaches girls' empowerment (Approach 1) with the education and mobilization of parents and community members (Approach 2) (11 programs) or girls' empowerment with enhancing access to formal schooling (Approach 3) (7 programs). Approach 1 was the most commonly used approach; Approach 5 was the least commonly used.

The 13 programs that addressed child marriage as one objective among several typically started from a girls' empowerment or gender equity framework. The programs addressed child marriage prevention in tandem with the empowerment and skills-building of girls and young women in various spheres of life such as health, livelihoods, and education, because gender inequity in these domains shares many of the same root causes, including poverty or inequitable gender norms. Consequently, these programs were often complex, addressing multiple drivers of child marriage with an integrated set of programmatic approaches. For example, the Development Initiative Supporting Healthy Adolescents (DISHA) program in India (Kanesathasan et al. 2008) involved life skills education, reproductive health education and services, efforts to change community norms, livelihoods training, and opportunity creation. Two of the programs addressing child marriage as a primary objective—the Berhane Hewan Program in Ethiopia and the Maharashtra Life Skills Program in India—shared this comprehensive, integrated strategy. These programs had a singular focus on child marriage and targeted multiple drivers of child marriage by using several programmatic approaches simultaneously.

The six programs with a more peripheral focus on child marriage used fewer programmatic approaches and targeted one or two key drivers of child marriage. These programs included the Kenya School-Based HIV/AIDS Prevention Program (Duflo et al. 2006) and the Malawi Zomba Cash Transfer Program (Baird et al. 2010; Baird, McIntosh, and Ozler 2011). Both focused on the provision of incentives to change behavior, but neither focused directly on discouraging child marriage. The Zomba Program offered cash incentives, some of which were conditional upon school enrollment and attendance. Although child marriage prevention was not a primary objective,

the Zomba Program addressed a key driver of child marriage, and its evaluation included the measurement of change in child marriage among recipients. The remaining studies that focused peripherally on child marriage, including the Gender Quality Action Learning (GQAL) program in Bangladesh (Alim 2007) and the Community-Based Rural Livelihoods Program in Afghanistan (Gandhi and Krijnen 2006), typically addressed a more general development problem, such as poverty, adolescent development, or gender inequality, and addressed child marriage as part of program activities and/or their evaluation data permitted the analysis of impact on child marriage knowledge, attitudes, or behavior.

Evaluation Strategies

Our second objective was to review the evaluation methodologies used in the included studies and assess their limitations. The evaluations examined changes in child-marriage-related knowledge, attitudes, and behaviors among girls at risk, parents, community members and officials. The measured outcomes included changes in knowledge of negative consequences associated with child marriage, perceptions of the ideal age at which girls should marry, attitudes toward decisionmaking regarding marriage, actual age at marriage for girls, and proportions of girls marrying before age 18. Eighteen of the 23 programs measured changes in marriage behavior; 12 measured changes in knowledge/attitudes.

The majority of evaluations (19) collected quantitative data to measure changes in outcomes related to child marriage. Four relied exclusively on qualitative data, and eight relied exclusively on quantitative data. Eleven used mixed methods to corroborate and elucidate their findings. Studies using quantitative data typically collected survey data from a sample of individuals in the program and control areas, or used village census data. The 15 studies using qualitative methods typically conducted focus group discussions and in-depth interviews, although some also included observation. The qualitative studies provided the least amount of information on the data collection and analysis process and thus were the most difficult to assess for their degree of completeness, rigor, and strength of results. The studies incorporating both quantitative and qualitative data typically provided more information regarding quantitative data collection methods and analysis, and emphasized the quantitative findings in the discussion.

Many of the evaluations framed their results with rich contextual information, and some demonstrated the effective use of qualitative data to supplement quantitative findings in explaining observed changes. For example, qualitative interviews with parents, teachers, and

girls conducted during the evaluation of the Maharashtra Life Skills Program in India (Pande et al. 2006) suggested that after the course "girls were more confident, spoke without hesitation or fear, exhibited more self-discipline, were more independent in day-to-day activities, and ultimately started influencing decisions in the household and about their own lives, including their marriage." This contextual richness is especially evident in the evaluations of the community-based, girl-focused interventions such as the Maharashtra Program. Most of the studies reviewed here, however, would have benefited from additional information regarding the process and mechanisms of change. Even the evaluation of the Maharashtra Program did not include sufficient qualitative data to determine the reason for the program's success in delaying marriage: whether it changed underlying community norms, provided a competing demand on girls' time, or some combination of these mechanisms.

Few evaluations documented other potential influences on the measured outcomes from the control areas or groups during the intervention period. Other interventions, economic changes, environmental influences, civil unrest, and similar changes outside the control of program designers could influence behavior in these areas. In some settings, development initiatives were numerous and might well have influenced the results. Future evaluation efforts should take into greater consideration the influence of these and other outside forces.

The evaluation strategies used in the reviewed studies reflect the realities of implementing interventions in developing country contexts, with implementers and evaluators facing limited budgets, capacity, and infrastructure, and other challenges. Some evaluators used innovative data collection methods or statistical techniques to compensate for the limitations of imperfect program design, selection bias, or lack of baseline data. For example, evaluators of the Kenya School-Based HIV/AIDS Prevention Program (Duflo et al. 2006) used an inventive technique to minimize the loss of girls who had married during the intervention. Evaluators would read aloud the names of those who had been present at baseline in classrooms of upper-level students and, if the individual was absent, asked whether the student was married. Several other studies used propensity score matching, which has become a popular tool for addressing selection bias and has been recommended by others as a method of achieving results that are closer to those of experimental studies (Dehejia and Wahba 1999). The DISHA evaluation in India compensated for the lack of endline data from its control areas that resulted from flooding by using propensity score matching (Kanesathasan et al. 2008).

Of the 23 programs, 4 allowed for highly methodologically rigorous evaluation, 7 for moderately rigorous evaluation, and 12 for substantially less rigorous evaluation. Given the constraints of context and resources, our finding that only 4 programs implemented highly rigorous evaluation is perhaps not surprising. The conclusions that can be drawn concerning child marriage interventions are constrained, however, because of these limitations in methodological rigor.

Participant selection bias is the most significant potential limitation of the reviewed studies. Whereas any number of factors may introduce bias into such evaluations, one especially relevant factor is the possibility that girls who chose to participate in the interventions—or the girls' parents—may be more likely to be predisposed to delay marriage than are those who do not participate. For example, parents who were especially concerned about the potential risk of program participation to their daughter's safety and sexual purity would probably be less likely to consent to her participation and more likely to have her marry at a younger age. Thus, the estimates of intervention impact are likely to be upwardly biased.

Traditional social science methods indicate that experimental methods can eliminate or substantially reduce selection bias. Three of the four programs with a high degree of methodological rigor employed experimental designs: the Maharashtra Life Skills Program in India, the School-Based HIV/AIDS Prevention Program in Kenya, and the Zomba Cash Transfer Program in Malawi. Such techniques assume that random assignment renders participants and nonparticipants (or groups) identical except for their program participation status, and thus any differences in the outcome observed between the two after participation can be attributed to the intervention. The quasi-experimental studies used features of experimental design, such as the comparison of results from intervention and control groups, to reduce selection bias and, at a minimum, to help clarify the attribution of impact. Some of these studies also used statistical methods such as propensity score matching to address selection bias in the analysis or to bolster the available data. The quasi-experimental studies did not, however, randomly assign individuals to intervention and control groups, a hallmark of experimental designs. The generalizability of the results of the quasi-experimental studies may thus be limited. Moreover, a considerable number of the included studies (eight) did not include comparison groups at all, seriously limiting the conclusions that can be drawn.

Other significant features of the evaluation approaches include the inability to discern the impact of specific program components, the lack of analysis of intervention by age or other participant characteristics, the reliance on self-reported age in the measurement of impact, and the short time horizon of many evaluations.

Most interventions employed at least two programmatic approaches, and with only one exception—the Kenya School-Based HIV/AIDS Prevention Program (Duflo et al. 2006)—did not attempt to determine the independent impact of each approach or discern whether individual intervention components were effective or worked synergistically. More widespread use of staged or graduated implementation designs would help to pinpoint the effectiveness of each program arm.

Some of the evaluations examined the differential impact of the intervention by age (for example, Amin and Sedgh 1998; Arends-Kuenning and Amin 2000; Erulkar and Muthengi 2007 and 2009; Gage 2009), but most did not. Given the significant physiological, emotional, and psychological differences between very young adolescents and those closer to adulthood, the determinants of very early marriages may differ from those of marriages occurring later, and programs may well have different impacts by age. Disentangling these potential differential impacts is essential, especially in settings where high proportions of girls marry before reaching age 15. Such analysis also reveals whether an intervention succeeded in delaying marriage at all, as the Berhane Hewan program did, even if it did not succeed in delaying it to age 18 or beyond. The age of 18 is an important milestone, but any delay in marriage may be beneficial. Furthermore, understanding variations of impact by age helps to elucidate why interventions succeed or fail and helps to inform the design of future activities. Explicit analysis of variations in other participant characteristics, such as comparisons between in-school and out-of-school girls, and between those living in rural versus urban areas, might be similarly instructive but were not widely found in the studies reviewed here.

Another noteworthy feature of most of the evaluations is that they relied on self-reported age to determine age at marriage. Given that early marriage is illegal in many of the settings being investigated and that many individuals do not know their precise age, findings based on self-reported age may be imprecise and may bias estimates of impact upward. This is especially likely in the findings of interventions that educated participants or community members about the legal age of marriage or the negative consequences of child marriage. Finally, the short time horizon of most evaluations leaves us without data to assess the long-term sustainability of changes in attitudes, knowledge, and practices concerning child marriage.

Program Evaluation Results

Twelve of the 23 programs examined changes in attitudes or knowledge concerning child marriage: 6 obtained positive results, 4 documented mixed results, and 2 found no

change. Eight of the 12, however, employed low methodological rigor. The only highly rigorous evaluation to measure change in knowledge or attitudes, the Berhane Hewan program in Ethiopia (Erulkar and Muthengi 2007 and 2009), found no significant change in the preferred age at marriage between intervention and control villages. Of the seven moderately rigorous studies, three examined changes in knowledge or attitudes: one found positive results, one found mixed results, and one found no significant change. The DISHA program in India (Kanesathasan et al. 2008) found statistically significant differences between the control and intervention groups in the ideal age of marriage and in knowledge of the legal marriage age, whereas the Ishraq study in Egypt (Brady et al. 2007) found mixed results: a statistically significantly smaller proportion of intervention participants desired being married before age 18, compared with girls in the control group and among nonparticipating girls in intervention villages, but the difference between them in attitudes concerning marriage decisionmaking was not statistically significant.

The proportion of programs measuring behavior change that were found to yield behavior change was similar to the proportion yielding change in knowledge or attitudes among those measuring such change. For behavior change, 9 found positive results, 7 found mixed results, and 2 found no significant change; for change in knowledge or attitudes, 6 were positive, 4 mixed, and 2 no change. An important difference, however, is that the methodological rigor of the evaluations examining behavior change was considerably stronger than that of the evaluations of change in knowledge or attitudes. Only 2 of the 10 programs that yielded positive or mixed results for change in knowledge or attitudes were of medium rigor and none were of high rigor, whereas 11 of the 16 of the programs that yielded positive or mixed results for behavior change were of either medium (7 programs) or high (4 programs) rigor. Thus, greater stock can be placed in the validity of the findings of behavior change than in those of change in knowledge or attitudes.

Of the four highly rigorous evaluations that examined changes in marriage behavior, two focused primarily on providing incentives and two on more comprehensive programs. Only one of these four studies had exclusively positive results (the Maharashtra Life Skills Program in India), whereas three had mixed results (the Berhane Hewan program in Ethiopia, the Zomba Cash Transfer Program in Malawi, and the School-Based HIV/AIDS Prevention Program in Kenya). The Maharashtra Program succeeded in increasing the mean age of marriage among girls in the intervention group by one year and found that the proportion marrying before age 18 declined by almost 20 percentage points in the

intervention area, compared with no significant change in the control area.

Among the three programs evaluated with high methodological rigor and yielding mixed results, the Berhane Hewan program in Ethiopia succeeded in reducing very early child marriage (among girls aged 10–14) but found that, among girls aged 15–19, those in intervention villages were significantly more likely to be married than were those in control villages (Erulkar and Muthengi 2007 and 2009). This suggests that the intervention succeeded in delaying very early marriage but also that these marriages were simply postponed until later in childhood, not beyond age 18. The Zomba Cash Transfer Program in Malawi tested the influence of conditionality in cash transfer programs on changing marriage behavior (Baird et al. 2010; Baird, McIntosh, and Ozler 2011). The studies of this intervention found that girls who were not enrolled in school at baseline were 40 percent less likely to marry after receiving cash transfers conditional upon school enrollment and attendance than were those who did not receive cash transfers. This suggests that they were at a higher risk of early marriage and that school enrollment had a protective effect. Conversely, among those enrolled at baseline, the child marriage behavior of participating girls was not significantly different from that of the control girls. After two years, however, unconditional transfers offered significant protection against child marriage for girls enrolled in school at baseline but who dropped out during the intervention. This suggests that among girls who are likely to drop out of school and have a high risk of early marriage, additional income may be a critical determinant of their ability to delay marriage. The School-Based HIV/AIDS Prevention Program in Kenya had similarly mixed results from its investigation of whether reducing the cost of schooling by providing free school uniforms and providing teacher training on the subject of HIV/AIDS risk behavior would reduce child marriage (Duflo et al. 2006). Girls in schools receiving free uniforms were 12 percent less likely to be married than were girls in control schools, and boys were 40 percent less likely to be married, but no statistically significant difference was found in the likelihood of marriage among children of either sex in schools that received teacher training.

Discussion and Recommendations

In the analysis above, we examined 23 interventions to prevent child marriage along several dimensions—first by programmatic approach, then by evaluation strategy and quality, and finally by their success in preventing child marriage or changing related knowledge, attitudes, or behaviors. The analysis by approach revealed that pro-grams employ five approaches. Most employed at least two primary approaches, and some also used secondary approaches. The analysis by evaluation strategy revealed a variety of methodologies and data collection methods, a wide range in the degree of rigor, and several important limitations. The analysis by program evaluation results demonstrated that integrated programs focusing on girls' empowerment and programs offering incentives have been reasonably successful in preventing child marriage and changing related attitudes and knowledge.

Taken together, these separate analyses reveal important patterns—in particular, the existence of three main groupings of programs—and highlight the programs' strengths and weaknesses. Programs in the first grouping take an integrated, "horizontal" approach, and employ multiple strategies or levers of change simultaneously to address child marriage and related objectives in a holistic manner. The second grouping takes a more narrowly focused "vertical" approach and typically addresses child marriage more peripherally. Programs in the third grouping take a more activist approach, focusing on national advocacy and legislative efforts.

The first grouping ("horizontal programs") includes many that worked directly with girls to empower them with information, skills, and resources. Examples include the Ishraq program in Egypt, the Berhane Hewan program in Ethiopia, the Adolescent Participatory Project in Nepal, and in India the Development Initiative Supporting Healthy Adolescents (DISHA), the Maharashtra Life Skills Program, and the Promoting Change in Reproductive Behavior (PRACHAR) program. These programs were typically implemented and evaluated by local organizations in partnership with international nongovernmental organizations such as ICRW, Pathfinder, the Population Council, and Save the Children, all of which have many years of experience with child marriage prevention activities. Such programs explicitly targeted child marriage, either as a primary objective or as one of several, and are based on the premise that an integrated, multipronged approach is the best method of fostering sustained reduction in child marriage following program implementation. The best examples of this approach provided clearly articulated theories of change, addressed multiple drivers of child marriage, and had well-designed and relatively rigorous evaluations that offered quantitative estimates of impact couched in rich contextual information that helped elucidate the process of change. Most achieved positive or mixed results in the near-term regarding changing behaviors and attitudes related to child marriage. Moreover, because of the horizontal programs' focus on changing deeply entrenched norms and opportunity structures for girls, these programs may have been more successful in achieving sus-

tained impact beyond the life of the intervention than were vertical "single lever" interventions. Thus, the evidence suggests that this is a promising approach.

The second grouping ("vertical programs") includes larger-scale school- and incentive-based programs such as the Zomba Cash Transfer Program in Malawi and the School-Based HIV/AIDS Prevention Program in Kenya, which test the impact of incentives and girls' school enrollment and retention on delaying marriage. These programs have emerged from a different constituency (one that has more recently begun to pay attention to child marriage), including national ministries, multilateral agencies such as the World Bank, and experts from the health and education sectors. Although such programs do not typically address child marriage as a main objective, they focus on two fundamental drivers of child marriage—poverty and lack of schooling—and have been implemented in contexts in which child marriage is of concern. The success of these programs in reducing child marriage despite their peripheral focus on the issue pinpoints two largely untapped approaches to child marriage prevention: working through the education system and providing incentives to alleviate poverty and encourage schooling. Providing incentives and education are politically popular and of interest to large-scale actors such as educational systems and multilateral organizations. Such efforts thus offer the promise of scale, which has been elusive for more community-based, girl-focused, integrated approaches. Furthermore, the narrower scope and simplicity of such programs facilitates their implementation and use of rigorous evaluation methodologies. Because these programs are fewer in number and their evaluations are just emerging, a critical mass of results providing concrete and reliable guidance does not yet exist. The impact on child marriage for both the Malawi and Kenya programs is encouraging but not definitive, perhaps precisely (or at least in part) because of their less direct focus on child marriage. Nevertheless, the evidence suggests that this is another promising approach to reduce child marriage.

A third set of programs ("activist programs") focused primarily or exclusively on national advocacy and legislative efforts or broad-based regionally targeted community mobilization. These included the legislative reform concerning the minimum age of marriage in Indonesia, the Gender Quality Action Learning (GQAL) program in Bangladesh, and the Tostan program in Senegal. These types of programs have been less widely implemented, less well evaluated, and, based on the few evaluations reviewed here, less effective than the other program groupings. Although the evidence for legislative efforts is insufficient (n = 1) to make definitive statements, such efforts are likely to make possible large-scale change but are likely insuffi-

cient for fostering sweeping change in the absence of other programmatic efforts.

These three groups are distinguished from one another by the complexity of their programmatic approaches and evaluation strategies, their scale, and their focus. Because the evidence concerning the activist programs is relatively weak, more definitive statements can be made regarding the horizontal and vertical program groupings. Thus, the remainder of our discussion concerns only the horizontal and vertical program groupings, although we draw key lessons from the activist grouping as well.

Horizontal programs face a number of challenges that undermine their effectiveness in child marriage prevention. First, the programmatic complexity of horizontal programs makes sophisticated evaluation challenging, especially given the limited resources and capacity typically available in lower-income countries. Moreover, none of the horizontal program evaluations attempted to ascertain the effectiveness of each program component, whether a particular component was necessary to achieve the observed changes, or which implementation format or intensity was most effective. Given that these program components may operate synergistically to achieve impact, doing so may be difficult. Without the ability to ascertain which components had an impact on which objectives or whether the components worked synergistically, however, this complexity becomes a missed opportunity.

A further critique of horizontal programs is their relatively limited use of structural/institutional approaches to prevent child marriage. For example, given the strong associations between educational attainment and delayed marriage (UNICEF 2007), we find encouraging signs of an increasing number of programs focusing on formal schooling, an approach that previous reviews have determined to be underused in child marriage prevention efforts (Jain and Kurz 2007; Mukherjee et al. 2008). The fact that many horizontal programs are aimed toward changing individual or family behavior, however, rather than on making structural changes to reduce barriers to girls' schooling, suggests that such efforts have not yet been institutionalized. This lack of institutionalization may limit the sustainability of child marriage programs and the reduction in child marriage they may foster.

Finally, and perhaps most important, the cost and infrastructural demands of such complex horizontal programs may make achieving scale and program sustainability unlikely. Given the limited resources available for child marriage prevention programs, this is a critical point for consideration, particularly because some of the successful vertical programs identified in

this review are already reaching many thousands of girls and are using platforms such as schools that are already designed for scale.

In contrast, one critique of vertical programs is that they do not typically incorporate intervention components that may be essential for sustaining impact beyond the life of the intervention, such as direct community engagement to change norms concerning the behaviors the programs are trying to change. By increasing access to schooling and providing cash to poor families, for example, these programs provide immediate or near-term solutions to some of the challenges that compel families to keep their daughters out of school and have them marry as children. These programs may also foster longer-term changes in opportunity structures for girls and shift norms concerning girls' roles, which may eventually foster sustained increases in girls' school enrollment and declines in child marriage. Such programs have typically had short implementation time frames, however. Without direct and immediate efforts to engage with community members, it remains unclear whether these programs can foster behavior change in a critical mass of individuals and families sufficient to foster sustained impact on their primary, secondary, or peripheral objectives.

Furthermore, the evaluations of reviewed vertical programs offer limited information regarding the pathways through which program activities might have influenced (or failed to influence) behaviors and attitudes related to child marriage. Given that these programs have focused more peripherally on child marriage, their limited guidance is not surprising. These evaluations are similarly silent, however, regarding mechanisms through which the programs achieved their main objectives. Thus, the evaluations of these programs have something of a "black box" character, lacking the contextual grounding to illuminate results, and offer relatively limited utility for future program design.

Given the limited use of structural or institutional approaches by horizontal programs, one method for strengthening them would be to formalize their institutional connections, particularly their integration with school systems. More extensive engagement of government school systems with the goal of preventing child marriage could impact millions of girls who are not reached by existing interventions and increase the likelihood of institutionalization and sustainability. Conversely, vertical programs that involve school systems may be strengthened by incorporating some components from horizontal interventions, such as life skills and livelihoods training. This could further maximize the impact of schooling on child marriage and have the added benefit of making formal schooling more relevant to the needs of young people. More systematic involvement of governments in livelihoods training and creation of work opportunities, along with other poverty alleviation efforts, could also have a large-scale impact on reducing child marriage.

Furthermore, designers of future vertical programs should consider incorporating indicators of knowledge, attitudes, and behaviors related to child marriage into their evaluations. Such efforts would help to clarify the ways in which vertical program design can influence child marriage, often an important element in the program's theory of change, and more generally shed light on the program's mechanism(s) of impact on program objectives. Because child marriage has demonstrable negative impact on numerous national development indicators, additional evidence of the impact of vertical programs on child marriage prevention would strengthen the case for investments in such programs.

Designers of vertical programs should consider incorporating the community engagement efforts that so many program implementers consider essential to sustaining impact after program implementation ends. Vertical programs might benefit from the lessons of successful large-scale information, education, and communication (IEC) campaigns such as those implemented in the family planning field. Such campaigns have typically incorporated intensive education initiatives through: the mass media, including radio or television serials; public commitments to behavior change from widely respected spokespeople and opinion leaders; other social media; and other elements drawn from commercial marketing campaigns, sometimes coupled with legislative and advocacy efforts. Vertical programs, with the involvement of large-scale actors (for example, government ministries, multilateral organizations such as the World Bank), already have access to platforms designed for scale and are already targeting significant drivers of child marriage. These programs have typically not directly engaged parents, community members, or religious leaders concerning child marriage, however. The existing potential of these programs could be capitalized upon to reach large numbers of individuals and achieve significant impact on child marriage prevention by incorporating some or all of the elements of large-scale IEC campaigns into their program implementation or by linking their efforts to an IEC campaign implemented by other agencies. A number of organizations, such as the Johns Hopkins Center for Communication Programs, have developed expertise in implementing highly successful campaigns and could offer their expertise on these matters to the child marriage prevention field.

Designers of both types of programs might also consider capitalizing on the selection bias endemic to so

many prevention programs, trying to transform a significant problem into an asset. That is, from the perspective of achieving intervention success, predisposal to delay marriage is a highly desirable attribute of program participants. In fact, innovation and diffusion theories suggest that enrolling "pioneers" who have the inclination and courage to contravene social norms may be the surest and fastest method of achieving social change (Rogers 1995; Gladwell 2002). Once enough pioneers have broken with tradition, new attitudes and behavior can diffuse rapidly across a large population, as efforts to end foot-binding in China, ban smoking, and expand contraceptive use throughout the developing world have demonstrated (Malhotra et al. 2009). Whether future efforts should continue to follow the traditional pathway to change is worth considering.

The evaluation of horizontal programs could be improved through the use of staged, or graduated, implementation of program components. Implementing single components or different combinations of components in separate areas or over time using the same basic design and evaluation strategy would facilitate the use of rigorous evaluation methodologies and help to disentangle the separate and synergistic effects of program components. The Population Council is using such a strategy in conducting a systematic assessment of the relative contribution and cost of different programmatic approaches to delay marriage in several African countries, including Ethiopia, Kenya, Tanzania, and Uganda (USAID 2011). The resulting evaluation will offer important guidance for the field on this issue. Similarly, the evaluation of vertical programs could be modified to better measure outcomes related to child marriage so that the results better illuminate the process by which the program impacts attitudes, knowledge, and/or behaviors related to child marriage.

Some of the evaluations reviewed here focused on measuring changes in individual-level attitudes and knowledge (for example, Brady et al. 2007; Erulkar and Muthengi 2007 and 2009; Kanesathasan et al. 2008). Whether change in individual attitudes results in the change of social norms remains unclear from these findings, however. For example, large proportions of adults in the community in Nepal where the Adolescent Participatory Project was conducted considered—even before the intervention—the ideal age of marriage for girls to be 21, but girls married much earlier nonetheless (Mathur, Mehta, and Malhotra 2004). Whereas the actual marriage age rose in intervention communities, a several-year gap between the ideal and actual ages of marriage still existed, suggesting that norms concerning early marriage remained largely unchanged and that potential

repercussions from contravening those norms remained in force. Because of this potential gap between attitudes and norms, and their implications for sustaining behavior change, future programs should collect more extensive evidence regarding how norms operate in target communities and how program implementation may have influenced them. Furthermore, evaluations of vertical programs could incorporate more specific measurement of changes in attitudes and norms related to child marriage at the individual and community level, and norms more directly associated with primary program objectives.

Many of the reviewed programs attempted to address selection bias and the influence of confounders, with varying degrees of success. These attempts to mimic experimental methods have improved the strength of the evidence base reviewed here. Like other scholars, however, we question whether experimental methods truly succeed in reducing bias in behavioral interventions because of the complexity of such interventions (Victora, Habicht, and Bryce 2004; Deaton 2009). Experimental methods are more appropriate for interventions with a short causal chain, and in which confounding factors are easily identified and/or controlled (Victora, Habicht, and Bryce 2004). The causal chain in child-marriage interventions can be complex, involving a longer timeframe and the influence of numerous contextual factors at multiple levels. Consequently, greater potential exists for intervening variables to influence the outcome. Furthermore, given the time commitment required of participants in some of the interventions here, selection bias may be especially prevalent, even in highly rigorous evaluations. As Heckman and Hotz (1989: 863) write, such issues "compromise the ability of experiments to provide unbiased estimates of program impact without resorting to the non-experimental statistical-adjustment methods that experiments were designed to avoid." Thus, we must not be overconfident in the results of such experimental studies.

We also question whether it is realistic to promote the implementation of true experimental designs in behavioral interventions in low-income contexts. Many of the factors influencing child marriage operate at the community level, implying that randomization might be best implemented at the community rather than individual level. The resources and logistics required to implement an intervention randomized at that level in a sufficient number of communities located far enough away from each other to avoid cross-contamination would be challenging in many lower-income countries, however, and for many implementing organizations.

Despite these reservations, traditional social science standards offer important guidance for improving the methodological rigor of interventions in this field and

should be employed more widely, especially in the attempt to select comparable control groups. Moreover, the exploration of emerging evaluation techniques and initiatives is also warranted. Some of these, such as the "most significant change technique," and the "systems change" and "collective impact" initiatives may be better suited to the endeavor of child marriage prevention than traditional evaluation approaches (Community of Science 2011; Kania and Kramer 2011).

For this review, we examined 23 interventions employing a range of programmatic approaches and a variety of evaluation strategies, with a range of program results. The accumulation of evidence suggests that approaches that attempt to empower girls and that offer incentives can be effective in preventing child marriage. The methodological limitations of the studies reviewed here, however, underscore that more can be learned regarding how these approaches prevent child marriage and whether the impact is sustained beyond the duration of program implementation. Moreover, given the number of interventions related to child marriage that have been implemented around the world, it is clear that more investment in their evaluation is needed. In sum, the body of evidence presented here suggests that interventions can foster changes in attitudes, knowledge, and behavior related to child marriage in relatively short time frames. Moreover, the fact that several different approaches seem to have an impact on child marriage indicates that there is reason for optimism in addressing child marriage effectively.

Notes

1 Child marriage is defined as marriage before age 18, in accordance with the definition of childhood in the Convention on the Rights of the Child (UNGA 1989).

2 A methodologist commissioned by the WHO also assessed the studies according to the GRADE methodology for systematic reviews, an approach developed to provide a structured and explicit method of judging the quality of available evidence based on criteria concerning study design, consistency of results across studies, imprecision, and publication bias, as well as effect size and other dimensions. Because the research questions guiding this review do not lend themselves to randomized controlled trials, most of the available evidence was not considered appropriate for the GRADE methodology. The bulk of the studies identified for this review used quasi-experimental or nonexperimental designs, and the evidence from these types of studies is downgraded relative to randomized controlled trials because of concerns about rigor and is not considered sufficiently rigorous for inclusion in a GRADE-based assessment of evidence on this question. The few identified studies using methodologies closest to experimental designs did not provide evidence in a manner that fits into GRADE. Thus, a complete GRADE assessment was not conducted (WHO 2012).

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