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POPULATION AND POVERTY RESEARCH NETWORK

MAKING THE CASE FOR INVESTING IN ADOLESCENT REPRODUCTIVE HEALTH

A Review of Evidence and PopPov Research Contributions

DECEMBER 2015

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About the Population and Poverty (PopPov) Research Initiative

The William and Flora Hewlett Foundation's Population and Poverty (PopPov) Research Initiative, in partnership with other funders, has supported a global group of researchers looking at how population dynamics affect economic outcomes. Research funded through the PopPov Initiative sheds light on pathways through which fertility, health, and population growth affect economic growth, providing insights and an evidence base relevant to achieving the Sustainable Development Goals. Findings show that investing in women's health, education, and empowerment improves economic well-being for individuals and households, and contributes to economic growth.

About the Author

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Caption for photo, page 2: Family planning and sex education session for teen girls at a soccer field, Uganda.

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MAKING THE CASE FOR INVESTING IN ADOLESCENT REPRODUCTIVE HEALTH

A REVIEW OF EVIDENCE AND POPPOV RESEARCH CONTRIBUTIONS

BY **THOMAS W. MERRICK**

POPULATION REFERENCE BUREAU

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Executive Summary

Solid evidence on the links between preventing adolescent childbearing and alleviating poverty can motivate policymakers and donors to invest in reproductive health and family planning programs for youth. Research that documents the clear cause-and-effect relationship between program interventions and outcomes, such as better health and delayed childbearing among teens, can guide decisions about investments in research or programs.

This report examines the evidence for investing in adolescent reproductive health and family planning programs from the perspective of making an evidence-based argument to guide the investment or spending decisions of public or private organizations. Key steps in developing such an argument—a business case—include the consequences of relevant trends, evidence on the potential of particular actions or interventions to change the status quo, and the costs associated with different actions. This report highlights new research from the Population and Poverty (PopPov) Research Initiative that bolsters the case for these investments and identifies knowledge gaps where research is still needed.

THE CONSEQUENCES OF CURRENT TRENDS

Recent research shows that adolescent childbearing and early marriage are detrimental to girls' health, school completion, and long-term earning potential, and their babies' health and development, contributing to poverty at the household and national level. If countries educate and invest in their young people, then these countries may benefit from the rapid economic growth that may occur when fertility and mortality decline and the working-age population grows in relation to the number of young dependents—a phenomenon known as the demographic dividend. Early marriage and early childbearing can undermine or even erase this potential economic growth through negative effects on the health, education, and earning potential of young mothers and their children.

INTERVENTION OPTIONS

Rigorous new research is examining the potential of interventions to address root causes of early marriage and childbearing in low- and middle-income countries, identifying those that are effective. Major reviews of multiple research studies underscore the importance of local context, showing that some interventions are effective in some settings but not others. This report surveys evidence on the effectiveness of several types of interventions:

School-based programs have been very effective in some settings but have shown mixed effects in others. Most involve a range of interventions (sexuality education, teacher training, services for students). More evidence is needed to sort out the effects of the specific kinds of interventions that are employed and the contextual factors that influence success in implementation.

Peer education has been employed as a behavior change tool in a variety of settings but with mixed results. Program planners need to pay attention to how peer education programs are designed and implemented and to contextual factors that influence their effectiveness.

Youth-friendly services have proven effective in some settings but the impact has been mixed in others. Most programs attempt to make their services more youth-friendly through a combination of interventions, including training providers, educating consumers, and improving the accessibility of services. Researchers need to focus evaluations on the specific approaches used to make services more youth friendly and on how they are implemented, particularly in reducing barriers that keep young people from using services.

Sexuality education that is comprehensive rather than focused on a single issue generally increases knowledge but a substantive minority of programs do not change behavior. Those programs that do change behavior can delay sexual debut, reduce frequency of sex and number of partners, and increase the use of condoms or other contraceptives. Comprehensive sexual education programs are more cost effective than single-issue interventions, but to achieve behavior change, we must know more about differences between the successful programs and the ones that fail.

Youth development and life skills training have multiple benefits such as improved sexual and reproductive health outcomes, depending on the context and how programs are implemented. Given the social and cultural obstacles to young people's sexual and reproductive health, these broader programs should continue to be a focus of study.

Social marketing and behavior-change communication interventions have been effective in motivating uptake of condoms and contraceptives. They have had less impact on effective use and continuation. Research can contribute to exploring the content and delivery mechanisms that would strengthen young people's commitment to these choices.

Cash transfers and other financial incentives are effective in motivating changes in reproductive health-related behaviors in a variety of settings. Program planners need to pay attention to the specific behaviors targeted and to how incentives to change these behaviors are implemented. In Malawi, for example, *unconditional* cash transfers to *girls* proved to be more effective than *conditional* transfers to their *parents*.

Multipronged interventions are needed to address the varied factors that influence adolescent reproductive health behaviors and outcomes. Identifying the specific elements of multifaceted programs that had the strongest effect is often difficult, but is needed to sort out which interventions are more effective in order to make such programs more cost effective.

COMPARING COSTS OF VARIOUS INTERVENTIONS

The evidence base on costs and cost effectiveness is still very weak, especially in low-income countries. Calculations of the relative cost of investing in programs to meet unmet contraceptive needs of adolescents (as well as to delay early marriage) would provide advocates for these programs with a useful tool to persuade governments and donors to invest in programs.

RECOMMENDATIONS

- Expand research on cost relative to outcomes. Decisionmakers need cost-effectiveness comparisons to know which interventions are most effective and at what cost, but the evidence is limited.
- Invest in research that includes pre- and post-testing with comparison groups. Scaling up or expanding successful interventions to prevent adolescent childbearing requires knowledge about which interventions work and about how to replicate programs in particular local contexts.
- Continue research on the long-term economic benefits of delayed childbearing on nations and households. Because of the multiplicity of factors involved in early childbearing, this report argues for continued research on the lasting impact of preventing adolescent childbearing, particularly with respect to reaping the economic benefits of a future demographic dividend, both at the societal level and in the lives of individual young people.

Introduction

For a decade, the William and Flora Hewlett Foundation's Population and Poverty (PopPov) Research Initiative has funded research on individual and household poverty with particular attention to the relationship between poverty and women's reproductive health and economic productivity. The overall purpose of this initiative is to contribute to understanding what types of policies and specific interventions might, in the medium term, reduce poverty, particularly among specific vulnerable populations such as adolescents (see Box 1). PopPov has contributed to a growing body of evidence reviewed in this report. This evidence suggests that a variety of interventions may prevent adverse health and education outcomes in young people.

During adolescence both environment and behavior have critical long-term consequences for individual health and economic well-being. Nutrition in these years is important to both physical and cognitive development, which affects educational achievement and health. Decisions about whether to remain in school, whether to marry, or whether to engage in sexual activity also have implications for education and health. Ultimately, these factors affect both the households in which young people live and labor market outcomes. Because trends in early marriage, early childbearing, and labor market productivity help determine national poverty levels and economic productivity, both government and the private sector have a vested interest in good adolescent health and education outcomes. The question that both government and private decisionmakers face is: What is the case for investing in interventions that improve adolescent health and education outcomes? This report looks, in particular, at the case for investing in adolescent health and family planning programs.

Business cases must address three main elements—the consequences of the status quo, the options available to change the status quo in a desired direction, and the cost of each option. If all options for promoting adolescent health and human capital development cost more than the adverse consequences of inaction or more than government or private sector investors have or are willing to divert from other areas, then decisionmakers are likely to invest in other activities. If "affordable" options exist, then the question is which type of investment to make, and cost effectiveness comes into play (see Box 2, page 5).

Research findings contribute to building a business case by identifying underlying causes of adverse outcomes such as poverty and low productivity and by testing potential solutions. Sound evidence on the links between adolescent reproductive health and economic well-being can motivate government and donor policy decisions about what types of investments to make in youth. Further, research that demonstrates clear causal links

BOX 1

The Population and Poverty (PopPov) Research Initiative Supports Strategic Investments in Youth

The William and Flora Hewlett Foundation began the Population and Poverty Research (PopPov) Initiative more than a decade ago when population funding declined. A working group of experts, convened to assess the evidence base, called for expanded research on the effects of population and reproductive health outcomes at both the societal and individual/household levels.[1] Since then, PopPov partners have funded more than 100 research grants and dissertation fellowships that have resulted in more than 200 publications and hosted nine research conferences at which researchers presented findings.

The working group addressed youth issues in several ways. They called for research to identify the most effective strategies to improve health and fertility outcomes among adolescents. They also recommended research on links between these outcomes and macroeconomic development prospects in countries where fertility transitions were lagging, particularly in Africa. They called for research into policies that might enable these countries to benefit from a demographic dividend—the rapid economic growth that can occur as fertility declines and a country's age structure shifts to fewer children and more working-age people. The experience of many East Asian countries provides a model: Rapid fertility decline created a bulge in the young working-age population and sound economic and social policy helped convert that potential into accelerated economic growth. The resulting youth bulge creates both opportunities and challenges. If countries can educate and employ young adults, they may benefit from the higher productivity and higher economic growth that can occur.[2]

REFERENCES

1 Marlene E. Lee and Kate Belohlav, *Investigating Elements of a Population, Poverty, and Reproductive Health Agenda* (Washington, DC: Population Reference Bureau, 2014); and Center for Global Development (CGD), *Population Dynamics and Economic Development: Elements of a Research Agenda, Final Working Group Report* (Washington, DC: CGD, 2005).

2 David Bloom, David Canning, and Jaypee Sevilla, *The Demographic Dividend: A New Perspective on the Demographic Consequences of Population Change* (Santa Monica, CA: Rand Corporation, 2002).

between interventions and improvement in adolescent reproductive health and family planning outcomes supports arguments in favor of these investments. This paper reviews recent additions to the growing body of research supporting investments in adolescent reproductive health, with attention to the role of the PopPov Research Initiative in strengthening that evidence base.

After 10 years of supporting research, the PopPov sponsors are seeking ways to build bridges among research, policymaking, and program financing and implementation. Business cases are a vehicle for mobilizing evidence to guide policies and to increase funding for programs (see Box 2). This report examines the elements of a business case for investing in adolescent reproductive health, drawing on the contributions of PopPov research. In this instance, the business case focuses on two specific outcomes linked to poverty through poor health, low educational attainment, and limited labor force participation: early marriage and early childbearing.

Making the case for funding interventions to improve adolescent reproductive health and family planning outcomes involves several building blocks. Policy audiences need evidence on the benefits of improved outcomes and on the adverse consequences of poor outcomes. For example, the increased participation of women in the paid economy is one driver of a demographic dividend—the rapid economic growth that can occur after mortality and fertility decline and a country's age structure shifts to fewer children and more working-age people. Early marriage and early childbearing can undermine or even erase this potential economic growth through detrimental effects on the health, education, and earning potential of young mothers and their children. Better evidence is needed on interventions that are effective in delaying early marriage and childbearing. This includes evidence on the effectiveness of specific interventions or combinations of interventions, as well as comparisons that show the cost effectiveness of alternative approaches.

Methodological problems pose challenges for these tasks and are one of the reasons why the evidence base requires strengthening. Linkages among early marriage and childbearing, education, and economic productivity involve complex causal relationships. These relationships run in both directions (endogeneity), with women choosing to marry rather than continuing in school or with women who pursue higher education having less time for social interactions that could result in marriage, for example. And the linkages among these factors may also be influenced by outside forces that are difficult to measure. PopPov called for improvements in data and methodological approaches to address these problems, including:

- Longitudinal surveys that would permit the study of natural experiments that occur when new programs or policies are rolled out over time.
- Randomized controlled trials (RCTs) to compare individuals randomly assigned to participate in a particular intervention with similar individuals in a control group who did not participate in the intervention.
- Econometric approaches using instrumental variables (a method of estimation that involves the use of a proxy variable to overcome endogeneity issues described above) to identify causal links.
- Simulation modeling to test possible cause-and-effect scenarios.

A major contribution of PopPov research over the last decade has been to strengthen the data and methodology for research on these topics. This report draws upon summaries of projects and papers from the PopPov website (www.poppov.org) as well as the author's earlier reviews of research on adolescent reproductive health and family planning (with Margaret Greene).[1]

BOX 2

Key Elements of a Business Case

A good business case contains objective and compelling evidence that allows decisionmakers to choose projects with the best returns. Clearly defined causal links between proposed activities and desired outcomes are essential to making the business case. Cost-effectiveness analysis weighs the cost of achieving a particular program outcome against the costs of alternative approaches. For example, such an analysis might identify which health intervention can save the most lives at the lowest cost over a specific period of time. This approach allows users at the highest levels of government—where financial resources are allocated across departments—to compare very different health interventions or to compare health interventions with other types of interventions. If the cause-and-effect relationship between an intervention and the purported outcome remains unproven, the uncertainty related to impact diminishes the expected returns on the financial investment.

Early Marriage and Early Childbearing Linked to Poverty

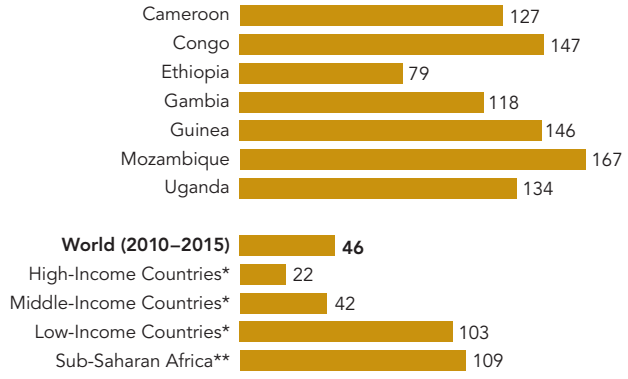
Research conducted over the past two decades has enhanced our understanding of the detrimental effects of adolescent childbearing and likely links to poverty through increased health risks and limitations on earning potential. Taken as a whole, the research makes clear that early pregnancy and childbearing are hindrances to girls and a lasting handicap to their children.[2]

Early pregnancy and childbearing are widespread in poor countries, and are likely to be both causes and effects of poverty. Figure 1 presents the number of births for every 1,000 women ages 15 to 19 in selected low-income or lower-middle-income African countries with data from 2010 or later at the time of publication. Adolescent fertility in these countries, with the exception of Ethiopia, is higher than the world average. According to the World Health Organization (WHO), 95 percent of births to adolescent mothers occur in low- and middle-income countries.

FIGURE 1

Adolescent Fertility Remains High in Many Low-Income African Countries.

Number of Births per 1,000 Women Ages 15 to 19



*Country classification by income level is based on the World Bank's 2014 GNI per capita.

**Sub-Saharan Africa refers to all of Africa except Northern Africa.

Sources: United Nations, *World Fertility Data 2012*, age-specific fertility 15-19 (for country specific rates); and United Nations, *World Population Prospects, The 2015 Revision*, accessed at http://esa.un.org/unpd/wpp/, on Nov. 18, 2015 (for world and regional estimates for 2010-2015).

A National Research Council and Institute of Medicine report examined some potential channels through which linkages between early marriage/early childbearing and poverty might run.[3] The main links include:

- Poor health outcomes for the young mother and her child, including higher risk of obstetric complications, leading to higher maternal mortality or higher disease and disability if she survives; increased risk of abortion and complications related to unsafe abortions; low birth weight and other problems for the newborn.[4]
- Poor educational outcomes for both the mother and her child, including dropping out of school and less schooling for the child.
- Lower and/or altered consumption patterns within the mother's immediate and extended family related to the costs of rearing the child.
- Lower labor force participation by the young mother, with less opportunity to contribute to household income.
- Reduced acquisition of social capital (smaller social network and/or less influence within networks) through reduced community participation and greater chances of divorce or single parenthood.

Finlay and colleagues explored the links between adolescent childbearing and poor child health.[5] They analyzed 118 Demographic and Health Surveys conducted in 55 low- and middle-income countries worldwide between 1990 and 2008 and found that teen mothers have the highest risk of having a firstborn child with poor health outcomes, among mothers between ages 12 to 35 years. Figure 2, page 7, presents the prevalence of stunting for firstborn children ages 1 to 5 years living in low- and middle-income countries where average maternal age at first birth is less than 20 years. Stunting in these African countries is markedly higher than the average across pooled data for all study countries in 2000. Because the firstborn children of adolescent mothers in both high and low socioeconomic groups exhibited higher risks of stunting than the firstborn children of older mothers, researchers conclude that biological mechanisms associated with early childbearing, not just social factors, are a cause of the stunting observed.

Most research on the consequences of early childbearing focuses on unmarried girls. In regions where early marriage is prevalent, many of the socioeconomic consequences of early childbearing are coupled with the effects of early marriage, and one finds the evidence on these impacts in the literature on early marriage rather than early childbearing. This might explain why more research on the impact of early childbearing is found for Latin America where girls marry later, than for Asia and Africa where teen marriage is more prevalent. A WHO/UNFPA/Population Council report on the

consequences of early marriage documents that married girls consistently:

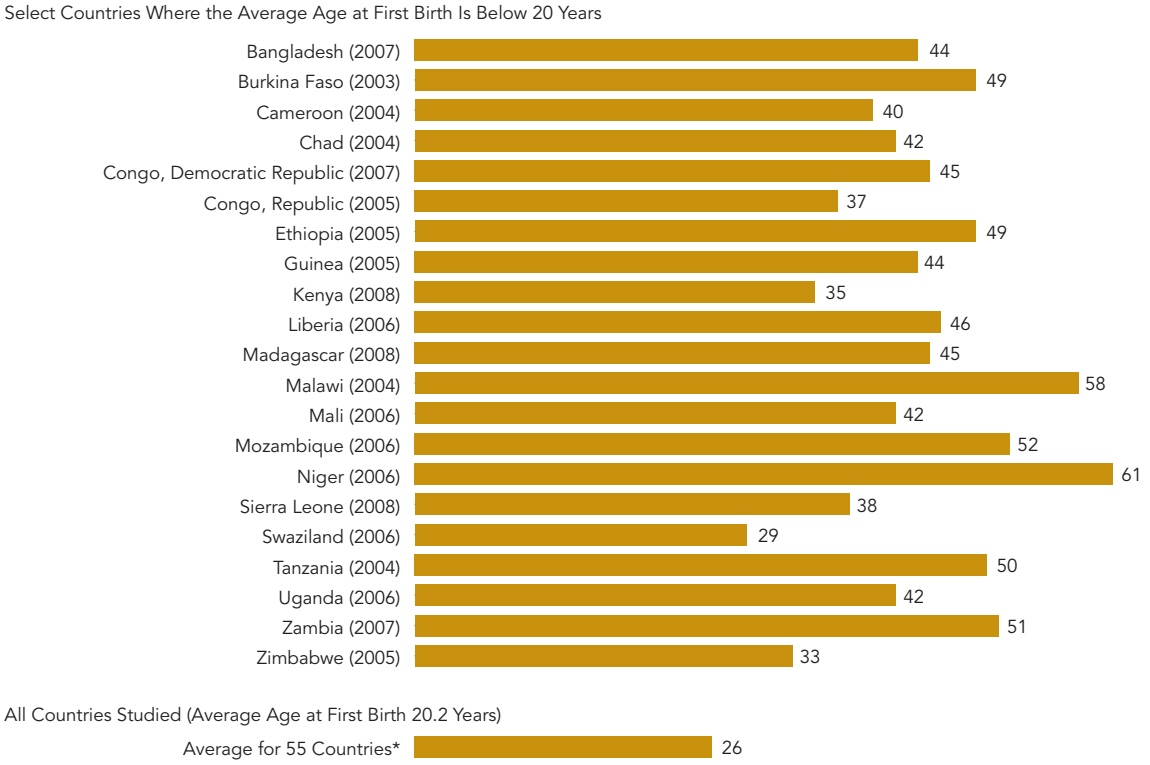
- Experience less opportunity for education.
- Have less household and economic power than older married women.
- Have less exposure to modern media and social networks.
- Are at great risk of gender-based violence.
- Face greater health risks, particularly when they are poor, exposed to HIV, and/or have their first birth at a young age.[6]

Children born to very young mothers are themselves vulnerable to health risks: They weigh less at birth and experience poorer health and higher mortality throughout childhood and beyond.[7] These children may experience stunting, which can lead to poorer school performance in the long run, increasing their chances of living in poverty and even having intergenerational effects on the reproductive capacity of the younger generation. An adolescents' early start on childbearing increases the likelihood of higher lifetime fertility, which itself has long-term effects on health and on household consumption. Also, a higher household dependency ratio—with more children per adult of working age—can contribute to household poverty.

FIGURE 2

Stunting Is Markedly Higher in Low- and Middle-Income Countries Where Most Mothers Tend to Be Adolescents at the Time of Their First Birth.

Percent of Firstborn Children Stunted, Ages 1 to 5 Years



*Countries studied were either low- or middle-income.

Notes: Stunting among children ages 1 to 5 at time of survey. Stunting is defined as a height z score of less than -2 using WHO reference population of healthy children by sex and age in developing countries. Prevalence estimates based on Poisson regression with fixed effects for country and year.

Source: Jocelyn E. Finlay, Emre Özaltin, and David Canning, "The Association of Maternal Age With Infant Mortality, Child Anthropometric Failure, Diarrhoea, and Anaemia for First Births: Evidence From 55 Low- and Middle-Income Countries," *BMJ Open* (2011): Doi: 10.1136.

Researchers at the Center for Global Development (CGD) compiled an assessment of recent micro-level research about the impact of adolescent pregnancy on school continuation/dropping out.[8] They found little research to support a causal link between adolescent pregnancy and performance in school. There are a number of studies that report strong associations but without establishing causal links between pregnancy and school performance.

The most solid evidence of the effects of teen childbearing on education and health was produced by PopPov Network researchers in South Africa. Using data from a longitudinal study of adolescents and young adults in metropolitan Cape Town, the PopPov investigators found that teenage mothers have more than twice the educational disadvantage of young women who give birth later in life. Giving birth before the age of 17 equates to being 1.26 years behind in education, compared to girls of the same age. In addition, teen mothers have higher risks of dying at a young age (before age 30) than young women who did not give birth as teenagers.[9] Data from a longitudinal demographic surveillance area in rural KwaZulu-Natal, South Africa, also show large education deficits and higher long-term risk of dying from HIV among teen mothers, irrespective of household characteristics.[10] In the Cape Town study, children born to mothers under the age of 20 have worse health outcomes than children born to older mothers.[11] These children are 10 times more likely to be underweight at birth, shorter as compared to others in their age group, and are more likely to be stunted. Adverse effects are more pronounced among children previously classified as "coloured" than among African children.[12] Adolescent childbearing has an intergenerational effect, increasing risks for both mother and child.

In another African study, Herrera and Sahn examined the impact of early childbearing on schooling and cognitive skills among young women in Madagascar using a panel survey designed to capture the transition from adolescence to early adulthood. Their study controlled for both the nonrandom placement of programs and the two-way causal relationship between fertility and education—that is, that high fertility causes low education and low education causes high fertility.[13] They report that having a child increases the likelihood that adolescent mothers drop out of school by 42 percent and decreases their chances of completing lower secondary school by 44 percent. The analysis shows that dropouts who were pregnant when they left school had math and French test scores that were on average 1.1 standard deviations lower than other students.

An ongoing panel study in Burkina Faso by PopPov researchers at the University of Montreal investigates how fertility behaviors affect schooling and work among children and adolescents in an urban setting. One of their preliminary findings indicates that having a greater number of siblings lowers overall level of schooling a child completes, a disadvantage that increases with advancement to higher levels in the educational system.[14]

Simulation models have been employed at global and national levels to assess adverse effects of early childbearing. World Bank researchers calculated that if all 200,000 adolescent mothers in Kenya had completed secondary school and were employed instead of having children so early, the cumulative effect would be to add US$3.4 billion to Kenya's gross income every year—an amount equivalent to the entire Kenyan construction sector. The same study noted that the lifetime opportunity cost related to adolescent pregnancies—measured by young mothers' foregone annual income over their lifetimes—ranged from 1 percent of annual gross domestic product in China to 26 percent in Nigeria, 27 percent in Malawi, and 30 percent in Uganda.[15]

A modeling exercise using data from Uganda suggested that the country could potentially save $3 for every dollar it spends on family planning for adolescents, representing a combination of health costs saved and societal benefits, such as productivity increases. Also, the researchers estimated that it would cost only $3.47 million annually to meet the country's unmet need for contraception among girls ages 15 to 19.[16]

Simulation results, however, are very sensitive to the correct specification of the relationships they model and the strength of those relationships. In the World Bank study, the impact depends heavily on the strength of the assumed linkage among early childbearing, dropping out of school, and entry into the workforce. The assumption that all young mothers would complete their schooling and have higher paid work if they had avoided an early birth is likely very optimistic for most low-income country contexts. Also, the costs of interventions to prevent early childbearing do not enter the calculations. Critics have argued that the results turn out to be considerably weaker if the influence of these and other factors are brought into play.

Teen girls discussing sexuality education and reproductive health information, Uganda.

Reproductive health lesson, Kenya.

Research Provides Evidence of the Effectiveness of a Variety of Intervention Strategies

Evidence exists on the effectiveness of several types of adolescent health and family planning interventions. Broadly varied interventions have been undertaken and evaluated in low- and middle-income countries, and several major reviews of intervention research have been carried out over the past decade.[17] Also informative are recent assessments of research needs by Hindin and colleagues and Ali and colleagues, as well as Chapter 5 of the UNFPA's *State of World Population 2013*, which reviews a range of intervention experiences.[18] In 2011, WHO published guidelines that included assessments of the effectiveness of interventions for preventing early pregnancy and poor reproductive health outcomes.[19] The International Center for Research on Women has reviewed the evidence base on adolescent family planning and the literature on what works in family planning, covering all age groups not just adolescents.[20]

SCHOOL-BASED INTERVENTIONS

Researchers have examined a wide range of school-based programs. CGD reviewed nine school-based programs, including two that provided abstinence-only education. The programs addressed a range of outcomes including reproductive knowledge and attitudes, contraceptive use, avoidance of pregnancy and early marriage, and risk avoidance. Most of the studies reported positive impacts of interventions on these outcomes, with the caveat that the effects tended to taper off with time.

The CGD researchers caution that their review screened studies for (quantitative) analytical rigor and so was limited to 21 studies published after 2000. They covered only a fraction of the broad range of available research on interventions and outcomes.[21] They also noted that the wide variety of outcomes and combinations of interventions made comparison of results difficult. Looking at the limited evidence they reviewed across outcome measures, they report that most interventions that attempted to improve cognitive indicators related to reproductive health had positive effects, at least in the short run. The effect on more basic outcome indicators like sexual activity, pregnancies, and births was less likely to be significant. However they did report that the evidence was generally positive for 12 programs utilizing a wide range of interventions to improve contraceptive use and for the three programs that sought to influence marriage-related indicators.

Teen girls discussing reproductive health information, Uganda.

Other researchers followed the Cochrane methodology for identifying relevant studies and limited their review to randomized control trials evaluating interventions that aimed to increase knowledge and attitudes relating to the risk of unintended pregnancy, delaying initiation of sexual activity, or encouraging consistent use of contraception among adolescents ages 10 to 19.[22] They concluded that programs involving the concurrent use of multiple interventions (education, skill building, and contraceptive promotion) could reduce unmet need and unintended and unwanted pregnancies in adolescents, but that promotion of contraceptives alone did not appear to reduce that risk. They urge caution in interpreting their results because they found methodological deficiencies even in the highly selective set of trials examined.

Efforts to increase girls' access to schooling and to improve the quality of girls' education are taking a variety of forms. These include scholarships, stipends, cash transfers, and recruiting and training of female teachers.[23] PopPov-supported researchers in Cameroon ran a randomized trial to evaluate the impact of school-based HIV education on preventing risky behaviors and found that the results depended heavily on local contexts.[24] In South Africa, PopPov researchers are tracking randomized classroom interventions in poor, HIV-affected communities in the Durban metropolitan area. These interventions seek to improve health and build social and economic assets over the life course.[25] In rural Rajasthan, researchers demonstrated that random selection of participants in a school-based empowerment program had positive effects that spilled over to girls not randomly selected, even more so than when participants were elected by their peers.[26]

Some investigators report that school enrollment encourages the perception of school girls as children and not of marriageable age, producing a protective effect by discouraging early childbearing.[27] But in South Africa, where early marriage is not so much a phenomenon and teen childbearing often takes place outside of marriage, Lam and colleagues reported that when girls stay in school and interact extensively with older male students who have repeated grades, this contributes to a statistically significant earlier sexual debut among adolescent girls and an increased age gap between the girl and her first partner.[28]

Girls need the flexibility to be able to return to school if they become pregnant or leave school for other reasons.[29] One study in Pakistan found that while girls with more schooling did not delay their marriages or first births, they were more likely to use contraception and delay second births.[30]

YOUTH-FRIENDLY SERVICES

The African Youth Alliance surveyed programs to enhance youth-friendly reproductive health services in Ghana, Tanzania, and Uganda. Results were mixed. Reported use of contraception was significantly higher for those girls and boys exposed to the intervention than for unexposed girls in Tanzania, but in Ghana and Uganda, use of contraception was only higher for girls exposed to the intervention than boys and unexposed girls.[31]

A systematic literature review by Denno and colleagues shows that the most effective out-of-facility approaches to reaching youth with services include condom distribution via street-level outreach and promotion of over-the-counter access to emergency contraception.[32] They recommended that more research needs to be done to determine if training health care workers and making facilities more youth friendly is an effective way to improve adolescent sexual and reproductive health. Evidence was strong for programs using a combination of interventions, including those that increased community approval of adolescent services.

A study in Zimbabwe found a significant increase in reported contraceptive-seeking behavior and a reduction in reported pregnancies as a result of an intervention to improve access and quality of reproductive health services for adolescents.[33] Integrating services into school settings can be an important way of making them friendly to young people. One programmatic evaluation of youth-friendly services in the United States found that over five years the cost savings in preventing unintended pregnancy was greatest among adolescent mothers at a savings of $17.23 for every $1 spent on contraception for 14-to-19-year-old women.[34]

In South Africa, preliminary results from PopPov researchers Branson and Byker report that the National Adolescent Friendly Clinic Initiative (NAFCI) contributed to increases in reproductive health knowledge and clinical access for adolescents.[35] Women who lived near a NAFCI clinic when they were ages 12 to 17 were less likely to experience an early teen birth and that adolescents who had access to NAFCI programs completed more years of schooling. They found little impact on unemployment in early adulthood.

The previously noted review by McQueston and colleagues at CGD included seven assessments of interventions that tailored existing reproductive health programs to meet the needs of adolescents.[36] Two of them—Kanesathasan and colleagues on a large scale adolescent program in India, and Bhuiya and colleagues on adolescent-friendly services in Bangladesh—had positive effects on contraceptive awareness and knowledge, with Kanesathasan and colleagues also showing increased contraceptive use among married adolescents.[37] Portner and colleagues reported that outreach to increase family planning access in Ethiopia decreased by one child the number of children born to the youngest women and that young women substantially delayed their childbearing when they had access to family planning.[38] All of the studies involved multiple types of interventions and outcomes, making it difficult to disentangle the impact of a specific type of intervention on a specific outcome.

SEXUALITY EDUCATION

Sexuality education of any type was found to delay sexual debut for adolescents, and those who learned about abstinence *and* contraception, especially females, were significantly more likely to use contraception at sexual debut.[39] An evaluation of Nigeria's Comprehensive Sexuality Education program identified key elements of scaling up effectively:

- Consensus about its components.
- Dividing implementation of the program's complex parts among organizations according to their area of expertise.
- Strong political leadership and advocacy by NGOs.
- Community mobilization.
- Sound program management.
- Constant monitoring, evaluation, and accountability.[40]

Results from several studies show that abstinence-only programs do not stop or delay adolescents from having sex, and can put them at greater risk of pregnancy and sexually transmitted infections (STIs) if information about contraception is not provided. In one study, a UNESCO-commissioned review of global studies evaluating comprehensive sexual education programs, nearly all these programs increased knowledge, and two-thirds positively impacted behavior—producing delays in sexual debut, reduced frequency of sex and number of partners, and increased condom or other contraceptive use. The same study also found that these programs are more cost effective than single-issue interventions.[41]

PEER EDUCATION

Mixed results exist on the effects of peer education programs. A study to evaluate a government-led peer education program in South Africa indicated the program did not delay age at sexual debut; the authors noted sub-optimal conditions in program implementation and suggest that peer education approaches require consistent monitoring and evaluation for efficacy.[42] High school respondents from a Canadian peer education intervention demonstrated improvements in their attitudes, in personal beliefs, and in perceived behavioral control with self-protective behaviors, such as postponing sexual debut and condom use.[43] Also, peer educator involvement in designing the intervention was linked to improvements in program outcomes.

Compared to sexuality education by teachers, peer-led education was not found to decrease teenage abortions but may have decreased live births. While the researchers did not find significantly positive results, they encouraged further research on the effectiveness of peer-led sex education approaches since students preferred it to teacher-led approaches.[44] Most interventions improved knowledge, attitudes, and intentions; and while some trials had positive results for behaviors, overall, there was not strong evidence on behavior change for peer-led education among adolescents.[45]

YOUTH DEVELOPMENT AND LIFE SKILLS

In low resource settings, more attention to overcoming girls' obstacles to labor force participation is needed if girls and their families are to perceive labor force participation as a viable option for their economic well-being, making delaying marriage seem less economically risky. Workforce opportunities for girls, such as garment factories in Bangladesh, can contribute greatly to delaying marriage and shifting childbearing norms.[46] Girls often leave school unprepared for work or cannot translate educational

Young mothers make cakes to sell as part of an income-generation program, Uganda.

accomplishments into remunerative jobs. Programs may help girls manage traditional gender expectations, negotiate the school-to-work transition, and play a role in the identification and promotion of safer and more accommodating workplaces.[47] Subsidized childcare may make it possible for young women to work, particularly in formal jobs.[48] The World Bank's Adolescent Girls Initiative works with the private sector to provide vocational training and employment opportunities for girls, but these interventions need to be evaluated before they can be scaled up.[49]

Programs that reinforce social supports for adolescent girls take a variety of forms. Old-age pensions to grandparents caring for grandchildren may ultimately benefit girls, such as improving the overall anthropometric measures of their children and increasing the girls' school attainment.[50] The creation of girl-only safe spaces have many advantages:

- Transforming girls' self-concepts.
- Providing social support, financial literacy, and financial services.
- Creating new opportunity structures.
- Ensuring continued education.
- Reducing HIV infection and other negative outcomes.[51]

PopPov researchers in Tanzania are seeking to improve our understanding of young girls' fertility decisions and how these decisions interact with their economic situation. They are conducting a randomized trial to track the effects of two empowerment strategies (providing reproductive health information and entrepreneurial skills training) on early childbearing outcomes. Preliminary findings show that business skills training has a stronger impact.[52] In Uganda, researchers evaluated a two-pronged intervention through which adolescent girls were simultaneously provided vocational training and information on sex, reproduction, and marriage. Relative to adolescents in control communities, after two years the intervention raised (by 72 percent) the likelihood that girls engaged in income-generating activities (mainly self-employment) and raised their monthly consumption expenditures by 41 percent. Teen pregnancy fell by 26 percent and early entry into marriage or cohabitation fell by 58 percent. Strikingly, the share of girls reporting sex against their will dropped from 14 percent to almost one-half that level, and girls reported they preferred to marry and begin childbearing at older ages.[53]

Youth club participants discuss family planning methods at a health clinic, Uganda.

The UNFPA *State of World Population 2013* report on early childbearing notes that while many governments have invested in programs that seek to enable adolescents to prevent a pregnancy, fewer of them invest in systems and services that support girls who have become pregnant or have had a child. Greene and colleagues reviewed a number of programs in the United States and developing countries that sought to increase the desire to delay further childbearing, increase contraceptive use, and increase birth intervals among young mothers.[54] They identified several promising interventions and suggested a "mix and match" strategy of combining interventions where effective prevention methods are used and tailored to specific epidemiological and cultural contexts.

SOCIAL MARKETING AND COMMUNICATIONS

An overview of child marriage prevention activities in the Amhara Region in Ethiopia found that the more people heard messages discouraging early marriage, the less supportive they were of early marriage, and in urban settings, roughly 25 percent of child marriages were stopped in the program areas.[55] An assessment of a reproductive health communications program for adolescents in Bihar, India, reported an increased age at marriage and first birth.[56] A review of programs implemented in Cameroon, Madagascar, and Rwanda to prevent STIs, HIV/AIDS, and unplanned pregnancies among adolescents used social and commercial marketing and interpersonal approaches to encourage protective behavior.[57] In Cameroon, knowledge about how to use and where to buy condoms increased among those of both sexes who were exposed to the program, and the reported use of condoms increased for young men. In Rwanda, young people who participated in the program were more likely to believe condoms are an effective way to prevent HIV/AIDS, believe their friends and family support condom use, and to know where to get and how to use them. Young people exposed to the program were also more likely to use HIV counseling and testing services. In Madagascar, more youth seeking sexual and reproductive health services at youth-friendly clinics increased significantly.

CASH TRANSFERS AND OTHER FINANCIAL INCENTIVES

Around the world, cash transfers and other financial incentives that aim to alter a variety of behaviors and outcomes have gained credibility as effective interventions.

Cash benefit programs in Brazil and Mexico designed to improve health and education indicators have been extremely successful.[58] A CGD review identified four evaluations of the effects of cash transfers on adolescent fertility and related outcomes.[59] They reported that cash transfers had the greatest impact on marriage-related indicators, noting that the transfers worked as an incentive to stay in school and increase financial independence, both of which could have reduced adolescent marriage. Filmer and Shady showed that a cash-transfer scholarship program in Cambodia increased the enrollment and attendance of recipients at program schools by about 30 percentage points. Larger impacts are found among girls with the lowest socioeconomic status at baseline.[60] They concluded that there is substantial potential for interventions that facilitate choosing school enrollment over other activities in lower-income countries like Cambodia. Findings from Mexico's Progresa-Oportunidades program, a nationwide antipoverty intervention aiming to improve education and health through cash transfers, showed a significant effect in delaying young women's sexual debut.[61]

PopPov researchers are strengthening the evidence base on the effectiveness of cash transfers in a number of settings by employing better data (mainly through RCTs):

- In north India, researchers assessed the impact of financial incentives to discourage son preference and found a positive effect at the state level on sex ratios at birth.[62]
- In southern Tanzania, researchers assessed the impact of combined economic and psychosocial interventions on both economic outcomes and sexual/reproductive health behaviors. They found significant reductions in the prevalence of STIs among the high cash-transfer recipients as well as stronger effects among lower socioeconomic and high-risk groups.[63]
- In a study of the impact of cash transfers in the Zomba district of Malawi, researchers found that for girls who were enrolled in school when the program started the unconditional cash transfers were more effective in delaying marriage than conditional transfers.[64] The program led to large increases in school enrollment for participants in the conditional cash transfer program, and among those not enrolled at the start of the program, the conditional cash transfer led to significant declines in early marriage, teen pregnancy, and self-reported sexual activity. Ongoing assessment suggests long-term impacts are sustained only when a cash transfer program actually produces substantial improvements in the amount of long-lasting capital, such as skills (human capital), an individual holds.[65]

COMBINATIONS OF INTERVENTIONS

Many reviewers noted that a multiplicity of factors influence adolescent reproductive health behaviors and outcomes and have called for multipronged interventions to change

Young mothers participate in a family planning information session, Uganda.

them. Identification of the specific elements of multifaceted programs that had the strongest effect is often difficult, but needed in order to sort out which interventions are more effective and to make such programs more cost effective. Recent analyses of multipronged approaches are allowing us to identify which components of interventions have the strongest impact or what combination of interventions produce the best results.[66] Also, some analyses now underway will provide information on medium-term, long-term, and intergenerational effects.[67]

Research Needed on Cost Effectiveness

Costing and cost-effectiveness comparisons are a key element in a business case. When financial and institutional resources are limited, decisionmakers need to know which interventions are most effective and at what cost. Cost-effectiveness comparisons are made across outcomes as well as across specific interventions to address outcomes

Prior to studies conducted as part of PopPov, the Futures Group looked at cost savings of family planning interventions, but not for youth. Some of the simulation work by PopPov investigators (Babigumira on Uganda) address costs, but others (Ashraf and colleagues on Nigeria) do not.[68] Bor and De Neve's 2015 PopPov conference paper on education, fertility, and HIV included a cost-effectiveness analysis.[69] They compared the cost effectiveness of attending secondary school with other proven HIV-prevention interventions, such as medical male circumcision, treatment as prevention, and pre-exposure prophylaxis. Secondary schooling was more expensive than circumcision and treatment as prevention but of similar cost effectiveness to pre-exposure prophylaxis. Importantly, unlike these other interventions, secondary schooling has large benefits beyond the reduction of HIV transmission—benefits that were excluded from their calculations. More of this kind of work is needed.

Performing skits with a reproductive health message, Kenya.

Overall, the evidence base on costs and cost effectiveness is still very weak, especially in low-income countries. Calculations of the relative cost of investing in programs to meet unmet contraceptive needs of adolescents (as well as to delay early marriage) would provide advocates for these programs with a useful tool to persuade governments and donors to invest in them. Unfortunately there is very little research that quantifies the economic costs and benefits of such programs available for low- and middle-income countries. A key recommendation of this review is to fund more research to address this gap.

Success Requires Implementation Research

Translating research into sound policy and action is not automatic. The research itself needs to be rigorous enough to pass muster in the scientific community. Much of the existing evidence provides a sound basis for policy and action, but more research is still needed to bolster that case. The translation process is complicated by the cultural and political sensitivity needed to provide reproductive health interventions for teens. Generating evidence is only half of the battle when the politics surrounding adolescent access to contraception and other reproductive health interventions are unsupportive.

However successful we are in mapping out the problems, consequences, and a plan of action in a given setting, there may well be difficulties in implementing that plan.

Understanding how to work in specific contexts represents another knowledge gap. For example, we reported mixed results on the effects of peer education programs. A study to evaluate a government-led peer education program in South Africa found that the program did not delay age at sexual debut; the authors noted sub-optimal conditions in program implementation and suggested that peer education approaches need consistent monitoring and evaluation for efficacy.[70] We need examples that show how research guided effective interventions and the conditions that needed to be in place for that research utilization to take place.

Given the large numbers of adolescents around the world, there is a great need to build on knowledge of what works and of how to take successful programs to scale. Scaling up programs requires strong data on intervention components and on the institutional and service-delivery factors that will ensure successful implementation, particularly when we learn that interventions work in some setting but not others. Being able to say that an intervention caused a specific outcome increases the likelihood that the evidence will lead to the program being replicated or scaled up. Thus an additional strong recommendation emerging from this review is the need to invest in intervention research that includes pre- and post-testing with comparison groups.

Over the last 10 years, PopPov researchers have contributed new and better data and methodologies to the study of both the consequences of poor reproductive health and family planning outcomes among adolescents, and the effectiveness of interventions to improve those outcomes. Some PopPov research reported here is still work in progress, but because preliminary analyses use rigorous methods, the final results are likely to be consistent with findings thus far. This body of research indicates that there are promising programs that can improve adolescent health and education outcomes.

We already know that relatively modest investments in adolescent contraceptive access can produce a high return by avoiding the disruptive effects of early childbearing on adolescents' lives. Because of the multiplicity of factors involved in early childbearing, continued research is needed on the lasting impact of improved reproductive health outcomes on the realization of a future demographic dividend both at the societal level and on the lives of individual young people. Trajectories of pregnancy and childbearing in adolescence affect their entire lives, and it is important to convey how that happens, what can be done to mitigate any harmful impacts, and how choosing to use contraception can yield positive reverberations later in life.

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