Adolescent childbearing: consequences and interventions

Emily Ruedinger\textsuperscript{a,c} and Joanne E. Cox\textsuperscript{a,b,c}

Purpose of review
Adolescent childbearing in the United States continues to occur at high rates compared with other industrialized nations, despite a recent decline. Adolescent mothers and their offspring are at risk for negative outcomes. Recent literature exploring the consequences of teenage childbearing and interventions to ameliorate these consequences are presented.

Recent findings
Negative consequences of adolescent childbearing can impact mothers and their offspring throughout the lifespan. These consequences are likely attributable to social and environmental factors rather than solely to maternal age. Increasing educational attainment, preventing repeat pregnancy and improving mother–child interactions can improve outcomes for mothers and their children. Home, community, school and clinic-based programs are all viable models of service delivery to this population.

Summary
Connecting teen mothers with comprehensive services to meet their social, economic, health and educational needs can potentially improve long-term outcomes for both mothers and their offspring. Programs that deliver care to this population in culturally sensitive, developmentally appropriate ways have demonstrated success. Future investigation of parenting interventions with larger sample sizes and that assess multiple outcomes will allow comparison among programs. Explorations of the role of the father and coparenting are also directions for future research.

Keywords
adolescent, childbearing, parenting, teen mother, young parent

INTRODUCTION
Teenage childbearing remains a common occurrence in the United States despite numerous programs and policies geared toward decreasing adolescent pregnancies. In fact, the United States boasts a higher rate of births to adolescent mothers than other industrialized nations \cite{1,2}. A total of 414,870 infants were born to mothers under the age of 20 in 2009 \cite{1}. The US birth rate for adolescents decreased steadily from 1991 to 2005. In 2005–2007, this trend reversed and the birth rate increased by 5%. Data from 2008 and 2009 suggest that the decline has resumed. Nonetheless, the birth rate to females aged 15–19 years remains considerable at 39.1 births per 1000 females in 2009, the most recent year with finalized data reported \cite{3}. Interventions designed to diminish the disparities faced by teen mothers and their children continue, therefore, to be important. This update will explore current literature describing the consequences of adolescent childbearing, and interventions aimed toward improving outcomes for teen mothers and their offspring.

CONSEQUENCES OF ADOLESCENT CHILDBEARING
Teenage childbearing has been associated with negative outcomes for teen mothers and their offspring. Teen mothers experience lower self-esteem and are at higher risk for depression, substance

\textsuperscript{a}Division of Adolescent/Young Adult Medicine, \textsuperscript{b}Division of General Pediatrics, Department of Medicine, Children’s Hospital Boston and \textsuperscript{c}Department of Pediatrics, Harvard Medical School, Boston, Massachusetts, USA

Correspondence to Emily Ruedinger, MD, Division of Adolescent/Young Adult Medicine, LO-306, Children’s Hospital Boston, 300 Longwood Avenue, Boston, MA 02115, USA. Tel: +1 617 355 7181; fax: +1 617 730 0185; e-mail: emily.ruedinger@childrens.harvard.edu

Curr Opin Pediatr 2012, 24:446–452
DOI:10.1097/MOP.0b013e3283557bb9
KEY POINTS

- Adolescent childbearing can have negative consequences that last through the lifespan for both teenage mothers and their offspring.
- The negative consequences of adolescent childbearing are likely more due to social and economic factors than to maternal age.
- Increased educational attainment, positive mother–child interactions, and prevention of repeat pregnancy are all factors associated with improved outcomes for teenage mothers and their offspring.
- Programs servicing parenting adolescents that are comprehensive, multidisciplinary, culturally sensitive and developmentally appropriate can mitigate the negative consequences of adolescent childbearing.

Adolescent childbearing can have negative consequences that last through the lifespan for both teenage mothers and their offspring. The negative consequences of adolescent childbearing are likely more due to social and economic factors than to maternal age. Increased educational attainment, positive mother–child interactions, and prevention of repeat pregnancy are all factors associated with improved outcomes for teenage mothers and their offspring. Programs servicing parenting adolescents that are comprehensive, multidisciplinary, culturally sensitive and developmentally appropriate can mitigate the negative consequences of adolescent childbearing.

Programs to mitigate the consequences of teenage childbearing are diverse. Older literature has described a variety of programs, including those that take place in schools, in the community and/or the home and in medical settings. Making comparisons between interventions has historically been complicated by the fact that study populations and outcomes are not standardized [2]. Further, many studies use intermediate outcomes to define ‘success’. Finally, parenting adolescents can prove a difficult population to study due to social and environmental factors. Despite these limitations, finding ways to better serve this population remains of interest because of the high costs associated with teenage childbearing.

HOME AND COMMUNITY-BASED PROGRAMS

Home-based programs seek to provide education, support and care in a setting that is familiar to and environmental factors that make teens more likely to become pregnant in the first place. It is likely that the social, economic and environmental factors that promote teenage childbearing also create many of the negative outcomes previously attributed to maternal age [2,8,16]. In fact, the outcome gaps between teenage and older mothers, and their respective offspring, are narrowed or even eliminated in many studies that control for the mothers’ childhood environment [17]. Regardless of root cause, however, it remains clear that teenage mothers and their offspring remain at high risk for numerous negative outcomes.

The impact of adolescent childbearing is compounded with repeat births [1*,4**,8]. Nearly 20% of all births to mothers under the age of 20 represent a repeat birth [1*]. A second birth within 24 months of the first occurs in 23% of African–American, 22% of Hispanic and 17% of white adolescent mothers [4**]. Past interventions to reduce these numbers have been geared toward increasing contraception use among teen mothers and providing further education and social support opportunities. Success of these programs has been mixed, and studies have often measured surrogate outcomes, such as rates of contraception use, rather than the true outcome of repeat pregnancy [4**]. A 2007 meta-analysis conducted by Corcoran and Pillai [18] included 16 programs aimed at decreasing repeat pregnancy rates and found overall success up to at least 19 months following the intervention, but the programs were quite varied, with no one clear model leading to success.

INTERVENTIONS FOR ADOLESCENT MOTHERS

Programs to mitigate the consequences of teenage childbearing are diverse. Older literature has described a variety of programs, including those that take place in schools, in the community and/or the home and in medical settings. Making comparisons between interventions has historically been complicated by the fact that study populations and outcomes are not standardized [2]. Further, many studies use intermediate outcomes to define ‘success’. Finally, parenting adolescents can prove a difficult population to study due to social and environmental factors. Despite these limitations, finding ways to better serve this population remains of interest because of the high costs associated with teenage childbearing.
comfortable for the adolescent. In this category, providers often include nurses, social workers and trained mentors. This type of programming offers flexibility in terms of scheduling and engagement of other caregivers living in the home in addition to the young mother. Because these interventions often involve one-on-one contact, individualization of services can sometimes be more easily achieved. Previous literature suggests that these types of programs can impact school continuation, parenting attitudes and repeat pregnancy rates [2,19].

A recent qualitative study of home visits by doulas highlighted many of the benefits of home visitation programs [20*]. Doulas are women who provide nonmedical support during the prenatal, labor and postnatal periods. The teens described their doulas as filling important roles that were often otherwise absent in their lives: mother, sister or friend. The doulas provided encouragement that inspired teens to pursue further education; modeled positive parenting techniques that informed the teens’ behaviors; and served as advocates for the teens in a variety of capacities, including healthcare, school, transportation and acquisition of support services.

Community-based and home-based programs can both offer the advantage of service delivery in a location that is familiar and convenient to the parenting teen. Because community programs often involve group meetings, there is the added benefit of providing participants the opportunity to interact with other teens in the same situation, fostering a sense of camaraderie and allowing teens to share wisdom with each other [21]. Further, community-based programs can often offer comprehensive, multidisciplinary services [2]. However, delivering information to a group rather than an individual allows less customization and less flexibility in terms of location and scheduling.

Recent themes among home and community-based programs include the use of motivational interviewing techniques; creating culturally competent curricula; and focusing on improved maternal sensitivity.

**Motivational interviewing**

A significant body of literature exists on the effectiveness of motivational interviewing techniques in changing adolescent behaviors, particularly substance use [22–26]. In the study of home visitations by doulas, the doulas were advised to use many motivational interviewing skills including asking, active listening and providing affirmations. The teens commented on their appreciation of these techniques [20*]. In a quantitative study, Barnet et al. explored the efficacy of motivational interviewing in increasing contraception use, and, thereby, decreasing repeat pregnancy rates, among a group of urban adolescent mothers. These investigators conducted a randomized controlled trial in which participants received routine care; a computer-assisted motivational intervention (CAMI); or CAMI plus bi-weekly to monthly home visits for parenting education and support. The CAMI algorithm categorized adolescents as low, medium or high-risk for repeat pregnancy, and trained CAMI counselors then provided a brief motivational intervention designed to increase the teen’s motivation to use contraception and avoid repeat pregnancy based on the teens’ score [23].

The above study was limited by a poor rate of completion due to failure to keep appointments and inability to locate the teens, but, when investigators controlled for degree of participation, rates of repeat birth were lower in both the CAMI group and the CAMI with home intervention group compared with controls [23]. Without controlling for degree of participation, the CAMI with home intervention group showed a nonsignificant trend toward decreased rates of repeat pregnancy. Of note, continuous insurance coverage was independently associated with a decreased risk of subsequent birth and may provide an additional opportunity for policy-level intervention [4**,23].

In a later analysis of these data, Barnet et al. explored the cost effectiveness of the CAMI intervention and found it to be at least as cost effective as other pregnancy prevention programs for which cost effectiveness was calculated in older literature, including another home visitation program. Not surprisingly, CAMI was most cost effective when directed toward the highest risk group; for older, newly insured teenage mothers, the cost per prevented repeated birth was calculated at $6,822 (based on the value of the US dollar in 2009) [4**]. In comparison to the high monetary and societal costs of teenage childbearing, this represents a negligible outlay.

**Culturally competent curricula**

Numerous investigators have commented on the importance of participants feeling connected to their providers. Along these lines, many home visitation programs employ the use of community members and/or providers with the same race and primary language to conduct the intervention [19,20*,23,27]. Sensitivity to an individual’s culture has been shown to improve health outcomes in a number of arenas [17,28,29]. Gaining an understanding of the context within which the teen is
parenting can lead providers to take a strength-based approach to their interventions, in turn creating a more positive experience for the teen [17].

Walkup et al. [30] further explored this concept when evaluating a curriculum among adolescent American Indian mothers that was specifically designed to be culturally sensitive to the varied beliefs of the participants, and allowed for flexibility based on an individual mother’s needs. Participants were randomized to the Family Spirit intervention or a standardized breastfeeding and nutrition curriculum, also delivered in the home over a similar number of sessions. Participants engaged in the Family Spirit intervention showed greater parenting knowledge at 6 and 12 months than the control group, using a tool designed by study investigators. A secondary outcome of improved infant behavioral development as measured by the Infant Toddler Social Emotional Assessment was also observed in the intervention group at 1 year of age; this is the first intervention to demonstrate improved infant behavioral outcomes [30]. Investigators found no significant differences for maternal involvement; social support; depressive symptoms; substance abuse; parenting stress; or parental support and stimulation of the child in the home environment as measured by the Home Observation for Measurement of the Environment checklist.

**Maternal sensitivity**

Maternal sensitivity has been emphasized as crucial to positive mother–infant relationships. Adolescent mothers tend to exhibit lower sensitivity to their infants’ cues than older mothers. It has been hypothesized that improving maternal sensitivity will improve developmental outcomes of the children of teenage mothers. Poor maternal sensitivity has also been linked to increased maternal stress and depression. As such, home-based interventions aimed toward increasing maternal sensitivity are proposed to benefit both the mother and the child [6,31]. Preliminary investigations maintain this hypothesis, supporting the need for larger studies.

Stiles performed an in-depth case study of a program that uses positive reinforcement, rather than negative feedback, to increase maternal sensitivity [6]. The intervention was delivered by a nurse in the young mother’s home. Over the course of eight visits, the nurse videotaped mother–infant interactions and then reviewed the tapes with the mother, providing coaching on her behavior. The intervention also included modeling of high-quality parent–infant interactions, goal setting and role playing. The mother demonstrated decreased parenting stress and improved maternal sensitivity as the intervention progressed, as measured by The Parenting Stress Index and a qualitative assessment based on Ainsworth’s Sensitivity Scale, respectively. Because of the case study design, generalizability of this study is unclear. Follow-up only took place over 3 months, making it impossible to draw conclusions about long-term effects. However, the initial information shows potential.

A similar program, Keys to Caregiving, was studied in a group of six adolescent mothers compared with seven adolescent mothers receiving an active control intervention of brief phone-based social support. In these young mothers, both intervention and control participants showed improved responsiveness over time as measured by the Nursing Child Assessment Teaching Scale. Within groups, there was a greater increase among mothers engaged in the Keys to Caregiving Program. Unfortunately, this study was underpowered to show between-group differences [31]. A comparable program aimed at enhancing maternal sensitivity as measured by the Emotional Availability Scales in an adult population of depressed mothers did show continued gains in the mother–infant interaction at 12 months of follow-up [32].

**SCHOOL-BASED PROGRAMS**

Higher educational achievement of teen mothers leads to enhanced mother–child interactions and more supportive home environments. This holds true not only in relation to level of educational achievement at the time of the child’s birth, but also in relation to the mother’s continuing educational achievement following the birth of the child. In fact, continuing maternal education can significantly diminish the impact of maternal age on the home environment [33**]. These findings corroborate the view that many of the poor outcomes of teenage pregnancy may be more related to negative environmental factors common among adolescent mothers than to maternal age. Further, they highlight the potential benefits of interventions for teenage mothers that emphasize the importance of and provide support for continuing education.

Past literature has shown school-based clinics to be an effective means of improving educational attainment among teenage mothers. A review of studies examining school-based clinics revealed that rates of school dropout and absenteeism were lower among pregnant and parenting adolescents receiving care in school-based clinics [34]. Other likely benefits of the school-based clinic model include improved developmental outcomes of the children born to teenage mothers; decreased rates of repeat
pregnancy when contraception and family planning services are offered within the school-based clinic; and improved pregnancy outcomes when prenatal services are also available in the school setting [34].

Aside from school-based clinics, additional means of improving educational outcomes among parenting teens and their offspring within the schools include provision of child care services and delivery of curriculum specific to this population within the school day [2,16,34,35]. Evaluation of one cognitive–behavioral skill building curriculum focused on education, personal relationships, parenting and career goals showed a significant positive impact on school attendance and grade point average [35]. There is significant variability among alternative school placement; although some of these schools may provide increased flexibility necessary for parenting teens, there is also some evidence to suggest these programs stress rote learning and fewer overall opportunities for participants [2,16].

Unfortunately, school-based programs do not reach the significant portion of teenage mothers who drop out of school. As the majority of teen mothers drop out of school prior to becoming pregnant, this model of service delivery will fail to engage a significant number of adolescent mothers [16]. Longitudinal data suggests that fewer than 50% of mothers who give birth at age 17 years or younger go on to graduate high school [33**].

**CLINIC-BASED PROGRAMS**

Teen tot programs serve as a medical home for both the parenting teen and for their offspring. Providers tend to take a family unit approach to care, viewing each visit as an opportunity to check in with all family members, not just the patient for whom the visit was scheduled. Teen tot clinics frequently offer services beyond just medical care, such as social support, mental health services, parenting classes and social programming to connect participants. Literature evaluating these programs is scarce, but that which is available supports the potential of these programs to reduce repeat pregnancy rates and improve educational and health outcomes of participants [2,36].

Cox et al. [37**] performed a longitudinal evaluation of a medical home model for teen mothers and their children over the course of 2 years. Multiple outcomes were measured, including utilization of preventive care; immunization rates; contraceptive adherence; rates of repeat pregnancy; maternal employment and education status; living situation; receipt of public assistance; and paternal financial support. The study was performed in an urban setting and participants were primarily of African–American race or Latino ethnicity, primiparous and from low-income backgrounds. The clinic was linked to a nearby prenatal and obstetrical program in an attempt to provide a smooth transition of care. The clinic incorporated all features of the medical home as defined by the American Academy of Pediatrics: accessible, family-centered, developmentally appropriate, continuous, comprehensive, coordinated, compassionate and culturally sensitive [38]. Families received multidisciplinary medical and social support services at their visits.

Over time, participants demonstrated significant increases in employment, condom use and independent living; paternal financial support declined significantly. Repeat pregnancy rates were lower compared with previously published studies, at 14.7 and 24.6% at 1 and 2 years, respectively. More teens remained in school when compared with national averages for teenage mothers. Nearly half of teens used depomedroxyprogesterone (DMPA) during the study period, and use was associated with a significant decrease in the likelihood of repeat pregnancy. DMPA usage rates were lower than that in one published study of a school-based intervention, but higher than that in a previously published teen tot model [19,27]. Immunization rates were above established benchmarks and above local, state and national rates. This study was limited by lack of a control group who did not receive services, and participants were relatively homogeneous. However, positive findings across so many domains illustrate the advantages of supporting teens and their offspring within a medical home model.

**FUTURE DIRECTIONS**

Investigations of parenting interventions that assess multiple outcomes with larger sample sizes will aid in making comparisons between programs. Whereas conducting studies that include a comparison or control group would be useful when trying to establish efficacy, this must be weighed against the obligation to provide services to all parenting teens and, therefore, comparison against previously established norms may be more appropriate. The paternal role in teenage parenting is another area of interest that remains largely unexplored to date, and of interest for future research.

**CONCLUSION**

Adolescent childbearing can have negative outcomes for both the mother and the infant. It is likely
that these outcomes are more affected by social and economic factors than by maternal age. Interventions to ameliorate these negative consequences are varied, as are the outcomes used to assess their efficacy. Promising avenues include the creation of culturally competent, developmentally appropriate interventions and provision of broad-based services that address the emotional, social, economic and educational needs of teenage mothers.

Acknowledgements

This article was supported in part by the Leadership Education in Adolescent Health grant # T71MC00009 Maternal and Child Health Bureau (Title 5, Social Security Act), Health Resources and Services Administration, Department of Health and Human Services and Office of Adolescent Pregnancy Programs, Grant #SAP PA 002033-02-C, Department of Health and Human Services.

Conflicts of interest

There are no conflicts of interest.

REFERENCES AND RECOMMENDED READING

Papers of particular interest, published within the annual period of review, have been highlighted as:

* of special interest
** of outstanding interest

Additional references related to this topic can also be found in the Current World Literature section in this issue (pp. 547–548).


This article presents a qualitative study of the impact of doulas in the lives of pregnant and parenting teens.


This large study demonstrates that the negative effects of maternal age at first birth on the quality of the home environment are mediated by maternal educational attainment.


This article provides a comprehensive evaluation of the medical home model of care delivery for adolescent-headed families, including data on multiple outcomes for both teenage mothers and their offspring.