Review article

Effective Strategies to Provide Adolescent Sexual and Reproductive Health Services and to Increase Demand and Community Support

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ABSTRACT

Access to youth friendly health services is vital for ensuring sexual and reproductive health (SRH) and well-being of adolescents. This study is a descriptive review of the effectiveness of initiatives to improve adolescent access to and utilization of sexual and reproductive health services (SRHS) in low- and middle-income countries. We examined four SRHS intervention types: (1) facility based, (2) out-of-facility based, (3) interventions to reach marginalized or vulnerable populations, (4) interventions to generate demand and/or community acceptance. Outcomes assessed across the four questions included uptake of SRHS or sexual and reproductive health commodities and sexual and reproductive health biologic outcomes. There is limited evidence to support the effectiveness of initiatives that simply provide adolescent friendliness training for health workers. Data are most ample (10 initiatives demonstrating weak but positive effects and one randomized controlled trial demonstrating strong positive results on some outcome measures) for approaches that use a combination of health worker training, adolescent-friendly facility improvements, and broad information dissemination via the community, schools, and mass media. We found a paucity of evidence on out-of-facility-based strategies, except for those delivered through mixed-use youth centers that demonstrated that SRHS in these centers are neither well used nor effective at improving SRH outcomes. There was an absence of studies or evaluations examining outcomes among vulnerable or marginalized adolescents. Findings from 17 of 21 initiatives assessing demand-generation activities demonstrated at least some association with adolescent SRHS use. Of 15 studies on parental and other community gatekeepers’ approval of SRHS for adolescents, which assessed SRHS/commodity uptake and/or biologic outcomes, 11 showed positive results. Packages of interventions that train health workers, improve facility adolescent friendliness, and endeavor to generate demand through multiple channels are ready for large-scale implementation. However, further evaluation of these initiatives is needed to clarify mechanisms and impact, especially of specific program components. Quality research is needed to determine how best to deliver sexual and reproductive health services outside the facilities, especially to vulnerable and marginalized populations.

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Adolescence is often considered a period of relatively good health. However, adolescents (aged 10–19 years) face particular health risks, especially in relation to reproduction and sexuality. Eleven percent of all births and 14% of maternal deaths worldwide are among 15- to 19-year-old females with 95% of adolescent births taking place in developing countries [1,2]. Adolescents are also vulnerable to unwanted pregnancies; each year 7.4 million [3] and 3 million [4] girls experience unintended pregnancies and unsafe abortions, respectively. An estimated 1,300,000 adolescent girls and 780,000 adolescent boys are living with human immunodeficiency virus (HIV) worldwide [5]. Over 800,000 young people are newly infected every year; 79% of these infections occur in sub-Saharan Africa (SSA). Globally, young people account for 41% of new infections among those aged 15 years or older [6]. Adolescent girls are especially vulnerable to HIV acquisition [7].

Poor, marginalized and disenfranchised youth suffer the highest burden of disease. For example, homeless adolescents face higher risks of HIV infection [8,9]. Adolescents with disabilities are particularly vulnerable to sexual abuse and resultant unplanned pregnancies and HIV and other sexually transmitted infections (STIs) [5]. Trends in SSA show that adolescent girls from the richest three quintiles have experienced declines in rates of pregnancy over time, whereas those from the poorest quintiles have faced increased rates [10].

Overall, improvements in adolescent health over the past few decades have not kept pace with those observed in children; mortality among 1- to 4-year-olds declined by more than 80% over the past five decades, whereas adolescent mortality rates only improved by 41%–48% [11]. Furthermore, risky sexual behaviors and reproductive health problems in adolescence can have long-lasting consequences into adulthood and into the subsequent generation. For example, impaired fetal growth is more common in pregnancies occurring before the age of 18 years, and low birth weight is an important risk factor for adult-onset diabetes [12].

Adolescence provides an important phase of life to capitalize on the potential and resources in this age group. The International Conference on Population and Development (ICPD) held in Cairo, Egypt, in 1994 established a comprehensive definition of reproductive health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes.” In line with the aforementioned definition of reproductive health, reproductive health care is defined as “the constellation of methods, techniques and services that contribute to reproductive health and well-being by preventing and solving reproductive health problems” [13]. The ICPD Program of Action further describes services included under the umbrella of sexual and reproductive health services (SRHS), such as family-planning counseling and services; prenatal and postnatal care and delivery; abortion services and postabortion care; treatment and prevention of reproductive tract and sexually transmitted diseases and infections including HIV; and information and counseling about human sexuality [13].

Despite the clear need for access to SRHS [14], coverage rates are low. Data from five countries in SSA with high rates of new HIV infections found that 7%–31% of males and 9%–58% of girls aged 15–24 years had been tested for HIV and received their results [5]. Less than half of young men in SSA reported using condoms at the time of the last sexual intercourse, and rates were even lower among young women [15]. In SSA, as many as 68% of adolescents have an unmet need for contraception [3]. Rates of skilled birth attendance—a critical intervention to reduce maternal and newborn mortality—are 55% in developing countries; coverage is similarly low among adolescent births, despite the higher risk related to young maternal age [16].

Efforts in recent years have focused on not only ensuring health service availability but also making its provision adolescent-friendly—that is, accessible, acceptable, equitable, appropriate, and effective [17]. These efforts aim to increase the ability and willingness to obtain services, particularly among those adolescents who need them the most.

This is one of the six articles in a series designed to take stock of progress toward achieving the ICPD Program of Action at its 20th anniversary mark. This article aims to review the current literature to synthesize current evidence on improving adolescent access to and use of SRHS.

Methods

This review consists of four specific and related review questions as listed in Table 1. We examined data within the context of a framework that defines the following parameters (Table 2):

1. “For whom?”—Population groups that are the beneficiaries of services. Of particular concern are marginalized groups (i.e., those who may be living at the fringes of society, such as adolescents who are homeless, incarcerated, or discriminated because of race, ethnicity, religion, social class, occupation (e.g., sex worker), or sexual orientation) because they are especially vulnerable to poor health outcomes. Other vulnerabilities to poor SRH outcomes include disability, gender inequalities and younger age, or developmental stage.
2. “Where?”—Types of settings where service delivery takes place.
3. “By whom?”—Types of provider delivering these services.

Information was drawn from existing reviews of the literature found by searching the Cochrane database and PubMed. We preferentially included reports that used systematic review methodology (i.e., reproducible and broad search strategy, clear inclusion/exclusion criteria, examination of biases, and strength of evidence). We also sought updated data about initiatives that were included in identified review articles. Furthermore, because published reviews often do not include gray literature, we

<table>
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<tr>
<th>Review questions</th>
<th>SRHS</th>
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<tbody>
<tr>
<td>A. How effective are interventions to establish or improve clinic- or hospital-based health services on adolescent use of SRHS or commodities and/or on adolescent SRH impact in resource-limited settings?</td>
<td>SRHS — sexual and reproductive health services.</td>
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<tr>
<td>B. How effective are interventions to establish or improve out-of-facility or community-based health services on adolescent use of SRHS or commodities and/or on adolescent SRH impact in resource-limited settings?</td>
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<td>C. How effective are interventions to establish or improve health services (facility- or community-based) on the use of SRHS or commodities or SRH impact among vulnerable or marginalized adolescents in resource-limited settings?</td>
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<td>D. How effective are IEC, social marketing, or mass media interventions on adolescent use of SRHS or commodities or on community acceptance or support for such services or commodities among adolescents in resource-limited settings?</td>
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</table>

We assessed all identified review articles and individual studies and evaluations included in the reviews for their relevance to our inclusion/exclusion criteria as outlined in Table 3. Publications could address more than one review question.

In 2006, WHO developed a framework of intervention typologies for a systematic review of youth health service utilization [18], which was further applied to a 2011 systematic review of youth HIV prevention interventions [19]. We used this framework because it differentiates programs on the basis of the kinds of interventions that were used and classifies them in an additive form, theoretically allowing for determination of component effect.

The typology first categorizes according to the health facility intervention: type 1: training health providers and/or staff to improve their knowledge, attitudes, and skills to more appropriately respond to the needs of adolescents or type 2: provider/staff training plus adjustments in the facility to make them more adolescent friendly (e.g., extending operating hours, reducing prices, modifying physical layout to increase privacy or confidentiality). The programs are also subtyped to describe the out-of-facility interventions used to disseminate information via: type a: the community, type b: other sectors (most often school based or through mass media), or type c: the community plus other sectors. Using this typology, studies could fall into six different categories: 1a, 1b, 1c, 2a, 2b, and 2c.

We also adopted the “Do not go, Steady, Ready, Go” classification. It was developed by WHO within the context of a 2006 series of adolescent HIV/AIDS systematic reviews, including the review mentioned previously on health service use. We found the classification useful because it translates the evidence base for various interventions into policy recommendations [20] (see Box). The criteria for the “Do not go, Steady, Ready, Go” classification in the 2006 review was based on the strength of evidence (assessing factors such as type and quality of study design) measured against predefined evidence thresholds for each individual type of intervention, taking into account factors such as feasibility, risk of adverse outcomes, and potential effect size with wide-scale implementation.

Results

Review Question A: facility-based SRHS

We identified five systematic reviews that met inclusion criteria [18,19,21–23] representing 18 unique initiatives to improve facility-based SRHS. They are presented in Table 4 according to their geographic location and the typology framework described previously.

Relevant data were drawn from three randomized controlled trials (RCTs); four and three quasi-experimental studies with and without longitudinal comparisons, respectively; and seven longitudinal assessments without comparison groups. Study characteristics and results are detailed in Table 5. We describe outcomes as delineated in our inclusion criteria (Table 3)—specifically those related to use of SRH services or commodities (either self-reported by survey or assessed by health facility data) or clinical SRH outcomes (e.g., rates of HIV or other STI infection, pregnancy rates).

Among the initiatives that involved health worker training without modifications to facilities (i.e., type 1a, 1b, and 1c), the three that demonstrated a significant effect pertaining to at least

<table>
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<th>Table 2</th>
<th>“For whom? Where? By whom? and What?” Framework of SRHS delivery</th>
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<tbody>
<tr>
<td><strong>For whom?” SRHS beneficiaries</strong></td>
<td>- Marginalized and vulnerable groups</td>
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<td>o Homeless, living on the street</td>
<td>o Slum dwellers</td>
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<td>o Poor</td>
<td>o Incarcerated</td>
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<td>o Living with HIV</td>
<td>o Living with disabilities</td>
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<td>o Intravenous drug users</td>
<td>o Sex workers</td>
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<tr>
<td>o Lesbian, gay, bisexual, transgender</td>
<td>o Orphans</td>
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<tr>
<td>- Rural/urban</td>
<td>- Un-married/married</td>
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<tr>
<td>- In school/out-of-school, in work</td>
<td>- Boys/girls</td>
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</table>

**Where?” SRHS delivery settings**

- Facilities
  - Clinics, hospitals
  - Standalone (adolescent SRHS only) versus integrated within existing facilities (with primary care services and/or for all age groups)
  - Public, NGO-run, Private
- Out-of-facility
  - Schools
    - School-based service delivery (e.g., clinics or nurses in schools)
    - School-linked service referral
  - Outreach/community—that is, where adolescents live or congregate
    - Homes, streets, parks, shopping malls
    - Informal health sector—for example, pharmacies, medicine sellers, traditional healers
  - Youth centers
  - Workplace
  - Detention facilities

**“By whom?” Providers of SRHS and commodities**

- Doctors, midlevel providers, midwives, nurses, counselors (including peer counselors)
- Community health workers, community-based distributors (e.g., of condoms, contraceptives), peer counselors
- Traditional birth attendants, traditional healers
- Pharmacists, medicine sellers, shopkeepers

**“What?” SRHS and commodities**

- HIV counseling and testing; care, support, and treatment
- STI counseling, testing, treatment, partner treatment
- Condoms, contraceptives, emergency contraception distribution, and counseling
- Pregnancy testing and pretest and posttest counseling and support
- Maternity care
- Safe abortion services
- Postabortion care
- Care for victims of sexual violence
- Male circumcision
- Immunizations—for example, HPV and TT
- Promotive guidance regarding SRH and development

HIV = human immunodeficiency virus; HPV = human papilloma virus; NGO = nongovernmental organization; SRHS = sexual and reproductive health services; STI = sexually transmitted infection; TT = tetanus toxoid.
some of our outcomes of interest were type 1c (i.e., those that included information dissemination both via the community and either the education sector and/or mass media or both). Two of these studies were rigorously designed cluster RCTs; both demonstrated mixed results. For example, Cowan et al. demonstrated a positive effect in terms of reduced pregnancy rates and increased likelihood of seeking contraceptive services among adolescent SRHS, we also included outcomes relating to changes in parental/community attitudes toward adolescent SRHS.

HIV = human immunodeficiency virus; IEC = information, education, and communication; SRHS = sexual and reproductive health services; STI = sexually transmitted infection.


**Box.** “Do not go, Steady, Ready, Go” classification

Go: Evidence threshold met
Sufficient evidence to recommend large-scale implementation coupled with careful monitoring of coverage, quality and cost, and research to better understand the mechanisms of action.

Ready: Evidence threshold partially met
Evidence suggests intervention effectiveness but large-scale implementation must be accompanied by further research to clarify mechanisms and impact.

Steady: Evidence threshold not met
Some promising evidence, but further development, pilot-testing, and evaluation are needed.

Do not go: Strong enough evidence of lack of effectiveness or harm
Do not implement.
Ugandan study assessed the impact of health center reorganization coupled with varying levels of health worker training and building district health teams’ capacity for training and supervision. Adolescents were involved in various project stages. There was a more than twofold increase in self-reported use of health services, including family planning and STI services, and a more modest increase in self-reported use of family planning, among adolescents in intervention compared with the control communities [33].

The second type 2a initiative entailed multiple strategies including information distribution and awareness-building activities targeting unmarried Chinese youth and the distribution of free contraceptives. These measures resulted in a 14-fold increased odds of contraceptive and condom use among those in the intervention compared with the control community [34]. We did not identify any type 2b studies that met our inclusion criteria.

Eleven type 2c initiatives met our inclusion criteria. Only one, a quasi-experimental study from Senegal, did not demonstrate any positive SRHS-related outcomes related to the intervention, although there was an overall increase in self-reported use of health services in both the intervention and control groups [47].

The remaining 10 type 2c studies demonstrated at least some positive SRHS-related outcomes, although none of the type 2 studies measured biologic outcomes (e.g., pregnancy or HIV/STI prevalence) as study end points. The three type 2c initiatives with the weakest study designs assessed before/after or longitudinal trends in clinic attendance and lacked control groups and denominator information. Mozambique, for example, launched a multisectoral program, branded “Geracao Biz” (“Busy Generation”) [48,49]. Adolescent-only clinics were refurbished, training materials were developed, and health workers met periodically to exchange technical information. Peer activists welcomed and materials were developed, and health workers met periodically to exchange technical information. Peer activists welcomed and educators in the waiting room. Longitudinal assessment of records from a subset of clinics demonstrated a dramatic increase in total clinic attendance and condom distribution.

In Madagascar, 15 private clinics “franchised” as a youth-friendly network and offered subsidized SRHS [50,51]. Extensive community outreach, social marketing, and mass media communication were also used. Clinic attendance increased almost twofold for males and fivefold for females. A national program in South Africa to improve adolescent-friendly health services (AFHS), including via national accreditation guidelines, was linked to a multimedia HIV prevention campaign. Overall clinic attendance by adolescents across 32 clinics increased but not for SRH visits specifically, although HIV testing did significantly increase [52].

Four African Youth Alliance (AYA) initiatives monitored service use and commodity distribution quarterly over 2 years [35–43]. These programs were implemented across four countries and involved the enhancement of clinics to improve their youth friendliness, although specific intervention components varied by AYA program country. Changes in clinic attendance varied by country and ranged from initial increases in attendance with subsequent leveling off or declines [37,38,40–43] to a steady increase in clinic attendance throughout [35]. Additionally, surveys of 17- to 22-year-olds were conducted 2–3 years after program inception for three of the four AYA programs. These data consistently demonstrated a positive effect on self-reported condom and contraceptive use among females (but not males) among those young people in intervention sites who recalled being exposed to AYA-specific activities as compared with those in control sites.

Two nonrandomized type 2c studies compared intervention to control groups with [44] or without [53] before/after intervention assessments. In Bangladesh, community- and school-based education coupled with referrals to services free of charge did not result in a significant difference in self-reported use of condoms. They did report an increase in service use, especially at sites that included the school-linked component. However, statistical testing of the difference between groups was not reported for this outcome [44]. An initiative in Mongolia focused on adolescent participation and community mobilization, often implemented by health workers, across a broad range of community members including teachers, health workers, and parents and adolescents themselves. They also trained health workers and provided basic commodities (e.g., contraceptives). Statistical methods were imperfect and did not take into account differences in the adolescent population in intervention versus control communities. Nonetheless, service use did statistically significantly increase in intervention compared with control sites [53].

One type 2c RCT, conducted in Nigeria, met inclusion criteria. It included training of private doctors along with clinic certification as adolescent friendly. Patent medicine vendors and pharmacists were also trained. Additionally, peer counselors and health providers delivered school-based health education on STI prevention and treatment. Self-reports of condom use and care seeking from a private physician or a pharmacist for STI symptoms increased among both males and females in intervention and control groups but with a more statistically significant outcome in the intervention group [45,46].

Four of the studies included in Review Question A review provided information on overall program costs [44,47,51,54]; however, none related costs to the scope of services provided or commodities distributed, number of beneficiaries reached, or health outcomes achieved. Without such analyses or data to calculate cost-effectiveness ratios, we were unable to compare costs. Therefore, these data are not included in this article.

Review Question B: out-of-facility SRHS

Although often delivered within the context of health facilities (e.g., clinics, hospitals), health services can also be delivered in the community—taking the services to where adolescents live and congregate. Potential locations for outreach services include schools, workplace, streets, malls, homes, youth centers, pharmacies, and storefronts. Review Question B deals with the effectiveness of approaches used to delivery SRHS in the community. We describe the related data from the eight initiatives [45,46,51,55–61], which we identified in four reviews [18,19,62,63] that met inclusion criteria.

Schools and workplaces. We were only able to identify evidence from one program that met our inclusion criteria. In Kenya, the delivery of messages regarding abstinence, faithfulness, and condom use to students from primary to university levels was combined with mobile HIV testing within school settings and an annual HIV testing day [56]. Although self-reported condom use did increase over time (there was no comparison group), outcomes regarding health service use were not reported.

Youth centers. Youth centers (YCs) are meeting points that offer a youth-friendly, safe, nonthreatening environment for information and service delivery across various sectors such as health, education, job training, or recreation. A 1997 review, based on
### Table 5
Characteristics and evidence from studies of facility-based SRHS

<table>
<thead>
<tr>
<th>Reference/primary study aim</th>
<th>Target population/location</th>
<th>Intervention</th>
<th>Design/sample size</th>
<th>Outcome of interest</th>
<th>Results</th>
<th>Conclusion</th>
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<tbody>
<tr>
<td><strong>Type 1a</strong></td>
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<tr>
<td>Mnani and Magnani [24]</td>
<td>10–24 year olds</td>
<td>Train health workers and peer educators in adolescent SRH communication skills. Community sensitization activities. Major difference between sites was extent of community involvement.</td>
<td>Longitudinal service statistics with control clinics</td>
<td># Aged 15–24 years seen for FP services</td>
<td>Baseline QI End line*</td>
<td>No substantial utilization of services in intervention versus control clinics</td>
<td>Data are estimates from graphs. Significance testing was not provided</td>
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<tr>
<td>Magnani et al. [25]</td>
<td>10–24 year olds</td>
<td>Provision of SRHS for adolescents in public clinics via training of health workers, coupled with SRH education in schools</td>
<td>Quasi-experimental with clinics and schools from the same area grouped into intervention and control groups</td>
<td>Clinic average annual number of new adolescent contraceptive users</td>
<td>Intervention clinics: 1997 (Beginning of project): 390 1999 (End of project): 500</td>
<td>Increase in new contraceptive users but no difference between intervention and control sites</td>
<td>Different organizations implemented each site group. Each organization had differing approaches, primarily varying based on how communities were engaged. However, implementation strategies precluded assessment of these approaches.</td>
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<td><strong>Type 1b</strong></td>
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<tr>
<td>Cowan et al. [26,27]</td>
<td>Youth with mean age of 15 years South-eastern provinces in Zimbabwe</td>
<td>Train and re-train health workers on youth friendliness and provide supportive supervisory visits, coupled with community-based programs to increase awareness for adults and parents as well as in- and out-of-school participatory comprehensive education programs to increase demand and provide education and negotiating skills around sexual activity, STIs, contraception, and SRHS</td>
<td>Cluster randomized trial with baseline and end-of-study (at 4 years) surveys of the population within the communities 15 Intervention and 15 control communities</td>
<td>HIV prevalence HSV-2 (genital herpes) prevalence Pregnancy prevalence Pregnancy during follow-up No condom use at the last sex No pregnancy prevention with the first partner No pregnancy prevention with the last partner No pregnancy prevention with any partner Went to clinic in the past 12 months</td>
<td>M/F aOR (95% CI) M.1.20 (.69–2.18) M.1.23 (.69–2.18) M.1.24 (.93–1.65) F.92 (.70–1.19) F.64 (.49–.83) M.1.03 (.83–1.29) F.93 (.72–1.20) M.90 (.69–1.17) F.97 (.76–1.25) M.87 (.64–1.17) F.1.04 (.77–1.40) M.97 (.63–1.21) F.99 (.74–1.30) M.99 (.76–1.29) F.98 (.76–1.28)</td>
<td>Strong evidence of slight increase in reported contraception-seeking behavior among females and moderate reduction in reported pregnancies as a result of the intervention. Otherwise, no significant change in any of the other outcomes of interest.</td>
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<table>
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<tr>
<th>Reference/primary study aim</th>
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<th>Results</th>
<th>Conclusion</th>
<th>Comments</th>
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<tr>
<td>Doyle et al., Hayes et al., Larke et al., Ross et al. [28–30,54] Improve access to and utilization of high-quality SRHS for young people</td>
<td>12–24 year-olds with a particular focus on 12–19 year-olds Mwanza Region, Tanzania</td>
<td>Four-prongs: (1) a teacher-led, peer-assisted, school-based SRH education program; (2) youth-friendly health services training and capacity building for health workers; (3) youth condom promotion and distribution; and (4) community promotion activities</td>
<td>Cluster randomized trial with baseline, 10 intervention and 10 control communities. 3,524 Attendees of intervention and 3,516 control schools surveyed at 3 years. 7,083 intervention and 6,731 control attendees surveyed at 9 years.</td>
<td>HIV prevalence: At 3 and 9 years</td>
<td>M 1.19 (.90–1.57) F 1.33 (1.05–1.69)</td>
<td>No improvement in biologic outcomes or statistically significant increase in reported use of SRHS or commodities, except for strong evidence of a modest increase in initiation of condom use prevalence among males and females</td>
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<td>HSV-2 prevalence: At 3 and 9 years</td>
<td>M 3.75 (.24–4.66) F 1.05 (.83–1.32)</td>
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<td>Syphilis prevalence: At 3 and 9 years</td>
<td>M 7.28 (.46–1.30) F 9.99 (.67–1.46)</td>
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<td>Chlamydia prevalence: At 3 and 9 years</td>
<td>M 1.14 (.53–2.43) F 9.99 (.67–1.46)</td>
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<td>Gonorrhea prevalence: At 3 and 9 years</td>
<td>M 1.27 (.87–1.86) F 7.31 (.20–2.63)</td>
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<td>Initiated condom use</td>
<td>M 1.41 (1.15–1.73) F 1.30 (1.03–1.63)</td>
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<td>Condom use at the last sex: At 3 and 9 years</td>
<td>M 1.47 (1.12–1.93) F 1.12 (.85–1.48)</td>
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<td>Condom use at the last sex with nonregular partner: At 9 years</td>
<td>M 1.11 (.97–1.36) F 1.34 (1.07–1.69)</td>
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<td>Went to clinic for STI symptoms: At 3 and 9 years</td>
<td>M .84 (.50–1.41) F 1.02 (.62–1.70)</td>
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<td>Longitudinal health service utilization, STI partner contact tracing, condom distribution statistics were also gathered on outpatient visits for 15–24 year-olds to 39 health facilities</td>
<td>Service statistics demonstrated increased health service utilization for STI symptoms by males (but was not statistically significant for females) as a result of the intervention</td>
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<td>Difference in mean number of visits or commodities distributed in intervention versus comparison group</td>
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<td>Outpatient visits, overall</td>
<td>Adjusted mean difference from baseline (95% CI)</td>
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<td>M, Year: F .75 (−.34 to 1.66)</td>
<td>M, Year 2: 5 (−.4 to 15)</td>
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<td>M, Year 3: 5 (−.7 to 16), p = .691, p trend = .026</td>
<td>F, Year 1: 6 (−.17 to 28)</td>
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<td></td>
<td>M, Year 2: 16 (−.9 to 42)</td>
<td>F, Year 3: 17 (−.5 to 38), p = .865, p trend = .135</td>
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<tr>
<td>Study</td>
<td>Location</td>
<td>Population</td>
<td>Interventions</td>
<td>Key Findings</td>
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<tr>
<td>Kim et al. [31,32]</td>
<td>Zimbabwe (urban Mutare and four towns in rural districts)</td>
<td>10–24 year olds</td>
<td>Training family planning providers in communication and counseling skills with a campaign to refer young people to clinics. The campaign included multiple channels including community events, hotlines, radio program, posters, and leaflets distributed and dramas performed at schools, churches, and town centers. Peer educators also visited homes.</td>
<td>Weak evidence for increase in reported use of services as a result of the intervention. No control site data for comparison areas.</td>
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<tr>
<td>Mbonye et al. [33]</td>
<td>Jinja, Uganda</td>
<td>10–19 year-olds</td>
<td>Training health workers and district health management team in adolescent SRH, communication, and counseling. Health centers reorganized to cater to adolescents and recreational services introduced. Basic SRH supplies provided to clinics.</td>
<td>Weak evidence for increased reported use of services and commodities as a result of the intervention.</td>
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<tr>
<td>Lou et al. [34]</td>
<td>Suburban Songjiang district, Shanghai, China</td>
<td>15–24 year-old unmarried youth</td>
<td>Training health workers to increase knowledge, sensitivity, and skills related to adolescent SRH, including counseling IEC materials and activities (lectures, videos, discussions) made available in the community. Community sensitization meetings for community leaders and parents.</td>
<td>Moderate evidence of increased reported use of condoms and contraceptives as a result of the intervention.</td>
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<thead>
<tr>
<th>Reference/primary study aim</th>
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<th>Intervention</th>
<th>Design/sample size</th>
<th>Outcome of interest</th>
<th>Results</th>
<th>Conclusion</th>
<th>Comments</th>
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<td><strong>Type 2c</strong></td>
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<tr>
<td><strong>African Youth Alliance (AYA) study [35,36]</strong></td>
<td>10–24 year olds with a focus on 15–20 year-olds Botswana, implementation sites throughout the country</td>
<td>Staff and health working training along with clinic establishment or enhancement to improve youth friendliness. Peer educators provided information in the clinics and in the community. Community behavior change component.</td>
<td>Longitudinal assessment of health service utilization data from 18 clinics</td>
<td>Total number of visits among 10–24 year olds</td>
<td>There was a steady increase in clinic attendance</td>
<td>Surveys of youth were conducted for other AYA country programs but not in Botswana because of resource constraints and the long lag period between the end of country program operations and the initiation of the survey-based evaluation</td>
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<tr>
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<td>10–24 year olds with a focus on 15–20 year-olds Ghana, implementation sites throughout the country</td>
<td>Staff and health working training along with clinic establishment or enhancement to improve youth friendliness. Peer educators provided information in the clinics and in the community. Multiple sources of media used in information dissemination campaign. Life skills planning and other educational activities. Policy and advocacy campaign and institutional capacity building.</td>
<td>Comparison of postintervention survey data of 17–22 year-olds in the intervention communities who reported having had exposure to AYA-specific activities, compared with those from control communities</td>
<td>Condom use at the first sex Ever used condom with current partner Always used condom with current partner Used modern contraceptive at the first sex Used modern contraceptive at the last sex</td>
<td>Reported use of condoms and contraceptives was significantly higher among “exposed” compared with “unexposed” females; no statistically significant difference noted among males</td>
<td>Many baseline reported behaviors regarding SRH commodity use were higher among males before exposure to intervention Measure of change from baseline comparing “exposed” to “unexposed” was not provided There was some contamination of control communities because of mass media and peer education intervention components Authors reported a preference in reporting analysis of “exposed” to “unexposed” rather than among intervention (i.e., including those who reported exposure to</td>
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### Table 5

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<th>Results</th>
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</tbody>
</table>
Longitudinal assessment of health service utilization data from 24 clinics

<table>
<thead>
<tr>
<th>Visit type</th>
<th>Total number of visits among 10–24 year-olds</th>
<th>Interval</th>
<th>#</th>
<th>Increase in clinic attendance in first quarter and then a leveling off for subsequent quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>All visits, among reporting clinics</td>
<td>Q3 ~ 8,000</td>
<td>Q4 ~ 15,000</td>
<td>Q5 ~ 17,000</td>
<td>Q6 ~ 13,000</td>
</tr>
<tr>
<td>STI testing</td>
<td>Q3 ~ 450</td>
<td>Q4 ~ 250</td>
<td>Q5 ~ 300</td>
<td>Q6 ~ 400</td>
</tr>
<tr>
<td>STI treatment</td>
<td>Q3 ~ 500</td>
<td>Q4 ~ 250</td>
<td>Q5 ~ 300</td>
<td>Q6 ~ 500</td>
</tr>
<tr>
<td>VCT</td>
<td>Q3 ~ 50</td>
<td>Q4 ~ 100</td>
<td>Q5 ~ 200</td>
<td>Q6 ~ 250</td>
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</tbody>
</table>

AYA study [36,39–41] 10–24 year-olds with a focus on 15–20 year-olds in Tanzania

Staff and health working training along with clinic establishment or enhancement to improve youth friendliness. Peer educators provided information in the clinics and in the community. Multiple sources of media used in information dissemination campaign. Life skills planning and other educational activities. Policy and advocacy campaign and institutional capacity building. Community behavior change component.

Comparison of postintervention survey data of 17–22 year-olds in the intervention communities who reported having had exposure to AYA-specific activities compared with those from control communities. # surveyed: “Exposed” in the intervention group: M: 492 F: 843 “Unexposed” (i.e., control group); M: 229 F: 336

Condom use at the first sex

- Ever used condom with current partner
- Always used condom with current partner
- Used modern contraceptive at the first sex
- Used modern contraceptive at the last sex

M: 24% unexposed, 44% exposed, p < .05
F: 33% unexposed, 54% exposed, p < .05
M: 78% unexposed, 81% exposed, p > .05
F: 59% unexposed, 75% exposed, p < .05

M: 14% unexposed, 28% exposed, p < .05
F: 15% unexposed, 25% exposed, p < .05
M: 22% unexposed, 43% exposed, p < .05
F: 37% unexposed, 56% exposed, p > .05

M: 68% unexposed, 67% exposed, p > .05
F: 39% unexposed, 64% exposed, p < .05

Reported use of condoms and contraceptives was significantly higher among exposed compared with unexposed females. Many outcomes related to contraceptive and condom use were also significantly higher among exposed males.

Measure of change from baseline comparing exposed to unexposed was not provided. There was some contamination of control communities because of mass media and peer education intervention components.

Authors reported preference in reporting analysis of “exposed” to “unexposed” rather than among intervention (i.e., including those who reported exposure to intervention and those who did not within intervention communities) versus control communities, making the results more of an efficacy rather than effectiveness analysis (continued on next page)
<table>
<thead>
<tr>
<th>Reference/primary study aim</th>
<th>Target population/location</th>
<th>Intervention</th>
<th>Design/sample size</th>
<th>Outcome of interest</th>
<th>Results</th>
<th>Conclusion</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>AYA study [36,39,42,43]</td>
<td>10–24 year-olds with a focus on 15–20 year-olds Uganda</td>
<td>Staff and health working training along with clinic establishment or enhancement to improve youth friendliness. Peer educators provided information in the clinics and in the community. Multiple sources of media used in information dissemination campaign. Life skills planning and other educational activities. Policy and advocacy campaign and institutional capacity building. Community behavior change component.</td>
<td>Comparison of postintervention survey data of 17–22 year-olds in the intervention communities who reported having had exposure to AYA-specific activities compared with those from control communities. # surveyed: “Exposed” in the intervention group: M: 995 F: 1,933 “Unexposed” (i.e., control group): M: 633 F: 615</td>
<td>Condom use at the first sex</td>
<td>Ever used condom with current partner Always used condom with current partner Used modern contraceptive at the first sex Used modern contraceptive at the last sex</td>
<td>M: 55% unexposed, 55% exposed, p &gt; .05 F: 45% unexposed, 58% exposed, p &lt; .05 M: 74% unexposed, 78% exposed, p &gt; .05 F: 57% unexposed, 77% exposed, p &lt; .05 M: 37% unexposed, 39% exposed, p &gt; .05 F: 20% unexposed, 35% exposed, p &lt; .05 M: 56% unexposed, 56% exposed, p &gt; .05 F: 48% unexposed, 59% exposed, p &lt; .05 M: 61% unexposed, 61% exposed, p &gt; .05 F: 42% unexposed, 59% exposed, p &lt; .05</td>
<td>Use of condoms and contraceptives was significantly higher among exposed compared with unexposed females; no statistically significant difference noted among males</td>
</tr>
<tr>
<td>Longitudinal assessment of health service utilization data from 96 clinics</td>
<td>Total number of visits among 10–24 year-olds</td>
<td>Visit type</td>
<td>Interval</td>
<td>#</td>
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<tr>
<td>All visits</td>
<td>Q1</td>
<td>16,383</td>
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<td></td>
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<td>Q2</td>
<td>37,980</td>
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<tr>
<td></td>
<td>Q3</td>
<td>40,161</td>
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<tr>
<td></td>
<td>Q4</td>
<td>12,509</td>
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<td></td>
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<td>Q5</td>
<td>14,201</td>
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<td></td>
<td>Q6</td>
<td>16,037</td>
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<td></td>
<td>Q7</td>
<td>13,096</td>
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<td>STI testing</td>
<td>Q1-3</td>
<td>1,323</td>
<td></td>
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<tr>
<td>STI testing</td>
<td>Q4-8</td>
<td>3,901</td>
<td></td>
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<tr>
<td>STI treatment</td>
<td>Q1-3</td>
<td>7,318</td>
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<tr>
<td>STI treatment</td>
<td>Q4-8</td>
<td>6,235</td>
<td></td>
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<tr>
<td>VCT</td>
<td>Q1-3</td>
<td>1,017</td>
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<tr>
<td>VCT</td>
<td>Q4-8</td>
<td>4,344</td>
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</table>
A: aOR 2.31, $p < .1$
B: aOR 2.41, $p < .1$

Condom use at the last sex among adolescents

A: Preimplementation: 135
6 months: 109
12 months: 349
24 months: 1,216
C: Pre-implementation: 271
6 months: 310
12 months: 557
24 months: 232

Evidence of increased service utilization due to the intervention, especially in the study arm that included school-based activities

Girls were the primary recipients of SRHS with the leading reason being for tetanus toxoid vaccination. Antenatal and postnatal care, FP, and STI services were also common reasons for SRHS visits Statistical comparison of service utilization data was not provided

### Bhuiya et al. [44]

**Improve adolescent reproductive health by providing adolescent-friendly reproductive health services and education**

13–19 year-olds
Urban communities in northwestern Bangladesh

Health worker and nonclinical staff training to improve welcoming and nonjudgmental attitudes; modification of facilities to improve wait times, privacy, confidentiality, and affordability. Peer educators and teachers referred adolescents to services. Community-based information provided via telephone hotline. Questions could be anonymously submitted in boxes at schools or clinics. Responses posted on school bulletin boards or in newspaper columns in question and answer format.

Before and after interviews of ~6,000 adolescents from two intervention and one control site. Also longitudinal service utilization statistics.

**Site A: Reproductive health education to out-of-school adolescents linked with adolescent-friendly services at health facilities**

**Site B: As per site A + school-based education and linkage with health facility component**

**Site C: Control**

Condom use at the last sex among unmarried male adolescents compared with baseline

Monthly average of SRHS visits

A: Preimplementation: 135
6 months: 109
12 months: 349
24 months: 1,216
B: Preimplementation: 84
6 months: 537
12 months: 1,469
24 months: 1,216
C: Pre-implementation: 271
6 months: 310
12 months: 557
24 months: 232

### Coplan [45]

**Improve treatment of STIs among adolescents**

14–20 year-olds
Attending school
Endo, Nigeria

Training on STI diagnosis and treatment for private providers (practitioners, patent medicine dealers, pharmacists) who were identified by adolescents as STI treatment providers for youth in the neighborhood. Private practitioners’ clinics were certified as adolescent friendly; this list was provided to peer educators. Education through schools by health professionals, peer educators, films, and organized discussions.

Cluster randomized with one treatment site consisting of STI treatment providers near four schools and two control sites with STI treatment providers near four schools each. Surveys of students were conducted in schools

Percent reported seeking treatment from a private provider for STI symptoms

Percent males reporting some condom use

Percent females reporting some condom use

Intervention: before: 17.5%, after: 40.7%
Control 1: before: 19.0%, after: 29.1%
Control 2: before: 24.0%, after: 30.4%
Change relative to control 1: OR, 1.85; 95% CI, 1.06–3.22
Change relative to control 2: OR, 2.35; 95% CI, 1.03–5.17

Intervention: before: 30.8%, after: 40.5%
Control 1: before: 32.1%, after: 36.1%
Control 2: before: 26.6%, after: 34.3%
Change relative to control 1: OR, 1.32; 95% CI, 0.97–1.79
Change relative to control 2: OR, 1.08; 95% CI, 0.6–1.46

Intervention: before: 30.2%, after: 36.5%
Control 1: before: 32.6%, after: 31.8%
Control 2: before: 28.2%, after: 25.4%
Change relative to control 1: OR, 1.82; 95% CI, 1.28–2.6
Change relative to control 2: OR, 1.96; 95% CI, 0.94–4.3

### Diop et al. [47]

**Improve reproductive**

10–19 year-olds
Urban communities

Clinic-based intervention: train health workers, peer educators, and organized discussions.

Before and after surveys of ~2,800 adolescents from two sites

Percent reporting use of health services

Pre and post-natal care and pregnancy testing

Pre and post-natal care

Pre and post-natal pregnancy testing

FP

Pre implementation: 135
6 months: 109
12 months: 349
24 months: 1,216
Pre and post-natal pregnancy testing

Pre implementation: 84
6 months: 537
12 months: 1,469
24 months: 1,216
Pre and post-natal pregnancy testing

Pre implementation: 271
6 months: 310
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24 months: 232
Pre and post-natal pregnancy testing

Pre and post-natal pregnancy testing

Pre and post-natal pregnancy testing

Pre and post-natal pregnancy testing

Pre and post-natal pregnancy testing
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<th>Conclusion</th>
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</thead>
<tbody>
<tr>
<td>Health among adolescents by creating a supportive environment for dealing with adolescent reproductive health problems, improving existing services, and providing reproductive health information and skills in schools</td>
<td>in northern Senegal</td>
<td>Educators, modification of the layout of clinics to make them more adolescent friendly (e.g., increase privacy)</td>
<td>Community-based intervention: sensitization on adolescent reproductive health for parents and community and religious leaders. Education sessions for adolescents led by peer educators using a life skills curriculum. Educational materials distributed at community events. Mass media messaging via radio. School-based intervention: reproductive health curriculum delivered by teachers and peer educators and events outside school hours</td>
<td>Boys aged 10–14 years: before/after, p value</td>
<td>6%/7%, &gt;.05</td>
<td>8%/13%, &lt;.05</td>
<td>9%/12%, &lt;.05</td>
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<td>Boys aged 15–19 years: before/after, p value</td>
<td>1%/7%, &lt;.05</td>
<td>4%/13%, &lt;.05</td>
<td>3%/12%, &lt;.05</td>
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<td>Girls aged 10–14 years: before/after, p value</td>
<td>8%/18%, &lt;.05</td>
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<td></td>
<td>Girls aged 15–19 years: before/after, p value</td>
<td>12%/14%, &gt;.05</td>
<td>8%/20%, &lt;.05</td>
<td></td>
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<tr>
<td>Hainsworth et al. [48,49]</td>
<td>15–24 year-olds Maputo, Mozambique</td>
<td>Three adolescent-only clinics refurbished and equipped to make them adolescent friendly, services except STI treatment offered for free; health worker training; periodic meetings of health workers to exchange information; IEC materials developed; peer activists trained</td>
<td>Longitudinal comparison of clinic attendance records at program start and 1 and 2 years postimplementation at eight clinics</td>
<td># Attending clinic</td>
<td>Baseline: Maputo 1,173, Zambezia 2,472</td>
<td>Year 1: Maputo 11,256, Zambezia 19,652</td>
<td>Year 2: Maputo 18,909, Zambezia 31,697</td>
</tr>
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<td># Of condoms distributed</td>
<td>Baseline: Maputo NA, Zambezia NA</td>
<td>Year 1: Maputo 11,669, Zambezia 19,300</td>
<td>Year 2: Maputo 16,271, Zambezia 24,894</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>Weak evidence of increased use of distribution of condoms</td>
<td>No control sites. Significance testing not provided</td>
<td></td>
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<tr>
<td>LaVake [50] Neukom et al. [51]</td>
<td>15–24 year-olds Tamatave, Madagascar, and surrounding rural areas</td>
<td>Franchise 13 for-profit and two private nonprofit clinics into a network of youth-friendly clinics meeting a minimum standard, which included having trained providers, flexible hours, welcoming and discreet facilities. Services were subsidized.</td>
<td>Before and after comparison of clinic attendance records at 15 clinics</td>
<td># Attending clinic</td>
<td>Before: Males: 138, Females: 389</td>
<td>After: Males: 250, Females: 1,959</td>
<td>Weak evidence of increased use of services</td>
</tr>
</tbody>
</table>
### loveLife [52]

**Reduce HIV, STI and unwanted pregnancy prevalence among youth by improving adolescent-friendliness of South African government clinics**

- **10–24 year-olds with a particular focus on 12–17 year-olds**
- **South Africa (national)**

Implement clinic quality-assessment teams to assess and make improvements based on national adolescent-friendly quality standards. Participating clinics also undergo repeated external assessments and are eligible to receive two-year renewable rating as an adolescent-friendly clinic. Simultaneous multimedia HIV prevention campaign.

### Sovd et al. [53]

**Improve access to quality SRHS for adolescents**

- **10–19 year-olds**
- **Districts in the capital and rural districts, Mongolia**

Training staff in adolescent health and development, providing basic equipment and supplies (e.g., contraceptives, weight scales) to clinics; making facilities more attractive to and confidential for adolescents, setting adolescent-friendly quality standards, community mobilization with adults and adolescents, adolescent participation in the interventions

![Table with data](image-url)

**Notes:**
- **aOR** = adjusted odds ratio; **aPR** = adjusted prevalence ratio; **CI** = confidence interval; **F** = female; **FP** = family planning; **IEC** = information, education, communication; **HSV-2** = herpes simplex virus-type 2; **I** = intervention; **M** = male; **NA** = data not available; **OR** = odds ratio; **Q** = quarter (with Q0 corresponding to baseline, Q1 to 3-month period after baseline, Q2 to 3-month period following Q1, and so on); **RCT** = randomized controlled trial; **STI** = sexually transmitted infection; **SRH** = sexual and reproductive health; **SRHS** = sexual and reproductive health services; **VCT** = voluntary counseling and testing for HIV.
- a Prevalence of reported condom use at 36 months among those who had reported no condom use at recruitment.
- b Contact tracing data disaggregated by gender were not provided.
- c Condoms were not distributed before the start of the intervention. Data disaggregated by gender were not provided.
- d p Value represents comparison of difference by trial arm in average monthly attendance over 3 postimplementation years. p Trend value represents test for trend in mean difference over time from post-implementation year 1 to postimplementation year 3.
- e Data not reported for quarter 4.
the best available evidence at that time, suggested that YCs were not likely to be a cost-effective way to increase the use of SRHS because of high operating costs associated with provision of multiple (including non-health related) services [64]. Further and more rigorous studies have since been published. In fact, a systematic review specifically on the effectiveness of 18 YC initiatives in increasing the use of SRHS was published in 2012 [63]; their findings were consistent with other relevant reviews [18,62,64]. YCs are overwhelmingly accessed by older male youth (often outside the intended age target range) who are repeat visitors residing in close proximity to the centers. They largely use the centers for recreational purposes. Indeed, YC attendees infrequently accessed the facilities’ health services. Although 27% and 97% of attendees of two different South African YCs reported using the facilities’ SRHS [65–67], the proportion was much lower across all other studies, ranging from 14% in Accra, Ghana [68], to <5% across five SSA and Caribbean studies [55,57,69–71]. Females constituted 92% of YC attendees who used clinic services [63]; however, uptake even among this group was low—females tended to use the centers for vocational reasons [57,69].

Five initiatives [51,55,57,58,60,61] measured outcomes meeting our inclusion criteria; results were mixed. For example, visitors to a Togo YC were significantly more likely to report using contraceptives [60]. In Rwanda, attendees were significantly more likely to have had an HIV test; yet there were no positive impacts on condom or contraceptive use [51,58]. A before/after analysis of an YC strategy in Monterey, Mexico was compared with both a community-based youth promoters strategy and a control community. They demonstrated a 44% increase in individuals under the age of 23 years who received condoms or contraceptives in the YCs, compared with a 2% increase in the control communities. There was an even more striking 98% increase in the youth promoter intervention communities. The authors reported that the YC intervention was more costly than the youth promoter intervention [61].

YCs were the only intervention type related to our Review Question B for which cost data were available and demonstrate that, with the generally low uptake of clinical services, the cost per beneficiary was high—ranging from US$4– US$200 per clinic visit or contraceptive adopter [55,67,72]. Furthermore, the more recreational, educational, and/or vocational services provided, the higher the cost per clinic visit [67].

Households, streets, parks, malls, markets, or other such settings. Data on the effectiveness of community-based distribution (by community health workers or community-based distributors, for example) of SRHS services and commodities are not readily available in the context of resource-limited settings. A 2012 review of the effectiveness of out-of-facility approaches to increase the use of SRHS [62] included one study meeting criteria for our review question. Data relating to YCs from this quasi-experimental study from Mexico was described previously. The authors also demonstrated that a community-based condom and contraception distribution strategy that specifically targeted youth was more effective in increasing commodity utilization (98% increase) than either community-based distribution without a youth-specific strategy (2% increase) or distribution in YCs (44% increase) [61].

Informal private health sector. As described previously for Review Question A, an initiative in Nigeria trained three groups that youth identified as providers whom they turn to treatment for STIs: private doctors, pharmacists, and patent medicine dealers. Training was on the syndromic management of STIs. Self-reported condom use and care seeking for STI symptoms from private physicians or pharmacists increased in both intervention and control groups, but with a more statistically significant outcome in the intervention group [45,46].

A Zambian quasi-experimental study evaluated the efficacy of providing emergency contraception (EC) prescriptions via four different provider groups: clinic-based providers, pharmacy staff, peer outreach counselors, and community sales agents such as shopkeepers and small-scale vendors [59]. The target group was 12- to 45-year-olds, but separate data were available for 15- to 24-year-olds. Among those who actually completed a prescription, pharmacies were popular sites for the receipt of and filling of EC prescriptions (50% and 70%, respectively), as were traditional health facilities where 20% received EC prescriptions. Thirty percent received the prescriptions from peer counselors. Interestingly, community sales agents were not popular choices for getting EC prescriptions despite pre-study qualitative assessments that identified the community sales agents as a preferred source of health services and the fact that most condoms obtained by adolescents in the project areas were from community-based distributors. This highlights the need for continued monitoring and evaluation of intervention implementation.

Review Question C: vulnerable and marginalized populations

We were unable to identify any initiatives meeting this article’s inclusion criteria that reported outcomes specifically for vulnerable or marginalized groups. In fact, the 2012 review of out-of-facility SRHS was coauthored by two authors of this article (D.M.D. and V.C.-M.). We initially set out to examine the impact of community-based health service interventions on marginalized youth. However, although the programs and projects often specifically intended to target such groups, none of the studies or evaluations reported outcome data disaggregated by such groups.

Review Question D: generating demand and community support

The preceding three questions deal with supply-side strategies. However, improving health service use also involves generating demand for services among adolescents and acceptance among gatekeepers in the community, such as parents and community leaders, who may question or oppose the provision of SRHS for adolescents. Aptly, the vast majority of the initiatives described previously not only included supply-side strategies such as health provider training and/or making facilities more adolescent friendly but also incorporated marketing or information dissemination to create demand and/or support for adolescent SRHS. In fact, as described under Review Question A and depicted in Tables 4 and 5, evidence of impact on the uptake of SRHS is most plentiful for type 2c interventions—that is, those that include training and facility improvements coupled with activities to increase demand and acceptance at the community level and via the education sector and/or mass media. It is nearly impossible to disentangle the attributable contributions of each component as study designs did not allow for such analyses.

In their systematic review published in 2010, Kesterton and Cabral de Mello specifically summarize the evidence base for interventions to create or increase young people’s demand for SRHS and those to increase community support [73].
Most—studies included in our review were identified from their publication.

Generating demand. We identified 21 initiatives [25–32,34–54,74–79] from three reviews [18,19,73] on SRHS demand-generation interventions among adolescents that met our inclusion criteria. The demand-generation activities were primarily school based in six of these programs [25,44–47,74,79], of which two demonstrated mixed results using referral systems linked to schools. There was strong evidence of increased care seeking for STI symptoms among those in the intervention schools/communities in a cluster RCT in Nigeria. However, there was no impact on self-reported use of condoms [45,46]. A Brazilian quasi-experimental study found no difference in new contraceptive use among adolescents in intervention compared with control clinics [25].

The three-arm quasi-experimental study design used in the Population Council’s Frontiers in Reproductive Health Program in four countries allowed for the examination of the impact of adding school-based in addition to community-based demand-generation and youth-friendly clinic activities. The Senegal and Bangladesh programs are described in Table 5. (Details on supply-side interventions were insufficient in the Mexico and Kenya program reports to allow for inclusion pertaining to Review Question A/Table 5.)

Results differed across the four programs. In Kenya, self-reported use of contraceptives increased in communities where school-based activities were applied compared with those with only community-based activities. However, self-reported use also increased in control communities. Furthermore, self-reported health service use was low across all three arms [74]. The program in Mexico showed no change in self-reported use of condoms and decreased overall self-reported health service use across all sites [79]. Results from Senegal demonstrated that self-reported use of health services increased for boys in both the school-based intervention and the control communities but not significantly so for girls in the school-based arm [47]. Finally, in Bangladesh, the number of SRHS visits increased more in sites with school-based activities compared with the sites with community-based activities alone and especially compared with the control sites [44].

Community-based information, education, and communication (IEC) strategies were the primary focus of demand-generation interventions in four initiatives which also included AFHS activities and are, therefore, represented in Table 5. The program with the strongest study design measured multiple outcomes and showed mixed results [26,27]. However, all four initiatives demonstrated some increased SRH commodity uptake or service use [26,27,34,50,51,53]. A community-based IEC program with a female youth empowerment focus from India, but without a health services component, demonstrated higher self-reported health service use among girls in the program compared with the controls [75].

A South African initiative used demand-generation activities that were primarily via media messaging [52], whereas a Zimbabwean program used a combination of media- and school-based strategies [31,32]. Weak evidence for the increased use of SRHS was seen in both studies (Table 5).

Nine initiatives aimed to increase demand generation by implementing multicomponent activities. Six of these also included AFHS interventions; data are portrayed in Table 5. The four AYA programs demonstrated increased self-reported use of condoms and contraceptives among females, but health service use results differed by country [35–43]. Clinic data from Tanzania [28–30,54] and Mozambique [48,49] demonstrated increased SRHS use; yet the RCT from Tanzania also demonstrated an increase in self-reported condom use, condom distribution, and STI-related service use. However, HIV and other STI prevalence were not impacted.

Two initiatives not portrayed in Table 5 that included multicomponent demand-generation activities reported before/after implementation data. A nationwide program without comparison groups in Jamaica demonstrated a small increase in adolescent clinic attendance at year one followed by a 123% increase at year two, including a 59% increase in family planning visits; however, detailed data and significance testing were not reported [73,78]. Investigators in Nepal compared a participatory approach using activities such as youth clubs and street theater to more traditional peer- and teacher-led education [76]. Among first-time pregnant young women, self-reported utilization of health facilities for delivery increased more significantly in the intervention site (17.4%–45%) than in the control (11.8%–22.5%) site. The effect was even more profound for self-reported use of antenatal services, increasing from 4.8% to 66.7% in intervention participants while decreasing from 41.2% to 36.6% among those in the comparison community.

Generating community support. Seventeen initiatives to increase community support met our inclusion criteria [24,26,27,31,32,35–44,47–51,53,74,77–82], of which 15 assessed SRHS uptake outcomes [24,26,27,31,32,35–44,47–51,53,74,77–79]; 12 of these also included AFHS interventions sufficiently explained for data to be included in Review Question A/Table 5 [24,26,27,31,32,35–44,47–51,53]. Fourteen of the 17 initiatives included assessments of community outcomes relevant to this review [24,26,32,35–44,47–49,74,77–82].

Many of the same types of strategies (e.g., radio and other media, IEC dissemination, launch events, drama, discussions in community groups) used to generate demand among adolescents were also used to mobilize parental and more general community support for SRHS. In fact, 14 of the 17 initiatives which aimed to improve community acceptance also met criteria for our demand-generation review question [24,26,27,31,32,35–44,48–51,53,74,77–79].

Reports from two multicountry programs, Reproductive Health Initiative for Youth in Asia (RHIYA) [80,81] and Frontiers in Reproductive Health [44,47,74,79], depicted how differences in baseline levels of community acceptance for young people's SRH and SRHS guided the extent and content of community mobilization. The Frontiers reports also identified differences in the degree of acceptance, according to topics of specific concern and sensitivity. For example, contraception was a sensitive topic in Senegal [47], despite 90%–100% adult baseline approval of adolescents receiving information about other SRH issues including STI/HIV/AIDS, sexuality, and early/unwanted pregnancies. Support for information provision to adolescents regarding contraception increased in one intervention group but did not do so in the second intervention nor control groups and was only statistically significant among adult women. Furthermore, less than three-quarters of adults in the postintervention groups approved of contraception information provision. The study also aimed to increase parent–adolescent communication on reproductive health. Although parent-reported unwillingness to discuss reproductive health issues declined significantly among women
(from approximately 25% at baseline to approximately 15%), the change was seen in both the intervention and control groups. A comparable magnitude of change was seen among males in the control and intervention groups, yet males started and ended with higher rates of acceptance.

Mixed findings on parent–youth communication were also found in the Mexico and Kenya Frontiers programs [74,79]. The Bangladesh Frontiers study found a reasonably high acceptance of SRH education and service provision at baseline because parents found it difficult to personally address SRH issues with their children. As such, evaluation of change in these attitudes was not felt to be necessary [44]. The reports on the RHYA program [73,80] noted substantial variation in attitudes toward sexuality and sexual health of young people in the seven Asian countries served by the project. Interestingly, they noted that adolescent SRH is widely considered to be a sensitive and private issue in Bangladesh (perhaps in contrast with the findings of the Frontiers program) and in Vietnam where there is a great reluctance to speak openly about the topic. Similarly, sensitivity was quite high in Pakistan, where it was recognized that community-based activities to generate support was vital to reach program goals. In Nepal, support groups were important to help parents develop communication skills to discuss and educate their children on SRH.

Overall, the other eight initiatives [24,31,32,35–43,48,49,82] demonstrated improved community acceptance of [24,35–43,48,49,82] and/or adolescent–parent (or other adult stakeholder) communications [31,32,35–43,48,49,82] regarding adolescent SRHS, mostly via qualitative measures of these outcomes. Three studies included related quantitative analyses. In Burkina Faso, the percentage of adolescents who reported feeling comfortable talking to their parents about sexuality issues rose from 36% at baseline to 55%; however, neither comparison group data nor significance testing was reported [82].

Kim et al. demonstrated a fivefold increased odds of young people reporting having had discussions about reproductive health because of the program among intervention participants compared with controls [31,32]. A study of Zambian youth found a weak positive correlation with one use of family planning services, no correlation with STI services uptake, and a negative correlation with overall SRH services uptake. However, all three service use indicators were positively correlated with community acceptance, albeit weakly, and none of these findings were statistically significant. The authors report that the study was not powered to detect such a difference [24].

Strategies targeting religious leaders as important channels led to their endorsement of AYA activities in Uganda and Botswana. However, SRHS use results varied between the two initiatives with increases in Botswana and declines in Uganda [35,42,43]. Religious leaders played an important role in a national program in Jamaica with a before/after assessment demonstrating declines in negative attitudes among community members toward adolescent sexual activity, although acceptance of SRHS was not measured. SRHS use declined slightly in the first year but increased by 123% in the second year [73,78].

Community acceptance and demand generation activities were primarily parts of packages that also included facility-based activities. We were unable to find cost-effectiveness analyses related to community acceptance and demand-generation activities. For the most part, even costing data were not provided. When included, the most expensive components were those aimed at creating demand and community support as opposed to the health facility interventions to train providers and make the clinics more adolescent friendly [44,47,54].

Discussion

This review summarizes a considerable body of knowledge that has been generated since the 1994 Cairo ICPD which defined SRHS and explicitly declared SRHS as a fundamental human right, including for adolescents. These data can help policy makers, programmers, and researchers improve adolescent access to quality SRHS. Table 6 summarizes the evidence related to Review Question A within the “Do not go, Steady, Ready, Go” classification framework. We adopted the policy recommendations as determined in the 2006 WHO review for each intervention typology unless our additional findings indicated a need for a classification shift.

Programs that did not include adolescent-friendly facility improvements or use a combination of information dissemination channels to promote demand/community acceptance are categorized as “Steady” or “Do not go.” This exemplifies the need for going beyond training health workers on the supply-side, carrying out multicomponent demand-side activities, and integrating demand- and supply-side strategies. Type 2c interventions, that is, those that include training and facility adjustments on the supply-side coupled with broad demand generation/community acceptance approaches, is “Ready” for large-scale implementation. Concomitant research remains necessary to clarify impact and mechanisms of action. The evidence base did not support a “Go” designation for any of the intervention types.

Thresholds and evidence quality rankings for questions B–D have not been determined; therefore, we did not formally apply the “Do not go, Steady, Ready, Go” classification to these intervention types. We are, however, able to comment on the degree of evidence related to these questions on the basis of our analysis. First, there is a relatively large body of literature that does not support YCs as an effective or cost-effective strategy to deliver SRHS. This emphasizes the important role research may have in not only ascertaining and disseminating positive outcomes but also determining the ineffectiveness of seemingly worthwhile interventions and thereby saving precious public health resources. Caution must be exercised, however, as this review did not address employment, educational attainment, or other social benefits which may or may not justify the deployment of YCs. The evidence base regarding the impact of SRHS delivery in other community venues on service use or on SRH is very limited; further research is needed.

Three-quarters of the 21 initiatives related to our review of demand-generation interventions overlapped with those included in our Question A review [25–32,34–54]. As such, many of them were subjected to the evidence threshold and quality assessment determination that was conducted in the 2006 WHO review for classification into the “Do not go, Steady, Ready, Go” framework. Seventeen of the 21 programs demonstrated at least some positive outcomes of interest including from three RCTs, suggesting that demand generation interventions are effective and “ready” for large-scale implementation if accompanied by further research to clarify mechanisms and impact. Evidence regarding activities to increase community support is not as plentiful or robust. Seventeen initiatives overall provide at least some positive, albeit
generally weak, evidence. Strategies to generate community support hold promise; further research and evaluations of existing projects and programs are needed.

Finally, it should be noted that no studies or evaluations of programs or projects addressing vulnerable or marginalized populations’ uptake of SRHS were identified. Research from the child health field demonstrates that strategies implemented among the general population often do not reach those in most need and that proactive strategies can produce equitable coverage [83–85]. Such research is critically needed in the adolescent health field. For example, analyses stratified by socioeconomic status and by other vulnerability groups (e.g., sex workers, out-of-school adolescents, orphans, disabled) can illuminate strategies best able to reach populations most in need of services.

Additional recommendations drawn from our results are portrayed in Table 7.

Table 7
Summary of recommendations

Researchers need to continue to build the evidence base for how to best deliver and improve access to SRHS and their impact on clinical outcomes. The evidence base needs strengthening on both the supply and demand creation side.  
- Cost-effectiveness analyses to inform the most efficient use of limited resources.  
- Determination of attributable contributions of specific components of multicomponent intervention packages. This represents a challenging area of implementation research, but it is critical to ascertain effective/non-effective implementation strategies.  
- When possible, analyses should stratify results by socioeconomic status and by other vulnerabilities to determine which strategies are effective at reaching populations most in need.  

Donors need to support not only the implementation of interventions with evidence of effectiveness but also fund evaluation, implementation research, and information dissemination.  
- Repositories of metadata to allow for access to relevant study details not currently readily available in peer review reports, because of publication constraints.  
- Until the specific components (e.g., length of health worker training, inclusion of supportive supervision, specifics regarding facility improvements and demand generation, and community support activities) are comparable across studies, it will be difficult to tailor programs to meet needs within specific contexts. Program designers and implementers can use the existing evidence base by designing and implementing programs that reach beyond simply training health workers without the other components of an effective package—adolescent-friendly facility improvements and components that address the demand creation side by adolescents and wider community acceptance of adolescents making use of SRHS.  
- Formative and summative evaluation coupled with dissemination can leverage individual program results to more widely useful information.  
- Program design and implementation should strive to reach populations in most need. Policy makers should address adolescent health as a global priority with access to SRHS as a key component.  
- The evidence base can be used to set policies and laws that promote a package of interventions, including linkages to other settings (e.g., schools) to promote utilization of services.  
- Action must be taken to amend policies and laws that prohibit school-based comprehensive sexuality education, including SRH and information regarding accessing SRHS.

SRHS = sexual and reproductive health services.
Our review does have some limitations. First, publication bias is a vexing issue in any such review because of limited disclosure of negative results. Interventions common to non-Anglophone settings could have been underrepresented as we only included reports published in English. In addition, intervention components or details (e.g., length or type of health worker training, costs of services borne by beneficiaries, content of demand generation, and community-sensitization activities) were often not reported and may have influenced outcomes; we were unable to assess the impact of interventions not stated explicitly. Furthermore, virtually all programs were multicomponent in nature—teasing out the impact of one component was usually impossible as studies and evaluations were not designed for the assessment of individual elements’ contribution to outcomes. Finally, not all research and evaluations were methodologically rigorous. Randomized trials were infrequent, control groups were often not included in longitudinal studies impeding the ability to attribute outcome to intervention, significance testing was sometimes not provided, and adjustment for confounding factors or baseline differences between intervention and control groups was often not included.

Many of the limitations encountered point to the pressing need for further research on how to best deliver adolescent SRH intervention packages and determine which components are most effective. Cost-effectiveness analyses and even cost data were largely unavailable. Fiscal responsibility and constrained budgets demand research to determine the best buys to improve adolescent SRH.

Much progress has been made since the 1994 ICPD meeting in Cairo, but coverage of SRHS among adolescents remains low. Concentrated efforts in policy, legislation, programming, research, and funding can point the way to improved and more equitable adolescent access to SRHS.

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