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Review article

The promotion of intrauterine contraception in low- and middle-income countries: a narrative review

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Abstract

Context: The contribution of copper-bearing intrauterine devices (IUDs) to overall contraceptive protection has declined in many countries, despite their well-known advantages. In response, initiatives to promote this method have been undertaken.
Objective: To review and interpret the experience of interventions to promote use of IUDs in low- and middle-income countries in order to provide strategic guidance for policies and programs.
Methods: We conducted a systematic search of Medline, Popline, Embase and Global Health electronic databases for relevant journal papers, reports and gray literature since 2010. Telephone interviews were held with two donors and six international family planning organizations.
Results: We identified a total of 31 publications. Four reported the results of randomized control trials and three were derived from quasi-experiments. The majority were based on service statistics. Eight publications concerned interventions for HIV-positive women or couples, nine for postpartum or postabortion cases and 14 for general populations. Intervention approaches included vouchers, franchising of private practitioners, mobile outreach services, placement of dedicated staff in high-volume facilities and demand creation. Most publications adduced evidence of a positive impact and some reported impressively large numbers of IUD insertions. Results to date on the uptake of IUDs in postpartum interventions are modest. There is also almost no evidence of effects on IUD use at national levels. Implant uptake generally exceeded IUD uptake when both were offered.
Conclusion: The evidence base is weak and offers few lessons on what strategies are most effective. The overall impression is that IUD use can be increased in a variety of ways but that progress is hampered by persistent adverse perceptions by both providers and potential clients. Provider enthusiasm is a key to success. The lack of a population impact stems in part from the fact that nearly all interventions are initiated by international organizations, with limited national reach except in small countries, rather than by government agencies.

Keywords: Intrauterine devices; Implants; Interventions; Africa; Asia; Latin America

1. Introduction

It is often stated (correctly but deceptively) that intrauterine devices (IUDs) are worldwide the most commonly used reversible contraceptive method. This fact is largely a reflection of high use in China's vast population; this one country accounts for over 60% of all IUD use [1]. China is not the only country where this method dominates. Out of 159 countries with recent national data, IUDs comprise 40% or more of all modern method use in a further 15 [2]. However, IUD's share of modern method mix is pitifully small, at less than 5%, in 63 countries and only 5%–9% in a further 32 countries. Most countries with very low IUD use are in Africa. Moreover, IUD's share is declining in many countries, in part because of the growing prevalence of injectables [3].

These sharp disparities in use are not unique to IUDs but reflect the fact that method mix is highly skewed in many countries. Skewness is poorly understood. It is unrelated to human development index, strength of family planning programs or the overall prevalence of use [4]. We speculate that an explanation has to be sought in the political history of contraceptive provision and subsequent path dependency. In the early years of family planning promotion, most governments had to focus efforts on one or two methods and, once a method becomes established, it is increasingly favored by both

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staff and couples. The familiar becomes the desirable. The imprint of early policy priorities is clearly seen in countries with high IUD use, such as China, Vietnam and many countries of the former Soviet Union.

Clearly, no ideal or target level of use can be set for IUDs. Nevertheless, stubbornly low levels of use in many countries and declines in many others are of concern because of the established advantages of IUDs: high effectiveness, few medical contraindications, low discontinuation, ease of use, low cost and suitability for postpartum uptake. In response, major initiatives have been made in the past 5 years or so to revitalize the IUD agenda in low- and middle-income countries, with financial backing from governments and foundations and technical support from large international organizations, notably Marie Stopes International (MSI) and Population Services International (PSI).

Our purpose in this paper is to review the experience to date and to distil the lessons learnt in order to inform future policies and programs. Attention is restricted to copper-bearing IUDs. The levonorgestrel intrauterine system (LNG IUS) has proved to be a popular option in the United States and a few European countries, and some commentators have urged its promulgation in Africa, Asia and Latin America [5]. Falling product prices favor this proposition, though cost is likely to remain a concern for donors [6]. Potential advantages of LNG IUS also include its role in treating menorrhagia and dysmenorrhea. However, experience thus far in these poorer regions is too sparse to merit consideration here.

2. Methods

This paper is based on subset of publications identified in a wider systematic search of literature on IUDs published since January 2010. This aimed to retrieve articles from peer-reviewed journals and gray literature, relating to any country, concerning facilitators and barriers to IUD use, users' and providers' points of view, or describing interventions aimed at increasing the uptake and continued use of the method.

We searched Medline, Popline, Embase and Global Health electronic databases using keywords and subject headings. This search was preceded by a manual search of four journals in order to establish keywords that would capture the relevant literature. A total of 102 potentially relevant papers were identified in these four journals. Studies were limited to those involving human subjects. No limitation was set on language, but search terms were in English. The search terms were as follows: IUD OR IUS OR LNG IUS OR "Copper T" OR "Multiload Cu375" OR "Mirena" OR "intrauterine device" OR "intrauterine system" OR "intrauterine contraception" OR "Levonorgestrel-releasing intrauterine system." Where possible, a limitation was set on search terms being present in the title or abstract. Details of the search are shown in Fig. 1.

As a supplement to the literature review and to assist with interpretation of results, one of the authors conducted semistructured telephone interviews with staff of the following organizations: US Agency for International Development, UK Department for International Development, MSI, PSI, Pathfinder International, International Planned Parenthood Federation, DKT International and FHI360. We identified an initial list of organizations known to be active in IUD promotion and added additional ones by snowballing. Contact was made initially to the most senior representative of each organization who was asked to participate or identify an appropriate senior staff member. All but one organization agreed to participate. Interviewees were requested to represent the experience of their institution. The purpose of the interviews was to identify the scale of IUD promotion activities and main delivery and demand-creation mechanisms, obtain a general evaluation of difficulties and obstacles encountered, and obtain impressions of IUD compared with implant acceptability. As many of these organizations were responsible for the publications under review, we considered their insights to be especially valuable. We have drawn on this material in the discussion at the end of the paper.

3. Results

We found a total of 31 papers and reports that documented the results of interventions, projects or programs in terms of IUD acceptance or use in Africa, Asia or Latin America. Some projects were solely intended to promote IUDs, others gave an equal emphasis to implants as the main alternative long-acting reversible method (LARC) or to long-acting reversible and permanent methods (LARPMs), while others promoted a wider range of methods. Among these 31, 4 were randomized control trials (RCTs), 4 were quasi-experiments, 5 were cohort studies without controls, 1 was a before–after study without controls and 1 was a Cochrane review. The remainder were based on service data, either for a single period or in the form of a time series: some compared outputs with independent sources. In addition, we located eight short program briefing documents, mainly from PSI. These briefs will not be reviewed here except where they add significantly to the main body of literature.

The Cochrane review located nine interventions in which copper-IUD uptake was explicitly mentioned as an outcome [7]. All but one study were published before 2010 and thus beyond the scope of this review but, in brief, the results suggested that antenatal, postnatal and perinatal counseling can improve uptake, but the limited evidence was negative on the effect of home visits and postabortion counseling.

The remaining publications fall into three main categories according to target population: HIV-related, postpartum and postabortion, and the general population. Each is considered below.

3.1. HIV-related initiatives

In the more recent literature, eight publications covering seven studies, summarized in Table 1, reported on the effect of interventions for HIV-positive women, concordant or discordant couples [8–15]. All were facility based and involved

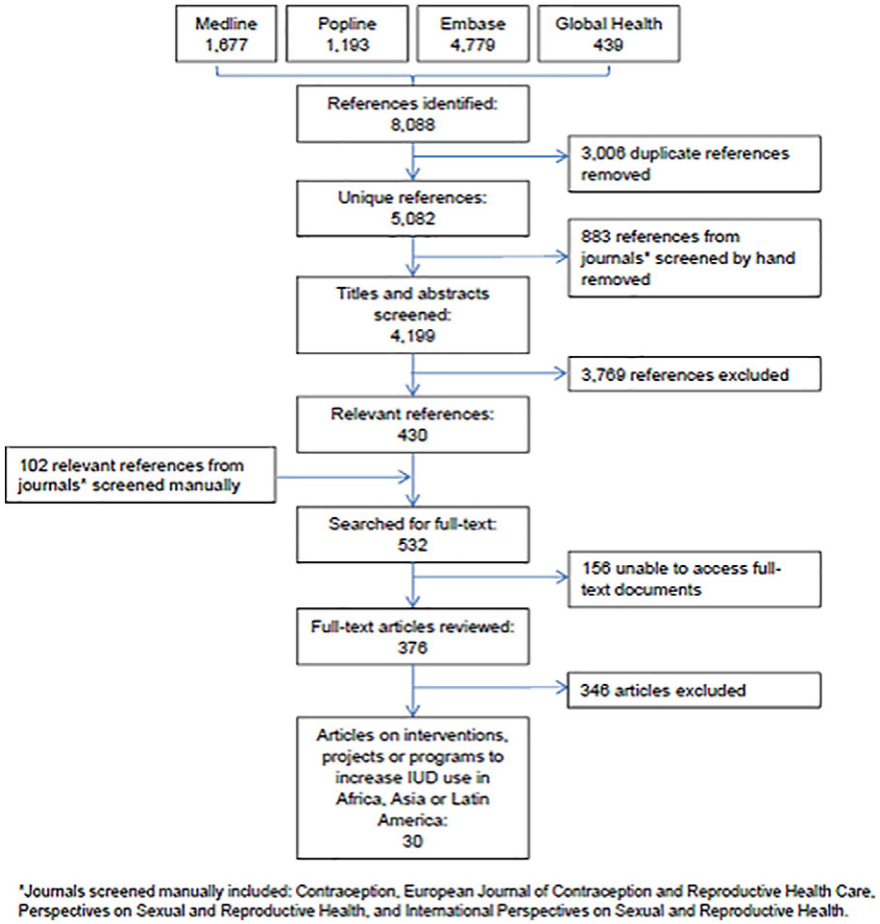

Fig. 1. Flowchart of literature search.

counseling or exposure to informational videos, with an emphasis on LARCs or solely on IUDs. The end point in some studies was immediate method-specific uptake, while others had a prospective dimension.

A cluster RCT that integrated family planning into AIDS facilities demonstrated a considerable effect on contraceptive uptake but a negligible impact on IUD use compared with injectable or implant use [8]. An RCT in Zambia directed at HIV-concordant and HIV-discordant couples found that exposure to a video on LARCs was effective at raising use [14]. Among couples using no method at baseline, 6% chose an IUD, 14% an implant, 45% injectables and 33% oral contraceptives. Among those already contracepting, 29% switched, mainly to LARCs. The intervention had an effect on subsequent pregnancy risk among prior users but not among prior nonusers [15]. Similarly, an intervention to increase LARC uptake in Lusaka and Kigali among HIV-discordant couples had a much greater impact on implant than on IUD uptake, with a threefold difference in both sites [11]. The authors thought that provider bias may have been partly responsible, because implants are simpler to insert than IUDs. In Zimbabwe, a small quasi-experiment involving staff training in LARC provision and interactive educational sessions also had a large impact on implant use at 3 months but little effect on IUD uptake [13]. Women preferred implants because of the shorter duration of use, no need for an immediate return visit and the fact that the implant, unlike the IUD, is inserted superficially and thus visible to the user [13]. Two projects with particular emphases on IUDs, one in Malawi and the other in Thailand, showed high uptake of this method among HIV-positive women after counseling [9,12].

3.2. Postpartum and postabortion initiatives

Nine publications, summarized in Table 2, concerned contraceptive counseling and provision following birth, abortion or miscarriage [16–24]. A major effort to provide postpartum IUD services in six countries, three in Asia and three in Africa, involved 330 hospitals in India and 78 health facilities (mainly hospitals) in the other countries. Major investments in national advocacy, training, institutional development and inculcation of local ownership were made. Over a period ranging between countries from 3 years to 6 months, a total of 106,000 insertions were recorded [22]. Among women counseled, the percentage who had an insertion ranged from 2.3% in Pakistan to 5.8% in the Philippines in the four countries where record-keeping allowed this calculation.

Table 1
HIV-related interventions

Author	Population	Design	Intervention	Results
Grossman et al. [8]	Kenya	Cluster-RCT. Baseline and endline periods were compared, as well as pregnancy rates during the follow-up year.	18 public HIV clinics, 12 intervention and 6 control. Intervention was integration of FP services, including LARCs, into HIV clinic; control was referral of clients to FP clinic at the same facility.	Women at integrated sites were significantly more likely to use more effective contraceptive methods at endline, compared to controls. In intervention facilities, IUD use rose 0.3%–1.0%, implants 0.6%–8.3%, and injectables 13.3%–22.5%. No difference was observed in incident pregnancy rates between intervention and control.
Haddad et al. [9]	Malawi	Service data from one facility	Detailed counseling on FP to 276 HIV+ women interested in FP and offer of immediate IUD insertion	35% of counseled women chose IUD but, regardless of initial choice, 79% agreed to same day insertion
Hoke et al. [10]	South Africa	Pre- and post-test (2 samples of 265 postpartum PMTCT clients in 5 health centres), intervention tracking tool, and in-depth interviews with providers	Service providers received training to strengthen contraceptive counseling and services, including IUDs, and referral for sterilization.	At both pre- and post-intervention, 7% of clients were sterilized and IUD use was negligible; by comparison, 75% of clients used injectables. Intervention shortcomings and health system constraints explained the failure to produce intended effects.
Khu et al. [11]	Rwanda and Zambia	Cohort study of HIV discordant couples	Participants enrolled in a longitudinal cohort study of heterosexual transmission who desired to delay fertility for ≥3 years were counseled on LARC methods and offered an IUD or implant on-site.	In Rwanda among participants, 89% (*N*=365) were counseled on LARCs and 8% adopted IUD and 27% implant. In Zambia, 67% (*N*=528) received LARC counseling and 7% adopted IUD and 26% implant.
Landolt et al. [12]	Thailand	Cohort study of 66 HIV+ women	Detailed counseling on IUDs (not on other methods)	44% had an IUD inserted. Continuation at 6 months was 93%.
Sarnquist et al. [13]	Zimbabwe	Quasi-experimental prospective trial	Nurses at 4 facilities trained in LARC provision. Intervention group (*n*=65 HIV+ women) received 3 group sessions on FP etc., mainly at ANC. Control group (*n*=33 HIV+ women) received standard care. Prior LARC use very low in both groups	At 3 months postpartum, IUD use was 1.6% vs. 9.1% (ns) and implant use was 86% vs. 73% (ns). Implants preferred because of shorter duration, no need for return visit and visibility of device
Stephenson et al. [14]; Wall et al. [15]	Zambia	4-armed RCT	Sero-discordant or concordant-positive couples were recruited, randomized and then exposed to 1 of 4 video-based interventions: (1) LARC-related; (2) motivational; (3) both (4) neither (control). Data on contraceptive choice made straight after enrolment and pregnancy rates over follow-up of 16 months evaluated.	21.5% were already using a method other than condom, among these 29% switched method, mostly to a longer-term method. 78.4% were not using any method or were using condoms. 92% of these adopted a new method, with a minority choosing IUD (3%) or implant (12%). Exposure to arms 1 and 3 resulted in significantly lower pregnancy rate than arms 2 and 4 among those already using prior to intervention but no effect on nonusers at baseline.

In a project spanning eight West African countries, 18 providers from major teaching hospitals were trained in postpartum IUD counseling and insertion. In three countries with relevant data, about 7% of counseled women had a device inserted [23]. Strikingly higher postpartum IUD acceptance was reported in a small project involving training in IUD provision to staff in 11 Nigerian private health facilities. Of 728 women who delivered during the study period, 41% had an insertion [18]. In contrast, a small postpartum trial in South Africa had a very modest effect on IUD use [10]. Briefing documents distil the lessons from programs to increase postpartum IUD uptake [25,26]. These lessons include the need to gain support of key clinical leaders, to orient a broad range of staff beyond those who will be actively involved in IUD counseling or insertion, to ensure effective collaboration and communication between antenatal, delivery and family planning staff, and to ensure the continuous availability of trained IUD providers. Such programs are especially complex because of the need for collaboration between staff with differing specialist duties. Projects are only likely to be effective in high-volume settings where demand is sufficient to allow trained providers to maintain skills. Community actions can stimulate demand.

Table 2
Postpartum and postabortion interventions

Author	Population	Design	Intervention	Results
Curry and Ross [16]; Curry et al. 2015b [17]	Chad, DRC, Djibouti, Mail and Pakistan	Facility records (*N*=79), July 2011–December 2013	Supporting Access to Family Planning and Post-Abortion Care in Emergencies (SAFPAC) initiative: Provider training, improved supply chain management, regular supervision, and community mobilization, with focus on LARCs.	52,616 new users of modern contraceptive methods recruited in 5 countries. Contraceptive acceptance among PAC clients ranged from 28% to 77%, of whom 45% chose implants and 16% IUDs. In Chad, DRC and Pakistan, IUDs increased share of method mix, following renewed emphasis on this method.
Eluwa et al. [18]	Nigeria	Service data, May 2014–Feb 2015	11 private-sector providers from 11 facilities trained in postpartum IUD services by MSI	Of 728 women delivered, 41% had postpartum insertion.
Carneiro Gomes Ferreira et al. [19]	Brazil	RCT	30-min personalized face-to-face contraceptive post-abortion counseling vs. standard group counseling. *N*=123 women in each.	At 6 months, contraceptive use was 41% higher in the intervention group but none chose IUD.
Huang et al. [20]	China	Single-intervention cohort of postpartum migrant women (*N*=840) and comparison with 2 preintervention cohorts from same facility	Free contraceptive counseling and a choice of method offered prior to discharge. Counseling and support were offered at 1.5, 3, 6, 9 and 12 months postpartum via telephone and/or clinic visits.	The overall contraceptive prevalence at 12 months was higher than in nonintervention cohorts: 97% vs. 74% and 63%. Method mix in intervention cohort was IUDs 40%, condoms 39%, sterilization 8%, and DMPA 7%.
Mayi-Tsonga et al. [21]	Gabon	Single-intervention cohort of women admitted to a single facility for abortion complications (*N*=383)	During admission, women received counseling on the copper-bearing IUD and other modern contraceptive methods.	Over 90% accepted to initiate a contraceptive method. 9.3% chose a LARC method.
Pfitzer et al. [22]	Ethiopia, Guinea, India, Pakistan, Philippines and Rwanda	Service data	JHPIEGO and MCHIP integrated PPFP and PPIUD services into maternal care in high-volume facilities. National policies and training materials introduced. A pool of national trainers was formed to support program expansion and sustainability.	Number of women counseled ranged from 1.7 million in India to 16,399 in Ethiopia. Percentages of PPIUD acceptors ranged from 2.3% of women counseled in Pakistan to 5.8% in the Philippines. The overarching lesson from these programs is the importance of engaging government leadership and building local ownership.
Pleah et al. [23]	Benin, Chad, Cote d'Ivoire, Niger, Senegal, Togo	Service data 2014–2015	18 providers from main teaching hospital in each country trained in postpartum IUD services, with support from JHPIEGO	Excluding Chad, 2269 IUD insertions performed over 2 years. For 3 countries with relevant data, about 7% of counseled women accepted IUD.
Samuel et al. [24]	Ethiopia	Service data, 2010–2014	545 mid-level staff involved in postabortion services in 101 public-sector trained and supported by IPAS/MoH with emphasis on LARCs. Demand creation via health extension workers	Over 4 years, uptake of postabortion contraception rose from 58% to 83%. IUD's share rose from 0.1% to 12%; implant rose from 2% to 43%.

As part of a program to integrate postabortion care and family planning in emergency settings in four African countries and Pakistan, 52,600 new users were reached, of whom 45% chose implants and 16% IUDs. The IUD share rose over time in three countries following renewed emphasis on this method [16]. A comprehensive program in Ethiopia trained and mentored staff at 101 public-sector facilities in postabortion LARC provision, improved logistical support and oriented health extension workers. Over 4 years, acceptance of contraception rose sharply and IUD insertions among acceptors increased from close to 0 to 12%, though implants were much more likely to be the method of choice [24]. An RCT in Brazil reported no success with IUD promotion and only limited impact was evident in Gabon [19,21].

3.3. Programs for general populations

A total of 14 publications reported on projects for the general population [27–40]. The most common approach to promote IUD use in the general population is the simple one of training and supporting providers together with demand-creation activities. Other strategies include voucher schemes, social franchising of private-sector practitioners, mobile outreach, integration with immunization services and

Table 3
General population interventions

Author	Population	Design	Intervention	Results
Khurram Azmat et al. [27]	Pakistan	Quasi-experimental design with 2 intervention and 2 control districts. Baseline and endline surveys, 18 months apart, carried out in each	16 private sector female providers trained under MSI social franchising scheme. Fieldworkers provide FP counseling and free IUD vouchers.	Modern method rose from 27% to 48% and IUD use from 2% to 14% in intervention areas. No change in control areas. Vouchers accounted for 35% of IUD insertions.
Blumenthal et al. [28]	13 developing countries	Service data (2009–2010) on IUD acceptors, compared with data on IUD users from representative national datasets	A 13-country PSI initiative focused on increasing consumer demand and high-quality IUD services. Services were provided through (a) private sector-franchised or affiliated clinics, (b) providers seconded to the public sector and (c) outreach clinics. Demand creation through special "event" days and mass media	576,000 IUD and 106,501 implant insertions performed in 2009–2010. Compared to national IUD users, users in this program were slightly younger and less educated. Among IUD acceptors, 24% used no modern method at the time of IUD initiation, and 28% reported injectable use in the three previous months.
Boddam-Whetham et al. [29]	Yemen and Pakistan	Service data, 2014, compared with expected number on business-as-usual assumption	Vouchers for LARPMs distributed, redeemable at 113 private providers in Pakistan under MSI franchise and an unspecified number of mainly public sector facilities in Yemen	In Yemen, 56,000 vouchers issued, of which 1135 were redeemed. In Pakistan, 84,000 vouchers issued with redemption rate of 88%. IUD insertions increased to 6800 against a business-as-usual expectation of 2300. Implants rose to 3800 against an expectation of 285. In both countries, sterilizations fell.
Cooley [30]	Mali	Service data, 2009–2011, interviews with key stakeholders and document review	Urban outreach model designed to integrate immunization and subsidized LARC services. Initially piloted in the private sector. 149 providers from 73 public sector facilities trained	Over 41,000 women received a LARC, compared to the 5543 women estimated to be using LARCs in 2006. In 2011, 17,000 implant and 2400 IUD insertions performed
Ikamari [31]	Kenya	Service data	Ministry of Health program to reinvigorate IUD use by: consensus-building activities for a range of stakeholders; advocacy and sensitisation activities among providers, clients and the general public; capacity-building and service-delivery activities; and demand-creating activities	The number of new IUD users in the 97 facilities supported by the program increased from 151 per quarter at baseline in early 2003 to 373 per quarter in early 2005. The cumulative number of IUD users in project sites over the 2-year intervention period was approximately 2800 women. The number of facilities that could provide IUDs rose from 5% to 35%.
Keeley [32]	Philippines	Semistructured interviews and service provision data	SHOPS Project involving private midwives from two large midwife franchises. IUD training provided	In 2012, data from 17 clinics showed that IUDs accounted for 48% of all FP services. Author concluded that private midwives can provide IUDs on a viable basis and serve the broader community.
Neukom et al. [33]	Zambia	Service data on women choosing LARC, compared to national data	In a PSI project, 18 dedicated LARC providers (all midwives) were placed in high-volume public sector facilities for 14 months. Group talks given plus offer of immediate service	In 14 months, 33,600 procedures performed (66% implant and 34% IUD). Implied rate per provider-day was about 8. The estimated program costs, including the value of donated commodities, averaged $13.0 per couple-year of protection.
Muthamia et al. [34]	Kenya (Nairobi)	Cohort study of women (N=1334 at endline; 50% attrition, 2011–2014), surveys of facilities and staff	Comprehensive intervention coordinated by JHPIEGO. LARC training and support for 92 public and private facilities. Multiple demand creation activities	Over 4 years, use of any modern method rose from 44% to 55%; IUDs, from 2.1% to 4.3%; and implants, from 2.4% to 8.9%.
Rahman et al. [35]	Bangladesh	Before–after surveys of women and staff in 7 intervention districts and 3 controls	Comprehensive intervention, including training in LARCs and demand creation	No effect on LARC uptake
Rattan et al. [36]	Chad, DRC	Service data, 2011–2015	Public-sector providers trained and supported in LARCs by CARE (N=21 in Chad, 19 in DRC). Demand creation	Over about 4 years, 47,000 and 36,000 new users recruited in Chad and DRC, respectively. In Chad, IUD's share rose from 2% to 14%, and that of implant fell from 89% to 50%. In DRC, IUD's share rose from 7% to 41%, and that of implant fell from 74% to 42%.
Rosapep [37]	Bangladesh	Service statistics, 2012–2014 and monitoring data for participating facilities, plus semistructured interviews with staff and management	Under The Strengthening Health Outcomes through the Private Sector (SHOPS) project, LARPM. 38 urban for-profit facilities received customized assistance for LARPM training, plus demand generation, and commodity supply.	Among 1041 clients, method mix was 44% tubectomy, 30% IUDs, and 24% implants. Overall volume was low and stagnant. Facilities were judged unsuitable to market LARPMs with the intensity needed to significantly increase demand. Skill retention could be a problem.

Table 3 (*continued*)

Author	Population	Design	Intervention	Results
Tilahun et al. [38]	Ethiopia	Service data (2011–2014) in 40 purposively selected facilities, qualitative information and survey of IUD clients	After scale-up, providers in 738 public-sector facilities trained in IUD services. Demand-creation through health extension workers and mass media	Examination of 50,000 records before and again 3 years after intervention showed that IUD share of method mix rose from 0.4% to 5.7%. Data imply 3–4 insertions per facility-day.
Vance and Bratt [39]	Tanzania	Service data	Retrospective cost-analysis of the ongoing service delivery phase of the Marie Stopes Tanzania mobile outreach service, focused on LARPM s. Expeditions of 6 out of 14 outreach teams over 5 months were examined.	Overall method mix was minilaparotomy (44%), IUDs (37%), and implants (20%). Based on the average cost per LA/PM acceptor ($22.37) and the average cost per CYP ($4.28), authors note that cost-effectiveness is higher when higher numbers are served. They recommend community mobilization for demand generation and coordination between health facilities in the selection of sites.
White and Corker [40]	Guatemala, Laos, Mali, Uganda	Service data, 2013–2014	Comprehensive approach (policy, service strengthening, supply chain, demand creation). 417 public-sector facilities supported	IUD insertions rose from 23,000 in first year to 79,000 in second year.

placement of dedicated LARC providers in high-volume public facilities. Two publications reported the results of quasi-experimental designs. The majority relied on service data alone, though some estimated population impact by comparison with national data. Publications are summarized in Table 3 and a selective commentary follows.

Two publications describe the results of MSI projects involving vouchers. Khurram Azmat and colleagues[27] reported on a quasi-experiment in Pakistan with two interventions and two control areas. Social franchising with a voucher scheme for IUDs was launched. After 18 months, IUD use had increased from 2% to 14% in the intervention sites, though vouchers were implicated in only about one-third of insertions, while remaining unchanged in the control sites. The second paper documents achievements using a similar approach but with vouchers extending to implants and sterilization as well as IUDs in Pakistan and Yemen [29]. In Pakistan, 84,000 vouchers were issued, of which a remarkably high 88% were redeemed, mainly for IUDs. In Yemen, 56,000 vouchers were issued, of which only 2% were redeemed, partly because of disruption to services due to civil unrest.

Dedicated LARC providers appear to have been successful in Zambia in a PSI private–public partnership. A total of 18 specially trained midwives were placed in high-volume public-sector facilities, offering group talks and immediate provision of IUDs and implants [33]. The results imply the performance of about eight procedures per provider-day, two-thirds implant and one-third IUD. In Mali, a larger-scale PSI project involved the training of 149 public-sector providers to integrate LARC and immunization services [30]. Given the number of trained providers, the 2400 IUD insertions in 2011 were small, though implant acceptors in the same year were much more numerous (17,000). As part of another large private–public collaboration in Ethiopia, this time involving Pathfinder, providers in 738 facilities were trained in IUD insertion [38]. Before-after analysis of records in 40 facilities showed that IUD's share of method-acceptance rose from less than 1% to 5.7%, implying three to four insertions per facility-day at endline. However, the representativeness of the 40 selected facilities is uncertain.

A paper by Rattan et al.[36], concerning Chad and the Democratic Republic of Congo (DRC), is of particular interest because of shifts over time in method-specific acceptance. Service data between 2011 and 2015 were used to document the outputs of a program, supported by CARE, to train public-sector providers in LARC services, supplemented by community-based demand generation. Implants initially dominated method choice, accounting for 89% of new users in Chad and 74% in DRC, with only small minorities accepting IUDs. Because of this imbalance, efforts were made to reinvigorate IUD use, including retraining, enhanced compensation to staff, provision of antibiotics for sexually transmitted infection treatment and community activities to dispel rumors. Over a 4-year period, implant's share fell to 50% in Chad and 42% in DRC, while that of IUDs rose to 14% in Chad and 42% in DRC.

A 13-country PSI initiative to provide high-quality IUD services through franchising, seconding dedicated providers to public-sector facilities and outreach clinics yielded 576,000 IUD insertions in 2009–2010 [41]. Similarly impressive large numbers are reported in an MSI technical brief [42]. In 2010, two million procedures were performed in 40 countries, about half of which were IUD insertions. In 20 countries of sub-Saharan Africa, 167,000 IUDs were provided against an estimated 576,000 total number of IUD users in these countries, suggesting that MSI is a major provider of this method. A more recent MSI publication, focused mainly on implants, reported that the organization was responsible for 750,000 implant and 250,000 IUD insertions in 2012 in Africa [43].

In a rare example of a government-led initiative, a broad program to reinvigorate IUD acceptance was launched in Kenya. In 97 facilities supported by the program, the number of new IUD users doubled over 2 years from 151 per quarter to 373 [31].

4. Discussion

The evidence base concerning IUD promotion is weak, certainly too weak to reach any conclusions on the relative effectiveness of different service delivery or demand-creation strategies. Only seven of the publications reviewed used an experimental or quasi-experimental approach and most of these concerned services at HIV/AIDS clinics. The dearth of experimental research is partly due to the multifaceted and community-based nature of many IUD projects, whose impact would have been extremely expensive and complex to assess by rigorous methods. However, for more straightforward facility-based interventions, RCTs and quasi-experiments are more feasible and the dearth of such evaluations is to be regretted. We call for donors to be more willing to sponsor rigorous family planning research.

The majority of papers and reports rely on the presentation of facility records, or service data, with no information about verification procedures. Results should be interpreted with caution, because of the ever-present danger that some staff, under pressure from above to demonstrate high performance, will exaggerate achievements. Even when taken as totally valid, results presented simply in the form of gross numbers of IUD insertions are difficult to interpret. Several publications partially overcame this defect by comparing project outputs with national estimates of actual, or expected, numbers of IUD users or acceptors. Presentation of time trends can also be convincing, particularly when very low baseline levels of IUD or LARC acceptance change radically in the presence of an intervention.

Despite the limitations of the evidence, it is clear that IUD uptake has been raised by different strategies, including franchising of private providers, vouchers, placement of dedicated staff in high-volume public facilities, mobile outreach teams and so on. Clearly, a demand for IUDs exists when appropriate promotional efforts are made. While the numbers of IUD insertions reported in some publications are impressively large, there is little sign of an impact at national levels. Demographic and Health Surveys (DHSs) provide no evidence of increasing IUD use in sub-Saharan Africa. Recent surveys indicate that less than 1.4% of married women are current IUD users, with the single exception of Kenya. It is surely no coincidence that Kenya was the only country in the region where we identified that government agencies initiated IUD promotion. Similarly, the preliminary state-level results of India's 2015–2016 National Family Health Survey and Pakistan's 2012–2013 DHS indicate stagnant levels of IUD use. One possible explanation is lack of government commitment to the training, logistics and community education needed for successful IUD promotion. The IUD agenda has been driven largely by international NGOs which, despite partnerships with the public sector, cannot be fully adequate substitutes for the lack of nation-wide mobilization led by government agencies.

As noted earlier, one of the key advantages of the IUD is its suitability for initiation of use before discharge from hospital after childbirth, a particularly important attribute in view of the renewed international interest in strengthening postpartum family planning. Evidence to date on the effectiveness of introducing postpartum IUD services is thin. We located only one large-scale, multicountry project [22]. Taking into account the investment made in national advocacy, imparting of local ownership, training and institutional support, the results of this project appear to be rather modest and implying a high cost–benefit ratio, with IUD acceptance among counseled women ranging from 2% to 6%. This is a priority area for future research.

One clear-cut conclusion from the review is that implant uptake typically eclipses IUD uptake in projects that ostensibly give equal emphasis to both. Several reasons for the relatively low uptake of IUDs were advanced in the telephone interviews. The most commonly mentioned factor concerned provider biases and misconceptions. Providers prefer to recommend methods that take less time and effort than IUDs. Secondly, there is resistance from women who do not feel comfortable having an insertion by a man, reinforced by the fact that many facilities lack the space for privacy. Some believe that IUDs are less effective than, for instance, oral contraceptives. Side effects, in particular heavy menstrual bleeding, act as a further deterrent. A third reason was lack of promotion at the national level. The example of top-down IUD promotion in China was cited. Though this policy initially restricted choice, IUDs remain widely used and popular, even more recently when a wider range of methods is available. Additional reasons mentioned by more than one informant included the difficulty of retaining provider skills and confidence, particularly in rural areas where client load is low, supply chain problems and restrictions in some countries prohibiting nurses and midwives from inserting IUDs.

Several informants accepted that implants were easier to promote than IUDs and are favored by some agencies for this reason. Again, both provider and client factors were implicated. Providers tend to favor implants because insertion is less complex than for IUDs. The fact that implants are considerably more difficult to remove than IUDs is not explained to women. For women, implants were less intrusive than IUDs and, being a relatively new method, have attracted less misconceptions and concerns.

Among the remedies suggested by stakeholders were information and education activities to counter misconceptions, training and retraining of staff, retention of trained providers, task shifting, and recruitment of enthusiastic, dedicated IUD providers. One informant thought that addressing the lack of incentives for staff to provide time-consuming and skill-demanding IUD services was important. The example of

a voucher scheme was mentioned. Initially, providers were reimbursed more generously for implants than IUDs, simply because the implant was a more expensive product. Unsurprisingly, implants were heavily favored by providers. When reimbursement for IUDs was raised, this method became more frequently used. This view is supported by the projects in Chad and DRC where IUD uptake increased substantially after a number of changes in service delivery were made including enhanced compensation to staff for IUD insertions [35]. One other project succeeded in increasing acceptance of IUDs relative to implants partly by re-enthusing providers [15].

A prevailing impression from the literature and telephone interviews with stakeholders is that effective IUD promotion is certainly possible but is rather an uphill battle. It is rarely easy to change method mix once the dominance of one or two methods has been established, except by the introduction of a totally new method. The forces of familiarity are strong. Perhaps the key to success for IUDs is provider motivation, as mentioned above. In intensively supervised projects, it may be feasible to reorientate staff toward greater enthusiasm for IUDs. Success is reported in two projects reviewed here, though both also engaged in extensive community-based efforts to dispel adverse rumors [16,36]. In less intensive programs, it is more difficult to generate the motivation for providers to actively promote a procedure that is more demanding than alternatives, except through the contentious and potentially corrupting use of financial incentives. An alternative is the training of dedicated IUD providers and placement in high-volume facilities, where other methods are routinely available.

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