Family Planning Vouchers in Low and Middle Income Countries: A Systematic Review

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Family planning (FP) vouchers have targeted subsidies to disadvantaged populations for quality reproductive health services since the 1960s. To summarize the effect of FP voucher programs in low- and middle-income countries, a systematic review was conducted, screening studies from 33 databases through three phases: keyword search, title and abstract review, and full text review. Sixteen articles were selected including randomized control trials, controlled before-and-after, interrupted time series analyses, cohort, and before-and-after studies. Twenty-three study outcomes were clustered around contraceptive uptake, with study outcomes including fertility in the early studies and equity and discontinuation in more recent publications. Research gaps include measures of FP quality, unintended outcomes, clients' qualitative experiences, FP voucher integration with health systems, and issues related to scale-up of the voucher approach.

nequitable access and skewed method mix in family planning (FP) services are persistent and pervasive problems in low- and middle-income countries, particularly in sub-Saharan Africa (Ross 2015; Barros et al. 2012; Bertrand et al. 2014). Family planning promotion is unique among health interventions in the breadth of its potential benefits: reduction of poverty, lower maternal and child mortality, empowerment of women, reduced burden of unintended pregnancies, and enhanced environmental sustainability by stabilizing trends in population growth rates (Cleland et al. 2006). However, socioeconomic, demographic, and geographic disparities in contraceptive use and access remain wide between and within countries, with significant implications for unequal attainment of sexual and reproductive health rights (Barros et al. 2012; Singh et al. 2014; Ortayli and Malarcher 2010; Creanga et al. 2011).

Since the 1960s more than 20 family planning programs in low- and middle-income countries have used voucher subsidies to reach disadvantaged populations and improve access to contraception, particularly long-acting methods (Harvey 1984; Anon 1974a; Cuca

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and Pierce 1977; Stycos and Mundigo 1974; Carranza 2010; Echeverry 1975; Fendall 1971; Treadway et al. 1976; Population Council 1993; Anon 1975; Isaacs 1975; Lim 1974; Chow et al. 1969; Cernada and Chow 1969; Obare et al. 2013; Chin-Quee et al. 2010; Agha 2011; Khurram Azmat et al. 2013; Hameed et al. 2015; Bajracharya et al. 2016; Anon 2010; IFPS Technical Assistance Project [ITAP] 2012; Meuwissen et al. 2006a; Kemplay et al. 2013; Boddam-Whetham et al. 2016; Brody et al. 2013). Although the specifics vary between programs, the voucher strategy identifies beneficiaries from disadvantaged groups and gives individuals a voucher that they can take to a contracted public or private provider for service (Sandiford et al. 2005). Similarly designed programs subsidize maternal health services and have been described elsewhere (Bellows et al. 2013). In some recent family planning (FP) voucher programs, community-based distributors use a poverty-grading tool based on household assets and amenities to identify poor women who qualify for vouchers. Vouchers are redeemed for services at contracted health facilities, which then submit claims to the voucher management agency (VMA).

Many public health-care professionals have advocated the use of vouchers, which can prioritize subsidies for disadvantaged populations in exchange for health services (Boler and Harris 2010; High Impact Practices in Family Planning [HIPs] 2015). Although many studies have been published over the years, including a systematic review of studies of reproductive health voucher programs (Bellows et al. 2011), there has been no systematic review of studies of FP voucher programs. This review will provide information about the effectiveness of such voucher programs in low- and middle-income countries and inform the future development of FP voucher programs.

METHODS

Study inclusion criteria and analytic methods were specified in a protocol registered on the PROSPERO database, number: CRD42015014149 (http://www.crd.york.ac.uk/PROSPERO).

Study selection was conducted through a three-phase process: (1) identification of studies for possible inclusion via keyword search of electronic databases along with expert identification; (2) eligibility screening of the titles and abstracts of identified studies; (3) eligibility screening of the remaining studies via full text review.

Prior to conducting these steps, a few basic inclusion criteria, typically required by databases for keyword searches, were adopted as a primer for the search process. The basic inclusion criteria included the following:

Time frame: Any publication between January 1, 1960 and May 31, 2016 was included in the search. Our selection of 1960 as the earliest year was based on the historical development of modern contraceptives. Vouchers for family planning prior to 1960 would have had very limited types of methods to subsidize.

Language of publication: Only publications in English were included.

Phase I: Keyword Search

The first phase of study selection involved a keyword search of relevant terms related to family planning vouchers. A range of databases was searched, including those that catalogue

peer-reviewed published literature, as well as databases of unpublished grey literature. The search was conducted using keywords drawn from the following clusters or themes: (1) low-and middle-income countries, (2) vouchers and healthcare financing, and (3) family planning and contraception. Keywords used as search terms varied across databases and websites, but the topical clusters remained a core factor in choice of keywords.¹

The following databases and online resources were searched for published studies and unpublished grey literature: PubMed; Popline; Cochrane Database of Systematic Reviews (CDSR); Cochrane Central Register of Controlled Trials (CENTRAL); IDEAS Economic database; Cumulative Index of Nursing and Allied Health (CINAHL); Science Direct; Inter-Science (Wiley); Africa Index Medicus (AIM); WHO Latin America and the Caribbean (LILACS); WHO South-East Asia (IMSEAR); WHO Eastern Mediterranean (IMEMR); WHO Western Pacific (WPRIM); African Healthline at Princeton University; Web of Science; Google Scholar; IUSSP; Population Reference Bureau; ELDIS; International Conference on Family Planning (ICFP) 2013; DFID; USAID; Canadian Foreign Affairs, Trade and Development, formerly CIDA; Population Council; Guttmacher Institute; London School of Hygiene and Tropical Medicine; Harvard University; Grey Literature (greylit.org); Research-Gate; African Journal Online; Center for Health Market Innovations; Social Franchising for Health; and University of California at Berkeley. One database (EMBASE) was not included due to restricted access.

Phase II: Title and Abstract Review

Titles and abstracts of all studies identified in Phase I were reviewed to determine whether studies should be advanced to the next phase of the review. Inclusion and exclusion criteria were used to select studies to be advanced to the next phase. Studies were advanced if the topic involved interventions related to social health protection programs that provided a voucher to disadvantaged clients and reimbursed healthcare providers or facilities for providing contraceptive services with pre-defined quality standards. Studies were also screened on the basis of evaluation design from the title and abstract review. Although initially the criteria were set to advance only studies that had a credible comparative design such as a randomized control trial (RCT), a cluster RCT, a controlled before-and-after study, or an interrupted time series design, to expand the number of studies advanced for more detailed review, studies using a before-and-after intervention design or a cross-sectional design were permitted as well. Studies that did not meet time frame, language, study population, and other inclusion criteria, as noted in Phase I, were rejected.

The review team also sought expert recommendations on studies to be included in the systematic review. Technical staff at Marie Stopes International (MSI) proposed reports from reproductive health voucher programs implemented by MSI in several countries. One other recommendation was obtained from the Population Council and another from a bibliography search. These citations were screened and those that met the inclusion criteria were also advanced to Phase III.

¹ See Appendix Table 4 for specific keywords by database. Appendix tables are available at the supporting information tab at wileyonlinelibrary.com/journal/sfp.

Phase III: Full Text Review

Full text of the studies advanced from Phase II was reviewed for final inclusion in the systematic review. Two co-authors independently assessed the studies based on their full text. To streamline this process, a comprehensive data extraction form (described further below) was developed to query data on different aspects of the screened studies, and more stringent inclusion/exclusion criteria were applied to the process of selection for the final set of studies.

As a first step, four key characteristics were queried in the data extraction form: 1) study design, 2) country where the study took place, 3) whether the study included a voucher linked to a subsidy or payment for family planning services, and 4) whether one or more of the primary outcomes were reported in the study. The primary outcomes of interest were: use of contraceptive services and/or commodities (utilization); continuation and switching; new contraceptive users (targeting); range of services (method mix); contraceptive prevalence (modern methods, overall and by method); unmet need for contraceptives (modern methods); unintended pregnancy; unsafe abortion; and fertility, including parity, completed fertility, timing of first birth, teenage births, and birth spacing.

Studies that did not meet these four primary criteria were excluded from the review. In this step, a modification was made to the inclusion/exclusion criteria related to study design. Studies were initially included if they used one of the following designs: randomized control trials, controlled before-and-after studies (quasi-experimental), case-control studies, time series, and cohort designs. Later, inclusion criteria were loosened to also consider before-and-after, cohort, and cross-sectional study designs, and reviewers revisited all citations from Phase II to identify all potential studies.

Following this screening, information on the remaining studies was entered into a data extraction form with 72 questions on various aspects of studies and the voucher program. The tool was initially tested with five randomly selected articles and refined accordingly to its final form. Data entered into the extraction form included article title, authors, publication date, source of funding, study design, country, length of study, outcome measures, sampling frame, sample size, characteristics of population of interest, description of intervention including type of contraceptive methods covered by the voucher, implementing partners, and quality assessment. Primary measures of effect in the studies were also included in the extraction. Summary measures extracted included odds ratios, prevalence percentages, and incidence rates. Outcome variables were examined across studies, with the weight of evidence determined by the number of studies looking at common outcomes and the quality of study designs. A combination of results through meta-analysis could not be conducted since there was not sufficient consistency in study design and outcome variables. Instead, a narrative synthesis of the data was conducted.

The data extraction form was analyzed by two co-authors. Each co-author made qualitative assessments for articles to be included in the systematic review. Any discrepancies between these two assessments were discussed and a final judgment regarding inclusion or exclusion was made.

For the 16 studies that met the inclusion criteria, study design quality was assessed using Cochrane criteria for Effective Practice and Organization of Care (EPOC 2015). Two coauthors independently assessed the risk of bias using the Cochrane EPOC group standard

criteria for RCTs and CBA studies. The co-authors also checked the adequacy of randomization and concealment of allocation, blinding of patients, health care providers, data collectors, and outcome assessors, and extent of loss to follow-up. A third co-author arbitrated any discrepancies between the assessors of study quality.

Final Selection

The initial keyword search identified 5,894 titles. Following a screening for duplicates, Phase I identified 3,872 titles to be advanced to Phase II, the title and abstract review. From this screening process, Phase II identified 252 studies to be advanced to Phase III, the full text review. Of these 252 studies, 16 were selected for final inclusion in the systematic review.

RESULTS

Characteristics of the Studies

Characteristics of the 16 studies included in the review are presented in columns 3 through 7 of Appendix Table 1. Some of the studies reported more than one primary outcome of interest. The studies were of family planning programs in 11 countries: five in Africa, four in Asia, and two in Latin America. Eleven studies have been reported since 2010, three were reported between 2000 and 2009, one in the 1990s, and one in the 1960s.

Methods

A majority of the studies had low-quality designs. Only two studies had results from randomized control trials (RCTs), while four reported results from controlled before-and-after (CBA) designs. One study used a prospective double cohort design. Four reported results from before-and-after studies, and five presented results from cross-sectional studies.

Duration

The duration of the interventions was approximately 24 months for the cohort and CBA studies, 48 months for the before-and-after studies, and 12 months for the RCTs. Several of the cross-sectional studies reported findings from intervention data of less than a year in duration.

Participants

Most study participants were women of reproductive age (15–49 years). In a majority of studies, these women were from poor or disadvantaged populations with limited access to family planning services due to socioeconomic, demographic, or geographic constraints. Four studies were of programs that targeted married women. One program in Nicaragua provided vouchers to adolescents as young as 12 years of age for a range of sexual and reproductive health services.

Quality of Studies

Appendix Table 2 summarizes the quality of the studies. Of the 16 studies, ten reported results from study designs that lacked sufficient rigor, including prospective cohort, cross-sectional, and before-and-after designs (Waddington et al. 2012). They were thus excluded from this assessment of quality. The remaining six studies reported results from a randomized control trial and controlled before and after designs and were assessed using the EPOC criteria. Among the six studies, the two RCTs had a low aggregate risk of bias and the four CBAs had an unclear aggregate risk of bias.

Family Planning Outcome Variables

Column 8 in Appendix Table 1 presents the study outcomes extracted from the included studies. Although there were nine primary outcomes of interest, three outcomes were quantified in the literature: (1) use of contraceptives, (2) changes to fertility, primarily fertility rates, and (3) contraceptive continuation.

From the 16 studies, 25 outcome variables were extracted with 23 outcomes related to contraceptive uptake, level, and continuation and two outcomes related to fertility. Contraceptive methods taken up in each study varied. Most programs offered a mix of short-term and long-term methods, with the voucher frequently subsidizing the costlier long-term methods, particularly implants and intrauterine devices (IUDs). One RCT in Jamaica tested the effect of vouchers on the uptake of oral contraceptive pills (OCPs) among consumers seeking emergency contraceptive pills (ECPs) at 21 pharmacies (Chin-Quee et al. 2010).

Of the 23 outcome variables on contraceptive uptake or level, 14 outcomes represented a significant increase or higher level of contraceptive use among the voucher-exposed group, three outcomes represented nonsignificant change in use, and six outcomes had no test of significance. No studies reported a significant reduction in use or lower contraceptive levels in the voucher group. The two studies related to fertility found a reduction after the introduction of the voucher.

Two studies presented changes in fertility following the introduction of a FP voucher, or coupon as it was called at the time. Taiwan in the 1960s developed a national population policy to promote voluntary family planning and stabilize fertility rates as a key objective of national development (Chow 1968). The IUD was promoted as a key part of the initiative and was subsidized using a coupon to expand contraceptive method mix. In 1969, a matched-pairs CBA study reported that the IUD coupon program was associated with a 32 percentage point reduction in three-year average fertility between 1964 and 1966. The paper reporting these findings appears to have been published twice in 1969 (Chow et al. 1969; Chang et al. 1969). The second study, an RCT, conducted at an NGO facility in Lusaka, Zambia, tested the efficacy of an individual voucher versus a couples voucher versus routine standard of care on contraceptive uptake and fertility. The study reported that short-term fertility (9–13 months after the clinic visit) was reduced the most among individual voucher recipients; among couples voucher beneficiaries, the male partner's involvement in fertility regulation may have hindered contraceptive uptake and was not associated with fertility reduction. The study found no significant change in fertility beyond two years (Ashraf et al. 2013). The study

did not comment on the potential role of vouchers in facilitating short-term birth spacing among low-income women unable to afford contraception.

Two studies assessed contraceptive continuation. The first reported no difference between women who obtained IUDs using a voucher and similar women obtaining them without a voucher, but numbers were not provided (Azmat et al. 2012). A follow-up study from the same population noted a nonsignificant difference in the 24-month probability of IUD continuation between voucher users and clients who paid out of pocket. However, a related test of six-month probability distributions from 0–24 months found a significantly greater probability of IUD continuation in each six-month period among voucher clients compared to clients who paid out of pocket (Hameed et al. 2015).

Among the six studies with high quality designs (two RCTs and four CBAs), the results were generally positive. Of the two RCTs, one found a statistically significant effect of the voucher program on IUD uptake (Ashraf et al. 2013), and the other found no effect of vouchers on OCPs among pharmacy-based purchasers of ECPs (Chin-Quee et al. 2010). Among the four CBA studies, there were six reported outcomes: two nonsignificant changes in contraceptive use among the general population and postnatal care, three significant increases in contraceptive use, and one significant decrease in fertility (Agha 2011; Bajracharya et al. 2016; Chow et al. 1969; Khurram Azmat et al. 2013).

The majority of the voucher programs included were donor funded and conducted as a private sector service. The early programs were in East Asia and Latin America (Chow et al. 1969; Meuwissen et al. 2006c). Since 2000, programs have been launched and expanded in sub-Saharan Africa and South Asia (Ashraf et al. 2013; Hameed et al. 2015; IFPS Technical Assistance Project 2012; Obare et al. 2013). Approximately half of the programs offered the voucher at no cost to the consumer; the other programs either charged for the voucher or no information about voucher price was available. Nearly half of the voucher programs mentioned targeting poor individuals. The remainder of the studies did not mention an explicit targeting mechanism (Appendix Table 3).

DISCUSSION

Evidence regarding the effectiveness of vouchers for contraceptive products and services has largely focused on metrics for contraceptive use. With respect to use outcomes, the voucher is a valuable means to tally contraceptive service visits. It is not surprising that nearly all of the studies reported on changes in use and that most studies found a significant increase in contraceptive use.

While the voucher literature is largely consistent on contraceptive use outcomes, there are missing metrics on other dimensions of performance and a failure to synthesize insights from program operations. Contraceptive discontinuation in voucher programs has not been well studied. Two studies from Pakistan reported that IUD continuation did not differ statistically between voucher and non-voucher cohorts at 24 months (Azmat et al. 2012; Hameed et al. 2015). However, one of the studies noted that the probability of continuation was consistently higher for the voucher cohort compared to the non-voucher cohort at each six-month internal (Hameed et al. 2015).

Aside from a study in Nicaragua that reported on simulated clients receiving their preferred method in a before-and-after design, no studies have reported on supply-side effects of family planning vouchers (Meuwissen et al. 2006b). Supply-side factors are critical to successful service delivery, and the FP voucher with its quality assurance mechanisms and financial reimbursement for service delivery is often overlooked as a strategy to address supply-side challenges.

Synthesis of findings from program operations is beyond the scope of this review but would be a valuable contribution to the literature. For example, the Marie Stopes study in Madagascar conducted a small follow-up on 65 voucher clients and found that two vouchers had been issued at a Bluestar facility, contrary to program requirements that vouchers be distributed to beneficiaries in the community (Kemplay et al. 2013). The results were not sufficiently rigorous to meet the inclusion criteria of this review, but the findings would be of interest in a scoping review of voucher program design and functionality. Another programmatic area to include in future scoping reviews would be the percentage of distributed FP vouchers that were not used. Several reports presented data on nonuse but did not present before-and-after results, time trends, or a comparison with alternative forms of community outreach to determine whether nonuse of vouchers was above or below a given standard.

Limitations

Although this review found largely positive effects, there are limitations to consider in synthesizing the results. The relative preponderance of positive effects raises questions about the potential for publication bias, although the means to detect such bias (e.g. pre-publication study protocols) are largely missing in this literature (Dwan et al. 2013; Ahmed et al. 2012). As the publication years indicate, most of the research has been conducted since 2000. In addition to the Taiwan and South Korea programs, there is evidence of voucher or coupon programs in the 1960s and 1970s operating in Antigua, Bangladesh, Colombia, Costa Rica, the Dominican Republic, Ghana, Iran, Malaysia, Tunisia, and Turkey; however, they were generally not well documented, a limitation that has been noted elsewhere (Harvey 1984; Anon 1974b; Cuca and Pierce 1977; Stycos and Mundigo 1974; Carranza 2010; Echeverry 1975; Fendall 1971; Treadway et al. 1976; Population Council 1993; Anon 1975; Isaacs 1975; Lim 1974).

Of the included studies, study designs were generally weak and offer little ability to attribute causation. Among the 24 reported outcomes, six were from cross-sectional comparisons and six from before-and-after comparisons. Although neither study design is considered rigorous by accepted standards, the findings are relevant to understanding the scope of the literature (Armstrong et al. 2011). Given the limited number of publications on this topic, the decision was made during the literature search to include findings from less rigorous studies.

Even the controlled before-and-after designs cannot control for potential unobserved confounders. Albeit with often weak designs, the studies did provide a consistent story regarding the direction and significance of the positive effects. Such evidence, however weak, is useful for scoping the literature and considering implications for program design.

Another limitation was the lack of disaggregated outcomes by provider type. Private and public providers might respond differently to the reimbursements for FP voucher services, yet most studies failed to compare outcomes by provider type. As an exception, one study compared 24-month IUD continuation among clients seen by community midwives and voucher clients seen by private franchised providers (Hameed et al. 2015).

Policy Implications

In spite of these limitations, this review yielded information on the effectiveness of voucher programs subsidizing contraceptive products and services. Vouchers target subsidies to beneficiaries who in the absence of the subsidy had a lower probability of service access and use. In most studies, beneficiaries were defined by economic status; in two programs, adolescents were identified as disadvantaged and given vouchers. The current review repeatedly found an observed association between being identified as a voucher beneficiary and increased contraceptive uptake.

Vouchers are an effective means for governments to flexibly engage private-sector capacity. Of the programs identified in this review, eight (four of which were replicated programs in different states of India) contracted only private providers, four contracted a mix of public and private providers, and four engaged only public providers. The results suggest that voucher programs can expand client choice by reducing financial barriers to contraceptive services and make private providers an option for disadvantaged clients previously restricted by cost.

The early literature on family planning coupons contains important operational lessons that future research could expand. Vouchers, or coupons as they were commonly referred to in the 1960s and 1970s, were originally used to track the number of households contacted, acceptors reached, and contraceptives distributed and to monitor subsidies claimed for contraceptive services. A 1969 paper noted three advantages of using coupons: administrative verification of IUD insertion; educational or motivational aid to the IUD acceptor by reminding the client of the subsidy and opportunity to complete the referral; and the ability to monitor and evaluate performance of referral agents and family planning service providers (Cernada and Chow 1969).

Future Research

Future research can contribute to a more complete understanding of outcomes on both the supply and demand sides. Research is also needed to examine how variation in program design can affect outcomes. Drawing from the literature synthesized in this review, several promising areas for future research are briefly presented here.

On the demand side, research suggests that voucher programs may encourage users of less effective contraceptive methods to switch to more effective, long-term methods and, in so doing, to reduce discontinuation rates. Rigorously designed studies can generate evidence to examine this question, which has immediate implications for what has been termed the "leaky bucket" of high discontinuation due to skewed or limited method mix (Castle and Askew 2015).

Studies generally reported outcomes from interventions ranging from 12 to 48 months in duration. The question remains whether there is a minimum duration of voucher intervention needed to effect sustainable change in contraceptive behavior. Embedding voucher-related questions within demographic surveillance systems, as was done in Nairobi for maternal health voucher services (Amendah et al. 2013), could contribute answers in future studies.

The voucher programs in Taiwan and South Korea in the 1960s offered an IUD coupon as a corrective measure to address the fact that short-term methods were more readily available and the costly IUD required a subsidy to ensure that price did not limit contraceptive choice. More recent voucher programs have offered a package of counseling and long-acting reversible methods (LARCs) or a broader method mix of short-term methods and LARCs (Agha 2011; Boddam-Whetham et al. 2016; Park et al. 1977). Future studies could evaluate the effectiveness of single-method versus comprehensive FP voucher packages in achieving higher contraceptive uptake and method continuation. Similarly, tests of "nudge" strategies, such as expiry dates on vouchers, to encourage use of vouchers can be routinely tested to establish parameters for future programs.

Voucher distribution has a community focus; however, some programs have used geographic and proxy means-testing to identify beneficiaries. Future operations research should test various distribution strategies to determine which ones reach the largest proportion of intended beneficiaries within specific countries or markets. Similarly, future operations research can determine whether distributing vouchers for free or selling them to consumers affects subsequent use of vouchers.

On the supply side, research should test the extent to which voucher payments and contractual conditions affect FP quality in terms of facility structure or readiness, clinical care (e.g., counseling performance), or client outcomes (e.g., satisfaction or method discontinuation). The literature on FP quality and long-term outcomes has a number of unanswered questions regarding which service delivery factors are the most likely to lead to improvement in long-term outcomes (Paine et al. 2000). In voucher programs, implementers ought to be encouraged to test contraceptive continuation under different payment strategies to providers that optimize client choice, method mix, and voluntarism (Eichler et al. 2010; Hardee et al. 2014). Within larger voucher programs that contract significant numbers of facilities and community-based distributors, is there competition between providers and does this induce changes in quality? The literature on maternal health vouchers has suggested that such effects may occur, but no studies have documented them beyond qualitative insights (Janisch et al. 2010; Ahmed and Khan 2011).

From a program management perspective, future research can compare levels of suspected fraud and waste in FP voucher programs to levels in other FP service delivery models and test mechanisms to reduce its incidence. Operations research into provider mix, factoring in contractual or administrative performance when reviewing providers' status in the voucher program, may be an effective means to minimize fraud.

Policy-relevant research can consider the role of vouchers when family planning methods are provided at little or no cost outside of the voucher program. Health education, demand generation, and referral to the appropriate provider remain key mechanisms within voucher programs that can help to reduce inequalities even where price is not an explicit barrier.

Research on the role of vouchers in empowering clients to avoid unintended pregnancy has been suggested in the literature, but not yet undertaken (Njuki et al. 2013). Empowerment of men as family planning users and partners is critical and future research can also help to identify ways to increase male involvement in family planning voucher programs (Hardee, Croce-Galis, and Gay 2016).

Lastly, studies could contribute in testing and documenting effective strategies that convert vouchers to government-financed models that can sustain the approach beyond donor horizons (Menotti and Farrell 2016).

There is a growing literature as documented in the current review; however, many emergent, policy-relevant questions remain unanswered in the context of family planning vouchers and additional, high quality research is warranted.

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ACKNOWLEDGMENTS

Funding from: (i) the UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP), a cosponsored program executed by the World Health Organization; and (ii) The Evidence Project, a global project implemented by the Population Council, funded by the United States Agency for International Development, is gratefully acknowledged.