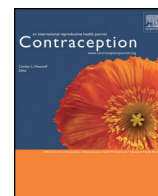




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Costs of administering injectable contraceptives through health workers and self-injection: evidence from Burkina Faso, Uganda, and Senegal^{☆,☆☆}

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ABSTRACT

Objective: To evaluate the 12-month total direct costs (medical and nonmedical) of delivering subcutaneous depot medroxyprogesterone acetate (DMPA-SC) under three strategies – facility-based administration, community-based administration and self-injection – compared to the costs of delivering intramuscular DMPA (DMPA-IM) via facility- and community-based administration.

Study design: We conducted four cross-sectional microcosting studies in three countries from December 2015 to January 2017. We estimated direct medical costs (i.e., costs to health systems) using primary data collected from 95 health facilities on the resources used for injectable contraceptive service delivery. For self-injection, we included both costs of the actual research intervention and adjusted programmatic costs reflecting a lower-cost training aid. Direct nonmedical costs (i.e., client travel and time costs) came from client interviews conducted during injectable continuation studies. All costs were estimated for one couple year of protection. One-way sensitivity analyses identified the largest cost drivers.

Results: Total costs were lowest for community-based distribution of DMPA-SC (US\$7.69) and DMPA-IM (\$7.71) in Uganda. Total costs for self-injection before adjustment of the training aid were \$9.73 (Uganda) and \$10.28 (Senegal). After adjustment, costs decreased to \$7.83 (Uganda) and \$8.38 (Senegal) and were lower than the costs of facility-based administration of DMPA-IM (\$10.12 Uganda, \$9.46 Senegal). Costs were highest for facility-based administration of DMPA-SC (\$12.14) and DMPA-IM (\$11.60) in Burkina Faso. Across all studies, direct non-medical costs were lowest for self-injecting women.

Conclusions: Community-based distribution and self-injection may be promising channels for reducing injectable contraception delivery costs. We observed no major differences in costs when administering DMPA-SC and DMPA-IM under the same strategy.

Implications: Designing interventions to bring contraceptive service delivery closer to women may reduce barriers to contraceptive access. Community-based distribution of injectable contraception reduces direct costs of service delivery. Compared to facility-based health worker administration, self-injection brings economic benefits for women and health systems, especially with a lower-cost client training aid.

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1. Introduction

More than 225 million women in low- and middle-income countries (LMIC) have an unmet need for modern contraceptives, the largest need being among women living in rural areas [1]. New contraceptive technologies and delivery strategies may reduce barriers to family planning access and continuation, thereby addressing unmet need.

Subcutaneous depot medroxyprogesterone acetate (DMPA-SC) is a novel formulation and presentation of the injectable DMPA. The DMPA-SC product available to Family Planning 2020 countries is Pfizer's Sayana® Press, which delivers the contraceptive drug through the BD Uniject™ injection system, allowing for easier administration by lay health workers with minimal training and for women to self-inject. Recent studies demonstrated the operational feasibility of these administration modalities and acceptability to women and health workers [2–4]. Previous formative research in Senegal and Uganda found that DMPA-SC might have logistical benefits relative to intramuscular DMPA (DMPA-IM), but actual costs of delivering DMPA-SC have not yet been evaluated [5]. Given that DMPA-SC is a new contraceptive intervention, there is need to assess any associated increase or decrease in the economic cost of service delivery for both health systems and women compared to existing interventions in order to inform decisions about contraceptive method mix.

Evidence on the costs of contraceptive service delivery in LMIC is generally scarce. Only a few studies have estimated the costs of delivering injectable contraceptives — mainly DMPA-IM [6–13] — in LMIC, and none have evaluated women's travel and opportunity costs attributable to seeking contraceptive services. Only one study assessed the costs of delivering DMPA-SC: an analysis of facility-based contraceptive delivery costs in Kenya [13]. Research gaps remain regarding community-based distribution and self-injection of DMPA-SC.

Therefore, we sought to investigate whether the costs to administer DMPA-SC differed from the costs to administer DMPA-IM and whether these costs differed by delivery strategy. We conducted these costing studies in parallel with studies evaluating the method continuation rates of DMPA-SC under facility-based administration in Burkina Faso, community-based distribution via Village Health Teams in Uganda, and self-injection in Senegal and Uganda, all compared to DMPA-IM [14,15] [Jane Cover, personal communication, 2017]. These studies found no major differences in continuation rates between DMPA-SC and DMPA-IM when the delivery strategy was the same [14], though self-injection of DMPA-SC led to higher continuation rates compared to facility-based delivery of DMPA-IM [15].

The main objective of this study was to assess the costs of delivering DMPA-SC and DMPA-IM using different strategies in three sub-Saharan African countries: Burkina Faso, Uganda and Senegal. We reported costs from a health system perspective and also accounted for women's travel and time costs to travel to, wait for and receive services. Specifically, we sought to understand the total direct costs of delivering DMPA-SC and DMPA-IM, including commodity costs; costs of provider time, medical supplies and drugs for the treatment of side effects; and travel and time costs to women. We did not seek to directly compare results across countries. However, we can draw some lessons by looking at the costs by delivery strategy, especially in Uganda where we assessed three delivery approaches (i.e., facility-based health worker administration, community-based health worker administration and self-injection) in two studies conducted in a very similar setting (same health care system, unit prices, time period, and partially overlapping geographic areas).

We then used the cost estimates as input in a follow-up cost-effectiveness study [16] which included the impact of discontinuation on pregnancy outcomes and costs.

2. Methods

We received in-country approval for conducting the costing studies from the Comité d'Ethique pour la Recherche en Santé in Burkina Faso,

Mulago Research Ethics Committee of Uganda and Comité National d'Ethique pour la Recherche en Santé of Senegal. We obtained consent to participate in this study from each health worker interviewed.

2.1. Injectable contraceptive service delivery in Burkina Faso, Uganda and Senegal

Burkina Faso introduced DMPA-SC through the facility-based delivery strategy in place for DMPA-IM [17]. Uganda introduced DMPA-SC through community-based distribution by Village Health Teams, most of whom were already providing DMPA-IM and other short-term contraceptive methods [17]. The Village Health Teams were affiliated with health facilities for reporting and replenishing the contraceptive commodities. Finally, Uganda and Senegal piloted DMPA-SC for self-injection under a research setting. A study health worker (nurse or midwife) trained women visiting health facilities and interested in self-injection to self-inject, practicing the technique on a prosthetic. The health worker then observed those deemed proficient in the self-injection technique during their first self-injection. Afterward, the health worker gave the client a training aid, a calendar to assist with re-injection dates and three DMPA-SC units to take home to self-inject. In the facilities participating in the self-injection research study, health workers also administered DMPA-IM.

2.2. Costing study design

We conducted four microcosting studies across the three countries. Microcosting is a cost estimation method that involves collecting detailed data on the resources used (input quantities) and the value of those resources (input prices) in the delivery of a health service [18–20]. Microcosting is particularly useful in the estimation of costs of new interventions or interventions that include nonmarket goods (e.g., volunteer labor), or for studying cost variation within the same procedure [21]. We used structured costing questionnaires to interview health workers on resources used to deliver all contraceptive services. We used a cross-sectional design, whereby we visited each health facility once within the data collection period. Health facilities included in the costing studies were a subsample of the study sites selected in parallel continuation studies using purposive sampling. Table 1 shows information on the study sites and health workers interviewed.

The direct medical costs for service delivery included the costs of contraceptive commodities, health worker time to deliver family planning services (including time for medical consultation if the client visited the health facility for side effects), medical supplies and drugs for the treatment of side effects. For self-injection, we also included the resources used for training women to self-inject: health worker time to train the client and necessary supplies [practice units, prosthetic (i.e., salt-filled condom), client training aid and reinjection calendar].

In addition, we estimated the direct nonmedical costs (women's travel costs and time) by interviewing women enrolled in the continuation studies (Table 1). To this purpose, we asked women who agreed to participate in the DMPA continuation studies about their modes of transport, travel time to reach the facility and transport costs.

We estimated the economic costs of contraceptive service delivery to account for donated health commodities as well as for the time of volunteers involved in contraceptive service delivery (Village Health Teams). We estimated annual costs per couple years of protection (CYP) — equivalent to receiving four injections of these 3-month injectable contraceptives [22].

2.3. Methods for estimating direct medical costs of service delivery and women's travel and time costs

Tables 2 and 3 show unit prices. Table 4 shows key input data used to estimate the costs of service delivery. We estimated annual commodity costs per CYP (i.e., by multiplying unit costs by four).

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