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KEEPING CONRACEPTIVES

ON THE SHELF

A CASE STUDY ON THE INFORMED PUSH MODEL FOR FAMILY PLANNING IN SENEGAL

In 2011 the Informed Push Model (IPM) was designed by Intrahealth International and its partners to address the issue of contraceptive unavailability in urban areas of Senegal. The IPM is a supply chain intervention system that brings the source of supply closer to the source of demand and alleviates local health facilities from directly placing and picking up product orders. A pilot study was conducted over a 6 month period in a district of Dakar and stockouts were completely eliminated at all 14 public health facilities. The project then expanded to include all 140 public facilities in the Dakar region with continued success and is currently undergoing further scale-up to the national level.

Editorial Note: A lack of consistently reliable access to contraception is one of a multitude of factors hindering family planning efforts by women in many low- and middle-income countries. When contraceptive products are out-of-stock at the point of purchase ("stockouts"), women's contraceptive choices are affected. It should be noted that stockouts are one of many determinants of contraceptive choice, and the authors are not positioning that stockouts are the only consideration in this matter. The following article describes efforts to implement the Informed Push Model, a supply chain intervention, in an attempt to increase Senegalese women's access to preferred contraceptive devices, by preventing stock-outs.

"Deciding about pregnancy should be by choices, not by chance. Having the information and means to do so is a basic human right. Family planning is one of the best investments that we can make for women's empowerment, gender equality, sustainable development and creating the future we want."
 – Dr. Babatunde Osotimhehin
Executive Director, UNFPA

So What?

Stockouts of contraceptives at health facilities are one of the main reasons that women in low-income countries simply cannot access the family planning products they desire. The Informed Push Model is Senegal's attempt at addressing this issue by providing women with choice and availability, and thereby giving them more control over their reproductive health.

Introduction

Family planning has a strong influence on the socio-economic development of a country; it empowers women, enabling them and their partners to decide if and when they want to have children. Programs that encourage the use of contraceptives prevent unintended pregnancies and unsafe abortions, and are key to economic growth in countries with high fertility rates. In Senegal, as in many West African countries, the lack of consistent access to contraceptives prevents many women from reliable family planning.

Frequently, gaps in the supply chain lead to contraceptive products being out-of-stock in pharmacies and health clinics. Supply chain limitations also mean that many locations only offer one or two types of contraceptives, making it difficult for women to find a method that fits their family planning needs. The prevalence of family planning can be described by the modern contraceptive prevalence rate (mCPR), which is a measure of the percentage of women of reproductive age who are using a contraceptive method. In Senegal, the mCPR was only 13% from 2008-2012 (1), which contributed to the nation's high fertility rate: about 5 births per woman from 2010-2013 according to the World Health Organization (WHO). Senegal also has rapid population growth (2.6% in 2015), as well as high maternal and child mortality rates (390 maternal deaths/100,000 live births reported in 2008-2012, and 60 child deaths/1000 live births in 2012).(1) The WHO also reported that the median age in Senegal was 18 years in 2012; therefore, a large proportion of the pop-

ulation today falls into the young child-bearing age category, and family planning and contraceptive use continue to be fundamental for the overall health of the country.

Background

Over the last 3-4 decades, the government of Senegal has implemented several initiatives involving family planning (FP) as a key strategy to improve the health of women and infants (2). In 1980, contraception was made legal for the first time in the country, and in 1988 the government adopted an official policy to reduce the population growth rate and the number of children per woman. The National Family Planning Program (PNFP) was launched in 1990 and resulted in a moderate increase in the use of modern methods of contraceptives by 0.7% each year from 1992-1997 (3). However, in 1998 the FP program was integrated into the Division of Reproductive Health within the Department of Primary Health Care. This led to a reduced focus on FP as priorities were instead placed on other health issues of the country (3). In 1995 and again in 2005, Senegal's population policy was updated to align with the international agenda as per the Millennium Development Goals (MDGs), whose objectives were to reduce the worldwide maternal mortality ratio by 75%, and to achieve universal access to reproductive health by 2015. These efforts have led to important gains in the nation's maternal and child health; for example, the total fertility rate (TFR) decreased from 7.2 to 5.3, a decline of almost two lifetime births per woman between 1978 and 2005 (1). However, progress has been slower since 2005: the TFR has remained relatively constant over the past ten years and the mCPR increased by only 1.9% from 1997-2011 (5).

In February 2011, eight representatives from West African nations met at a conference in Ouagadougou where they formed a unified commitment to boost reproductive health programs in the region. Following this partnership, Senegal's government put forth the National Action Plan for Family Planning for the period 2012-2015. Its goal was to increase the rate of contraceptive use in women of childbearing age to 27% by the end of 2015 (4). As part of this action plan, the government of Senegal identified 5 key challenges that impact the progress of family planning in the country (4):

1. Demand creation
2. Availability of products
3. Access to services
4. Political and financial engagement
5. Coordination between stakeholders

Therefore, in 2012, the Informed Push Model was implemented as a supply chain delivery system intervention to address the second identified challenge of product availability.

Problem Statement

A baseline evaluation of the contraceptive supply chain from 2010-2011 in two districts of Senegal revealed that stockouts of FP products in the public sector caused over 80% of female users to be unable to acquire the contraceptive method they wanted (15). 55% of the women experiencing a stockout switched between products, rendering the contraceptive method less effective, and the remaining 45% discontinued use or went to a private pharmacy to purchase their desired product at a higher price (8). This problem of supply and demand was a major cause of low client satisfaction, and in 2011 it was reported that 29% of women in Senegal had an unmet need for FP (7). Therefore, an intervention in the supply chain system was necessary to address the issue of contraceptive product stockouts at local public health facilities.

Project Intervention

Initially, the system to distribute contraceptives from central warehouses to local facilities used a "pull" model based on customer demand (2). The system was managed as follows:

- Local health facilities known as service delivery points (SDPs) sent their orders to the district depots
- The district aggregated these orders and sent a collective order to the Pharmacies Régionales d'Approvisionnement (PRA)
- The regional facility transmitted the orders from all its districts to the Pharmacie Nationale d'Approvisionnement (PNA)

In this system, each operational level was responsible for planning their commodity needs and placing orders four times a year. The PNA then delivered products based on the quarterly inventory records. Although this system ensured effective integration of FP products in the PNA system, a drawback was the problem of storing enough products since the PNA, PRAs, and districts had to stock large quantities of different contraceptive products at one time. Moreover, delays were often noted in the ordering of contraceptives by the SDPs because profits from the sales of contraceptives were first used to pay for the SDP's operating costs. Furthermore, the local staff of medical practitioners and midwives often did not have the resources or the expertise to maintain an adequate stock of supplies. The inefficiencies in this system resulted in major stockouts at the SDPs even when contraceptives were available at the national or regional levels.

Fixing the supply chain:
The "push" model of delivery is based on forecasted demand of products as opposed to actual or consumed demand (Figure 1) (8). The IPM brings the source of supply closer to the source of demand by employing dedicated professional logisticians to deliver the contraceptive products through loaded trucks directly to the health facilities. These logisticians project demand for contraceptives and are therefore directly "informed" on the needs of each SDP. Based on these forecasts, contraceptives are delivered to the SDPs on a monthly basis, which relieves health facilities from

the task of placing orders and spending time picking up the products (8).

Key features of the IPM intervention include task shifting, public-private partnerships, payment based on consumption, and aligning incentives, as described below:

Task shifting
By using specialized logistics professionals based at a regional level to carry out tasks such as quantification, data collection, and distribution, the logistics performance of the delivery system is improved, and health workers are thus freed to focus on their specialties in providing health services. The logistics professionals come from the private sector and utilize a practice called vendor-managed inventory, whereby they take responsibility for actively resupplying SDPs rather than the SDPs requisitioning products. Additionally, by distributing products directly from the regional level to the SDPs, the district is no longer required to maintain a physical inventory, thereby streamlining the supply chain. The district's role shifts from physical supply chain operations to management of SDPs and service provision. Task shifting also allows for leveraging of the limited supply chain management expertise by using a small number of trained professionals to serve a large number of SDPs.

Public-private partnerships
The IPM uses private operators, or third-party logistics providers, to store and distribute the family planning products to public health facilities. The third-party logistics providers are experienced logistics companies with previous experience in the health sector, and are managed with performance-based pay contracts to ensure results.

Payment based on consumption
Before the IPM, SDPs were required to pay for family planning products at the time of order, which resulted

FIGURE 1. Informed Push Model Streamlines Deliveries and Eliminates Orders Between Service Delivery Points (SDPs) and the Regional Warehouse
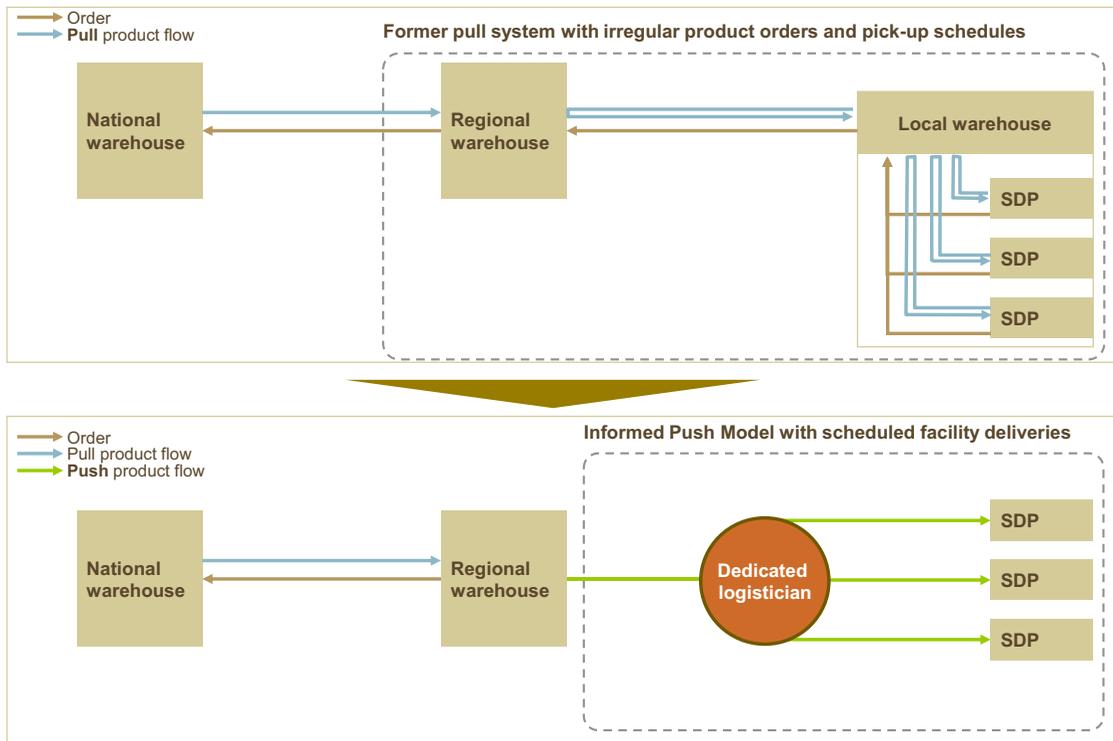
in major cash flow problems. With the IPM, the products are delivered and consumption data recorded. The SDPs are then charged based on these consumption rates. This re-established the cost-recovery system and eliminated the cycle of stockouts at SDPs.

Aligning incentives
The IPM aligns the incentives of all parties involved in making sure that family planning products reach SDPs and the community.

Implementation
To assess the efficiency of the IPM in reducing stockouts as well as its feasibility and sustainability, a pilot project was undertaken in the Pikine district of Sene-

gal over a 6-month period from February 2012 to July 2012. The neighbouring district of Guediawaye, where the IPM was not implemented and the original "pull" delivery system was maintained, was used as a control for the pilot study (8).

Evaluation
The IPM is evaluated using several different indicators. The immediate process indicators of the IPM are measured through changes in contraceptive stockouts rates and mCPR. The downstream, long-term outcomes of the IPM are measured by Senegal's fertility rates and maternal mortality rates. The results of the IPM through these indicators are discussed below.

FIGURE 2. Percentage of Facilities Experiencing a Stockout in 2 Comparison Districts, Dakar, Senegal, January–July 2012
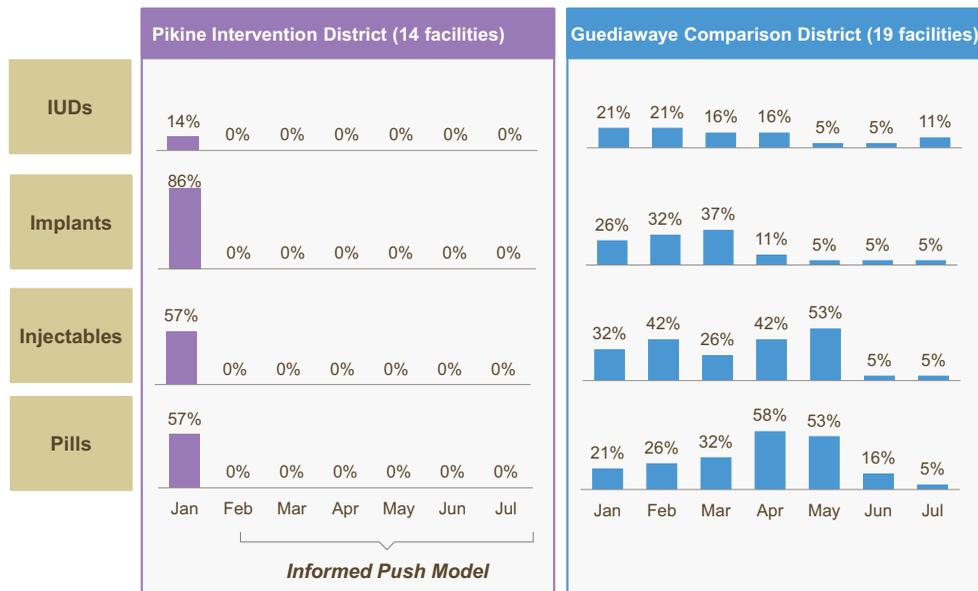

Process indicators:

The results of the pilot study in the Pikine district were dramatic. Before the IPM was implemented, Pikine experienced high levels of stockouts, such as a 43% stockout rate for the injectable contraceptive Depo Provera, and an 82% stockout rate for the contraceptive implant Jadelle (15). This translates to the products only being available to consumers about 17 and 5 days out of each month, respectively. However, after just one month of the IPM's implementation, stockouts of oral contraceptive pills, injectables, implants, and intrauterine devices (IUDs) were completely eliminated in all 14 public health facilities in Pikine (Figure 2) (8). In the Guediawaye district stockout rates persisted at an average of 23%. The immediate success of the pilot study led to the expansion of the IPM delivery system to include all 140 public health facilities in the entire Dakar region, and within another six months the stockout rates dropped to less than 2% throughout the city (8).

In addition, the elimination of stockouts led to an increase in contraceptive use. After one year of the IPM's service delivery improvements, the mCPR in Pikine rose by 11% (Figure 3) (8). The types of contraceptive methods used also changed. Women started taking advantage of the newly available choices, such as the long-acting contraceptive implants, whose consumption increased by 2,081% in just one year (8).

Downstream outcomes:

Apart from the immediate results of the IPM, the sustained outcome of this intervention would be a reduction in fertility rates and maternal mortality rates. However, it is currently not possible to conclusively evaluate the long-term effect of the IPM pilot study as these data are only collected at a national level, and the IPM is still undergoing scale up to include the entire

FIGURE 3. Average Monthly Consumption of Contraceptives in Pikine District, Dakar, Senegal, Before and 1 Year After IPM Implementation
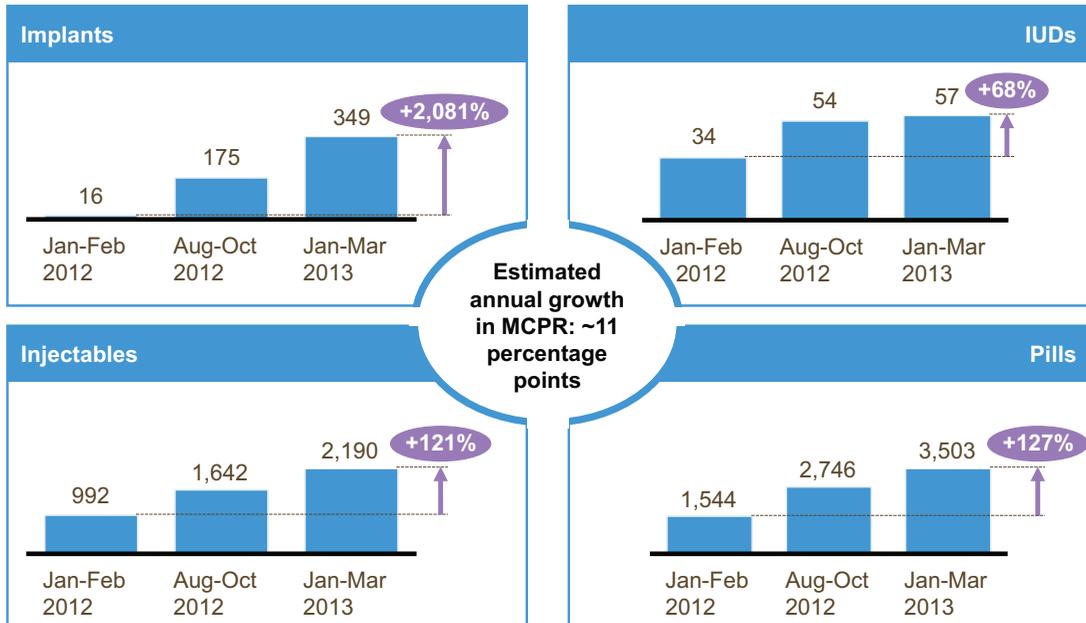
country. Furthermore, such data is only available up to the year 2013, and according to the World Health Organization, the fertility rate in Senegal dropped only slightly from 4.98 to 4.93 births per woman from 2012 to 2013. Therefore, a decline in fertility rates when the IPM is functioning at a national level is necessary in order to deem the IPM project a success. Furthermore, Senegal will hopefully experience a decrease in maternal mortality rate as the IPM continues to operate throughout the country. In 2013, the maternal mortality rate was about 350 deaths per 100,000 live births, and 16.4% of deaths among women of reproductive age were due to maternal causes (13). In the future this number must decline in order to deem Senegal's IPM a success for maternal and child health.

Funding and Cost Analysis
Funding for the IPM relies on private donors. In 2012

the Bill and Melinda Gates Foundation partnered with the international NGO Intrahealth as well as Senegal's Ministry of Health to implement the pilot study. About 160,000 USD was spent on the progressive expansion of the IPM in 2012 (4). After the success of the pilot, the Bill & Melinda Gates Foundation and Merck & Co. Inc., through its Merck for Mothers initiative, announced a $9 million partnership to provide financial and technical support for the national expansion of the IPM (12). Senegal's Ministry of Health, Senegal's National Pharmacy (the PNA), and the private software company Dimagi, are working in partnership with Intrahealth as the lead implementing partner (9).

The total annual operating cost for family planning when the project reaches a national scale in Senegal is estimated to be 500,000 USD, which is equivalent to about 11% of the national annual spending on con-

traceptives (8). The IPM functions under a cost recovery model, in which revenue is not recognized until the seller's costs have been recovered in sale transactions. Preliminary analysis has therefore suggested that the total costs recovered at a national scale will be 1,050,000 USD annually (8). This represents a level of sales that would support a national mCPR of 25% to 30%. It is also expected that 50% of the cost recovery (525,000 USD) will go to IPM logistics costs, such as hiring of trained logisticians (10).

In Senegal, private-sector pharmacies and health clinics may charge 3 to 9 times the price for a health product compared to a public facility (8). Before the IPM was implemented, the price of one month's supply of oral contraceptive pills from a private pharmacy in Senegal was about $3.10 (USD). Due to the decrease in stockouts at local public clinics, oral contraceptives have been made available to women at a price of about 20 cents US per month (11). To date, about 2.3 million USD has been spent on the expansion of the IPM from 2012-2015 (4).

Project Challenges:
Further cost-effectiveness analysis is critical for a complete evaluation of the IPM. For example, the cost of PNA management and the cost of integrating other products into the IPM supply chain are unknown. To ensure project sustainability and self-sufficiency without relying on outside sources of funding, the IPM must transition to being fully managed by the PNA and its 11 regional PRAs. Currently, the PNA is reluctant to ensure their sustained involvement in the project. The target of having the PNA managing the IPM in 6 regions of the country by July 2015 was not reached. Intrahealth is therefore working with consultants from McKinsey to present a sound transition plan of the IPM that will include the proposed operational system and a financial balance showing how PNA can break even or possibly even make profit (M. Dicko, personal communication, October 23, 2015). There is also

the intention to request a consultant to undertake a high-level advocacy plan with the Ministry of Health, private partners supporting health in Senegal, and the PNA. As such, the IPM design will remain flexible to respond to the most cost-effective and politically viable option. At this point it is not clear what the PNA's role will be in continuing the IPM and therefore Intrahealth is currently in discussions with the PNA and with the Ministry of Health on this issue (15).

Furthermore, to ensure the project is sustainable at the final national scale up stage, there must be integration of the IPM system with other health products so that delivery costs remain feasible. The IPM is currently distributing 11 family planning products, however this must be increased to 118 health products in total (M. Dicko, personal communication, October 23, 2015). Therefore, in-depth product segmentation analysis is needed to guide the inclusion of additional health products, and a comparative analysis of the cost per unit of product delivered through alternative distribution models is also necessary.

Reflection
Although the IPM is viewed as a success story for Senegal's family planning initiative, the scale up of the project to a national level is encountering several challenges. The bigger the operation and the more extensive the geographical reach, the more supplies and manpower necessary to sustain the project. As the model expands into regions that are less populated and potentially have more difficult road conditions, modifications are necessary to ensure optimal delivery systems. The government of Senegal is therefore working on establishing standard operating procedures, issuing and managing contracts with private logisticians, and supporting data use and performance management to advance the IPM nationally (8). It is also necessary to train providers in contraceptive technology and to intensify demand-creation and advocacy activities focused around family planning.

This supply chain intervention case study highlights the complexity of system implementation, evaluation, and scale up of programs targeted towards urban districts to more remote areas with limited resources. Improved maternal health is a global initiative, and the IPM reflects an important first step in achieving this goal for a country with traditionally limited access to reproductive health services. Given that the project is still in progress, substantial conclusions cannot yet be drawn. However, the program was largely successful in eliminating contraceptive stockouts in the country's most populated region, a key issue to be addressed. Future consideration of geographical delivery barriers, information sharing, and health promotion programs would be highly beneficial in ensuring the continued success and uptake of the program. Hopefully, the IPM can serve as a model for other countries with high maternal mortality rates and low contraceptive availability to continue making progress in achieving health equity throughout the world.

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