



9 Supply chain management

The introduction of subcutaneous DMPA (DMPA-SC, brand name Sayana® Press) promises to expand women’s access to family planning options by increasing opportunities for lower-level health workers and even clients themselves to administer injectable contraceptives. Insights from the first introductions can help inform new country experiences and transitions, whether small pilots or scaled delivery. This section discusses results and lessons learned during introduction pilots in four countries and provides recommendations to guide future efforts by ministries of health and implementing partners related to **supply chain management**.

MOVING THE NEEDLES

Supply chain management refers to the process of managing the movement of commodities from a central storage facility all the way through the health system to end users. This includes inventory and logistics management, warehousing, and transportation. The purpose of supply chain management is to make products widely available to consumers—in the case of DMPA-SC, getting the unit in the hands of the person who will ultimately administer the injectable (e.g., a health worker or a family planning client herself, in the case of self-injection).

Family planning practitioners and public health experts leading product introduction efforts

may not always be familiar or comfortable with the logistics systems associated with supply chain management—but it is a critical function that ensures women’s and adolescent girls’ ongoing access to new contraceptive products. There are distribution and logistics experts in every country who can and should be engaged in DMPA-SC introduction.

For example, it can be helpful to budget for health worker training on DMPA-SC distribution and supply management, or conduct a dedicated training on this topic for the relevant point people (e.g., logisticians)—not just at the central level, but in district or regional warehouses and/or at the facilities that serve as key delivery and distribution points.

During the pilot phase, implementers in Niger and Burkina Faso organized discrete one-day trainings for individuals responsible for logistics and contraceptive stock management. Without this orientation, logisticians and pharmaceutical store managers would not have been familiar with the DMPA-SC package and required storage conditions, supply chain reporting and resupply tools, and geographic destination in the pilot regions.



INTRODUCTION TIP

Consider training needs for supply management among health workers and logisticians as part of introduction planning.

During the initial assessment phase, PATH carefully studied the existing distribution system and identified any additional measures needed to ensure the maximum potential for sustainability and supply security. Developing a map of each country’s supply chain was a valuable element of this assessment; the map helped to reveal which agency or individual is responsible for movement of the product at different points, and when and where data are collected and transferred.

EFFECTS OF SUPPLY MANAGEMENT APPROACHES ON PROGRAM COSTS AND RESULTS

Where and how facilities obtain resupplies of products depends upon the system design. Ideally, resupply quantities should be based on recent historical consumption and use the defined inventory control levels to determine the quantity to order. In some systems, that means healthcare workers at the facility report on stock used over the reporting period (consumption) and stock on hand (inventory) and use a standardized formula to calculate their needs as an “order” to submit to the higher level at regular intervals. In other systems, healthcare workers report those data points for the reporting period and their resupply quantities are calculated for them at the higher level. Standardized resupply procedures need to be in place for all levels of the supply chain to ensure the timely availability of products.

The system design will dictate how facilities receive their resupply of products. In some systems, higher levels use the data mentioned previously to determine order quantities and distribute to the facilities. In other systems, products are distributed to a regional or district level and facilities must go and pick up products themselves. This can lead to less routine

Public-sector distribution chain for DMPA-SC in Senegal



“Introduction of a new contraceptive method such as DMPA-SC can present a needed opportunity to invest in training or retraining staff who are handling stock inventory at all levels. Particularly in a pilot introduction scenario or when conducting operational research, it is important to invest in strengthening the supply chain so that stockouts don’t negatively bias program results.”

– Sara Tift, Director for DMPA-SC activities at PATH

CASE STUDY

PATH/Siri Wood



Burkina Faso relies on national distribution system from the outset

Burkina Faso began integrating the DMPA-SC product, Sayana Press, into the national contraceptive distribution system from the start of the pilot. In the first quarter, the DMPA-SC coordinator attended a workshop with the Ministry of Health (MOH) and USAID | DELIVER PROJECT on contraceptive supplies logistics and information systems. This allowed stakeholders to validate the integration of DMPA-SC into the existing tools for contraceptive supply chain data collection and supervision. And in addition to training providers in DMPA-SC administration, the United Nations Population Fund (UNFPA) supported the MOH to integrate DMPA-SC into a broader workshop on management of essential reproductive health commodities using CHANNEL web-based software. This training benefited individuals working in the supply chain in the national and regional medicines storehouses (Centrale d'Achat des Médicaments Essentiels Génériques et des Consommables médicaux [CAMEG]).

In the first nine months of Burkina Faso's pilot introduction, the supply of DMPA-SC to the pilot areas was consistent. This was followed by a period of decreased consumption due to stockouts when supplies were not delivered from the central to the regional level and on to district facilities in a timely manner. Over the course of the pilot period, stockouts occurred in up to 67 percent of facilities, compromising the product's potential to increase access. For example, because of DMPA-SC stockouts, providers prioritized remaining stocks for continuing injectable users—therefore decreasing the number of doses available for new users.

Another factor contributing to supply challenges in Burkina Faso was the fact that the initial product stock that was imported in late 2013 had been manufactured in 2012, with a three-year shelf life. Since training was not complete until July 2014, there was only a year left before product expiry. Stockouts in Burkina Faso were also exacerbated by general weaknesses in the national stock surveillance system for reproductive health commodities, which contributed to stockouts of a number of products. Stockouts impact client and provider confidence in the continued availability of contraceptive products, which is often reflected in a slow return to prior levels of product use or proportions of new user recruits following a period of stockouts.

When national stakeholders convened in November 2015 and decided to offer DMPA-SC nationally, they identified a number of prerequisites for effective scale-up: notably, that the MOH should continue to include DMPA-SC in the country's existing essential medicines procurement and distribution cycles, conduct weekly surveillance of reproductive health commodities, and actively monitor the pharmacovigilance tracking system. To ensure supply chain security, stakeholders also insisted on close involvement of CAMEG agents, particularly at regional data validation meetings. Attendance at these meetings enabled supply chain and logistics managers at the central levels to remain apprised of consumption trends at the district and regional levels.

CASE STUDY

PATH/Breanne Crady



Alternative distribution system in Uganda

In Uganda, the MOH advised early on that DMPA-SC would need to be distributed through the Uganda Health Marketing Group (UHMG)'s alternative, private distribution system. This was in part due to the narrow geography of the pilot (28 of 112 districts) and the fact that the product was not on the national Essential Medicines List.

PATH funded distribution in 10 of the 28 pilot districts through a subagreement with UHMG, which incurred additional project costs as compared to integrating the product directly into the national distribution system. UHMG distributed DMPA-SC from its national warehouse all the way to facilities; the facilities then managed the final distribution step to the community health workers (CHWs)/Village Health Teams (VHTs). Other partners such as FHI 360 and WellShare International were included on a list of partners permitted to pick up product from UHMG, and they managed their own distribution in the other 18 districts with their donor funding. The primary advantage of UHMG's private distribution was that it minimized stockouts. Monitoring data from Uganda reflect steady increases in consumption. The key drawback was the cost.

In 2016, when the Ugandan government approved additional provider trainings in a move toward scale, resources were insufficient to continue the alternative distribution at the facility level. However, Uganda was not yet ready to include the product in the national system given that the geographic scope was still limited. As an intermediate step, PATH funded distribution to the district level and worked with district leadership to include DMPA-SC in established district distribution systems. PATH also worked with the distributor to train logistics leads in each district on supply management and distribution for the new product. A clear end date of March 2017 was established for this parallel system. To prepare for the transition, PATH, UNFPA, and the MOH worked together to get the product on the Essential Medicines List and integrated into the National Medical Stores.

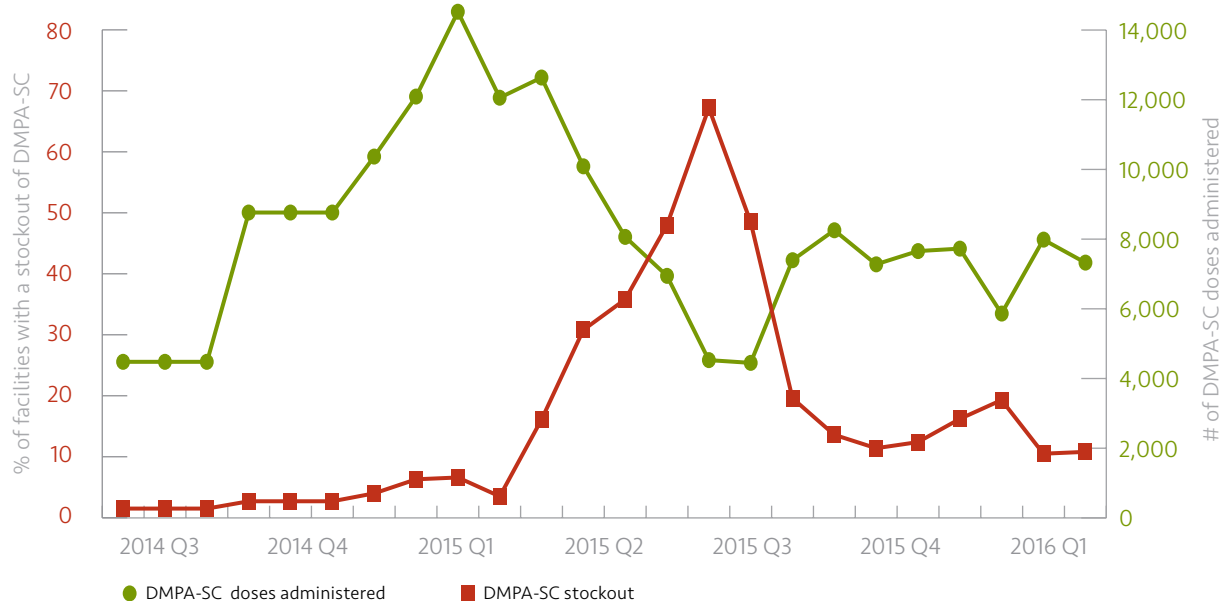
resupply if there are not adequate resources available for transportation between facility and resupply point. In most systems with CBDs, the CHWs pick up products from their facilities, and data from their use needs to be reported as well.

As a program gets started, data on consumption may be limited or non-existent so initial stocks supplied to facilities should be estimated and use monitored closely until the resupply system is fully in place. That may mean providing

an initial round of "seed stock" to facilities, monitoring use, and redistributing between facilities if needed.

Regardless of the system, it is critical that data on product use and stock levels routinely flows up from the points of use to central level decision makers so that they have historical data on which to base forecasts and plan orders and ensure products are routinely resupplied to where they are needed. Therefore an important point of product introduction is ensuring that

Proportion of facilities with DMPA-SC stockout and number of doses administered, by month—Burkina Faso (2014–2016)



Note: Q, quarter.

Using data on average monthly consumption.

Beyond PATH's project monitoring, some global donors and family planning supply experts also track demand by monitoring "average monthly consumption" (AMC) through national, ministry-led information systems. AMC is the average number of units consumed in a month, and it is calculated using three to six months of historical data. The number of historical data points used to determine the AMC can vary depending on product history, seasonality, stockouts, or other factors. AMC is used both at the national level to determine national stock status and adjust procurement plans and at the individual warehouse and facility level to determine when and how much to reorder.

Ideally, AMC is calculated based on actual consumption reported by facilities, but in cases where data from facilities is not available as frequently as needed, it may be based on the average quantities issued from distribution points (central to regional, or regional to district, or district to facility). When calculating the AMC using quantities issued from distribution points, the data should come from the lowest level with reliable data possible, in order to provide as close a proxy as possible for actual quantities dispensed to users.

To help monitor stock levels, AMC is compared with stock on hand to calculate the number of months of stock of each product (MOS) (or how long the stock on hand will last at the average monthly consumption). MOS, combined with information on desired inventory levels, can be used to determine quantities to order to ensure continuous supply of products at warehouses and facilities. Monitoring MOS against the inventory control policy helps identify problems with stock levels and address them to avert shortages and overstocks.



Informed Push Model in Senegal reduces stockouts.

IntraHealth International, in collaboration with Senegal’s MOH, has led introduction of the IPM to reduce contraceptive stockouts. IPM reinvests proceeds from clients’ contraceptive purchases back into the public contraceptive supply system to ensure the constant flow and availability of products. The model makes a wide range of family planning commodities available, allowing women to more freely choose the methods they want at affordable prices.

Through this model, trained logisticians deliver supplies to points of sale on a regular schedule, restocking where necessary and recording quantities of products sold. With a professional logistician managing stock and deliveries, the health facilities no longer need to place and pick up orders.

When IPM was introduced into health centers, stockouts of contraceptive pills, injectable contraceptives, implants, and intrauterine devices were completely eliminated at the 14 public health facilities in Pikine during the six-month pilot phase. The government subsequently expanded IPM to all 140 public facilities in the Dakar region; six months later, stockout rates throughout the region dropped to less than 2 percent. Partners are currently expanding IPM nationally to improve the family planning supply chain in Senegal’s public sector.

A donor-subsidized model such as IPM is effective at reducing stockouts, but is challenging to sustain and scale up to the national level. To ensure financial sustainability of the IPM, Senegal’s government is evaluating different scenarios, and IPM design will remain flexible to respond to the most cost-effective and politically viable option. A number of strategies to maintain funding for the IPM at national scale are under consideration: for example, using revenue from contraceptive and other product sales, including a government budget line item for product distribution, and collaborating with other donors and multilateral programs to support product distribution.

DMPA-SC is added to existing distribution systems and logistics management information system (LMIS) reporting forms.

During the pilot introductions, DMPA-SC was distributed through the most appropriate mechanisms in each country. During the pilots, distribution involved three distinct approaches:

- Integration of DMPA-SC into the existing public-sector national distribution system from the outset (Burkina Faso, see box on page 82).
- Integration of DMPA-SC into a donor-funded initiative to improve distribution of contraceptive supplies and reduce stockouts, called the Informed Push Model (IPM; Senegal) (see box page 85).

- Establishment of a parallel distribution system with donor funding, using a private distributor approved by the MOH as an alternative to the public-sector system (Uganda). In this case, the National Medical Stores in Uganda could not distribute the product to a subset of select districts or before the product was on the national Essential Medicines List (see box on page 83).

Every country setting has unique characteristics that affect product distribution and supply of any new contraceptive. By integrating DMPA-SC into an existing national level supply chain, there is limited additional investment needed by implementing partners and donors; however if it is added to a parallel system or to an existing initiative, there may be a need for the partners, donors, or MOH to make investments to ensure that the product can be absorbed into this system and distributed.

Burkina Faso and Niger rely on existing national distribution systems; they experienced stockouts beginning in the second quarter of 2015. In these countries, stockouts resulted from the lack of timely and accurate requests coming to the central level from peripheral districts, which led to a sharp decline in use of DMPA-SC (see graph above). Meanwhile, Uganda and Senegal have privately funded parallel distribution systems and experienced very limited stockouts. While a reinforced system such as the IPM in Senegal nearly eliminates stockouts (less than 2 percent during the pilot), the model may not be sustainable if it relies on outside donor funding (see text box on page 85). The pilot experiences demonstrate the importance of overall supply chain integration and strengthening as a key component of new product introduction.

TRACKING SUPPLIES TO IDENTIFY AND ADDRESS PROBLEMS

At the outset of the pilot introductions, the number of doses distributed and the number and percentage of facilities with stockouts were identified as priority indicators by the global

donor consortium and national family planning leaders. PATH tracked and reported on these indicators throughout the pilot introduction (see Section 10: Monitoring and evaluation).

Supply chain data visibility is critical for managing stocks and ensuring timely decisions can be made to support continuous availability of products at service-delivery points. Governments and partners that are managing distribution are also likely to track central inventory stock reports that cover opening balance, closing balance, batch number, date of manufacture, and date of expiry per quarter, as well as supply/resupply distribution reports that cover geographies/ facilities resupplied and the number of units (if any) returned due to impending expiry. For example, UHMG reported these details to PATH on a quarterly basis as part of its DMPA-SC inventory management activities during the pilot introduction.

SUPPLIES: IT IS NOT JUST ABOUT DMPA-SC

During the pilot introductions, PATH found that it was important to consider and plan for a number of supplies in addition to DMPA-SC. These included sharps disposal boxes, units for practice injections during trainings, condoms for dual protection, and pregnancy tests for use when initiating women on the injectable. Program planners needed to ensure timely and effective procurement of these supplies for introduction to proceed smoothly; this becomes even more crucial when transitioning to scale. When self-injection of DMPA-SC is offered, there will also be implications for supply chain design—such as determining how many units each client will be given to take home, ensuring that clients are given units that still have sufficient shelf life, and providing guidelines to clients regarding storage and disposal at home, all of which affect supply chain design and data collection. PATH began exploring these operational considerations as self-injection was offered outside of research for the first time in Uganda in late 2016.

RECOMMENDATIONS: PRODUCT DISTRIBUTION

PATH/Siri Wood



- **Invest in distribution systems to ensure DMPA-SC will be consistently available.** Introduction of a novel technology shines a light on the strengths and weaknesses of existing distribution systems. An innovation's potential to increase access is only as good as the distribution system required to deliver it. Broader investments may be required for successful introduction—especially at the most peripheral levels (e.g., community health workers).
- **Map the supply chain.** Map the supply chain from the central warehouse all the way to the end user to identify potential obstacles. This exercise will identify the agencies and individuals who are responsible for various tasks in the supply chain.
- **Consider how DMPA-SC can most efficiently be integrated into the existing supply chain for family planning commodities.** To the extent integration in the national system is possible, this approach will minimize additional investments and position the product to move to scale. As needed, consider targeted investments to strengthen reporting, logistics management and minimize stockouts.
- **Review key logistics data points such as AMC and MOS to ensure sufficient supply of the product at each supply chain level.** AMC and stock status will inform resupply orders at the facility level and procurement plans at the national level. When consumption of a new product is increasing from month to month, an average of the last three to six months may underestimate what consumption is likely to be in the coming months, and procurement calculations should be adjusted based on growth rates.
- **Account for shelf life of available DMPA-SC units and product expiry.** Sayana Press has a three-year shelf life, for example. Ensure that there is a plan for tracking product expiry and recapturing units in advance of their expiry. Sufficient stock should be distributed to the field in advance of product expiry.

RESOURCES



The Supply Chain Manager's Handbook. Available at <http://supplychainhandbook.jsi.com/>. This resource offers practical guidance for program managers who design, manage, and assess supply chain management systems for health commodities and programs. In addition, policymakers and stakeholders working in supply and logistics will find it helpful as a system overview and overall approach. It includes detailed information about the design and implementation of supply chain management information systems and inventory control systems.



Essential Medicines and Health Products Information Portal. Available at apps.who.int/medicinedocs/en/ This portal supports efforts to improve access to essential medicines and health products by making publications available online. It includes 5,604 medicine- and health product-related publications from the World Health Organization, other United Nations partners, global nongovernmental organizations, development agencies and their partners, countries, and academics. The portal is updated monthly.



The Reproductive Health Supplies Coalition publications web page. Available at www.rhsupplies.org/activities-resources/publications/. The website is a repository for many resources including the Reducing Stockouts Impact Calculator, Strategic Pathway to Reproductive Health Commodity Security, Optimizing Supply Chains for Improved Performance, Contraceptive Stockouts: A Review of the Published and Grey Literature, and Building a Strong Supply Chain Workforce: The Role of Pre-Service Training.