

Providing Reliable Last Mile Access to Contraceptives and Other Essential Medicines: The Informed Push Model with Third Party Logistics Providers in Senegal

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EXECUTIVE SUMMARY



contraceptive availability nationwide



health facilities reached by third party logistics providers



women with more reliable access to contraception



essential medicines now included in IPM-3PL

The use of contraception is recognized as one of the most cost-effective ways to lower maternal mortality rates – potentially averting one-third of maternal deaths by reducing the overall number of pregnancies and helping women plan and space their pregnancies.¹ The modern contraceptive prevalence rate (mCPR) among women of reproductive age in Senegal, though increasing, is among the lowest in the world due in part to product stock-outs at public health facilities.^{2,3}

To solve the stock-out problem, and to increase access to these potentially lifesaving products, the government of Senegal, led by the Ministry of Health and Social Action (MoHSA) and National Supply Pharmacy (PNA), in partnership with IntraHealth International (IntraHealth) and with support from *Merck for Mothers** and the Bill & Melinda Gates Foundation, designed, piloted and scaled up the Informed Push Model with third party logistics providers (IPM-3PL).

IPM-3PL is a last mile direct delivery model that has strengthened commodity, data, and financial flows across the public health supply chain.



Through this model, 3PLs deliver commodities directly to health facilities, making real-time stocking decisions based on inventory and consumption data. 3PL logisticians perform forecasting, logistics, and data management on behalf of facility staff.



3PLs enter data into a tablet-based electronic logistics management information system (eLMIS), which feeds data in real time to authorities at the district, regional and national levels, and facilitates health program monitoring.



Health facilities pay for commodities after they are purchased by customers, ensuring availability of a broad range of commodities, and adequate cash collection to cover the supplied commodities.

Beginning in 2015, the model was scaled nationally and has reduced contraceptive stock-outs to an average of 2% of all health facilities nationwide⁴, improving access to contraceptives for an estimated 3.2 million women. Moreover, consumption data from more than 1,400 health facilities are now electronically captured and available for procurement and programmatic decision-making.

Given these results, the MoHSA and PNA have expanded IPM-3PL to include other essential commodities beyond contraception, as a part of a broader supply chain transformation called “Yeski Naa” (“I have arrived”). By late 2017, management of the model has been transitioned to the government of Senegal.

Lessons learned in Senegal are applicable to other low-resource settings. IPM-3PL is a model for integrating private sector logistics providers into public health supply chains, streamlining supply chains across multiple commodities, providing real-time data for decision-making, and creating mechanisms to finance and sustain supply chain reforms over time.

*This program is supported by funding from Merck, through Merck for Mothers, the company's 10-year \$500 million initiative to help create a world where no woman dies giving life. Merck for Mothers is an initiative of Merck & Co., Inc., Kenilworth, N.J., U.S.A.

THE STORY OF IPM-3PL

UNDERSTANDING CONTRACEPTIVE USE IN SENEGAL

In 2011, nearly 30% of married women in Senegal who did not want to become pregnant were not using modern contraception, also known as unmet need. Overall, Senegal had one of the lowest modern contraceptive prevalence rates (mCPR) worldwide at just 12% among married women.⁵

DEVELOPING A SOLUTION

In 2012, the Ministry of Health and Social Action (MoHSA) launched a comprehensive strategy under its commitment to FP2020 to increase access to family planning – recognizing contraception as one of the most efficient methods to save women’s and children’s lives and promote economic growth.⁶

As part of this strategy, the country set out to increase mCPR from 12% to 27%, which equates to an additional 350,000 contraceptive users, and reduce unmet need from 30% to 15% by 2015. In addition, Senegal committed to increasing its yearly budget allocation to reproductive health from 2.5% to 5%, including budget increases of 200% for contraceptive commodities and 100% for management of family planning programs.⁷

The strategy recognized that improvements in the public health supply chain were central to achieving these ambitious goals. In public facilities, where 85% of women access family planning services,⁸ a full range of contraceptive methods was often not available.

BASELINE SUPPLY CHAIN PERFORMANCE

Baseline assessments of public health facilities revealed challenges to maintaining stock availability in Senegal, including bottlenecks related to commodity, data, and financial flows. A survey conducted by Senegal’s Urban Reproductive Health Initiative in 2011 found high contraceptive stock-outs in urban public health facilities*, including combined pills (over 70% of facilities experienced stock-outs), injectables (almost 70%), emergency contraception (63%), and progestogen-only pills (57%).⁹

A second study by McKinsey & Co. in the Dakar region, funded by the Bill & Melinda Gates Foundation, found that in a sample of facilities, stock-outs of injectable contraceptives occurred 43% of the year, and implants, 83%¹⁰ of the year. However, stock-outs were highly variable from month to month with implant stock-outs ranging from 5-37% of facilities each month in the control districts. At least 60% of facility stock-outs occurred despite stock availability at the national level.



Figure 1. Access to contraceptive in Senegal

*Facilities having experienced at least one stock-out in the last 12 months.

HOW SUPPLY CHAINS OPERATED IN SENEGAL BEFORE IPM-3PL

Prior to IPM-3PL, the PNA delivered commodities from the national warehouses to regional warehouses. Districts were responsible for picking up commodities from their regional warehouse. Health facility staff were responsible for picking up commodities from their district warehouse.

CONTRACEPTIVE SUPPLY CHAIN BEFORE IPM-3PL

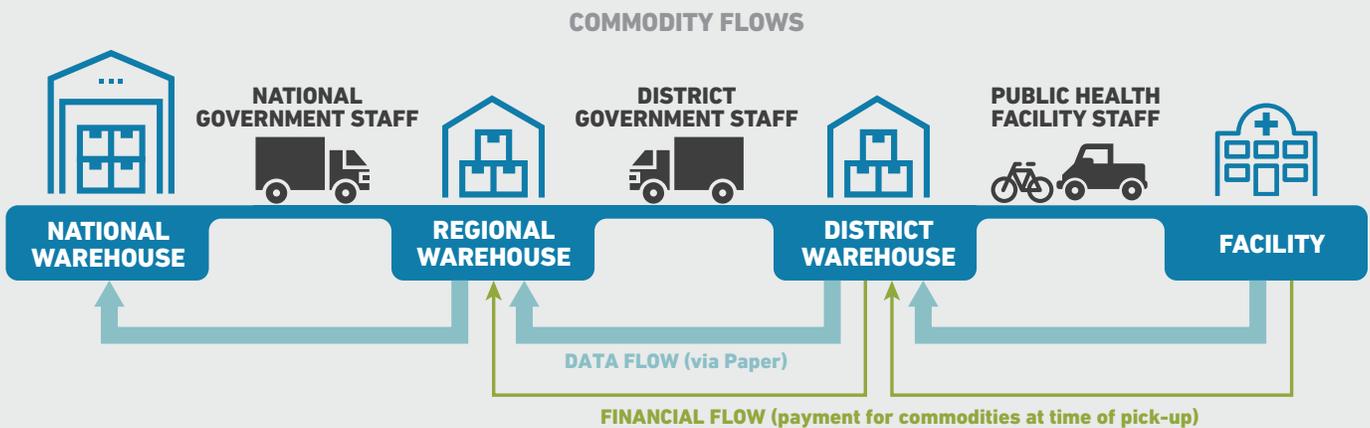


Figure 2. Overview of the former contraception and essential medicines supply chain in Senegal

BEFORE IPM-3PL, BOTTLENECKS IN THE CONTRACEPTIVE SUPPLY CHAIN OCCURRED IN THREE WAYS:

-  **COMMODITY FLOW:** Health facilities and districts were responsible for ordering and picking up commodities from district and regional warehouses, respectively, but lacked resources to do so in a timely or efficient manner.
-  **DATA FLOW:** Health facility-level consumption data could not be accurately collected because of structural inefficiencies (e.g., data were paper-based, difficult to transfer and share, and subject to high human error). Thus, accurate forecasting and restocking was unfeasible, and decision-making lacked rigor.
-  **FINANCIAL FLOW:** Health facilities were required to pay for commodities prior to consumption; limited cash restricted procurement or led to prioritization of higher revenue-generating commodities. (In Senegal, over 60% of products incur an out-of-pocket purchase fee in public health facilities.)

OTHER CONTRIBUTING FACTORS INCLUDED:

-  **Complexity:** The existing system was a highly complex “pull-based” model with multiple parallel supply chains implemented by the government and various NGOs for essential commodities, all of which had their own processes.
-  **Lack of trained logisticians and overburdened health workers:** The system relied on facility health care workers to accurately forecast, manage, track and order supplies, but they often lacked training, ownership, and time to oversee the logistics.

IPM-3PL PILOT

In order to reduce stock-outs, in 2011, MoHSA, PNA, IntraHealth, and the Bill & Melinda Gates Foundation partnered to develop and pilot an innovative supply chain model – the Informed Push Model with third-party logistics providers (IPM-3PL) – in one district. The model, which incorporates private-sector logistics providers (3PLs) into the public health supply chain, lowered contraceptive stock-outs to less than 2% across 140 facilities in six months across the Dakar region, thus helping to build the case for nationwide scale up.

The pilot model directly addressed existing bottlenecks in the contraceptive supply chain, as follows:



COMMODITY FLOW: Private logisticians routinely visited health facilities to assess consumption of products, forecast needs and stock commodities, freeing health workers to focus on delivery of care.



DATA FLOW: During the pilot, commodity consumption data were collected on-site using Excel forms, and then data were compiled and shared with government authorities. This system was later adapted to use an electronic logistics management information system (eLMIS) to transmit data in real-time through an internet-enabled computer tablet to the IPM-3PL Monitoring and Evaluation Unit, regional logisticians, and Ministry of Health employees. Real-time data transmission facilitated accurate forecasting and the ability to quickly pinpoint and address challenges with stock availability.



FINANCIAL FLOW: Health facilities paid for commodities after patients purchased them, not at the time of delivery. This ensured stock availability even when health facility funds were limited, and promoted stocking of a broad range of products, and not just those that produce the highest revenue.

A detailed description of the current IPM-3PL follows in Appendix 1 on page 19.

NATIONAL SCALE UP

In 2013, *Merck for Mothers* joined the Bill & Melinda Gates Foundation, IntraHealth and the MoHSA and PNA to expand IPM-3PL to all public health facilities in an effort to provide reliable access to contraceptives nationwide. IntraHealth, working closely with PNA, scaled the IPM-3PL model to all 1,404 service delivery points (SDPs) over two years. As they had done during the pilot, the collaborating partners expanded and refined the electronic logistics management information system (eLMIS) to track stock levels and capture consumption patterns of contraceptives nationally.

By the end of the first year, consumption of contraceptives had increased by 48%. Today, as a direct result of the implementation and national scale up of IPM-3PL, an estimated 3.2 million women in Senegal have more consistent access to a full range of contraceptive methods, which helps them safely time and space their births and avoid unplanned pregnancies.*¹²

*The scaled up Informed Push Model with third-party logistics providers achieved the same results as the pilot, drastically **reducing contraceptive stock-outs to an average of 2% of facilities nationwide**, based on data collected through the electronic logistics management information system. The reporting rate for key logistics indicators through the eLMIS was 100% of all health facilities and districts, and stock availability results have been maintained over the course of more than three years.¹¹*

*Estimated based on service delivery point catchment areas.

SENEGAL'S CONTRACEPTIVE SUPPLY CHAIN

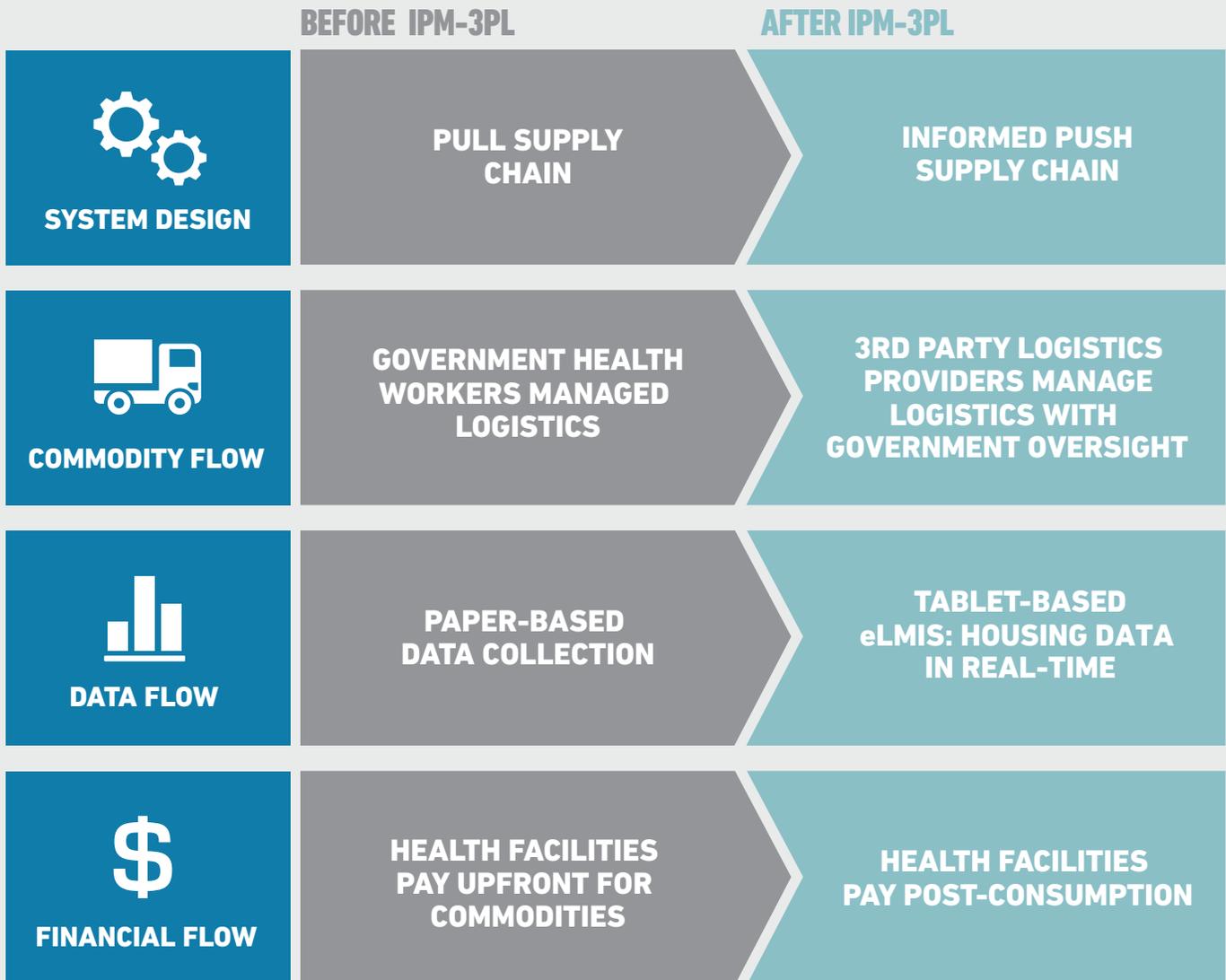


Figure 3. Senegal's supply chain before and after implementation of IPM-3PL

GOVERNMENT ADOPTION

MoHSA recognized that integrating additional products into the model – while simultaneously reducing the overall number of vertical supply chains – was essential for long-term sustainability of the health supply chain. Before adopting IPM-3PL and fully integrating it into Senegal's public health supply chain, MoHSA requested that PNA and IPM-3PL project test the feasibility and effectiveness of the model to distribute a wider package of essential health commodities, beyond contraceptives.¹³

To assist with this evaluation, PNA and IPM-3PL project compared three different versions of the model in different regions over a six-month period in 2015-2016 (see Figure 4).

The results demonstrated that scenario #2 (as shown in Figure 5), a last-mile supply chain operated by 3PLs, was more effective than scenarios #1 and #3 and required less capital investment in transportation from the government.

SUPPLY CHAIN SCENARIOS: COMPARING PUBLIC VS. PRIVATE COMMODITY DELIVERY

SCENARIO #1 (ST. LOUIS REGION)



SCENARIO #2 (FATICK REGION)



SCENARIO #3 (DAKAR, THIES & KAOLACK REGIONS)



Figure 4. Government-led scenarios testing direct delivery supply chain models in Senegal

COST CONSIDERATIONS

To better understand costs, *Merck for Mothers* worked with IntraHealth to compare the cost of operating and managing an IPM with 3PL last mile delivery for contraceptives vs. the cost of a fully public version of IPM. Use of 3PLs for last mile distribution and data collection reduced the costs for delivering contraceptives in Senegal by more than one third – approximately 36% – at national scale, compared to a fully public IPM.¹⁴

A subsequent analysis conducted by McKinsey & Co., with input from *Merck for Mothers*, found that costs were comparable for the fully public vs. public-private version of the model *when including additional essential medicines* — but that IPM-3PL was more effective in getting essential commodities reliably to service delivery points (SDPs) and in transferring consumption data upward using an eLMIS. Thus, in Senegal, performance was the significant differentiator, and costs were comparable.

Citing both performance and cost data, the MoHSA elected to integrate IPM-3PL into the national health supply chain for public health commodity distribution to SDPs.

EXPANDING THE MODEL

In August 2016, the MoHSA formally launched the transition of IPM-3PL into a broader, integrated supply chain system called *Yeksi Naa* ("I have arrived"). This system combines *Jegesi Naa* (PNA-led distribution to the district) with IPM-3PL (3PL-led distribution from district to SDPs and data collection). PNA will manage and finance the entire supply chain.

Yeksi Naa is now being scaled to deliver up to about 100 essential commodities, including contraceptives, to all of Senegal's public health facilities.

The transition of IPM-3PL management from IntraHealth to PNA has been completed as of Q4 2017. IntraHealth continues to work closely with the MoHSA and PNA to transfer key skills (contracting, oversight, etc.) to government personnel. PNA is actively taking over the contracting with private 3PLs and the management of the eLMIS. To that end, a new distribution service as well as a monitoring & evaluation unit have been established at the PNA.

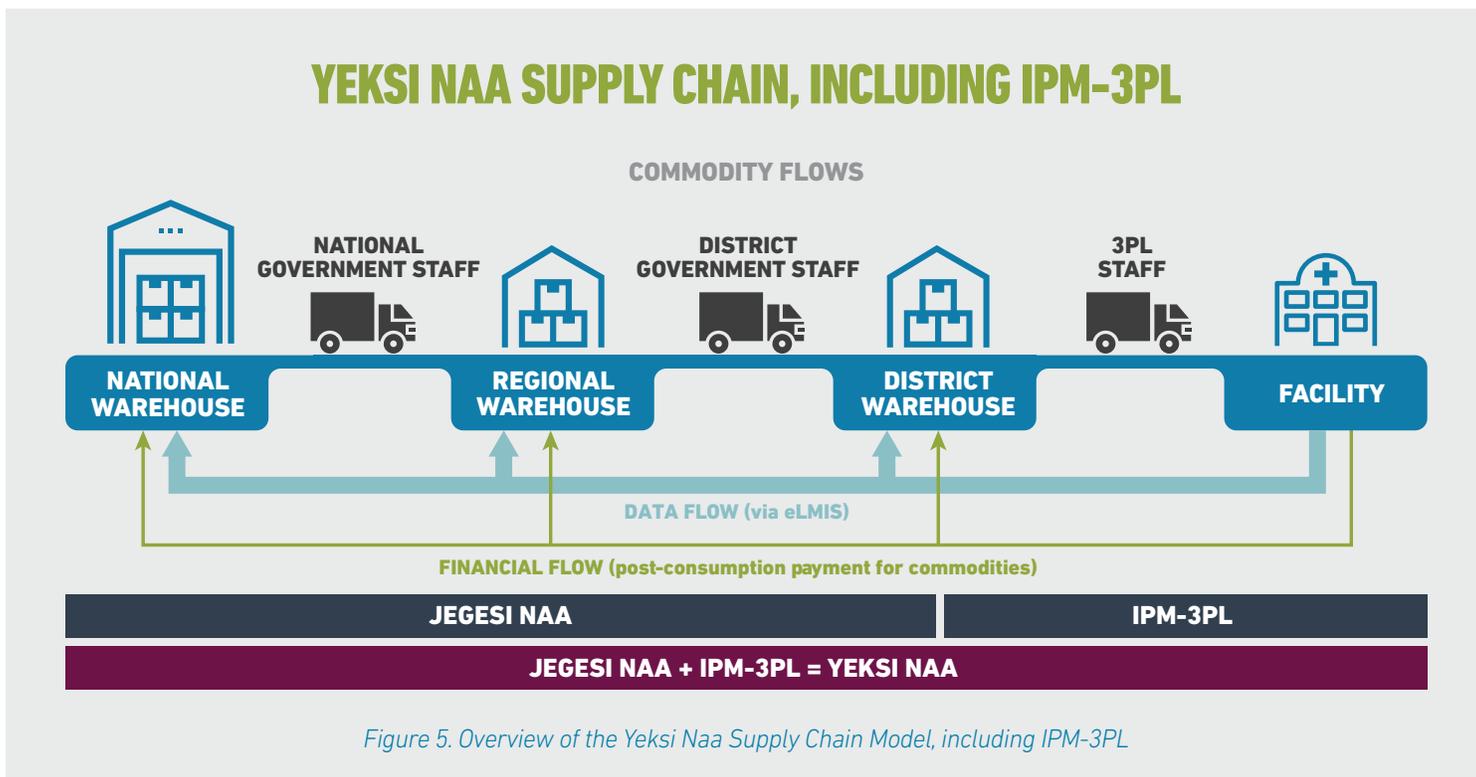


Figure 5. Overview of the Yeksi Naa Supply Chain Model, including IPM-3PL

Following successful pilots, Yeksi Naa will deliver 100 essential medicines to service delivery points by late 2017. These products include contraceptives, maternal and child health commodities, HIV, malaria and TB medicines.

EXPANDING IPM-3PL TO INCLUDE ESSENTIAL COMMODITIES: A PHASED APPROACH

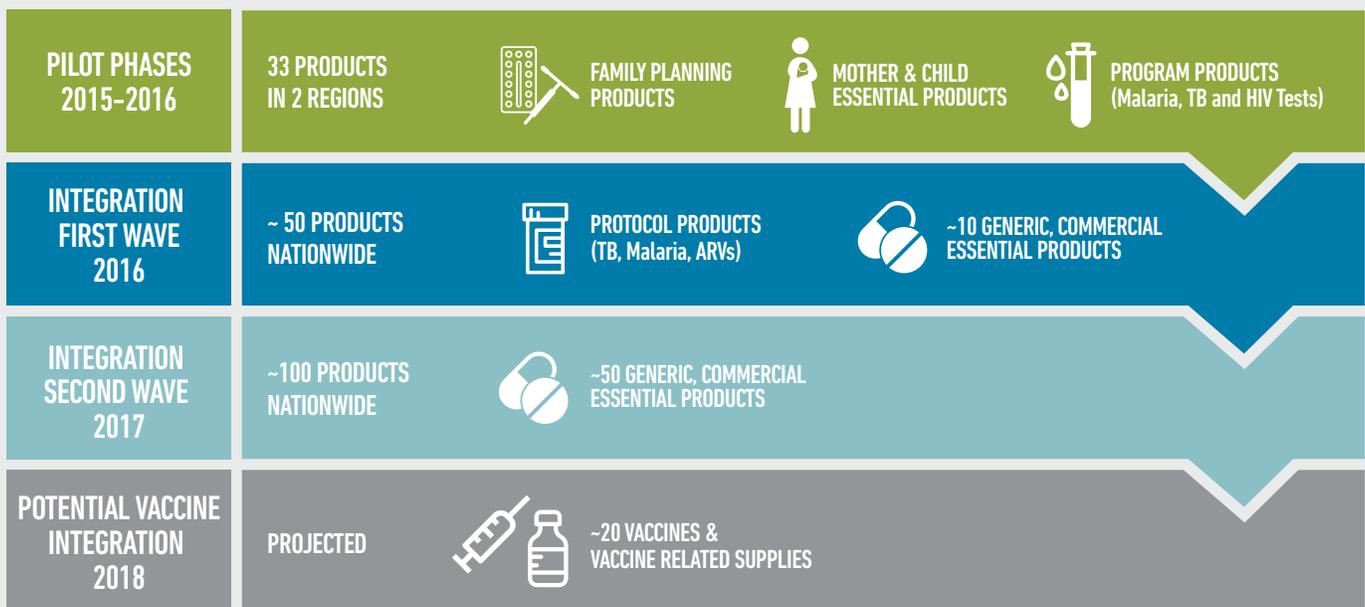


Figure 6. Integration of additional essential commodities into the Yeksi Naa supply chain

IMPLEMENTING IPM-3PL: A TIMELINE

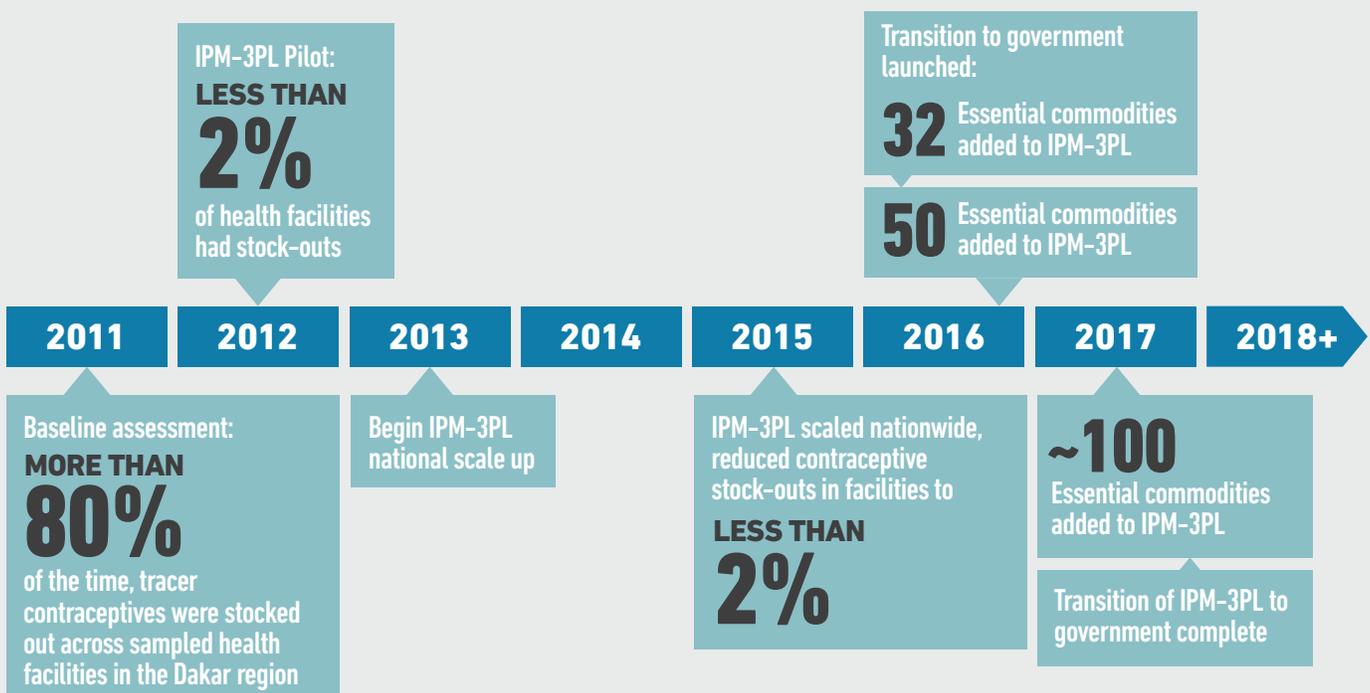


Figure 7. IPM-3PL pilot and expansion in Senegal

SUSTAINABILITY

A key component of IPM-3PL collaborators' efforts has been planning for its operational and financial sustainability. With technical assistance from *Merck for Mothers*, the Bill & Melinda Gates Foundation, and McKinsey & Co., Senegal's MoHSA, PNA and IntraHealth developed a robust transition roadmap that included pre-requisite activities for PNA to operate IPM-3PL. Financial sustainability was planned by identifying four potential financing mechanisms to ensure the model is viable for years to come. These include:

- **MARGIN REDISTRIBUTION:** In Senegal, service delivery points charge small user fees for contraceptives and certain commodities. Partners developed a strategy based on financial analyses of Fatick region data that proposes that health facilities and district depots remit 25% of their net proceeds from the sales of products included in IPM-3PL to PNA. Despite remitting 25% of proceeds to PNA, health facilities' and districts' proceeds are still expected to be higher than they were previously due to increased consumption driven by stock availability. In late 2017, this scheme was being rolled out across Senegal. In total, margin redistribution is expected to yield an estimated \$1.5m USD annually, covering an estimated 70% of *Yeksi Naa* end-to-end supply chain costs nationally.
- **FEE INCREASES:** Another strategy is to increase the fee PNA charges to public health programs (e.g., HIV, TB, malaria) to distribute their products to SDPs via the *Yeksi Naa* model instead of leaving them at the regional level for collection by districts. Public health programs have accepted a doubling of their contributions to PNA (from 5% to 10% of the value of their products). This should be enough to cover the remaining 30% of *Yeksi Naa* end-to-end supply chain costs.
- **SUPPLY CHAIN BUDGET LINE:** The MoHSA signaled that it may add a dedicated budget line for *Yeksi Naa*. However, funds from this line would be used only in the case where those raised from the aforementioned two mechanisms are insufficient to cover all supply chain costs.
- **OTHER SUPPORT:** Another option is to solicit financial and technical contributions from donors such as UNFPA, USAID and The Global Fund to Fight AIDS, Tuberculosis, and Malaria.

EXTERNAL EVALUATION

Alongside IPM-3PL model's implementation and transition, the London School of Hygiene and Tropical Medicine has been conducting a robust impact evaluation involving extensive qualitative and quantitative data collection since 2013. Key evaluation questions include:

- **How effective is IPM-3PL?**
- **How is IPM-3PL being implemented?**
- **How does the Senegalese context affect how IPM-3PL was implemented?**
- **How much does IPM-3PL cost, and how cost-effective is it?**

The evaluation studied the impact of IPM-3PL between 2013-2015. Results from their evaluation are expected in late 2017 and early 2018, and will complement results reported here.

In addition, a Senegalese private auditing company, Health Development Solutions, conducted an annual verification of IPM-3PL model's field results.

SUCCESS FACTORS

Executing IPM-3PL requires coordination and cooperation among a diverse range of stakeholders leading various processes and managing relationships between the public and private sectors. The following factors were critical to successfully executing supply chain reforms in Senegal.

WIDESPREAD ORGANIZATIONAL SUPPORT & COMMITMENT

As with other initiatives, if strong advocacy from leadership is lacking, most efforts to change fail during implementation. Employees often resist change to their work practices due to uncertainty of the impact on their job, the additional time and energy required to make changes, lack of definition of the new system, and lack of adequate skills for the new tasks. For IPM-3PL in Senegal, organizational leadership, support, and advocacy were essential for the necessary business process changes to occur successfully.

It was particularly important to have strong advocacy from high level government officials at an early stage of implementation. Senegal's Minister of Health, Prof. Coll-Seck, publicly advocated for supply chain reform and committed to making requisite policy changes. Later on, as the model transitioned to government management, Senegal's President Macky Sall highlighted his commitment to the *Yeksi Naa* partnership in his New Year 2017 Address to the Nation.

In addition, the MoHSA's Director of the Reproductive Health and Child Survival department and the Director of PNA have played, and continue to play, key roles in facilitating supply chain improvements in the country. Also, the Director General of Health led the preparation of the Emergency Plan and chaired the weekly meetings of the steering committee in charge of monitoring its implementation. Additionally, all 14 Regional Medical Officers provided office space for the project regional logisticians from whom they receive regular progress reports during their regional monthly coordination meetings. Senegal's commitment to supply chain reform is well aligned with their programmatic commitments and goals, including their pledge to Family Planning 2020.¹⁵

IntraHealth, as the implementing partner, played an important supportive role in leading the successful introduction of IPM-3PL. In addition to facilitating the execution of the model, IntraHealth provided extensive training and mentorship support to 3PLs to ensure operational efficiency. The architecture and cost of this supervision should not be overlooked as other countries consider adapting the IPM-3PL.





Photo Credit: IntraHealth International/Clément Tardif

LOGISTICS LED BY LOGISTICIANS

By design, IPM-3PL is centered around patients, and by extension, the health workers that serve them. The model delivers contraceptives and other essential medicines directly to local health facilities without orders from the facility, removing the burden of demand forecasting from health facility staff, which are often inadequately resourced and trained for the task. In addition, health facility staff no longer need to travel outside their communities to collect the commodities from a district warehouse. In the past, some health facilities had to close while staff traveled to the warehouse. Now, they can remain open, while products come to them and facilities can better anticipate increases in contraceptive demand as well as potential delivery constraints (e.g., rainy season road closures).

WILLINGNESS TO PARTNER WITH THE PRIVATE SECTOR

With IPM-3PL, the local private sector brings operational efficiency to the supply chain serving public health facilities while the public sector remains in charge of it. A competitive bidding process is used to select a 3PL provider, driving cost-effectiveness, and the 3PL provider works under a performance-based contract, with a strong oversight role for the contractor (i.e., PNA).

If certain conditions are not met – if, for example, stock-out rates exceed 2% of facilities, based on data from the eLMIS – PNA can replace the 3PL with another company. The contract can be rebid after expiration to drive further cost-savings. Thus, the 3PL has a strong incentive to maintain high service levels at a competitive cost and develop innovative solutions to increase efficiencies. Beyond supply chain strengthening, utilizing 3PLs drives local business development, which enhances the local economy and creates jobs.

PROVIDING PRODUCTS ON CONSIGNMENT

IPM-3PL reduces financial risk to, and burden on, health facilities by allowing them to pay for commodities only after they have collected payments from clients – essentially selling the products on consignment. This is a significant change from past practices, which required facilities to pay for commodities up front, at the time of pickup from district storehouses. Under the old system, the amount of available cash dictated purchase quantities; health facilities were forced to make more frequent trips to the storehouse, or allow stock to run out; and they prioritized products that sold quickly and had high returns. As a result, a full range of products was not always available in SDPs. IPM-3PL significantly alters the flow of money, so that commodity availability is no longer impeded by cash availability.

IMPROVED DATA VISIBILITY

Increasing data visibility in the supply chain was critical to the model's performance and expansion while providing a number of additional benefits to the MoHSA, PNA and partners. At the most basic level, data inform delivery quantities to SDPs. On a larger scale, data are used for demand planning, supply planning, distribution, and payments. IPM-3PL data can also be used to inform actions outside the supply chain: troubleshooting issues stemming from unusual commodity use patterns; developing proxy measures for contraceptive use by district, region, or nationally; or determining what types of methods are sold by location. A better understanding of commodity use trends can help pinpoint areas where further training, additional staff, and/or demand creation/social and behavior change communication is needed.

PRODUCT INTEGRATION & SUSTAINABILITY

Adding more products to IPM-3PL was needed to make IPM-3PL financially sustainable in Senegal. The model started with just 11 contraceptives. By incorporating more products into IPM-3PL, the cost per commodity decreases due to economies of scale (i.e. the same delivery team can handle more commodities in each delivery).

Although the time spent at the health facility will increase with the delivery of additional products, that increase will be disproportionate. Doubling the number of products, for example, should only increase time at the SDP by 50%, while driving time remains constant. Integrating additional products into the model improved efficiency while spreading the cost over a larger number of programs. Increased revenue from higher volumes can be used to fund the cost of 3PL contracts and IPM-3PL management. Further, a trickle-down effect of improved availability of the majority of products is increased attendance at health facilities by the population, thus contributing to an improvement in overall health.

CONTINUOUS IMPROVEMENT PROCESS

Continuous improvement – a key component of any business process – enhances quality, drives higher efficiencies and decreases costs. In essence, operators of any system must be able to identify and make improvements in a controlled manner, and procedures must be in place to examine the impact of a change before the change is implemented. Changes should be documented and disseminated, ensuring that all locations where changes take place remain consistent in operations.

The IPM-3PL model evolved from 2011, the year it was piloted, to 2015, the year of its national scale up. During those four years, IntraHealth used data to identify performance bottlenecks related to stock availability and learned how to account for regional specificities and re-distribute products as necessary. As IntraHealth and 3PLs scaled IPM-3PL, these data were used





Photo Credit: IntraHealth International/Clément Tardif

to continuously refine the model and pilot new solutions in select districts or regions. These actions informed the development of standard operating procedures, which are being used nationwide, to drive consistent service performance and data quality. Further improvements, such as training drivers to assist with logistics, continue to be implemented, thus reducing operating expenses.

The IPM-3PL model was also able to solicit and identify important sources of motivation and insights for continuous improvement. Starting in August 2014, the IPM-3PL M&E team instructed 3PL operators to ask SDP storeroom keepers and head nurses about causes of stock-outs and report them on a monthly basis. Identification of stock-out causes provided opportunities to make significant process improvements and further reduce stock-out occurrence.¹⁶

ADVOCACY & COMMUNICATION

Technical performance on the ground is not enough to trigger institutionalization in health systems. Without institutionalization, new approaches frequently dry up and end with the closure of the funded project. Institutionalization is often very challenging, in part because it may require the government to expend additional resources (financial, human, material) to maintain essential activities over the long term. To trigger such decisions, significant levels of communication and advocacy are required.

From its third year of implementation, the IPM-3PL team deployed an intense advocacy and communication campaign using all channels and forums. Examples include: certification ceremonies in regional capital cities, which were used to attract visual, written and electronic media, film production and dissemination on national TV stations; advocacy workshops in all 14 regions; and consistent direct dialogue with the Minister of Health and other key decision-makers.

Dissemination of results had significant influence with decision-makers, who opted to scale up the IPM-3PL and support development of a PNA- and IntraHealth-led roadmap to transition the project to government management.¹⁸

CONCLUSION

In Senegal, IPM-3PL, as part of the *Yeksi Naa* supply chain system, is improving the availability of contraceptives and access to other health care commodities. Integrating private sector logistics providers into the public health supply chains brought operational efficiency by streamlining supply chains across multiple commodities, providing real-time data for decision-making, and creating mechanisms to finance and sustain supply chain reform over time.

Furthermore, increasing data visibility in the supply chain enabled evidence-based decision making and stakeholder understanding of impact. The data informed supply planning, distribution and product payment, while also informing process improvement action beyond the supply chain.

The model has the potential for adaptation and adoption in other resource-limited settings, across a range of product types and geographies. Best practice elements of the approach can be applied individually to supply chain systems in other low- and middle-income countries to drive improved availability of products in health facilities.

PHASES OF SUPPLY CHAIN REFORM: A SUMMARY OF THE EXPERIENCE IN SENEGAL

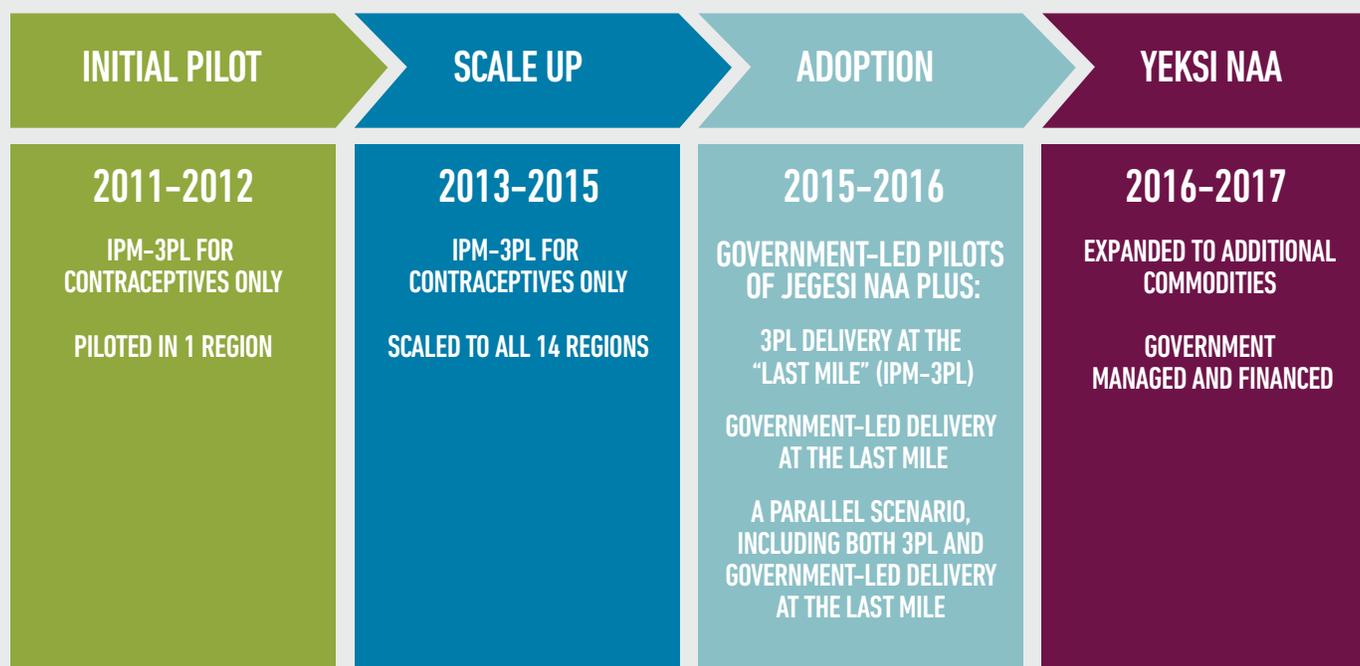


Figure 8. Phases of supply chain reform for health supplies in Senegal

APPENDIX

- 1) **A Closer Look At The Informed Push Model (IPM-3PL) Within The *Yeksi Naa* Supply Chain**
- 2) ***Yeksi Naa* Process Flow Map**
- 3) **Sample Ordering/Delivering Voucher (BLC) For Contraceptives**
- 4) **Sample Snapshot Of Dashboard For Dakar Region**
- 5) **Links To Other Resources**



A CLOSER LOOK AT THE INFORMED PUSH MODEL (IPM-3PL) WITHIN THE YEKSI NAA SUPPLY CHAIN

The following section provides details on IPM-3PL model: its key features and how it was implemented. This section may be useful for practitioners seeking to learn from and/or adapt IPM-3PL to new contexts.

OVERVIEW

IPM-3PL is the final segment of Senegal's *Yeksi Naa* supply chain, which moves commodities from national or donor procurement through distribution to national, regional, district, and facility levels. IPM-3PL segment of the *Yeksi Naa* supply chain is a last mile direct delivery supply chain system, adapted from the commercial sector, that uses contracted private logisticians to deliver commodities down to health facilities.

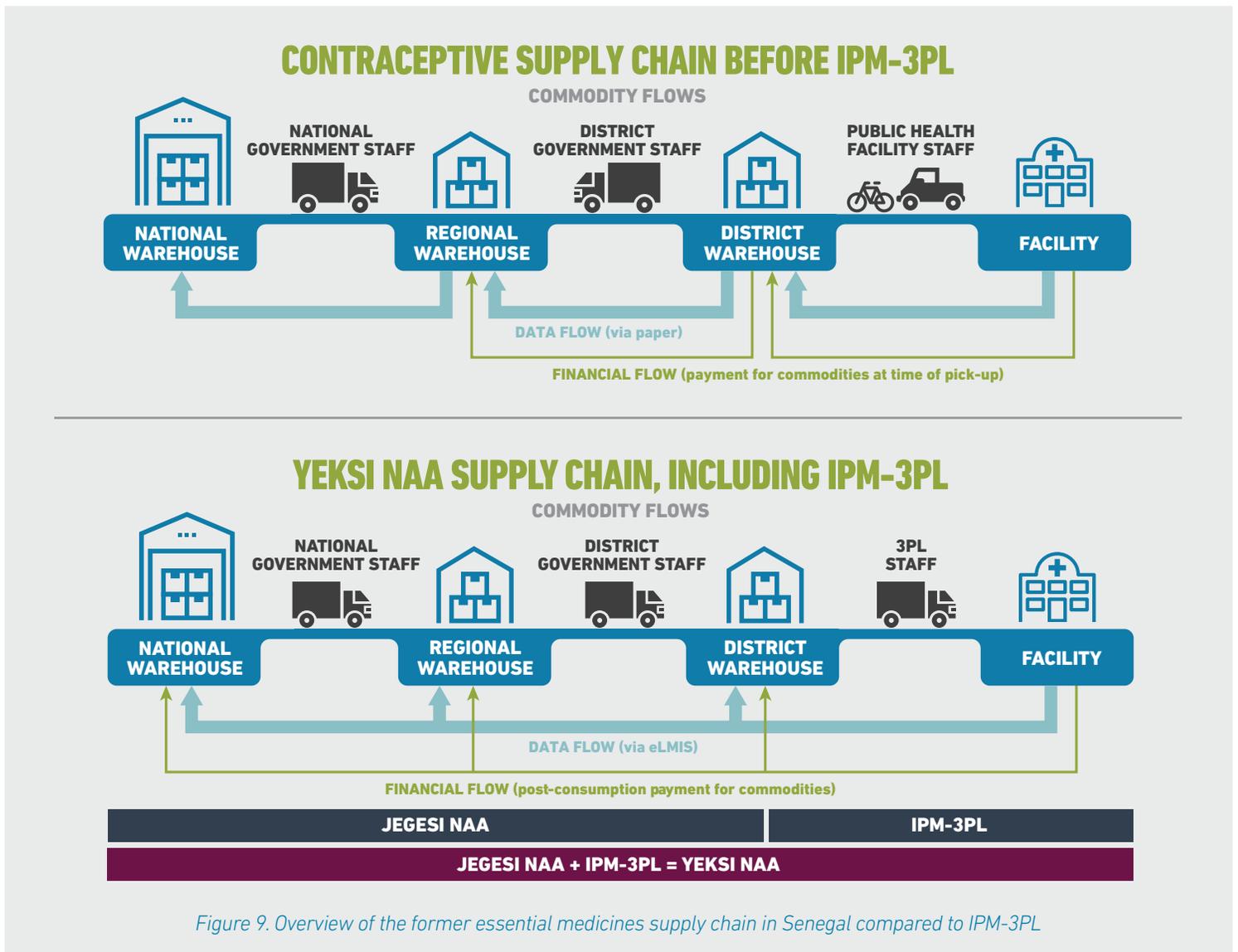


Figure 9. Overview of the former essential medicines supply chain in Senegal compared to IPM-3PL



COMMODITY FLOW

In the former supply chain system, health care workers had to pick up commodities from district warehouses, and district staff had to pick up products from regional warehouses. With health care workers overseeing logistics and traveling to maintain supplies, time available for patients was more limited. Health workers may not have had adequate training or time to handle logistics.

With Yeksi Naa, the National Supply Pharmacy (PNA) procures and stocks commodities at a national warehouse, delivers products to regional warehouses, and then further to district warehouses. 3PLs pick up products from district warehouses and deliver them directly to health facilities, using real-time data to determine quantities to leave at each facility.

Deliveries from National Level to Regional and District Levels (Jegesi Naa)

Commodities are stocked in PNA national warehouse for use throughout the entire public health system in Senegal, and may be ordered by PNA and delivered by suppliers. Donor organizations such as USAID and UNFPA also provide commodities to the PNA. Purchased and donated commodities are shipped to the PNA national warehouse in Dakar for storage and distribution.

There are 11 regional (“PRA”) warehouses in Senegal. Each regional warehouse stores and distributes commodities for use in that region. In addition, there are three mobile warehouses that cover three regions without a physical warehouse. Regional warehouses place orders to the PNA national warehouse for commodities based on consumption data provided by the service delivery points via the districts. The PNA delivers the ordered commodities to the PRA warehouse. In those regions that lack a physical regional warehouse, deliveries are made directly to district storerooms via mobile warehouse.

The PRA uses consumption data to inform decisions about what commodities will be delivered down to district warehouses. This practice is called Jegesi Naa, which means “I am getting closer”—the commodities are literally moving closer to the patients.

Deliveries to the Last Mile (IPM-3PL)

3PLs are contracted to pick up commodities at district warehouses and deliver them to service delivery points monthly. The 3PL has a delivery team that consists of a driver and a logistician, and may include an assistant logistician. When additional products were integrated in the delivery system, some 3PLs trained their drivers to become an additional logistician during the time of actual deliveries.

The delivery team drives to the district warehouse each morning and stocks the truck with the required commodities. On most occasions, a district employee accompanies the delivery team on their visits to service delivery points. Generally, delivery teams cover 4-5 service delivery points per day, and at the end of the day, commodities are returned to the district storehouse. Delivery teams usually work several days to cover all service delivery points in a district before moving onto the next district.

Initially, when deliveries were limited to contraceptives, each commodity was delivered each month. With the integration of additional commodities (up to a total of about 100 commodities), 3PLs are still visiting health facilities monthly, but are generally replenishing each type of commodity every other month (i.e., some commodities are replenished in month 1 and the remainder in month 2). This reduces the number of commodities that need to be counted and re-stocked each month. Emergency replenishment is provided in the off-cycle month if needed.

3PLs are trained to handle health commodities, perform physical counts, calculate consumption and forecast need in real-time with help from the tablet-based eLMIS, with minimal assistance from staff at service delivery points. In Senegal, five 3PLs are under contract to cover the country, separated by geographic regions. Choosing multiple 3PLs fosters competition and reduces risk.



DATA FLOW

Before Yeksi Naa, stock data were collected through paper-based forms and sent up the supply chain for aggregation and reporting. Reporting delays and challenges in data quality limited the system's performance. Also, because of stock insufficiencies, quantities delivered did not represent actual needs. Their use as "demand" for forecasting future needs was a cause of stock-outs.

In Yeksi Naa, data are collected at health facilities via an electronic logistics management information system, which 3PLs operate through a tablet at every visit. 3PL workers enter data on current stock, and the system, in real-time, calculates consumption, forecasts need based on a three-month consumption trend, and provides recommendations on stock levels to leave at the facility. Data are available online and reports are generated to summarize stock levels and consumption by service delivery point, district, and region and can be used to pinpoint and troubleshoot issues with supply and demand, make procurement decisions and inform programs.

Data Collection at the Facility Level

When commodities are first provided to a service delivery point on a consignment basis, the quantities of each commodity are recorded on stock cards and are captured in the eLMIS. Data are entered into the system via a tablet that the 3PL carries during each visit. The commodity quantity data are also recorded on paper-based delivery documents, a paper-based inventory sheet, and in an Excel file. In addition, the service delivery point's (SDP) existing quantities of commodities are recorded in all four systems as stock owned by the service delivery point.

This first delivery data and existing inventory data are used at the next and subsequent deliveries to determine how much consignment stock has been dispensed by the service delivery point. The consignment stock dispensed quantities are used to calculate how much money the service delivery point owes the district, which provided the consignment stock.

Service delivery point stock cards are updated by the stockroom clerk prior to each 3PL visit. Each commodity has a unique stock card with starting inventory, dates and quantities dispensed, and ending inventory just prior to a delivery. When the 3PL logistician arrives at the service delivery point, their first activity is to count the quantities of each commodity present in the service delivery point and to check their counts against the stock cards.

If a discrepancy exists, the 3PL logistician and the service delivery point storeroom clerk work together to resolve the difference. Resolution may include recounting commodities, checking the stock card totals, and cross-referencing service delivery point daily dispensing records to see if a dispensing was missed or recorded inaccurately.

The 3PL logistician records the correct quantities on the stock cards for each type of commodity. The quantities are also entered into the delivery documents, the eLMIS, an inventory sheet, and an Excel file. The Excel data entry may be done immediately or may be completed later. If damaged or expired product is being returned by the service delivery point, the quantities of commodities to be returned are also recorded on service delivery point stock cards as well as in delivery documents, the eLMIS, inventory sheet, and Excel file.

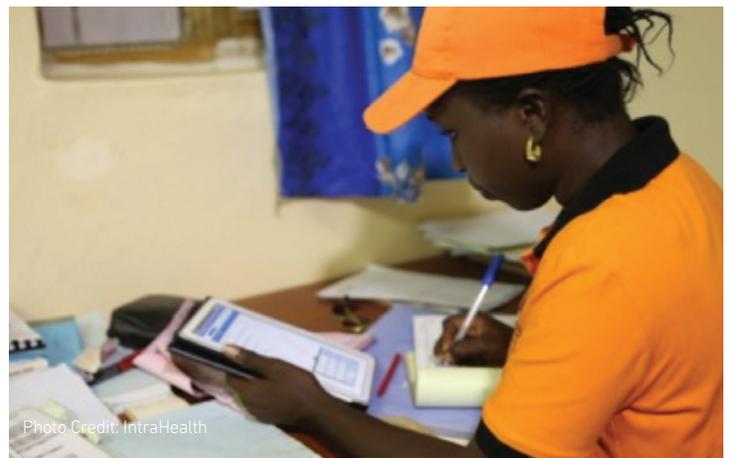


Photo Credit: IntraHealth

Logistician using tablet-based eLMIS in Senegal

Forecasting with the eLMIS

The 3PL logisticians use the eLMIS to determine the quantity of commodities to leave at the service delivery point. Prior to their visit in each district, the 3PL logistician works with an assistant logistician responsible for the district to update maximum quantities for each commodity at each service delivery point. This helps ensure there is sufficient inventory in the delivery truck. Maximum quantities are the initial target inventory to be left at the service delivery point at each delivery. Generally, this equals three months of consumption for that commodity, providing buffer stock until the next monthly delivery.

At the time of deliveries, the maximum quantity is updated as needed. The eLMIS tablet calculates the maximum quantity based on the three most recent months of consumption. Thus, if the consumption rate has changed in the previous month, the maximum quantity will be updated by eLMIS based on the average consumption rate during the previous three months.

The 3PL logistician can adjust the quantities to deliver based on future weather conditions and the information provided by the head nurse. Maximum quantities are recorded on delivery documents and the eLMIS, which calculates the quantity of commodities to provide based on maximum quantities and stock on hand. The 3PL can also modify the calculated quantities if a stock-out occurred in the previous month, or if other factors warrant a further adjustment, i.e., future events such as medical training on a specific contraceptive method or local festivals that will increase population temporarily.

In essence, maximum quantities calculated by the district and through the eLMIS are used as guidelines. Decisions about how much stock to leave at the facility are made in real-time with input on local conditions from the service delivery point.

Delivery Data

Once the quantities of commodities to be delivered to the service delivery point are determined, the 3PL logistician or helper goes to the 3PL truck and retrieves the designated quantities of each commodity. The logistician recounts the commodities left, and the service delivery point storeroom clerk also counts the commodities. The quantities to be left at the service delivery point are recorded on service delivery point stock cards, delivery documents, the eLMIS, inventory sheet, and Excel file. The 3PL logistician and service delivery point head nurse sign the delivery documents at the time of the delivery.

Invoicing

Commodities that are sold to patients are included on an invoice. If a district employee is present, the 3PL and district employee fills out the invoice with the quantity and cost of consignment commodities (see appendix) dispensed by the service delivery point since the last visit. The SDP's own stock is not included on the invoice since the service delivery point already purchased that material or received it free of charge in an annual distribution. (One time per year, the PRA provides commodities to service delivery points (SDP) free of charge. The quantities are limited and are determined by the PRA.)

The invoice is given to the storeroom clerk and the clerk pays the district employee if present. If a district employee is not present, the 3PL logistician prepares the invoice and leaves it with the service delivery point storeroom clerk. The clerk is expected to pay the invoice within one month of invoice receipt.

Data Collation & Dissemination

Stock cards remain at the service delivery point after the 3PL visit. The tablet used to enter data is synchronized at the end of each day. The IntraHealth team has access to eLMIS data as soon as the tablet is synchronized. The 3PL can only view the data they entered into the tablet. Delivery documents have three duplicate copies. One copy is left at the service delivery point, one copy is retained by the 3PL, and one copy is provided to IntraHealth. The inventory sheet is maintained by the 3PL logistician to reconcile inventory at the end of the day. The Excel file is sent to IntraHealth. The invoice is left at the service delivery point.

IntraHealth compiles monthly reports on inventory and consumption data. The reports are distributed to several stakeholders for analysis and follow-up actions. District reports are prepared and sent to the reproductive health employee for each district. The reproductive health employee shares the District report with colleagues in the district, as well as with service delivery point head nurses and midwives.

Regional reports are prepared and sent to the regional pharmacist and contain data for the specific region. National reports are prepared and sent to MoHSA Director of Reproductive Health and Child Survival Department. These reports are used to track progress against contraceptive use targets and to plan actions to achieve targets.



FINANCIAL FLOW

Before Yeksi Naa, health facilities were required to pay for commodities prior to consumption. Because facilities often had limited cash on hand, sometimes facilities were not able to procure products or prioritized commodities that would generate a high margin.

Yeksi Naa provides commodities on a consignment basis, via the district, to health facilities. Service delivery points are responsible for re-paying the district for the commodities received within one month after the commodity has been sold to patients. This "reversal" of the financial flow has alleviated significant pressure on the service delivery point, and promotes stocking and dispensing of a broad range of products

When 3PLs visit service delivery points, the 3PL generates an invoice, assisted by tablet calculation, that reflects commodities consumed since the last delivery. The invoice is left at the service delivery point, and payment should be made within a month of the invoice receipt.

Districts collect and send money to PRAs (regional branches of PNA) for commodities delivered.

Commodities that are sold to patients generate revenue that is shared by service delivery points, districts, regions, and PNA to cover operational expenses and commodity costs.* The amount of money retained at each level of the supply chain is referred to as the margin. The service delivery point adds and retains 30% to the price to reimburse the district, and the district adds and retains 15% to the price to reimburse the region. The region adds and retains 20% to the price to reimburse PNA. The remaining monies above and beyond the margin are to cover the cost and purchase of replacement commodities.

In September 2017, a new margin redistribution structure (as noted on page 12) is in effect in an effort to sustain IPM-3PL. Given increased product volumes at SDPs, greater sales are expected, and thus SDPs and districts may take a lower margin percentage but still have comparable total margins. Now, districts and SDPs keep 25% less of their margins, which is provided to the PNA to pay for Yeksi Naa operations.

TOTAL REVENUE PER UNIT SOLD

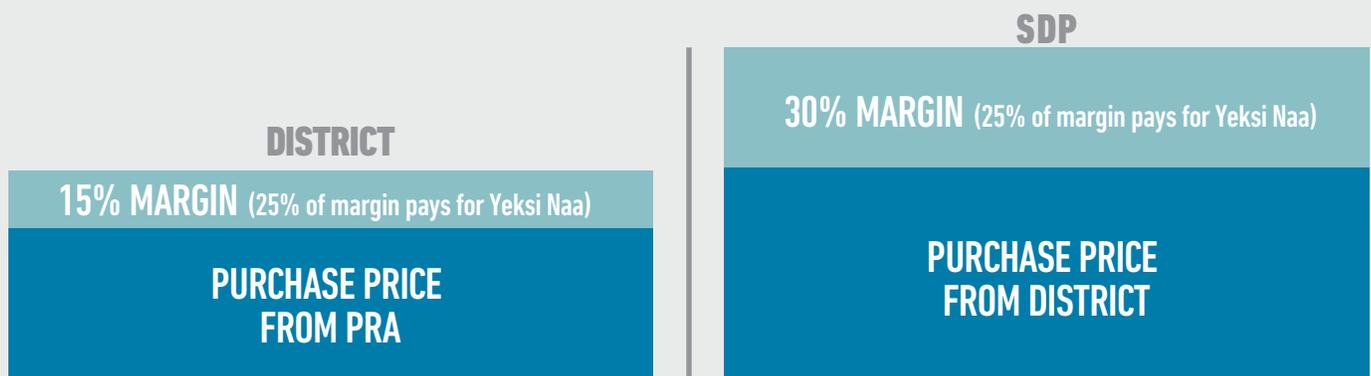


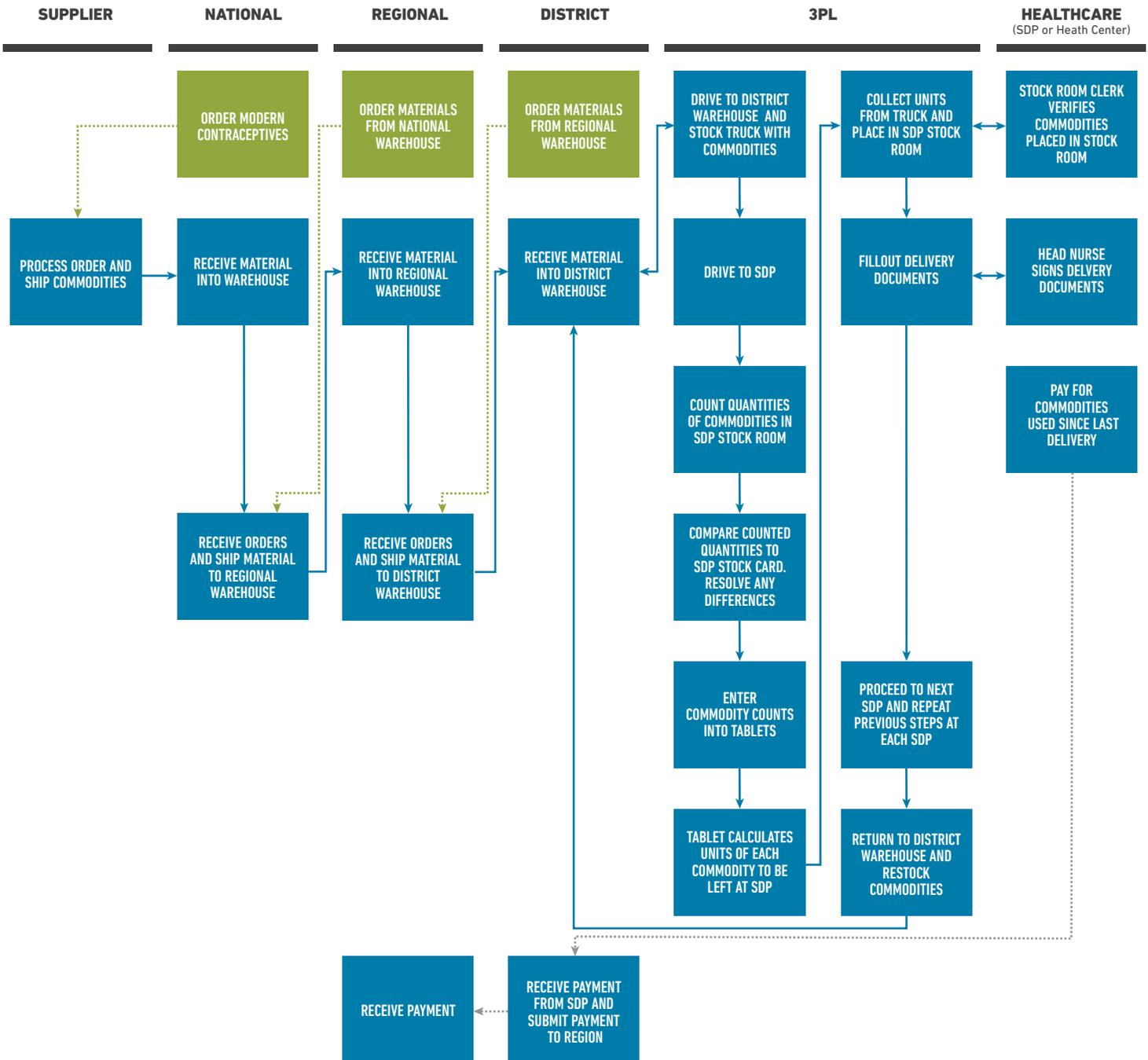
Figure 10. District and SDP revenue structure

*As ~35% of commodities are provided free of charge, commodity cost recovery is not 100%.



Photo Credit: IntraHealth International/Clement Tardif

YEKSI NAA PROCESS FLOW MAP



SAMPLE ORDERING/DELIVERING VOUCHER (BLC) FOR CONTRACEPTIVES

District		Guédiawaye		Infirmier Chef de Poste				Date			
PPS				Téléphone:				Dernière Livraison			
		DIU	Implant	Injectable	Injectable	Pilule	Pilule	Préservatif	Préservatif	CU	Collier
		TCU 380A	Jadelle	Dépo-Provera	Sayana Presse	Microlut/Ovrette	Microgynon Lof.	Masculin	Féminin	Prégnon/Duet	-
		Unité	Unité	Flacon	Flacon	Cycle	Cycle	Unité	Unité	Unité	Unité
Stock maximum	Défini et ajusté par l'entrepot mobile en fonction de la consommation su PPS										
Stock appartenant au PPS après la dernière livraison	D'après la dernière livraison de produits: stock appartenant au PPS restant si positif										
Stock après la dernière livraison	D'après la dernière livraison de produits: stock disponible + quantités										
Stock disponible et utilisable a la livraison	Inventaire visuel réalsisé avec l'ICP ou le dépositaire su PPS										
Stock appartenant au PPS restant	$E = B - C + D$										
Consommation facturable de la période	$F = 0$ si $E \geq 0$ $F = -E$ si $E >= 0$										
Prix unitaire	Prix District - PPS (FCFA HT)	380	380	152	152	76	76	0	0	57	152
Recouvrements du district	$H = F \times G$: Recouvrement du district par produit consommé (FCFA HT)										
Produits reçus hors entrepot mobile	Ex : Reçu du dépôt de district depuis la dernière livraison (c.f.: fiche de stock)										
Pertes et ajustements	Produits périmés, perdus, abimés deuis dernière livraison (c.f.: fiche de stock)										
Consommation réelle du PPS	$K = C - D + I - J$: Consommation réelle du PPS depuis la dernière livraison										
Dont consommation communataire	Produits distribué aux cases dépendantes du PPS depuis la dernière livraison										
Livraison	Stock maximum - Stock disponible et utilisable a la livraison										
Numéro de lot	Prérempli par l'entrepot mobile										
Date de péremption du lot	Prérempli par l'entrepot mobile										
Nouvelles acceptantes du programme PF	Total toutes méthodes depuis la dernère livraison (cf. registre PF du PPS)										
Sterilisations	Depuis la dernère livraison (cf. registre)										

SAMPLE SNAPSHOT OF DASHBOARD FOR DAKAR REGION

Sample image of eLMIS dashboard that reports stock-out rates (facilities reporting stock-outs over the last month) for each commodity included in the IPM-3PL.

Disponibilité des Produit au mois de septembre 2017 dans la région de Dakar

PRODUITS		DISTRICT										INDICATEURS			
TYPE	PRODUITS	CENTRE	DIAMNIADIO	SUD	NORD	KEUR MASSAR	PIKINE	GUEDIAWAYE	RUFISQUE	MBAO	QUEST	Nbre de PPS en rupture	Nbre de PPS visités	Taux de rupture	Taux de disponibilité
PRODUITS PRIORAIRES DE LA PHARMACIE NATIONALE D'APPROVISIONNEMENT	CEFIXIME	0	0	0	0	0	0	0	0	0	0	0	147	0.00%	100%
	DIAZEPAM 10MG/2ML	8	4	0	0	2	0	1	2	0	0	17	147	11.56%	88.44%
	EPINEPHRINE 1MG/1ML	0	0	0	0	0	0	0	0	0	0	0	147	0.00%	100.00%
	FER 0,6% Sirop	7	11	2	5	11	12	12	30	11	2	103	147	70.07%	29.93%
	HYDROCORTISONE 100MG	0	5	0	0	1	3	2	0	4	1	16	147	10.88%	89.12%
	MEBENDAZOLE 500MG Sirop	1	1	0	6	6	4	2	14	5	1	40	147	27.21%	72.79%
	MEBENDAZOLE 100MG Sirop	3	5	1	3	11	4	2	10	8	1	48	147	32.65%	67.35%
	PARACETAMOL 1G/100ML	0	0	0	0	0	0	0	0	0	0	0	147	0.00%	100%
	PARACETAMOL 120G/5ML	7	6	1	4	11	2	6	19	7	2	65	147	44.22%	55.78%
PRODUITS DE LA MERE ET DE L'ENFANT	AMPICILINE 1G Amp	0	7	1	1	2	3	2	11	9	2	38	147	25.85%	74.15%
	CEFTRIAXONE 1G	6	5	4	6	6	10	7	9	6	5	64	147	43.54%	56.46%
	GENTAMICIN 80mg	2	2	1	0	0	4	1	6	4	0	20	147	13.61%	86.39%
	DEXAMETHASONE	2	2	3	1	3	4	0	5	2	0	22	147	14.97%	85.03%
	PHYTOMENADIONE	0	1	1	0	0	1	2	5	2	0	12	147	8.16%	91.84%
	AMOXILLIN 250mg	10	9	3	11	15	9	9	24	8	5	103	147	70.07%	29.93%
	SRO Failble osmoraltite	2	0	0	0	3	1	1	6	2	0	15	147	10.20%	89.80%
	ZING 20mg	0	1	0	0	4	2	0	13	1	0	21	147	14.29%	85.71%
	OXYTOCINE 5 UI	1	2	0	1	4	0	2	6	2	0	18	147	12.24%	87.76%
	MAGNESIUM SULFATE 20%	0	0	0	0	0	0	0	0	0	0	0	147	0.00%	100%
	SULFATE MAGNESIUM 500MG	2	7	1	1	1	0	3	7	5	1	28	147	19.05%	80.95%

LINKS TO OTHER RESOURCES

IPM-3PL OVERVIEW

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PHARMACIE



NOTES

