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Haryana, India: Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) Logistics Indicator Assessment Report

JANUARY 2015

This publication was produced for review by the U.S. Agency for International Development. It was prepared by the USAID | DELIVER PROJECT, Task Order 4.



PEPFAR
U.S. President's Emergency Plan for AIDS Relief

Haryana, India: Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) Logistic Indicator Assessment Report

USAID | DELIVER PROJECT, Task Order 4

The USAID | DELIVER PROJECT, Task Order 4, is funded by the U.S. Agency for International Development (USAID) under contract number GPO-I-00-06-00007-00, order number AID-OAA-TO-10-00064, beginning September 30, 2010. HIV-related activities of Task Order 4 are supported by the President's Emergency Plan for AIDS Relief. Task Order 4 is implemented by John Snow, Inc., in collaboration with PATH; Crown Agents Consultancy, Inc.; Eastern and Southern African Management Institute; FHI360; Futures Institute for Development, LLC; LLamasoft, Inc; The Manoff Group, Inc.; Pharmaceutical Healthcare Distributors (PHD); PRISMA; and VillageReach. The project improves essential health commodity supply chains by strengthening logistics management information systems, streamlining distribution systems, identifying financial resources for procurement and supply chain operation, and enhancing forecasting and procurement planning. The project encourages policymakers and donors to support logistics as a critical factor in the overall success of their healthcare mandates.

Recommended Citation

USAID | DELIVER PROJECT, Task Order 4. 2014. *Haryana, India: Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) Logistics Indicator Assessment Report*. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 4.

Abstract

In May 2014, the USAID | DELIVER PROJECT, with support from the Ministry of Health and Family Welfare (MOHFW), the National Health Mission (NHM) and Haryana Department of Health & Family Welfare and Health Mission, conducted an assessment on the availability of reproductive, maternal, newborn, child, and adolescent health and HIV and AIDS commodities and the performance of the logistics management and supply chain systems in Haryana. This report presents the findings of the assessment as well as recommendations to strengthen the logistics systems.

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Acronyms

AIDS	acquired immune deficiency syndrome
ANM	auxiliary nurse midwife
ART	antiretroviral therapy
ARV	antiretroviral
ASHA	Accredited Social Health Activists
BCG	Bacillus Calmette–Guérin
CHC	community health center
DAC	Department of AIDS Control
DPT	diphtheria, tetanus, and pertussis
EC	emergency contraceptives
EML	essential medicines list
FEFO	first-to-expire, first-out
FY	financial year
GMSD	government medical supply depot
GoI	Government of India
HIV	human immunodeficiency virus
HMSCL	Haryana Medical Services Corporation Limited
HMIS	health management information system
IFA	iron folic acid
ILR	ice-lined refrigerator
IUCD	intrauterine contraceptive device
JSI	John Snow, Inc.
LIAT	Logistics Indicators Assessment Tool
LMIS	logistics management information system
MOHFW	Ministry of Health and Family Welfare
NHM	National Health Mission
NRHM	National Rural Health Mission (Prior name of NHM until 2013)
OCP	oral contraceptive pills

ODISCMS	Online Drug Inventory and Supply Chain Management System
OI	opportunistic infection
OPV	oral polio vaccine
ORS	oral rehydration salt
PHC	primary health center
RCH	reproductive child health
RMNCH+A	reproductive, maternal, newborn, child, and adolescent health
RTI	reproductive tract infection
SACS	State AIDS Control Societies
SC	sub-center
SDH	sub-divisional hospitals
SDP	service delivery point
SHM	State Health Mission
SOH	stock on hand
SOP	standard operating procedure
STI	sexually transmitted infection
UIP	universal immunization program
URCH	Urban Reproductive Child Health center
USAID	U.S. Agency for International Development
VVM	vaccine vial monitor
WIF	walk-in-freezer

Acknowledgments

We would like to thank the personnel at the Ministry of Health and Family Welfare (MOHFW) and the National Health Mission (NHM) in Delhi for their support of this assessment, especially Dr. Ajay Khera, Deputy Commissioner, Child Health and Immunization, Ministry of Health and Family Welfare.

We are grateful for the support of Haryana's Department of Health & Family Welfare and National Health Mission (NHM), especially Dr. Rakesh Gupta, Mission Director; Mrs. Inoshi Sharma, Director-Administration; and Dr. Suresh Dalpath, Deputy Director-Child Health. Special thanks goes to the senior management staff and consultants from the Haryana Medical Services Corporation Limited (HMSCL), especially Dr. Ashish Gupta, Managing Director; Dr. Nitin Garg, Assistant Director, Purchase and Supply Chain; Dr. Nishikant Sharma, Assistant Director, Tendering and Quality Control; Dr. Harpreet Kaur, Assistant Director, Demand and M&E; and Dr. Sandeep Kumar, Consultant Supply Chain. We are also thankful to Maternal and Child Health Integrated Program (MCHIP) staff and State RMNCH+A Unit (SRU) for their roles in coordinating with the various Haryana stakeholders and providing helpful contextual information for the design and implementation of the survey.

Many thanks go to the IMS Health Information & Consulting Services India Pvt. Ltd. staff, especially Nilesh Maheshwari, Deepak Batra, Apoorva Jain, and Indrani Sharma for all their time before, during, and after the assessment as well as their team of field collectors and supervisors without whom this study could not have occurred.

We are grateful to all the staff at the warehouses, district stores and health facilities (district hospitals, community health centers, primary health centers, and sub centers) from Bhiwani, Faridabad, Gurgaon, Hisar, Jind, Karnal, Mahendragarh, Panipat, Sirsa, and Yamunanagar who took the time out of their schedules to share valuable feedback with the field teams.

Thanks also go to all of the stakeholders for sharing the valuable information, opinions, and perspectives that went into informing the assessment, and for showing us around their facilities.

Finally, we extend special thanks to the U.S Agency for International Development (USAID), whose assistance was instrumental in the implementation of this activity. We are grateful for the continuous support extended by James Browder and Vijay Paulraj from USAID/India.

We hope that this report will contribute to improving the access to and availability of essential priority medicines included in the Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) strategy.

Executive Summary

Over the past two decades, India has seen impressive economic growth and prosperity, becoming the world's largest democracy and fourth largest economy. However, these high rates of economic growth and geopolitical diversity have not translated into inclusive growth. India still ranks 136 out of 186 countries on the 2013 Human Development Index, and approximately 60 percent of its population continues to live on less than \$2 per day (UNDP, 2014). The country still faces a wide range of development challenges and health disparities, especially among those living in rural areas, the poor, and women and children. Despite recent progress toward achieving Millennium Development Goals (MDGs) 4 and 5, maternal, infant, and child mortality rates continue to be high across India.

The Government of India (GoI) has confirmed its commitment to reducing maternal and child mortality. It acknowledged that scaling up life-saving commodities is vital to achieve MDGs 4 and 5. In 2013, the GoI launched the *Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) Strategy*; the strategy outlines priority interventions that will have high impact on child survival and maternal health. One of the interventions the government outlined, and reiterated as a top priority is the strengthening of drug procurement and logistics management systems of reproductive, maternal, newborn, child, and adolescent health (RMNCH+A) commodities.

Given this context and as part of ongoing support to the implementation of the RMNCH+A strategy, the Ministry of Health and Family Welfare (MoHFW) requested that the U.S. Agency for International Development (USAID) provide technical assistance in supply chain management of essential RMNCH+A commodities, including condoms, sexually transmitted infection (STI) drugs, and opportunistic infections drugs. To further the goal of providing comprehensive and integrated health services to mothers, infants, children, and adolescents, the USAID | DELIVER PROJECT is working at the national level in six states (Uttarakhand, Jharkhand, Himachal Pradesh, Haryana, Punjab, and Delhi) where USAID is the lead development partner under the *Call to Action for Child Survival and Development* to strengthen the supply chain management systems of RMNCH+A commodities.

As part of this activity, the project conducted a comprehensive survey in two priority states (Haryana and Jharkhand) to document the issues around commodity availability and management at various levels within the four supply chains impacting the RMNCH+A strategy. The four supply chains are essential medicines, family planning, vaccines, and reproductive tract infection (RTI)/STI, and HIV and AIDS. The study used an adapted version of the Logistics Indicators Assessment Tool (LIAT). The goal of this survey is to provide information regarding the availability of 42 products the USAID | DELIVER PROJECT, in close consultation with the State Health Mission (SHM) / Haryana Medical Services Corporation Limited (HMCSL) and USAID, identified as key tracer commodities at service delivery points (SDPs) and regional/district warehouses. The assessment captures health commodity systems performance and commodity availability at all levels of facilities in the public health system. The assessment provides stakeholders with up-to-date information on the current operating systems for commodities management related to the RMNCH+A strategy.

This study was conducted at 11 warehouses (7 essential medicine and 4 vaccine warehouses), 21 central/district stores, 20 hospitals, and 333 SDPs in 10 selected districts in Haryana. It assessed product availability and specific logistics activities, including reporting, ordering, inventory control, issuing, transportation, training, supervision, and maintaining storage conditions. Data were collected through direct observation—e.g., of storage areas and available records and reports—and conducting a physical inventory. Data were also gathered by interviewing the facility-level officers in charge and facility-level personnel responsible for managing and storing commodities using an adapted version of the LIAT. Data were collected using Lenovo Idea Tab a1000 Android tablets and the Magpi mobile application, which Datadyne designed. Magpi facilitates the transfer of data through forms on phones and transmits data from the phones directly to the Internet.

Key Findings

Stock Assessment and Stock-keeping Practices by Supply Chain

Essential Medicines

According to Haryana's Essential Medicines List (EML) guidelines, all facility levels in Haryana, excluding sub centers (SCs), are required to *manage* the 24 essential medicines assessed in the survey; these medicines are indispensable for the provision of the maternal, neonatal and child health services defined in the public mandate. However, the average number of essential medicines managed across all facilities is slightly more than 18 products, falling well below the 24 product minimum the national guidelines require. SCs, which provide a smaller range of services, are required to manage at least 15 products. However, it was found that only nine products on average were managed across those facilities. Regarding *product availability*, facilities also dropped far below the EML-required minimum of 24, averaging just over 15 products per facility. Similarly, SCs averaged just over six products, which is far below the 15 product minimum EML guidelines require (Table 5).

Overall, only four products were managed in 80 percent or more of facilities over the previous 12 months: albendazole (97.5 percent), oral rehydration salts (ORS) (84.4 percent), iron folic acid (IFA) (red) (81.5 percent), and vitamin A (81.5 percent). Products that were managed at the fewest facilities in the last year include cefixime (22.3 percent), vitamin K (20.8 percent), ceftriaxone (15.5 percent) and methyldopa (15.1 percent).

The survey found that stockouts in essential medicines were frequent across all levels of the system and varied widely across products. The most frequently stocked-out products on the day of visit across all facilities were co-trimoxazole (49.4 percent), IFA (blue) (41.6 percent), IFA syrup (41.1 percent), vitamin K (39.2 percent), and methyldopa (37.2 percent) (Table 7). Stockout rates over the previous three months were not as high as rates on the day of visit. However, large variations existed among products. IFA (blue) and IFA syrup had the highest stockout rates over the previous three months at 22.7 percent and 20.3 percent, respectively (Table 8). The frequency of stockouts for each product occurred between one and two times over the last three months; the average duration of these stockouts was nearly 37 days. Though lower-level facilities manage fewer products, stockouts tended to be more frequent; the duration of these stockouts was longer than higher-level facilities (Tables 9 and 10).

Most commodity managers for essential medicines reported using stock ledgers, stockcards, or electronic records to track and record their logistics data. Overall availability of stockcards/registries was high, with on average of 93 percent of facilities having a record for the product they managed. However, only 62.7 percent of facilities had stockcards that were both available and updated. Some

variations also existed among products. This indicates that stock-keeping practices were not necessarily institutionalized within the facility (Table 28). Further analysis of the data indicated that stock availability on day of visit was statistically correlated with record management across all levels. Thus, as expected, products were more likely to be available on the day of visit when stockcards were available and updated. When analyzed for accuracy, results showed that 80 percent of updated records were within ± 10 percent of the physical count (Table 29).

When reporting inventory information to higher levels, commodity managers for essential medicines reported using the Online Drug Inventory and Supply Chain Management System (ODISCMS) and stock/issues registers most frequently (Figure 4). The reliability and accuracy of reports sent via the online system appear to be an issue, as only 56 percent of entries in the online system were within ± 10 percent of the physical count on the day of visit. In comparison, 80 percent of stockcards/stock registries balances were accurate (Table 36).

Haryana's online reporting system was intended to provide real-time data to higher levels for informed decision-making. Results showed that the online system was being used at facilities at all levels; however, the rates of use varied by level. General hospitals and community health centers (CHCs) reported using the online system at virtually all facilities (100 percent and 94.8 percent, respectively); primary health centers (PHCs) and district stores reported less usage (69.3 percent and 61.9 percent, respectively) (Figure 7).

Vaccines

National guidelines indicate that facilities at all levels of the supply chain, except for SCs, are required to manage all five products assessed in this survey (i.e. bacillus Calmette–Guérin [BCG]; diphtheria, tetanus, and pertussis [DPT]; hepatitis B; measles; and oral polio vaccine [OPV]). It was found that the average number of products managed on the day of visit across all facility levels fell slightly below guideline requirements, with most levels managing all five products. Regarding product availability on the day of visit, the state average also fell just below the five product minimum (Table 11). However, in looking at vaccine management over the previous 12 months, it was found that not all facility levels were managing all five products consistently. Almost all warehouses, CHCs, and PHCs reported managing all five products within the last year; however, more than 50 percent of district stores and 20 percent of hospitals reported not managing any vaccines in the 12 months before this survey (Table 12).

Regarding stock availability, the survey found that stockout rates for vaccines were generally low across facilities. Approximately 75 percent of facilities had all five vaccines available on day of visit. While vaccine products were generally available throughout the system, a 25 percent stockout rate for hepatitis B vaccine could be seen in warehouses (Table 13). Similar to stockouts on the day of visit, stockouts in the previous three months were infrequent and varied marginally among products. BCG had the highest rates of stockout across all facilities, including stockouts at 25 percent of warehouses and 8 percent of CHCs and PHCs. Hepatitis B was also stocked out in 25 percent of warehouses, but it was consistently available at other facility levels (Table 14). Stockouts of vaccines happened between one and three times in the three months before the survey; the average duration of stockouts for vaccines was 21 days (Tables 15 and 16).

Commodity managers for vaccines most frequently reported using stockcards and stock registries for managing commodities. The survey also found that most facilities managing vaccines had available and updated stockcards for each of the five products (Table 30). Regarding accuracy, results showed that close to 80 percent of updated records were within ± 10 percent of the

physical count (Table 31). When reporting to higher levels, commodity managers reported using stock and issues register forms and National Health Mission (NHM) Department Monthly Format for Sub-Centers and Equivalent Institutions forms most frequently. These reports are sent to the district store or district health office every month (Figures 5 and 6).

Family Planning

Five family planning products were assessed in this survey, including condoms, emergency contraception, the Copper T 380A intrauterine contraceptive device (IUCD), oral contraceptive pills (OCP), and pregnancy test kits. According to national guidelines, facilities at all levels of the supply chain—excluding warehouses because family planning products are delivered directly to district level in Haryana—are required to manage each of these five products. The average number of products managed across all facility levels is 3.8 products, falling well below guideline requirements. Regarding product availability, the state average also fell below the five product minimum at only 2.5 products (Table 17).

Regarding product management over the last 12 months, the IUCD was the most consistently managed product, at approximately 90 percent, across all facility levels. The other family planning products were managed far less consistently, with emergency contraception being managed at less than half of all facilities (Table 18).

The survey found that stockouts of family planning commodities were frequent. Facilities across all levels had stockout rates close to 50 percent for one or more products on the day of visit; CHCs, PHCs, and SCs had stockouts of varying degrees for every family planning product. Stockout rates varied widely among family planning products, with rates between 7.1 percent for IUCDs and 50.3 percent for emergency contraception. Emergency contraception was the most frequently unavailable product, with approximately 50 percent of facilities stocked out of the product on the day of visit (Table 19).

Stockouts of family planning commodities within the last three months were not nearly as high as stockouts on the day of visit. Stockout rates varied from 2.1 percent for IUCDs to 24.3 percent for condoms. Stockout rates for emergency contraception were much lower within the last three months (5.6 percent) than they were on the day of visit (50.3 percent). This indicates, potentially, a recent issue with the family planning supply chain or an issue with quality of recordkeeping (Table 20). Stockouts of family planning commodities occurred between one and two times over the last three months; the average duration of these stockouts was approximately 40 days. Stockouts occurred more frequently at lower levels of the system and often lasted longer (Tables 21 and 22).

Commodity managers for family planning most frequently reported using stockcards or stock ledgers for commodity record management. The survey found that available and updated family planning stockcards varied by product within levels. This indicates inconsistent practices in facilities across the supply chain (Table 32). However, results showed that over 80 percent of updated records for each product, except for emergency contraception, were within +/- 10 percent of the physical count. Emergency contraception records were relatively less accurate, falling just around 70 percent compared with other products (Table 33). When reporting to higher levels, commodity managers reported using stock and issues register forms and NRMH Health Department Monthly Format for Sub-Centers and Equivalent Institutions forms most frequently. These reports are sent to the district store or district health office every month (Figures 5 and 6).

RTI/STI and HIV and AIDS

Eight HIV and AIDS commodities were included in this assessment, including drugs for RTI/STI treatment, antiretrovirals (ARVs), and HIV test kits. According to guidelines, facilities at all levels of the supply chain are required to manage anywhere from three to eight HIV and AIDS products, depending on facility type and level. The national guidelines require RTI/STI treatment kits be available at PHCs, CHCs, and RTI/STI clinics in hospitals. Additionally, all PHCs are expected to provide HIV test kits, while CHCs and hospitals that provide HIV and AIDS treatment through Link-ART Centers and ART clinics are expected to provide ARVs. SCs are not required to provide any services (or products) related to HIV and AIDS or RTI/STIs.

With the exception of hospitals, the average number of RTI/STI and HIV and AIDS commodities managed in facilities across all levels of the system fell far below national requirements. CHCs and PHCs managed an average of 1.4 and 1.2 commodities, respectively. General hospitals, on the other hand, managed an average of 4.1 RTI/STI and HIV and AIDS commodities. This is within the three to eight product range required by national guidelines. Regarding product availability, the state average also fell below the required minimum at only 1.4 products available on the day of visit. At the CHC and PHC levels, less than one product was available on the day of visit. This indicates that very few RTI/STI and HIV and AIDS products were available at facilities below the district level (Table 24).

Findings indicated that over the previous 12 months very few facilities at any level of the system were managing the required HIV and AIDS and RTI/STI products. Approximately 65 percent of hospitals managed RTI/STI Treatment Kit 1; 40 percent managed RTI/STI Treatment Kits 4 and 6, and less than half managed ARV commodities, including ZLN Combo (50 percent) and nevirapine (45 percent). In CHCs, where RTI/STI treatment kits and ARVs are supposed to be managed, very few facilities (less than 10 percent for each product) reported managing these products within the last year. Similarly, only 7 percent of PHCs reported managing HIV test kits, and less than 1 percent reported managing RTI/STI kits, all of which are required to be managed at the PHC level (Table 25).

Stockouts of RTI/STI and HIV and AIDS products were common across Haryana. RTI/STI treatment kits had the highest stockout rates on the day of visit, ranging from 32.9 percent for Kit 1 to 66.0 percent for Kit 4 (Table 26). Stockouts of RTI/STI and HIV and AIDS products within the last three months were lower compared with stockouts on the day of visit. Most products were available within the three months before the survey, except for RTI/STI treatment kits and an ARV product (Table 27).

Similar to the other supply chains, commodity managers for RTI/STI and HIV and AIDS products reported using stockcards or stock ledgers most frequently for commodity management. Available and updated stockcards varied greatly among products and across levels. Stockcards for RTI/STI treatment kits were the least available and least updated of all products (Table 34). Over 80 percent of updated records for each product, excluding HIV test kits, were within +/- 10 percent of the physical count. Less than 60 percent of stockcards for HIV test kits fell within +/- 10 percent of the physical count (Table 35). When reporting to higher levels, commodity managers reported using stock and issues register forms and NHM Department Monthly Format for Sub-Centers and Equivalent Institutions forms most frequently. These reports are sent to the district store or district health office every monthly (Figures 5 and 6).

Cross-Cutting Findings Across Supply Chains

Inventory Management

Results indicated that despite differences in who manages the overall system, the ordering processes across supply chain systems in Haryana function similarly and are largely decentralized. Very few facilities relied on the Central Health Mission or SHMs to determine their product needs; instead, the majority of facilities were responsible for determining their order quantities and type (Figure 8).

Facilities across all supply chains determine the quantities for their orders by using past consumption data (Figure 9). Most facilities reported a monthly frequency for indents for each commodity. On average, the time between indenting and receiving was less than two weeks for the majority of facilities across supply chains (Figure 12). Most orders were filled between 75 percent and 100 percent; a small proportion was filled between 50 percent and 75 percent (Figure 13). With the exception of essential medicines, very few emergency orders/unplanned local purchases were made. For essential medicines, about 45 percent of the orders placed within the last three months were emergency orders/unplanned local purchases (Figure 14). Respondents further reported that the district warehouse was the source of supply for most facilities across all supply chains (Figure 15). However, as found earlier with stock assessment, most district stores did not manage or store most of the tracer products. This indicates some confusion among commodities managers about where their supplies come from. This could be attributed to stockout levels since commodity managers could be expecting the district stores to resupply them with products when in fact local procurement is necessary.

In Haryana, the 42 tracer products could be stored at the facilities in one of six ways. Approximately two-thirds of products were stored in acceptable or excellent conditions. The most challenging conditions across all levels included cartons and products in poor condition, lack of space and organization, and lack of fire equipment (Figure 16). Warehouses appeared to have issues with stacking (i.e., products stacked at least 10 cm off the floor, products stacked at least 30 cm away from the walls and other stacks, and products stacked no more than 2.5 m high), first-to-expire, first-out(FEFO), and the availability of fire safety equipment (Table 37).

Transportation

The majority of facilities within the essential medicines (59.9 percent), family planning (62.8 percent), and RTI/STI and HIV and AIDS (66.7 percent) supply chains picked up their commodities from the next level. Within the vaccine supply chain, approximately 55 percent of facilities received commodities from higher levels. Very few facilities relied on local suppliers or the manufacturer for commodity transportation (Figure 17). The most common form of transportation used to transport commodities, across all supply chains, was facility vehicles (Figure 18).

Human Resources

Almost 85 percent of facility managers reported having standard operating procedures (SOPs) for cold chain and biomedical waste management available (Figure 20). Approximately 70 percent reported having standard treatment guidelines for STIs and less than 50 percent had guidelines for OI (Figure 19). Similarly, just half of the respondents in hospitals, CHCs, and PHCs reported receiving a copy of the RMNCH+A 5x5 matrix. This document provides policy objectives and lists the minimum medicines and commodities that are required to reduce poor maternal, infant and child health outcomes (Figure 21). Sixty-five percent of commodity managers reported having

inventory guidelines; however, only 16 percent of respondents were able to produce the copy to allow for verification (Figure 22).

Training is an important function that ensures staff members are equipped with necessary skills to do their jobs. However, findings indicated that many commodity managers reported never having received training on recordkeeping. Of those who had been trained, on-the-job training was most common (Figure 23). Conducting regular supportive supervision is an important way to reinforce training and promote adherence to logistics system procedures. Most facilities received a supervision visit within the last month; nearly all facilities received visits within the last three months, with the exception of the district store (Figure 24).

Recommendations

Based on the findings from the project’s management information system review, landscape analysis, key performance indicators review, and this survey, the following recommendations are provided to expand the capacity of the supply chains operating within Haryana. Due to funding and time constraints, the project prioritized recommendations that could be implemented during the lifecycle of the project by strategically coordinating with the SHM/ HMSCL to develop state-level work plans.

General

Recommendations

- Coordinate supply chain operations through the establishment of a “supply chain management unit” at the state level and institutionalize SOPs to strengthen operations.
- Develop and institutionalize SOPs to improve operations, such as the distribution of inventory, through documentation and adherence.
- Provide specialized supply chain training to staff to improve adherence to the system.
- Base forecasting, procurement, distribution, and availability on real-time consumption data.
- LMIS data capture tools (e.g. forms, ODISCMS) should be standardized to ensure data are being gathered uniformly across systems and capturing key data points.
- Online system fields, reports, and dashboards should be updated to improve data visibility and decision-making.

Strategic Planning and Oversight and Human Resources

Recommendations

- Develop supply chain strategy.
- Strengthen the “Supply Chain Management Unit” at the state level and create a supply chain officer position at hospitals.
- Develop terms of reference for staff with supply chain tasks and supply chain guidelines and distribute to all facility levels.
- Develop supply chain management workshop (including stock management and recordkeeping) and provide training-of-trainers for SHM/ HMSCL trainers to deliver workshop.

- Assess staff's workloads with supply chain tasks to determine if more people and what kind of staff need to be hired.
- Partner with university to develop a pre-service supply chain training curriculum.

Forecasting and Procurement

Recommendations

- Update and document SOPs for procurement processes.
- Review product lists and selection process to ensure all commodities listed in the RMNCH+A 5x5 matrix are included in various procurement mechanisms.
- Develop a standardized model for forecasting and supply planning for RMNCH+A commodities, which would include a financial gaps analysis.
- Conduct analysis to determine location of time lag in the quality testing process. Implement solution based on analysis (e.g., increase number of labs to manage quality testing).
- Develop a PIP indicator to measure accuracy of the quality assurance check.

Inventory Management

Recommendations

- Support adherence to GoI-/WHO-recommended storage guidelines at all facility levels.
- For all facilities storing products—
 - Document and, as appropriate, review and update warehouse management SOPs (e.g., determine application of RMNCH+A and EML guidelines).
 - Document and, as appropriate, review and update inventory management SOPs (e.g., confirm rules for inventory control levels to improve ordering accuracy).
- Develop existing ODISCMS capacity to include information on stock position for GoI programs (e.g., family planning products and vaccines).
- Support adherence to ODISCMS through increased personnel and performance monitoring.

Transportation

Recommendations

- Develop a plan and process for managing and monitoring third party logistics contracts that are awarded (e.g., transportation), including—
 - Personnel requirements
 - Vendor selection criteria
 - Key performance indicators
 - Contracting parameters

- Coordinate with transportation vendor to optimize transportation routes once vendor has been selected.
- Analyze gaps in policy versus application of policy.

LMIS

Recommendations

- Strengthen ODISCMS so that it can replace existing paper-based system—
 - Improve data collection by adding ODISCMS fields, including dispensing data, losses/adjustments, days of stock, expiry information, and number of days/weeks stocked out.
 - Conduct performance and stress testing of ODISCMS to identify current problematic areas within the application.
 - Upon completion of functional requirements, capture, review, and potentially redesign the information technology architecture to address new requirements and application performance.
 - While documenting business processes, capture functional requirements/ enhancements in a Software Requirements Specifications document for NIC.
- For sub-centers, standardize forms and stock-keeping records.
- Enhance data visibility by—
 - Developing an information exchange between systems (e.g., ODISCMS to gain access to the HMIS).
 - Incorporating the SCs' and URCH stock position into ODISCMS through the implementation of a mobile phone-based LMIS at the SCs levels.

Background

As outlined in *A Strategic Approach to Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) in India*, improving maternal and child health and survival is central to the goals of the National Health Mission (NHM) and Millennium Development Goals 4 and 5. Reproductive, maternal, newborn, child, and adolescent health (RMNCH+A) should not be addressed as isolated goals but instead through a “continuum of care” approach. This approach holistically takes into account the various stages of the lifecycle, as well as the places where care is provided.

Health outcomes are linked to various stages of the lifecycle; for example, low birthweight of infants and premature delivery, high under-5 mortality (20 percent of the world’s total), poor nutritional status of women and adolescent girls, and unmet need for contraception (27 percent among married adolescents and low condom use among adolescents in general) are issues that are interconnected. Improving these health outcomes at various stages of the lifecycle needs to occur at all levels of the health system, from the community to health facilities at all levels.

India’s strong community-based program (including 8.7 lakh Accredited Social Health Activists [ASHA] workers), as well as a three-tiered health system, provides a strong platform for delivery of services across the entire continuum of care, ranging from community to primary healthcare, as well as first referral-level care to higher referrals and levels of care.

Given this context and as part of ongoing support to the implementation of the RMNCH+A strategy, the Government of India’s (GoI’s) Ministry of Health and Family Welfare (MOHFW) requested that the U.S. Agency for International Development (USAID) provide technical assistance in supply chain management of essential RMNCH+A commodities. USAID has engaged the USAID | DELIVER PROJECT, which John Snow, Inc. (JSI) implements, to provide technical support to the GoI on supply chain management of RMNCH+A commodities, including condoms, sexually transmitted infection (STI) and opportunistic infection (OI) drugs. To further the goal of providing comprehensive and integrated health services to mothers, infants, children, and adolescents, the project will work at the national level and in six states (Uttarakhand, Jharkhand, Himachal Pradesh, Haryana, Punjab, and Delhi) where USAID is the lead development partner under the *Call to Action for Child Survival and Development* to strengthen the supply chain management systems of RMNCH+A commodities.

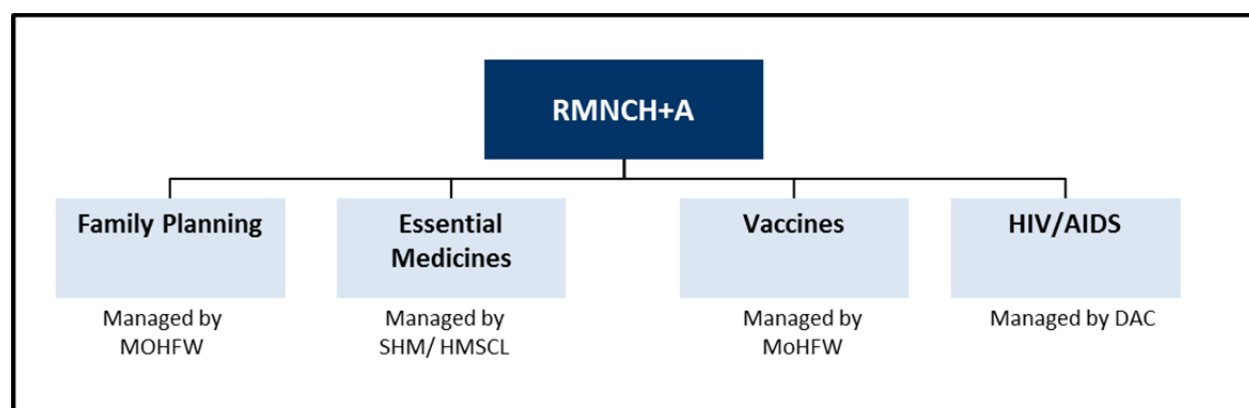
The NHM and the Department of AIDS Control (DAC) manage RMNCH+A supplies at the national level and through their respective state institutions—State Health Mission (SHM)/ Haryana Medical Supplies Corporation Limited (HMSCL) and State AIDS Control Societies (SACS). The NHM’s and the Department of AIDS Control’s (DAC’s) annual monitoring reports indicate improvements within key supply chain functions, including information recording and reporting and storage and distribution systems. However, anecdotal evidence exists of an increased proportion of facilities (and clients) signaling the shortage of essential medical supplies. Therefore, with support from the MOHFW, the project conducted a comprehensive survey in two priority states—Haryana and Jharkhand—to document the issues around commodity availability and management at various levels within the four supply chains—i.e., essential medicines, family planning, vaccines, and reproductive tract infection (RTI)/STI and HIV and AIDS—that impact the RMNCH+A strategy.

This survey is part of a series of four activities (under the direction of the MOHFW and Haryana's SHM/ HMSCL) the project deployed to build a real-time picture to show how each supply chain function is working. Together these activities provide a comprehensive understanding of how supply chains are operating and can inform recommendations for the SHM/ HMSCL and project partnership. The survey is also intended to provide baseline data for project interventions.

Overview of Haryana Supply Chains

In Haryana, as in other states, products the RMNCH+A strategy highlights and the ones listed in the RMNCH+A 5x5 matrix currently fall within four independent supply chains: essential medicines, family planning, vaccines, and RTI/STI and HIV and AIDS. As illustrated in Figure 1 below, a different controlling body within the MOHFW manages and operates each supply chain. Therefore, each system has separate policies and practices for forecasting and supply planning, product selection and procurement, warehousing and inventory control, transportation, logistics management information systems (LMIS), strategic planning and oversight, and human resources.

Figure 1. Supply Chains Supporting the RMNCH+A Commodities



Essential Medicines

The SHM/ HMSCL manages essential medicines. Haryana has adapted the 2011 National Essential Medicines List (EML) to create its own state-specific EML that is updated annually. The EML specifies which medicines should be available at each of the four health facility levels within the state: general hospitals, community health centers (CHCs), primary health centers (PHCs), and sub centers (SCs).

In 2013, Haryana overhauled its essential medicines supply chain. Products, which the SHM/ HMSCL orders, are now sent directly from the vendors to newly designed regional warehouses located throughout the state. From the regional warehouses (currently 7 but soon to be 10), the commodities are picked up or delivered to 21 district stores, hospitals, CHCs, and PHCs. SCs pick up commodities from PHCs, and community health workers (ASHAs) pick up products from the SCs. In cases where products are not available at the regional warehouses, hospitals, CHCs, and PHCs can acquire commodities through local procurements using allocated facility funds.

As part of the overhaul, Haryana rolled out the Online Drug Inventory and Supply Chain Management System (ODISCMS). The ODISCMS is intended to be used by all levels within the system, except for SCs and ASHAs, to help track commodity flow from time of procurement to use

within a facility. District stores, PHCs, and CHCs use the ODISCMS to order product from the warehouses monthly, while product for hospitals is ordered biweekly. Facilities are also supposed to report, at a minimum, every week availability and consumption of all essential medicines at the facility.

ASHAs report their consumption of essential medicines to SCs using paper-based forms. SCs aggregate data from all ASHAs affiliated with the facility and send them to the PHCs and district health offices along with their monthly reports. General hospitals, PHCs, and CHCs also send data independently (via the ODISCMS and other reports) to the district office. Once the district aggregates all lower-level reports, they are sent to the state.

Family Planning

Family planning is a centrally-funded program that the GoI manages through the MOHFW. Since its inception in 1952, as the world's first family program, its emphasis has evolved from reducing birth rates to promoting reproductive health and reducing maternal and infant mortality and morbidity. It aims to promote family planning on the basis of voluntary and informed choice for both short- and long-term methods. The GoI is committed to providing family planning and related services and, in response, launched National Family Planning Policy 2000. The policy promotes informed choice and availability of reproductive health services.

According to GoI policy, beginning at the SCs level, all public health facilities should be able to offer all spacing methods, including condoms, emergency contraceptives (EC), intrauterine contraceptive devices (IUCDs), and oral contraceptive pills (OCPs). ASHAs are also supposed to carry condoms, OCPs, and EC, as well as pregnancy test kits, within villages.¹

The MOHFW is responsible for placing orders annually with pre-selected manufacturers based on quantity requirements sent to the national program by each state. Vendors send family planning orders directly to Haryana's 21 district stores. The districts then deliver products to the hospitals, CHCs, and PHCs. PHCs then deliver commodities to the SCs, where ASHAs pick up their products.

Logistics data for family planning products are submitted as part of the MOHFW health management information system (HMIS) using the computer-based District Health Information System (DHIS-2). ASHAs submit paper reports to SCs where the data from all the ASHAs associated with the SCs is aggregated and sent to PHCs through their own monthly paper-based reports. PHCs, CHCs, and hospitals send data independently to the person in charge of the family planning program at the district office. Once the district aggregates all lower-level reports, a consolidated district report is sent to the state. Similarly, the state completes a monthly state report, consolidating all district-level data into one report and submitting to the national level.

Vaccines

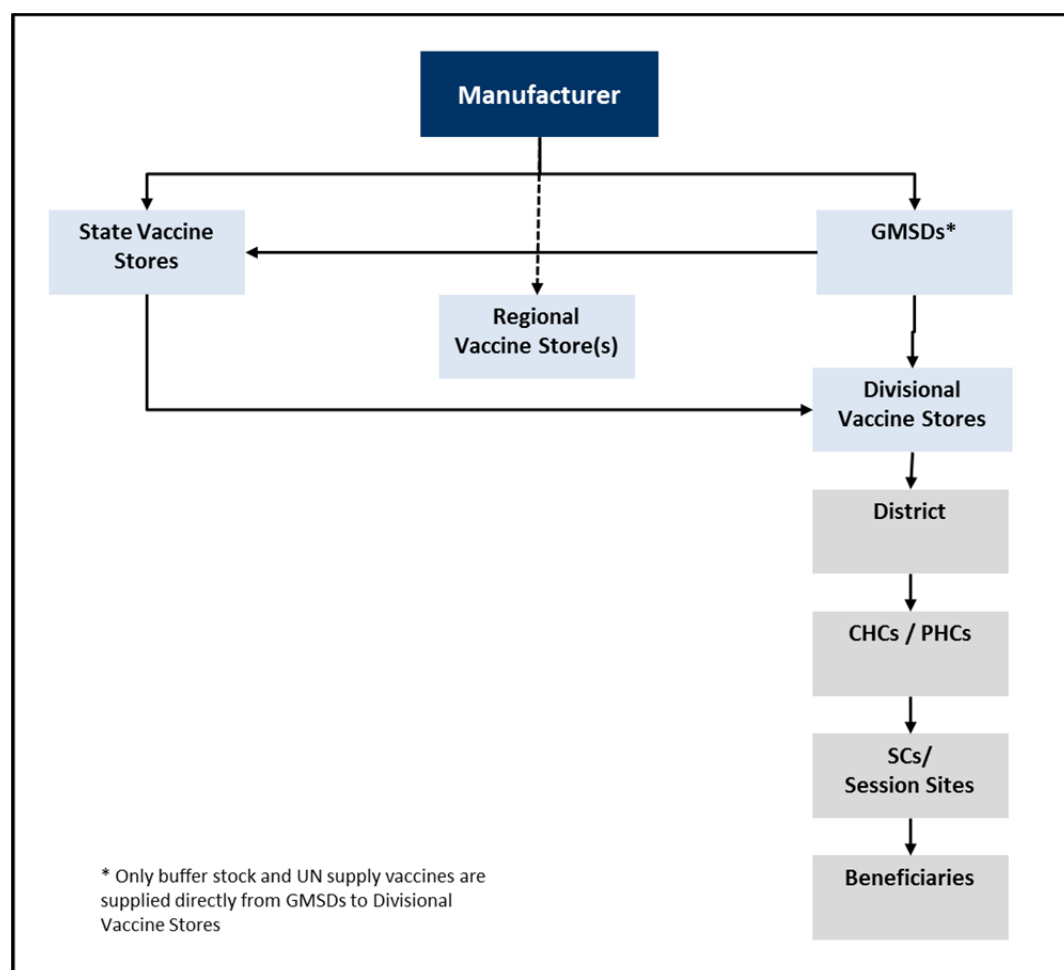
India has one of the largest universal immunization programs (UIPs) in the world. Under the UIP, all children in India are supposed to be inoculated against six deadly vaccine-preventable diseases: tuberculosis, diphtheria, tetanus, pertussis, polio, and measles. Recently, hepatitis B and Japanese encephalitis vaccines have been introduced in selected districts, cities, and states/union territories.

¹ <http://nrhm.gov.in/nrhm-components/rmnch-a/family-planning/background.html>

Cold chain is a system of storing and transporting vaccines at the recommended temperature from the point of manufacture to point of use. To provide potent and effective vaccines to the beneficiaries, a vast cold chain infrastructure is required. It should have a network of vaccine stores, walk-in-coolers, walk-in-freezers (WIFs), deep freezers, ice-lined refrigerators (ILRs), refrigerated trucks, vaccine vans, cold boxes, vaccine carriers, and icepacks from the national level to the states and out to the outreach sessions. All vials also have a vaccine vial monitor (VVM) on their label, which provides a visual indication of whether the vaccine has been kept at the correct temperature.

Since the inception of the UIP, a wide network of cold chain stores has been created consisting of government medical supply depots (GMSDs), state/regional/divisional vaccine stores, and district and PHC/CHC vaccine storage points. Vaccines typically arrive at one of four GMSDs located throughout the country (Karnal, Chennai, Mumbai, and Kolkata), where stock is maintained for a maximum of three months. Vaccines are then transported to state vaccine stores and then move through divisional and district vaccine stores until they reach the last storage point in CHCs or PHCs. Per national guidelines, vaccines should not be stored at the SCs. During immunization sessions, PHCs are responsible for distributing vaccines for use in SCs and at outreach session sites. After the immunization session, unused and unopened vaccines are brought back to the PHC under cold chain on the same day, to be kept in ILRs at the PHC (provided the vial's VVM is in the usable stage). Figure 2 shows the flow of vaccines through the network.

Figure 2. Vaccine Production and Distribution in India



The MOHFW is responsible for placing orders annually with pre-selected manufacturers based on quantity requirements sent to the national program by each state. As Haryana hosts one of the four GMSDs (Karnal), vaccines are delivered directly to the depot; they are also delivered to three other regional vaccine stores within the state. Depending on vaccination schedules, vaccines are delivered once per month, or once every two weeks, to district stores, CHCs, and PHCs to ensure CHCs and PHCs have approximately one month of stock at all times. As part of the HMIS reports, the auxiliary nurse midwife (ANM) at the SCs submits logistics data for vaccines, which are in the form of doses provided to beneficiaries; logistics data for vaccines are collated at the PHC for all SCs. Likewise, logistics data are provided to the higher levels via monthly HMIS reporting.

RTI/STI and HIV and AIDS

RTI/STI drug kits are centrally procured and supplied through the DAC under the MOHFW, along with other HIV- and AIDS-related products, including HIV test kits and antiretroviral therapy (ART). According to national guidelines, minimum RTI/STI services, including treatment, should be available at all PHCs, CHCs, and RTI/STI clinics in hospitals. To help maintain treatment standards, the DAC developed seven pre-packed RTI/STI treatments kits. Kits are numbered and color coded, to be provided at sub-district NHM-supported facilities (sub-divisional hospitals (SDH), CHCs, and PHCs in the district). PHCs are also expected to provide HIV test kits, while treatment for HIV and AIDS is provided at Link-ART Centers and ART clinics located at designated CHCs and hospitals.

As with other centrally-funded programs, the DAC procures all commodities annually. Commodities are directly supplied to district-level consignees under the RTI/STI prevention and control program. They are then distributed quarterly to hospitals, CHCs, and PHCs. District stores are expected to store enough buffer stocks to support facilities' needs.

Logistics data for RTI/STI and HIV and AIDS commodities are submitted to districts from individual facilities. The ANM/medical officer generates monthly reports at PHCs, which are then transmitted to CHCs. The district Reproductive Child Health (RCH) Officer then compiles them at the district level. The district RCH officer uploads the monthly reports into the DAC's Strategic Information Management System at the beginning of every month. The medical officer in charge and the STI counselor at designated STI/RTI clinics submit monthly reports to SACS.

Survey Purpose and Objectives

The goal of this survey is to provide information regarding the availability of key tracer commodities at service delivery points (SDPs) and regional/district warehouses. This survey also aims to measure other key indicators of systems performance at various levels of public sector health facilities that the MOHFW, NHM, or DAC manages. These facilities include hospitals, CHCs, PHCs, and SCs. The information gathered in this survey will help to design interventions to improve the functioning of the overall supply chain system.

The specific objectives of the assessment include—

- Providing information on the ability of districts to manage various supply chain functions, including storage, maintenance of information systems (e.g., logistics records and reports), distribution to lower-level facilities, training and routine monitoring, and logistics capacity of personnel

- Assessing the availability of 42 selected RMNCH+A, OI, STI, and HIV and AIDS products, as well as duration and frequency of stockouts in the last three months
- Determining a baseline for benchmarking current systems performance and measuring the success of upcoming project interventions
- Identifying key points to strengthen the supply chain system and help shape the next steps needed for supply chain improvements.

Assessment Methodology

The survey used an adapted version of the Logistics Indicators Assessment Tool (LIAT), a standardized tool the project developed. The LIAT has been applied in many countries around the world, including those in the Southeast Asia region. The tool was adapted and customized specifically for this study and the context within the states. It was further revised with input from data collectors during the training period and following a pilot test. The final version of the tool can be made available via email at askdeliver@jsi.com.

The assessment captured health commodity systems performance and commodity availability at all levels of facilities in the public health system, including SDPs (primary, secondary, and tertiary levels) and warehouses (district and state); the assessment provides stakeholders with up-to-date information on the current operating systems for commodities management related to the RMNCH+A strategy. The project identified 42 products as “tracer commodities” in close consultation with the SHM/ HMSCL, USAID, and key development partners. The complete list is included in Appendix E.

The project partnered with IMS Health, an internationally recognized organization with a strong presence in India and knowledge of India’s health system, to carry out the survey.

The study assessed product availability and specific logistics activities, including reporting, ordering, inventory control, issuing, transportation, training, supervision, and maintaining storage conditions. Data were collected through direct observation—e.g., of storage areas and available records and reports—and conducting a physical inventory. Data were also collected by interviewing the facility-level officers in charge and facility-level personnel responsible for managing and storing commodities. To ensure entrance into the facilities, a letter from the SHM/ HMSCL was circulated, which was followed up by direct contact with the district program managers and medical officer in charge. This was done to provide them with background information on the purpose and objectives of the assessment. Visits to facilities were also scheduled in advance.

Sampling Framework

The survey was designed as a cross-sectional quantitative study. To ensure results were comparable at each level of the system, the power of results was calculated at 90 percent confidence interval and 8 percent margin of error.

In each state, a census of warehouses, district stores, and hospitals was conducted. A multistage cluster sampling was then used to select primary- and secondary-level facilities. The three stages of this sampling methodology are as follows—

- Districts selected through probability proportional to size (PPS);
- Randomized selection of CHCs and PHCs/Urban Reproductive Child Health (URCH) centers within chosen districts
- SCs and urban dispensaries selected based on their affiliation with the CHCs/PHCs

To ease logistics during data collection, a set number of facilities at each level were selected for each district. Probability weights were calculated and applied during data analysis to provide representation at the state level.

Two facility lists were used during the sampling. For stages one and two, districts and facilities were selected using the “institution list register,” which was downloaded from the ODISCMS portal on February 23, 2014. In stage three, facilities were selected from Haryana’s HMIS December 2013 facility list. Urban dispensaries, which were recently added to the NHM structure and serve the same purpose as SCs in urban areas, were not included in either of the lists. Therefore, it was decided that the urban dispensaries would be randomly selected from a list located at each district store.

Through a sampling process, 10 districts across Haryana were selected for the survey (Figure 3). While not specifically part of the sampling frame, a mix of RMNCH+A priority and non-priority districts were selected. The selected sample size included 11 warehouses (7 essential medicines and 4 vaccine warehouses), 21 central/district stores, 20 general hospitals, and 333 SDPs (Table 1).

Figure 3. Map of Haryana and Selected Districts

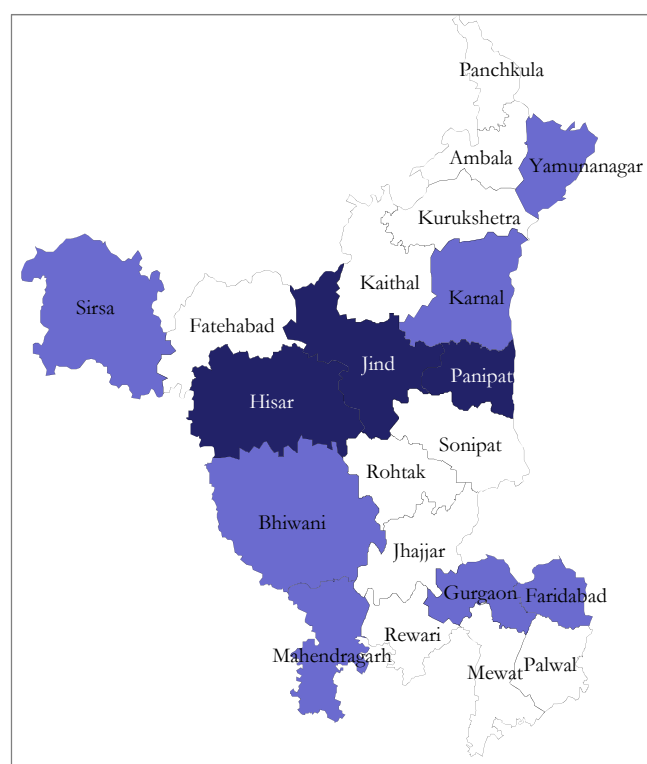


Table 1. Haryana Health Center Sampling Frame

Selected Districts	CHCs/SDH	PHCs/ URCHs	SCs	Urban Dispensaries
Bhiwani	13	13	12	1
Faridabad	5	13	5	8
Gurgaon	7	13	8	5
Hisar*	10	13	10	3
Jind*	8	13	12	1
Karnal	7	13	12	1
Mahendragarh	7	13	12	1
Panipat*	3	13	10	3
Sirsa	8	13	11	2
Yamunanagar	7	12	12	1
TOTAL	75	129	104	25

*RMNCH+A priority districts

Higher-Level Facilities	Total
Essential Medicines Warehouses	7
Vaccine Warehouses	4
Central/District Stores	21
General Hospitals	20

Indicator Choice

A set of standard indicators was selected to provide stakeholders with comprehensive information about the current situation. Table 2 lists a selection of these indicators.

Table 2. List of Select Indicators

Indicators	Data Source(s)
Stock Status	
Availability of products on the day of visit	Physical inventory
Percentage of facilities stocked out of products in the previous three months	Stock records
Average number of days a product was stocked out in the previous three months	Stock records
Average frequency of stockouts of a product in the previous three months	Stock records
LMIS	
Recordkeeping	
Percentage of facilities with stock records available by product	Presence of stock records
Percentage of stock records updated by product	Evidence of use of stock records in specified time period
Percentage of facilities with accurate stock balances on stock records by product	Comparison of stock record balance and physical inventory count
Percentage of facilities with accurate stock balances in ODSCMS by product (essential medicines only)	Comparison of ODSCMS balance and physical inventory count
Reporting	
Percentage of stores that reported sending reports to higher level	Respondent
Ordering and Inventory Control	
Percentage of facilities that had to place an emergency order in the previous three months	Respondent
Human Resources	
Percentage of facility personnel trained in recordkeeping	Respondent

Indicators	Data Source(s)
Percentage of facilities with inventory Guidelines	Respondent
Percentage of facilities with copy of RMNCH+A 5x5 matrix	Respondent
Transportation	
Responsibility for transportation of products	Respondent
Method of transportation used	Respondent
Storage	
Percentage of facilities that maintain acceptable storage conditions	Visual observation
Percentage of facilities that maintained the recommended storage condition, for each storage condition	Visual observation

Data Collection

Before the assessment began, a team of 26 data collectors, plus supervisors, participated in a six-day training in Gurgaon, Haryana, India, on the use of LIAT and Magpi, a mobile application used for data collection. The orientation included a discussion of data collection guidelines to (1) identify the types of information to be gathered and (2) standardize the data collection process to promote the comparability of results. Participants received a comprehensive set of guidelines on implementing field work, tips for data collection, instructions on how to use the tablets and global positioning system (GPS) devices for data collection, instructions for the LIAT forms, and additional job aids to use as reference guides while in the field.

Data were collected using Lenovo Idea Tab a1000 Android tablets and the Magpi mobile application, which Datadyne designed. Magpi facilitates the transfer of data through forms on phones and transmits data from the phones directly to the Internet. Data collectors also used a supplemental paper-based tool to record notes about the facilities.

During the training, input from the survey team members was integrated into the survey tool, which was pilot tested. All data collectors participated in a half-day pilot test in one of five health facilities in Gurgaon. During this pilot testing, data collectors were able to practice applying the tool and identifying additional modifications necessary to improve data collection. Changes that participants suggested during the pilot were then incorporated into the final version of the tool.

Data collection took place over the course of four weeks (May 1–31, 2014).² Twenty data collectors were assigned to ten teams. The teams were dispatched to different districts to collect data from selected health facilities.

²Additional data collection occurred at 15 facilities during the week of June 9–13.

Data Management and Analysis

Records were uploaded directly from Lenovo tablets to the web-based Magpi database. IMS Health staff inventoried, cleaned, and validated the records in the database throughout the data collection period.

The format of records received in Magpi allowed for easy transferring of data to Microsoft® Excel. However, additional steps were required to format records for analysis in other packages such as SPSS. Data cleaning and validation continued for two weeks following the completion of data collection. Some problems encountered during this process included receipt of duplicate records, failure of transmission of some records due to poor connectivity, and data entry errors such as incorrect facility codes.

Analysis of the data was conducted in SPSS. For purposes of analysis, “not applicable,” “not specified,” and “missing” responses were removed from the denominators. Results were disaggregated by facility type (i.e., warehouse, district store, hospital, CHC, PHC, and SC).

Quality Assurance

Several methods were used to ensure quality adherence throughout the assessment process. The data collection instrument was reviewed before the training to ensure it was adapted to the current situation. The instrument was reviewed and modified again following a pilot test during the training, with input from data collectors. The training also included a comprehensive review of the tool to ensure data collectors were fully versed in the questions and methodology before field data collection.

One supervisor oversaw four to five field researchers. The supervisor’s responsibility was to check on the execution and accuracy of data entry on the tablets by observing each field researcher. If the supervisor was not able to accompany the field researcher during the actual visit, the supervisor visited the facility to cross check the work of the researcher. A supervisor team was also set up in Delhi to call respondents at facilities to check the consistency of answers versus the encoded data. Supervisors also verified whether an interview and the stock review took place in the facility.

Several quality safeguards were incorporated into the data entry program, such as automatic skips, where appropriate; range checks; and coding checks. A validating team was set up to manually “edit” encoded data by checking consistency and completeness of answers. Those considered “re-asks” were sent back to the field team for verification.

After data were entered into the SPSS database, quality checks and validation were completed to ensure accuracy of the database. Preliminary analyses and frequencies were run before a full data analysis to ensure consistency within the database.

Limitations

Several limitations of the survey exist that should be considered at the time of interpretation of results:

- **Non-Response Bias:** Survey findings are based on available data, so for questions based on facility records or reports, only facilities that had records or reports could be included in the results. Therefore, some results may not be representative of all facilities.

- **Interview Bias:** Respondents self-reported actions related to ordering and reporting procedures, which were not confirmed by further document review.
- **Lack of Universal Facility List:** As mentioned earlier, two facility lists were used in the selection of lower-level facilities; neither list included urban dispensaries. An assumption was made that urban dispensaries were located in all urban areas. However, upon arrival at the districts, it was found that most dispensaries had recently been upgraded to URCH or PHC levels. In Gurgaon, Faridabad, and Panipat, this resulted in URCHs being covered instead of urban dispensaries. In Bhiwani, Hisar, Jind, Karnal, Mahendragarh, Sirsa, and Yamunanagar, additional SCs not associated with any of the sampled PHCs were visited instead of urban dispensaries.
- **Time Period Issues Due to Financial Year (FY) Overlap:** The timing of the survey overlapped with the end of FY 2013 (March 31) and the beginning of FY 2014 (April 1) in India. Many facilities follow the practice of starting new record books at the start of the FY. As a result, some FY 2013 records were packed/stored elsewhere. This meant that field workers could not capture historical product availability for the full period of the record review and likely underrepresent the actual situation.

Additionally, entries in the FY 2014 registers copied from old registers were made on or around April 1, which for purposes of data collection constituted “updated records.” Consequently, more records might have been considered “updated” and included in the analysis, possibly skewing these results.

- **Missing Interviews with Commodity Managers:** While all attempts were made to interview relevant staff, including advance scheduling and repeated visits to facilities, some interviews were not conducted with commodity managers most familiar with ordering, procedures, or what sources for funding or supplies were being used for each of the product groups. In some cases, field workers were sent to interview relevant substitutes who could not provide answers for the information being sought; in other cases, the interview was skipped.
- **Inaccessible Storage Locations:** Storage locations were inaccessible at several facilities due to the commodity manager’s absence from the facility on the day of visit.

It should be noted that none of these limitations is unusual for a survey of this type.

Findings for Essential Medicines, Vaccines, Family Planning, and HIV and AIDS and RTI/STI Commodities

Description of Facilities

A total of 386 facilities were visited during the survey. As mentioned above, inaccurate assumptions were made regarding urban dispensaries, resulting in more PHCs/URCHs and fewer SCs/urban dispensaries being visited than originally sampled. Table 3 below presents the final breakdown of warehouses, district stores, hospitals, CHCs, PHCs, and SCs by district visited.

Table 3. Health Facilities Sampled by District and Type

	Warehouses *	District Stores	General Hospitals	CHCs**	PHCs*	SCs
Ambala	1	1	1	.	.	.
Bhiwani	1	1	1	13	13	13
Faridabad	.	1	1	5	21	5
Fatehabad	.	1	1	.	.	.
Gurgaon	2	1	1	7	16	8
Hisar	2	1	1	11	12	14
Jhajjar	.	1	1	.	.	.
Jind	.	1	1	8	13	12
Kaithal	1	1	1	.	.	.
Karnal	1	1	.	7	13	13
Kurukshetra	1	1	1	.	.	.
Mahendragarh	.	1	1	7	13	13
Mewat	.	1	1	.	.	.
Palwal	.	1	1	.	.	.
Panchkula	.	1	1	.	.	.
Panipat	.	1	1	3	16	10
Rewari	.	1	1	.	.	.
Rohtak	2	1	1	.	.	.
Sirsa	.	1	1	8	14	13

	Warehouses *	District Stores	General Hospitals	CHCs**	PHCs*	SCs
Sonipat	.	1	1	.	.	.
Yamunanagar	.	1	1	7	12	14
Total	11	21	20	76	143	115

*11 warehouses (7 essential medicine and 4 vaccine warehouses)

**For purposes of analysis, subdistrict hospitals were classified as CHCs, and URCHs centers were classified as PHCs.

In addition to collecting data on commodity availability, the survey collected information to evaluate the supply chain performance. At each facility, interviews were conducted with the facility manager in charge. Interviews were also conducted with the person(s) responsible for managing the products to ascertain information on ordering and reporting procedures or what sources for funding or supplies were being used for each of the product groups. Depending on the size and structure of the facility, the field staff interviewed one person who completed all necessary sections or four separate people. Therefore, in total, 271 interviews were conducted with facility officers in charge at warehouses; district stores; general hospitals; CHCs; and PHCs, and 115 interviews were conducted with ANMs at the SC level. In addition, 330 interviews were conducted with commodity managers: 247 responded to questions on essential medicines; 208 responded to questions on family planning; 217 responded to questions on vaccines; and 70 responded to questions on RTI/STI and HIV and AIDS testing and treatment commodities.

Stock Management and Availability

The following section discusses the availability of products at each level of the system in Haryana. Three key questions that help to determine how well facilities have been able to provide the necessary products to clients, when needed, are examined. The three questions are—

1. Does the facility manage the product per national/state operating procedures and guidelines?
2. Is the facility able to provide the product on the day of visit?
3. Has the facility been able to provide the product within the previous three months?

As mentioned earlier, 42 commodities were selected as tracer products. These products cover four supply chains: essential medicines, vaccines, family planning, and RTI/STI and HIV and AIDS. Field workers collected data for this section by physically counting products in storerooms and reviewing stock-keeping records.

For a full list of the 42 commodities by facility level, see Table E1 in Appendix E.

Essential Medicines

Twenty-four essential medicines were included in this assessment (Table 4). The essential medicines and dosages included in this survey were selected using the RMNCH+A 5x5 matrix and the Haryana EML. As mentioned above, they were also reviewed with colleagues at the SHM/ HMSCS and other development partners.

Table 4. Essential Medicines Commodities Included in the Assessment

Albendazole (400 mg, Tb)	IFA-(Red) (100 mg Fe/500 mcg FA, Tb)
Ampicillin (500 mg, Vial)	IFA Syrup (100 mg Fe/500 mcg FA/ 5 ml)
Amoxicillin (250 mg, Cap)	Magnesium Sulfate (500 mg/ml, Amp)
Azithromycin (500 mg, Tb)	Methyldopa (250 mg, Tb)
Cefixime (200 mg, Tb)	Metronidazole (200 mg, Tb)
Ceftriaxone (250 mg, Vial)	Misoprostol (200 mcg, Tb)
Co-trimoxazole (800 mg. sulfamethoxazole/160 mg trimethoprim, Tb))	ORS (Sachet)
Co-trimoxazole ST (100 mg sulfamethoxazole/20 mg Trimethoprim, Tb) (Co-trimoxazole ST)	Oxytocin (5 IU/ml, Bottle)
Dexamethasone (2ml, Amp)	Vitamin A (100,000 IU/ml, Bottle)
Doxycycline (100 mg, Cap)	Vitamin K (1 ml, Amp)
Gentamycin (40 mg/ml, Vial)	Zinc Sulfate (20 mg, Tb)
IFA-(Blue) (100 mg Fe + 500 mcg FA, Tb)	Tetanus Toxoid (0.5 ml, Amp)
IFA=iron folic acid Fe=iron FA=folic acid ORS= Oral rehydration salt Amp=Ampoule Cap=Capsule Tb=Tablet Note: To differentiate between the two formulations of Co-trimoxazole, “Co-trimoxazole 100 mg sulfamethoxazole/20 mg Trimethoprim” will be referred to as “ Co-trimoxazole ST ” in the report and subsequent tables.; IFA (Blue) tablets are provided to adolescents through the Weekly Iron-Folic Acid Supplementation (WIFS) program while IFA (Red) tables are provided to pregnant women	

According to Haryana’s EML guidelines, all facility levels in the district are required to manage all 24 essential medicines assessed in the survey. These medicines are indispensable for the provision of the maternal, neonatal, and child health services defined in the public mandate. SCs, which provide a smaller range of services, are required to manage at least 15 products (Table 4) assessed in the survey. The average number of essential medicines managed in facilities across all levels of the system is below the 24 product minimum required by the national guidelines. General hospitals and CHCs regularly managed the most products (21.1 and 20.2 products, respectively), while district stores regularly managed the least, at an average of only five products.

Regarding product availability, facilities at all levels of the system are far below the EML-required minimum (Table 5). Similar to product management, hospitals had the most product availability (19.8) followed by CHCs (17.8). Warehouses had an average of only 9.6 products available on the day of visit, and SCs only had 6.3. District stores had the least amount of products available (1.6).

Table 5. Average Number of Essential Medicines Managed and Available on Day of Visit

Facility Level	# of Products Required to Manage per Guidelines/EML	# of Products Managed (mean)	# of Products Available Day of Visit (mean)
Warehouses (n=7)*	24	13.6	9.6
District Stores (n=18)	24	5.0	1.6
General Hospitals (n=20)	24	21.1	19.8
CHCs (n=76)	24	20.2	17.8
PHCs (n=143)	24	18.2	15.3
SCs (n=112)	15	8.7	6.3
STATE AVERAGE (n=380)		10.9	8.5
STATE AVERAGE (excl SC) (n=217)		18.3	15.5

*11 warehouses (7 essential medicine and 4 vaccine warehouses)

Only four products were managed in 80 percent or more of the facilities at all levels of the system: albendazole (97.5 percent), ORS (84.4 percent), IFA (red) (81.5 percent), and vitamin A (81.5 percent) (Table 6). Products that were managed at the fewest facilities include cefixime (22.3 percent), vitamin K (20.8 percent), ceftriaxone (15.5 percent) and methyldopa (15.1 percent). It is important to note that many products that were managed at warehouses, hospitals, CHCs, and PHCs were not often managed at the district stores or SCs. In fact, very few products were managed consistently across facilities at district stores and SCs.

Table 6. Percentage of Essential Medicines Managed at the Facility in the Previous 12 Months by Facility Type

	Ware-houses (n=7)	District Stores (n=21)	General Hospitals (n=20)	CHCs (n=76)	PHCs (n=129)	SCs (n=129)	Total	Total Excluding SCs
Albendazole	100.0	33.3	100.0	100.0	100.0	97.4	97.5	97.9
Amoxicillin	100.0	14.3	100.0	98.7	95.2	20.3	37.0	93.6
Ampicillin	100.0	14.3	100.0	96.6	74.7	7.6	23.7	78.5
Azithromycin	100.0	19.0	100.0	98.7	93.7	6.8	26.3	92.7
Cefixime	85.7	14.3	100.0	91.5	83.8	4.3	22.3	83.8
Ceftriaxone	100.0	4.8	100.0	74.2	59.5	1.7	15.5	62.5
Co-trimoxazole	71.4	23.8	80.0	80.4	72.9	20.2	32.2	73.2
Co-trimoxazole ST	71.4	9.5	25.0	27.5	23.0	58.6	50.8	24.1
Dexamethasone	100.0	14.3	100.0	98.3	86.8	24.7	39.0	87.6
Doxycycline	100.0	19.0	100.0	98.7	94.5	11.0	29.7	93.3
Gentamycin	85.7	19.0	85.0	89.7	82.6	9.6	26.1	82.2
IFA (blue)	100.0	28.6	40.0	45.5	44.1	39.9	40.9	44.4
IFA (red)	100.0	19.0	100.0	94.3	89.0	79.5	81.5	88.4
IFA Syrup	57.1	19.0	65.0	67.7	75.5	77.9	76.4	71.6
Magnesium Sulfate	100.0	9.5	100.0	94.7	68.6	24.7	35.8	73.6

	Ware-houses (n=7)	District Stores (n=21)	General Hospitals (n=20)	CHCs (n=76)	PHCs (n=129)	SCs (n=129)	Total	Total Excluding SCs
Methyldopa	71.4	14.3	85.0	73.5	46.2	4.1	15.1	52.4
Metronidazole	85.7	4.8	80.0	89.0	70.5	23.5	34.7	72.8
Misoprostol	85.7	14.3	95.0	92.5	76.9	29.6	40.8	79.0
ORS	100.0	19.0	100.0	97.8	97.2	81.2	84.4	95.0
Oxytocin	100.0	19.0	100.0	91.6	76.3	22.1	35.0	78.8
Tetanus Toxoid	42.9	52.4	80.0	94.5	91.7	34.4	47.1	90.3
Vitamin A	100.0	19.0	100.0	92.2	91.1	79.2	81.5	89.4
Vitamin K	28.6	19.0	85.0	69.3	53.7	10.2	20.8	56.6
Zinc Sulfate	100.0	4.8	90.0	66.1	74.7	77.7	76.3	71.4

Stock Availability

The survey found that stockouts in essential medicines were frequent across all levels of the system and varied among products. General hospitals had lower stockout rates and more product availability compared with other facility levels. However, even hospitals experienced stockout rates over 20 percent for several products (e.g., IFA syrup, methyldopa, IFA [blue], and co-trimoxazole ST).

Stockout rates varied widely among essential medicines, with rates between 8 percent for zinc sulfate and 49.4 percent for co-trimoxazole ST. The most frequently stocked out products on the day of visit across all facilities levels were co-trimoxazole (49.4 percent), IFA (blue) (41.6percent percent), IFA syrup (41.1percent percent), vitamin K (39.2percent percent), and methyldopa (37.2 percent). The most available products across facilities in Haryana were zinc sulfate (8.0 percent), ORS (9.7 percent), amoxicillin (10.1 percent), magnesium sulfate (10.6 percent), and ceftriaxone (10.6 percent).

Table 7 provides further information on the level of availability of each essential medicines product at the sites on the date of the visit.

Table 7. Percentage of Stockouts of Essential Medicines on the Day of Visit by Product and Facility Type

	Ware-houses	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total Excl. SCs
Albendazole	0.0	71.4	0.0	3.6	4.1	18.5	15.3	4.5
Amoxicillin	14.3	100.0	0.0	1.4	5.2	17.5	10.1	4.7
Ampicillin	0.0	66.7	0.0	5.6	8.6	21.8	11.2	7.7
Azithromycin	14.3	100.0	0.0	2.4	6.7	49.6	14.9	6.2
Cefixime	50.0	66.7	0.0	5.3	12.6	39.5	15.3	11.1
Ceftriaxone	14.3	100.0	5.0	11.6	11.7	0.0	10.6	11.6
Co-trimoxazole	100.0	80.0	6.3	27.9	30.7	69.6	49.4	30.5
Co-trimoxazole ST	100.0	50.0	20.0	43.6	60.1	33.1	35.6	55.9
Dexamethasone	71.4	66.7	5.0	9.1	25.6	34.5	28.0	21.7

	Ware-houses	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total Excl. SCs
Doxycycline	0.0	75.0	5.0	1.4	1.5	68.9	21.2	2.0
Gentamycin	0.0	50.0	0.0	10.0	7.6	45.0	18.7	8.2
IFA (blue)	28.6	16.7	25.0	34.7	43.0	42.2	41.6	39.9
IFA (red)	0.0	75.0	0.0	4.0	14.2	17.7	16.2	11.7
IFA Syrup	100.0	100.0	38.5	51.1	59.4	36.5	41.1	57.9
Magnesium Sulfate	14.3	100.0	0.0	4.5	12.4	11.1	10.6	10.1
Methyldopa	100.0	100.0	29.4	26.8	39.4	39.6	37.2	36.5
Metronidazole	50.0	100.0	12.5	13.5	12.0	43.1	28.8	13.0
Misoprostol	50.0	100.0	5.3	5.7	15.5	18.2	16.1	13.5
ORS	0.0	75.0	0.0	2.9	8.0	10.7	9.7	6.9
Oxytocin	57.1	75.0	0.0	14.9	16.5	31.2	23.6	16.4
Tetanus Toxoid	0.0	9.1	6.3	0.0	2.3	n/a	n/a	2.0
Vitamin A	0.0	75.0	5.0	7.5	13.8	14.9	14.3	12.4
Vitamin K	100.0	100.0	5.9	44.2	36.2	41.3	39.2	38.0
Zinc Sulfate	0.0	100.0	16.7	20.1	16.1	5.7	8.0	16.8

Table 8 shows stockouts of products over the last three months. Similar to the previous table, stockouts were frequent and varied widely among products. IFA (blue) and IFA syrup had high stockout rates on both the day of visit (41.6 percent and 41.1 percent, respectively) and within the past three months (22.7 percent and 20.3 percent, respectively).

Table 8. Percentage of Stockouts of Essential Medicines Commodities within Last Three Months by Product and Facility Type

	Ware-houses	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total Excluding SCs
Albendazole	0.0	50.0	0.0	4.5	7.6	11.9	10.6	6.9
Amoxicillin	0.0	100.0	0.0	5.6	8.2	18.4	10.9	7.5
Ampicillin	0.0	0.0	0.0	0.0	11.9	0.0	6.1	7.1
Azithromycin	0.0	0.0	0.0	6.1	5.9	0.0	5.1	5.7
Cefixime	0.0	0.0	5.3	8.9	10.5	0.0	8.8	9.7
Ceftriaxone	0.0	0.0	6.7	12.1	11.2	0.0	9.5	11.1
Co-trimoxazole	0.0	50.0	9.1	14.1	8.4	22.8	15.1	9.8
Co-trimoxazole ST	0.0	0.0	0.0	20.0	39.3	5.5	7.2	31.0
Dexamethasone	0.0	0.0	0.0	1.4	10.1	7.2	7.0	6.9
Doxycycline	0.0	0.0	5.6	7.3	10.0	32.7	11.7	9.1
Gentamycin	0.0	0.0	6.3	4.9	8.1	34.1	11.0	7.1
IFA (blue)	100.0	0.0	16.7	23.0	23.7	22.6	22.7	23.0

	Ware-houses	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total Excluding SCs
IFA (red)	0.0	50.0	0.0	16.3	16.9	18.0	17.5	16.1
IFA Syrup	0.0	0.0	10.0	27.9	27.3	19.0	20.3	26.4
Magnesium Sulfate	0.0	0.0	5.6	7.6	11.6	0.0	5.7	10.1
Methyldopa	0.0	0.0	28.6	2.3	9.9	0.0	8.0	9.0
Metronidazole	0.0	0.0	7.7	6.6	6.7	12.0	8.6	6.7
Misoprostol	0.0	0.0	7.1	11.5	8.2	19.5	13.1	9.2
ORS	0.0	100.0	0.0	4.9	4.7	8.3	7.3	4.8
Oxytocin	0.0	50.0	11.1	19.2	7.8	31.9	19.0	11.7
Tetanus Toxoid	0.0	0.0	0.0	0.0	2.8	n/a	n/a	2.0
Vitamin A	0.0	100.0	5.9	9.6	13.0	12.5	12.4	12.1
Vitamin K	0.0	0.0	23.1	15.8	16.9	0.0	12.7	17.0
Zinc Sulfate	0.0	0.0	27.3	5.1	5.9	4.0	4.5	6.6

Tables 9 and 10 describe the frequency and duration of stockouts in the three months before the survey. Stockouts for all essential medicines occurred between 1 and 2 times over the last 3 months, and the average duration of these stockouts was nearly 37 days. Though lower-level facilities managed fewer products, stockouts tended to be more frequent, and the duration of these stockouts was longer than higher-level facilities.

Table 9. Average Frequency of Stockouts of Essential Medicine Commodities within Last Three Months by Product and Facility Type

	Ware-houses	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total Excluding SCs
Albendazole	.	1.0	.	1.6	1.0	1.2	1.2	1.1
Amoxicillin	.	1.0	.	1.0	1.3	1.0	1.1	1.3
Ampicillin	1.3	.	1.3	1.3
Azithromycin	.	.	.	1.2	1.0	.	1.1	1.1
Cefixime	.	.	2.0	1.2	1.1	.	1.2	1.2
Ceftriaxone	.	.	1.0	1.9	1.0	.	1.3	1.3
Co-trimoxazole	.	1.0	2.0	1.4	1.4	1.0	1.2	1.4
Co-trimoxazole ST	.	.	.	1.0	1.8	1.0	1.2	1.6
Dexamethasone	.	.	.	3.0	1.0	1.0	1.1	1.1
Doxycycline	.	.	1.0	1.4	1.2	3.0	1.8	1.2
Gentamycin	.	.	2.0	1.0	1.0	1.0	1.0	1.0
IFA (blue)	1.0	.	2.0	1.5	1.1	1.0	1.1	1.2
IFA (red)	.	1.0	.	1.2	1.4	1.1	1.1	1.3
IFA Syrup	.	.	1.0	1.3	1.4	1.1	1.2	1.3

	Ware-houses	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total Excluding SCs
Magnesium Sulfate	.	.	1.0	1.0	1.3	.	1.2	1.2
Methyldopa	.	.	1.3	1.0	1.0	.	1.1	1.1
Metronidazole	.	.	3.0	1.8	1.0	2.0	1.6	1.3
Misoprostol	.	.	1.0	1.0	1.0	1.0	1.0	1.0
ORS	.	1.0	.	1.0	1.2	1.4	1.3	1.1
Oxytocin	.	1.0	1.0	1.2	1.2	1.4	1.3	1.2
Tetanus Toxoid	1.0	n/a	n/a	1
Vitamin A	.	1.0	1.0	1.4	1.0	1.1	1.1	1.1
Vitamin K	.	.	1.3	2.1	1.2	.	1.4	1.4
Zinc Sulfate	.	.	1.7	1.0	1.0	1.0	1.0	1.1

Table 10. Average Number of Days of Stockouts of Essential Medicines Commodities within Last Three Months by Product and Facility Type

	Ware-houses	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total Excluding SCs
Albendazole	.	75.0	.	16.5	18.2	20.8	20.8	21.0
Amoxicillin	.	13.0	.	22.9	30.7	25.1	26.9	29.0
Ampicillin	59.7	.	59.7	59.7
Azithromycin	.	.	.	17.8	41.8	.	35.5	35.5
Cefixime	.	.	5.0	30.5	33.3	.	31.8	31.8
Ceftriaxone	.	.	90.0	35.8	57.8	.	51.7	51.7
Co-trimoxazole	.	23.0	31.0	57.7	40.2	31.5	36.2	43.7
Co-trimoxazole ST	.	.	.	75.5	45.5	24.5	31.8	50.0
Dexamethasone	.	.	.	45.0	45.3	1.0	26.6	45.3
Doxycycline	.	.	5.0	30.4	28.2	89.0	46.7	28.1
Gentamycin	.	.	25.0	8.5	35.1	52.0	39.8	30.1
IFA (blue)	60.0	.	30.0	38.6	37.1	51.0	46.7	37.8
IFA (red)	.	60.0	.	18.6	19.2	18.8	19.0	19.6
IFA Syrup	.	.	90	44.4	28.4	29.4	30.3	33.5
Magnesium Sulfate	.	.	3	49.3	47.4	.	46.4	46.4
Methyldopa	.	.	21.5	7.0	44.3	.	35.3	35.3
Metronidazole	.	.	58.0	45.5	23.6	88.0	59.2	30.9
Misoprostol	.	.	9.0	19.4	34.4	24	25.6	27.6
ORS	.	60.0	.	11.3	13.1	25	23.1	14.6
Oxytocin	.	61.0	24.5	25.0	35.1	26	27.8	30.1

Tetanus Toxoid	27.0	.	.	15.4	23.2	n/a	n/a	21.5
Vitamin A	.	60.0	60.0	16.1	29.2	22.75	24.0	28.0
Vitamin K	.	.	30.0	26.5	30.5	.	29.5	29.5
Zinc Sulfate	.	.	51.0	30.0	70.0	43.55	48.1	59.8

Vaccines

Five vaccine products were assessed in this survey, including ones for bacillus Calmette–Guérin (BCG); diphtheria, tetanus, and pertussis (DPT); hepatitis B; measles; and oral polio Vaccine (OPV). As mentioned earlier, national guidelines indicate that facilities at all levels of the supply chain, except for SCs, are required to manage each of these five products. (Therefore, SCs have been removed from the following analysis and excluded from overall totals.) In addition to the four regional vaccine warehouses, essential medicines warehouses will at times manage hepatitis B vaccines, which are purchased through the essential medicines supply chain.

The average number of products managed across all facility levels was only slightly below guideline requirements, with most levels managing all five products (Table 11). Regarding product availability, the state average also fell only slightly below the five product minimum. However, availability varied among products at different levels of the system (3.8 to 5.0).

Table 11. Average Number of Vaccines Managed and Available on Day of Visit

Facility Level	# of Products Required to Manage per Guidelines/EML	# of Products Managed (mean)	# of Products Available Day of Visit (mean)
Warehouses (n=5*)	5	4.2	3.8
District Stores (n=10)	5	5.0	5.0
General Hospitals (n=17)	5	4.8	4.8
CHCs (n=73)	5	5.0	4.9
PHCs (n=133)	5	5.0	4.7
STATE AVERAGE (excl SC) (n=238)		4.8	4.7

*In addition to the four (4) vaccine warehouses, Hepatitis B vaccine was found in one (1) essential medicine warehouse and is therefore included in this analysis".

Table 12 provides further information on vaccine product management. As this table indicates, more than half of district stores and approximately 20 percent of hospitals did not manage any vaccines in the 12 months prior to this survey. However, the remaining facilities (i.e., warehouses, CHCs, and PHCs) generally managed the recommended number of products throughout the previous year.

Table 12. Percentage of Vaccines Managed at the Facility in the Previous 12 Months by Facility Type

	Warehouse s (n=4)	District Stores (n=21)	General Hospital s (n=20)	CHCs (n=76)	PHCs (n=129)	Total*
BCG	100.0	47.6	85.0	96.2	93.1	92.2
DPT	100.0	47.6	80.0	93.7	91.1	90.0
Hepatitis B	100.0	47.6	80.0	96.2	93.1	92.0
Measles	100.0	47.6	80.0	96.2	93.1	92.0
OPV	100.0	47.6	80.0	94.5	92.4	91.2

*excludes SCs

Stock Availability

The survey found that stockout rates for vaccines were generally low across all levels of the system (Table 13). Approximately 75 percent of facilities had all five vaccines available on the day of visit. While all vaccine products were generally available throughout the system, a 25 percent stockout rate for hepatitis B vaccine could be seen in warehouses. Hepatitis B and OPV also experienced higher rates of stockout at facilities in lower levels of the system. As Table 13 indicates, 8.4 percent of PHCs and 5.4 percent of CHCs were stocked out of hepatitis B on the day of visit. Interestingly, almost 8 percent of PHCs were stocked out of OPV, yet no stockouts at the other facilities were seen on the day of visit.

Table 13. Percentage of Stockouts of Vaccines on the Day of Visit by Product and Facility Type

	Warehouses	District Stores	General Hospitals	CHCs	PHCs	Total*
BCG	0.0	0.0	0.0	3.2	3.8	3.4
DPT	0.0	0.0	0.0	1.8	3.8	3.1
Hepatitis B	25.0	0.0	0.0	5.4	8.4	7.5
Measles	0.0	0.0	0.0	1.0	2.9	2.4
OPV	0.0	0.0	0.0	0.0	7.6	5.5

*excludes SCs

Table 14 shows stockouts of products over the last three months. Similar to the previous table, stockouts were infrequent and varied marginally among products. BCG had the highest rates of stockout across all facilities, including stockouts at 25 percent of warehouses and close to 8 percent at CHCs and PHCs. Hepatitis B was also stocked out in 25 percent of warehouses but was consistently available at other facility levels.

Table 14. Percentage of Stockouts of Vaccines within Last Three Months by Product and Facility Type

	Warehouses	District Stores	General Hospitals	CHCs	PHCs	Total*
BCG	25.0	0.0	0.0	7.4	7.8	7.5
DPT	0.0	0.0	0.0	2.7	3.5	3.1
Hepatitis B	25.0	0.0	0.0	1.5	1.0	1.3
Measles	0.0	0.0	0.0	4.3	3.5	3.5
OPV	0.0	0.0	0.0	3.0	6.3	5.2

*excludes SCs

Stockouts of vaccines happened between one and three times in the three months before the survey; virtually all of these stockouts occurred at the CHC and PHC levels. The average duration of stockouts for vaccines was 21 days. However, stockouts for several vaccines managed at the PHC level, including DPT and measles, lasted longer than 30 days.

For more information on stockout frequency and duration, see Tables 15 and 16 below.

Table 15. Average Frequency of Stockouts of Vaccines within Last Three Months by Product and Facility Type

	Warehouses	District Stores	General Hospitals	CHCs	PHCs	Total*
BCG	1.0	.	.	1.1	2.0	1.8
DPT	.	.	.	1.6	2.8	2.5
Hepatitis B	3.0	.	.	1.0	1.0	1.3
Measles	.	.	.	1.0	2.8	2.3
OPV	.	.	.	1.0	2.0	1.9

*excludes SCs

Table 16. Average Number of Days of Stockouts of Vaccines within Last Three Months by Product and Facility Type

	Warehouses	District Stores	General Hospitals	CHCs	PHCs	Total*
BCG	27.0	.	.	15.4	23.2	21.5
DPT	.	.	.	15.2	32.5	29.0
Hepatitis B	70.0	.	.	21.0	2.0	18.0
Measles	.	.	.	1.7	35.3	25.7
OPV	.	.	.	6.1	14.4	13.3

*excludes SCs

Family Planning

Five family planning products were assessed in this survey, including condoms, emergency contraception, the Copper T 380A IUCD, oral contraceptive pills (OCP), and pregnancy test kits. According to national guidelines, facilities at all levels of the supply chain should manage all five products. (As mentioned above, family planning products in Haryana are delivered directly to the district level, so the following analysis excludes the warehouses.)

The average number of products managed across all facility levels was below guideline requirements, with all levels managing less than the five product minimum (Table 17). Regarding product availability, the state average was also well below the five product minimum, at only 2.5 products. As the data indicate, fewer products were available at lower levels of the system.

Table 17. Average Number of Family Planning Products Managed and Available on Day of Visit

Facility Level	# of Products Required to Manage per Guidelines/EML	# of Products Managed (mean)	# of Products Available Day of Visit (mean)
Warehouses (--)	N/A	N/A	N/A
District Stores (n=14)	5	4.8	3.9
General Hospitals (n=15)	5	4.2	3.6
CHCs (n=72)	5	4.2	2.9
PHCs (n=132)	5	4.0	2.6
SCs (n=107)	5	3.8	2.5
STATE AVERAGE (n=340)		3.8	2.5
STATE AVERAGE (excl SC) (n=217)		4.1	2.7

Table 18 provides further information on family planning product management. As this table indicates, the IUCD was the most consistently managed product (approximately 90 percent) across all facility levels. The other family planning products were managed far less consistently, with emergency contraception being managed the least, at less than half of all facilities.

Table 18. Percentage of Family Planning Products Managed at the Facility in the Previous 12 Months by Facility Type

	District Stores (n=21)	General Hospitals (n=20)	CHCs (n=76)	PHCs (n=129)	SCs (n=129)	Total	Total (excluding SCs)
Condoms	66.7	70.0	89.4	84.6	72.5	75.2	84.6
Emergency Contraception	52.4	55.0	68.9	53.2	43.7	46.6	56.6
IUCDs	66.7	75.0	86.8	85.4	91.4	89.9	84.8
OCP	66.7	70.0	82.0	71.0	72.9	72.9	73.2
Pregnancy Test Kits	66.7	45.0	73.9	73.5	71.4	71.7	72.5

Stock Availability

The survey found that stockouts of family planning commodities were frequent. CHCs, PHCs and SCs experienced more stockouts compared with facilities at other levels of the system. However, facilities across all levels had stockout rates close to 50 percent for one or more products on the day of visit

Stockout rates varied widely among family planning products, with rates between 7.1 percent for IUCDs and 50.3 percent for emergency contraception. Emergency contraception was the most frequently stocked-out product, with approximately 50 percent of facilities stocked out of the product on the day of visit. Similarly, OCP, condoms, and pregnancy test kits were frequently stocked out, with stockout rates over 40 percent across all facilities.

Table 19 provides further information on the level of availability of each family planning product at the sites on the day of the visit.

Table 19. Percentage of Stockouts of Family Planning Commodities on the Day of Visit by Product and Facility Type

	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total (excl. SCs)
Condoms	28.6	7.1	24.6	34.9	46.5	42.8	31.7
Emergency Contraception	45.5	36.4	43.6	54.1	50.2	50.3	50.6
IUCDs	0.0	0.0	9.6	19.7	4.6	7.1	16.5
OCP	21.4	21.4	42.9	32.5	45.4	42.9	34.4
Pregnancy Test Kits	7.1	11.1	38.1	38.2	41.3	40.2	36.8

Stockouts of family planning commodities within the last three months were not nearly as high as stockouts on the day of visit. However, similar to the previous table, stock rates were still high and variant across the different product types (Table 20). Stockout rates varied from 2.1 percent for IUCDs to 24.3 percent for condoms. Pregnancy test kits were available in more than 80 percent of facilities but experienced 40 percent stockout rates at district stores. Interestingly, stock rates for emergency contraception were much lower within the last three months (5.6 percent) than they were on the day of visit (50.3 percent). This indicates a recent issue with the family planning supply chain or alternatively an issue with the quality of recordkeeping.

Table 20. Percentage of Stockouts of Family Planning Commodities within Last Three Months by Product and Facility Type

	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total (excl. SCs)
Condoms	10.0	10.0	12.6	15.0	28.1	24.3	14.1
Emergency Contraception	9.1	18.2	1.2	5.3	6.0	5.6	4.7
IUCDs	0.0	9.1	1.8	6.1	1.4	2.1	5.0
OCP	10.0	0.0	21.0	11.2	17.1	16.1	12.8
Pregnancy Test Kits	40.0	0.0	22.1	11.7	18.0	17.4	15.3

Tables 21 and 22 describe the frequency and duration of stockouts in the three months before the survey. Stockouts of family planning commodities occurred between one and two times over the last three months; the average duration of these stockouts was approximately 40 days. Stockouts occurred more frequently at lower levels of the system and often lasted longer, with the exception of IUCDs at the SC level. While stockouts of IUCDs occurred just one time across all facilities, with the exception of district stores, their duration lasted only two days at the SC level. This was much lower than the duration of stockouts for this product across facilities at higher levels of the system.

Table 21. Average Frequency of Stockouts of Family Planning Commodities within Last Three Months by Product and Facility Type

	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total (excl. SCs)
Condoms	2.0	1.0	1.0	1.2	1.1	1.1	1.2
Emergency Contraception	1.0	1.0	1.0	1.3	1.6	1.5	1.2
IUCDs	.	1.0	1.0	1.0	1.0	1.0	1.0
OCP	1.0	.	1.0	1.4	1.3	1.3	1.2
Pregnancy Test Kits	1.0	.	1.3	1.0	1.7	1.6	1.1

Table 22. Average Number of Days of Stockouts of Family Planning Commodities Within Last Three Months by Product and Facility Type

	District Stores	General Hospitals	CHCs	PHCs	SCs	Total	Total (excl. SCs)
Condoms	54.0	14.0	17.4	36.3	32.9	32.8	32.2
Emergency Contraception	20.0	46.0	50.0	74.7	61.2	62.5	66.8
IUCDs	.	44.0	28.0	44.8	2.0	20.5	43.4
OCP	57.0	.	12.0	46.2	44.4	42.4	34.3
Pregnancy Test Kits	40.8	.	27.2	51.4	44.9	44.3	41.8

RTI/STI and HIV and AIDS

Eight HIV and AIDS commodities were included in this assessment, including drugs for RTI/STI treatment, antiretrovirals (ARVs), and HIV test kits (Table 23). The national guidelines for HIV and AIDS commodities management vary by facility type. According to guidelines, facilities at all levels of the supply chain are required to manage between three to eight HIV and AIDS products, depending on facility type and level. As mentioned above, the national guidelines require that RTI/STI treatment kits be available at PHCs, CHCs, and RTI/STI clinics in hospitals. Additionally, all PHCs are expected to provide HIV test kits; CHCs and hospitals that provide HIV and AIDS treatment through Link-ART Centers and ART clinics are expected to provide ARVs.

As mentioned earlier, SCs are not meant to provide any services (or products) related to HIV and AIDS or RTIs/STIs. Therefore, SCs have been removed from the following analysis and excluded from overall totals.

Table 23. RTI/STI and HIV and AIDS Commodities Included in the Assessment

RTI/STI Treatment	ARVs
Kit 1 – Grey (Azithromycin 1g/Cefixime 400 mg, Tb)	Efavirenz (600 mg, Tb)
Kit 4 – Blue (Doxycycline 100 mg/Azithromycin 1g, Tb)	Nevirapine (NVP) (10 mg/ml suspension)
Kit 6 – Yellow (Cefixime 400 mg/Metronidazole 400 mg/Doxycycline 100 mg, Tb)	TL Combo (Lamivudine (3TC) 300 mg/Tenofovir (TDF) 300 mg, Tb)
HIV Test Kit Whole Blood Finger Prick Test Kit Type I (any)	ZLN Combo (3TC 150 mg/NVP 200 mg/ Zidovudine (AZT) 300 mg, Tb)
Tb=Tablet	

With the exception of hospitals, the average number of RTI/STI and HIV and AIDS commodities managed in all facilities was far below national requirements. CHCs and PHCs managed an average of 1.4 and 1.2 commodities, respectively. General Hospitals, on the other hand, managed an average of 4.1 RTI/STI and HIV and AIDS commodities, which is within the three to eight product range that national guidelines require. Regarding product availability, the state average also fell below the required minimum, at only 1.4 products available on the day of visit. At the CHC and PHC levels, less than one product was available on the day of visit. This indicates that very few RTI/STI and HIV and AIDS products are available at facilities below the district level (Table 24).

Table 24. Average number of RTI/STI and HIV and AIDS products managed and available on day of visit

Facility Level	# of Products Required to Manage per Guidelines/EML	# of Products Managed (mean)	# of Products Available Day of Visit (mean)
Warehouses (--)	N/A	N/A	N/A
District Stores (--)	N/A	N/A	N/A
General Hospitals (n=17)	3–8	4.1	3.7
CHCs (n=17)	3–8	1.4	0.9
PHCs (n=12)	3–8	1.2	0.8
STATE AVERAGE (excluding SCs) (n=46)		1.8	1.4
Product requirements depend on ARV treatment and HIV testing service availability at facilities.			

As Table 25 indicates, approximately 65 percent of hospitals managed RTI/STI Treatment Kit 1, and 40 percent managed RTI/STI Treatment Kits 4 and 6. About half of the facilities managed ARV commodities, including the ZLN combo (50 percent) and nevirapine (45 percent). According to the data, RTI/STI and HIV and AIDS products were mostly managed at hospitals. Very few of these products appeared to be managed at CHCs (and even less at the PHC level); however, the drugs inside the RTI/STI treatment kits are being managed via the essential medicines supply chain and are available at these levels.

Table 25. Percentage of RTI/STI and HIV and AIDS Products Managed at the Facility in the Previous 12 Months by Facility Type

	General Hospitals (n=20)	CHCs (n=76)	PHCs (n=129)	Total*
Efavirenz	35.0	4.1	0.0	1.9
HIV Test Kit	30.0	6.4	7.0	7.3
Nevirapine	45.0	8.4	0.7	3.7
RTI/STI Treatment Kit 1	65.0	4.7	0.7	3.5
RTI/STI Treatment Kit 4	40.0	2.1	0.7	2.2
RTI/STI Treatment Kit 6	40.0	0.9	0.7	1.9
TL Combo	40.0	1.3	0.0	1.5
ZLN Combo	50.0	5.5	0.0	2.7

*excludes SCs

Stock Availability

Stockouts of RTI/STI and HIV and AIDS products were common across all levels of the system and varied by product. Stockout of RTI/STI kits ranged between 32.9 percent (Kit 1) and 66.0 percent (Kit 4) on the day of visit. All facilities that managed nevirapine had the product available on

day of visit; however, stockouts of other ARVs were present, including a 100 percent stockout rate of TL combo and an 80 percent stockout rate of efavirenz on the day of visit at CHCs that managed them (Table 26).

Table 26. Percentage of Stockouts of RTI/STI and HIV and AIDS Products on the Day of Visit by Product and Facility Type

	General Hospitals	CHCs	PHCs	Total*
Efavirenz	0.0	80.3	.	37.0
HIV Test Kit	0.0	39.0	9.8	14.1
Nevirapine	0.0	0.0	0.0	0.0
RTI/STI Treatment Kit 1	7.7	45.3	100.0	32.9
RTI/STI Treatment Kit 4	37.5	100.0	100.0	66.0
RTI/STI Treatment Kit 6	25.0	0.0	100.0	43.6
TL Combo	0.0	100.0	.	19.1
ZLN Combo	10.0	23.7	.	16.1

*excludes SCs

Stockouts of RTI/STI and HIV and AIDS products within the last three months were lower compared with stockouts on the day of visit (Table 27). Most products were available within the three months before the survey, except for an RTI/STI treatment kit and an ARV product. Two hospitals experienced a stockout of RTI/STI Treatment Kits 1 and 4; one CHC experienced a stockout of efavirenz. Drugs were otherwise available at all facilities managing them. See Appendix D, Tables D1 and D2 for more details on average stockout and stockout duration.

Table 27. Percentage of Stockouts of RTI/STI and HIV and AIDS Products within Last Three Months by Product and Facility Type

	General Hospitals	CHCs	PHCs	Total*
Efavirenz	0.0	100.0	.	19.0
HIV Test Kit	0.0	0.0	0.0	0.0
Nevirapine	0.0	0.0	0.0	0.0
RTI/STI Treatment Kit 1	12.5	0.0	0.0	12.5
RTI/STI Treatment Kit 4	16.7	0.0	0.0	16.7
RTI/STI Treatment Kit 6	0.0	0.0	0.0	0.0
TL Combo	0.0	0.0	.	0.0
ZLN Combo	0.0	0.0	.	0.0

*excludes SCs

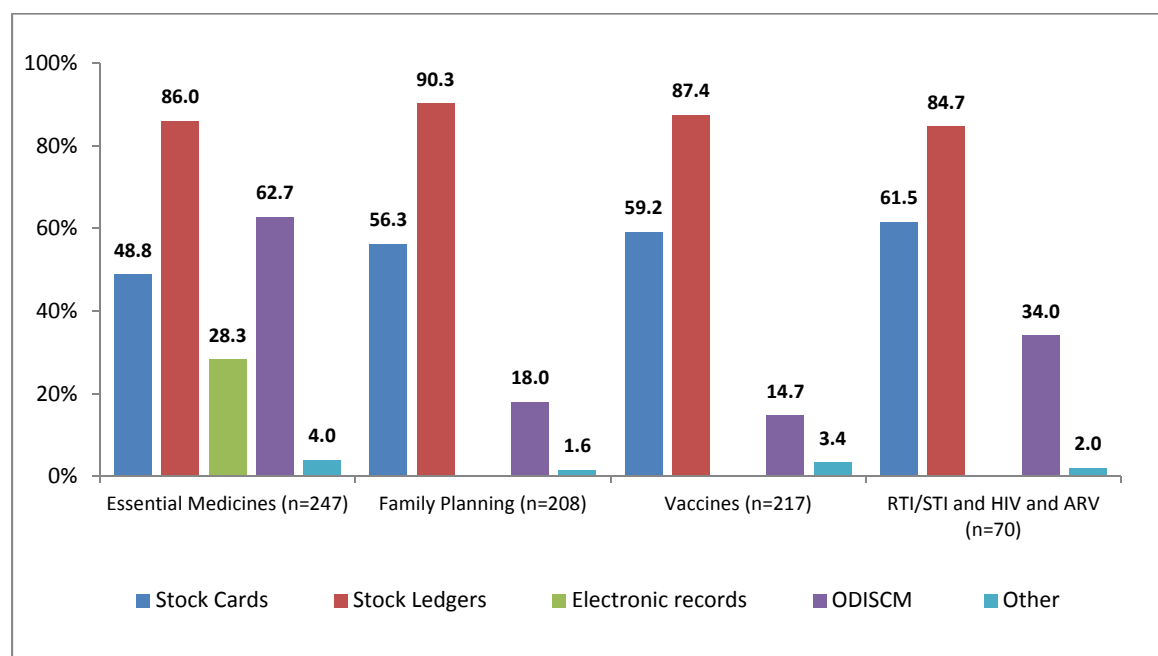
Logistics Management Information System

This section discusses how well LMIS is functioning across supply chain systems for warehouses, district stores, hospitals, CHCs, and PHCs. Findings are under the following subheadings for each product group: recordkeeping and report forms. Data were collected through interviews with commodity managers for each supply chain; a record review of the 42 products included in the assessment and managed at the facility was also done.

Recordkeeping

Logistics personnel require tools such as stockcards/stock registries and daily activity registries to track and record key logistics data. These data include quantities received, dispensed, or issued and losses/adjustments. As shown in Figure 4, commodity managers across all supply chains most frequently reported using stockcards and stock registries for managing commodities. Twenty-eight percent of commodity managers responsible for essential medicines also reported using electronic records (e.g., Excel) to track their products.

Figure 4. Types of Inventory Logistics Forms Used to Manage Commodities by Supply Chain, According to Commodity Managers



Unavailable or outdated stockcards represent gaps in the LMIS because current information is not available for stock management. Improving recordkeeping is therefore required to identify and respond to overall supply chain operational issues and inform decision-making. During supportive supervision visits, supervisors should work with facility personnel to ensure they are using and updating stockcards regularly.

Tables 28, 30, 32, and 34 show the percentage of facilities with stockcards available (by product), as well as the percentage of stockcards that were updated. This is defined as having something noted on the record within the last 30 days. Facilities were also assessed on the accuracy of the balance

entries on their stockcards (shown in Tables 29, 31, 33, and 35). Accuracy was determined by comparing the balance of updated stockcards with the physical count for each product on the day of the assessment visit. Stockcards were considered accurate if the balance was within +/- 10 percent of the physical count.

Essential Medicines

Overall availability of stockcards/stock registries was high, with on average of 93 percent of facilities having a record for the product they managed. However, only 62.7 percent of facilities had stockcards that were both available and updated. Some variations also existed among products, indicating that stock-keeping practices were not necessarily institutionalized within the facility.

When examining results by level, as shown below in Table 28, most of the warehouses and district stores had stockcards for the products they managed, but few were updated. General Hospitals had 100 percent stockcard availability of almost all products, but updated stockcards varied across products at this level. CHCs and PHCs also have high availability of stockcards, but the percentage of the available stockcards that were also updated varied across products.

Table 28. Percentage of Facilities with Available and Updated Stockcards for Essential Medicines by Level

	Warehouses		District Stores		General Hospitals		CHCs		PHCs		Total*	
	% avail	% updated	% avail	% updated	% avail	% updated	% Avail	% updated	% avail	% updated	% avail	% updated
Albendazole	57.1	14.3	85.7	57.1	100.0	95.0	100.0	84.1	98.6	81.9	98.4	81.8
Amoxicillin	57.1	14.3	66.7	33.3	100.0	90.0	96.6	75.7	97.8	80.3	97.0	78.6
Ampicillin	71.4	14.3	66.7	33.3	100.0	95.0	94.7	79.9	91.3	55.0	92.1	62.4
Azithromycin	71.4	14.3	75.0	0.0	100.0	90.0	98.3	82.7	98.5	76.3	98.1	77.0
Cefixime	66.7	16.7	66.7	33.3	100.0	95.0	98.2	81.7	95.0	64.1	95.5	68.6
Ceftriaxone	71.4	14.3	0.0	0.0	100.0	75.0	91.3	58.2	93.0	51.9	92.3	53.8
Co-trimoxazole	60.0	0.0	80.0	40.0	100.0	68.8	89.2	41.1	90.3	57.8	90.0	53.5
Co-trimoxazole ST	80.0	20.0	50.0	50.0	100.0	60.0	77.7	29.6	84.8	30.4	83.0	31.0
Dexamethasone	57.1	0.0	66.7	33.3	100.0	95.0	98.3	80.2	92.8	56.3	93.8	62.5
Doxycycline	57.1	14.3	75.0	25.0	100.0	90.0	96.9	83.0	97.8	75.6	97.0	76.7
Gentamycin	50.0	16.7	75.0	50.0	100.0	94.1	95.2	70.2	94.9	62.6	94.5	64.8
IFA (blue)	57.1	14.3	83.3	83.3	100.0	75.0	85.8	53.6	82.6	53.8	83.2	54.0
IFA (red)	57.1	14.3	75.0	50.0	100.0	95.0	97.1	85.0	96.1	74.9	95.9	77.0
IFA Syrup	75.0	0.0	75.0	25.0	100.0	76.9	96.5	44.3	84.2	37.0	86.9	39.1
Magnesium Sulfate	71.4	14.3	100.0	50.0	100.0	90.0	97.7	65.2	94.8	61.0	95.5	62.6
Methyldopa	60.0	0.0	66.7	0.0	100.0	82.4	96.3	52.2	96.9	45.2	96.1	48.1
Metronidazole	66.7	16.7	0.0	0.0	100.0	81.3	100.0	59.8	93.1	59.4	94.6	59.6
Misoprostol	66.7	16.7	66.7	0.0	100.0	73.7	100.0	79.9	92.5	57.2	94.2	62.7
ORS	71.4	14.3	75.0	25.0	100.0	90.0	97.0	80.2	97.1	76.2	96.8	76.5
Oxytocin	71.4	14.3	75.0	50.0	100.0	90.0	96.4	79.1	95.4	58.5	95.4	64.2

	Warehouses		District Stores		General Hospitals		CHCs		PHCs		Total*	
	% avail	% updated	% avail	% updated	% avail	% updated	% Avail	% updated	% avail	% updated	% avail	% updated
Tetanus Toxoid	100.0	33.3	100.0	90.9	100.0	100.0	97.4	88.9	95.5	83.3	96.1	84.8
Vitamin A	71.4	14.3	75.0	25.0	95.0	85.0	95.4	74.6	95.5	66.3	95.0	67.9
Vitamin K	100.0	0.0	75.0	25.0	94.1	76.5	88.1	45.1	89.6	45.5	89.3	46.3
Zinc Sulfate	71.4	14.3	0.0	0.0	88.9	61.1	95.9	58.3	90.6	50.5	91.1	51.8

*excludes SCs

Further analysis of the data indicated that stock availability on day of visit is statistically correlated with record management across all levels. Thus, as expected, products were more likely to be available on the day of visit when stockcards were available and updated. When analyzed for accuracy, results showed that 80 percent of updated records were within +/- 10 percent of the physical count. However, facilities across all levels had issues of accuracy with certain products, such as IFA syrup and IFA (blue) tablets.

Table 29. Percentage of Facilities with Accurate or Near Accurate Balances (+/- 10) between the Physical Inventory and Stockcard Balances on the Day of Visit for Essential Medicines by Facility Type

	Warehouses	District Stores	General Hospitals	CHCs	PHCs	Total*
Albendazole	100.0	50.0	94.7	79.0	81.9	81.5
Amoxicillin	100.0	0.0	100.0	86.8	87.0	87.3
Ampicillin	100.0	100.0	94.7	91.6	86.6	88.8
Azithromycin	100.0	.	94.4	84.4	84.3	84.7
Cefixime	100.0	100.0	89.5	78.3	83.0	82.1
Ceftriaxone	100.0	.	86.7	85.8	77.3	80.4
Co-trimoxazole	.	50.0	90.9	77.1	83.3	82.2
Co-trimoxazole ST	0.0	100.0	100.0	76.8	60.7	66.3
Dexamethasone	.	100.0	78.9	76.2	81.6	79.8
Doxycycline	100.0	100.0	88.9	86.1	89.2	88.5
Gentamycin	100.0	100.0	87.5	84.0	85.1	85.1
IFA (blue)	0.0	80.0	83.3	75.0	67.4	69.6
IFA (red)	100.0	50.0	94.7	79.4	77.7	78.8
IFA Syrup	.	0.0	50.0	57.1	47.4	49.5
Magnesium Sulfate	100.0	0.0	94.4	88.0	78.4	81.9
Methyldopa	0.0	.	78.6	80.1	76.6	77.9
Metronidazole	100.0	.	92.3	94.4	76.6	82.0
Misoprostol	100.0	.	92.9	85.8	84.1	85.0
ORS	100.0	100.0	94.4	86.5	81.0	82.8
Oxytocin	100.0	50.0	83.3	85.2	84.6	84.6

Tetanus Toxoid	100.0	70.0	75.0	77.6	84.6	82.4
Vitamin A	100.0	100.0	94.1	97.9	78.0	83.6
Vitamin K	.	0.0	84.6	66.0	71.8	70.9
Zinc Sulfate	100.0	.	90.9	85.4	85.3	85.6

Vaccines

Availability of stockcards was over 90 percent in all facilities that reported managing vaccines. As shown in Tables 30 and 31, most facilities maintained updated and accurate records.

Table 30. Percentage of Facilities with Available and Updated Stockcards for Vaccines by Level

	Warehouses		District Stores		General Hospitals		CHCs		PHCs		Total*	
	% avail	% updated	% avail	% updated	% avail	% updated	% avail	% updated	% avail	% updated	% avail	% updated
BCG	100.0	100.0	100.0	100.0	94.1	94.1	96.8	92.8	97.0	85.8	97.0	87.9
DPT	100.0	100.0	100.0	100.0	100.0	100.0	96.7	92.6	97.0	87.0	97.1	88.9
Hepatitis B	100.0	100.0	100.0	100.0	100.0	100.0	89.1	89.1	76.5	76.5	93.1	93.1
Measles	100.0	100.0	100.0	90.0	100.0	100.0	95.7	89.7	95.5	85.0	95.8	86.6
OPV	100.0	100.0	100.0	100.0	100.0	100.0	97.4	88.9	95.5	84.9	96.2	86.5

Table 31. Percentage of Facilities with Accurate or Near Accurate Balances (+/- 10) between the Physical Inventory and Stockcard Balances on the Day of Visit for Vaccines by Facility Type

	Warehouses	District Stores	General Hospitals	CHCs	PHCs	Total*
BCG	100.0	70.0	87.5	70.5	81.7	79.2
DPT	100.0	60.0	93.8	76.2	79.0	78.6
Hepatitis B	100.0	90.0	87.5	85.5	81.5	83.0
Measles	0.0	33.3	62.5	68.0	82.3	77.0
OPV	100.0	80.0	75.0	72.1	80.4	78.5

Family Planning

Similar to essential medicines, family planning stockcards that were available and updated varied by product within facility levels. This indicates inconsistent practices in facilities across the supply chain. As shown in Table 32 and Table 33 below, less than 50 percent of CHCs and PHCs had updated records of OCP or pregnancy kits; however, out of those updated, most (85.1 percent and 84.7 percent, respectively) were accurate. In comparison, despite 100 percent of facilities managing emergency contraception across all levels having updated stockcards within the previous 30 days, only 73 percent were actually accurate (Table 33).

Table 32. Percentage of Facilities with Available and Updated Stockcards for Family Planning Commodity by Level

	District Stores		General Hospitals		CHCs		PHCs		Total*	
	% avail	% updated	% avail	% updated	% avail	% updated	% avail	% updated	% avail	% updated
Condoms	92.9	71.4	92.9	71.4	90.0	59.0	87.7	55.2	88.5	56.9
Emergency Contraception	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
IUCDs	100.0	85.7	100.0	73.3	92.3	56.9	90.9	53.7	91.7	55.7
OCP	100.0	71.4	92.9	64.3	87.6	40.7	83.3	44.1	85.1	44.6
Pregnancy Test Kits	92.9	71.4	88.9	44.4	92.1	45.5	82.0	40.0	84.7	42.2

Table 33. Percentage of Facilities with Accurate or Near Accurate Balances (+/- 10) between the Physical Inventory and Stockcard Balances on the Day of Visit for Family Planning Products by Facility Type

	District Stores	General Hospitals	CHCs	PHCs	Total*
Condoms	90.0	80.0	84.2	81.9	82.7
Emergency Contraception	72.7	72.7	71.0	73.7	73.0
IUCDs	83.3	72.7	77.8	86.5	84.0
OCP	80.0	88.9	79.2	88.8	86.3
Pregnancy Test Kits	80.0	100.0	87.8	88.1	87.9

RTI/STI and HIV and AIDS

As noted earlier, management and availability of RTI/STI and HIV and AIDS products were limited. Therefore, the following results were based on 5 to 10 cases, each depending on the level. The results should be interpreted with caution.

Table 34. Percentage of Facilities Where Stockcards Are Available and Updated for Use in Managing RTI/STI and HIV and AIDS Products by Level

	General Hospitals		CHCs		PHCs		Total*	
	% avail	% updated	% avail	% updated	% avail	% updated	% avail	% updated
Efavirenz	85.7	71.4	100.0	19.7	.	.	92.3	47.6
HIV Test Kits	100.0	50.0	100.0	35.0	80.3	40.2	86.4	40.4
Nevirapine	66.7	55.6	100.0	59.4	100.0	0.0	87.8	49.9
RTI/STI Treatment Kit 1	84.6	61.5	35.7	0.0	.	.	57.4	34.2
RTI/STI Treatment Kit 4	87.5	75.0	.	.	.	.	47.6	40.8

RTI/STI Treatment Kit 6	87.5	25.0	100.0	100.0	.	.	64.2	25.4
TL Combo	100.0	100.0	100.0	0.0	.	.	100.0	80.9
ZLN Combo	90.0	80.0	100.0	30.8	.	.	94.4	58.2

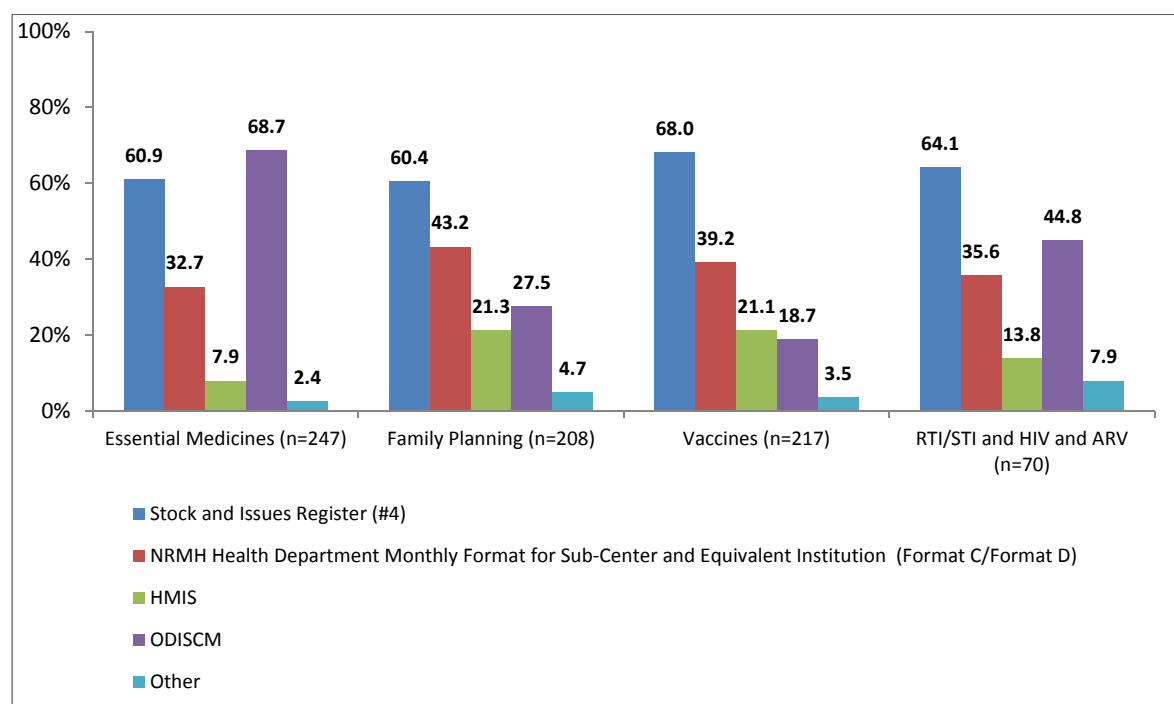
Table 35. Percentage of Facilities with Accurate or Near Accurate Balances (+/- 10) between the Physical Inventory and Stockcard Balances on the Day of Visit for HIV and AIDS by Facility Type

	General Hospitals	CHCs	PHCs	Total*
Efavirenz	100.0	0.0	0.0	81.0
HIV Test Kits	100.0	63.8	49.0	59.1
Nevirapine	80.0	100.0	0.0	91.8
RTI/STI Treatment Kit 1	100.0	0.0	0.0	100.0
RTI/STI Treatment Kit 4	83.3	0.0	0.0	83.3
RTI/STI Treatment Kit 6	100.0	100.0	0.0	100.0
TL Combo	87.5	0.0	0.0	87.5
ZLN Combo	87.5	100.0	0.0	90.4

Reporting Forms

While reliable recordkeeping at the facility level is important, it is also crucial for this information to be reported to higher levels to ensure that effective logistics decision-making takes place. To enable this, the information sent in reports must be complete and accurate. As indicated in Figure 5, each system used a variety of forms to manage commodities and report logistics information to higher levels.

Figure 5. Types of Forms Used for Reporting Inventory Information to the Higher Level by Supply Chain, According to Commodity Managers



The reliability and accuracy of reports appear to be an issue across all supply chains, especially at the lower level (Table 36). Only 56 percent of entries, including 60 percent of CHCs and PHCs, in Haryana's ODSCMS were within ± 10 percent of the physical count on the day of visit. (See Appendices B, C, and D for accuracy rates of LMIS reports for other supply chains.)

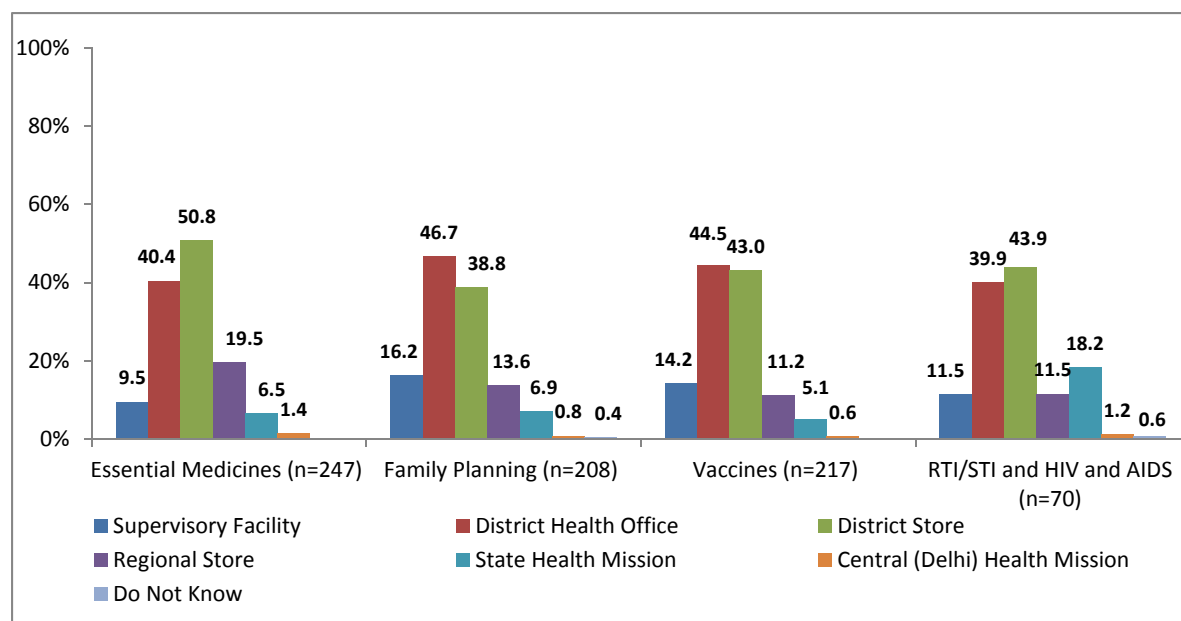
Table 36. Percentage of Facilities with Accurate Balances (± 10) between the Physical Inventory and ODSCMS on the Day of Visit for Essential Medicines by Facility Type

	Warehouses	District Stores	General Hospitals	CHCs	PHCs	Total*
Albendazole	85.7	66.7	73.3	63.5	53.1	57.4
Amoxicillin	85.7	100.0	66.7	56.5	59.0	59.9
Ampicillin	85.7	100.0	64.7	58.9	68.8	66.5
Azithromycin	83.3	100.0	62.5	49.3	50.0	51.5
Cefixime	100.0	66.7	58.8	51.7	59.0	58.6
Ceftriaxone	83.3	100.0	80.0	76.5	87.2	83.5
Co-trimoxazole	100.0	100.0	100.0	84.6	55.1	67.3

	Warehouses	District Stores	General Hospitals	CHCs	PHCs	Total*
Co-trimoxazole ST	100.0	100.0	100.0	100.0	85.0	88.5
Dexamethasone	100.0	100.0	50.0	52.6	58.2	57.4
Doxycycline	85.7	100.0	60.0	39.1	55.9	52.7
Gentamycin	83.3	50.0	58.3	60.0	57.4	59.3
IFA (blue)	100.0	100.0	100.0	60.0	60.7	65.5
IFA (red)	100.0	0.0	46.2	40.0	51.1	49.1
IFA Syrup	100.0	100.0	100.0	100.0	68.0	75.8
Magnesium Sulfate	100.0	50.0	75.0	71.2	73.6	73.6
Methyldopa	100.0	0.0	72.7	57.1	90.1	80.7
Metronidazole	100.0	100.0	100.0	72.7	54.9	64.4
Misoprostol	80.0	0.0	69.2	69.5	71.4	70.7
ORS	71.4	100.0	42.9	47.7	52.6	51.5
Oxytocin	100.0	25.0	57.1	58.7	65.9	63.8
Tetanus Toxoid	40.0	0.0	28.6	20.0	32.8	29.7
Vitamin A	100.0	0.0	100.0	69.5	53.4	60.8
Vitamin K	100.0	25.0	66.7	42.1	60.8	58.3
Zinc Sulfate	100.0	14.3	58.3	57.9	66.7	66.4

Commodity managers across all facility levels reported sending their inventory reports to the district store or district health office every month. As shown in Figure 6, this did not vary by supply chain. See Tables A6, B6, C6, and D8 in Appendices A– D for more details on the frequency of inventory reporting.

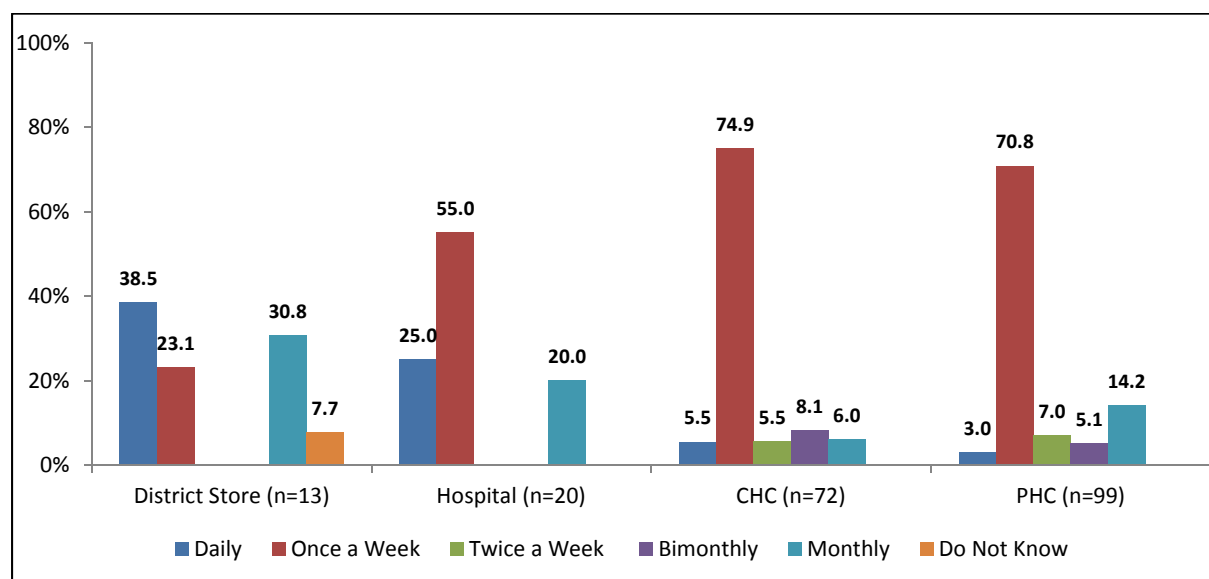
Figure 6. Where Inventory Reports Are Sent by Supply System and Facility Type, According to Commodity Manager



Haryana's online reporting system was intended to provide real-time data to higher levels for informed decision-making. Questions were added to the Haryana LIAT survey to capture use of this online LMIS. Results showed that the online system was being used at facilities at all levels; however, the rates of use varied by level. General Hospitals and CHCs reported using the online system at virtually all facilities (100 percent and 94.8 percent, respectively), while PHCs and district stores reported less usage (69.3 percent and 61.9 percent, respectively) (See Appendix A, Table A7).

Facilities at all levels are required to update the online system at least once a week. As Figure 7 indicates, many facilities across all levels, except for district stores, were following this requirement. According to the data, hospitals and CHCs adhered to this requirement best, with approximately 80 percent of facilities logging into the online system at least once per week. Over 70 percent of facilities at the PHC level also reported consistent login. Facilities reported they used this online system most frequently to enter issues and receipt data, prepare/submit indents, and check the balance of stock at the warehouse. For more information on reported use of the online system, see Appendix A, Table A8.

Figure 7. Reported Frequency of Login into the Online System



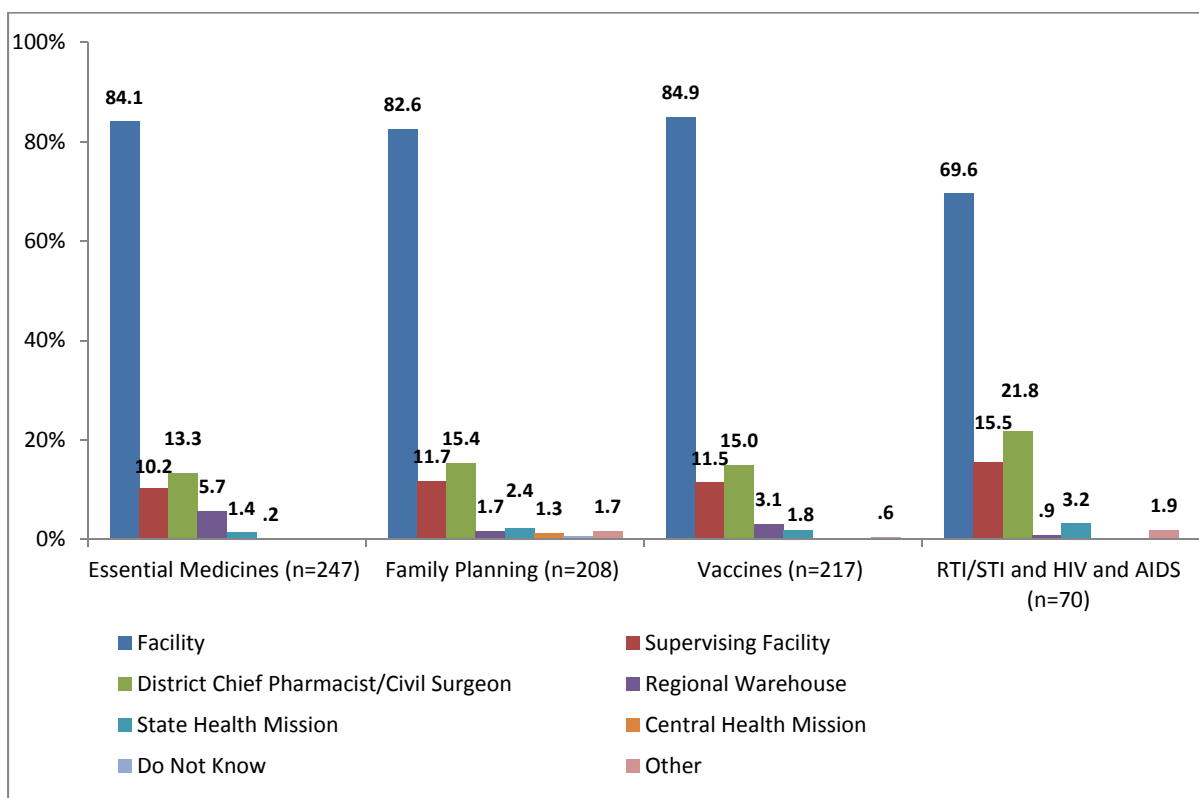
Inventory Management

The following section discusses the key steps, processes, and tools needed to adequately manage and store sufficient product. This includes the ordering process for additional commodities, source of supply, as well as warehousing processes and storeroom conditions. Results were based on interviews with commodity managers for each supply chain and field workers' observations of the facility storeroom(s). Results are provided to allow for comparison across supply chains. Facility-level results can be found in Appendices A–D.

Ordering Process

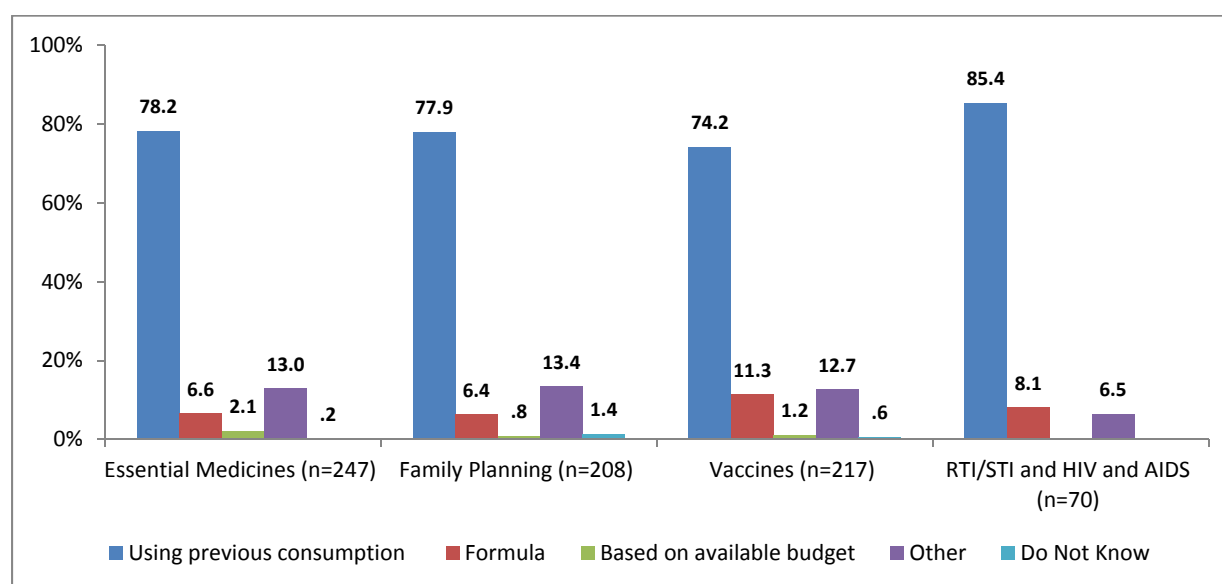
The table below shows the entity responsible for determining which medicines to order and the quantity. Results indicated that despite differences regarding who manages the overall system, the ordering processes across supply chain systems in Haryana function similarly and were largely decentralized. As Figure 8 shows, respondents reported that the majority of facilities were responsible for determining their order quantities and type. It was further reported that very few facilities relied on the Central Health Mission or SHMs to determine their product needs.

Figure 8. Entity Responsible for Determining Which Products to Order and the Quantity by Supply Chain



As shown in the graph below (Figure 9), the quantities ordered for each facility were predominantly based on previous consumption. It should be noted, however, that given the inconsistencies in recordkeeping and high stockout rates, consumption patterns are likely to be inaccurate.

Figure 9. How Quantities Are Determined by Supply Chain



In Figure 10 below, most facilities reported a monthly frequency for indents for each commodity, which adheres to guidelines and policy. Consistent with this data, virtually all facilities reported sending an indent/report within the last month (Figure 11).

Figure 10. Frequency of Indents Made by Facility According to Policy by Supply Chain

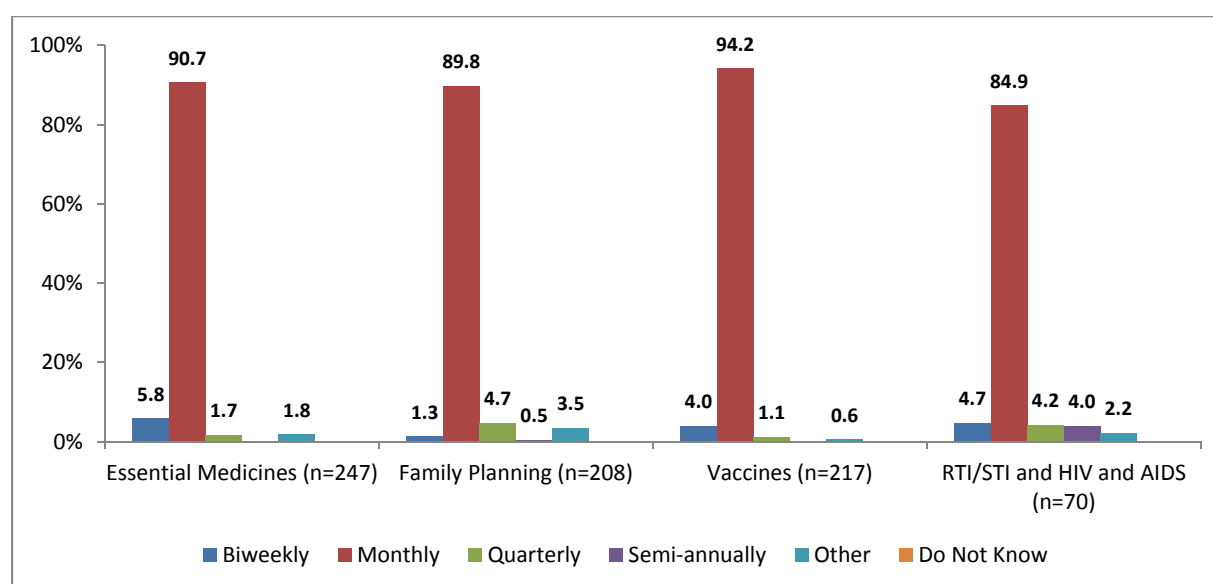


Figure 11. Last Time Indent/Report Was Sent by Facility by Supply Chain

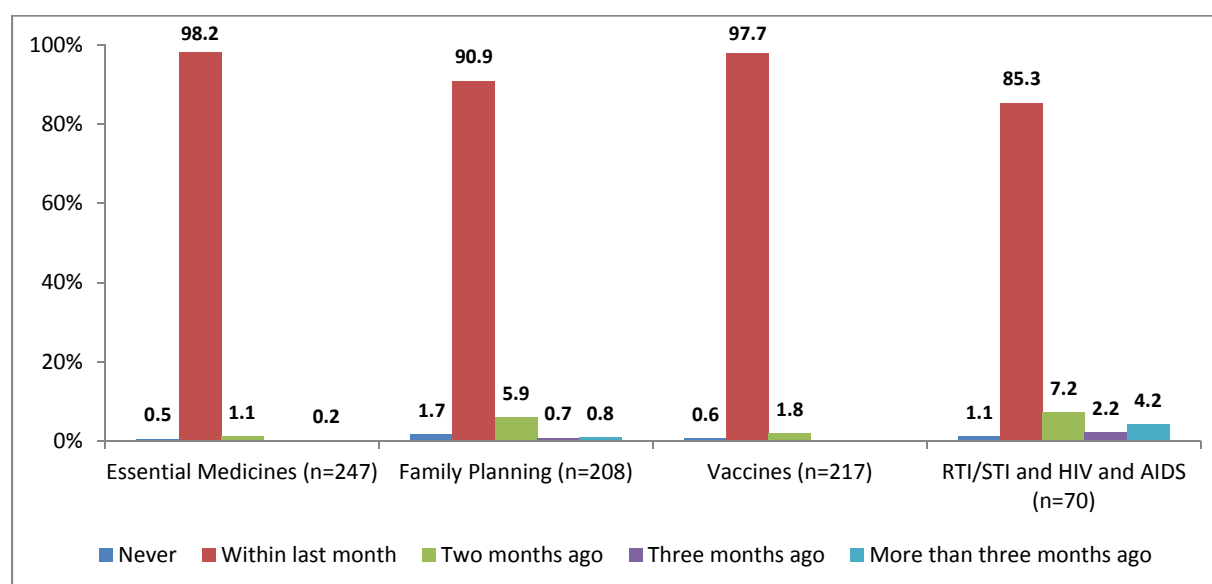
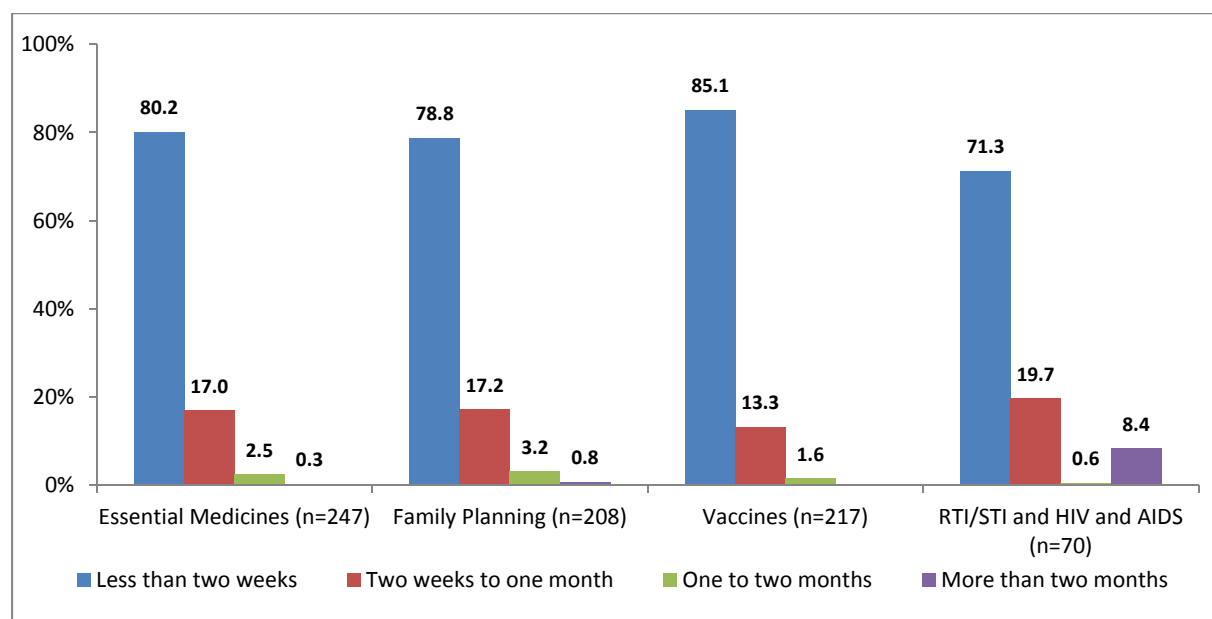


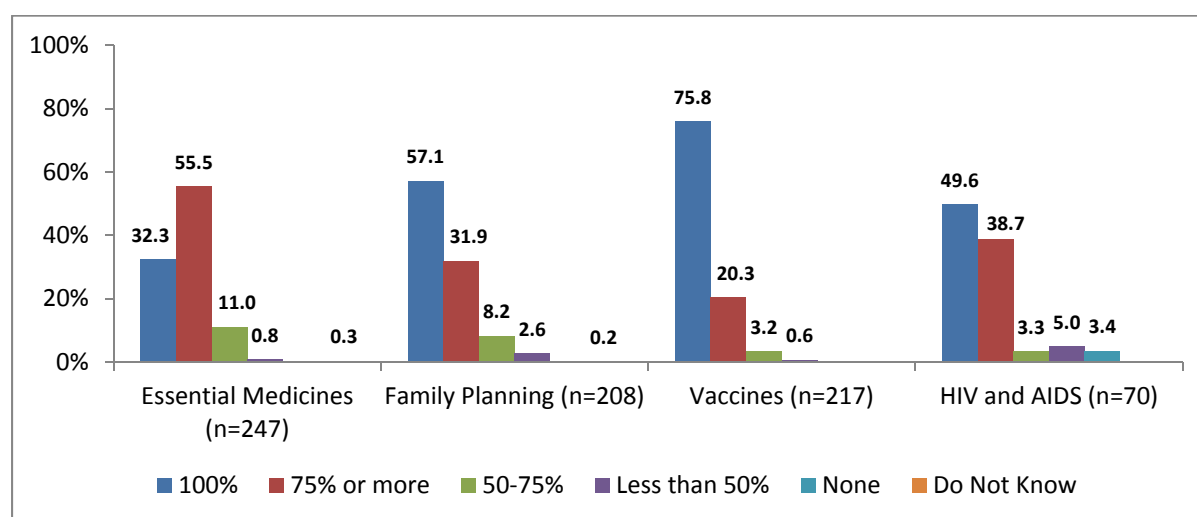
Figure 12 below shows the order fill rates by supply chain. On average, the time between indenting and receiving was less than two weeks for the majority of facilities across supply chains. Following this response, about 17 percent of all facilities received their order between two weeks and one month of placing the order.

Figure 12. Average Length of Time between Indenting and Receiving by Supply Chain



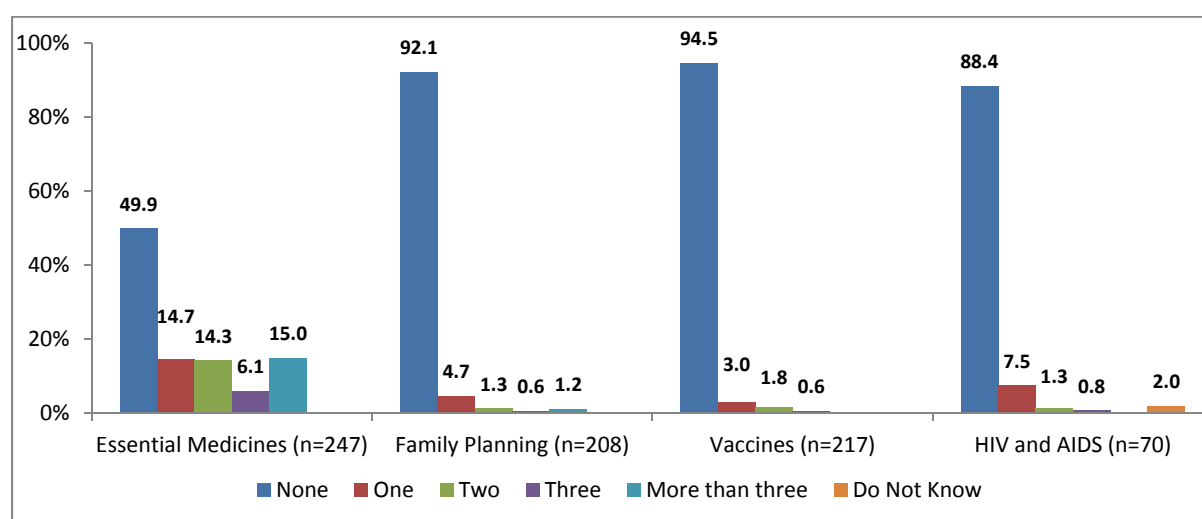
The graph below (Figure 13) shows that most orders were filled between 75 percent and 100 percent of the time, with a small proportion filled between 50 percent and 75 percent.

Figure 13. How Well Indents Are Filled by Supply Chain



The graph below (Figure 14) shows the frequency of emergency orders/unplanned local purchases in the previous three months. With the exception of essential medicines, very few emergency orders/unplanned local purchases were made. For essential medicines, about 50 percent of the orders placed within the last three months were emergency orders/unplanned local purchases.

Figure 14. Number of Emergency Orders/Unplanned Local Purchases in Previous Three Months by Supply Chain

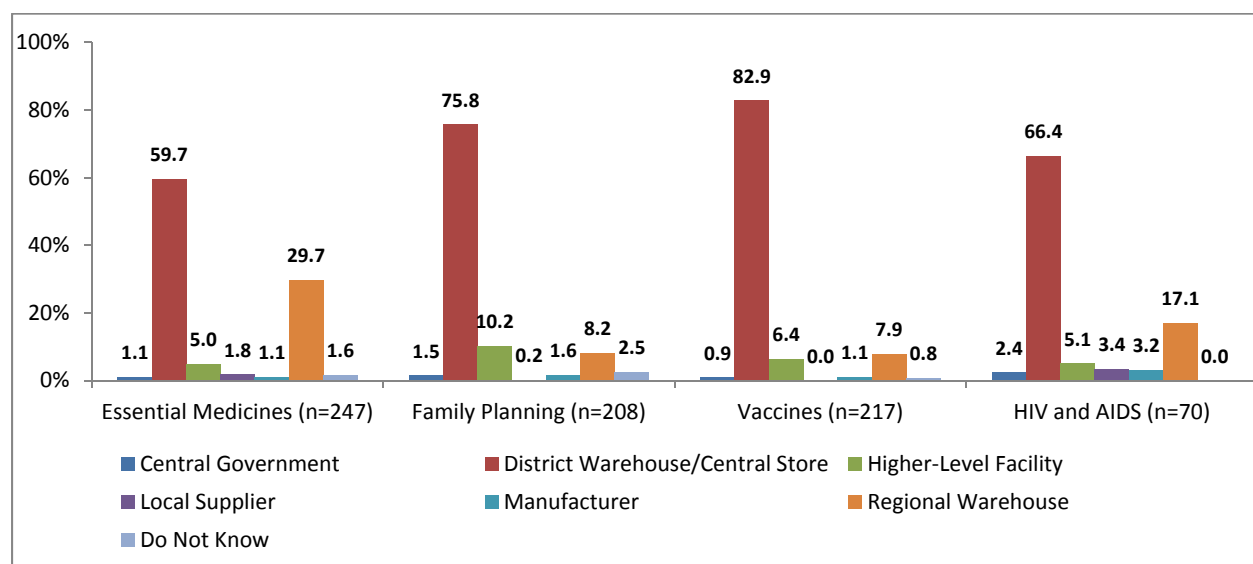


It is important to note that despite indications that facilities reported monthly, a gap in supply chain management exists regarding ordering. This is evident with the high stockout rates of products found at the facilities across supply chains. It appears that facilities are not ordering enough products when the monthly indents are being made, and emergency orders are not being placed. This gap could be because facilities (as opposed to a more centralized system) are responsible for managing their orders.

Additionally, as Figure 15 shows, respondents reported that the district warehouse is the source of supply for most facilities across all supply chains. However, as found earlier with stock assessment,

most district stores did not manage or store most of the tracer products. This indicates some confusion among commodity managers about where their supplies come from. This could be affecting stockout levels since commodity managers could be expecting the district stores to resupply them with products when in fact local procurement is necessary.

Figure 15. Most Frequent Source of Supply in Previous Six Months by Supply Chain



Storeroom Conditions

Proper storage helps maintain quality products. It helps ensure that products do not become damaged, unnecessarily expired, or lost. Proper storage practices promote the ready availability and accessibility of products in storage. In assessing facilities, data collectors assessed each facility using the criteria for proper storage. Facilities that met more than 90 percent of the storage criteria were considered to have excellent storage conditions. Those that met between 71 percent and 90 percent were considered acceptable, and those that met 70 percent or less were considered unacceptable. The criteria used, based on the World Health Organization's (WHO's) recommended guidelines, were as follows—

- Products that are ready for distribution have visible identification labels and expiry dates or manufacturing dates.
- Products are stored and organized in a manner accessible for first-to-expire, first-out (FEFO) counting and general management.
- Cartons and products are in good condition and not crushed due to mishandling. If cartons are open, products are dry and not cracked from heat/radiation.
- The facility makes it a practice to separate damaged or expired products from good products and removes them from inventory.
- Products are protected from direct sunlight on the day of the visit.
- Cartons and products are protected from water and humidity on the day of the visit.
- The storage area is visually free from harmful insects and rodents.

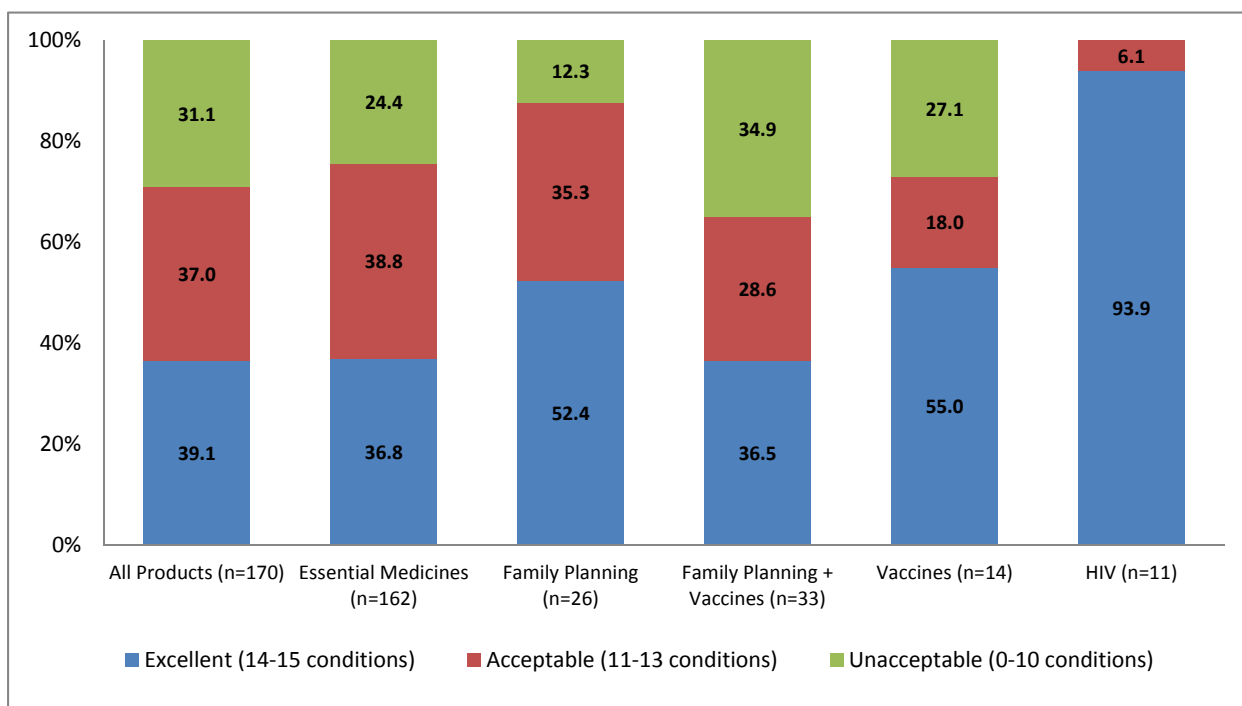
- The storage area is secured with a lock and key but is accessible during normal working hours. Access is limited to authorized personnel.
- Products are stored at the appropriate temperature according to product temperature specifications.
- The roof is in good condition to avoid sunlight and water penetration.
- The storeroom is in good condition, i.e., clean, all trash removed, sturdy shelves, and organized boxes.
- The current space and organization are sufficient for existing products and reasonable expansion, e.g., receipt of expected product deliveries for the foreseeable future.
- Appropriate fire safety equipment is available and accessible.
- Medicine is stored separately from insecticides and chemicals.

Facilities with stacked boxes—i.e., larger facilities—were also assessed on the following storage conditions (although not factored into the index)—

- Products are stacked at least 10 cm off the floor.
- Products are stacked at least 30 cm away from the wall and other stacks.
- Products are stacked no more than 2.5 m high.

In Haryana, the 42 tracer products could be stored at the facilities in one of six ways. As shown below in Figure 16, approximately two-thirds of products were stored in acceptable or excellent conditions. The most challenging conditions across all levels included cartons and products in poor condition, lack of space and organization, and lack of fire equipment.

Figure 16. Storage Condition Composite Index



Warehouses appeared to have issues with stacking (i.e., products stacked at least 10 cm off the floor, products stacked at least 30 cm away from the walls and other stacks, and products stacked no more than 2.5 m high), FEFO, and the availability of fire safety equipment (Table 37).

Table 37. Percentage of Warehouses Meeting Individual Storage Conditions

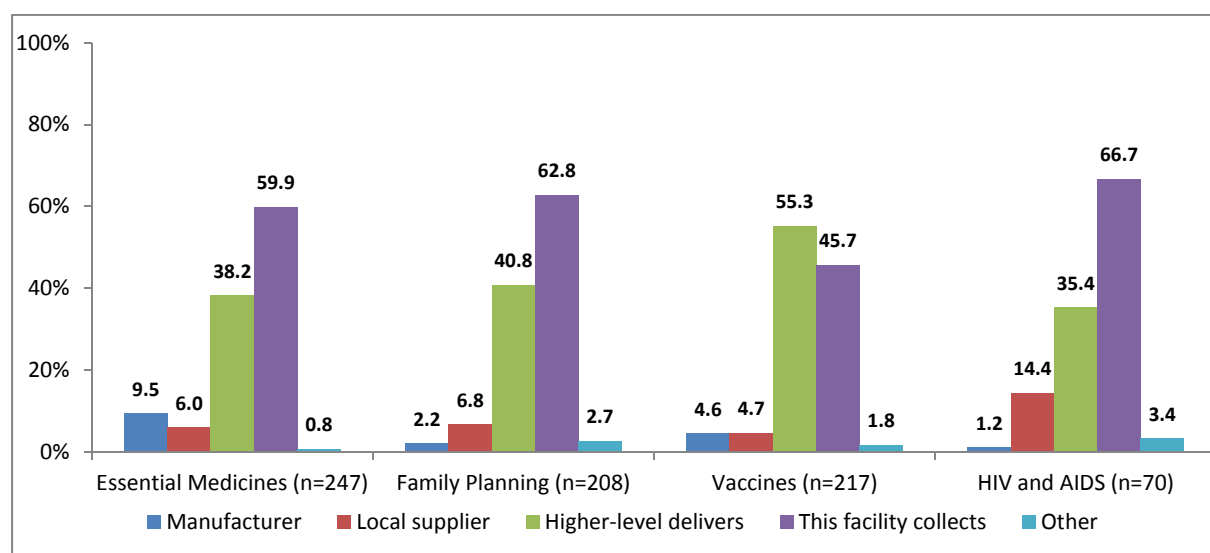
	Essential Medicines (n=7)	Vaccines (n=4)
Products are ready for distribution; they are arranged so identification labels and expiry dates or manufacturing dates are visible.	85.7%	75.0%
Products are stored and organized in a manner accessible for FEFO counting and general management.	85.7%	75.0%
Cartons and products are in good condition, not crushed due to mishandling.	85.7%	75.0%
The facility makes it a practice to separate damaged or expired products from usable products and removes them from inventory.	100.0%	75.0%
Products are protected from direct sunlight.	100.0%	75.0%
Cartons and products are protected from water and humidity.	100.0%	75.0%
Storage area is visually free from garbage/clutter, harmful insects, and rodents.	100.0%	100.0%
Storage area is secured with a lock and key.	85.7%	100.0%
High-value commodities or control substances are in a separately locked location that remains locked at all times unless dispensing.	100.0%	75.0%
Products are stored at the appropriate temperature according to product temperature specifications.	71.4%	100.0%
Roof is in good condition to avoid sunlight and water penetration.	100.0%	100.0%
Storeroom is in good condition.	85.7%	100.0%
The current space and organization are sufficient for existing products and reasonable expansion.	85.7%	75.0%
Fire safety equipment is available and accessible.	57.1%	75.0%
Products are stored separately from insecticides and chemicals.	100.0%	100.0%
Products are stacked at least 10 cm off the floor.	42.9%	100.0%
Are the products stacked at least 30 cm away from the walls and other stacks?	42.9%	100.0%
Are the products stacked no more than 2.5 m high?	71.4%	100.0%

Transportation

Efficient transportation is a vital requirement for a well-functioning logistics system. It enables commodities to be moved in a timely fashion where they are required. It also ensures continual availability of products at SDPs.

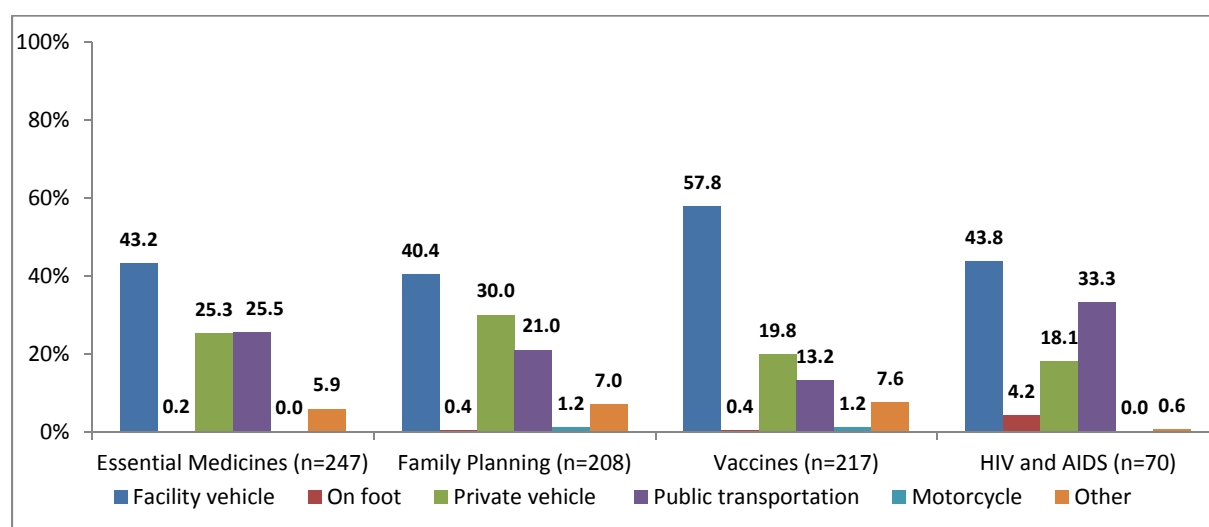
The majority of facilities within the essential medicines (59.9 percent), family planning (62.8 percent), and RTI/STI and HIV and AIDS (66.7 percent) supply chains picked up their commodities from the next level. Within the vaccine supply chain, approximately 55 percent of facilities received commodities from higher levels. Very few facilities relied on local suppliers or the manufacturer for commodity transportation.

Figure 17. Responsibility for Transporting Products to Facility by Supply Chain



The most common form of transportation used to transport commodities, across all supply chains, was facility vehicles. More than half of all vaccines were transported by facility vehicles. While essential medicines, family planning, and RTI/STI and HIV and AIDS commodities relied on facility vehicles, many were also transported by private vehicles (25.3 percent, 30.0 percent, and 18.1 percent, respectively) and public transportation (25.5 percent, 21.0 percent, and 33.3 percent, respectively) (Figure 18).

Figure 18. Method of Commodity Transportation by Supply Chain



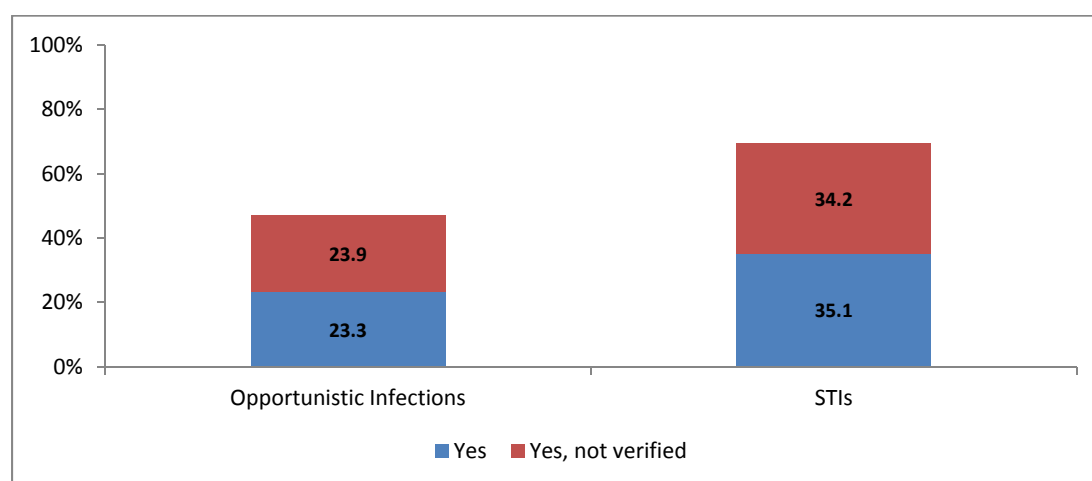
Human Resources

To run effectively, supply chains require motivated, trained, and skilled staff with competency in the various essential logistics functions. They also have to be empowered to make decisions that positively influence health supplies and supply chains. Support must be provided to them in the forms of guidelines, training, and supervision to help maintain the system. The following section describes the components related to human resources that help to ensure personnel development. Results were based on data collected through interviews with facility managers and the commodity managers.

Availability of Guidelines

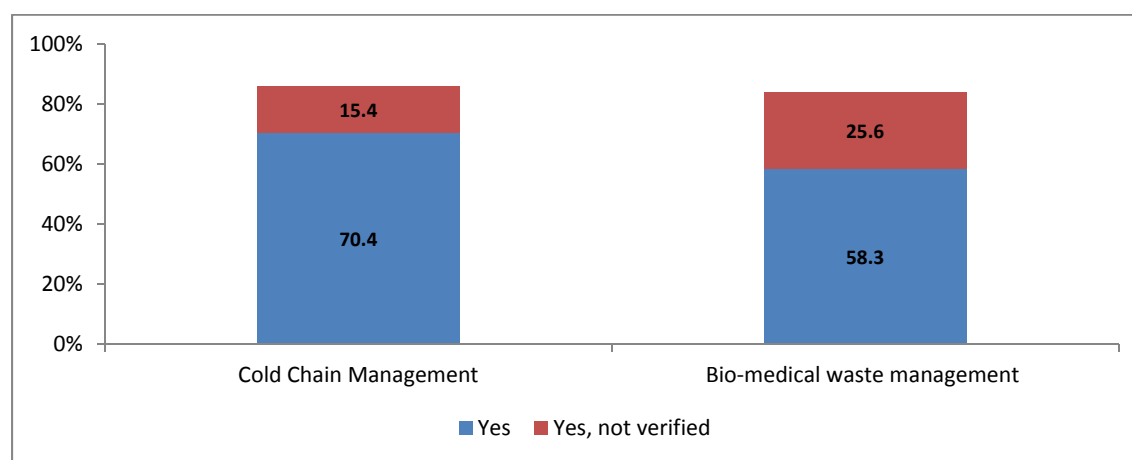
Treatment guidelines provide health workers with guidance on how to diagnosis patients and what drugs to prescribe. From a supply chain perspective, treatment guidelines are important since they provide direction for products that need to be managed at the facilities. As seen in Figure 19, a little less than 50 percent of facility managers reported having standard treatment guidelines for OI. Compared with other guideline availability (see Figures 19 and 20 below), this is relatively low. Approximately 70 percent of all facilities reported having standard treatment guidelines for STIs.

Figure 19. Availability of Standard Treatment Guidelines for OI or STIs (n=271)



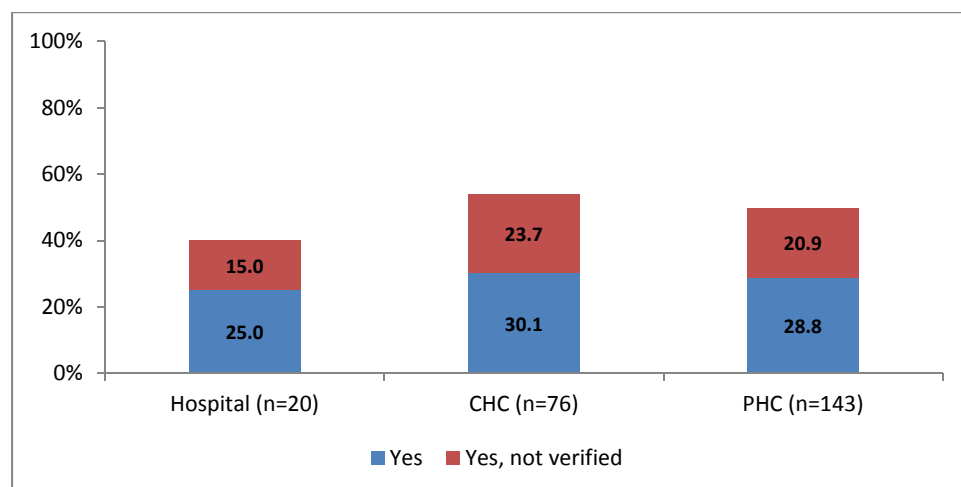
Most facility managers reported having standard operating procedures (SOPs) for cold chain or biomedical waste management. Nearly 86 percent of all facilities that managed cold chain had written guidelines/SOPs for cold chain management. Similarly, close to 85 percent of facilities reported having biomedical waste management guidelines/SOPs.

Figure 20. Availability of Written Guidelines/SOPs for Cold Chain Management or Biomedical Waste Management (n=271)



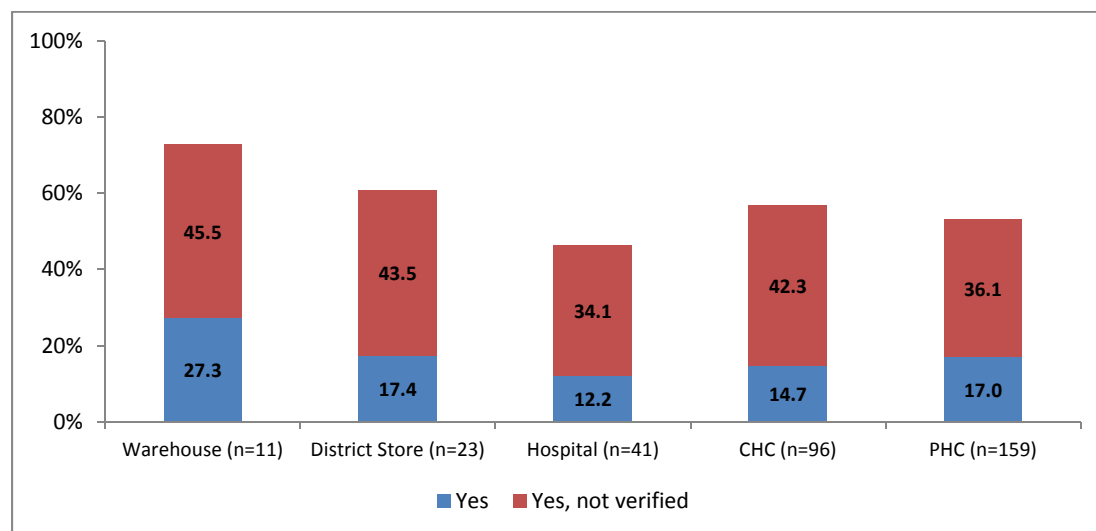
Within the RMNCH+A strategy, the RMNCH+A 5x5 matrix provides policy objectives and lists the minimum medicines and commodities required to reduce poor maternal, infant, and child health outcomes; it has been widely distributed. However, when field workers asked facility managers whether they had received a copy of the matrix, less than half of the respondents at hospitals and PHCs had received one (See figure 21).

Figure 21. Percentage of Facilities with RMNCH+A 5x5 Matrix, According to Facility Managers



Commodity managers were also asked about the availability of inventory guidelines. Inventory guidelines provide managers with standards and steps for ordering, receiving, and storing products. Sixty percent of commodity managers reported having inventory guidelines, although only eighteen percent of respondents could produce the copy to allow for verification. As shown below in Figure 22, guidelines were more likely to be available at higher-level facilities, such as warehouses and district stores.

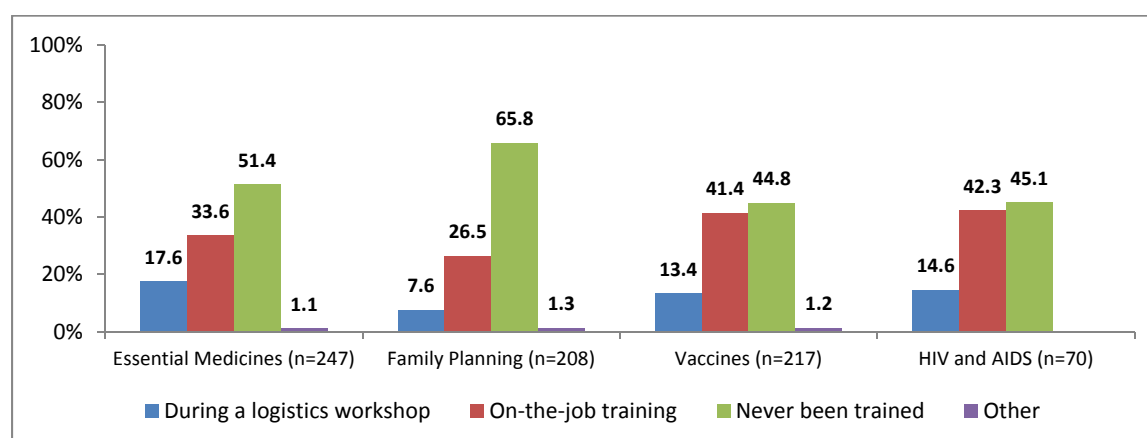
Figure 22. Availability of Inventory Guidelines by Facility Level



Training

As mentioned above, training is an important function that ensures staff members are equipped with the necessary skills to do their jobs. As shown in Figure 23, many commodity managers reported never having received training on recordkeeping. Of those who had been trained, on-the-job training was most common.

Figure 23. Percentage of Respondents Trained in Recordkeeping by Supply Chain

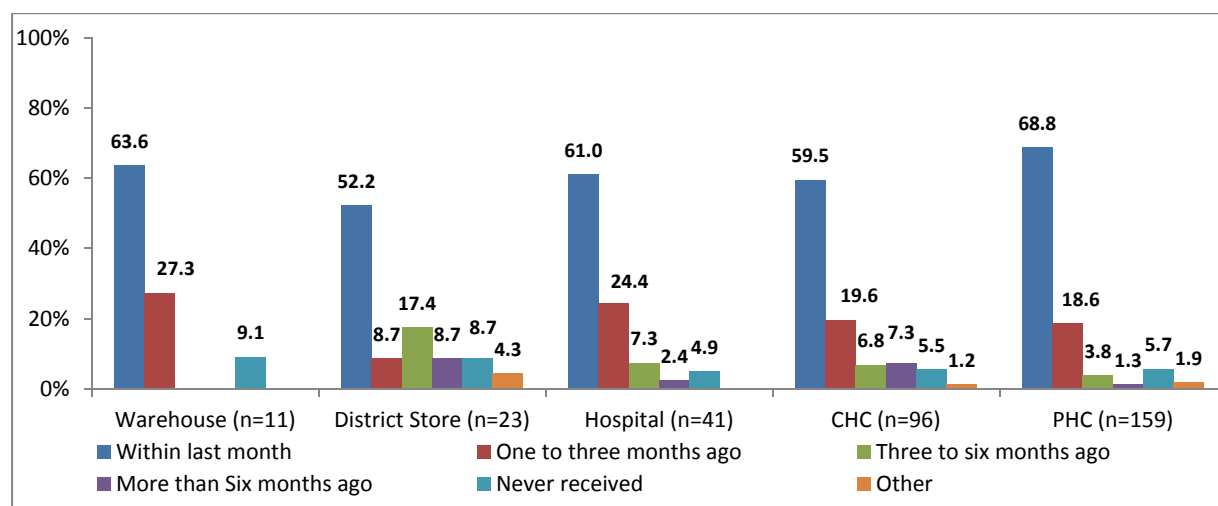


Supervision

Conducting regular supportive supervision of logistics practices (using standardized checklists and providing timely feedback to supervised personnel) is an important way to reinforce training and promote adherence to logistics system procedures. The procedures were established to increase the availability of commodities. Thus, this study collected information on supervision visits.

As the data in Figure 24 indicate, most facilities received a supervision visit within the last month; over 80 percent of all facilities received visits within the last three months, with the exception of the district store. About 78 percent of district stores received a supervision visit within the last six months, with 18 percent of these visits happening three to six months before the survey.

Figure 24. Last Supervision Visit



Logistics Management at the Sub-centers

The findings in this section provide an indication of the level of logistics management and performance of essential medicines and family planning supply chains at the SC level. Compared with higher-level facilities, the supply chain operates differently at this level, and many functions do not apply. Therefore, a separate interview questionnaire was created specifically for interviewing ANMs at this level. Additionally, as mentioned earlier, vaccines and HIV and AIDS and RTIs/STIs were not included because SCs do not manage these commodities.

Stock Management and Availability

Unavailable or outdated stockcards represented a gap in the system, where the most current information was not available for key decisionmakers to make programmatic or supply decisions. Table 38 shows the level of availability of stockcards for essential medicines at SCs, as well as how many of these cards were updated by commodity. Survey findings indicated that stockcard availability was relatively high across all SCs, with stockcards available for 19 products at 75 percent or more facilities on the day of visit. Although stockcard availability was high, it varied widely across products, with availability ranging from 39.7 percent for cefixime to 100 percent for ceftriaxone.

With the exception of a few products, the percentage of facilities with available and updated stockcards was relatively low. Stockcards of only two products (cefixime and ceftriaxone) were available and up-to-date in all SCs visited. Otherwise, stockcards of most other products, while available, were not up-to-date.

It should be noted that not all essential medicines included in this assessment are necessarily managed at the SCs.

Table 38. Percentage of Facilities Where Stockcards Are Available and Updated for Use in Managing Essential Medicines

Essential Medicines	% available	% updated
Albendazole	92.7	73.3
Amoxicillin	83.0	57.8
Ampicillin	66.1	50.0
Azithromycin	75.9	50.0
Cefixime	39.7	100.0
Ceftriaxone	100.0	100.0
Co-trimoxazole	85.9	45.1
Co-trimoxazole ST	84.8	61.9
Dexamethasone	79.5	57.0
Doxycycline	62.1	37.6
Gentamycin	45.9	59.7
IFA (blue)	77.5	48.1
IFA (red)	90.1	74.6
IFA Syrup	87.7	59.5

Essential Medicines	% available	% updated
Magnesium Sulfate	78.5	52.7
Methyldopa	79.3	25.5
Metronidazole	74.2	40.2
Misoprostol	75.9	39.2
ORS	92.5	72.2
Oxytocin	84.0	45.3
Tetanus Toxoid	87.1	61.2
Vitamin A	93.5	74.2
Vitamin K	83.2	30.9
Zinc Sulfate	89.7	66.9

Similar to essential medicines, stockcard availability was relatively high for family planning commodities. The stockcards for all products were available at 80 percent or more of the SCs visited. The percentage of facilities with available and updated stockcards was lower across all products, with the exception of emergency contraception (Table 39).

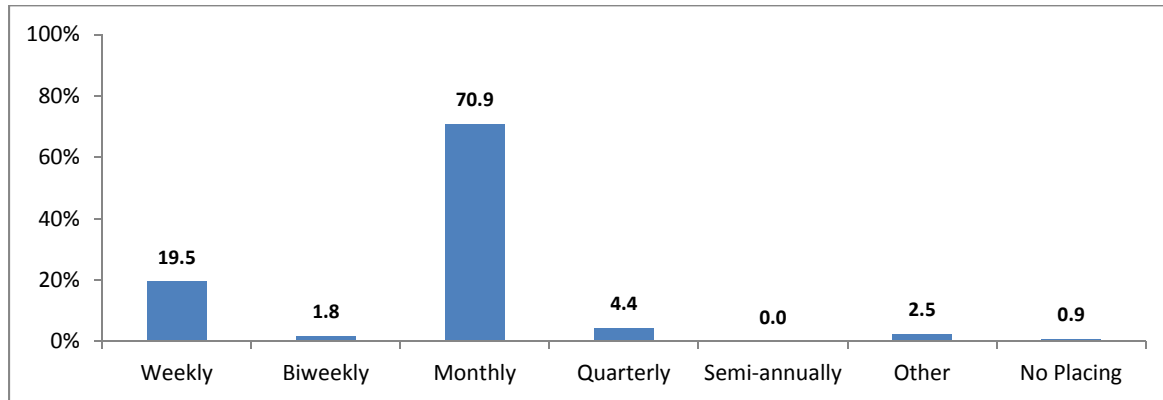
Table 39. Percentage of Facilities Where stockcards Are Available and Updated for Use in Managing Family Planning Products

Family Planning	% available	% updated
OCP	85.5	49.0
Condoms	82.0	61.5
Emergency Contraception	100.0	100.0
IUCDs	90.4	73.2
Pregnancy Test Kits	87.2	54.7

Inventory Management

As Figure 25 indicates, resupply at the majority of SCs happened monthly. Approximately 20 percent of SCs were resupplied weekly. Very few facilities went more than a month without being resupplied.

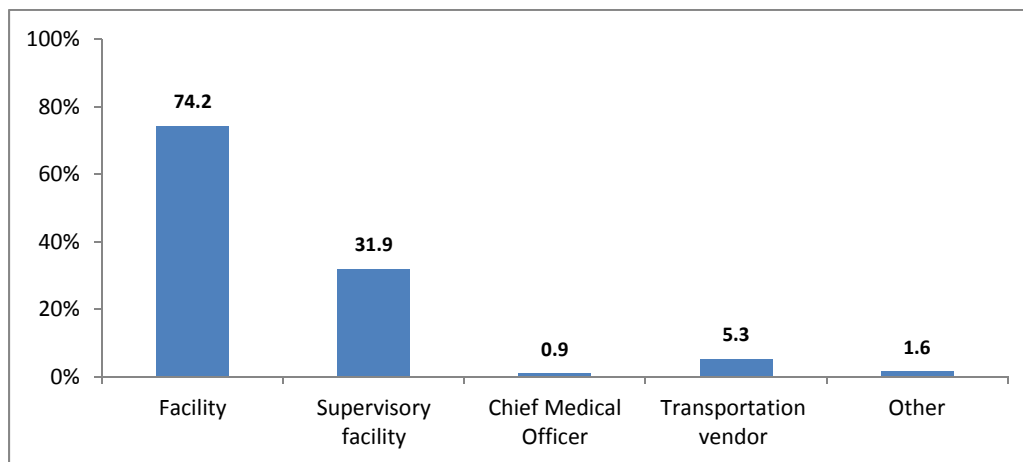
Figure 25. Resupply at Level (n=115)



Transportation

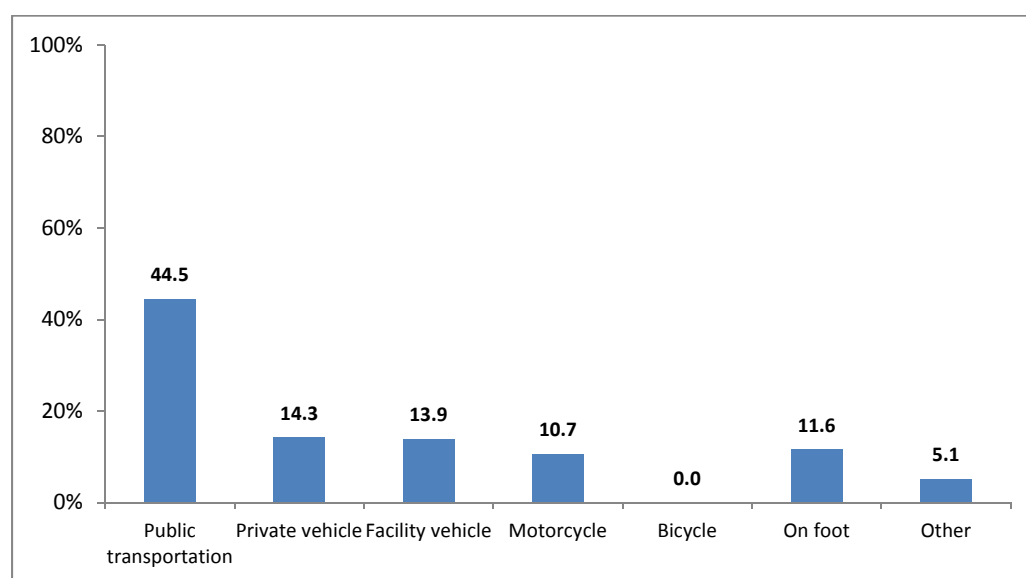
Most SDPs (74.2 percent) at the SCs were responsible for transporting commodities. Approximately 32 percent of SCs reported that their supervising facility was responsible for transporting commodities to the SC. Very few SCs reported using transportation vendors or chief medical officers (Figure 26).

Figure 26. Responsibility for Transporting Products to Facility (n=115)



Public transportation was the most frequently reported mode of transportation used at the SC for moving commodities. Almost 45 percent of SCs reported using this mode of transportation. Private vehicles and facility vehicles were used less often than public transportation; however, they were still used to transport commodities in about 15 percent of all SCs. Motorcycles were used least often (10.7 percent) in the transport of commodities (Figure 27).

Figure 27. Type of Transportation for Commodities Most Often Used (n=115)



Human Resources

SCs were asked when they last received a supervision visit and what was done on this visit. As Figure 28 indicates, approximately 90 percent of SCs had received supervision visits within the last three months; more than 75 percent had received supervision visits within the last 30 days. Only 2.7 percent of facilities had never received a supervision visit.

Supervision visits at the SCs often included reviewing stock management, checking of patient registers, and receiving feedback from supervisors. Almost half of the supervision visits also included equipment inspection and reviewing waste management practices. For more information on what was done during the last supervision visit, see Table 40 below.

Figure 28. Last Received Supervision Visit (n=115)

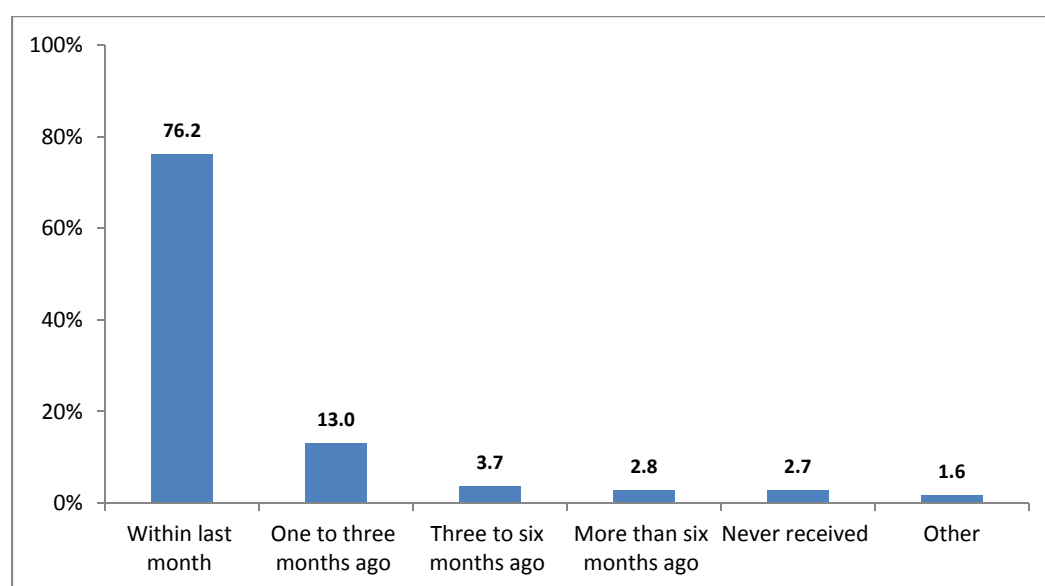


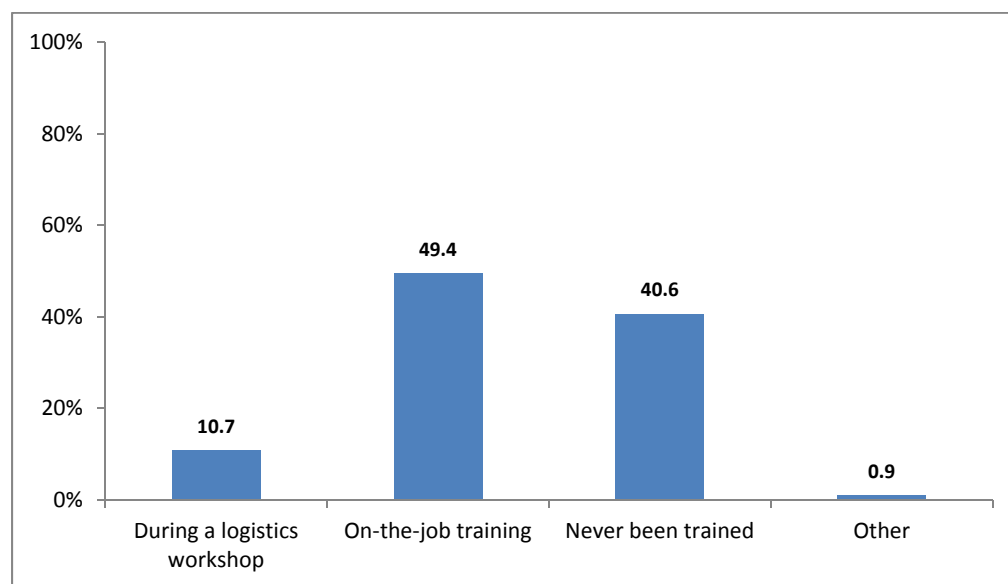
Table 40. What Was Done on the Supervision Visit (n=115)

Supervision Visit Activities	Percent
Checking of Patient Registers	64.8
Equipment Inspected	48.0
Financial Audit	6.5
Infrastructure Inspected	34.5
Provide Feedback to/from Staff	59.1
Reinforcement of Universal Safety Precautions	21.2
Stock Management	78.4
Waste Management Practices	45.7
Other	2.7

Training

Almost 50 percent of ANMs reported learning how to manage product records using on-the-job training. Nearly 41 percent of ANMs reported receiving no training in record management, including how to complete necessary forms. Only nearly 11 percent of ANMs reported formally learning how to manage logistics records during a logistics management workshop (Figure 29).

Figure 29. How ANMs Learned to Complete Forms/Records for Managing Products (n=115)



Recommendations

Based on the findings from the project’s management information system review, landscape analysis, key performance indicators review, and this survey, the following recommendations are provided to expand the capacity of the supply chains operating within Haryana. Due to funding and time constraints, the project prioritized recommendations that could be implemented during the lifecycle of the project by strategically coordinating with the SHM/ HMSCL to develop state-level work plans.

General

Recommendations

- Coordinate supply chain operations through the establishment of a “supply chain management unit” at the state level and institutionalize SOPs to strengthen operations.
- Develop and institutionalize SOPs to improve operations, such as the distribution of inventory, through documentation and adherence.
- Provide specialized supply chain training to staff to improve adherence to the system.
- Base forecasting, procurement, distribution, and availability on real-time consumption data.
- LMIS data capture tools (e.g. forms, ODISCMS) should be standardized to ensure data are being gathered uniformly across systems and capturing key data points.
- Online system fields, reports, and dashboards should be updated to improve data visibility and decision-making.

Strategic Planning and Oversight and Human Resources

Recommendations

- Develop supply chain strategy.
- Strengthen the “Supply Chain Management Unit” at the state level and create a supply chain officer position at hospitals.
- Develop terms of reference for staff with supply chain tasks and supply chain guidelines and distribute to all facility levels.
- Develop supply chain management workshop (including stock management and recordkeeping) and provide training-of-trainers for SHM/ HMSCL trainers to deliver workshop.
- Assess staff’s workloads with supply chain tasks to determine if more people and what kind of staff need to be hired.
- Partner with university to develop a pre-service supply chain training curriculum.

Forecasting and Procurement

Recommendations

- Update and document SOPs for procurement processes.
- Review product lists and selection process to ensure all commodities listed in the RMNCH+A 5x5 matrix are included in various procurement mechanisms.
- Develop a standardized model for forecasting and supply planning for RMNCH+A commodities, which would include a financial gaps analysis.
- Conduct analysis to determine location of time lag in the quality testing process. Implement solution based on analysis (e.g., increase number of labs to manage quality testing).
- Develop a PIP indicator to measure accuracy of the quality assurance check.

Inventory Management

Recommendations

- Support adherence to GoI-/WHO-recommended storage guidelines at all facility levels.
- For all facilities storing products—
 - Document and, as appropriate, review and update warehouse management SOPs (e.g., determine application of RMNCH+A and EML guidelines).
 - Document and, as appropriate, review and update inventory management SOPs (e.g., confirm rules for inventory control levels to improve ordering accuracy).
- Develop existing ODISCMS capacity to include information on stock position for GoI programs (e.g., family planning products and vaccines).
- Support adherence to ODISCMS through increased personnel and performance monitoring.

Transportation

Recommendations

- Develop a plan and process for managing and monitoring third party logistics contracts that are awarded (e.g., transportation), including—
 - Personnel requirements
 - Vendor selection criteria
 - Key performance indicators
 - Contracting parameters
- Coordinate with transportation vendor to optimize transportation routes once vendor has been selected.

- Analyze gaps in policy versus application of policy.

LMIS

Recommendations

- Strengthen ODISCMS so that it can replace existing paper-based system—
 - Improve data collection by adding ODISCMS fields, including dispensing data, losses/adjustments, days of stock, expiry information, and number of days/weeks stocked out.
 - Conduct performance and stress testing of ODISCMS to identify current problematic areas within the application.
 - Upon completion of functional requirements, capture, review, and potentially redesign the information technology architecture to address new requirements and application performance.
 - While documenting business processes, capture functional requirements/ enhancements in a Software Requirements Specifications document for NIC.
- For sub-centers, standardize forms and stock-keeping records.
- Enhance data visibility by—
 - Developing an information exchange between systems (e.g., ODISCMS to gain access to the HMIS).
 - Incorporating the SCs' and URCH stock position into ODISCMS through the implementation of a mobile phone-based LMIS at the SCs levels.

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Appendix A

Additional Essential Medicines Tables

Table A1. SC-managed Essential Medicines Commodities Included in the Assessment

Albendazole (400 mg, Tb)	Misoprostol (200 mcg, Tb)
Co-trimoxazole ST (100 mg sulfamethoxazole/20 mg Trimethoprim, Tb)	ORS (Sachet)
Dexamethasone (2ml, Amp)	Oxytocin (5 IU/ml, Bottle)
IFA-Blue (100 mg Fe + 500 mcg FA, Tb)	Tetanus Toxoid (0.5 ml, Amp)
IFA-Red (100 mg Fe/500 mcg FA, Tb)	Vitamin A (100,000 IU/ml, Bottle)
IFA Syrup (100 mg Fe/500 mcg FA/ 5 ml)	Vitamin K (1 ml, Amp)
Magnesium Sulfate (500 mg/ml, Amp)	Zinc Sulfate (20 mg, Tb)
Metronidazole (200 mg, Tb)	

IFA=iron folic acid Fe=iron FA=folic acid ORS= Oral rehydration salt Amp=Ampoule
Cap=Capsule Tb=Tablet

Note: Note: To differentiate between the two formulations of Co-trimoxazole, “Co-trimoxazole 100 mg sulfamethoxazole/20 mg Trimethoprim” will be referred to as “Co-trimoxazole ST” in the report and subsequent tables.; IFA (Blue) tablets are provided to adolescents through the Weekly Iron-Folic Acid Supplementation (WIFS) program while IFA (Red) tablets are provided to pregnant women

Table A2. Types of Inventory Logistics Forms Used to Manage Essential Medicines

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
Stockcards/Bin Card/Inventory Control Card	42.9%	37.5%	60.0%	54.7%	47.0%	48.8%
Stock Ledger	57.1%	62.5%	95.0%	80.8%	87.9%	86.0%
Electronic Records (Excel/Access)	85.7%	37.5%	40.0%	36.5%	24.4%	28.3%
ODISCMS	100.0%	100.0%	95.0%	77.7%	55.9%	62.7%
Other	0.0%	0.0%	0.0%	1.8%	4.9%	4.0%

Table A3. Types of Forms Used for Reporting Inventory Information to the Higher Level for Essential Medicines

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
Stock and Issues Register (#4)	42.9%	62.5%	60.0%	61.0%	61.2%	60.9%
NRMH Health Department Monthly Format for Sub-Center and Equivalent Institution (Format C/Format D)	42.9%	0.0%	30.0%	32.7%	33.2%	32.7%
HMIS	0.0%	0.0%	10.0%	5.9%	8.6%	7.9%
ODISCMS	85.7%	100.0%	100.0%	86.4%	61.5%	68.7%
Other	0.0%	0.0%	0.0%	1.5%	2.8%	2.4%

Table A4. Types of Data Included in Completed Inventory Reports for Essential Medicines

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
SOH	100.0%	100.0%	100.0%	98.6%	100.0%	99.7%
Receipts	100.0%	87.5%	95.0%	83.6%	78.9%	80.7%
Quantities Used	100.0%	100.0%	90.0%	94.1%	92.9%	93.2%
Losses and Adjustments	85.7%	0.0%	25.0%	5.4%	15.8%	14.4%

Table A5. Logistics Information Included in Completed Inventory Report for Essential Medicines

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
SOH	100.0%	100.0%	100.0%	98.6%	100.0%	99.7%
Quantities Used	100.0%	100.0%	100.0%	94.2%	96.5%	96.2%
Losses and Adjustments	85.7%	12.5%	45.0%	28.7%	38.8%	37.1%
Completed Report Not Available	14.3%	0.0%	5.0%	0.0%	2.1%	1.9%

Table A6. Where Inventory Reports for Essential Medicines Are Sent

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
Supervisory Facility	14.3%	62.5%	15.0%	8.7%	8.5%	9.5%
District Health Office	0.0%	25.0%	30.0%	35.7%	43.1%	40.4%
District Store	0.0%	0.0%	15.0%	51.6%	53.7%	50.8%
Regional Store	0.0%	25.0%	50.0%	23.7%	17.2%	19.5%
State Health Mission	100.0%	12.5%	30.0%	3.2%	5.0%	6.5%
Central (Delhi) Health Mission	0.0%	0.0%	10.0%	0.0%	1.5%	1.4%

Table A7. Use of the Online Drug Inventory and Supply Chain Management System

	District Store (n=21)	General Hospital (n=20)	CHC (n=76)	PHC (n=143)	Total (n=260)
NA	0.0%	0.0%	1.4%	1.4%	1.4%
No	38.1%	0.0%	3.8%	29.3%	22.8%
Yes	61.9%	100.0%	94.8%	69.3%	74.2%

Table A8. Reported Reasons for Using the Online System

	District Stores	General Hospitals	CHCs	PHCs
Entered Issues Data	76.9%	85.0%	80.7%	80.0%
Entered Receipt Data	61.5%	85.0%	82.7%	73.8%
Checked Balance of Stock at Warehouse	53.8%	60.0%	56.2%	58.2%
Prepared/Submitted Indent	69.2%	60.0%	55.3%	34.5%
Other	7.7%	10.0%	3.0%	4.0%

Table A9. Frequency of Inventory Reports for Essential Medicines Are Sent to Higher Level

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
Weekly	57.1%	12.5%	45.0%	9.6%	14.2%	14.6%
Monthly	42.9%	100.0%	60.0%	91.7%	86.5%	86.5%
Quarterly	0.0%	12.5%	0.0%	2.7%	2.2%	2.3%
Semi-annually	0.0%	0.0%	0.0%	0.0%	2.2%	1.6%
Annually	0.0%	0.0%	0.0%	.9%	0.0%	0.2%
Other	14.3%	12.5%	0.0%	0.0%	.7%	0.8%

Table A10. How Staff Learned to Complete Forms/Records for Managing Essential Medicines

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
During a Logistics Workshop	71.4%	12.5%	35.0%	16.8%	16.3%	17.6%
On-the-Job Training	57.1%	50.0%	30.0%	32.3%	33.5%	33.6%
Never Been Trained	14.3%	37.5%	45.0%	51.8%	52.3%	51.4%
Other	0.0%	0.0%	0.0%	0.0%	1.5%	1.1%

Table A11. Responsibility for Determining Which Essential Medicines to Order and the Quantity

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
The Facility Itself	42.9%	87.5%	75.0%	86.1%	84.4%	84.1%
The Supervising Facility	0.0%	12.5%	15.0%	13.6%	9.2%	10.2%
District Chief Pharmacist/Civil Surgeon	0.0%	12.5%	10.0%	13.9%	13.5%	13.3%
Regional Warehouse	0.0%	0.0%	25.0%	6.4%	4.9%	5.7%
State Health Mission	71.4%	0.0%	5.0%	0.0%	0.7%	1.4%
Central Health Mission	0.0%	0.0%	5.0%	0.0%	0.0%	0.2%

Table A12. Responsibility for Transporting Essential Medicines to the Facility

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
Drug Manufacturer Delivers	100.0%	37.5%	0.0%	8.3%	8.5%	9.5%
Local Supplier Delivers	0.0%	0.0%	10.0%	4.8%	6.4%	6.0%
Higher Level Delivers	28.6%	12.5%	25.0%	41.2%	38.4%	38.2%
This Facility Collects	0.0%	50.0%	65.0%	59.0%	60.9%	59.9%
Other	14.3%	0.0%	5.0%	0.0%	.7%	0.8%

Table A13. Other Sources of Supply for Essential Medicines Used in Previous Six Months

	Warehouses (n=7)	District Stores (n=8)	General Hospitals (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
Central Government	28.6%	0.0%	0.0%	0.0%	0.0%	0.3%
Drug Manufacturer	28.6%	0.0%	5.0%	0.0%	.7%	1.0%
Regional Warehouse	0.0%	37.5%	30.0%	21.7%	10.7%	13.8%
District Warehouse/ Central Store	0.0%	0.0%	30.0%	57.2%	44.6%	45.8%
Higher-Level Facility Warehouse	0.0%	0.0%	5.0%	13.0%	5.1%	6.6%
Local/Private Supplier	0.0%	37.5%	45.0%	25.3%	23.2%	24.2%
None	57.1%	25.0%	0.0%	12.8%	23.6%	21.0%

Table A14. Steps Taken Before Storing Essential Medicines Once Products Are Received at Facility

	Warehouses (n=7)	District Stores (n=8)	General Hospital (n=20)	CHCs (n=72)	PHCs (n=140)	Total (n=247)
Verify Product against Packing Slip	100.0%	87.5%	90.0%	94.2%	93.0%	93.1%
Count Product to Verify Quantity	100.0%	87.5%	100.0%	100.0%	97.9%	98.3%
Add Quantity to Stockcard/Bin Card/Stock Registry	85.7%	87.5%	90.0%	90.6%	92.8%	92.1%
Add Quantity to Computer System	100.0%	75.0%	80.0%	76.2%	53.6%	60.0%

Appendix B

Additional Family Planning Tables

Table B1. Types of Inventory Logistics Forms Used to Manage Family Planning Products

	Warehouse (n=0)	District Stores (n=15)	General Hospital s (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
Stockcards/Bin Card/Inventory Control Card	.	60.0%	50.0%	59.0%	55.4%	56.3%
Stock Ledger	.	100.0%	83.3%	86.2%	91.4%	90.3%
Electronic Records (Excel/Access or Other Software)	.	20.0%	16.7%	18.9%	17.7%	18.0%
Other	.	0.0%	0.0%	1.7%	1.7%	1.6%

Table B2. Types of Forms Used for Reporting Inventory Information to the Higher Level for Family Planning Products

	Ware house (n=0)	District Stores (n=15)	General Hospitals (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
Stock and Issues Register #4	.	93.3%	66.7%	56.5%	60.1%	60.4%
NRMH Health Department Monthly Format for Sub-Center and Equivalent Institution (Format C/Format D)	.	33.3%	58.3%	38.1%	44.8%	43.2%
HMIS	.	13.3%	41.7%	16.0%	22.6%	21.3%
ODISCMS	.	13.3%	0.0%	31.0%	27.8%	27.5%
Other	.	13.3%	0.0%	8.3%	3.4%	4.7%

Table B3. Percentage of Facilities with Accurate Balances (+/- 10) between the Physical Inventory and LMIS on the Day of Visit for Family Planning by Facility Type

	Warehouse	District Store	General Hospital	CHC	PHC	Total*
Combined Oral Pills	0.0	0.0	0.0	71.4	46.5	43.9
Condoms	0.0	0.0	33.3	50.0	61.7	54.7
Emergency Contraception	0.0	0.0	100.0	100.0	54.1	63.3
IUCDs	0.0	0.0	0.0	44.4	50.0	43.7
Pregnancy Test Kits	0.0	0.0	100.0	71.4	33.3	38.1

Table B4. Types of Data Included in Completed Inventory Reports for Family Planning Products

	Warehouse (n=0)	District Stores (n=15)	General Hospitals (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
SOH	.	100.0%	100.0%	100.0%	100.0%	100.0%
Receipts	.	86.7%	91.7%	83.6%	79.4%	80.8%
Quantities Used	.	86.7%	91.7%	89.7%	90.5%	90.2%
Losses and Adjustments	.	13.3%	8.3%	8.3%	12.3%	11.3%

Table B5. Logistics Information Included in Inventory Report for Family Planning Products

	Warehouse (n=0)	District Stores (n=15)	General Hospitals (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
SOH	.	100.0%	100.0%	100.0%	100.0%	100.0%
Quantities Used	.	93.3%	100.0%	97.1%	95.7%	96.1%
Losses and Adjustments	.	33.3%	16.7%	32.0%	29.7%	30.0%
Completed Report not Available	.	6.7%	0.0%	.9%	0.0%	0.4%

Table B6. Where Inventory Reports for Family Planning Products Are Sent

	Warehouse (n=0)	District Stores (n=15)	General Hospitals (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
Supervisory Facility	.	33.3%	41.7%	13.4%	15.6%	16.2%
District Health Office	.	40.0%	33.3%	53.8%	45.1%	46.7%
District Store	.	6.7%	16.7%	43.2%	39.3%	38.8%
Regional Store	.	20.0%	16.7%	11.8%	13.9%	13.6%
State Health Mission	.	26.7%	16.7%	6.2%	6.1%	6.9%
Central (Delhi) Health Mission	.	6.7%	0.0%	2.6%	0.0%	0.8%
Do Not Know	.	0.0%	0.0%	1.7%	0.0%	0.4%

Table B7. Frequency of Inventory Reports for Family Planning Products Are Sent to Higher Level

	Warehouse (n=0)	District Stores (n=15)	General Hospitals (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
Weekly	.	0.0%	0.0%	0.0%	1.7%	1.2%
Monthly	.	86.7%	100.0%	98.1%	97.4%	97.3%
Quarterly	.	6.7%	0.0%	0.0%	0.0%	0.2%
Annually	.	6.7%	0.0%	0.0%	0.0%	0.2%
Other	.	6.7%	0.0%	1.9%	1.7%	1.9%

Table B8. How Staff Learned to Complete Forms/Records for Managing Family Planning Products

	Warehouse (n=0)	District Stores (n=15)	General Hospitals (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
During a Logistics Workshop	.	13.3%	8.3%	6.3%	7.8%	7.6%
On-the-Job Training	.	33.3%	16.7%	28.2%	26.0%	26.5%
Never Been Trained	.	60.0%	75.0%	64.1%	66.3%	65.8%
Other	.	0.0%	0.0%	3.0%	.9%	1.3%

Table B9. Responsibility for Determining Which Family Planning Products to Order and the Quantity

	Warehouse (n=0)	Districts Store (n=15)	General Hospitals (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
The Facility Itself	.	80.0%	91.7%	73.1%	85.4%	82.6%
The Supervising Facility	.	13.3%	8.3%	13.9%	11.1%	11.7%
District Chief Pharmacist/Civil Surgeon	.	20.0%	16.7%	19.5%	13.8%	15.4%
Regional Warehouse	.	6.7%	0.0%	3.9%	.9%	1.7%
State Health Mission	.	0.0%	8.3%	6.8%	.9%	2.4%
Central (Delhi) Health Mission	.	13.3%	0.0%	1.5%	.9%	1.3%
Do Not Know	.	0.0%	0.0%	0.0%	.9%	.6%
Other	.	0.0%	0.0%	7.3%	0.0%	1.7%

Table B10. Responsibility for Transporting Family Planning Products to the Facility

	Warehouse (n=0)	District Stores (n=15)	General Hospitals (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
Manufacturer Delivers	.	6.7%	8.3%	2.7%	1.7%	2.2%
Local Supplier Delivers	.	6.7%	0.0%	6.8%	7.0%	6.8%
Higher Level Delivers	.	33.3%	33.3%	39.9%	41.6%	40.8%
This Facility Collects	.	53.3%	58.3%	70.0%	61.1%	62.8%
Others	.	6.7%	0.0%	0.0%	3.5%	2.7%

Table B11. Other Sources of Supply for Family Planning Products Used in Previous Six Months

	Warehouse (n=0)	District Store (n=15)	General Hospital (n=12)	CHC (n=66)	PHC (n=115)	Total (n=208)
Central Government	.	13.3%	8.3%	2.6%	1.8%	2.4%
Manufacturer	.	0.0%	0.0%	0.0%	.9%	.6%
Regional Warehouse	.	33.3%	8.3%	5.6%	10.0%	9.6%
District Warehouse/Central Store	.	13.3%	33.3%	50.1%	50.7%	49.1%
Higher-Level Facility Warehouse	.	26.7%	8.3%	10.2%	8.0%	9.1%
Local/Private Supplier	.	6.7%	0.0%	6.7%	1.8%	3.0%
None	.	20.0%	50.0%	40.2%	37.7%	38.0%

Table B12. Steps Taken Before Storing Family Planning Products Once Products Are Received at Facility

	Warehouse (n=0)	District Stores (n=15)	General Hospitals (n=12)	CHCs (n=66)	PHCs (n=115)	Total (n=208)
Verify Product against Packing Slip	.	93.3%	100.0%	96.1%	94.0%	94.6%
Count Product to Verify Quantity	.	93.3%	100.0%	100.0%	96.4%	97.2%
Add Quantity to Stockcard/Bin Card/Stock Registry	.	86.7%	83.3%	96.1%	89.8%	91.0%
Add Quantity to Computer System	.	13.3%	25.0%	15.8%	19.1%	18.3%
Do Not Know	.	0.0%	0.0%	0.0%	.9%	.6%

Appendix C

Additional Vaccine Tables

Note – two (2) vaccines (Hepatitis B and Tetanus) were found in two (2) essential medicine warehouses and are included in the below analysis.

Table C1. Types of Inventory Logistics Forms Used to Manage Vaccines

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
Stockcards/Bin Card/Inventory Control Card	50.0%	62.5%	60.0%	58.9%	59.3%	59.2%
Stock Ledger	66.7%	87.5%	93.3%	89.2%	86.9%	87.4%
Electronic Records (Excel/Access or other Software)	50.0%	12.5%	0.0%	14.6%	14.8%	14.7%
Other	0.0%	0.0%	0.0%	1.6%	4.1%	3.4%

Table C2. Types of Forms Used for Reporting Inventory Information to the Higher Level for Vaccines

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
Stock and Issues Register #4	66.7%	62.5%	73.3%	65.6%	68.7%	68.0%
NRMH Health Department Monthly Format for Sub-Center and Equivalent Institution (Format C/Format D)	50.0%	37.5%	53.3%	44.2%	37.0%	39.2%
ODISCMS	33.3%	50.0%	13.3%	18.8%	21.4%	21.1%
HMIS	0.0%	37.5%	20.0%	30.9%	14.9%	18.7%
Other	16.7%	0.0%	0.0%	4.3%	3.2%	3.5%

Table C3. Percentage of Facilities with Accurate Balances (+/- 10) between the Physical Inventory and ODISCMS on the Day of Visit for Vaccines by Facility Type

	Warehouses	District Stores	General Hospitals	CHCs	PHCs	Total
BCG	0.0	0.0	0.0	28.9	31.8	29.9
DPT	0.0	16.7	25.0	34.2	28.7	29.0
Hepatitis B	50.0	0.0	0.0	31.3	47.6	42.6
Measles	0.0	66.7	28.6	15.4	28.4	25.2
OPV	50.0	0.0	0.0	14.3	33.0	27.6

Table C4. Types of Data Included in Completed Inventory Reports for Vaccines

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
SOH	100.0%	100.0%	100.0%	100.0%	99.2%	99.4%
Receipts	83.3%	87.5%	93.3%	85.7%	82.0%	83.2%
Quantities Used	100.0%	87.5%	93.3%	91.7%	92.6%	92.4%
Losses and Adjustments	50.0%	12.5%	13.3%	17.2%	19.2%	18.8%

Table C5. Logistics Information Included in Inventory Report for Vaccines

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
SOH	100.0%	100.0%	100.0%	100.0%	99.2%	99.4%
Quantities Used	100.0%	100.0%	100.0%	97.3%	94.3%	95.2%
Losses and Adjustments	66.7%	12.5%	40.0%	36.4%	39.0%	38.4%

Table C6. Where Inventory Reports for Vaccines Are Sent

	Warehouses (n=6)	District Stores (n=8)	General Hospitals/DHs (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
Supervisory Facility	16.7%	0.0%	13.3%	10.8%	15.5%	14.2%
District Health Office	0.0%	12.5%	46.7%	48.4%	44.5%	44.5%
District Store	0.0%	0.0%	20.0%	43.9%	45.0%	43.0%
Regional Store	0.0%	62.5%	20.0%	14.6%	9.1%	11.2%
State Health Mission	100.0%	25.0%	26.7%	5.3%	2.4%	5.1%
Central (Delhi) Health Mission	0.0%	0.0%	0.0%	0.0%	.8%	.6%

Table C7. Frequency of Inventory Reports for Vaccines Are Sent to Higher Level

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
Weekly	0.0%	12.5%	0.0%	1.6%	1.6%	1.7%
Monthly	100.0%	87.5%	100.0%	98.4%	98.4%	98.3%
Other	0.0%	0.0%	0.0%	0.0%	.8%	.6%

Table C8. How Staff learned to Complete Forms/Records for Managing Vaccines

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
During a Logistics Workshop	33.3%	12.5%	20.0%	9.8%	13.9%	13.4%
On-the-Job Training	16.7%	50.0%	33.3%	62.5%	35.5%	41.4%
Never Been Trained	50.0%	37.5%	53.3%	27.7%	49.8%	44.8%
Other	0.0%	0.0%	0.0%	0.0%	1.6%	1.2%

Table C9. Responsibility for Determining Which Vaccines to Order and the Quantity

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
The Facility Itself	83.3%	87.5%	86.7%	83.9%	85.2%	84.9%
The Supervising Facility	0.0%	25.0%	6.7%	9.4%	12.2%	11.5%
District Chief Pharmacist Civil Surgeon	0.0%	12.5%	6.7%	17.6%	14.8%	15.0%
Regional Warehouse	0.0%	12.5%	6.7%	1.2%	3.4%	3.1%
State Health Mission	16.7%	0.0%	13.3%	3.0%	.8%	1.8%
Other	0.0%	0.0%	0.0%	2.6%	0.0%	.6%

Table C10. Responsibility for Transporting Vaccines to the Facility

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
Manufacturer Delivers	50.0%	0.0%	6.7%	1.5%	4.9%	4.6%
Local Supplier Delivers	0.0%	0.0%	0.0%	5.2%	4.9%	4.7%
Higher Level Delivers	0.0%	37.5%	46.7%	53.7%	54.6%	53.3%
This Facility Collects	50.0%	62.5%	46.7%	50.0%	43.9%	45.7%
Other	0.0%	0.0%	0.0%	0.0%	2.4%	1.8%

Table C11. Other Sources of Supply for Vaccines Used in Previous Mix Months

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
Central Government	33.3%	0.0%	0.0%	0.0%	.8%	.9%
Manufacturer	16.7%	0.0%	6.7%	0.0%	.8%	.9%
Regional Warehouse	0.0%	37.5%	20.0%	2.3%	4.2%	4.6%
District Warehouse/Central Store	0.0%	0.0%	26.7%	49.6%	52.7%	50.0%
Higher-level Facility Warehouse	16.7%	12.5%	13.3%	9.1%	8.3%	8.8%
None	33.3%	50.0%	40.0%	46.9%	42.3%	43.3%

Table C12. Steps Taken Before Storing Immunization Vaccines Once Products Are Received at Facility

	Warehouses (n=6)	District Stores (n=8)	General Hospitals (n=15)	CHCs (n=67)	PHCs (n=121)	Total (n=217)
Verify Product Against Packing Slip	100.0%	100.0%	100.0%	95.9%	95.1%	95.6%
Count Product to Verify Quantity	100.0%	100.0%	100.0%	97.4%	97.5%	97.6%
Add Quantity to Stockcard/Bin Card/Stock Registry	100.0%	100.0%	100.0%	91.3%	90.9%	91.5%
Add Quantity to Computer System	66.7%	25.0%	26.7%	16.9%	18.1%	18.7%
Check VVM	66.7%	50.0%	40.0%	48.3%	38.7%	41.3%
Do Not Know	0.0%	0.0%	0.0%	.9%	0.0%	.2%

Appendix D

Additional RTI/STI and HIV and AIDS Tables

Table D1. Average Frequency of Stockouts of HIV and AIDS Commodities within Last Three Months by Product and Facility Type

	General Hospitals	CHCs	PHCs	Total
Efavirenz	.	1.00	.	1.00
HIV Test Kits	.	.	.	.
Nevirapine	.	.	.	.
RTI/STI Treatment Kit 1	1.00	.	.	1.00
RTI/STI Treatment Kit 4	1.00	.	.	1.00
RTI/STI Treatment Kit 6	.	.	.	.
TL Combo	.	.	.	.
ZLN Combo	.	.	.	.

Table D2. Average Number of Days of Stockouts of HIV and AIDS Commodities within Last Three Months by Product and Facility Type

	General Hospitals	CHCs	PHCs	Total
Efavirenz	.	60.00	.	60.00
HIV Test Kits	.	.	.	.
Nevirapine	.	.	.	.
RTI/STI Treatment Kit 1	60.00	.	.	60.00
RTI/STI Treatment Kit 4	65.00	.	.	65.00
RTI/STI Treatment Kit 6	.	.	.	.
TL Combo	.	.	.	.
ZLN Combo	.	.	.	.

Table D3. Types of Inventory Logistics Forms Used to Manage HIV Test Kits and ARVs

	Warehouses	District Stores	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
Stockcards/Bin Card/Inventory Control Card	.	.	57.1%	62.1%	62.1%	61.5%
Stock Ledger	.	.	85.7%	89.5%	80.9%	84.7%
Electronic Records (Excel/Access or Other Software)	.	.	50.0%	39.3%	27.6%	34.0%
Other	.	.	0.0%	0.0%	3.8%	2.0%

Table D4. Types of Forms Used for Reporting Inventory Information to the Higher Level for HIV Test Kits and ARVs

	Warehouses	District Stores	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
Stock and Issues Register #4	.	.	71.4%	61.2%	65.2%	64.1%
NRMH Health Department Monthly Format for Sub-Center and Equivalent Institution (Format C/Format D)	.	.	42.9%	35.9%	35.1%	35.6%
HMIS	.	.	14.3%	15.4%	11.9%	13.8%
ODISCMS	.	.	28.6%	45.6%	46.7%	44.8%
Other	.	.	28.6%	9.4%	3.8%	7.9%

Table D5. Percentage of Facilities with Accurate Balances (+/- 10) between the Physical Inventory and LMIS on the Day of Visit for RTI/STI and HIV and AIDS by Facility Type

	General Hospitals	CHCs	PHCs	Total*
Efavirenz	0.0	0.0	0.0	0.0
Nevirapine	33.3	0.0	0.0	14.3
RTI/STI Treatment Kit 1	50.0	33.3	0.0	42.9
RTI/STI Treatment Kit 4	66.7	0.0	0.0	66.7
RTI/STI Treatment Kit 6	50.0	0.0	0.0	50.0
TL Combo	33.3	0.0	0.0	33.3
ZLN Combo	33.3	0.0	0.0	33.3

Table D6. Types of Data Included in Completed Inventory Reports for HIV Test Kits and ARVs

	Warehouse	District Store	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
SOH	.	.	92.9%	100.0%	100.0%	99.4%
Receipts	.	.	100.0%	85.3%	69.6%	78.3%
Quantities Used	.	.	85.7%	86.7%	88.7%	87.9%
Losses and Adjustments	.	.	28.6%	39.3%	27.3%	31.5%

Table D7. Logistics Information Included in Completed Inventory Report for HIV Test Kits and ARVs

	Warehouse	District Store	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
SOH	.	.	100.0%	100.0%	96.2%	98.0%
Quantities Used	.	.	100.0%	96.6%	96.2%	96.7%
Losses and Adjustments	.	.	35.7%	55.5%	46.1%	48.1%

Table D8. Where Inventory Reports for HIV Test Kits and ARVs Are Sent

	Warehouse	District Store	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
Supervisory Facility	.	.	28.6%	19.2%	3.8%	11.5%
District Health Office	.	.	0.0%	45.8%	42.0%	39.9%
District Store	.	.	14.3%	31.6%	58.0%	43.9%
Regional Store	.	.	14.3%	11.7%	11.3%	11.5%
State NACO/DAC Office	.	.	57.1%	29.3%	3.8%	18.2%
Central (Delhi) NACO/DAC Office	.	.	14.3%	0.0%	0.0%	1.2%
Do Not Know	.	.	7.1%	0.0%	0.0%	0.6%

Table D9. Frequency of Inventory Reports for HIV Test Kits and ARVs Sent to Higher Level

	Warehouse	District Store	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
Weekly	.	.	7.1%	6.1%	3.8%	4.9%
Monthly	.	.	85.7%	91.8%	92.5%	91.7%
Quarterly	.	.	7.1%	2.1%	0.0%	1.4%
Semi-annually	.	.	0.0%	0.0%	3.8%	2.0%
Annually	.	.	0.0%	0.0%	3.8%	2.0%

Table D10. How Staff learned to Complete Forms/Records for Managing HIV Test Kits and ARVs

	Warehouse	District Store	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
During a Logistics Workshop	.	.	21.4%	9.5%	15.0%	14.6%
On-the-Job Training	.	.	35.7%	50.6%	38.6%	42.3%
Never Been Trained	.	.	57.1%	36.4%	50.2%	45.1%

Table D11. Responsibility for Determining Which HIV Test Kits and ARVs to Order and the Quantity

	Warehouse	District Store	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
The Facility Itself	.	.	92.9%	76.3%	61.8%	69.6%
The Supervising Facility	.	.	7.1%	7.6%	22.6%	15.5%
District Chief Pharmacist/Civil Surgeon	.	.	7.1%	18.4%	27.0%	21.8%
Regional Warehouse	.	.	0.0%	2.6%	0.0%	0.9%
State Health Mission	.	.	7.1%	0.0%	3.8%	3.2%
Other	.	.	7.1%	3.4%	0.0%	1.9%

Table D12. Responsibility for Transporting HIV Test Kits and ARVs to the Facility

	Ware-house	District Store	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
Drug Manufacturer Delivers	.	.	7.1%	0.0%	0.0%	1.2%
Local Supplier Delivers	.	.	0.0%	10.8%	19.4%	14.4%
Higher Level Delivers	.	.	28.6%	32.9%	37.9%	35.4%
This Facility Collects	.	.	71.4%	58.5%	73.0%	66.7%
Other	.	.	0.0%	9.4%	0.0%	3.4%

Table D13. Other Sources of Supply for HIV Test Kits and ARVs Used in Previous Six Months

	Ware-house	District Store	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
Central Government	.	.	14.3%	0.0%	3.8%	3.8%
Regional Warehouse	.	.	14.3%	10.7%	8.2%	9.5%
District Warehouse/Central Store	.	.	14.3%	40.3%	46.1%	40.7%
Higher-level Facility Warehouse	.	.	14.3%	9.1%	7.5%	8.6%
Local/Private Supplier	.	.	0.0%	15.4%	7.8%	9.8%
Donated by NGO	.	.	0.0%	6.0%	0.0%	2.2%
None	.	.	50.0%	31.5%	26.6%	30.7%

Table D14. Steps Taken Before Storing HIV Test Kits and ARVs Once Products Are Received at Facility

	Ware-house	District Store	General Hospitals (n=14)	CHCs (n=28)	PHCs (n=26)	Total (n=70)
Verify Product against Packing Slip	.	.	100.0%	96.6%	88.7%	92.7%
Count Product to Verify Quantity	.	.	100.0%	96.6%	88.7%	92.7%
Add Quantity to Stockcard/Bin Card/Stock Registry	.	.	92.9%	93.2%	76.5%	84.3%
Add Quantity to Computer System	.	.	71.4%	25.9%	27.6%	31.6%

Appendix E

Commodities Included in the Assessment

	Medicines/ Product	Formulation	Type of Supply Chain				Required Availability by Level of Care (According to EML or Other Guideline)				RMNCH +A Matrix
			SHM/ HMSC L	Family Planning	Vaccines	RTI/STI and HIV and AIDS	General Hospital	CHC	PHC	SC	
1	Albendazole	400 mg	x				x	x	x	x	x
2	Ampicillin	Injection powder 500 mg	x				x	x	x		x
3	Amoxicillin	Capsules 250 mg	x				x	x	x		x
4	Azithromycin	500 mg	x				x	x	x		
5	Cefixime	200 mg	x				x	x	x		
6	Ceftriaxone	Injection powder 250 mg	x				x	x	x		x
7	Co-trimoxazole (Sulfamethoxazole- Trimethoprim)	100 mg sulfamethoxazole + 20 mg trimethoprim	x				x	x	x	x	x
8	Co-trimoxazole	800 mg sulfamethoxazole + 160 mg trimethoprim	x				x	x	x		x
9	Dexamethasone	Injection	x				x	x	x	x	x
10	Doxycycline	100 mg	x				x	x	x		

	Medicines/ Product	Formulation	Type of Supply Chain				Required Availability by Level of Care (According to EML or Other Guideline)				RMNCH +A Matrix
			SHM/ HMSC L	Family Planning	Vaccines	RTI/STI and HIV and AIDS	General Hospital	CHC	PHC	SC	
11	Gentamycin	40 mg/ml (injection)	x				x	x	x		x
12	Iron folic acid (IFA) tablets (Blue) (IFA- WIFs)	100 mg iron + 500 mcg folic acid	x				x	x	x	x	x
13	Iron folic acid (IFA) tablets (Red)	100 mg iron + 500 mcg folic acid	x				x	x	x	x	x
14	Iron folic acid (IFA) Syrup	100 mg iron + 500 mcg folic acid / 5 ml	x				x	x	x	x	x
15	Magnesium Sulfate	500 mg/ml, 1 ml ampoule	x				x	x	x	x	x
16	Methyldopa	Tablet 250 mg	x				x	x	x		x
17	Metronidazole	Tablets 200 mg	x				x	x	x	x	x
18	Misoprostol	Tablet 200 mcg	x				x	x	x	x	x
19	ORS	Packets	x				x	x	x	x	x
20	Oxytocin	Injection (5 IU 1 ml ampoule)	x				x	x	x	x	x
21	Vitamin A Syrup	Suspension 100000 IU/ml	x				x	x	x	x	x
22	Vitamin K	Injection (1 ml)	x				x	x	x	x	x
23	Zinc Sulfate	Tablets 20 mg	x				x	x	x	x	x
24	BCG	Injection			x		x	x	x	x	x
25	DPT	Injection			x		x	x	x	x	x
26	Hepatitis B (Vaccine)	Injection			x		x	x	x	x	x
27	Measles (Vaccine)	Injection			x		x	x	x	x	x

	Medicines/ Product	Formulation	Type of Supply Chain				Required Availability by Level of Care (According to EML or Other Guideline)				RMNCH +A Matrix
			SHM/ HMSC L	Family Planning	Vaccines	RTI/STI and HIV and AIDS	General Hospital	CHC	PHC	SC	
28	Oral Polio Vaccine (OPV)	Oral Vials			x		x	x	x	x	x
29	Tetanus Toxoid (TT)	Injection	x				x	x	x	x	x
30	Condoms	Any (1 or pack of three)		x			x	x	x	x	x
31	Emergency Contraception	Any		x			x	x	x	x	x
32	IUCDs	Copper T 380A		x			x	x	x	x	x
33	Oral contraceptive pills	Any		x			x	x	x	x	x
34	Pregnancy Test Kits	Any		x			x	x	x	x	x
35	Efavirenz (EFV)	600 mg tablets				x	x	x			
36	Nevirapine (NVP)	Oral suspension (10 mg/ml)				x	x	x			
37	RTI/STI Treatment Kit 1 (Grey)	Tb. Azithromycin 1 g /Cefixime 400 mg				x	x	x	x		x
38	RTI/STI Treatment Kit 4 (Blue)	Tb. Doxycycline 100 mg and Azithromycin 1 g				x	x	x	x		x
39	RTI/STI Treatment Kit 6 (Yellow)	Tb. Cefixime 400 mg/ Metronidazole 400 mg/ Doxycycline 100 mg				x	x	x	x		x

	Medicines/ Product	Formulation	Type of Supply Chain				Required Availability by Level of Care (According to EML or Other Guideline)				RMNCH +A Matrix
			SHM/ HMSC L	Family Planning	Vaccines	RTI/STI and HIV and AIDS	General Hospital	CHC	PHC	SC	
40	TL Combo	Tb, Lamivudine (3TC) 300 mg+ Tenofovir (TDF) 300 mg (disoproxil fumarate)				x	x	x			
41	ZLN Combo –	Lamivudine (3TC) 150 mg+ Nevirapine (NVP) 200 mg + Zidovudine (AZT) 300 mg				x	x	x			
42	HIV Test Kit	Whole Blood Finger Prick Test Kit Type I				x	x	x	x		

Appendix F

Individual Storage Conditions

	All Products Stored Together	Essential Medicines	Family Planning	Family Planning + Vaccines	HIV	Vaccines
Products that are ready for distribution are arranged so identification labels and expiry dates or manufacturing dates are visible.	71.3%	80.7%	96.5%		100.0%	66.9%
Products are stored and organized in a manner accessible for FEFO counting and general management.	73.7%	79.3%	86.5%	67.3%	100.0%	66.9%
Cartons and products are in good condition, not crushed due to mishandling.	70.9%	66.6%	77.4%	75.1%	100.0%	66.9%
The facility makes it a practice to separate damaged or expired products from usable products and removes them from inventory.	84.8%	83.9%	62.9%	85.7%	100.0%	94.0%
Products are protected from direct sunlight.	96.9%	92.1%	90.0%	76.6%	93.9%	94.0%
Cartons and products are protected from water and humidity.	87.1%	85.3%	88.5%	87.6%	100.0%	94.0%
Storage area is visually free from garbage/clutter, harmful insects, and rodents.	81.3%	83.2%	79.1%	74.6%	100.0%	74.0%
Storage area is secured with a lock and key.	93.7%	88.3%	87.8%	99.5%	100.0%	80.0%

	All Products Stored Together	Essential Medicines	Family Planning	Family Planning + Vaccines	HIV	Vaccines
High-value commodities or control substances are in a separately locked location that remains locked at all times unless dispensing.	89.7%	82.3%	87.2%	86.6%	100.0%	94.0%
Products are stored at the appropriate temperature according to product temperature specifications.	84.1%	83.1%	88.2%	74.7%	100.0%	80.0%
Roof is in good condition to avoid sunlight and water penetration.	92.1%	84.9%	87.3%	90.0%	100.0%	100.0%
Storeroom is in good condition.	70.8%	82.2%	87.7%	54.2%	100.0%	87.0%
The current space and organization is sufficient for existing products and reasonable expansion.	64.9%	69.8%	88.2%	77.2%	100.0%	81.0%
Fire safety equipment is available and accessible.	23.3%	24.9%	13.0%	34.0%	46.4%	35.9%
Products are stored separately from insecticides and chemicals.	96.3%	76.2%	89.0%	87.7%	93.9%	93.0%

For more information, please visit deliver.jsi.com.

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