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NICARAGUA: INTEGRATING LOGISTICS FUNCTIONS AT THE MINISTRY OF HEALTH

A CASE STUDY—ASSESSING THE EFFECTS OF
INTEGRATION ON SUPPLY CHAIN PERFORMANCE
AND CONTRACEPTIVE SECURITY



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USAID | DELIVER PROJECT, Task Order 1

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Abstract

In April 2008, the Ministry of Health (MOH), with technical assistance from the USAID | DELIVER PROJECT, Task Order 1, conducted an assessment of the impact of integrating the supply chain on supply chain performance and product availability in Nicaragua. This study assesses the effects of integrating the logistics system in five Ministry of Health (MINSa) regions by comparing supply chain performance and commodity availability among these five regions and several regions that still operate some logistics functions vertically. The quantitative analysis suggests that, in general, stockout rates were relatively low in both integrated and non-integrated regions, especially on the day of the visit (less than four percent on average for all commodities inventoried at any type of facility on the day of the visit). The analysis determined that facilities at all levels in both integrated and non-integrated regions are experiencing stockouts. The data collected for the study suggest that the integrated system itself did not necessarily cause higher stockout levels for certain products. Instead, it appears that some issues with system design (inventory control and buffer stocks), delays and stock availability issues at the central level, and some instability during the beginning of the transition to an integrated system may have translated into stockouts. Overall, this case study illustrates both challenges and successes related to the integration process and guaranteeing the availability of contraceptives and essential medicines in the integrated supply chain.

This document is available in both English and Spanish and can be obtained directly from the USAID | DELIVER PROJECT at deliver.jsi.com.

Cover photo: Pharmacy nurse organizing prescriptions dispensed to users. Leonel Rugama Pharmacy, Estelí region (Integrated SILAIS).

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ACRONYMS

CIPS	<i>Central de Insumos para la Salud</i> (Nicaraguan central medical store)
DAIS	<i>Dirección de Abastecimiento de Insumos para Salud</i> (Nicaraguan Essential Medicines Directorate)
EDL	Essential Drug List
FP	family planning
HCAP	<i>Hoja de control de abastecimiento y pedido</i> (Nicaraguan essential medicines receipt and issues form)
LAC	Latin America and the Caribbean
LIAT	Logistics Indicators Assessment Tool
LMIS	logistics management information system
MINSA	<i>Ministerio de Salud de Nicaragua</i> (Nicaraguan Ministry of Health)
MOH	ministry of health
MOSAFC	<i>Modelo de Salud Familiar y Comunitario</i> (Nicaragua Family and Community Health Model)
NGO	nongovernmental organization
ORS	oral rehydration solution
SDP	service delivery point
SIGLIM	<i>Sistema Integrado para la Gestión Logística de Insumos Médicos</i> (Integrated LMIS in Nicaragua)
SIAL	<i>Sistema de Información para la Administración Logística</i> (LMIS for contraceptives in Nicaragua)
SILAIS	<i>Sistemas Locales de Atención Integral en Salud</i> (regions in Nicaragua)
STG	standard treatment guideline
TB	tuberculosis
USAID	United States Agency for International Development

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EXECUTIVE SUMMARY

Recently, like many other countries in the LAC region, Nicaragua began to phase out USAID contraceptive donations while, at the same time, the Ministry of Health of Nicaragua (MINSAL, for its acronym in Spanish) commenced a gradual process of integrating the contraceptive and essential medicine supply chains. MINSAL began this process by applying many of the tools successfully developed and tested for the contraceptive supply chain, over the last 10 years, to the logistics system for essential medicines. During this transition, the MINSAL also worked to preserve aspects of the essential medicine supply chain that were working effectively, for example, warehousing and distribution. In the early stages of the integration¹ process, the MOH decided to integrate the logistics management information system (LMIS) gradually in selected regions in order to test the new system, make improvements, and then take the integrated LMIS to scale.

This study seeks to assess the effects of integrating the logistics system in five Nicaraguan Ministry of Health regions by comparing supply chain performance in these regions with partially integrated supply chain functions in several other regions. This case study takes a first step toward documenting and assessing this process while also collecting quantitative data on commodity availability and qualitative data on the advantages and challenges of integration in Nicaragua.

The authors expect this study will provide useful data to ministry of health representatives in other countries that are planning to integrate or already are integrating their commodity supply chain on how integration can affect contraceptive and essential drug supply chain management. The analysis also provides observations for the MINSAL in Nicaragua that may help further consolidate supply chain integration processes at the national level.

Over the last four years (2003–2008), various steps were carried out to help integrate the supply chain nationwide:

- 1) Originally, six distinct supply chains were operated separately.
- 2) The contraceptive logistics system was designed and rolled out nationwide.
- 3) Next, the MINSAL recognized a need to integrate some commodities as broader integration reforms took place.
- 4) The MINSAL analyzed all information systems to draw from their strengths by conducting focus groups.
- 5) Based on these analyses, MINSAL recognized the contraceptive supply chain LMIS as a model system for integrating the essential medicine's supply chain.
- 6) Next, a new integrated LMIS was developed and piloted in two SILAIS, drawing on the strengths of both the contraceptive and essential medicines' logistics systems.
- 7) Based on the results of the pilot program, the LMIS was then revised.
- 8) The pilot program was then expanded to five SILAIS (Nicaragua's health regions).
- 9) The LMIS continued to be improved and revised.

¹ Integration can best be defined as the merging of vertically managed health services and management activities—logistics, for example.

- 10) Next, various assessments were carried out to determine the success of the pilot program based on logistics performance indicators such as reporting rates, stockouts, and duration of stockouts.
- 11) Finally, based on positive results, the MINSA decided to expand the pilot program to the remaining 12 SILAIS.

Beyond outlining the steps in the integration process, and in response to the qualitative survey about the integration process, all the technicians and decisionmakers interviewed (10), at the central level, stated clearly and decisively that integrating logistics functions for essential medicines and contraceptives has been a great advance in the MINSA. Several respondents identified that, although some functions managed vertically were working for some commodities (contraceptives, for example), different data were collected by distinct systems and stored in separate and unrelated repositories that were used for varying purposes. By implementing the integrated LMIS, essential logistics data are now available for essential medicines as well as contraceptives. Nevertheless, there have been challenges with the new system that central-level respondents hope will be addressed as the system is further consolidated.

At the local level, technicians and decisionmakers made some very similar observations to those brought up at the central level, with some additional observations. Seventy percent of the 56 respondents interviewed, both technicians at the clinic level and decisionmakers at the regional office level, indicated that they prefer the Nicaraguan integrated LMIS (SIGLIM) to managing contraceptive and essential medicines' information vertically. Local-level technicians and decisionmakers also observed some challenges to effectively rolling out the new system, which they hope to remedy as the system is further strengthened over the years.

The quantitative analysis suggests that, in general, stockout rates were relatively low in both integrated and non-integrated regions, especially on the day of the visit (less than four percent on average for all commodities inventoried at any type of facility on the day of the visit). The fact that stockouts were observed is reasonable considering the fact that the LMIS is being consolidated and rolled out at the national level, and these recent changes have inevitably caused some instability throughout the logistics system. Stockouts varied significantly by the level of the supply chain assessed. For example, fewer stockouts were observed at service delivery points than at higher levels of the supply chain. These findings suggest that efforts are being made to protect the client from any negative stock situation throughout this transition process. Nevertheless, facilities at all levels in both integrated and non-integrated SILAIS are experiencing stockouts. The data collected for the study suggest that the integrated system itself did not necessarily cause higher stockout levels for certain products. Instead, it appears that some issues with system design (inventory control and buffer stocks), delays and stock availability issues at the central level, and some instability during the beginning of the transition to an integrated system may have translated into stockouts.

Some of these stockouts appear to be caused by shortcomings at the central level; whereas, other stockouts are most likely caused by challenges in inventory management at lower levels of the system. In several cases, facilities in the integrated SILAIS experienced more stockouts than did the non-integrated facilities. One possible explanation for these stockouts could be the lower buffer stocks held in integrated SILAIS, which has less to do with the integration process itself and more to do with the logistics system design in the integrated SILAIS. These lower buffer stocks may have led to stockouts because the lead time for filling orders often exceeds the amount of stock on hand. On the other hand, for several commodities, the non-integrated facilities experienced higher stockout rates than did the integrated facilities. In the majority of non-integrated site stockouts, the commodities were different from those that had been stocked out at the central level.

Although differences can be observed in stock status between integrated and non-integrated sites, several external factors may be contributing to these shortcomings in both integrated and non-

integrated SILAIS, such as central-level reporting requirements; financing, procurement, and transport/distribution challenges; geographic location; human resource capacity; etc. Some of these factors may affect supply chain performance in either modality to a greater or lesser degree.

In conclusion, by conducting both a qualitative and quantitative analysis midway through the integration process, the study revealed that integration is a long and complicated process that must be carefully managed to avoid stockouts in the short, medium, and long term. Although the integration process and other external factors may affect the logistics system before, during, and after this process, the authors believe that careful planning and high-level support for commodity security can help mitigate some of the challenges observed in Nicaragua.

Because integration processes are inevitably taking place, it is important to advocate for a focus on the supply chain throughout the broader health reform process. Even when the supply chain is strengthened throughout the integration process, commodity availability may not automatically improve immediately. Because the integrated system is exponentially more complex than managing various supply chains vertically, it may take some time before commodity availability can be guaranteed in the new system. Logistics staff will be managing hundreds of commodities and learning and implementing new skills that will take a significant amount of time to consolidate at a national level. The Nicaragua case study illustrates both challenges and successes related to the integration process and guaranteeing contraceptives' and essential medicines' availability in the integrated supply chain. In spite of these challenges, supply chains can be designed to succeed in almost any environment, as long as policymakers and program managers are committed to making and keeping products available to their clients. In all circumstances, supply chain management requires careful and detailed planning, policy-level visibility and support, sufficient human and material resources, and a commitment to the collection and use of accurate and timely information to drive supply chain decision making.

INTRODUCTION

Historically, international donors have partially or completely supplied contraceptives and other priority commodities, such as vaccines, in the Latin American and Caribbean (LAC) region and also have provided technical assistance to build and support their logistics systems. As a result, ministries of health (MOHs), social security institutes, and nongovernmental organizations (NGOs) have set up, financed, and managed vertical contraceptive logistics systems that function separately from essential medicine and other specialized—also vertical—systems, such as vaccine, HIV and AIDS, tuberculosis (TB), and malaria supply chains.

In recent years, however, donor support for contraceptives has started to decline worldwide. In the early 1990s, Latin America was the first region to begin experiencing a decline in contraceptive donations from the U.S. Agency for International Development (USAID) and other donors. Six countries—Dominican Republic, El Salvador, Honduras, Nicaragua, Paraguay, and Peru—have begun planning for phaseout of donations and technical assistance by developing and implementing their national contraceptive security² plans, including policy, procurement, financing, service delivery, logistics, and market segmentation strategies. While Bolivia and Guatemala are not expected to stop receiving donations in the near future, they are participating in the regional moves to improve contraceptive security. Throughout the phaseout process, most ministries of health in the region have opted to integrate contraceptives with other essential medicines, while HIV and AIDS, malaria, and TB logistics systems are often still managed vertically, mainly due to continued donor support.

Recently, like many other countries in the LAC region, Nicaragua began a phaseout of USAID contraceptive donations while, at the same time, The Ministry of Health of Nicaragua (MINSa, for its acronym in Spanish) commenced a gradual process of integrating the contraceptive and essential medicine supply chains. The MINSa began this process by applying many of the tools successfully developed and tested for the contraceptive supply chain, over the last 10 years, to the logistics system for essential medicines. During this transition, the MINSa also worked to preserve aspects of the essential medicine supply chain that worked effectively, for example, warehousing and distribution. In the early stages of the integration process, the MOH decided to integrate the LMIS gradually in selected regions in order to test the new system, make improvements, and then take the integrated LMIS to scale. In the meantime, other logistics functions, such as warehousing, inventory control management, and human resources, that were already functioning satisfactorily across all regions, were strengthened and maintained in the regions that piloted the integrated LMIS.

To help frame this study, the authors reviewed findings from previous studies conducted in Latin America and other regions that have not been entirely conclusive on the positive and negative effects of integration on supply chain performance and product availability. For example, logistics assessments in Mali and Tanzania suggest that integration efforts that increase the number of commodities managed by one supply chain may interrupt the availability of contraceptives if the process is not managed carefully and the strengths of the various vertical systems are not preserved (Bossert et al. 2002, Bossert et al. 2003, and Kinzett and Lunt 2000). Additionally, these studies found that contraceptive availability may be interrupted in the short term but eventually improves over time. A possible disruption makes sense since integration involves a complex series of changes

² Contraceptive security exists when every person is able to choose, obtain, and use quality contraceptives and other essential reproductive health products whenever he or she needs them.

to the logistics system during the transition phase. The authors ultimately found these previous findings to be consistent with the experience observed in Nicaragua.

Although these previous studies assessed stock availability, they did not necessarily document and evaluate the steps in the integration process or the most effective way of carrying out these steps and managing the transition to minimize disruptions in the supply chain. The present case study takes a first step toward documenting and assessing this process while also collecting quantitative data on commodity availability and qualitative data on the advantages and challenges of integration in Nicaragua. The authors expect that this study will help other countries that are considering integrating their supply chains to make better-informed decisions about how to manage the transition process effectively at all levels of the system.

DEFINING INTEGRATION

For the purpose of this study, integration can best be defined as the merging of vertically managed health services and management activities—logistics, for example. Figures 1 and 2 provide examples of how vertical and integrated systems operate, highlighting their basic differences.³

Figure 1: Vertical Logistics System

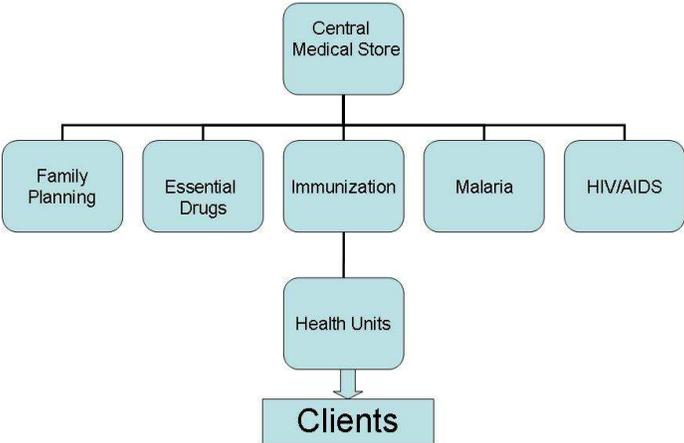
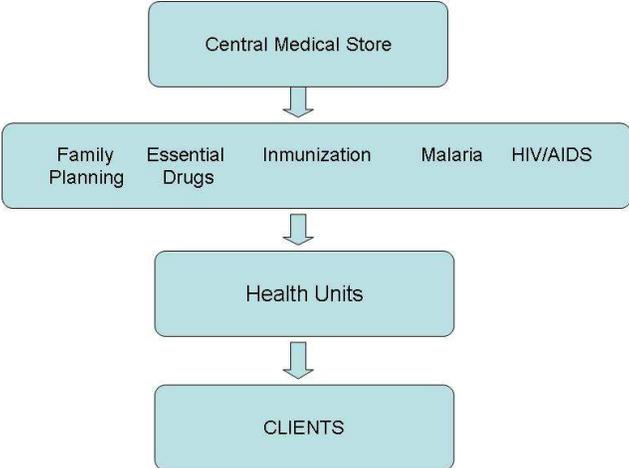


Figure 2: Integrated Logistics System



³ This section is based on previous study: Beith, Alix, Nora Quesada, Wendy Abramson, Anabella Sánchez, and Nadia Olson. 2006. *Decentralizing and Integrating Contraceptive Logistics Systems in Latin America and the Caribbean, With Lessons Learned from Asia and Africa* (draft). Arlington, Va: DELIVER, for the U.S. Agency for International Development.

Understanding and examining the essential logistics functions associated with the logistics cycle are fundamental when prioritizing supply chain management throughout the integration process. Table 1 lists the essential logistics functions that must be managed efficiently to ensure commodity availability for the client. The following analysis focuses on these logistics functions in order to provide a comprehensive assessment of the integration process and supply chain performance in the Nicaraguan Ministry of Health.

Table 1 Logistics Functions

Functions of the Logistics System
Treatment protocols
Product selection
Forecasting and needs quantification
Budgeting
Procurement
Inventory control
Transportation
Human resources/Personnel
Training and supervision
Monitoring and evaluation/Quality assurance
Logistics management information system
Warehousing and distribution
Organizational support

BACKGROUND

JUSTIFICATION

This paper takes previous studies of integrating contraceptives and essential medicines one step further by grounding them in one country's experience with implementing the steps in the integration process. Before carrying out this study, the authors conducted a literature review of previous studies of the effects of health reforms, such as integration and decentralization (see the references section for a list of studies). One such study used a statistical method to assess the effects of these reforms on supply chain performance (Bossert et al. 2002). The findings of these studies were not conclusive in regard to the positive or negative effects of integrating logistics functions, except that the LMIS and quantification of needs functions may work effectively when integrated, and that stock availability could be temporarily interrupted throughout the transition process. By documenting the integration process and exploring some of the strengths and weaknesses of how this process was undertaken, this study helps to qualify ways to roll out the stages of integration. In addition, by exploring whether integration in Nicaragua improved or impeded contraceptive and essential medicine availability, this paper helps to quantify the benefits and drawbacks of gradually merging various components of these two supply chains. The study findings and lessons will ultimately assist other countries to systematically and thoughtfully prepare to integrate their supply chain.

GOAL AND OBJECTIVES

STUDY GOAL

This study seeks to assess the effects of integrating the logistics system in five Nicaraguan Ministry of Health (MINSa) regions by comparing integrated supply chain performance in these regions with partially integrated supply chain functions in several other regions. The authors expect this study will provide useful data on how integration can affect contraceptive and essential drug supply chain management to ministry of health representatives in other countries that are planning to integrate or already are integrating their commodity supply chain. The analysis also provides observations for MINSa in Nicaragua that may help further consolidate supply chain integration processes at the national level.

SPECIFIC STUDY OBJECTIVES

- To document the process by which the logistics system was integrated, especially the process of consolidating the logistics management information system (LMIS) for contraceptives and essential medicines in five regions.
- To determine and compare the stock status of selected commodities among regions that are piloting an integrated LMIS and those that still use several vertical LMIS, including the vertical LMIS for contraceptives (SIAL for its acronym in Spanish).
- To compare the strengths and weaknesses of the logistics system among integrated regions (using an integrated LMIS and inventory control system) and several that are still using vertical LMIS for several programs.

WHO SHOULD READ THIS PAPER

This paper is targeted to ministry of health staff logisticians, managers, and policymakers involved in supply chain management and logistics system design at the national level. Additionally, the findings can assist technical assistance staff and international advisors working in supply chain management, particularly in the area of integration, to help guarantee improved commodity availability, specifically contraceptive security, throughout health reform processes.

METHODOLOGY

DATA COLLECTION

This study collected both quantitative and qualitative data from the period April 6–26, 2008, to analyze the effectiveness of the supply chain in delivering priority commodities, including essential medicines, contraceptives, and medical supplies at the MINSA. At the same time, the assessment collected data to help understand the integration process, the management of the transition process from various vertical systems into one integrated system, and ways that integration has affected supply chain performance and, ultimately, product availability.

SITE VISITS

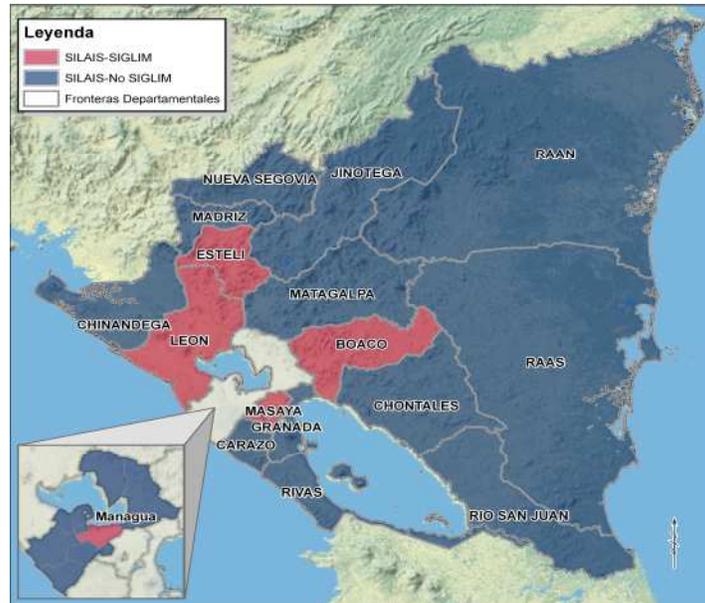
To prepare for the study, the team developed a study protocol that outlined the methodology and the qualitative and quantitative instruments, and this protocol was reviewed and approved by the MINSA. Data gathered were based on a convenience sample of ten regions and sixty six sites, including service delivery points (SDPs) and storage facilities. Facilities were selected at every level of the supply chain and visited during a two-week period. To ensure a balanced assessment of the two supply chain modalities currently operating in the country, an equal number of sites (both storage and SDPs) were selected from integrated and non-integrated regions (SILAIS, for the acronym these regions in Spanish).⁴ Facilities were randomly selected from all five pilot integrated SILAIS and included sample regional warehouses, municipal warehouses, and corresponding SDPs. The non-integrated regions visited were selected based on technical inputs from the MINSA as well as their geographic proximity to the integrated SILAIS. An equal number to, and same type of facilities as, those selected in the integrated SILAIS were then selected randomly within the non-integrated SILAIS. Because the study focused on regions in proximity to one another, the sample of sites is not statistically representative of the logistics system overall. Instead, the data collected provide a snapshot for comparison between the two types of regions visited.

The integrated SILAIS visited include Managua (which currently has 14 integrated sites), Estelí, Masaya, León, and Boaco. The partially integrated SILAIS selected (referred to throughout as “non-integrated”) include Managua (which currently has 99 vertical sites), Matagalpa (because it is a priority region for reducing maternal mortality and it is near two integrated SILAIS), and Chontales (because it is one of the largest regions with the most SDPs and also near the integrated SILAIS).

All of the MINSA SILAIS in Nicaragua are illustrated in Figure 3, and a detailed list of regions and sites visited can be viewed in Appendix A.

⁴ Although neither modality manages all logistics functions completely vertically or integrated today, for the sake of simplifying terms in this paper, the authors refer to regions that are currently managing two distinct LMIS, for contraceptives and essential medicines, as *non-integrated SILAIS*. In contrast, SILAIS referred to as *integrated* are those regions using the new integrated LMIS, called the SIGLIM. Despite these terms, readers should be aware that certain logistics functions, such as transportation and warehousing, are managed jointly in all SILAIS.

Figure 3 Map of Regions in Nicaragua



DATA COLLECTION INSTRUMENTS

Two instruments were developed and used throughout the assessment.

A quantitative instrument was used to analyze logistics system performance and commodity availability in five integrated SILAIS and three non-integrated SILAIS. An adapted version of the USAID | DELIVER PROJECT Logistics Indicators Assessment Tool (LIAT) was used to develop the quantitative tool. (See Appendix C for a copy of the survey instrument.)

The quantitative tool was applied at the central level in the Central Medical Stores (CIPS, for its acronym in Spanish) and at the regional headquarters, municipal, and service delivery levels of the eight SILAIS assessed.

The instrument primarily focused on assessing commodity availability of nine tracer commodities, including contraceptives (see Table 2 for a list of tracer drugs); the logistics management information system; inventory control management practices; storage conditions; and transport, distribution, and supervisory mechanisms currently in place in Nicaragua.

Table 2 Tracer Commodities Assessed

Product Description
Amoxicillin Oral Suspension 250mg/5ml. bottle 100 ml
Nitrofurantoin Capsule 100mg
Enalapril Maleato. Tablet 10 mg
Oral Rehydration Solution: Glucose 13.5g, Sodium Chloride 2.6g, Trisodium Citrate 2.9g, Potassium Chloride 1.5g
Magnesium Sulfate 10% 1gr. Plastic Syringe 10 ml IV
Medroxyprogesterone Acetate 150 mg/1 ml
Levonorgestrel and Ethinyl Estradiol 0.3 + 0.03 mg
Glibenclamida Tablet 5 mg
Rubber Condom No Logo

A qualitative instrument was also used to analyze the integration process and the challenges and successes of integrating various logistics system functions, in particular the logistics management information system (SIGLIM). (See Appendix C for a copy of the survey instrument.) Key informant interviews were applied at all levels of the health system:

- Central level (MINSA central medical stores managers, decisionmakers, and program and supply chain managers)
- Regional level (MINSA regional program and supply chain managers, stock managers, and service delivery providers in both integrated and non-integrated SILAIS)

Two versions of the qualitative questionnaire were designed to be applied in both integrated and non-integrated SILAIS. These surveys helped to gather data on the opinions of various technical staff throughout the MINSA and donor community about the advantages and challenges of integrating the logistics system. The tool also gathered opinions from technical staff working in integrated and non-integrated regions about the integration process and future plans to consolidate the integrated LMIS nationwide, and the functions related to the process (i.e., forecasting, resupply, etc.).

SECONDARY DATA

The study also gathered secondary information from various documents that describe the integration process in Nicaragua. MINSA logistics system assessments, reports about the pilot program that first implemented the integrated logistics information system (SIGLIM) in various regions, and the SIGLIM guidance manual were used to help provide background information on the transition from a vertical LMIS (SIAL, for its acronym in Spanish) to the integrated SIGLIM.

CASE STUDY LIMITATIONS

Although this study attempts to compare the supply chain between integrated and non-integrated facilities, readers should consider the fact that the non-integrated SILAIS have already begun to take some initial steps to prepare for the eventual integration of the essential medicines and contraceptive supply chains. For example, at the time of the field work, many staff in the non-integrated SILAIS were already familiar with the SIGLIM and had recently been trained in the new information and inventory control management system. When these staff answered questions about their

management system, the fact that they were familiar with the integrated system may have colored their responses to the qualitative survey and may also have affected the way they manage their inventory. Additionally, technical staff in non-integrated SILAIS may have begun to order their commodities on the basis of consumption data that they collect informally, rather than based on the quantities originally programmed for that level (based on demographic and budget considerations). These influences, though anecdotal, may have skewed the findings and modified the comparison between integrated and non-integrated regions, thus complicating a distinct case-and-control comparison.

Finally, the data collected by the qualitative survey reflect the opinions of leaders, technicians, and service delivery providers. The results provided in the qualitative section of the report should not be considered an objective or conclusive assessment of the various supply chains and the integration processes as respondents were encouraged to provide their thoughts and personal opinions.

MINISTRY OF HEALTH LOGISTICS SYSTEM

INTEGRATING VERTICAL HEALTH PROGRAMS

As a part of broader health sector reform processes in recent years, the MINSA implemented a new model, called the integrated health care model (MOSAFIC, for its acronym in Spanish), and decided to merge individual health programs into one program management unit at the central level, including the former Integral Women's Health Program, where the family planning subprogram was located. These changes respond to global trends to integrate vertical program management and often involve reducing staff positions that were dedicated to one program exclusively. These broader processes affected decisions to integrate commodity supply chains, and the amount of human resources available to manage the process as logistics systems were merged. Nonetheless, this change did not reduce the strong support that family planning (FP) receives throughout the public health system. Access to family planning services was prioritized within the broader program and the successful logistics system in place has ensured continued contraceptive availability.

DESCRIPTION OF THE MINISTRY OF HEALTH COMMODITY SUPPLY CHAIN

Figure 4 illustrates the MINSA commodity supply chain. Commodities are delivered via two channels—public procurement and donations. Commodities are then stored at the MINSA central medical stores (CIPS, for its acronym in Spanish). CIPS's main responsibility is to store the supplies, receive orders, and dispatch requisitions submitted by regions and by municipal districts. From the CIPS, these supplies are delivered to regions with warehouses, directly to health centers at the municipal level, or to hospitals. If a region has a warehouse, commodities are delivered there first and then passed on to the health center at the municipal level. Commodities are then transferred from the municipal health center to municipal pharmacies (located on the same premises) and health posts at the lowest level of the supply chain. Finally, commodities are delivered to clients at hospitals, municipal pharmacies, and health posts.

Figure 4 MINSA Supply Chain

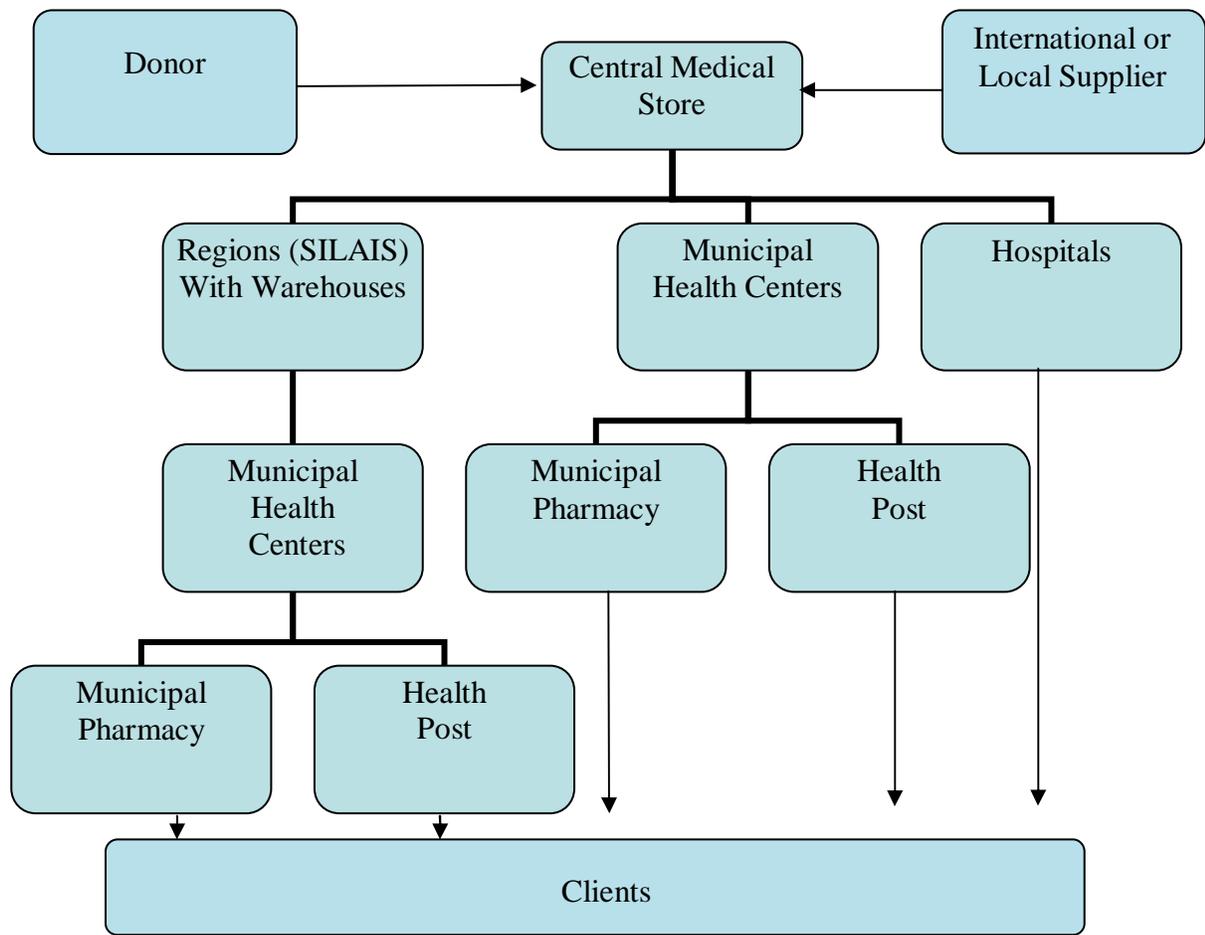


Table 3 describes the basic logistics functions and their degree of integration in Nicaragua.

Table 3 Current Integration Status of the MINSA Supply Chain in Nicaragua

Function	Description	Integration Status
Budgeting	The donors and government budget for contraceptives. The government budgets for essential medicines and vaccines.	Vertical
Procurement	The acquisition section under the Procurement Unit of the Essential Medicines Directorate (DAIS) carries out all bidding processes for essential drugs, including contraceptives.	Integrated
Forecasting and needs quantification	Consumption based for all drugs (vaccines not included) in integrated SILAIS. Based on budgets and fixed programming in non-integrated SILAIS.	Partially Integrated
Logistics management information system	Integrated LMIS, called SIGLIM, from regions to lower levels of the supply chain in the integrated SILAIS. Contraceptive-specific information system, called "SIAL," and separate essential drugs registry forms in non-integrated regions. The central level does not run an integrated LMIS nationwide because the SIGLIM has not yet been implemented in all regions.	Partially Integrated
Inventory control	According to established maximum and minimum levels in integrated SILAIS. Similar inventory control procedures are used in non-integrated and integrated SILAIS, but maximum and minimum levels have not been established in non-integrated SILAIS, except for contraceptives.	Integrated in five pilot regions using SIGLIM Vertical
Distribution	Distribution is managed jointly either (1) from central warehouse to regions (SILAIS) or (2) from central warehouse to municipalities. In addition, in a few instances in the case of essential medicines, suppliers distribute directly to selected municipalities and hospitals.	Integrated
Storage	Warehousing norms pertain to all products and products are stored in the same facility at all levels.	Integrated

FINDINGS

THE INTEGRATION PROCESS

THE HISTORY OF THE INTEGRATION PROCESS

Historically, the MINSA has managed several vertical logistics systems, with accompanying and distinct information systems. Before 2003, the MINSA operated six distinct supply chains (for essential medicines, contraceptives, anti-tuberculosis medications, vaccines, and antimalarial medications). Each of these systems had its own financing, human resources, forecasting, and management information system at all levels, while other logistics functions, such as transportation and warehousing, were managed jointly to varying degrees. For example, contraceptives and essential medicines were stored in the same facilities and managed by the same warehousing staff, but registered on different forms by different health system personnel at different levels of the supply chain.

As the MINSA staff began to integrate the health system overall, they also recognized the need to integrate certain aspects of these vertical supply chains. They acknowledged, after applying various contraceptive logistics assessments in 2001, 2002, 2003, and 2004,⁵ that the lack of coordination among vertical programs led to gaps and overlaps in information throughout the health system, difficulties in communication, delays in commodity deliveries, and unnecessary bureaucracy in supply chain management processes. These challenges became especially evident when the positive results and impact of the contraceptive logistics system were analyzed. Although the family planning program had good data for contraceptives, the Essential Medicines Directorate (DAIS, for its acronym in Spanish), and all those responsible for managing essential medicines, did not always understand the concept of stock on hand, consumption, and losses and adjustments for many commodities dispensed and stored throughout the country. Instead these data were managed by separate program staff and, in some cases, donor rather than MINSA staff. In addition, broader health system integration processes necessitated a change in supply chain management because programs themselves were transferred or merged into one health system. In other words, although family planning services were still delivered throughout the health system, this program was no longer managed vertically but was being transferred to the MINSA's General Directorate of Health Services (USAID | DELIVER PROJECT 2006).

It is worth noting that in previous studies as well as in this analysis for the MINSA, the supply chain integration process has not included vaccines and HIV/AIDS products. Most likely these supplies continue to be managed vertically because of the political priority and special reporting requirements ministries of health and donors have required for these programs.

In 2001, several years before the supply chain integration process began in earnest, the MINSA passed a national normative document for family planning logistics management that recognized the importance of basing forecasts and stock levels on consumption and stock on hand data. In addition, this guide defined maximum and minimum stock levels for contraceptives at all levels of

⁵ USAID | DELIVER PROJECT. 2003. *Nicaragua: Third Quantitative Evaluation of Logistics Indicators*. Managua, Nicaragua: USAID | DELIVER Project, Task Order 1.

USAID | DELIVER PROJECT. 2004. *Nicaragua: Fourth Quantitative Evaluation of Logistics Indicators*. Managua, Nicaragua: USAID | DELIVER Project, Task Order 1.

USAID | DELIVER PROJECT. 2005. *Nicaragua: Report on pilot project of new integrated Logistics Management Information forms for essential drugs*. Managua, Nicaragua: USAID | DELIVER PROJECT, Task Order 1.

the health system. Based on these norms, an accompanying manual was developed for contraceptive supply chain management that helped staff to follow these directives. As a result of these and other efforts, facilities experienced a dramatic drop in stockouts of one or more contraceptives from 76 percent in 2001 to 6 percent in 2004 (USAID | DELIVER PROJECT 2005).

Once it became clear, through logistics assessments and regular monitoring of logistics indicators, that the contraceptive supply was operating efficiently, the MINSa became interested in applying some of these same norms to the essential medicines supply chain by merging various logistics functions that historically had been managed separately into one supply chain. In 2003, the MINSa carried out a qualitative assessment to evaluate how to move forward when integrating these two supply chains. Using focus group methodology, the MINSa gathered information on the various logistics systems operating in the country, with representation from all levels of the health system. The focus groups gathered information on the complexity of the various supply chains, including the operating cost, use of essential logistics data for decisionmaking, guaranteeing commodity availability, and training needs, etc. The focus group exercises also gathered data on the characteristics of an efficient integrated logistics information system from the participants' perspectives. These inputs were then used to inform subsequent efforts to integrate the logistics information system and inventory control management functions.

To support the integration process, the USAID | DELIVER PROJECT designed forms for data collection throughout the supply chain and in 2006 was asked to help the MINSa pilot the new integrated LMIS and inventory control management in two SILAIS (Masaya and Estelí). This pilot process sought to draw from the strengths of the two separate supply chains to benefit the new integrated LMIS and inventory control system as much as possible. The pilot program started working toward developing new logistics forms that merged various aspects of the old forms, used by the essential medicine and contraceptive supply chains, starting with 10 tracer drugs and four contraceptives. Once new forms had been developed (requisition forms, daily registers, unmet demand forms, and reporting forms), several staff throughout the SILAIS were trained on new stock levels, how to use these forms, and new ordering procedures based on the formula provided on the requisition form. This formula based stock levels on two essential logistics data, stock on hand and consumption (USAID | DELIVER PROJECT 2006).

At the end of 2006, based on positive results of the pilot program, especially on the analysis of unmet demand data, the integrated system was expanded to cover four SILAIS (Masaya, Estelí, Boaco, and León) and two areas of Managua (CS Pedro Altamirano and CS Francisco Buitrago), covering a total of 39 municipalities and 229 service delivery points. At this point the new LMIS and inventory control procedures were validated, revised, and, ultimately, formalized as the SIGLIM. Throughout this phase, various supervisions and trainings were carried out in each health establishment operating the new system. These trainings included central- and regional-level staff, essential medicine managers, and other MINSa decisionmakers. The trainings covered the fundamentals of managing an efficient logistics system and the new information system and ordering process. The training and supervision processes were key to the success of the pilot test of the SIGLIM and allowed staff to fine-tune the new system and processes in a timely and effective manner (USAID | DELIVER PROJECT 2007).

Finally, in 2007, various assessments—a qualitative and quantitative assessment and regular monitoring of logistics indicators—were carried out to determine the effectiveness of the integrated system. The results of these assessments were generally positive. For example, the qualitative and quantitative analyses found that more than half of all service delivery points visited managed adequate levels of stock. After reviewing these results, the MINSa determined that enough progress had been made to approve expansion of the integrated system to a national level and for all essential medicines.

At the time of this assessment, the MINSA was in the process of expanding integration to all SILAIS for all essential medicines, including contraceptives. Training had been carried out in most SILAIS and new roles and responsibilities clarified. The next step will be to implement the SIGLIM and integrated inventory control procedures in the remaining 12 SILAIS.

In sum, over the course of four years (2003–2008), various steps were carried out to help integrate the supply chain nationwide:

- 1) Originally, six distinct supply chains were operated separately.
- 2) The contraceptive logistics system was designed and rolled out nationwide.
- 3) Next, the MINSA recognized a need to integrate some commodities as broader integration reforms took place.
- 4) The MINSA analyzed all information systems to draw from their strengths by conducting focus groups.
- 5) Based on these analyses, the MINSA recognized the contraceptive supply chain LMIS as a model system for integrating the essential medicines supply chain.
- 6) Next, a new integrated LMIS was developed and piloted in two SILAIS, drawing on the strengths of both the contraceptive and essential medicines' logistics systems.
- 7) Based on the results of the pilot program, the LMIS was then revised.
- 8) The pilot program was then expanded to five SILAIS.
- 9) The LMIS continued to be improved and revised.
- 10) Next, various assessments were carried out to determine the success of the pilot program based on logistics performance indicators such as reporting rates, stockouts, and duration of stockouts.
- 11) Finally, based on positive results, the MINSA decided to expand the pilot program to the remaining 12 SILAIS.

Some respondent observations related to the history of integration in Nicaragua:

“The gradual process facilitated the implementation of the pilot program of the logistics information system (SIGLIM). The system was designed, tested, and then taken to the highest political level to approve its implementation.” Manager, Donor Agency

“The integrated information system (SIGLIM) is in harmony with our political priorities, the policy of delivering free commodities to everyone based on need.” Senior Decisionmaker, MINSA

THE STATUS OF INTEGRATION OF LOGISTICS FUNCTIONS FROM THE PERSPECTIVE OF CENTRAL-LEVEL KEY INFORMANTS

The following sections present the observations of the respondents interviewed for this study. It is important to keep in mind that because these findings present subjective points of view, there may be some distinct or contradictory observations presented below. These differences simply reflect the varying opinions presented to the authors while conducting the survey at various levels of the health system. Please note that these findings do not necessarily reflect the authors' technical views or a system assessment.

All the technicians and decisionmakers interviewed (10) at the central level stated clearly and decisively that integrating logistics functions for essential medicines and contraceptives has been a

great advance in the MINSA. Several respondents identified that, although some functions managed vertically were working for some commodities (contraceptives, for example), different data were collected by distinct systems and stored in separate and unrelated repositories that were used for varying purposes. By implementing the integrated LMIS, essential logistics data are now available for essential medicines as well as for contraceptives. Nevertheless, there have been challenges with the new system that central-level respondents hope will be addressed as the system is consolidated further.

Table 4 summarizes the detailed observations provided by the respondents about the logistics system. Every observation listed in this table was mentioned multiple times by different respondents (at least by three of the 10 respondents interviewed) to the qualitative survey implemented at the central level.

Table 4 Central-level Respondents’ Observations about the Logistics System

Topic	Observations
Policy implications for the logistics system	<p>The SIGLIM permits staff to more effectively implement the reinforced government’s “policy of free services” by collecting data directly from the client and responding to client demand.</p> <p>All high-level decisionmakers interviewed stated very clearly that they intend to continue to support the SIGLIM and implement it to scale.</p> <p>An increase in demand, as a response to government advertising about universal access to all medicines, was one of the causes of stockouts of some commodities at the time of the study.</p>
Contextual factors related to the logistics system	<p>Organizational problems, such as strikes at the central warehouse, pose challenges to commodity availability.</p> <p>Challenges identifying manufacturers or providers of quality essential medicines pose obstacles to efficient procurement.</p> <p>Time-consuming procedures and hurdles related to procurement and protective procurement laws slow the procurement process.</p> <p>Long lead times for some commodities make using essential logistics data challenging for timely decision making on forecasts, procurement, and distribution of commodities.</p> <p>Challenges with coordination among departments, levels, and programs obstruct information sharing.</p> <p>The essential medicines list and the rational use of medications and dispensing protocols need to be updated because policy and structural changes have modified the way in which medications are managed. A revised essential medicines list, standard treatment guidelines, and dispensing protocols should be issued to reflect these changes.</p>
Logistics analysis for decision making	<p>The new data available in some regions prove useful for managing the supply chain and the broader health system and for making policy and technical decisions.</p> <p>The new SIGLIM allows technicians to determine the amount of stock on hand, product consumed, days stocked out, and unmet demand for all essential medicines, including contraceptives.</p>
LMIS and standardized inventory control procedures	<p>Respondents identified considerations related to the transition from a non-integrated to an integrated system, including:</p> <p>Distinct LMIS forms with varying information are currently available by region but will soon be harmonized across all regions.</p> <p>Forecasts and order amounts are still based on historical budgets, but eventually consumption data will be available from all regions, and forecasts can be generated from these new data.</p> <p>Some logistics functions are still being harmonized (forecasts, procurements, and budget allocations).</p> <p>Essential logistics data are still not collected, aggregated, and analyzed at the central level. This will be the last step in the integration process once data are available from all regions.</p>
Meeting client needs	<p>The SIGLIM positions the client at the center of the logistics system, which fits well with the new government priority to further empower the community, correct inequities throughout the health system, and fight poverty.</p>
Warehousing, organization, and staffing	<p>An increase in supply, because of increasing demand for products, may eventually burden storage capacity and human resources. The MOH will need to plan carefully to ensure adequate storage and human resources to manage an increasing inventory.</p>

Some respondent observations related to the state of integration in Nicaragua:

“For us the SIGLIM is strategic. Why does it interest us? It is key for the MINSA in accomplishing its mission. It is useless to have the personnel and infrastructure you need without having the commodities. Many prior experiences were not successful. There were a multitude of instruments. Now, SIGLIM provides one unified information system that is based on actual demand.” Respondent at the Central Level

“We have to see the SIGLIM expanded to the entire health system so the entire logistics cycle can be managed on the basis of this information. It is not useful to have a tool if the entire cycle, procurement in particular, is not in sync with SIGLIM.” Senior Decisionmaker, MINSA

THE STATUS OF INTEGRATION FROM THE PERSPECTIVE OF KEY INFORMANTS AT THE LOCAL LEVEL

At the local level, technicians and decisionmakers made some very similar observations to those brought up at the central level, with some additional observations. Seventy percent of the 56 respondents, both technicians at the clinic level and decisionmakers at the regional offices, interviewed indicated that they prefer SIGLIM to managing contraceptive and essential medicines information vertically. Again, though, local-level technicians and decisionmakers also observed some challenges to effectively rolling out the new system that they hope to remedy as the system is further strengthened over the years.

Table 5 summarizes the detailed observations provided by the respondents about the logistics system at the local level. Every observation listed in this table was mentioned multiple times by different respondents to the qualitative survey implemented at this level.

Table 5 Local-level Respondents' Observations about the Logistics System

Topic	Observations
<p>Policy implications for the logistics system</p>	<p>The new LMIS (SIGLIM) helps regions better implement the new policies of the current government by focusing on the needs of the client.</p> <p>The recent increase in demand for products (because of the government policy, “free commodities for all”) has been a challenge for regions throughout this transition process because the system was not sufficiently prepared ahead of time to handle increased amounts of products.</p> <p>Forecasts should be based on consumption data, and it is necessary to anticipate how policies will affect the need for additional quantities to avoid stockouts in the future.</p>
<p>Contextual factors related to the logistics system</p>	<p>Strikes, unsynchronized calendars due to delays in ordering and procurement processes, transportation issues, and essential medicines stockouts at the central level create challenges to commodity availability at the regional level.</p> <p>Regional personnel work hard to redistribute stock between municipalities to avoid stockouts at service delivery points.</p> <p>Local budget can be used to procure commodities locally to fill gaps when there are stockouts nationally.</p> <p>Challenges with sufficient storage space, road conditions, and transportation issues (i.e., size of trucks) interfere with the ability to manage an efficient logistics system.</p>
<p>Logistics analysis for decision making</p>	<p>Most respondents at the regional level stated that they prefer the SIGLIM to managing the information of contraceptive and essential medicines vertically.</p> <p>The SIGLIM helps both respond to data requests from the central level and use essential logistics data to improve management at the regional level.</p> <p>Consumption data help staff to find ways to better execute their budget, understand how many commodities are being used, identify commodities that move quickly through the system and those that are overstocked or not used enough, improve rational use of medications, and identify unmet demand or stockouts.</p> <p>New logistics data help doctors to supervise their staff and respond more effectively to the needs of their clients and personnel.</p> <p>Better inventory data and management practices help respond to real demand and improve inventory and warehouse management.</p> <p>A lack of computerization interferes with the ability to conduct advanced analysis of the wealth of information the system currently receives at the regional level.</p>
<p>Unified LMIS and standardized inventory control procedures</p>	<p>With SIGLIM, warehouses are managing less stock and, as a result, they are able to avoid overstock, maintain more organized warehouses, and more easily avoid expiration of drugs.</p> <p>A few respondents considered it necessary to review “reserve levels” for products with higher demand in order to have sufficient buffer stocks to meet unexpected increases in demand.</p> <p>Positive adjustments need to be added to the integrated logistics information system because, as it stands, the formula only accounts for losses.</p> <p>The essential medicines list needs to be reviewed by level of the health system. Once these commodities are defined by level, the generic names of these commodities should be printed directly on the forms.</p>

	<p>More rows and spaces are needed to add new commodities that are currently not included automatically on the SIGLIM requisition form.</p> <p>There were some difficulties adapting to the new formulas at first, but now most technicians are convinced that the new SIGLIM is more efficient.</p> <p>Many SILAIS do not have computers to help aggregate and process data efficiently at the regional level.</p> <p>Computerization is a necessary step to implement integration effectively. Technicians lose significant time entering and analyzing data for hundreds of commodities by hand rather than into an automated information system.</p>
Meeting client needs	<p>By basing order amounts on historical consumption data and quantified unmet demand, technicians are in a better position to satisfy their clients.</p> <p>Once the integrated system is up and running nationwide, the new LMIS will be able to respond more quickly to client demands, and the new system should be adaptable to any significant change in client demand.</p>
Organization and staffing	<p>There has been increased supervision of and training on implementing the new system.</p> <p>Managing the SIGLIM and guaranteeing accurate data and calculations is time consuming.</p> <p>Limited human resources interferes with the ability to manage an efficient integrated logistics system.</p>

Some local respondent observations related to the state of integration in Nicaragua:

“With the SIGLIM, we have been able to lower the amount of stock we store at this level. For example, we no longer store as much of the commodities not used by the clients. In this way, we are able to spend our budget more efficiently.” Essential Medicines Manager, Regional Level

“There is no duplication of functions in the ordering and distribution process, but staff are overburdened with work. A study has not been conducted to analyze the amount of effort expended and how to better distribute our human resources.” Director, Regional Level

“The difficulties with procurement and strikes at CIPS create delays in distribution of orders received in CIPS. For example, in April we receive quantities that reflect demand trends of several months earlier. There are not only problems at the central level. At the regional level, we also did not have the administrative capacity to pressure the central level to honor our orders. We want to transform that reality and request and receive quantities based on our average monthly consumption from the previous months. The SIGLIM will also help us improve this situation.” Director, Regional Level

KEY INFORMANT THOUGHTS ON ADVANTAGES AND DISADVANTAGES OF THE INTEGRATED LOGISTICS SYSTEM

Table 6 summarizes respondents’ thoughts on the benefits and challenges of integrating the contraceptive and essential medicines logistics functions. Some strengths were also identified that do not relate directly to the integration process—for example, political support for increased commodity availability, a graduation plan with the donors, and increased government financing for procuring commodities, particularly contraceptives. In addition to these observations, respondents commented on external challenges not directly related to integration—unexpected increases in demand, storage limitations, inadequate transportation modes, stockouts at the central level, delays in procurement, the delivery schedule of the CIPS, and donations of products soon to be expired or

not included in the Essential Drug List (EDL). These external observations are not included in the table below; instead, the table focuses on the specific benefits and challenges of integration.

Table 6 Key Informants' Observations of Benefits and Challenges of the Integrated LMIS

Logistics Function	Benefits	Challenges
Forecasting/ Routine Ordering	<p>The columns on the SIGLIM forms make it easy to calculate the amount of commodities you need.</p> <p>By recording unmet demand, the central level can become aware of upswings in demand.</p>	<p>Data managers have struggled to change their behavior and respect the formulas based on actual consumption data.</p> <p>Because the SIGLIM is not implemented in all SILAIS, forecasts for essential drugs (except contraceptives), based on consumption data, cannot yet be carried out nationwide at all levels of the system.</p>
Human Resources	<p>The new SIGLIM has reduced the workload of multiple forms and different data entry procedures.</p>	<p>Human resources now have double responsibilities.</p> <p>The new SIGLIM requires continuous training for all staff because the formulas are more complex.</p> <p>Managing the manual system is time consuming and overburdens staff.</p> <p>The new system requires an increased number of logistics or essential medicines managers than did the old system that depended on program staff.</p>
Financing	<p>The new system is sustainable.</p> <p>With new data it is possible to analyze how much a SILAIS is spending.</p> <p>Distribution costs have been lowered because commodities are distributed jointly.</p> <p>New data allow you to analyze whether your budget is higher than what you actually need.</p> <p>New data help with the definition and execution of budgets.</p>	
Storage	<p>Warehouses are more organized.</p> <p>Storage needs are planned in a more integrated fashion, estimating the capacity needs for all products.</p>	<p>An increase in demand, in response to improved commodity availability, may eventually strain limited storage capacity at some levels.</p>
LMIS	<p>The new system merged all forms.</p> <p>Staff no longer use multiple instruments and notebooks to register stock information.</p> <p>Large sheets are now available with plenty of space to write.</p>	<p>Computers are now needed throughout the entire system and are not currently available.</p> <p>A computerized system, not currently available, is now needed to manage hundreds of commodities through one logistics system.</p> <p>Managing the manual system is extremely time consuming.</p> <p>The forms do not always come preprinted.</p> <p>In order to accommodate all essential drugs and contraceptives, daily registers are large and become cumbersome to handle and file.</p>

Inventory Control	<p>Stock levels have improved.</p> <p>The new system guarantees better commodity availability at the SDP.</p> <p>The buffer stock levels help to prevent stockouts.</p> <p>Orders are made on the basis of actual demand (consumption and unmet demand).</p>	<p>Buffer stock levels are very low and are not sufficient to cover consumption for some commodities and during certain months.</p>
Monitoring and Evaluation	<p>The system allows you to monitor stock on hand and other logistics indicators continuously.</p> <p>Logistics data are more accurate and more readily available.</p>	<p>It is challenging to get managers at all levels to use the information they now have available to them</p>
Supervision	<p>With the new SIGLIM, there has been increased supervision and support from the central level.</p> <p>The system has improved accountability and control.</p> <p>The system allows you to conduct inventories easily.</p>	<p>There is still a need to improve management at the clinical level and the rational use of medications.</p>
Client Needs	<p>The SIGLIM provides:</p> <ul style="list-style-type: none"> • information that can be used to revise the essential medicine list and improve the rational use of medications; • data to help measure the number of people using family planning; • an estimate of unmet demand; and • a close estimate of need. <p>The new system has regulated services because it allows you to have the medicines you need.</p> <p>Personnel feel motivated to better meet the needs of the client.</p> <p>The formulas to calculate need are very useful.</p> <p>SDPs are able to monitor when specific products are approaching stockouts.</p> <p>With SIGLIM, management is more decentralized because the ordering system is based on local needs.</p>	<p>Because of multiple tasks at the SDPs, it is challenging to convince staff to register unmet demand.</p>
Organizational Support (coordination, communication)	<p>SIGLIM has harmonized the way staff talk about logistics.</p> <p>Integration allows staff to have one administrative system that manages everything.</p> <p>SIGLIM creates an increased need to coordinate between the municipal and administrative level and among different programs.</p>	<p>SIGLIM has not been implemented nationwide or at CIPS.</p> <p>Coordination is still limited between the central and regional levels.</p>

LOGISTICS SYSTEM PERFORMANCE

For the quantitative analysis, two versions of an adapted LIAT were applied in integrated and non-integrated SILAIS over the span of two weeks. The main areas of the supply chain assessed include:

- the logistics management information system (SIAL and SIGLIM),
- the inventory management control system,
- supervision practices,
- storage conditions, and
- stock status for the tracer drugs evaluated.

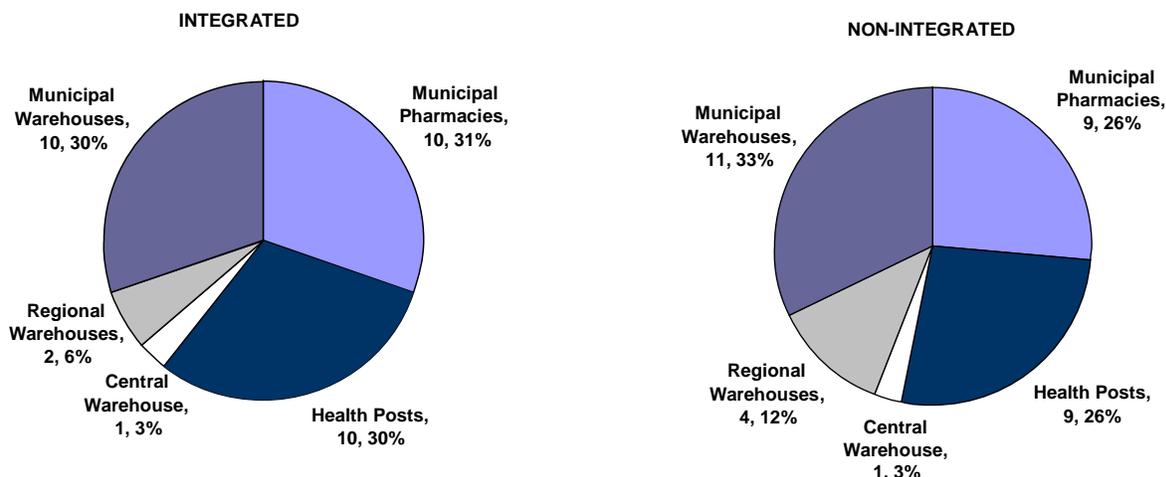
The indicators collected for this study are provided and analyzed below. Some of the indicators collected are comparable between the two types of surveys and others are not. (See Appendix C for a copy of the two types of survey instruments.) The results presented in this report primarily focus on the indicators that could be compared between the two datasets. For information on the two complete datasets, contact the Nicaragua Office of the USAID | DELIVER PROJECT.

Data shown in this section are presented by comparing the logistics system and stock situation in integrated and non-integrated SILAIS. Because the MINSA has already decided to integrate the LMIS at the national level, as have many other ministries in Latin America, the authors do not intend to evaluate this decision. On the contrary, the authors believe that a logistics system can work efficiently under any system, whether integrated or managed vertically, as long as there is political will at all levels to ensure commodity security. The purpose of the comparative analysis is to learn, midway through the process, what is currently working in the integrated system as well as what is not working so that these challenges can be remedied before the integration process is completed. In addition, by comparing the integrated with the non-integrated regions, readers can draw lessons about how to roll out the integration process in their countries by duplicating best practices and avoiding the pitfalls observed in Nicaragua. In other words, the findings can help other countries identify essential elements of the logistics system design that need to be considered when planning and gradually implementing the integration process.

SITES VISITED

Sixty-six sites were visited, including the central warehouse, regional warehouses, municipal warehouses, and service delivery points (municipal pharmacies and health posts), during the course of the study. See Figure 5 for a distribution of different type of sites visited in the integrated and non-integrated regions.

Figure 5 Sites Visited in Integrated versus Non-integrated SILAIS



Although, the exact number of sites was distributed slightly differently between integrated (32 total) and non-integrated (33 total) SILAIS, a similar proportion of type of sites can be observed between the two types of regions. The only difference is that two more regional warehouses were visited in the integrated SILAIS; however, because so few regional warehouses were visited overall (six total), in both cases, the data collected at regional warehouses only provide a snapshot of what is going on at this level. The central warehouse (CIPS) is included in both graphs because the central warehouse delivers commodities to both the integrated and non-integrated SILAIS, thus responding to and managing data culled from both types of regions.

THE LOGISTICS MANAGEMENT INFORMATION SYSTEM AND INVENTORY CONTROL

The logistics management information system and inventory control practices for the integrated and non-integrated SILAIS are slightly different. Table 7 helps to summarize the type of data included on the requisition forms used in the integrated regions versus the two separate information systems used for essential medicines and contraceptives in the non-integrated regions.

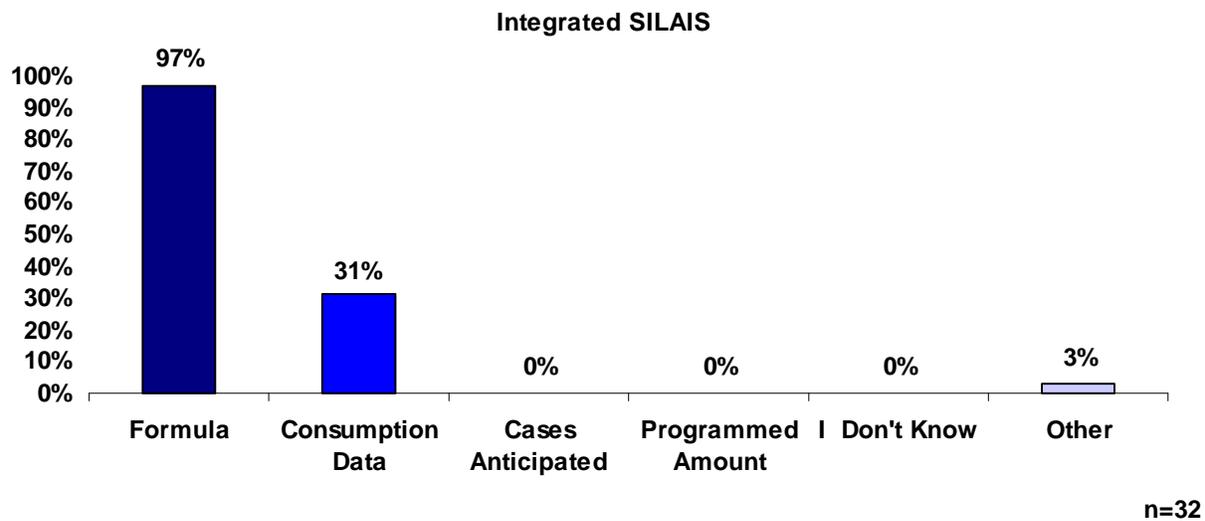
Table 7 Columns Included on Forms used in the Integrated and Non-integrated SILAIS

Integrated Requisition Form (SIGLIM)	Non-integrated Requisition Form for Contraceptives (SIAL)	Non-integrated Requisition Form for Essential Medicines (HCAP)
		Measure of unit
Beginning balance	Beginning balance	Beginning balance
Total entries	Total entries	Entries
		Month
Total consumption	Total consumption	Total consumption
Unmet demand		Days of stockout
Negative adjustments	Adjustments	
Current balance	Ending balance	Ending balance
Months stock on hand	Months stock on hand	
Programmed quantities	Programmed quantities	Programmed quantities
Requisition quantities	Requisition quantities	Requisition quantities
Received quantities	Received quantities	Received quantities
Unit cost		Unit cost
Total cost		Total cost

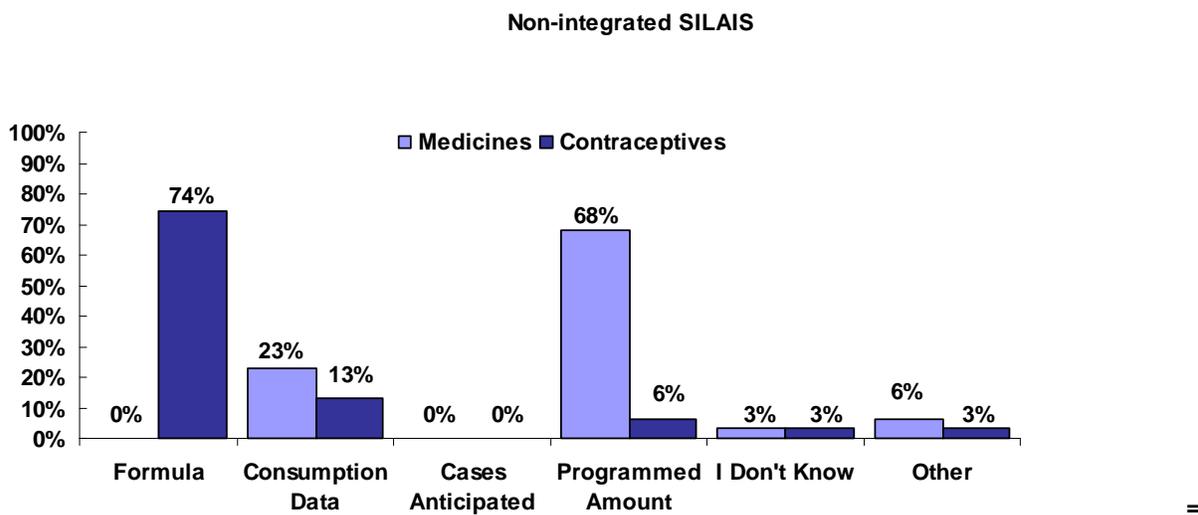
Table 7 illustrates that SIGLIM regularly collects a broader range of essential logistics data points than the LMIS for either essential medicines or contraceptives (including stock on hand, consumption data, amount not dispensed, adjustment, and amount requested). Table 7 also illustrates that data on stock on hand, consumption, and amount requested are included on the two different requisition forms for essential medicines and contraceptives. In addition, the table illustrates that the LMIS for contraceptives also collects adjustment data, but does not estimate unmet demand.

Although all three requisition forms collect some essential logistics data, the main difference among the three is that the inventory control system in the integrated SILAIS and contraceptive LMIS uses these data to calculate orders, whereas the non-integrated system for essential medicines does not. For instance, when asked how they calculate the amount of product they order regularly, respondents in integrated and non-integrated SILAIS provided different answers. Figure 6 illustrates that, in the majority of cases, respondents managing the integrated and contraceptive LMIS use consumption data and/or a formula (based on consumption) to estimate their future commodity orders. When managing the vertical LMIS for essential medicines, respondents stated that they primarily base their order on the amount that was originally allocated for their level (shown in the “programmed quantities” column of the form based on catchment area and available budget). Although the non-integrated SILAIS register consumption data for essential medicines, these data are not officially consolidated or used for calculating orders or making any other logistical decision. The finding that some respondents are using consumption data to calculate their essential medicine needs suggests that, at their own initiative, respondents may have begun to apply their SIGLIM training to the vertical LMIS although this is not yet the official practice for calculating need in those SILAIS.

Figure 6 Data or Method Used to Calculate Future Need



n = 32 health establishments



n = 31 essential medicines, n = 34 contraceptives

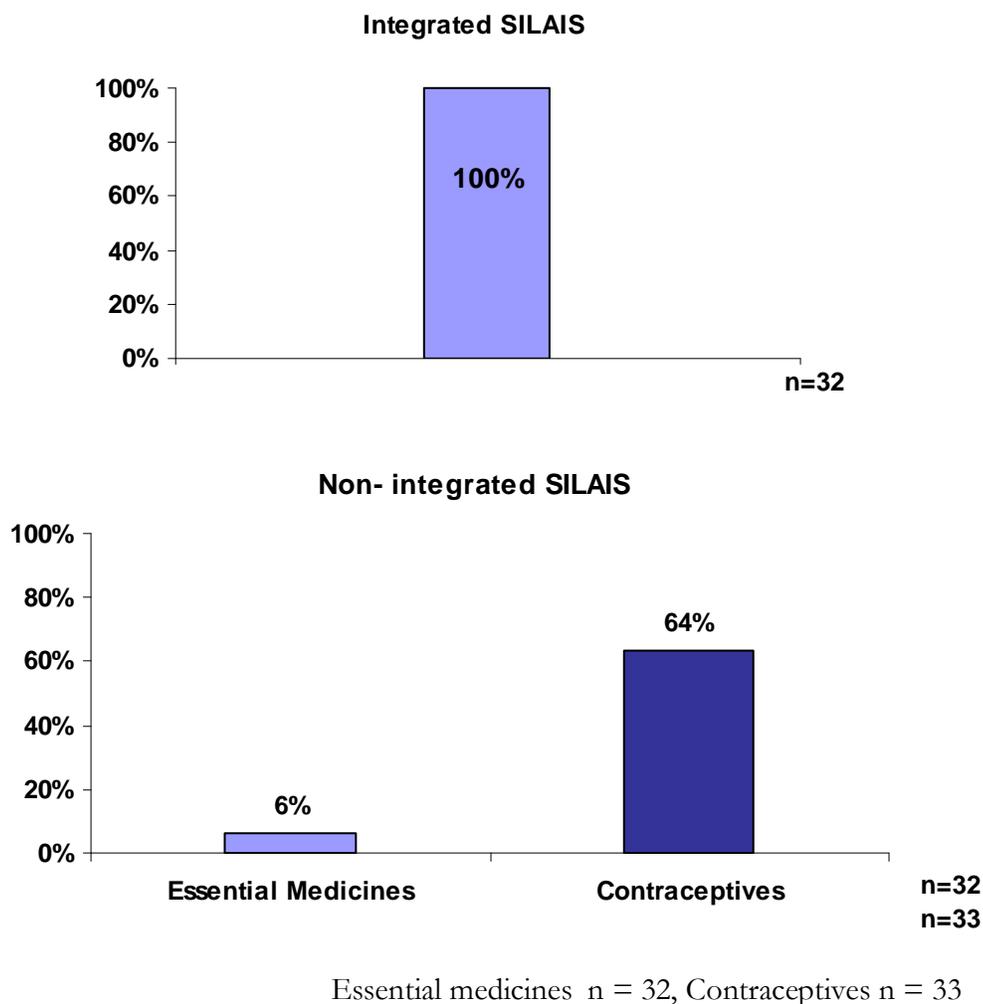
In addition to requisition forms and ordering practices, the inventory control card is another important form used in all supply chains, whether they are managed vertically or jointly. The assessment team confirmed that inventory control cards were available in all storage facilities visited. There was no marked difference between integrated and non-integrated SILAIS in their use of inventory control cards, suggesting that the use of inventory control cards has been managed according to MINSA norms and independent of the LMIS integration process.

In terms of reporting rates, in both integrated and non-integrated SILAIS, lower levels send reports to higher levels of the supply chain according to the norms established in the corresponding logistics manuals (monthly for SDPs and bimonthly from municipal districts and SILAIS to central level).

When assessing reporting rates, 97 percent of respondents in integrated SILAIS confirmed that they had reported to the higher level. In the non-integrated SILAIS, reporting rates were significantly lower for essential medicines (68 percent) and only slightly lower for contraceptives (93 percent). This difference in reporting rates might be related to the different operational norms and procedures for the distinct inventory control systems. For example, in non-integrated SILAIS, where orders are based on pre-established programmed amounts, essential logistics data are registered but it has not been emphasized that personnel should consolidate and report these data to higher levels. In contrast, in the contraceptive and integrated systems, these reports are required in order to receive new stock.

Beyond the reporting system, new maximum and minimum levels have been assigned to the integrated SIGLIM, referred to as buffer stock. When asked about buffer stock, there was a significant difference in responses between respondents in the integrated system and the non-integrated system. See Figure 7 for a summary of the responses.

Figure 7 Percentage of Facilities that Manage Buffer Stock in Integrated versus Non-integrated SILAIS



Based on these results, the non-integrated system does not have clear buffer stocks defined for the management of essential medicines (6 percent). Although the assessment team is aware that maximum or buffer stock levels are managed by the contraceptive LMIS, 64 percent of survey respondents were clear about their existence. This may be due to the terminology used in the survey

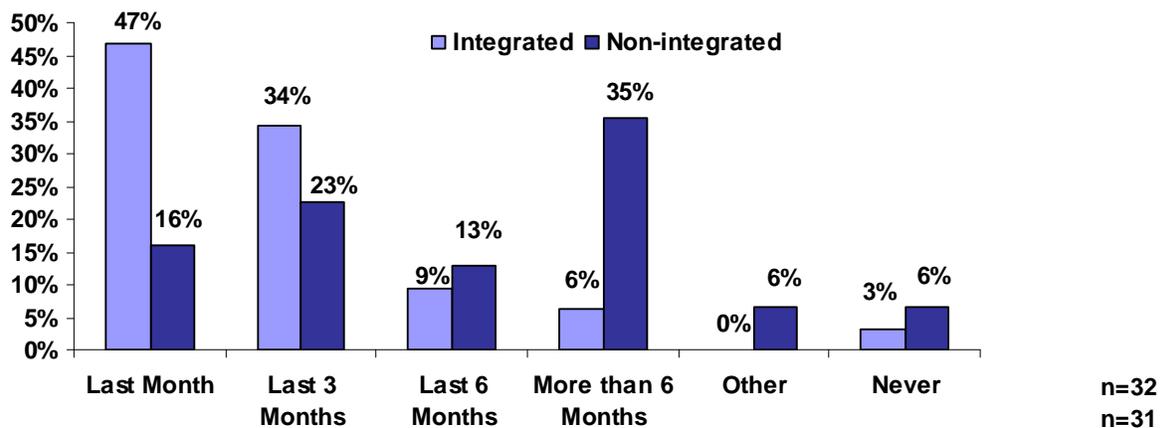
(buffer stocks versus maximum levels, as they are referred to in the contraceptive LMIS), or it might suggest that staff operating more than one vertical LMIS are less familiar with a logistics system that uses buffer stock levels than are those who have been trained to manage the SIGLIM. In the integrated regions, 100 percent of respondents were clear that they manage buffer stock levels.

In addition to being aware of buffer stock levels, it is important to note here that the integrated system manages significantly different stock levels from the contraceptive inventory control system in non-integrated SILAIS. In the integrated SILAIS, the buffer stock is equivalent to two weeks' worth, whereas in the vertical system, contraceptive buffer stocks equal one month's worth. The stock levels used between the integrated and non-integrated SILAIS illustrate one of the significant design decisions made when rolling out the new integrated system. Later, the authors discuss how the design of the new integrated logistics system and setting new norms and standards before integration may have had both positive and negative effects on product availability.

SUPERVISION

In addition to the basic functioning of the LMIS, the assessment team compared supervision practices between integrated and non-integrated SILAIS. Figure 8 illustrates that supervision is much more frequent in the SILAIS that have been using the SIGLIM than it is in those that are still managing separate LMIS for essential drugs and contraceptives.

Figure 8 Supervision Rates over Several Months in Integrated versus Non-integrated SILAIS



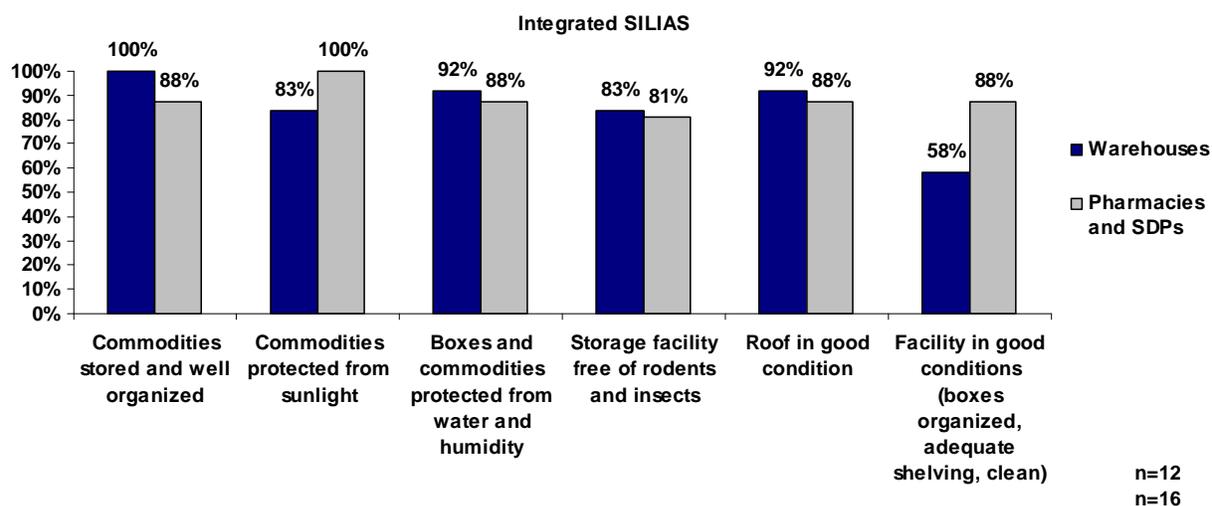
Integrated n = 32, Non-integrated n = 31

For example, in almost all (81 percent) of the integrated facilities surveyed, the respondents had received supervision in the last three months or less, whereas only 39 percent of all non-integrated facilities had received supervision in this same period. The integrated LMIS may facilitate more frequent supervision because the reporting system easily demonstrates where managers need to target supervision. In addition, managers in the integrated system may be able to leverage resources for supervision visits more easily because all commodities are managed under the same LMIS and personnel. Nonetheless, future assessments will be needed to validate this finding. Another explanation for why integrated SILAIS receive more supervision might be related to the intensive follow-up and monitoring by the MINSA's essential medicines managers who are helping local staff to master new SIGLIM procedures as they are rolled out throughout the system.

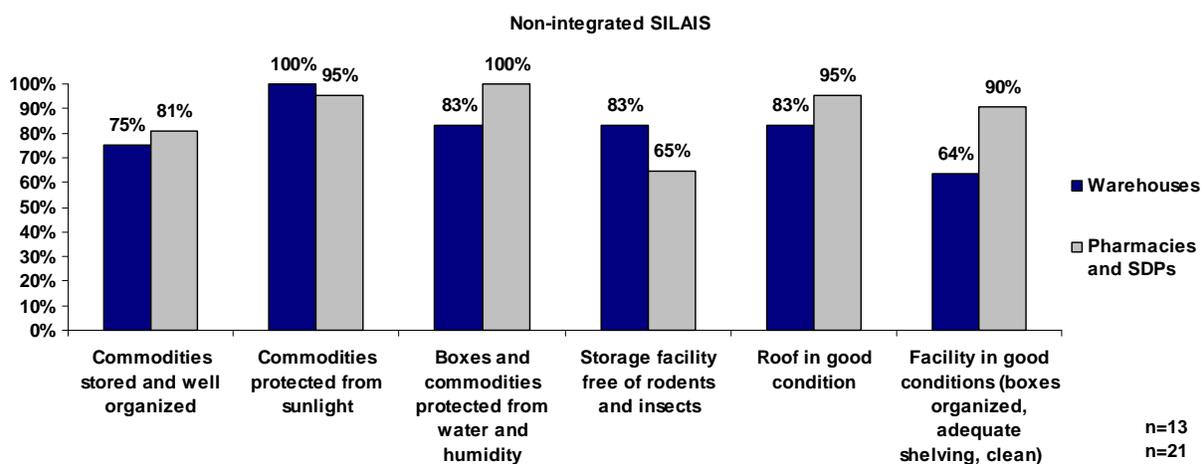
STORAGE CONDITIONS

Storage conditions assessed did not vary significantly between the integrated and non-integrated SILAIS visited (see Figure 9). The only interesting difference was that the commodities in the integrated warehouses appeared to be more organized than they were in the non-integrated warehouses (100 percent versus 75 percent). Perhaps this can be attributed to the way the commodities are managed under the integrated system. The remaining differences appear to have more to do with environmental factors than the LMIS modality used. Another thing to consider is that storage practices do not vary significantly between the integrated and non-integrated facilities; however, the amount of commodity flowing through the storage facility does vary among regions. Significant quantities flowing through a storage facility can affect the storage conditions at that level. These data are assessed later in the report.

Figure 9 Facilities Satisfying Storage Conditions in Integrated versus Non-integrated SILAIS



Warehouses n = 12, Pharmacies and SDPs n = 16



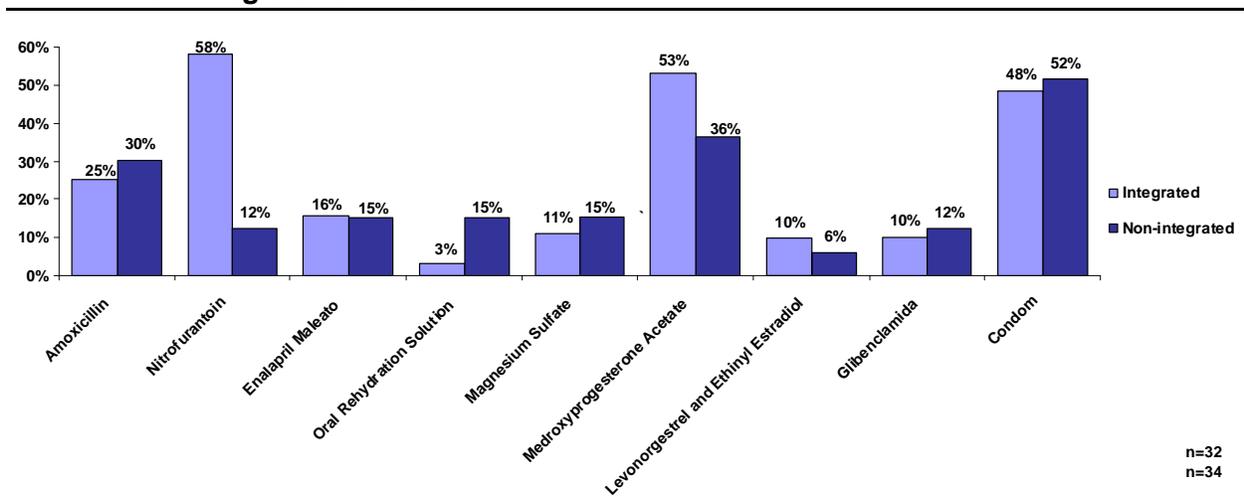
Warehouses n = 13, Pharmacies and SDPs n = 21

STOCK STATUS

Data on stock status revealed interesting yet variable findings on product availability. In general, stockout rates were relatively low in both integrated and non-integrated regions, especially on the day of the visit (less than four percent on average for all commodities inventoried at any type of facility on the day of the visit). Nonetheless, the fact that stockouts were observed is reasonable considering the fact that the LMIS is being consolidated and rolled out at the national level, and these recent changes inevitably have caused some instability throughout the logistics system. In addition, stockouts varied significantly by the level of the supply chain assessed. Nevertheless, fewer stockouts were observed at service delivery points than at higher levels of the supply chain. These findings suggest that efforts are being made to protect the client from any negative stock situation throughout this transition process.

Figure 10 compares aggregated stockout rates over the last six months for the tracer commodities assessed in the integrated versus non-integrated SILAIS. According to the figure, nitrofurantoin was stocked out in 58 percent of the integrated facilities visited sometime in the last six months. Many fewer non-integrated facilities (12 percent) experienced a stockout of that commodity during that period. Stockouts of nitrofurantoin in integrated facilities may be attributed to the fact that this medicine was recently introduced and an unknown future demand and low buffer stock may have led to increased risks of stockouts. For the injectable contraceptive (medroxyprogesterone acetate), facilities in the integrated SILAIS also experienced more stockouts (53 percent) than did non-integrated facilities (36 percent). For the remaining tracer commodities assessed, stockout rates were similar between integrated and non-integrated facilities, except in the case of oral rehydration solution. In this case, more non-integrated facilities (15 percent) than integrated facilities (3 percent) experienced a stockout during this period.

Figure 10 Facilities that Experienced a Stockout over the Last Six Months in Integrated versus Non-integrated SILAIS



Integrated n = 32, Non-integrated n=34

One of the causes of higher stockout rates for some commodities in integrated SILAIS might be that lower buffer stocks have been set up for the new integrated system (two weeks for all essential medicines, including contraceptives, in integrated SILAIS versus one month for contraceptives in non-integrated SILAIS)⁶. These higher buffer stock levels probably help prevent stockouts in the

⁶ It is not possible to compare buffer stocks between the integrated and non-integrated SILAIS for essential medicines because the non-integrated SILAIS still rely on an allocation system for inventory

vertical contraceptive supply chain. Another possible explanation for stockouts within the integrated system is the relationship between stock levels and the ordering schedule available throughout the integrated system. According to anecdotal evidence provided during the qualitative surveys, respondents indicated that, although the official lead time is two weeks, in practice, due to various delays (see qualitative section for details), the CIPS ordering schedule or lead time to deliver commodities (about three weeks) is longer than the buffer stock available at the lower levels (two weeks), which often leads to stockouts.

Beyond the stockouts observed throughout the system, quantitative and qualitative data collected in-country confirmed that stockouts of amoxicillin, nitrofurantoin, acetate medroxyprogesterone, magnesium sulfate, and condoms occurred at the central medical stores (CIPS) (see Table 8 for a list of stockouts at the CIPS). This finding suggests that many stockouts experienced at lower levels may originate because of stock availability issues at the central level (see qualitative section for some examples). Furthermore, some facilities with low reserve levels may have ended up stocked out at either type of SILAIS when the duration of the stockout at the central level was greater than the reserve level and the time it took to get resupplied at the local level. In contrast, facilities with higher stock levels, such as in the non-integrated system that is managed by an allocation system, may be able to avoid these central-level stockouts from trickling down to the regional level.

Table 8 Commodities and Number of Stockout Occurrences at the Central Level (CIPS)

Product Stocked Out	Number of Stockouts in Last Six Months
Amoxicillin Oral Suspension	One
Nitrofurantoin Capsule	One
Magnesium Sulfate	One
Medroxyprogesterone Acetate	Two
Rubber Condom No Logo	One

As shown in Table 9, stockouts at the SDP level are quite variable between integrated and non-integrated SILAIS. Some commodities were stocked out in both types of SILAIS (medroxyprogesterone acetate and condoms), whereas other commodities were stocked out to varying degrees between both types of SILAIS (amoxicillin and nitrofurantoin). One of the reasons for this pattern might be stockouts at the CIPS (Table 8) and/or management issues (e.g., setting of reserve levels) at both types of SILAIS that are not directly related to the integration process.

When comparing the number of times stockouts occurred during the last six months at the CIPS (Table 8) with the number of stockouts at the service delivery point level (Table 9), condoms and medroxyprogesterone acetate stockouts at the central level appear to have trickled down more significantly to the lowest level, in both types of SILAIS, than did some of the other stockouts experienced at the central level.

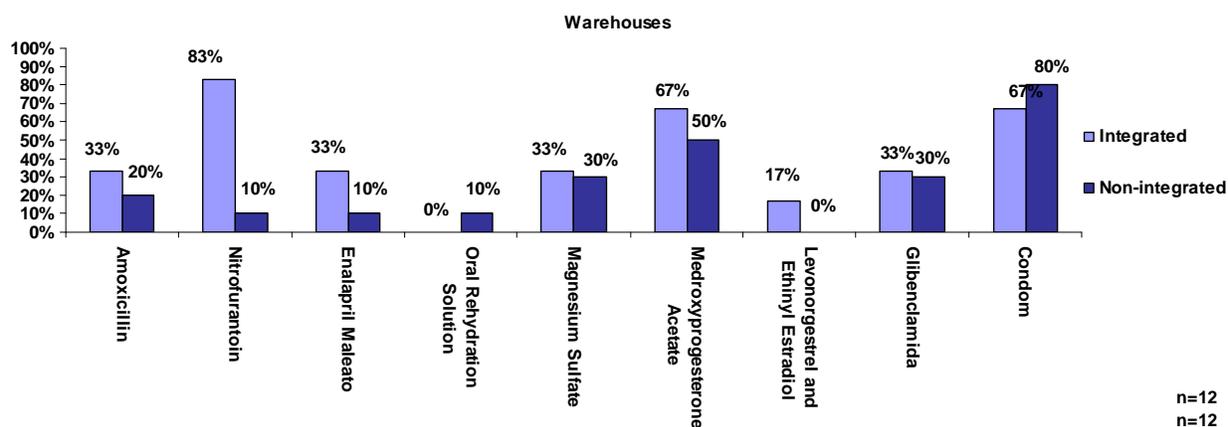
management. The supply chain for contraceptives in non-integrated SILAIS, however, does manage buffer stock, and for this reason a comparison has been made with contraceptive stock levels.

Table 9 Number of Times Selected Commodities were Stocked Out at the SDP level in Integrated and Non-integrated SILAIS

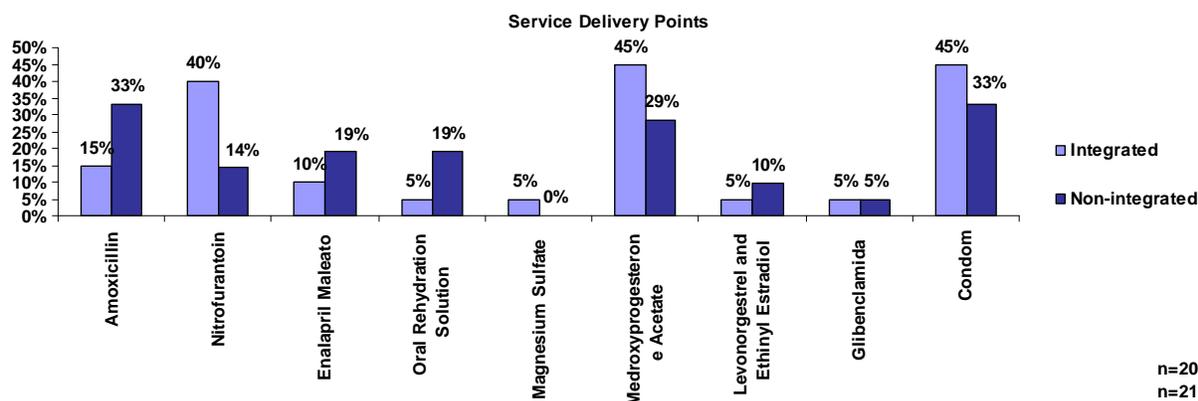
Product Stocked Out	Integrated SILAIS n = 20 SDPs	Non-integrated SILAIS n = 20 SDPs
	Number of Stockouts in Last Six Months	Number of stockouts in Last Six Months
Amoxicillin Oral Suspension	4	10
Nitrofurantoin Capsule	20	4
Magnesium Sulfate	1	0
Enalapril	2	4
Medroxyprogesterone Acetate	13	7
Rubber Condom No Logo	12	16

When disaggregating data by the level of the supply chain or type of facility, the difference in stockout rates between integrated and non-integrated facilities changes significantly. Figure 11 provides stockout rates over the last six month for warehouses and service delivery points, respectively.

Figure 11 Facilities that Experienced a Stockout over the Last Six Months in Integrated versus Non-integrated SILAIS by Type of Facility



Integrated n = 12, Non-integrated n = 12



Integrated n = 20, Non-integrated n = 21

For example, in the case of warehouses, nitrofurantoin and enalapril are the only two commodities that illustrate a substantial difference in stockout rates between integrated and non-integrated facilities. For both commodities, more integrated facilities experienced stockouts than did non-integrated facilities. Also, Graph 11 shows that for certain products (medroxyprogesterone acetate and condoms), in both integrated and non-integrated SILAIS, warehouses experienced more stockouts than SDPs, which reflects the fact that products are being filtered down to the SDP level, where clients need them. On the other hand, for oral rehydration solution and condoms, more non-integrated facilities experienced stockouts than did integrated facilities. In sum, it appears that all of the central level (CIPS) stockouts (see Table 8) did translate into stockouts at warehouses. In addition, facilities experienced stockouts, albeit fewer, of enalapril, glibenclamide, and levonorgestrel that cannot be explained by shortcomings at the central level (CIPS). Unfortunately, there were stockouts of condoms and medroxyprogesterone acetate at service delivery points in both types of SILAIS (as seen in Figure 11 and Table 9).

In the case of service delivery points (municipal pharmacies and health posts), integrated facilities experienced more stockouts for nitrofurantoin (40 percent), condoms (45 percent), and medroxyprogesterone acetate (45 percent) than did non-integrated facilities. This stock out pattern in SDPs was also affected by stock outs at the central level (CIPS) for certain products (See Table 8 and 9). On the other hand, non-integrated facilities experienced more stockouts of oral rehydration solutions (19 percent), amoxicillin (33 percent), enalapril (19 percent), and levonorgestrel (10 percent) than did integrated facilities.

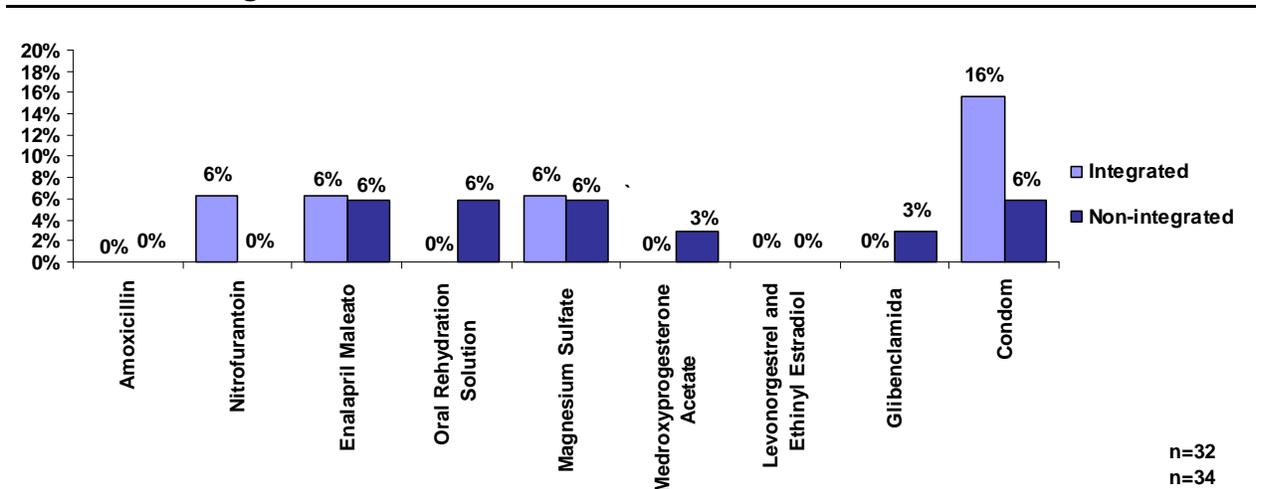
When comparing stockout rates at service delivery points with the aggregated data for the entire system (see Figure 11) and the stockout rate at warehouses, it becomes clear that, although a significant number of facilities were stocked out of commodities somewhere in the system, in both the integrated and non-integrated systems, managers were sometimes able to prevent these stockouts from occurring at the service delivery point (see Figure 11). For example, although there were central-level stockouts of amoxicillin and magnesium sulfate, these stockouts did not trickle down significantly to the lowest level in the integrated facilities. Additionally, non-integrated facilities were able to maintain sufficient stock at the service delivery point to avoid massive stockouts of nitrofurantoin.

Qualitative data collected at the lower levels of the system confirmed that regions have some budget of their own to procure commodities locally when they are not available at the national level. Many of the condoms observed during the site visits were procured locally rather than provided by the CIPS. This is one way, albeit not the most cost-efficient way, for SILAIS to avoid experiencing stockouts at the service delivery point and having to turn clients away.

One of the causes of stockouts at SDP levels may be that some facilities received fewer commodities than they ordered (probably due to stockouts at higher levels). For example, in the case of condoms, 17 of 32 establishments received no product when placing orders and, for nitrofurantoin, three of 32 establishments did not receive the quantities they ordered.

In addition to stockouts over the last six months, the study assessed stockouts at the time of the visit. Figure 12 illustrates that some of the significant stockouts observed over the last six months had been resolved at the time of the visit. On average, stockout rates at the time of the visit were very low (four percent). Nevertheless, sixteen percent of facilities were stocked out of condoms in the integrated SILAIS. Stock-outs of magnesium sulfate have a similar pattern (6 percent) across the entire system, because at the time of the study, the MINSA norm was to replenish SDPs even if they did not have past consumption/demand of this product. This practice was adhered to because this drug is prescribed for obstetric emergencies and must be available whether or not past consumption has occurred.

Figure 12 Facilities that Experienced a Stockout at the Time of the Visit in Integrated versus Non-integrated SILAIS

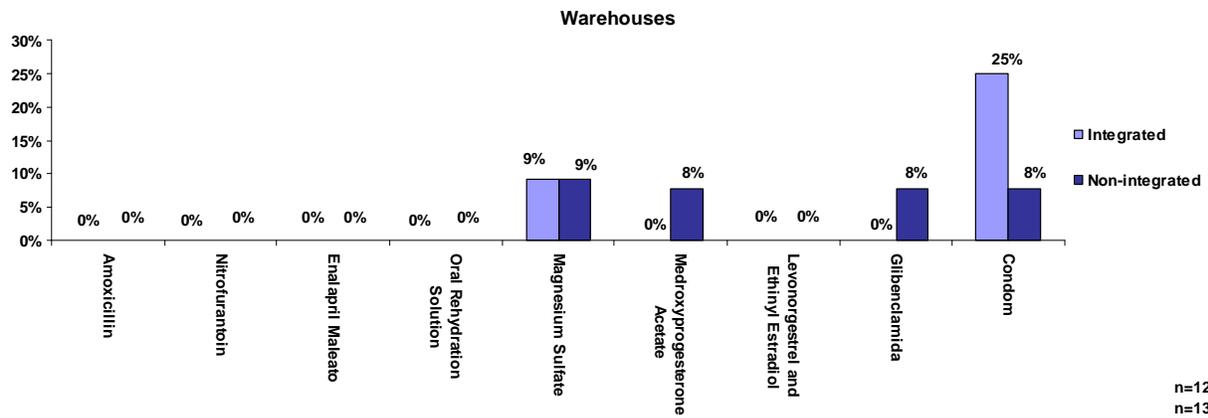


Integrated n = 32, Non-integrated n = 34

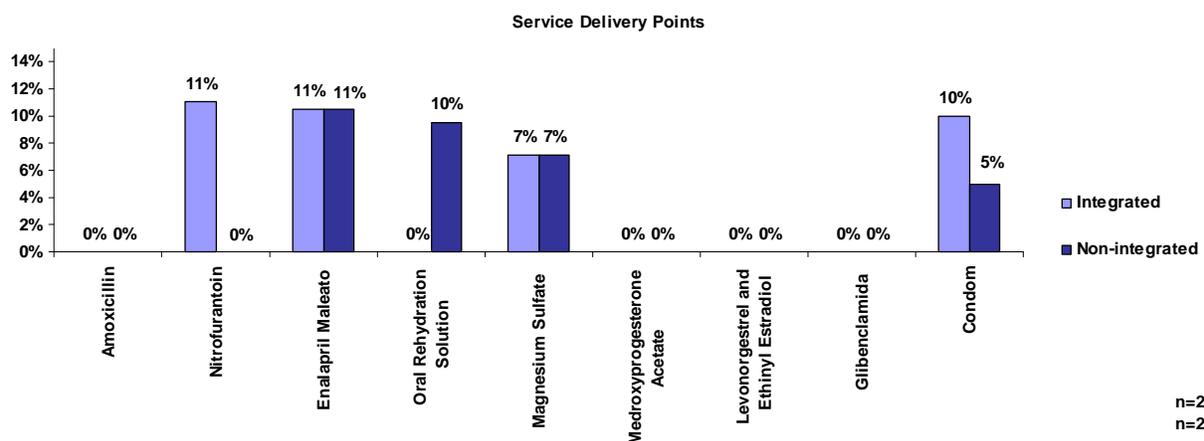
By disaggregating by type of facility, one can observe that condom stockouts are concentrated at the warehouse level (see Figure 13). However, stockout rates of nitrofurantoin are significantly higher at integrated service delivery points than they are in warehouses. The inverse pattern is true of oral

rehydration solution, with a much higher stockout rate at the non-integrated SDPs than at the warehouses.

Figure 13 Facilities that Experienced a Stockout at the time of Visit in Integrated versus Non-integrated SILAIS by Type of Facility



Integrated n = 12, Non-integrated n = 13



Integrated n = 20, Non-integrated n = 21

Table 10 provides some analysis of the stock on hand in the two different logistics systems to get a sense of whether stock levels may also be affecting inventory management. In the table, the months of stock on hand can be compared between the service delivery points (pharmacies and health posts) of the integrated and non-integrated SILAIS.

Table 10 Comparison of Months of Stock on Hand between Integrated and Non-integrated SDPs (Pharmacies and Health Posts) at the Time of the Visit

Product	Months of Stock on Hand	
	Integrated	Non-integrated
Amoxicillin Oral Suspension	0.8	0.9
Nitrofurantoin Capsule	1.2	1.3
Enalapril Maleato	0.3	0.5
Oral Rehydration Solution	1.3	7.5
Magnesium Sulfate	Data not available	Data not available
Medroxyprogesterone Acetate	1.0	1.2
Levonorgestrel and Ethinyl Estradiol	0.8	1.3
Glibenclamida	1	3.1
Rubber Condom No Logo	0.6	1.0

The table illustrates that, at the time of the visit, the non-integrated system was managing and maintaining higher stock levels than were the integrated service delivery points. For example, all commodities had higher levels of stock on hand in the non-integrated regions than in the integrated regions, with oral rehydration solution and glibenclamida significantly higher in non-integrated SILAIS (1.3 versus 7.5 and 1 versus 3.1, respectively). These stocks may help prevent the non-integrated facilities from stocking out as much as the integrated facilities. However, when the country is experiencing a limited supply of commodities at the national level, these inequities in stock distribution may be an inefficient way of dispersing stock across the country.

In summary, the above analysis suggests that facilities at all levels in both integrated and non-integrated SILAIS are experiencing stockouts. The data collected in this study do not support a conclusion that the integrated system itself has caused challenges for commodity managers that result in higher stockout levels for certain products. Instead, it appears that some issues with system design (inventory control and buffer stocks), delays and stock availability issues at the central level, and some instability during the transition to integration may have translated into stockouts throughout the entire system. In addition, the responsible parties at the MINSA struggle to harmonize the budget processing cycle with product procurement plans based on real demand, which has also resulted in stockouts at the central level. These discrepancies affect product availability as observed in the results of this study. One future solution would be to ensure effective negotiations between the Ministry of Finance and the MINSA Finance Unit to guarantee all financing necessary to ensure a full supply of contraceptives.

Some of these stockouts appear to be caused by shortcomings at the central level, whereas other stockouts are most likely caused by shortcomings in inventory management at lower levels of the system. In several cases, facilities in the integrated SILAIS experienced more stockouts than the non-integrated facilities. One possible explanation for these stockouts could be the lower buffer stocks held in integrated SILAIS, which has less to do with the integration process itself and more to do with the logistics system design in the integrated SILAIS. These lower buffer stocks may have led to stockouts because the lead time for filling orders often exceeds the amount of stock on hand. On the other hand, for several commodities, the non-integrated facilities experienced higher stockout rates than did the integrated facilities. In the majority of non-integrated stockouts, the commodities were different from those that had been stocked out at the central level.

Although differences can be observed in stock status between integrated and non-integrated, several external factors may be contributing to these shortcomings in both integrated and non-integrated SILAIS, such as central-level reporting requirements; financing, procurement, and transport/distribution challenges; geographic location; human resource capacity; etc. Some of these factors may be affecting supply chain performance in either modality to a greater or lesser degree. For example, if a non-integrated facility lacks storage space, it may be disproportionately affected by overstocks, compared to an integrated facility that manages less stock or any facility that has more storage space. In contrast, if an integrated SILAIS manages less stock than does a non-integrated SILAIS, it may be more quickly and significantly affected by a stockout at the central level. In other words, to guarantee efficient supply chain performance at a national level, all logistics functions must be strengthened, whether the system is managed vertically or integrated.

Before presenting a summary of lessons learned drawn from this study about the impact of integration on supply chain performance in Nicaragua, it is worthwhile to reiterate that this study serves mainly as a snapshot analysis of integration status and its impact on product availability. Previous statistically rigorous studies on the effects of integrating supply chains (Bossert et al. 2002) in Ghana and Guatemala were also inconclusive on the effects of integration on supply chain performance. Nevertheless, the results of this study help to validate some of the previous studies' insightful conclusions about managing logistics functions in an integrated system, as described below:

- √ Facilities that integrated their needs quantification (had the same person or type of staff do the needs quantification) had more accurate forecasts in relation to what they consumed.
- √ Facilities with a mixed and/or vertical process tended to forecast for significantly more commodities than they consumed. No relationship was found between these variables and contraceptives or vaccines.
- √ Facilities with a more integrated system were more likely to have greater than fifty percent of their drugs stocked out over the last six months, than non-integrated system. This finding is congruent with the stock availability data found among integrated regions of this study. Nevertheless, further analysis would need to be carried out to statistically determine if other factors such as financing and reserve levels may have been affecting product availability in Nicaragua.
- √ Facilities with an integrated LMIS were more likely to always submit the requisition forms than in non-integrated LMIS. This finding is also congruent with the findings in this report that show that, in the non-integrated SILAIS, reporting rates were significantly higher in the integrated regions. In other words, the integration process may have some positive affects on reporting rates because staff are required to submit their forms, including consumption data, in order to place their orders.

The following section provides some lessons learned based on both the qualitative and quantitative survey results.

LESSONS LEARNED

The study revealed several interesting facts about the impact of integration on product availability in Nicaragua, and it underscored several principles about how to conceive and implement an integration agenda. Those lessons are detailed below. For a summary primer of recommendations on how to approach integration successfully, please see Appendix B.⁷

- **The MINSA has learned that in the early stages of the integration process, stockouts may still occur.** As the integration process moves along, and changes are implemented gradually, managers need to bear in mind that adequate stock levels and product availability at all times will not occur from one day to the next. High-level financial commitment and continuous monitoring and evaluation, supervision, mentoring, and refresher trainings of principles and procedures are required during every phase of the integration process. And, even with all this organizational support, stockouts may still occur until enough funding is allocated to cover needs and the new integrated system is consolidated at every level and in every region of the health system. Finally, once the system is consolidated, there still may be other factors that complicate efficient management of the new system. For example, in Nicaragua, contextual issues—such as procurement challenges, lead times, and ordering schedules—that result in stockouts appear to affect the integrated SILAIS disproportionately because they manage lower buffer stock levels. To guarantee continuous stock availability, these obstacles need to be anticipated/foreseen and resolved. Although this study did not attempt to determine exactly how the integration process affects stock, the fact that the integrated regions have been more affected by stockouts at the central level suggests that the integration process may have created some temporary challenges for stock managers in Nicaragua. Steps, such as temporarily increasing buffer stock levels, sensitizing personnel, keeping backup data, resolving logistics system issues at the central level, and using unmet demand data to quantify financial requirements, should be taken before and during the integration process to guarantee its successful implementation.
- The study findings suggest that **careful analysis of the logistics system design is essential to protect the system from stockouts during the process of change, adaptation, and consolidation.** When planning for integration, logisticians and decisionmakers need to carefully review each element of the supply chain design, in particular reviewing the information and inventory control systems and evaluating lead times according to current processes. All of this is essential to avoid stockouts. For example, buffer stocks need to correspond to real lead times and constraints.
- Throughout the integration process, MINSA staff learned quickly that there are **external constraints outside their purview that ultimately affect commodity availability** and the successful merging of more than one supply chain. For example, adapting buffer stocks according to demand type, procurement challenges at the central level, protective

⁷ Sánchez, Anabella, Wendy Abramson, Nadia Olson, and Nora Quesada. 2006. *Decentralizing and Integrating Contraceptive Logistics Systems in Latin America and the Caribbean: Considerations for Informed Decision Making throughout the Health Reform Process*. Arlington, Va.: DELIVER, for the U.S. Agency for International Development.

Beith, Alix, Nora Quesada, Wendy Abramson, Anabella Sánchez, and Nadia Olson. 2006. *Decentralizing and Integrating Contraceptive Logistics Systems in Latin America and the Caribbean, With Lessons Learned from Asia and Africa* (draft). Arlington, Va.: DELIVER, for the U.S. Agency for International Development.

procurement laws, organizational challenges at the central warehouse (CIPS), a lack of synchronization between budgets and real demand, and a shortage of human resources has affected successful implementation of the new system. Until these challenges are addressed, the integration system will not be fully consolidated at the national level and stockouts may continue to disproportionately affect the integrated SILAIS.

- The MINSA learned throughout the integration process how important it was to **implement the process in phases**. Rather than merging all functions of the supply chains at once and nationwide, the MINSA decided to test the LMIS integration process in two regions first. In addition, the pilot program only focused on ten tracer essential medicines and four contraceptives. Once the system had been validated in these regions, it was expanded to other regions and applied to all commodities. By piloting the process, the technical team was able to slowly validate and refine the system as well as demonstrate to decisionmakers that the system could positively affect commodity availability before it was applied nationwide. The fact that the integration process has not been finalized provides an opportunity to remedy some of the challenges that currently exist throughout the system.
- Although some logistics system design issues still need to be resolved, logistics managers also learned the **importance of integrating on the basis of good logistics principles**. By illustrating to decisionmakers that the contraceptive supply chain was working because it collected and based orders on essential logistics data—such as stock on hand, consumption data, and adjustments—these principles were also preserved when merging the contraceptive and essential medicines supply chains. In addition, political will and financing were available to help strengthen these basic logistics functions that were being merged between systems.
- Technicians advocating for integration learned quickly that **political will from the highest levels was essential to moving the process forward**. Leaders from the highest echelons of the MINSA were committed to moving the integration process forward. Additionally, these champions helped to reach compromises, adapt, and sell the system to others to guarantee its successful implementation. These leaders also helped to guarantee that family planning commodities were given the same priority attention as other essential medicines.
- Logistics managers learned that because the integrated system manages hundreds of commodities, **it will be necessary to computerize the system as soon as possible**. Computerization will significantly reduce the burden on staff to manage the integrated LMIS manually. On the other hand, these managers also learned that it is not necessary to have an automated system designed and installed prior to beginning the process. By focusing on tracer commodities at first, personnel were able to learn the mechanics of managing the system without the help of an automated system. Once the automated system is up and running, these personnel will have a better understanding of the data entered into and managed by this information system.
- Technicians also learned that when integrating more than one supply chain, **not all logistics functions need to be fully merged into one supply chain**. Integration makes the most sense for functions such as storage and distribution; savings in these two areas are substantial because they reduce management and transportation costs. In Nicaragua, these two functions have been integrated for several years, which has led to cost savings. Other functions that may be integrated are the LMIS and inventory control management, in which a database and standard inventory norms may be unified for all essential medicines, contraceptives, and other centrally procured medicines, while still allowing disaggregation of data for individual products. On the other hand, functions such as product selection and forecasting may benefit from special program attention (while still being managed in an integrated system) rather than developing a standard approach for all commodity groups.

- MINSA staff recognize that, **until the new information system is implemented nationwide, it will not be possible to manage all logistics functions jointly at the top end of the supply chain.** For example, if essential logistics data—such as consumption—are only available for some regions but not for others, it is not possible to carry out a national-level forecast based on historical demand. In other words, until all SILAIS implement the SIGLIM, procurement amounts will be based on budgeted or allocated amounts, while orders, in some regions, are based on consumption data. These limitations may have caused some stockouts that will only be remedied once the new information system is used effectively throughout the entire country. Managers learned that it was important to make these challenges explicit to personnel and decisionmakers so they were aware that the integration process takes time and will not work at all levels until the new LMIS is up and running in all SILAIS.
- Program managers and health system directors learned that **good logistics data can provide useful information for monitoring their expenditures, rational use of medications, and defining new essential medicines lists** for all levels of the health system. Several managers stated that these new data helped them understand which commodities were most popular at different levels of the health system, when certain commodities were not being used and others overused, and exactly why their budgets were being over- or underexpended.
- It became clear to logistics managers that, **to guarantee a successful integration process, they were going to have to ensure improved supervision, training, and technical support to their staff.** Some staff were resistant to, and challenged by the new system. In order to get these staff to adapt to this significant change in their responsibilities, the MINSA and donors were required to invest significantly in training and supervision throughout every step of the process to make sure their staff felt supported.
- Logistics advisors made clear right from the start that during any given change process, such as integrating a vertical LMIS into a unified system, **assigning human resources at the right time and in the right place is fundamental** to effectively managing the transition and adapting to new roles and responsibilities. By assigning sufficient resources, managers can help to mitigate resistance throughout the integration process. For example, the essential medicines managers, who have been assigned to every region and municipal district in Nicaragua, serve as leaders and facilitators of change, with responsibility for nurturing their staff to move the integration process along and avoid disruptions in product availability as much as possible.
- The MINSA learned that integrating contraceptives and the essential medicines' LMIS **can encourage a more holistic and sustainable approach to logistics management** because the supply chain planning is not divorced from or seen as exclusive for a certain group of medicines. For example, this joint management has translated into better planning of requisitions, transportation, supervision visits, and ordering frequency in Nicaragua.
- **Integration can improve coordination among different health programs**, thus positively affecting supply chain management as well. Before integrating the Integral Women's Health Program and the contraceptives supply chain management, staff were not aware of other program needs. For example, the essential medicines manager was not aware of contraceptives needs. A unified LMIS has promoted an integrated vision, standard procedures, and joint collaboration among different programs in Nicaragua.

In conclusion, by conducting both a qualitative and quantitative analysis midway through the integration process, the study revealed that integration is a long and complicated process that must be carefully managed to avoid stockouts in the short, medium, and long term. Although the integration process and other external factors may affect the logistics system before, during, and after this process, the authors believe that careful planning and high-level support for commodity security can help mitigate some of the challenges observed in Nicaragua and other countries facing integration.

Because integration processes are inevitably taking place as part of health reform processes in many countries, it is important to advocate for a focus on the supply chain throughout the broader health reform process. Even when the supply chain is strengthened throughout the integration process, commodity availability may not automatically improve immediately. Because the integrated system is exponentially more complex than managing various supply chains vertically, it may take some time before commodity availability can be guaranteed in the new system. Logistics staff will be managing hundreds of commodities and will be learning and implementing new skills that will take a significant amount of time to consolidate at a national level. The Nicaragua case study illustrates both challenges and successes related to the integration process and guaranteeing the availability of contraceptives and essential medicines in the integrated supply chain. In spite of these challenges, supply chains can be designed to succeed in almost any environment, as long as policymakers and program managers are committed to making and keeping products available to their clients. In all circumstances, supply chain management requires careful and detailed planning, policy-level visibility and support, sufficient human and material resources, and a commitment to collecting and using accurate and timely information to drive supply chain decision making.

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APPENDICES

APPENDIX A

LIST OF SITES VISITED

	INTEGRATED SILAIS
1	<i>Warehouse SILAIS ESTELI</i>
2	<i>Warehouse Health Center Leonel Rugama ESTELI</i>
3	SDP Pharmacy Leonel Rugama ESTELI
4	Health Post Paso Hondo ESTELI
5	<i>Warehouse Pueblo Nuevo ESTELI</i>
6	SDP Pharmacy Pueblo Nuevo ESTELI
7	Health Post Eduardo Selva ESTELI
8	<i>Warehouse ES Dávila Bolaños MASAYA</i>
9	SDP Pharmacy Dávila Bolaños MASAYA
10	Health Post Las Flores MASAYA
11	Health Post Los Altos MASAYA
12	<i>Warehouse ES Nindiri, MASAYA</i>
13	SDP Pharmacy Nindiri MASAYA
14	<i>Warehouse SILAIS LEON</i>
15	Health Post Calle Real LEON
16	Health Post El Tamarindo LEON
17	<i>Warehouse Malpasillo LEON</i>
18	SDP Pharmacy Fanor Urroz MalpasilloLEON
19	<i>Warehouse La Paz Centro LEON</i>
20	SDP Pharmacy La Paz Centro LEON
21	SDP Perla Maria Norori LEON
22	<i>Warehouse Perla LEON</i>
23	Health Post Villa 23 De Julio LEON
24	Health Post Esquipulas MANAGUA
25	<i>Warehouse ES Pedro Alatamirano MANAGUA</i>
26	SDP Pharmacy Pedro Altamirano MANAGUA
27	<i>Warehouse Ramón Guillén BOACO</i>
28	SDP Pharmacy Ramón Guillén BOACO
29	Health Post Santa Elisa BOACO
30	<i>Warehouse Santa Rita Tenstepe, BOACO</i>
31	Health Post El Empalme Tenstepe,BOACO
32	Pharmacy Tenstepe, BOACO

	Non Integrated SILAIS
1	<i>Warehouse SILAIS CHONTALES</i>
2	<i>Warehouse Health Center Juigalpa CHONTALES</i>
3	Pharmacy Health Center Adan Barillas Huete CHONTALES
7	Health Post Sector 4 CHONTALES
8	Health Post Zona 1 CHONTALES
5	<i>Warehouse Health Center Carlos Roberto Huebemes El Rama.CHONTALES</i>
4	Pharmacy Health Center Carlos Roberto Huembes. CHONTALES
6	Health Post Wapi-El Rama CHONTALES
9	<i>Warehouse CIPS MANAGUA</i>
11	<i>Warehouse Health Center Francisco Morazán MANAGUA</i>
12	Pharmacy Francisco Morazán MANAGUA
10	Health Post Edgar Lang MANAGUA
16	<i>Warehouse Health Center San Francisco Libre MANAGUA</i>
15	Pharmacy Health Center San Francisco Libre MANAGUA
13	Health Post Laurel Galan- reporta a San Fco. El Libre MANAGUA
17	<i>Warehouse Health Center Yolanda Mayorga MANAGUA</i>
18	Pharmacy Health Center Yolanda Mayorga MANAGUA
14	Health Post San Benito - reporta a Yolanda Mayorga MANAGUA
19	<i>Warehouse SILAIS MATAGALPA</i>
24	<i>Warehouse Health Center Matiguás MATAGALPA</i>
25	Pharmacy Health Center Matiguás MATAGALPA
20	Health Post El Jobo MATAGALPA
21	<i>Warehouse Health Center Darío MATAGALPA</i>
22	Pharmacy Health Center Darío MATAGALPA
26	Health Post Llanos de Tomalapa MATAGALPA
27	<i>Warehouse Health Center Policlínico Trinidad Guevara MATAGALPA</i>
28	Pharmacy Health Center Policlínico Trinidad Guevara MATAGALPA
23	Health Post Matasano MATAGALPA
29	<i>Warehouse Health Center Camilo Ortega Saavedra - Municipio Tola RIVAS</i>
30	Pharmacy Health Center Camilo Ortega Saavedra RIVAS
34	Health Post Pilas Coyal RIVAS
32	<i>Warehouse Health Center Mannin Renner RIVAS</i>
33	Pharmacy Health Center Mannin Renner RIVAS
31	Health Post Manuel Castillo Rivas RIVAS

APPENDIX B

PRIMER OF RECOMMENDATIONS

PLAN FOR SUCCESSFUL INTEGRATION AND MANAGING CHANGE

It is very important to plan ahead for any integration of supply systems. Guiding principles need to be established, specifications must be developed, and detailed work plans that clearly articulate the responsibilities and expectations of all partners in an integrated supply system need to be prepared. Disseminating these guidelines and providing technical assistance for the design, testing, and capacity building required to put integrated systems into place are essential to ensuring a smooth transition. Make sure to involve technical staff from all levels when defining these specifications. For instance, in Nicaragua, a focus group was held at the beginning of the process to gather technical inputs from important stakeholders from every level of the health system.

Consider the following questions to help identify possible problem areas and collect technical inputs:

- Why do we need/want to integrate?
- What functions should/will be integrated? For what products? At what levels?
- Who will need training? Of what type? At what levels?
- What supervision will be needed? How much? Of what type and at what levels?
- What buy-in is required to make the integration efforts more successful? Which stakeholders should be involved? At what levels? What role should they play in planning and implementation? What is the best way to involve them, even if their participation is considered transitory? How is integration viewed by those involved? Who is threatened by the process, who gains, and how can potential conflicts be managed?
- Are there any “champions” and “early adopters” to help guide the process?
- Should we consider developing MOUs to help define specific roles and responsibilities for each stakeholder involved in the process?
- What aspects of the different supply chains that we intend to merge are already working effectively?
- Which logistics principles will we be applying to the new integrated system?

INVOLVE AS MANY STAKEHOLDERS AS POSSIBLE, INCLUDING FAMILY PLANNING AND LOGISTICS EXPERTS

In many cases, low-quality planning seems to originate with parties who have no expertise in logistics— those who make decisions that affect logistics without understanding the consequences. Involving family planning managers and logistics experts in early planning stages and throughout the process will improve the outcomes of integrating various logistics functions. Such expertise will also help protect family planning services and their positive effects on maternal and child health, as well as help maintain an efficient supply chain, especially if the contraceptive supply chain has been shown to guarantee good commodity availability. In Nicaragua, logistics experts and family planning,

trained during the process of strengthening the contraceptive supply chain, were involved intensely in the integration process.

FOCUS ON HUMAN CAPACITY: ENSURE WIDESPREAD TRAINING AND AVOID DELETION OR DUPLICATION OF ROLES AND FUNCTIONS

When integrating logistics systems, it is easy to delete responsibility from one party's portfolio while neglecting to add it to someone else's. It is also easy to underestimate the affects that changing roles and responsibilities will have on each involved person and group or to overestimate their willingness to cooperate and lead the process forward. These problems can be minimized by updating position descriptions or using memorandums of understanding (MOUs) to clearly specify the roles and responsibilities of staff. In many cases, the process of developing written MOUs can also provide an opportunity to identify potential problems and head them off; for example, by helping to identify the best division of labor. In Nicaragua, the MINSA staff were always aware of the shifts in responsibilities taking place throughout the system. Nevertheless, detailed MOUs were not devised. This may have been one of the reasons staff indicated they felt overburdened by their new responsibilities.

STRONG LEADERSHIP IS ESSENTIAL

“Championship”—the active, personal interest of senior decision makers who have the authority to induce forward motion—has been shown to be essential for facilitating successful logistics reform and ensuring sustained contraceptive availability. In Nicaragua, political will was cultivated slowly over a period of many years and over the span of more than one government administration. Because the integrated logistics system places the client at the center, it was easy to gain the political support necessary to implement the integrated system – from the Minister to the municipal pharmacy nurse dispensing medicines to the clients. Nevertheless, there are still challenges to address. Until these challenges are resolved, the integrated system will not perform to its fullest capacity. In other words, champions are needed over the long-term and only sustained political support will help guarantee the effective implementation of the integrated system nation-wide. Furthermore, there are external challenges that will need to be addressed to guarantee commodity availability. Without these champions, these challenges would not be within the scope of the logistics technicians to resolve.

IF POSSIBLE, PILOT, OR AT LEAST IMPLEMENT ON A SMALL SCALE

Design and carefully test integrated supply systems before expanding them to the national level. It is important to revise, test, and then finalize all policies and procedures related to human resources, registers and reports, databases, references and training manuals, and guidelines and tools for supervising, monitoring, and evaluating before introducing a new system countrywide. In Nicaragua the integrated system was tested in two SILAIS and, then again, in five SILAIS and only for a select number of commodities. Once the system was tested, revised, and demonstrated results, it was easier to make the case to expand this new system to all other commodities and regions.

RECOGNIZE THAT SOME LOGISTICS FUNCTIONS PERFORM BETTER WHEN INTEGRATED

Integration makes the most sense for functions such as storage and distribution; savings in these two areas are substantial because they reduce management and transportation costs. Another function that may be integrated is the logistics management information system, in which a database may run unified for all essential medicines, contraceptives, and other centrally procured medicines, while still allowing desegregation of data for individual products. In Nicaragua, transportation and storage functions have been managed jointly for most commodity groups for several years. In contrast, the LMIS is just beginning to be integrated in some regions and the automated system is just beginning

to be defined. Moreover, decisions still need to be made about how certain logistics functions, such as forecasting and procurement, will be managed into the future. The Nicaragua example demonstrates that integration needs to be a well-planned process, requiring much iteration until each function is situated best within the spectrum of integrated and vertical supply chain management approaches.

AUTOMATION IS ESSENTIAL WHEN INTEGRATING A LARGE NUMBER OF PRODUCTS

A streamlined LMIS is essential for effective overall system performance. An LMIS that has accurate, timely, and complete data allows managers to facilitate stock movements to ensure product availability, provide accountability to funders and policymakers, help minimize waste, and ensure increased transparency. One way to streamline an LMIS in an integrated system is to work to install an automated system as early as possible. Countries should not consider integrating the recording and information systems without planning to eventually have an automated system. If integration occurs without automation, the system might eventually collapse because manual capacity to process data may be insufficient for such a large number of products. The Nicaragua example illustrates that staff at the regional level feel overburdened because they must manage the new reporting and ordering system by hand. In order to lessen this burden MOHs, like the MINSA, will need to move forward quickly with plans to automate the logistics management information system, even when they set up a manual system first.

APPENDIX C

COPY OF SURVEY INSTRUMENTS

Estudio de caso integración del Sistema de Suministros
 Ministerio de Salud de Nicaragua
 Instrumento Cuantitativo SILAIS Integrados (SIGLIM)
 Abril 2008

Servicios e infraestructura del establecimiento

IDENTIFICACIÓN DEL ESTABLECIMIENTO

Nombre del establecimiento _____	
SILAIS _____	SILAIS <input type="checkbox"/>
MUNICIPIO _____	
Tipo de establecimiento: (1=Almacén; 2= Establecimiento de Salud [ES])	Almacén/ES..... <input type="checkbox"/>
Si ES, indique tipo: (1= centro de salud; 2= puesto de salud)	Tipo de establecimiento ES..... <input type="checkbox"/>
Si almacén, marque nivel: (1=central; 2= SILAIS, 3= Municipal)	Tipo de almacén..... <input type="checkbox"/>
Características del establecimiento: ¿Acceso pavimentado? (0=no; 1=sí)	Pavimento..... <input type="checkbox"/>
¿Hay electricidad? (0=no; 1=sí)	Electricidad <input type="checkbox"/>
¿Funcionan el teléfono o la radio el día de la visita? (0=no; 1=sí) ...	Comunicación externa..... <input type="checkbox"/>
Teléfono No. _____	

INFORMACIÓN SOBRE LA ENTREVISTA

Fecha: _____	DÍA/ MES/ AÑO
Entrevistador/es: _____	<input type="text"/>

No.	Pregunta	Código de clasificación	Pasar a
01	¿Cuál es su cargo?	Responsable de la Unidad.....1 Enfermera jefe.....2 Director del establecimiento.....3 Responsable de insumos médicos.....4 Otro (especifique).....9	

No.	Preguntas		Pasar a / Comentarios									
101	¿Cuántos medicamentos y anticonceptivos maneja en este establecimiento? (anote el número aquí) _____ medicamentos (anote el número aquí) _____ anticonceptivos											
102	¿Qué insumos incluye su lista básica?	<table border="1"> <thead> <tr> <th>CÓDIGO</th> <th>Si = 1</th> <th>No = 0</th> </tr> </thead> <tbody> <tr> <td>Medicamentos</td> <td></td> <td></td> </tr> <tr> <td>Anticonceptivos</td> <td></td> <td></td> </tr> </tbody> </table>	CÓDIGO	Si = 1	No = 0	Medicamentos			Anticonceptivos			
CÓDIGO	Si = 1	No = 0										
Medicamentos												
Anticonceptivos												
	Pida ver los formularios Tarjeta Estiba, Registro de cantidades y verifique si las casillas están llenas de acuerdo al Manual SIGLIM											
103	A. Tarjeta Estiba (SOLO PARA SILAIS Y MUNICIPIOS)	Sí.....1 No.....0										
	B. Control de movimiento de insumos médicos para farmacia de Centro de Salud	Sí.....1 No.....0										
	C. Registro de cantidades no despachadas por recetas para farmacias de puestos y centros de salud	Sí.....1 No.....0										
	D. Otro (Especifique y pregunte por qué. Anote la respuesta en casilla para comentarios)	Sí.....1 No.....0										
	Pida ver los siguientes formularios y verifique si las casillas están llenas conforme al Manual SIGLIM?											
104	D. Informe sobre movimiento y solicitud de insumos médicos para Puestos de Salud)	Sí.....1 No.....0										
	E. Requisa para farmacia de centro de salud	Sí.....1 No.....0										
	F. Requisa municipal	Sí.....1 No.....0										
	G. Requisa SILAIS	Sí.....1 No.....0.										
	H. Otro ¿Por qué?	Comentarios										

105	¿De que formulario toma el dato de cantidades no despachadas?	Control de movimiento de insumos.....1 Registro de cantidades no despachadas.....2 Otros.....9	
106	Pida ver los informes de los últimos tres meses y verifique si llenan las siguientes columnas.		
	A. Existencias disponibles	Sí.....1 No.....0	
	B. Consumo total	Sí.....1 No.....0	
	C. Cantidad no despachada	Sí.....1 No.....0	
	D. Ajustes	Sí.....1 No.....0	
107	¿Qué productos reporta/solicita en los informes y requisas del SIGLIM?	Medicamentos1	
		Vacunas.....2	
		Anticonceptivos.....3	
		Antituberculosos.....4	
		Otros.....9	
108	¿Con qué frecuencia se envían estos informes al nivel superior? (Observar fechas para verificar respuesta)	No envío.....1	} Pase a # 110
		Mensualmente.....2	
		Bimestralmente.....3	
		Trimestralmente.....4	
		Otro:.....9	
109	¿Por qué no ha enviado los informes?	No tengo formularios.....1 Tenía suficiente producto.....2 Estuve de vacaciones.....3 No sé como llenarlos.....4 Otro.....9	
110.	(APLICAR SOLO PARA SILAIS Y MUNICIPIOS) ¿Cuántos establecimientos deben enviar informes a este establecimiento?	_____	Comentarios
111.	(APLICAR SOLO PARA SILAIS Y MUNICIPIOS) ¿Cuántos establecimientos enviaron informes para el mes de marzo 2008? Asegúrese de ver los informes	_____	Comentarios (si no reportó el 100% de servicios, pregunte por qué)
112	¿Manejan nivel de reserva?	Sí.....1 No.....0	→ Si dice NO, pase a No. 114

113.	¿Cuál es el nivel de reserva para este establecimiento?	Nivel de reserva _____	
114.	¿Cuántos pedidos de emergencia de estos medicamentos (leer la lista de productos) ha realizado usted en los últimos 6 meses	Ninguno.....0 Uno.....1 Dos.....2 Tres.....3 Más de tres.....4	
115.	¿Cómo calcula las cantidades a pedir?	Fórmula (especifique).....1 Consumo.....2 Casos esperados.....3 Programación.....4 No sé.....5 Otro (Especifique).....9.	Si responde 1 y 2 llene el CUADRO 3
116	¿Quién transporta los medicamentos y anticonceptivos de su establecimiento? (Encierre en un círculo todos los que correspondan)	Nivel superior entrega 1 Este establecimiento pasa a buscar.....2 Otro (especifique).....9	
117	¿El transporte incluye medicamentos, anticonceptivos y vacunas?	Si.....1 No.....2	PASE a # 119 PASE a # 118
118	¿Por qué no incluyen todos los medicamentos, anticonceptivos y vacunas?	Comentarios: Pase a la No. 120	
119.	¿Cuál es el transporte más frecuente?	Vehículo del establecimiento1 Vehículo del CIPS.....2 Transporte público3 Vehículo privado4 Motocicleta5 A pie6 Otro (especifique).....9	
120.	Cuando recibió la última visita de supervisión, que incluía el manejo logístico de medicamentos y anticonceptivos? (ej., revisión de informes, eliminación de productos vencidos, control de existencias)?	Nunca 1 En el último mes2 En los últimos 3 meses.....3 En los últimos 6 meses4 Hace más de 6 meses.....5 Otro (Especifique).....9	

INSTRUCCIONES CUADRO 1: **Condición de existencias EN BODEGAS (SILAIS Y MUNICIPIOS) (últimos 6 meses)**

1. SI HAY TARJETA ESTIBA: Verifique si hay tarjeta estiba responda 1 para Sí o 0 para No
2. LA TARJETA ESTA AL DÍA: Fíjese si la tarjeta estiba ha sido actualizado en los últimos 30 días, responda 1 para Sí o 0 para No. Nota: Si la tarjeta estiba fue actualizado la última vez con un saldo de 0 y el establecimiento no ha recibido nuevos pedidos, considere que la tarjeta estiba está al día.
3. SALDO TARJETA ESTIBA: Registre en el Cuadro 1 el saldo que aparece en la tarjeta estiba. (ESTO APLICA SOLO PARA ESTABLECIMIENTOS CON BODEGA, ALGUNOS SILAIS Y/O MUNICIPIOS Y BODEGA CENTRAL)
4. DESABASTECIMIENTO ULTIMOS SEIS MESES: Registre si el establecimiento se ha quedado sin producto en algún momento de los últimos seis meses antes del estudio. (EN CS Y PS TOMAR DATO DE INFORME SIAL, para medicamentos la HCAP EN ALMACÉN TOME DATO de la tarjeta estiba, y en Farmacia la sabana de descargue diario)
Nota: Para todos los productos desabastecidos (cero existencias) en los últimos seis meses (incluido el día de la visita), explicar los motivos (por producto).
5. NUMERO DE DESABASTECIMIENTOS: Registre cuántas veces el producto ha faltado en los seis meses antes del estudio, según la tarjeta estiba, los informes. De lo contrario tome dato de memoria del informate. Anote siempre la fuente del dato. Tome el dato del numero de veces en la Tarjeta de Estiba o sabana de descargue, observe la cantidad de días marcados con X, y las veces que tengan grupos de X son los numeros de desabasteicmiento.
6. CONSUMO TOTAL: Registre el consumo total durante los seis meses antes del estudio. **Si la bodega que distribuye a otros servicios no consolida el consumo de sus servicios, anotar "ND". NOTA: Para este registro use la HOJA DE TRABAJO y anote el consumo total en cada mes, que aparecen en los informes que utiliza el establecimiento. Luego totalice los 6 datos y trasládalo al Cuadro 1. Haga esto para cada producto.**
7. NUMERO DE MESES CON DATOS CONSUMO: Registre el número de meses que los datos del consumo total representan (pueden ser menos de seis); registre los meses para los cuales hay algún dato anotado, incluyendo 0. Nota: si la columna 1 "ofrece este producto" es N=0, anote NA en esta columna.
8. VERIFIQUE LA INSPECCIÓN VISUAL: Registre Si=1 No = 0
9. CANTIDAD PRODUCTO VENCIDO EN ÚLTIMOS SEIS MESES: Anote la cantidad de productos vencidos en los últimos seis meses (VER TARJETA ESTIBA Y/O ACTA). Cuente todos los productos vencidos e los últimos seis meses. Si hay productos próximos a vencer (lapso de una semana), anótelos en la sección de comentarios, pero no lo incluya en el conteo de producto vencido.

CUADRO 1: CONDICIÓN DE EXISTENCIAS PARA BODEGAS DE SILAIS Y MUNICIPIOS

Producto	Unidad de medida	¿Hay Tarjeta Estiba?		¿La Tarjeta Estiba está al día?		Saldo en Tarjeta Estiba		Desabastecimiento en los últimos seis meses (S/N)		Número desabastecimientos		Consumo Total (últimos seis meses)		Número meses con datos de consumo		Inspección Visual (Verificar existencia de productos)		Cantidad de producto vencido en los últimos seis meses		
		1	(S/N)	2	(S/N)	3		4		5	6	7	8	9	Si	No	0			
1	Amoxicilina. Suspensión																			
2	Nitrofurantoina Capsula de 100mg																			
3	Enalapril																			
4	Solución Electrolitos Orales :																			
5	Sulfato de Magnesio																			
6	Medroxiprogesterona acetato																			
7	Levonorgestrel y etinilestradiol 0,3 + 0,03 mg																			
8	Gilbenciamida																			
9	Condón																			

INSTRUCCIONES CUADRO 1A: Condición de existencias EN ESTABLECIMIENTOS DE SALUD (últimos 6 meses)

1. **Saldo en INFORME SIGLIM:** Registre la cantidad de producto al 30 de marzo (TOMAR DATO DE INFORME SIGLIM)
2. **DESABASTECIMIENTO ÚLTIMOS SEIS MESES:** Registre si el establecimiento se ha quedado sin producto en algún momento de los últimos seis meses antes del estudio. (TOMAR DATO DE INFORME SIGLIM).
3. **NUMERO DE DESABASTECIMIENTOS:** Registre cuántas veces el producto ha faltado en los seis meses antes del estudio, según informe del SIGLIM. De lo contrario tome dato de memoria del informate.
4. **CONSUMO TOTAL:** Registre el consumo total durante los seis meses antes del estudio. **NOTA:** Para este registro use la **HOJA DE TRABAJO** y anote el consumo total en cada mes, que aparecen en los informes SIGLIM del establecimiento. Luego totalice los 6 datos y traslade al cuadro 1. Haga esto para cada producto.
5. **NUMERO DE MESES CON DATOS CONSUMO:** Registre el número de meses que los datos de entrega representan (pueden ser menos de seis); registre los meses para los cuales hay algún dato anotado, incluyendo 0.
6. **INVENTARIO FISICO:** Anote la cantidad de producto en el establecimiento,
7. **CANTIDAD PRODUCTO VENCIDO EN ÚLTIMOS SEIS MESES:** Anote la cantidad de productos vencidos en los últimos seis meses (**VER ACTA DE MERMA**). Cuento todos los productos vencidos e los últimos seis meses. Si hay productos próximos a vencer (lapso de una semana), anótelo en la sección de comentarios, pero no lo incluya en el conteo de producto vencido.

CUADRO 1: CONDICIÓN DE EXISTENCIAS PARA ESTABLECIMIENTOS DE SALUD

	Producto	Unidad de medida	Saldo en Informe SIGLIM al día de hoy	Inventario físico	Desabastecimiento en los últimos seis meses (S/N)	Número desabastecimientos	Consumo Total (últimos seis meses)	Número meses con datos de consumo	Cantidad de producto vencido en los últimos seis meses	
									4	5
1	Amoxicilina. Suspensión	Fco	1	2	3	4	5	6		7
2	Nitrofurantoina Capsula de 100mg	Cáps								
3	Enalapril	Tab.								
4	Solución Electrolitos Orales	sobre								
5	Sulfato de Magnesio	Amp								
6	Medroxiprogesterona acetato	amp								
7	Levonorgestrel y etinilestradiol 0,3 + 0,03 mg	ciclo								
8	Glibenclamida	Tab								
9	Condón	Uri.								

HOJA DE TRABAJO PARA SUMAR LA COLUMNA 11 "CONSUMO TOTAL" DEL CUADRO 1

Instrucciones para anotar el consumo total por mes

Mes 1 al 6: Octubre 2007 a Marzo 2008

Si no tienen los seis meses corridos, deje en blanco el mes.

Ejemplo: Si tienen solamente 4, empiecen en el mes que corresponda: Mes 1 al 4: Octubre, Noviembre, Diciembre y Enero. Anotar No disponible ND en la columna 5 y 6

Producto	Unidad	Mes 1	Mes 2	Mes 3	Mes 4	Mes 5	Mes 6
Amoxicilina. Suspensión	Fco						
Nitrofurantoina Capsula de 100mg	Cáps						
Enalapril	Tab.						
Solución Electrolitos Orales :	sobre						
Sulfato de Magnesio	amp						
Medroxiprogesterona acetato	amp						
Levonorgestrel y etinilestradiol 0,3 + 0,03 mg	ciclo						
Gilbenciamida	Tab						
Condón	Uni.						

CUADRO 2: Lista de Chequeo Condiciones de almacenamiento

Los ítems 1–6 deben evaluarse en todos los establecimientos y lugares donde se almacenan productos (almacén, bodega, cuarto, cajón de un escritorio, etc.). Coloque una marca en la columna apropiada basándose en su inspección visual del lugar de almacenamiento; anote las observaciones del caso en la columna de comentarios. **Para recibir un “sí,” todos los productos y las cajas deben satisfacer los criterios para cada producto . Si no hay producto en el momento de la visita, el lugar donde generalmente se almacenan los insumos debe evaluarse de todas formas..**

No	Descripción	No	Sí	N/A	Comentarios
01.	Los productos están almacenados y organizados de modo que estén rotulados, con fechas de vencimiento visibles, y los que primero vencen son los primeros en salir, para conteo y manejo en general.				
02.	Los productos están protegidos de la luz solar a toda hora del día y en todo el año.				
03.	Las cajas y los productos están protegidos contra el agua y la humedad durante todo el año.				
04.	El almacén, bodega o farmacia está libre de roedores e insectos (Fijarse si hay trazas de roedores - excrementos- o insectos]				
05.	El techo está siempre en buen estado para evitar la penetración del sol y del agua.				
06.	El lugar se mantiene en buenas condiciones (cajas en buen estado, no abolladas ni aplastadas, lugar limpio, sin basura, estanterías sólidas, cajas organizadas y en buen estado, las cajas y frasquitos de DepoProvera hacia arriba).				

CUADRO 3. PORCENTAJE DE DIFERENCIA ENTRE LA CANTIDAD PEDIDA Y LA CANTIDAD RECIBIDA

Nota: Buscar el último pedido para cada medicamento. Si en el mes de marzo no pidieron ir al mes anterior, hasta encontrar un pedido de cada producto.

Método/Marca/ Producto	Unidad	Cantidad pedida para el último período	Fecha del pedido	Cantidad recibida en el último pedido o compra	Fecha de recibo del pedido o compra
1		2	3	4	5
Amoxicilina. Suspensión	Fco				
Nitrofurantoina Capsula de 100mg	Cáps				
Enalapril	Tab.				
Solución Electrolitos Orales :	sobre				
Sulfato de Magnesio	Amp				
Medroxiprogesterona acetato	amp				
Levonorgestrel y etinilestradiol 0,3 + 0,03 mg	ciclo				
Glibenclamida	Tab				
Condón	Uni.				

Estudio de caso: Integración del Sistema de Suministros
Ministerio de Salud de Nicaragua
Instrumento Cuantitativo SILAIS NO Integrados
Abril 2008

Servicios e infraestructura del establecimiento

IDENTIFICACIÓN DEL ESTABLECIMIENTO

Nombre del establecimiento _____

Ubicación _____

SILAIS: _____

MUNICIPIO _____

Tipo de establecimiento: (1=Almacén;
2= Establecimiento de Salud [ES])

Si ES, indique tipo: (1= centro de salud; 2= puesto de salud)

SILAIS

Almacén/ES

Tipo de establecimiento ES

Si almacén, marque nivel: (1=central; 2=SILAIS; 3= Municipal)	Tipo de almacén..... <input type="checkbox"/>
Características del establecimiento: ¿Acceso pavimentado? (0=no; 1=sí)	Pavimento..... <input type="checkbox"/>
¿Hay electricidad? (0=no; 1=sí)	Electricidad..... <input type="checkbox"/>
¿Funcionan el teléfono o la radio el día de la visita? (0=no; 1=sí)	Comunicación externa..... <input type="checkbox"/>
Teléfono No. _____	

INFORMACIÓN SOBRE LA ENTREVISTA

Fecha: _____	DÍA/	MES/	AÑO
Entrevistador/es: _____	<input type="text"/>	<input type="text"/>	<input type="text"/>
_____	<input type="text"/>	<input type="text"/>	<input type="text"/>

No.	Pregunta	Código de clasificación
01	¿Cuál es su cargo?	Responsable de la Unidad.....1 Enfermera jefe.....2 Director del establecimiento.....3 Responsable de insumos médicos.....4 Otro (especifique).....9

No.	Preguntas	Código de clasificación	Pasar a / Comentarios
101	¿Cuántos medicamentos (incluido vacunas) y anticonceptivos maneja en este establecimiento?		
102	¿Qué insumos incluye su lista básica?	CÓDIGO Si = 1 No = 0 Medicamentos Anticonceptivos	
103	¿Utiliza formularios para registrar y reportar los insumos?	CÓDIGO Si = 1 No = 0 Medicamentos Anticonceptivos	
104	¿Qué formularios emplea para registrar y preparar sus informes de insumos? (Pedir ver los formularios) Marque una X el que corresponda	Medicamentos Anticonceptivos	
	A. Informe SIAL (uso en todo nivel)		
	B. Hoja de control, abastecimiento y Pedido (HCAP) PARA PUESTO DE SALUD		

C. Sabana de descargue diario (FARMACIA EN CENTROS DE SALUD)			
D. Requisa al CS (FARMACIA)			
E. Tarjeta Estiba (para ALMACENES de Municipios y SILAIS)			
F. Otro (Especifique y pregunte por qué. Anote la respuesta en casilla para comentarios)			

105	¿Los informes incluyen los siguientes datos? (Pedir ver formularios)	Marque con una X donde corresponda		
		Medicamentos	Anticonceptivos	
	A. Existencias disponibles			
	B. Consumo total			
	C. Cantidad no despachada			
	D. Ajustes			
	E. Cantidad a Solicitar			
106	¿Con qué frecuencia envían estos informes al nivel superior? (Observar fechas para verificar respuesta)	Medicamentos Mensualmente.....A Bimestralmente.....B Trimestralmente.....C No envió.....D Otro:.....9	Anticonceptivos => Si dice A,B,C o 9, Pase a # 108	
107	¿Por qué no ha enviado los informes?	No tengo formularios.....1 Tenía suficiente producto.....2 Estuve de vacaciones.....3 No sé como llenarlos.....4 Otro.....9		
108.	(APLICA PARA SILAIS Y MUNICIPIOS) ¿Cuántos establecimientos enviaron informes para el mes de marzo 2008? (Pedir ver informe y anotar si usan la información para consolidación)	Medicamentos	Anticonceptivos	
109.	¿Manejan nivel de reserva?	Sí.....1 No.....0	=> Si dice NO, Pase a # 111	
110.	¿Cuál es el nivel de reserva para este establecimiento?	Medicamentos Nivel de reserva: _____	Anticonceptivos Nivel de reserva: _____	

111.	¿Cuántos pedidos de emergencia de estos medicamentos (leer la lista de productos) ha realizado usted en los últimos 6 meses	Medicamentos	Anticonceptivos	
		Ninguno.....0 No aplica.....1 Uno.....2 Dos.....3 Tres.....4 Más de tres.....5		
112.	¿Cómo calcula las cantidades a pedir?	Medicamentos	Anticonceptivos	
		Fórmula.....1 Consumo.....2 Casos esperados.....3 Programación.....4 No sé.....5 Otro (Especifique).....9		Si la respuesta es 1 o 2, llene el Cuadro 3
113.	¿Quién transporta los medicamentos y anticonceptivos a su establecimiento?	Medicamentos	Anticonceptivos	
		Nivel superior entrega 1 Este establecimiento pasa a buscar..... 2 Otro (especifique)..... 9		
114.	¿Cuál es el transporte más frecuente?	Medicamentos	Anticonceptivos	
		Vehículo del establecimiento.....1 Vehículo del CIPS.....2 Transporte público.....3 Vehículo privado.....4 Motocicleta.....5 Otro (especifique).....9		
115	Cuando recibió la última visita de supervisión, que incluía el manejo logístico de medicamentos y anticonceptivos? (ej., revisión de informes, eliminación de productos vencidos, control de existencias)?	Nunca 1 En el último mes.....2 En los últimos 3 meses.....3 En los últimos 6 meses4 Hace más de 6 meses5 Otro (Especifique).....9		

INSTRUCCIONES CUADRO 1: EN BODEGAS SILAIS Y MUNICIPIOS

Condición de existencias (últimos 6 meses y día de la visita)

10. SI HAY TARJETA ESTIBA, Verifique si hay tarjeta estiba responda 1 para Sí o 0 para No
11. LA TARJETA ESTA AL DÍA. Fíjese si la tarjeta estiba ha sido actualizado en los últimos 30 días, responda 1 para Sí o 0 para No. Nota: Si la tarjeta estiba fue actualizado la última vez con un saldo de 0 y el establecimiento no ha recibido nuevos pedidos, considere que la tarjeta estiba está al día.
12. SALDO TARJETA ESTIBA: Registre en el Cuadro 1 el saldo que aparece en la tarjeta estiba. (ESTO APLICA SOLO PARA ESTABLECIMIENTOS CON BODEGA, ALGUNOS SILAIS Y/O MUNICIPIOS Y BODEGA CENTRAL)
13. DESABASTECIMIENTO ULTIMOS SEIS MESES: Registre si el establecimiento se ha quedado sin producto en algún momento de los últimos seis meses antes del estudio. (EN CS Y PS TOMAR DATO DE INFORME SIAL, para medicamentos la HCAP EN ALMACÉN TOME DATO de la tarjeta estiba, y en Farmacia la sabana de descargue diario) **Nota: Para todos los productos desabastecidos (cero existencias) en los últimos seis meses (incluido el día de la visita), explicar los motivos (por producto).**
14. NUMERO DE DESABASTECIMIENTOS: Registre cuántas veces el producto ha faltado en los seis meses antes del estudio, según la tarjeta estiba, los informes. De lo contrario tome dato de memoria del informate. Anote siempre la fuente del dato. Tome el dato del numero de veces en la Tarjeta de Estiba o sabana de descargue, observe la cantidad de dias marcados con X, y las veces que tengan grupos de X son los numeros de desabastecimiento.

15. **CONSUMO TOTAL:** Registre el consumo total durante los seis meses antes del estudio. **Si la bodega que distribuye a otros servicios no consolida el consumo de sus servicios, anotar "ND". NOTA: Para este registro use la HOJA DE TRABAJO y anote el consumo total en cada mes, que aparecen en los informes que utiliza el establecimiento. Luego totalice los 6 datos y trasládalo al Cuadro 1. Haga esto para cada producto.**
16. **NUMERO DE MESES CON DATOS CONSUMO:** Registre el número de meses que los datos del consumo total representan (pueden ser menos de seis); registre los meses para los cuales hay algún dato anotado, incluyendo 0. Nota: si la columna 1 "ofrece este producto" es N=0, anote NA en esta columna.
17. **VERIFIQUE LA INSPECCIÓN VISUAL:** Registre Si=1 No = 0
18. **CANTIDAD PRODUCTO VENCIDO EN ÚLTIMOS SEIS MESES:** Anote la cantidad de productos vencidos en los últimos seis meses (VER TARJETA ESTIBA Y/O ACTA). Cuente todos los productos vencidos e los últimos seis meses. Si hay productos próximos a vencer (lapso de una semana), anótelos en la sección de comentarios, pero no lo incluya en el conteo de producto vencido.

CUADRO 1: CONDICIÓN DE EXISTENCIAS BODEGAS MUNICIPALES Y SILAIS

Producto	Unidad de medida	¿Hay Tarjeta Estiba? (S/N)	¿La tarjeta estiba está al día? (S/N)	Saldo en Tarjeta Estiba (SOLO APLICA EN BODEGA)	Desabastecimiento en los últimos seis meses (S/N)	Número desabastecimientos	Consumo Total (últimos seis meses)	Número meses con datos de consumo	Verificación visual de existencias en el estante	Cantidad de producto vencido en los últimos seis meses
		1	2	3	4	5	6	7	8	9
1 Amoxicilina. Suspensión	Fco									
2 Nitrofurantoina Capsula de 100mg	Cáps									
3 Enalapril 10 mg.	Tab.									
4 Solución Electrolitos Orales	sobre									
5 Sulfato de Magnesio	amp									
6 Medroxiprogesterona acetato	amp									
7 Levonorgestrel y etinilestradiol 0,3 + 0,03 mg	ciclo									
8 Glibendámdida	Tab									
9 Condón	Uni.									

INSTRUCCIONES CUADRO 1: PARA CENTROS DE SALUD Y PUESTOS

Condición de existencias (últimos 6 meses y día de la visita)

1. SALDO EN REGISTRO : Registre en el Cuadro 1 el saldo que aparece al 30 de marzo en la sabana de descargue diario, HCAP o SIAL .
2. DESABASTECIMIENTO ULTIMOS SEIS MESES: Registre si el establecimiento se ha quedado sin producto en algún momento de los últimos seis meses antes del estudio. (TOMAR DATO DE INFORME sabana de descargue, HCAP o SIAL.
3. NUMERO DE DESABASTECIMIENTOS: Registre cuántas veces el producto ha faltado en los seis meses antes del estudio, según la sabana de descargue, HCAP o SIAL . De lo contrario tome dato de memoria del informate. Tome el dato del numero de veces en el registro, observe la cantidad de días marcados con X, y las veces que tengan grupos de X son los numeros de desabasteicmiento.
4. CONSUMO TOTAL: Registre el consumo total durante los seis meses antes del estudio. **NOTA: Para este registro use la HOJA DE TRABAJO y anote el consumo total en cada mes, que aparecen en los informes que utiliza el establecimiento. Luego totalice los 6 datos y trasládalo al Cuadro 1. Haga esto para cada producto.**
5. NUMERO DE MESES CON DATOS CONSUMO: Registre el número de meses que los datos del consumo total representan (pueden ser menos de seis); registre los meses para los cuales hay algún dato anotado, incluyendo 0. Nota: si la columna 1 “ofrece este producto” es N=0, anote NA en esta columna.
6. INVENTARIO FÍSICO: Realice conteo de existencias para cada producto. No tome en cuenta producto vencido.
7. CANTIDAD PRODUCTO VENCIDO EN ÚLTIMOS SEIS MESES: Anote la cantidad de productos vencidos en los últimos seis meses (VER ACTA DE MERMA). Cuente todos los productos vencidos e los últimos seis meses. Si hay productos próximos a vencer (lapso de una semana), anótelos en la sección de comentarios, pero no lo incluya en el conteo de producto vencido.

CUADRO 1: CONDICIÓN DE EXISTENCIAS EN CENTROS Y PUESTOS DE SALUD

	Producto	Unidad de medida	Saldo en Sábana o HCAP o SIAL el día de hoy	Inventario físico	Desabastecimiento en los últimos seis meses (S/N)	Número desabastecimientos	Consumo Total (últimos seis meses)	Número meses con datos de consumo	Cantidad de producto vencido en los últimos seis meses
		1							
1	Amoxicilina. Suspensión	Fco							
2	Nitrofurantoina Capsula de 100mg	Cáps							
3	Enalapril	Tab.							
4	Solución Electrolitos Orales :	Sobre							
5	Sulfato de Magnesio	Amp							
6	Medroxiprogesterona acetato	Amp							
7	Levonorgestrel y etinilestradiol 0,3 + 0,03 mg	Ciclo							
8	Glibenclamida	Tab							
9	Condón	Uni.							

HOJA DE TRABAJO PARA SUMAR LA COLUMNA 11 "CONSUMO TOTAL" DEL CUADRO 1

Instrucciones para anotar el consumo total por mes

Mes 1 al 6: Octubre 2007 a Marzo 2008

Si no tienen los seis meses corridos, deje en blanco el mes.

Ejemplo: Si tienen solamente 4 datos, empiecen en el mes que corresponda: Mes 1 al 4: Octubre, Noviembre Diciembre y Enero, anotar No disponible ND en la columna 5 y 6

Si no llevan datos de consumo registre NO CONSOLIDAN

Producto	Unidad	Mes 1	Mes 2	Mes 3	Mes 4	Mes 5	Mes 6
Amoxicilina.	Fco						
Suspensión							
Nitrofurantoina	Cáps						
Capsula de 100mg							
Enalapril	Tab.						
Solución Electrolitos	sobre						
Orales :							
Sulfato de Magnesio	amp						
Medroxiprogesterona	amp						
acetato							
Levonorgestrel y	ciclo						
etinilestradiol 0,3 +							
0,03 mg							
Gilbendiamida	Tab						
Condón	Uni.						

CUADRO 2: Lista de Chequeo Condiciones de almacenamiento

Los ítems 1–6 deben evaluarse en todos los establecimientos y lugares donde se almacenan productos (almacén, bodega, cuarto, cajón de un escritorio, etc.). Coloque una marca en la columna apropiada basándose en su inspección visual del lugar de almacenamiento; anote las observaciones del caso en la columna de comentarios. **Para recibir un “sí,” todos los productos y las cajas deben satisfacer los criterios para cada producto. Si no hay producto en el momento de la visita, el lugar donde generalmente se almacenan los insumos debe evaluarse de todas formas..**

No	Descripción	No	Sí	N/A	Comentarios
01.	Los productos están almacenados y organizados de modo que estén rotulados, con fechas de vencimiento visibles, y los que primero vencen son los primeros en salir, para conteo y manejo en general.				
02.	Los productos están protegidos de la luz solar a toda hora del día y en todo el año.				
03.	Las cajas y los productos están protegidos contra el agua y la humedad durante todo el año.				
04.	El almacén está libre de insectos y roedores. (Fijarse si hay trazas de roedores [excrementos o insectos].)				
05.	El techo está siempre en buen estado para evitar la penetración del sol y del agua.				
06.	El lugar se mantiene en buenas condiciones (cajas en buen estado, no abolladas ni aplastadas, lugar limpio, sin basura, estanterías sólidas, cajas organizadas y en buen estado, las cajas y frascos de Depo-Provera hacia arriba).				

CUADRO 3. PORCENTAJE DE DIFERENCIA ENTRE LA CANTIDAD PEDIDA Y LA CANTIDAD RECIBIDA

Llene solamente si en la pregunta 112 contestaron "fórmula o consumo".

Método/Marca/ Producto	Unidad	Cantidad pedida para el último período	Fecha del pedido	Cantidad recibida en el último pedido	Fecha de recibo del pedido
1		2	3	4	5
Amoxicilina. Suspensión	Fco				
Nitrofurantoina Capsula de 100mg	Cáps				
Enalapril	Tab.				
Solución Electrolitos Orales :	sobre				
Sulfato de Magnesio	amp				
Medroxiprogesterona acetato	amp				
Levonorgestrel y etinilestradiol 0,3 + 0,03 mg	ciclo				
Glibenclamida	Tab				
Condón	Uni.				

CUESTIONARIOS CUALITATIVOS

Meta y Objetivos de la Entrevista

Evaluar y documentar el impacto de la integración del sistema logístico del Ministerio de Salud en Nicaragua en la disponibilidad de anticonceptivos y otros medicamentos esenciales.

Objetivos específicos de la entrevista:

- Asegurarse que el entrevistado está informado sobre el proceso de integración en Nicaragua;
- Analizar las ventajas del sistema integrado y determinar si estas ventajas han tenido un impacto en la disponibilidad de anticonceptivos y medicamentos esenciales.
- Analizar desafíos que se han enfrentado a través del proceso de integración y si estos desafíos han tenido un impacto en la disponibilidad de anticonceptivos y medicamentos esenciales.

II. División de cuestionarios por perfil de entrevistado

Las respuestas de las preguntas cubrirán las siguientes áreas: *planificación familiar y medicamentos esenciales*. Dependiendo del perfil del entrevistado, se aplicará diferentes versiones del cuestionario:

Cuestionario A - tomadores de decisiones de varios programas de salud y gestión de medicamentos/MOH y donantes

Cuestionario B - técnicos implementadores de varios programas de salud, del almacén central, y también de los donantes

Cuestionario C - tomadores de decisiones y/o técnicos de SILAIS integrados (SIGLIM)

Cuestionarios D – prestadores de servicio de SILAIS integrados (SIGLIM)

Cuestionario E - tomadores de decisiones y/o técnicos de SILAIS no integrados

Cuestionarios F – prestadores de servicio de SILAIS no integrados

CUESTIONARIO A - TOMADORES DE DECISIONES DE VARIOS PROGRAMAS DE SALUD Y GESTIÓN DE MEDICAMENTOS: MINSA Y DONANTES

Nombre _____

Título _____

Fecha _____

Nombre del establecimiento: _____

A.1. ¿Dentro del POA de su institución, existen estrategias sobre la implementación del SIGLIM? Favor de anexarlo.

Sí No *Comentarios:*

A.2. ¿Cuáles son los problemas, fuera de la cadena de suministro, que afectan el funcionamiento de la misma? (Nota: incluyan los factores más relevantes - políticos, culturales o económicos tales como acontecimientos políticos, cambios del gobierno, disminución de donaciones, etc.)

A.3. En años recientes se ha integrado gradualmente el sistema logístico de anticonceptivos con el sistema de medicamentos esenciales en ciertos SILAIS. ¿Por qué se tomó la decisión de integrar el sistema logístico (Ej. SIGLIM)?

¿Cuáles han sido los pasos/etapas principales del proceso de integración del sistema logístico (Ej. SIGLIM)?

¿Cuáles han sido algunas ventajas de haber integrado el sistema logístico (Ej. SIGLIM) de estos medicamentos (Ej. presupuesto, distribución, abastecimiento, eficiencia, sostenibilidad, etc.)?

¿Cuáles han sido algunos desafíos de haber integrado el sistema logístico (Ej. SIGLIM) de estos medicamentos?

A.4. ¿Cuenta el MINSA con un rubro protegido para la compra de anticonceptivos?

¿Cuál es el rubro para financiar los medicamentos esenciales?

A.5. Hasta ahora el SIGLIM esta siendo implementado de la mano de MINSA con apoyo externo y ha requerido muchos recursos para su manutención y operación, ¿Como planea el MINSA continuar e institucionalizar este proceso a medida que el apoyo externo disminuya?

A.6. Si el sistema logístico de vacunas se maneja en forma vertical, ¿Cuales son las razones de esta decisión? ¿Hay posibilidad que en el futuro las vacunas se administren en forma integrada con el resto de medicamentos? ¿Por qué sí o por qué no?

A.7. ¿Si pudiera cambiar cualquier aspecto del sistema logístico en los SILAIS integrados (SIGLIM), que cambiaría?

Y, ¿en los no integrados?

CUESTIONARIO B - TÉCNICOS IMPLEMENTADORES DE VARIOS PROGRAMAS DE SALUD, DEL ALMACÉN CENTRAL, Y DE DONANTES

Nombre _____

Título _____

Fecha _____

Nombre del establecimiento: _____

B.1. ¿Cómo se da la coordinación y el proceso entre los diferentes niveles de gestión (Ej. CIPS, bodega, almacenes de SILAIS, almacenes municipales) para abastecer/distribuir insumos?

B.2. ¿Existe duplicidad de funciones que podrían atrasar el proceso de solicitud y entrega de suministros; independiente de los instrumentos de información que se utilizan?

B.3. ¿Los anticonceptivos y otros medicamentos forman parte de la Lista Básica de Medicamentos?

B.4. De ser así, ¿se estiman las necesidades anuales de estos insumos (vacunas, antituberculosos, anticonceptivos) en forma integrada? ¿Cuáles son los pasos para preparar las estimaciones?

B.5. ¿Cuales son los cuellos de botella para abastecer los insumos médicos eficientemente a la red de servicios?

y anticonceptivos, en particular?

B.6. En años recientes se ha integrado gradualmente el sistema logístico de anticonceptivos con el sistema de medicamentos esenciales en ciertos SILAIS. ¿Por qué se tomó la decisión de integrar el sistema logístico (Ej. SIGLIM)?

¿Cuáles han sido los pasos/etapas principales del proceso de integración del sistema logístico (Ej. SIGLIM)?

¿Cuáles han sido algunas ventajas de haber integrado el sistema logístico (Ej. SIGLIM) de estos medicamentos (Ej. presupuesto, distribución, abastecimiento, eficiencia, sostenibilidad, etc.)?

¿Cuáles han sido algunos desafíos de haber integrado el sistema logístico (Ej. SIGLIM) de estos medicamentos?

B.7. ¿Desde que se integraron los medicamentos, han experimentado alguna mejora/disminución en la disponibilidad de anticonceptivos?

Y, de medicamentos esenciales?

B.8. ¿Cuáles son las razones del MINSA de tener integrados el transporte y la distribución de insumos médicos desde hace varios años?

B.9. ¿Los informes que reciben a nivel central proporcionan los datos sobre el estado de las existencias y consumo en los establecimientos de prestación de servicios (por ejemplo: el personal del nivel central dispone de información que permita determinar si los servicios están en una situación de desabastecimiento, de existencias suficientes o de sobreabastecimiento)?

¿En los SILAIS integrados (SIGLIM y otro)?

Sí No *Comentarios:*

¿En los SILAIS no integrados (SIAL y otro)?

Sí No *Comentarios:*

B.10. ¿Para que utiliza la información de los informes de los SILAIS integrados (SIGLIM)?

Estimación de necesidades _____ Adquisición Transporte / Entregas
 Programación de visitas de supervisión _____ Gestión de inventarios
 Cantidades de reabastecimiento Otras

Comentarios:

¿Y, la información de los informes de los SILAIS no integrados?

Estimación de necesidades Adquisición Transporte / Entregas
 Programación de visitas de supervisión Gestión de inventarios
 Cantidades de reabastecimiento Otras

Comentarios:

B.11. ¿Cuáles funciones del sistema logístico considera o percibe que funcionan mejor si se manejan a través de los programas (de manera vertical)? ¿Y por qué? ¿Y cuáles funciones del sistema logístico considera o percibe que funcionan mejor si se integran? ¿Y por qué? [Nota: enfatizar que es la integración de las funciones logísticas de medicamentos esenciales (incluidos PF, vacunas, otros etc.) y no de la gestión del programa de salud]. Marque con una X en la casilla correspondiente.

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B.12. ¿En que forma considera que el SIGLIM ha mejorado la programación, presupuesto, y abastecimiento de los medicamentos? Brinde ejemplos.

B.13. ¿Describa la forma en que el SIGLIM ha mejorado (o no) el cálculo de las cantidades a pedir para evitar el desabastecimiento y el sobre-abastecimiento de insumos?

B.14. El SIGLIM reporta las cantidades no despachadas, ¿considera que este dato ha mejorado el cálculo de la demanda total de medicamentos?

B.15. El SIGLIM se define en base a niveles de reserva, ¿considera que este dato ha mejorado la disponibilidad de medicamentos?

B.16. ¿Considera que si el SIGLIM estuviese funcionando en todo el país, la programación, el presupuesto, y la adquisición anual se apoyaría en la información que provee este sistema? ¿Por qué?

Sí No

Comentarios:

B.17. ¿Cuáles son los aspectos más exitosos del SIGLIM?

B.18. ¿Si pudiera cambiar cualquier aspecto del sistema logístico en los SILAIS integrados (SIGLIM), que cambiaría?

Y, en los no integrados (no SIGLIM)?

CUESTIONARIO C - TOMADORES DE DECISIONES Y/O TÉCNICOS DE SILAIS INTEGRADOS (SIGLIM)

Nombre _____

Título _____

Fecha _____

Nombre del establecimiento: _____

C.1. ¿Qué hechos piensa usted que afectan el abastecimiento o suministro de medicamentos? (Nota: explique que esta pregunta se refiere por ejemplo a factores políticos, culturales o económicos tales como cambios del gobierno, disminución de donaciones, etc.)

C.2. Para abastecer y distribuir insumos, ¿Cómo se dá la coordinación entre los diferentes niveles con los que usted se comunica? (Ej. CIPS, almacenes municipales)

C.3. ¿Existe duplicidad de funciones en el proceso de solicitud y entrega de suministros? O sea, ¿hay otras personas o instancias haciendo este trabajo?

C.4. ¿Cuáles siguen siendo los cuellos de botella para abastecer eficientemente de insumos médicos a la red de servicios de su SILAIS?

C.5. En años recientes se ha integrado gradualmente el sistema logístico de anticonceptivos con el sistema de medicamentos esenciales en ciertos SILAIS. ¿Cuáles han sido algunas ventajas de haber integrado el sistema logístico (Ej. SIGLIM) de estos medicamentos (Ej. presupuesto, distribución, abastecimiento, eficiencia, sostenibilidad, etc.)?

¿Cuáles han sido algunos desafíos de haber integrado el sistema logístico (Ej. SIGLIM) de estos medicamentos?

C.6. Desde que se integraron los medicamentos, ¿Han experimentado alguna mejora/disminución en la disponibilidad de anticonceptivos?

¿Y, de medicamentos esenciales?

C.7. ¿Los informes que usted recibe le permite conocer los datos de las existencias y consumo en los establecimientos de prestación de servicios (por ejemplo: el personal del SILAIS dispone de información que permita determinar si los servicios están en una situación de desabastecimiento, de existencias suficientes o de sobre-abastecimiento)?

Sí No

Comentarios:

C.8. ¿Cuáles son los indicadores relacionados a la logística y/o a la disponibilidad de productos que el sistema de información rastrea en su SILAIS (por ejemplo: índices de desabastecimiento, porcentaje de informes presentados, meses de existencia disponible, recetas no despachadas, etc.)?

C.9. ¿Para que utiliza la información de los informes del SIGLIM?

Estimación de necesidades Adquisición Transporte / Entregas
 Programación de visitas de supervisión Gestión de inventarios
 Cantidades de reabastecimiento Otras

Comentarios:

C.10. Si el sistema logístico de vacunas se maneja en forma vertical, ¿Cuales considera usted que son las ventajas y desventajas de manejarlo así?

C.11. ¿Cuáles funciones del sistema logístico considera o percibe que funcionan mejor si se manejan a través de los programas (de manera vertical)? ¿Y por qué? ¿Y cuáles funciones del sistema logístico considera o percibe que funcionan mejor si se integran? ¿Y por qué? [Nota: enfatizar que es la integración de las funciones logísticas de medicamentos esenciales (incluidos PF, vacunas, otros etc.) y no de la gestión del programa de salud]. Marque con una X en la casilla correspondiente.

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C.12. ¿Cómo piensa usted que el SIGLIM ha mejorado la programación, presupuesto, y abastecimiento de los medicamentos? Brinde ejemplos.

C.13. ¿Cuáles son los aspectos más exitosos del SIGLIM?

C.14. Si pudiera cambiar cualquier aspecto del sistema logístico en los SILAIS que manejan el SIGLIM, ¿que cambiaría?

CUESTIONARIOS D – PRESTADORES DE SERVICIO BAJO SILAIS INTEGRADOS (SIGLIM)

Nombre _____

Título _____

Fecha _____

Nombre del establecimiento: _____

D.1. En años recientes se ha integrado gradualmente el sistema logístico de anticonceptivos con el de medicamentos esenciales en ciertos SILAIS. ¿Cuáles han sido las ventajas del sistema integrado SIGLIM (Ej. distribución, abastecimiento, transporte, eficiencia, sostenibilidad, etc.)?

¿Qué es lo novedoso, o lo más difícil que usted ha experimentado con el uso del SIGLIM?

D.2. Desde que está utilizando el SIGLIM, ¿Usted dispone de más o de menos anticonceptivos en la unidad?

¿Y, en el caso de medicamentos?

D.3. ¿Cuánto tiempo tarda usted para completar los informes del SIGLIM y hacer el pedido al centro de salud?

D.4. ¿El SIGLIM le brinda información o datos necesarios para hacer sus pedidos? Si la respuesta es no, ¿Cuáles datos considera que le hacen falta?

D.5. Desde que usa el SIGLIM, ¿usted recibe más/menos supervisión y apoyo para mejorar sus pedidos y las existencias de medicamentos? Si ahora recibe más supervisión y apoyo, ¿cómo lo ha logrado?

D. 6. ¿Usted recibió capacitación para manejar bien el SIGLIM?

D.7. ¿Considera que algo de los formatos anteriores (HCAP, SIAL, etc.) hace falta en el SIGLIM?

D. 8. ¿Puede explicarnos cómo el SIGLIM le ayuda a calcular mejor las cantidades de medicamentos a pedir para que no queden en cero o que no tenga más de lo que necesita?

D.9. ¿El dato de las cantidades no despachadas le permite calcular mejor las cantidades a pedir para atender la demanda total de medicamentos?

D.10. ¿El colchón de reserva del SIGLIM para esta unidad de salud le ha permitido calcular mejor las cantidades a pedir para despachar todas las recetas de medicamentos?

D.11. ¿Cuáles son los aspectos del SIGLIM que más le gustan?

D.12. ¿Usted prefiere el SIGLIM o el sistema anterior para administrar los medicamentos? ¿Por qué?

D.13. ¿Si pudiera cambiar algo del SIGLIM, que cambiaría?

CUESTIONARIO E - TOMADORES DE DECISIONES Y/O TÉCNICOS DE SILAIS NO INTEGRADOS

Nombre _____

Título _____

Fecha _____

Nombre del establecimiento: _____

E.1. ¿Qué hechos piensa usted que afectan el abastecimiento o suministro de medicamentos? (Nota: explique que esta pregunta se refiere por ejemplo a factores políticos, culturales o económicos tales como cambios del gobierno, disminución de donaciones, etc.)

E.2. Para abastecer y distribuir insumos, ¿Cómo se dá la coordinación entre los diferentes niveles con los que usted se comunica? (Ej. CIPS, almacenes municipales)

Para anticonceptivos?

Y, para medicamentos esenciales?

E.3. ¿Existe duplicidad de funciones en el proceso de solicitud y entrega de suministros? O sea, ¿hay otras personas o instancias haciendo este trabajo?

Para anticonceptivos ?

Y, para medicamentos esenciales?

E.4. ¿Cuales son los cuellos de botella para abastecer los insumos médicos eficientemente a la red de servicios?

Para anticonceptivos?

Y, para medicamentos esenciales?

E.5. ¿Los informes que reciben a su nivel le permite conocer los datos de existencias y consumo en los establecimientos de salud (por ejemplo: el personal del SILAIS dispone de información para determinar si los prestadores de servicios están en desabastecimiento, en existencias suficientes o en sobreabastecimiento)?

Para anticonceptivos?

Sí No

Comentarios:

Y, para medicamentos esenciales?

Sí No

Comentarios:

E.6. Dispone de información sobre consumo y existencias en todos los niveles del SILAIS, por ejemplo a nivel de SILAIS, municipio y establecimientos de salud?

E.7. ¿Cuáles son los indicadores relacionados a la logística y/o a la disponibilidad de productos que el sistema de información rastrea en su SILAIS (por ejemplo: índices de desabastecimiento, porcentaje de informes presentados, meses de existencia disponible, recetas no despachadas, etc.)?

Para anticonceptivos?

Y, para medicamentos esenciales?

E.8. ¿Para que utiliza la información en los informes del SIAL en su SILAIS?

Para anticonceptivos?

Estimación de necesidades Adquisición Transporte / Entregas
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 Cantidades de reabastecimiento Otras

Comentarios:

Y, para medicamentos esenciales?

Estimación de necesidades Adquisición Transporte / Entregas
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 Cantidades de reabastecimiento Otras

Comentarios:

E.9. Si el sistema logístico de vacunas se maneja en forma vertical, ¿cuales son algunas de las ventajas y desventajas de que se maneja así?

E.10. ¿Cuáles funciones del sistema logístico considera o percibe que funcionan mejor si se manejan a través de los programas (de manera vertical)? ¿Y por qué? ¿Y cuáles funciones del sistema logístico considera o percibe que funcionan mejor si se integran? ¿Y por qué? [Nota: enfatizar que es la integración de las funciones logísticas de medicamentos esenciales (incluidos PF, vacunas, otros etc.) y no de la gestión del programa de salud]. Marque con una X en la casilla correspondiente.

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E.11. ¿Si pudiera cambiar cualquier aspecto del sistema logístico, que cambiaría?

CUESTIONARIO F – PRESTADORES DE SERVICIO DE SILAIS NO INTEGRADOS

Nombre _____

Título _____

Fecha _____

Nombre del establecimiento: _____

F.1. ¿Cuánto tiempo tarda Usted para completar los informes y hacer el pedido al centro de salud?

El SIAL para anticonceptivos?

Y, la HCAP para medicamentos?

F.2. ¿El SIAL le brinda los datos logísticos esenciales para hacer sus pedidos? Si la respuesta es no, cuáles datos considera que le hacen falta?

Para anticonceptivos?

Y, para medicamentos?

F.3. ¿Recibe Usted supervisión y apoyo para mejorar sus pedidos y el abastecimiento de medicamentos?

Para anticonceptivos?

Y, para medicamentos?

F. 4. ¿Usted recibió capacitación para manejar bien todos los formularios que usa?

Para anticonceptivos?

Y, para medicamentos?

F.5. Han tenido alguna dificultad con el abastecimiento de

anticonceptivos?

medicamentos esenciales?

F.6. ¿Explíquenos como el SIAL le brinda información para calcular las cantidades a pedir para evitar caer en cero o tener más insumos de los que necesita?

Para anticonceptivos?

Y, para medicamentos esenciales?

F.7. ¿El SIAL le dice las cantidades de insumos consumidos, el número de pérdidas, y datos sobre el número de insumos no despachados?

Para anticonceptivos?

Y, para medicamentos esenciales?

F.8. ¿Cuáles son los aspectos del SIAL que más le gustan para mejorar el abastecimiento?

Para anticonceptivos?

Y, para medicamentos esenciales?

F.9. ¿Cuál sistema Usted prefiere para administrar sus insumos, el de anticonceptivos o el de medicamentos esenciales? Por qué?

¿Y, si pudiera cambiar algo del sistema, que cambiaría?

anticonceptivos –

medicamentos esenciales –

vacunas –

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