



Building a Strong Supply Chain Workforce

The Role of Pre-Service Training



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Abstract

Those who carry out supply chain management (SCM) tasks often have no formal training in supply chain logistics, which can lead to stockouts and poor contraceptive security. To address this knowledge gap, many institutions utilize in-service training activities which take healthcare personnel away from their work, are expensive to implement, and often rely heavily on external technical assistance. The USAID | DELIVER PROJECT has enabled countries on three continents to introduce supply chain management course into pre-service curricula, and to develop and implement training programs that provide a better prepared health workforce for supply chains. USAID is investing in pre-service training (PST) as a cost-effective and sustainable alternative to build a competent health workforce in supply chain management.

Cover photo: PST, in Ghana, 2015, a lecturer from University of Ghana teaching SCM content to his fellow lecturers. Photo taken by Eomba Motomoke.

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Acronyms

AIDS	acquired immune deficiency syndrome
ALT	adult learning theory
CPD	continuing professional development
DAR	daily activity register
HIV	human immunodeficiency virus
IPLS	Integrated Pharmaceutical Logistics System
IST	in-service training
LIAT	Logistics Indicators Assessment Tool
LMIS	logistics management information system
LSAT	Logistics System Assessment Tool
M&E	monitoring and evaluation
MOH	Ministry of Health
NGO	nongovernmental organization
PST	pre-service training
SCM	supply chain management
SOP	standard operating procedure
SWG	Stakeholder Working Group
USAID	U.S. Agency for International Development

Preface

This guide was developed to assist institutions of higher learning, governments, nongovernmental organizations (NGOs), and other stakeholders in establishing pre-service training (PST) programs for the supply chain management (SCM) of health commodities. This guide also describes the unique roles each stakeholder plays in the process. It outlines key steps for planning, designing, developing, implementing, and evaluating PST programs and shares lessons learned from PST activities by the USAID | DELIVER PROJECT (the project) and other projects led by John Snow, Inc. (JSI). These activities took place in a variety of international settings. The guide also includes a summary checklist as a quick guide to the process of putting together and implementing a PST.

The PST for SCM introduces SCM concepts to students in the health disciplines while they are still in school so that upon graduation, they have the knowledge and skills to immediately contribute to product availability at all levels of the supply chain. Pre-service training is recognized as a cost-effective intervention to build the capacity of health professionals, including those involved in public health logistics. The project, in collaboration with local governments and other stakeholders, has been at the forefront of developing and supporting PST for SCM around the world, including in Benin, Bolivia, Ghana, Ethiopia, Malawi, Morocco, Pakistan, Rwanda, Tanzania, Zambia, and Zimbabwe. Lessons learned from the project's many years of experience with PST for SCM are incorporated into this document. For more information on the cost-effectiveness of PST, see annex 1.

Although primarily written to support pre-service program development in the SCM of healthcare commodities, the guide is also relevant for use in other pre-service disciplines. Regardless of the type of program, users should account for country and institutional contexts and needs when implementing practices from this guide into their programs.

Why Pre-Service Training?

Pre-service training delivers knowledge and skills to individuals in a specific area of study before they enter the workforce. The terms pre-service training and pre-service education are used interchangeably and refer to undergraduate and postgraduate coursework.

When effectively implemented, PST offers many potential advantages in health professions, including—

- **Benefits to future patients:** Equipped with the latest knowledge and skills, new graduates entering the workforce can immediately focus on their supply chain duties instead of taking time to build their competencies through in-service sessions or on-the-job training, benefiting facility operations and, ultimately, the patient.
- **Cost savings:** PST reduces the need for costly in-service training (IST) and technical assistance. This, in turn, eliminates the need for the financial incentives and participant allowances associated with these interventions, resulting in additional budget savings.

- **Sustainability:** Because PST is embedded in institutions, it enjoys a continuity not afforded to ad-hoc IST, which depends on funding availability and management priorities.
- **Rigorous knowledge and skills evaluation:** PST is supported by national or institutional policies that approve/accredit curricula and specify competency requirements and standards. This helps ensure that the technical content is standardized across institutions and over time while also providing opportunities for program evaluation and continuous improvement.
- **Professional recognition:** PST offers formal recognition and status that bolster career paths and can lead to acknowledgment of SCM workers as professionals.
- **Mitigation of workforce deficiencies:** PST in SCM helps develop adequate numbers of motivated and qualified SCM workers, helping to address the acute shortage of healthcare workers in developing countries.

Why Supply Chain Management?

Public health programs require, among other components, a dependable and efficient supply chain to deliver essential commodities. An indispensable part of these systems is sufficient numbers of personnel with the knowledge and skills to fulfill essential supply chain functions. However, in most resource-limited countries, these personnel are not available.

Ideally, a health system would employ dedicated professionals trained specifically in SCM via a degree or diploma program whose unique expertise would enable them to manage a health logistics system. In most places, however, this is not yet the case. Instead, logistics tasks often become the responsibility of clinical staff (nurses, doctors, and pharmacists) and other facility workers who have little to no training in logistics and who perform these duties in addition to their other responsibilities. Exposing pre-service students, both those specializing in SCM and those studying other health disciplines, to key SCM concepts and competencies equips them with the knowledge they will need to perform these duties.

Pre-Service Training versus In-Service Training

The severe shortage of qualified public health logisticians in developing countries highlights the growing need to strengthen the human resource capacity of supply chain personnel and to increase the production of qualified workers. Policymakers and academic program administrators should consider all opportunities for this strengthening, including PST, with reinforcement as necessary through IST and continuing professional development (CPD). However, IST and CPD can be expensive and usually require workers to spend precious time away from the workplace to attend trainings.

The impact of including SCM in PST programs can be substantial in terms of creating a better prepared workforce and saving money over time because of a decreased need for IST and CPD.

“One of the major reasons for erratic supply of health commodities in many developing countries is due to lack of adequately trained human resource on health supply chain management. In Ethiopia, pharmacists are highly involved in the management of health commodities. Nine years back graduates of the School of Pharmacy had no courses directly addressing health SCM in their curriculum but now attempts are being made to include SCM courses with reasonable credit hours in the harmonized curriculum in the country. As a result, I am observing improvements in the health SCM practice...”

- International Association of Public Health Logisticians (IAPHL) Member (Ethiopia)

Steps in Planning and Implementing Pre-Service Training for Supply Chain Management Programs

The process of creating a new PST program in SCM is summarized in the steps below. These steps should be used as a general guide, as specifics will vary depending on the country context; supply chain courses already offered; and the specific requirements of local academic institutions, regulatory bodies, and government agencies.

Step 1	Getting Started
Step 2	Engage Stakeholders and Conduct Preliminary Planning
Step 3	Develop PST Strategic Plan
Step 4	Assess Training Needs
Step 5	Develop Curriculum
Step 6	Orient Lecturers
Step 7	Implement Program
Step 8	Monitor, Evaluate, and Revise

A checklist summarizing these steps appears on the following pages. This checklist can serve as a rapid planning tool to develop the SCM program and to track achievement of the steps involved.

Resources in the annex can also assist with the process.

Steps in Planning and Implementing Pre-Service Training for Supply Chain Management Programs: Summary Checklist

Task	Tick when completed	Notes
Step 1: Getting Started		
Conceptualize program: Who, what, why, where, when, and how.		
Learn national/local/institutional policies that regulate education/health/labor.		
Step 2: Engage Stakeholders and Conduct Preliminary Planning		
Identify and engage key stakeholders.		
Form stakeholder working group (SWG) and initiate regular schedule of meetings.		
Step 3: Develop PST Strategic Plan		
Develop a strategic plan with objectives, tasks and roles, timeline, budget, and monitoring and evaluation (M&E) plan.		
Step 4: Assess Training Needs		
Collect existing curricula and other key documents.		
Conduct a training needs assessment.		
Compile assessment data and interpret findings.		
Develop an implementation plan based on the gathered data.		
Step 5: Develop Curriculum		
Develop curriculum, including teaching guide, student materials, and plan for site visits.		
Step 6: Orient Lecturers		
Orient faculty and others to teach the curriculum content.		
Develop and implement a promotional plan to attract students.		

Step 7: Implement Program		
Implement program/course with support from SWG and SCM professionals.		
Step 8: Monitor, Evaluate, and Revise		
Monitor process according to the M&E plan by collecting and analyzing data.		
Revise program/course content, structure as needed.		
Advocate for sustainability and scale-up of program using evidence gathered.		

Step I: Getting Started

Conceptualize the Program

The initial work involves thinking carefully about the creation of a supply chain PST program and the reasons why and how it should be created. This can be done through brainstorming sessions with the key persons involved. Questions such as the following need to be considered:

- What would the benefits of such a program be?
- What objectives would the program hope to accomplish?
- How would the program be structured and what would the key content include?
- How would site visits and practica be included to provide hands-on experiences?
- What potential challenges are anticipated and how might they be addressed?
- How would this program fit in with existing SCM training programs?
- What, roughly, would be the development timeline and required budget?

Program planners should perform an environmental scan and literature search to identify where similar programs have been established, the determining factors that contributed to their successes, as well as challenges and lessons learned. If possible, include consultations with key people involved in these programs. These preliminary investigations can help develop an understanding of a country's short- and long-term goals in supply chain workforce development.

For a better implementation learn also about the deployment procedures for graduates who choose to work in the public sector, such as what specific facilities might employ them and what knowledge and skills are expected of new employees. Even if offering a degree or diploma in SCM is an academic organization's ultimate goal, consider starting on a smaller scale. Prioritize key content areas of SCM, and then consider how they might be embedded in existing courses or covered in new stand-alone SCM courses. Create the new content and advocate for it to be included in the curriculum. Once these initial courses/sessions are offered, conduct rigorous monitoring and

evaluation (M&E) to determine their popularity, usefulness, and the level of skills transfer to the workplace after graduation. The more data that can be collected to demonstrate improved workplace performance, the easier it will be to convince decisionmakers of the program's value and the importance of scaling it up. It is important to recognize that creating a PST program is a long-range and iterative process and should be a multi-year commitment.

Understand the Policy and Regulatory Environments

Policies and regulations vary by country. Thus, establishing a PST program in SCM requires a deep understanding of the local policy and regulatory environments governing the public education and health sectors, which are usually the responsibility of government agencies, regulatory bodies, and professional councils.

Most institutions have established policies and procedures for introducing new courses. Save time and effort by learning in advance the basic steps of how the process works at the institution(s) under consideration. Ask appropriate stakeholders at academic institutions how the process starts. For example, does it start by convening a meeting, writing a letter, or employing other means? Involve the Ministry of Education from the start of the process and become familiar with its rules/policies early.

At minimum, obtain information about—

- the school and course accreditation processes
- graduation requirements (How many credit hours are required? What are the prerequisite courses?)
- certification or licensing (Are exams required to become a certified or licensed public health logistician?)
- deployment policies (Where are future graduates likely to work?).

Learn about the local accreditation process. A nongovernmental body such as a professional council usually carries out this process, but in certain countries it may be under the auspices of relevant government departments or ministries. This process is worth undertaking as it significantly improves the credibility of the program since it uses established evaluation criteria, such as faculty qualifications, relevancy of curriculum content, availability of student resources, and administrative procedures.

Step 2: Engage Stakeholders and Conduct Preliminary Planning

After the plan has been conceptualized and the regulatory environment has been scanned, identify and engage institutions that are receptive to the establishment of the PST program and are willing to actively support and serve as stakeholders and advocates for the process. Early involvement of stakeholders, including those at the pre-service institutions themselves, can help ensure that the proposed program will meet local needs and lead to a sense of country ownership long-term.

Each type of stakeholder has a unique role to play in the establishment of a pre-service program in SCM. National policymakers such as ministries of health and education and regulatory bodies may develop standards and licensing procedures for new and existing academic programs and for the

curricula used. Academic institutions approve and facilitate the creation, implementation, and evaluation of specific courses. The private sector and NGOs can provide technical assistance and guidance on selecting the most appropriate content and the methodologies to be included in the courses. All these stakeholders need to work together to create effective and successful SCM pre-service programs.

Tap into existing relationships with decisionmakers to get key stakeholders on board. Those who know the supply chain management situation well and understand the benefits of having well-prepared supply chain staff working in the health system, as well as those with the authority to influence the PST design process, should advocate for the initiation of the program. (See “Who Are Pre-service Training Stakeholders?” box below.)

Form a Stakeholder Working Group (SWG) that comprises donors, government officials from health and education ministries, and academic partners, and schedule regular meetings. This group should 1) agree on the justification for PST in SCM; 2) map out the benefits for the various parties involved (See the “Who Are Pre-service Training Stakeholders?” box above); and 3) agree on a strategy for the way forward, including creating plans with policymakers and other thought leaders to advocate for the program’s objectives.

The stakeholders should develop early in the process specific advocacy messages, including explanations of the benefits of PST endeavors.

These can include—

- **academic institutions** benefiting by offering an additional skillset to their students, thereby distinguishing the school from its competitors and perhaps attracting additional students
- **lecturers** benefiting from additional training on the new topics, contributing to their ongoing professional development
- **students** benefiting by adding another skillset to their competencies, thereby making them more attractive to employers
- **program graduates** benefiting by enjoying increased satisfaction on the job because they are providing better service to their patients

Who Are Pre-service Training Stakeholders?

Primary stakeholders are involved in the PST development process from start to finish. They include representatives from—

- regulatory bodies such as ministries of health, education, and labor; pharmacy councils or pharmacy regulation departments; and nursing councils
- organizations supporting health education, such as health sciences institutes, public health institutions, pharmacy and nursing associations, etc.
- faculty and administrators from the academic institution(s) where the program is proposed
- international donors, NGOs and quasi-governmental agencies, such as USAID, GTZ, EU, UN, and WHO.

Secondary stakeholders get involved after needs assessments and other preliminary planning have been completed. They include representatives from—

- sister academic institutions in the country/region
- international and national supply chain management NGOs
- local public health departments
- health logistics organizations that can offer internships or employment opportunities.

- **health system customers** benefiting from higher quality of care once the graduates are placed in facilities
- **health systems** benefiting from more efficient and effective operations, minimizing product stockouts and wastage.

Stakeholder Engagement: Key Lessons Learned

- Limit the number of partners working on the PST effort. Too many can delay or prevent implementation of the project.
- Identify the right local partners for initial contact. The Ministry of Health (MOH) and local supply chain organizations are good resources to consult for this information.
- Establish an implementation plan with clear roles and responsibilities and share it with all stakeholders.
- Obtain a signed agreement such as a “Memorandum of Understanding” with the country’s MOH and institutions of higher learning that are involved in the project. This will help ensure a common commitment to the goals, timelines, and responsibilities.
- Identify and select the host institution based on what is best for the country. Different institutions can host PST courses, e.g., a pharmacy college, nursing school, etc.

Step 3: Develop PST Strategic Plan

One of the first tasks the stakeholders are responsible for is developing a PST Strategic Plan. This detailed plan can help clarify the objectives of the intervention; guide the design, development, and implementation processes; specify roles and responsibilities of various partners; provide budget and timeline details; and provide a plan for monitoring and evaluating activity progress.

An important part of this plan is to first carefully determine (if not already done so) which academic institution(s) should host the courses/program. Political, economic, and academic considerations, as well as leadership ability, should be considered when selecting an institution for this effort.

The PST Strategic Plan should answer the following questions:

- Which institution(s) may be able to support such a program? Could a combination of institutions partner to create it? If multiple academic institutions or departments (i.e., pharmacy, laboratory sciences, and nursing programs) will implement the program, which ones will introduce the curriculum first? Or will it be done simultaneously?
- Who will be responsible for the overall process (e.g., department head or technical expert)?
- Which local SCM professionals and organizations might be able to support the process and the new faculty when the program is in place? Are they already part of the SWG? What organizations/facilities might be willing to offer internship or practicum opportunities to students?
- What budget will be needed and for which aspects of the plan? What other resources will be required? How will these resources be obtained?
- What will be the role of the stakeholders in the process (e.g., curriculum review, advocacy, or evaluation)? Who specifically will be responsible for each activity?

- Who can provide knowledgeable guidance on the financial support necessary for this endeavor? Are they already part of the SWG?
- How will progress on the Strategic Plan be measured?
- How will the PST for SCM initiative be evaluated and, if desired, scaled up?

Step 4: Assess Training Needs

Plan and Implement a Needs Assessment

A training needs assessment will help identify existing SCM gaps in the curriculum and ensure that the additional content is the most essential and appropriate information. In this assessment, identify all local teaching institutions responsible for training health cadres with supply chain responsibilities, any supply chain content currently included in these curricula, and the amount of time devoted to it (hours per class/semester). In addition, use the assessment process to determine the level of SCM knowledge that graduating seniors have and how well they perform SCM duties when first deployed to a job. Review all relevant rules and regulations from universities/colleges, professional associations, and other groups that may influence the decision of incorporating SCM into the school curricula. During the assessment process, gather data on the SCM workforce needs of the health system through facility visits across levels of the health system tasked with supply chain duties (i.e., pharmacists, laboratory workers, and nurses) to learn the responsibilities of each cadre, how many staff are needed to perform these duties, and how many of these staff are currently in place.

Complete the assessment before making any detailed plans to introduce new curriculum content. The needs assessment should help answer the questions below:

- What do the logistics workers need to know and be able to do to perform their jobs well?
- What gaps in these knowledge and skills currently exist and which of them can be addressed through PST?

The data from the assessment can also be used for advocacy with decisionmakers to establish a PST for SCM curriculum or strengthen existing pre-service curricula in this area, as well as to inform them of what content should be added. The assessment data can serve as a baseline for later use when evaluating and assessing the impact of the PST process.

Assemble a Data Collection Team

The working group overseeing the PST process should assemble a data collection team that has knowledge of health logistics, research methods, and the local system of higher education. Some members of the SWG may also help with data gathering. Hold orientations and planning meetings for the team to help ensure that members understand the processes and procedures.

Gather and Analyze the Data

Create or adapt an instrument to gather data from relevant informants and delineate what the data collection and analysis processes will be. Include inputs from the working group during the development of the tool to ensure ownership by the stakeholders. A sample needs assessment tool for determining pre-service supply chain content can be found in annex 2.

If it is not practical to include all relevant schools and facilities in the assessment, select a representative sample. Include the content of several health education programs, including pharmacy, nurse/clinical officer, laboratory, health system management, and health policy, in the comprehensive pre-service supply chain curricula since supply chain duties are dispersed across many cadres in the health system. Use a variety of data collection methodologies, such as in-depth interviews, focus groups, and a review of existing documents. Make observation visits to relevant academic institutions, as well as to warehouses, stores, and other facilities integral to supply chain management to gain an accurate understanding of operations of the various levels of the country's logistics system.

Interview a variety of informants, including personnel currently working in the supply chain, policymakers, representatives from the ministries of health and education, stakeholders from relevant professional associations, training institution faculty/administrators/students whose courses include or could include supply chain content, and staff at service delivery points.

Share Findings with Stakeholders – Create an Implementation Plan

After the data have been collected and analyzed, hold a workshop with stakeholders in which an implementation plan based on the findings of the assessment is developed. Invite both primary and secondary stakeholders to attend. Because some of them will have taken part in establishing the assessment findings, their presence will be helpful in further explaining the results. In addition, include donors and decisionmakers who control resources and influence opinions in this meeting. If the Ministry of Health (MOH) has a Logistics Management Unit, invite representatives from this unit as well.

An outcome of this meeting is to gain broad input and agreement on the proposed process for incorporating SCM content into PST. This workshop will also help create a common sense of purpose and vision among those participating and will help ensure that the plans made will come to fruition. The Implementation Plan can be a simple table (e.g., a Gantt or bar chart) that identifies at a glance the tasks that need to be done and in what timeframe, with accompanying text to provide details as to how the tasks will be accomplished and by whom. (See sample Implementation Plan in annex 3.) Ensure that one of the outcomes from this meeting is that some person or group is tasked with tracking the forward movement of this plan and advising the working group should problems arise.

Basic questions about the way forward need to be addressed, either as part of the Implementation Plan or in another format. These questions include—

- Does the pre-service institution that will be hosting the course(s) already include SCM topics anywhere in its curriculum? Where can they be found and what content is covered?
- In which department would it be best to place this content? Should it be in courses for nurses, pharmacists, logisticians, or someone else? Could it be placed in more than one department? Should it be offered to first year, second year, third year, graduating, or postgraduate students? Will the SCM content be elective or compulsory?
- What specific topics should be included in this new content? Ensure that the proposed content addresses the gaps identified in the needs assessment.

- What are the institutional requirements for the selected program? Will they be included as part of a larger degree program, a certificate program, or, initially, just a few key courses or sections of existing courses? How many credits will be given to the course(s)?
- Where will the courses fit in the academic calendar? Will they be concentrated or spread throughout the year?
- Who will develop the curriculum materials for each cadre, and how will this be financed? What method(s) will be used to build the curriculum (curriculum development workshop, teams/individuals working on different sections, etc.)? Will the content be adapted from another PST program from another school or country? By what process does the new content need to be approved and by whom?
 - What opportunities might there be to include a practicum in the SCM program/course? What organizations/facilities might provide these opportunities? Who will be responsible for planning and managing the practica?
- How will the pre-service content be linked to IST so it is complementary and mutually reinforcing?
- What resources (e.g., funds, staff, and expertise) will be necessary to develop the curricula and who will provide them?
- What materials will be needed to run the course and who will provide them (e.g., software, books, human resources, etc.)?
- Who will teach the course(s) and what type of training or orientation will the person need? How will students be evaluated? Assessment methods may include exams, class projects, term papers, homework assignments, and quizzes.
- What will the role of stakeholders be throughout the process? Who will be responsible for which tasks according to what timeline?

Step 5: Develop Curriculum

Draft Technical Content

Once the results of the training needs assessment have been shared with stakeholders, their input has been collected, and findings summarized, the next step is to design the desired program structure and develop the relevant content based on these findings. The program can be developed in a short workshop for stakeholders or by a small group with the necessary knowledge of both basic supply chain competencies and adult learning theory (ALT). Involve the SWG in the process. Review and approve learning objectives and course outlines, and then review the draft curricula. See annex 4 for a sample course outline.

At this stage, determine the teaching methods to be used. Take the concepts and principles of ALT into consideration and develop plans for including this approach in the curriculum and teaching methods, as appropriate. See annex 5 for more information. Consider including site visits to health facilities, such as clinics, hospitals, or warehouses, so students can see first-hand how the public health supply chain works. This will help make abstract principles more real to students. See annex 6 for guidelines on site visits.

Conduct a review of existing materials that may be appropriate to use in the PST, as well as resources available from the project and other country PST programs. See annex 7 for some recommended resources from the project. Several countries and regions already have established PST programs in place, and most would be willing to share all or parts of the curricula they use. After identifying the existing resources, determine which, if any, could be adapted for the PST curriculum based on the learning objectives and the previously developed course outline(s). By comparing the required technical content with any existing resources, the PST curriculum developers can identify the need for any additional materials development. Include copies of the logistics-related forms and procedures currently used in the local public health system.

Solicit Review Comments and Approval of Curriculum

When the draft curriculum is completed, include a technical review to ensure that the content and quality meet minimum academic standards. If resources are available, have the review conducted by outside technical experts. They could be local academic experts, international technical assistance organizations, representatives of the private sector, or peer institutions inside or outside of the country. Based on the outcome of the technical review, make any recommended revisions to the curriculum.

Submit the revised curriculum for institutional review to the learning institution, as required, as well as to the country's regulatory body/professional association tasked with approving curricula. This process will vary according to local policies.

Once all approval processes have been completed, bring the stakeholders together once again to consult the Implementation Plan and document the process thus far, including any outstanding issues or challenges encountered and how they were addressed.



A representative from the USAID Health Office in Pakistan hands over the new supply chain management course curriculum to Dr. Huma Qureshi, Executive Director of the Health Services Academy (HAS). The HAS Board of Studies approved the three-credit supply chain management course for master's program students in 2013.

Step 6: Orient Lecturers

Identify those who will be responsible for presenting the material at the institution. This may include lecturers, professors, or outside experts specifically contracted to teach the content. They will need to have some technical background in health commodity logistics, which they may or may not already possess. Orient them on the technical content of the curriculum through a curriculum review process, training-of-trainers, or other appropriate methodology.

This orientation can be provided by international organizations specializing in health commodity logistics, staff from institutions that have previously implemented a PST program, local industry experts, or existing institutional staff who have the necessary skills and background. In addition, provide post-training support to faculty as they teach the new content. For instance, the project conducts orientations, typically lasting two weeks, in which ALT is used. This participatory teaching methodology could be new to lecturers and faculty, so orientations should include the opportunity to practice teaching using ALT.

Another key element of the lecturer's orientation experience is the opportunity to review and comment on the curriculum content. During the review, encourage participants to comment on all sections of the curriculum and to make any revisions that may be needed. This exercise not only improves the content but it helps the lecturers become closely oriented with the curriculum content; it also provides them with a sense of ownership and pride.

If the course is to be mandatory, announce this addition to the students' curriculum while the content is still under development. If it is to be an elective course, promote it to the students and others who may be interested, so they are aware of this new resource. You can do this in a variety of ways, including through social media, course catalogs, and school and local newspapers. If this is the first institution to offer such a course in the area, invite the local press to promote the course through an article. If funds are available, offer merit-based scholarships to encourage students to sign up to attract particularly promising and deserving students; this also draws attention to the program. Discuss these options with the stakeholders, using the knowledge in the group to create a course promotional strategy.

The Lecturer's Orientation Experience

"My eyes and mind are now opened to appreciate that the logistics system as a whole must be at the center of SDP (service delivery points) to our clients."

– Pharmacy Department lecturer, Zambia

"The importance of these actions goes beyond our expectations since we are now able to provide lectures and trainings to our students who will deal with logistics and likely work [in logistics]. This will help the Government of Rwanda reach its Vision 2020 regarding health commodities security."

– Dr. Charles Karangwa, Acting Head, Department of Pharmacy, National University of Rwanda

Did You Know? The Lecturer's Orientation Can Be Used as an Advocacy Tool!

Inviting outside observers to the orientation activity can provide additional advocacy opportunities and encourage institutional interest in PST programs. For instance, if initial advocacy efforts do not convince some desired academic institutions to implement PST, these institutions can be invited to participate as observers in the lecturer's orientation activity. During the orientation, the participating university lecturers will be introduced to the SCM technical content and relevant teaching methodologies. After observing the orientation, the remaining institutions will gain an enhanced understanding of the benefits of PST to their institutions and their graduates. This may cause them to decide to participate in the PST program after all.

Step 7: Implement Program

Once the curriculum is finalized and approved and the faculty has been oriented on the content, the curriculum is ready to be used in the classroom. Other faculty members or technical experts can observe the lecturer(s) to help ensure that the content is being delivered adequately and that ALT techniques are applied. Invite guest experts to provide real world examples of local SCM operations and challenges. Collect ongoing quality assurance data and monitor data through classroom observation and lecturer feedback, as well as student exam scores and course reviews.

The curriculum itself may require dissemination, and any supporting reference materials will need to be made available to the students. Ideally, materials should be made available to all in both electronic and hard copies. Make sure to budget for any printing expenses. Provide the academic institution's library with copies of the materials, as well as multiple copies of *The Logistics Handbook: A Practical Guide for the Supply Chain Management of Health Commodities*, which is produced by the project and

provided free to academic institutions. See the resources in annex 7 for additional recommendations for curriculum materials.

Following the completion of the first PST course and its evaluation, review the Strategic Plan and update it as necessary.

In many countries, the project has provided schools with a one-time PST “starter pack” that contains its *Logistics Handbook*, lecturer guides, student manuals, standard operating procedure manuals, presentation slides, and other supply chain reference materials in both soft and hard copies. In some countries, the project also supports institutions by providing LCD projectors and computers. This pack symbolizes the project “handing the baton” to the schools, so they can own their PST in SCM program implementation process.

Step 8: Monitor, Evaluate, and Revise

As with any intervention, M&E of the process helps implementers use objective evidence to make informed decisions regarding its effectiveness. M&E is an ongoing process that involves collecting and analyzing data to determine how well the program activities have met expected objectives or the extent to which changes in outcomes can be attributed to the program. The program may need to prove its value at first. M&E data can be used in justifying this value.

Monitoring and evaluating a PST intervention helps demonstrate the extent to which the program objectives have been met and helps suggest areas for additional strengthening in the curriculum, teaching methodologies, or other aspects of the activity. Some objectives of monitoring pre-service education are to assess gains in knowledge/skills of the students, the quality of the teaching, the acceptability of the students/faculty/administrators to the new content, and the cost-effectiveness of the process.

Questions that M&E can answer include—

- Do the new content and methodologies meet the intended learning objectives?
- Does the curriculum content build on existing knowledge and abilities of students? Is this new knowledge useful and applicable?
- Is the new program/course supported by the institution’s deans, directors, and faculty? Is it supported by external stakeholders?
- Are the students satisfied with course?
- Is the teaching in alignment with what is taught in other courses/sessions and in in-service?
- Are the necessary resources, supplies, and equipment available for teaching the content?
- What percentage of students complete/pass the program/course? How many classroom hours were spent on the new content?
- Are graduates adequately prepared for the workforce? (This can be measured in a variety of ways, including by comparing workers who received PST with those who did not.)
- Are there any cost savings compared to transferring this knowledge via in-service training?

Plan the Evaluation

Develop an evaluation plan with the support of stakeholders that includes roles and responsibilities, a budget, and a timeline. Part of this plan includes establishing evaluation criteria for measuring progress toward the objectives established for the intervention. For instance, if one objective is to

increase the ability of currently enrolled nursing students to assess stock status, one evaluation criterion might be the percentage change in the scores on related test questions administered to them before and after this content is presented.

The methodologies used for collecting the data can vary. Using a combination of the following methods will produce the most accurate and useful data: written questionnaires, in-depth interviews, focus groups, course session pre-/post-tests and evaluations, and observation of faculty during teaching. In addition to quantitative data, gather qualitative data through course/lesson evaluations, focus group discussions, and in-depth interviews with students. Develop or adapt questionnaires, observation checklists, and other survey instruments for this purpose.

A sample PST course evaluation form for students is attached in annex 8.

Conduct the Evaluation and Use the Findings

Conduct the evaluation and share the results with the key stakeholders. The SWG can then assess what the findings mean and what actions can be taken to address challenges and improve outcomes. Next, plan, implement, and evaluate the selected activities that address the challenges. For instance, if the exams show that students tend to be confused by certain topics, review and revise the curriculum content, methodology, or materials for those topics. Aggregate these results, collected on the institutional level, with the results from other institutions to improve the curricula nationally.

If desired, conduct an evaluation of the costs incurred to strengthen the school curricula. It is difficult to assess this with complete accuracy, but an estimate can be useful in both estimating ongoing costs and providing estimates for similar actions in the future. Longer-range M&E efforts can focus on the performance of the students once they are working in the health system. Baseline information about the performance of workers who did not have supply chain content included in their schooling can then be compared with the performance of the new graduates to determine if PST did, in fact, better prepare the students for their jobs.

Once new interventions are planned and implemented, continue M&E efforts in a cycle of ongoing continuous improvement.



Feven Zertsion, a pharmacy graduate from Mekelle University in Ethiopia, smiles with her graduation certificate. *"I feel more prepared to join the public sector as a pharmacist. The training particularly increased my skill in product management at the store and use of the different recording and reporting forms."*

Success Stories from the USAID | DELIVER PROJECT

The project has many decades of experience supporting the conceptualization, planning, implementation, and evaluation of pre-service programs in SCM. Examples of these activities include—

- The Government of Pakistan now offers a four-month SCM internship at its Health Services Academy, which provides three credit hours and leads to certification. The internship program gives new graduates hands-on experience in logistics and SCM before joining the workforce.
- In 2013, the project launched a PST in SCM curriculum in nursing and pharmacy schools in Ghana. This training is now available at all 3 universities that offer pharmacy degrees, 109 nursing and midwifery schools, and 4 other health institutions. By October 2015, an estimated 21,800 nursing and midwifery students received formalized SCM training, far exceeding the approximately 600 nurses and midwives reached annually through IST and on-the-job training.
- The project's PST activities in Tanzania initially engaged all the country-level organizations that are involved in local SCM and training. This included the MOH, U.S. Centers for Disease Control & Prevention, the Ministry of Education, I-Tech, and the Pharmacy Council. These stakeholders were brought together and briefed on the proposed process at the very start. The MOH led the process of scheduling initial meetings and site visits with the academic institutions to allow the project to assess current curricula and educational programs. The MOH presence was required for the site visits to take place, demonstrating the crucial importance of establishing MOH buy-in at an early stage. Following the site visits, the same stakeholders gathered again to review the findings, jointly identify gaps in curricula, and discuss how these gaps could be addressed with additional SCM content.
- The University of Zambia School of Pharmacy opted to infuse SCM content into the Pharmacy Administration and Pharmacy Practice courses rather than having it as a stand-alone course. The project advocates this practice, which helps ensure sustainability of the curriculum in case of changes in school leadership. If a course is added as a stand-alone course, it is easier for future administrations to remove, thus full integration of content into existing courses is recommended when possible.
- To understand where there may be opportunities for PST in SCM in Ghana, the project visited a selection of schools of health sciences to assess places in the curricula where SCM content could logically be integrated. The assessment team collected and analyzed data from health learning institutions on SCM topics that were already covered in the curricula; information on intended audience, length of the course, and number of lecturers/tutors; and approval processes to integrate new content. The assessment also included facility visits, during which the competencies of pharmacists and nurses carrying out SCM tasks were observed. The findings and recommendations from the assessment were used to facilitate buy-in from key stakeholders

and develop a way forward for PST implementation in Ghana nationally. To learn more about the outcome of the work in Ghana, see annex 9.

- In Malawi, the project organized a PST curriculum review workshop, during which lecturers contributed to the development and review of the curriculum. This process not only gave the lecturers a chance to learn more about the SCM content that they would soon teach their students, but it also created a sense of ownership.
- A continuing shortage of trained supply chain workers at service delivery points in Ethiopia led to PST being given to pharmacy students at Mekelle and Addis Ababa universities just before their graduation in 2013. The cost-effectiveness of PST compared with IST was then investigated by the project.

To serve as a “control,” in-service workers received identical training as the students, which was provided by the same cadre of trainers. A year later, a cost analysis showed that providing supply chain training to prospective supply chain personnel (graduating students) was significantly more cost-effective than providing it to health facility staff; the cost savings were seen in reduced transport and per diem costs. In addition, PST reduced the time healthcare workers were away from their posts. The difference in costs suggests that PST has an important role to play in logistics training in Ethiopia; the results can be extrapolated to other supply chain training programs in other countries. To learn more about the outcome of the work in Ethiopia, see annex 1.

- To help build the Rwandan supply chain workforce, the project began implementing a PST initiative in 2009, in partnership with the National University of Rwanda. To better understand the successes of the program, identify areas for improvement, and capture lessons learned, the university, in collaboration with the project, conducted an assessment of the curriculum’s design and delivery. The purpose of this assessment was to—
 - Determine the usefulness and effectiveness of PST at health facilities.
 - Document successes.
 - Identify areas for improving and expanding course content and administration.

The key findings included—

- Course administration was proficient, receiving the highest ratings on the questionnaires for “value of supply chain course content” and “course content is informative,” with the materials needing some updating.
- Course content was generally used in the workplace and was perceived to prepare students to meet on-the-job task requirements, with some retooling needed to address a changing job market, which was shifting to the private sector.
- Job knowledge scores illustrated high retention in operational areas, which correlate with respondents’ perception of use of the content on the job. There remains a need to expand applied aspects of the course teaching to deepen and expand student skill levels.

A main conclusion of the study is that including both PST and IST in the health education system is optimal, as this can provide a continuous system of capacity building in SCM.

Annexes

Annex 1. Comparison of the Cost-effectiveness of Pre-service Training and In-service Training in Ethiopia

Annex 2. Supply Chain Management Pre-service Training Assessment Tool

Annex 3. Sample Implementation Plan

Annex 4. Sample Course Outline

Annex 5. Introduction to Adult Learning Theory

Annex 6. Guidelines for Site Visits

Annex 7. Recommended Course Materials

Annex 8. Sample Course Evaluation

Annex 9. Case Study: Ghana: Future Healthcare Workers Diversify Skillset to Reduce Stockouts

Also see Initiating In-Country Pre-Service Training in Supply Chain Management for Health Commodities: Process Guide and Sample Curriculum Outline, which can be found online at:

http://deliver.jsi.com/dlvr_content/resources/allpubs/guidelines/InitiatInCount_PreServiceTrain.pdf

Annex I

Comparison of the Cost-Effectiveness of Pre-Service Training and In-service Training in Ethiopia

By Habtamu Berhe, Paul Dowling, and Woinshet Nigatu

Background

Ethiopia has implemented the Integrated Pharmaceutical Logistics System (IPLS) since 2009, under the Pharmaceutical Funds and Supplies Agency. Although more than 5,000 healthcare workers have been trained on IPLS, staff attrition and an expanding service delivery have required ongoing training. To address this, partners provide mainly in-service training (IST); although, recently, pre-service training (PST) has been offered to graduating pharmacy technicians. However, data are not available to compare the cost-effectiveness of PST versus IST.

Method

Graduating pharmacy technicians were given IPLS training in two locations. One year after training, the technicians completed a questionnaire; it included information about their current work place and the relevance of the training to their current roles and responsibilities. Costs to train PST trainees were calculated and compared with costs for IST. An assumption was made that IST and PST were equally effective provided that trainees were hired within one year of graduation.

Results

Training cost per IST trainee—per diem, transport, meals, trainer costs, and costs for removing trainees from their workplace—was six times that of a PST trainee, which only included trainer time and materials. One year after graduation, approximately 90 percent of PST trainees were working in the healthcare sector. Assuming similar knowledge retention (this was not assessed), PST is almost six times more cost-effective. The breakeven point, where IST and PST are equally cost-effective, is about 17 percent, i.e., if more than 17 percent of PST trainees are hired within one year, PST is more cost-effective.

Discussion

In this instance, assuming knowledge retention levels are similar, PST is a cost-effective solution. PST is cheaper as trainees do not have transport or per diem costs; PST also reduces the time healthcare workers are away from their posts. While relative training costs and recruitment rates will vary from country to country, the data suggest that, in many settings, PST will be more cost-effective. However, more research is needed to assess the effectiveness of training. Our assumption (which has not been validated) is that training is equally effective, if trainees begin work in pharmaceutical logistics within one year of training.

Lessons Learned

Some assessment of comparative training effectiveness should be done to validate the assumption that PST and IST are equally effective, if trainees begin work within one year of training.

Citation

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Annex 2

Supply Chain Management Pre-Service Training Assessment Tool

Part I: Stakeholders

1. Do you think it is a good idea to teach supply chain during health professional training?

☐ Yes

☐ No

2. If yes, why?

3. What areas of supply chain management would be useful to students? (Check all that apply.)

☐ Inventory
Management

☐ Storage
☐ Distribution

☐ Ordering
☐ Procurement

☐ Forecasting

☐ LMIS: _____

4. If a course were to be offered at the school, how long should it be?

☐ A week

☐ A month

☐ A semester

☐ One day

☐ Other: _____

5. Should this course be required or elective?

☐ Required

☐ Elective

☐ Other : _____

6. Would the course be stand-alone, or would it be a smaller part of the larger course (i.e., a module of a course)?

7. In your opinion, which health professionals should receive this training in school?

☐ Pharmacy students

☐ Nursing students

☐ Laboratory students

☐ Other _____

8. Which institutions do you suggest be targeted to teach pre-service supply chain management?

9. What role do you see you or your organization playing in supply chain management PST?

Implementation Partners and Donors

1. Who currently provides PST in SCM and what resources are available for the training? (collect them)

2. Which institution(s) would be ideal to host a PST in SCM course?

3. What role would this partner or donor like to play in the implementation of a PST in SCM course?

- ☐ Curriculum development
- ☐ Support to reproduce curriculum for lecturers and students
- ☐ Support in providing required equipment
- ☐ Monitoring and evaluation of PST
- ☐ Providing guest lecturers on SCM topics
- ☐ Reviewing the curriculum (annually or biannually)
- ☐ Other: (specify)_____

Part 2: Schools of Health/Learning Institutions

1. Is a SCM course taught to your students?

☐ Yes

☐ No

2. What SCM topics are included in the course?

If none are included, do you think it is a great idea to introduce SCM to students before they complete their course?

☐ Yes

☐ No

3. Is/should the SCM course be a stand-alone course or integrated into the existing curriculum?

☐ Stand-alone

☐ Integrated

☐ Other _____

4. If we were to integrate SCM topics into the existing curriculum, what is the approval process and how long would it take?

5. Would you share a copy of the curriculum?

☐ Yes ☐ No ☐ Not available _____

☐ Not available _____

6. How many hours should be devoted to the SCM course?

☐ 10-14 hours ☐ 15-19 hours ☐ 20-24 hours Other_____

Other_____

7. What areas of SCM do you think would be useful to students? (Check all that apply.)

☐ Inventory Management ☐ Storage ☐ Ordering ☐ Forecasting ☐ LMIS: _____

☐ Distribution ☐ Procurement

☐ LMIS: _____

8. If a course were to be offered at the school, how long should it be?

☐ A week ☐ A month ☐ A semester ☐ One day ☐ Other: _____

☐ Other: _____

9. Should this course be required or elective?

☐ Required ☐ Elective ☐ Other _____

☐ Other

10. How will this course be graded?

11. How many credits can be given to this course?

12. In your opinion, which health professionals should receive this training in school?

☐ Pharmacy students	☐ Nursing students
☐ Laboratory students	☐ Other

☐ Other _____

13. At what stage of the course should SCM be taught?

☐ 1st Year

☐ 2nd Year

☐ 3rd Year

☐ 4th Year

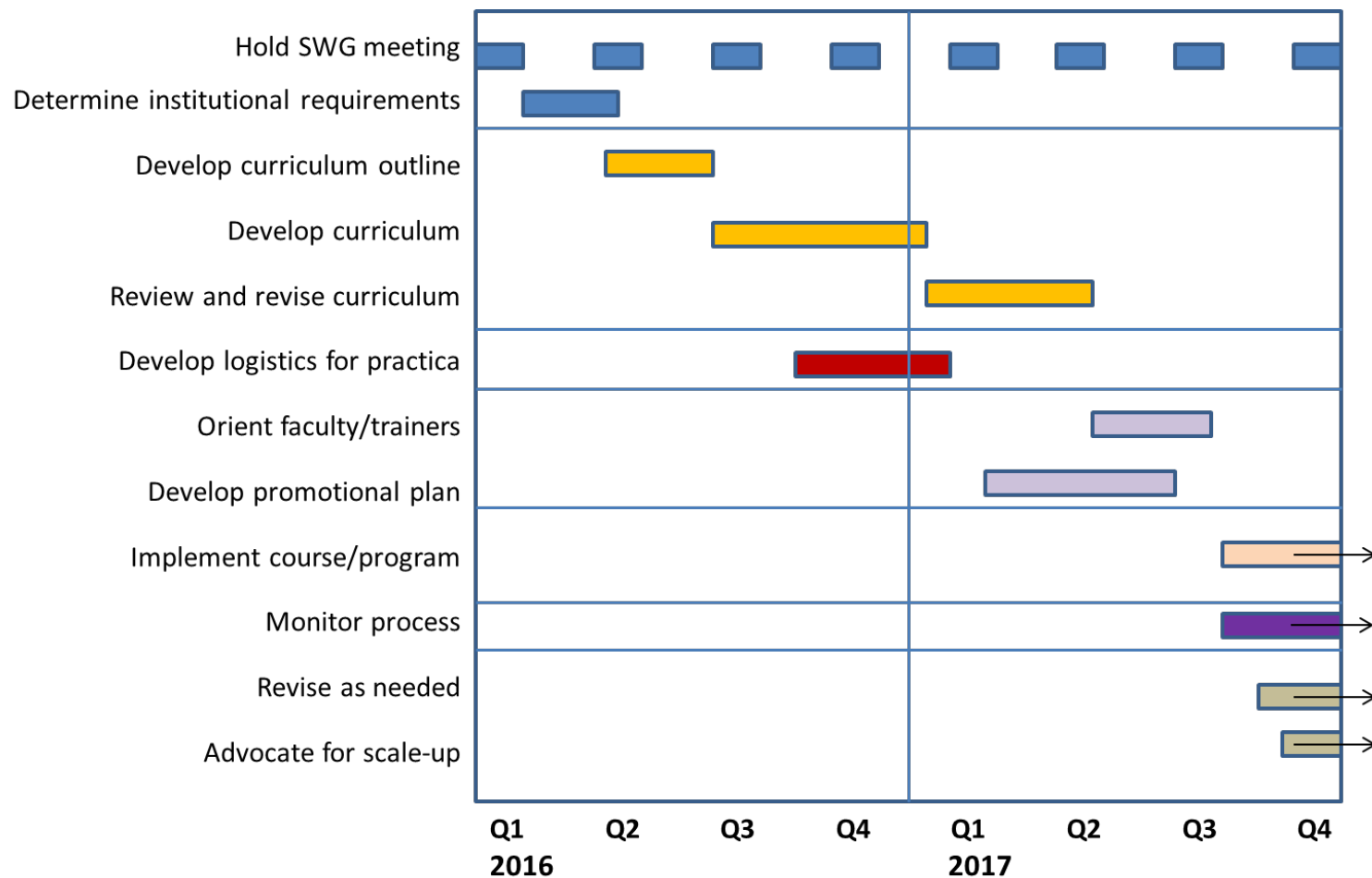
Other _____(specify)

14. If this course is offered, who will teach it? How many lecturers would be available to teach the course?

15. Do they need training in SCM?

Annex 3

Sample Implementation Plan



Annex 4

Sample Course Outline

Introduction

The following sample course curriculum outline is to be used for a country's pre-service training (PST) in supply chain management (SCM) for future health professionals. While schools typically cover a full range of topics related to patient care—diagnosing diseases, using medicines to treat the diseases, and other topics related to the treatment or prevention of disease or illness—healthcare workers are often also responsible for managing the commodities that will be used to provide patient care. The proposed course complements the clinical training that the students receive by preparing them to capably manage their commodities and, thus, better perform the full range of duties.

The course title, goals, and objectives cover standard SCM topics that will be useful to healthcare workers at various levels of the country's commodity pipeline and whose jobs will probably include one or more aspects of commodity management.

While the course topics are applicable to nearly every commodity management situation, specific course content must be adapted to suit both the form and content of the country's specific commodity management procedures and academic calendars. For instance, logistics management information system (LMIS) records and reports specific to the country should be taught during the course; also, the course will probably need to be modified to ensure that the forms' content and use are covered. Equally important, aspects related to in-country resupply procedures and commodity management requirements will need to be integrated into the course. Additional course modifications may need to be conducted if and when a country changes or updates its commodity management procedures.

From the academic perspective, it may be necessary to add modifications to accommodate the length of the academic semester or year, the number of contact hours required by the school's mandate, and other institution-specific requirements. Nevertheless, great care should be taken when omitting topics, as all topics are part of the minimum and basic skills required for commodity management.

Course Title

The suggested title for the course is *Supply Chain Management for Health Commodity Security* or *Supply Chain Management Course*. Whatever the specific title of the course, it should convey the primary purpose of the course: the management of health commodities.

Course Goals

The suggested course goals are to—

1. understand the basic principles and importance of SCM in ensuring health commodity security
2. define the students' specific roles and responsibilities, following their graduation and placement, as they relate to supplying commodities in the public health sector to ensure that the health logistics system is functioning properly.

The suggested course goals focus on two main aspects of the course: (1) providing the skills that the healthcare worker will need to manage health commodities and (2) understanding their roles and responsibilities in commodity management. To ensure that the country-specific course goals are met, any additions or changes to the course goals will probably require minor to significant changes in the course content.

Course Features

To achieve these goals, the PST course will have the following key features, all of which are typically included in any advanced course of formal study:

1. Classroom lessons are essential; each must have specific objectives.
2. Field visits will help students learn from practical observations of the existing SCM system in their country; they can then apply important principles to examine areas of improvement.
3. Quizzes, mid-terms, final examinations, and written term papers can be used to evaluate the students' learning progress.

The key features of the course reflect the usual content of a PST course, with a range from theory to practice.

It is expected that faculty members, not outside *experts*, will administer the course. However, when the instructors have no SCM experience as a specialty area, a lecturer's orientation can be used. Also, an initial course offering could include an outside expert as a *mentor* for the school's regular staff.

Course Delivery

The SCM course would ideally be offered during the last quarter of the regular academic program for the position being trained (pharmacy technician, master nurse, etc.). This will enable the students to implement what they have learned soon after completing their overall course of study.

Additionally, students will be able to learn the most current operating procedures related to commodity management, further reducing the need for intensive in-service training in the future.

Course Outline

The course is organized into a series of 14 contact activities, including classroom teaching and field visits. Classroom lessons, field visits, and several sessions for quizzes, mid-terms, and final examinations can be planned, with at least two classes per week during the quarter. See the following suggested course outline.

The indicative outline for course requirements and student evaluation is as follows:

1. Class attendance and informed participation—20%
2. Quizzes—10%
3. Examinations:

- a. Mid-term exam—20%
- b. Final exam—20%
- 4. Field trip—15%
- 5. Term paper—15%

Course Objectives

By the end of the PST course, the students will be able to—

1. Describe the concept of commodity security and the role of logistics in ensuring commodity security.
2. Describe the purpose of the health SCM system, and discuss the relationships between the major activities of the system.
3. Explain the purpose of the standard operating procedure manual in the SCM of health commodities.
4. Outline the flow of commodities and information in a country.
5. Identify key individual roles and responsibilities in the country; describe their specific roles and responsibilities in contributing to health SCM.
6. Identify the purpose and elements of a LMIS; analyze the LMIS currently used in their country and in selected countries; make specific recommendations for improving the LMIS.
7. Accurately complete the LMIS forms for a country, in a specific program, for the logistics system:
8. ☐stock card ☐daily activity register ☐report and requisition.
9. Accurately complete other forms, based on the programs in the country.
10. Receive and issue commodities to ensure full accountability for these supplies.
11. Articulate the internationally accepted guidelines for the proper storage of health commodities; describe how they can be better applied in their country.
12. Assess health commodity stock status from the central levels to peripheral facility levels; determine what actions should be taken based on the outcome.
13. Determine appropriate order quantities for all levels (central levels to peripheral facility levels) using max-min inventory control procedures. Select appropriate max-min inventory control systems for a variety of situations.
14. Monitor a logistics system program and supervise staff.
15. Define quantification and describe the steps in the quantification process.
16. Describe a variety of methods for preparing a short-term forecast of health commodity needs.
17. Identify practical considerations when planning orders and shipments.
18. Apply basic logistics principles to the management of a wide variety of health commodities, including contraceptives, HIV and AIDS products, essential drugs, and tuberculosis and malaria drugs.

19. Related to SCM responsibilities differentiate between routinely monitoring activities and supervising staff.
20. Apply theoretical concepts in SCM for health commodities during a practical field visit.

It is important to understand that the course objectives define the general content areas of the course, as well as what the future healthcare workers will be able to *do* to manage their commodities. This is reflected in the fact that all course objectives use *action verbs* and allow the teacher/trainer to directly *observe* the degree to which the student has achieved the objectives. The general course objectives, which help identify the topics that will make up the course, should be refined into topic-specific objectives; this will add an additional level of detail and will be used to define the individual class content.

Course Description

This section briefly describes each key lesson in the PST and lists the learning objectives of the lesson. As noted above, lessons can be modified or divided among individual classes, depending on how each individual institution organizes its classes.

Lesson 1: Setting the Context of the Course: Commodity Security

Lesson Overview:

This lesson provides a basic understanding of commodity security and the framework in which commodity security functions.

Lesson Objective:

After completing this lesson, the participants will be able to—

1. Explain the concept of commodity security as the framework for the course and its relationship to logistics.

Lesson 2: Introduction to Health Supply Chain Management System

Lesson Overview:

This lesson provides a basic understanding of a functional health commodity SCM system, its purpose and elements, and the relationship between the activities of the system.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Describe the purpose of a health SCM system and the elements that make up an effective system.
2. Identify the major activities within the system and the key participants who work within the system.
3. List the components within the SCM system and describe the interrelationship of these components as they relate to the logistics cycle.

4. Define pipeline, lead time, issues data, and dispensed-to-user data.
5. Describe push and pull distribution systems.
6. Describe the different levels (central, regional, district, facility) of the health logistics pipeline in the students' country; trace the flow of commodity through this pipeline.

Lesson 3: Introduction to the Standard Operating Procedure Manual for Supply Chain Management

Lesson Overview:

Participants will learn the importance and functions of the standard operating procedure (SOP) manual in the SCM of health commodities.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Use the table of contents to find information in the SOP manual.
2. Describe the purpose of the SOP manual in the SCM of health commodities.
3. Describe key features of the SOP manual.

Lesson 4: Facilities and Staff in the Supply Chain Management of Health Commodities

Lesson Overview:

Participants learn the roles and responsibilities of staff, by level, in the SCM of health commodities.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Identify the position and role of personnel who manage the logistics system.
2. Discuss the relationship between the individual's role and the role of others in the facility and others in the system.

Lesson 5: Logistics Management Information System

Lesson Overview:

Participants learn the importance and functions of the LMIS for managing health commodities and learn to analyze different systems in their country and selected countries to recommend improvements for the LMIS.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Describe the purpose of the LMIS.

2. List essential data for health logistics management.
3. List and describe the three types of logistics records; give examples of each type.
4. Describe the purpose of reporting; give examples of different reporting systems.
5. Assess LMIS forms currently in use in their country and in selected countries; recommend changes, if necessary.
6. Describe the purpose of feedback reports; identify types of information that may be useful in feedback reports.

Lesson 6: Completing the Stock card

Lesson Overview:

Participants learn how to fill out a stock card and discuss the data collected on the stock card.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. List the stockkeeping record used in the country.
2. Use a job aid to complete the stockcard for the country.
3. Start a new stockcard.
4. Update a stockcard when supplies are received, issued, transferred, locally bought, expired, damaged, or physically counted.

Lesson 7: Completing the Daily Activity Register for Health Commodities

Lesson Overview:

Participants learn how to fill out a daily activity register, if they are used in the country.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Describe the importance of a daily activity register (DAR).
2. Describe when the DAR is completed and by whom.
3. Complete the DAR.

Lesson 8: Reporting Commodities

Lesson Overview:

Participants learn how to complete a report and when to send it.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Describe who is responsible for completing the report for health commodities, when it should be completed, and why it is important.
2. Complete a report.
3. Complete a physical count and calculate the “Physical Count of Store Room and Dispensary” at the end of the month, for each supply.

Lesson 9: Ordering Commodities**Lesson Overview:**

Participants learn how to place an order.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. List what should be reviewed when receiving and processing a report.
2. Complete a report and make an order by calculating the average monthly consumption.
3. Describe the role of staff who fill out the reports and those who calculate order quantity.
4. Place an emergency order.

Lesson 10: Storage and Warehousing**Lesson Overview:**

Participants learn about internationally accepted guidelines for the proper storage of health commodities, and describe how the commodities guidelines can be followed in their country.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Articulate proper guidelines for the storage of health commodities, including HIV and AIDS commodities.
2. Identify selected product-related problems commonly found in warehouses or clinics.
3. Describe special storage considerations for program-specific commodities.
4. Conduct a visual inspection of a warehouse according to the guidelines and principles of proper storage.
5. Identify, by visual inspection, common product quality problems.
6. Correctly calculate storage space requirements at all levels (central levels to peripheral facility levels).

Lesson 11: Assessing Stock Status

Lesson Overview:

Participants learn to assess health commodity stock status at the central, regional, district, and health facility levels.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Describe the purpose and process of assessing health commodity stock status in *months of stock*.
2. Calculate the number of months of stock available at any storage level in their country when they are given the inventory and dispensed-to-user data.

Lesson 12: Max-Min Inventory Control Systems

Lesson Overview:

Participants learn about the purpose and use of the max-min inventory control systems; they determine issue or order quantities, based on the max-min stock levels and procedures in place in their country. Participants further learn to select an appropriate max-min inventory control system for a variety of situations.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Define the following terms: maximum months and quantity of stock, minimum months and quantity of stock, review period, lead time, safety stock, and emergency order point.
2. State the storekeeper's decision rule for three versions of the max-min inventory control system.
3. Set order/issue quantities using the forced ordering version of the max-min inventory control procedures.
4. Set forced ordering max-min stock levels.
5. List advantages and disadvantages of using max-min inventory control; select appropriate max-min inventory control systems for a variety of situations.

Lesson 13: Monitoring and Evaluation of Health Logistics System

Lesson Overview:

Using tools like the Logistics Indicators Assessment Tool (LIAT) and the Logistics System Assessment Tool (LSAT), participants learn to assess the logistics system at all levels in their country.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Describe the purpose of conducting a logistics system assessment.
2. List steps in planning and conducting a logistics system assessment.
3. Describe the use of the LIAT and the LSAT in assessing a logistics system.
4. Identify and select indicators to measure the logistics system performance in their country to assess all elements of the system, including the inventory control procedures, LMIS, and storage practices.
5. Make effective recommendations.
6. Identify characteristics of an implementation strategy.
7. Describe their role in assessing and improving the logistics system.

Lesson 14: Quantification for Health Commodity Requirements

Lesson Overview:

Participants will become familiar with the process for quantifying drug requirements, understand the issues to consider when conducting quantification, and understand the role of quantification in SCM.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Explain what quantification is and why it is important.
2. Explain what forecasting is and why it is important.
3. Explain what procurement planning is and why it is important.
4. Explain the relationship between quantification, forecasting, and procurement planning.
5. Describe the general steps to quantification, forecasting, and procurement planning.
6. Use four data types to describe the preparation of a commodity forecast.
7. Identify conversion factors required to convert number of visits, people, and incidents of a disease into quantities of commodities.

Lesson 15: Procurement Planning and Shipment Scheduling

Lesson Overview:

Participants will learn how to calculate the quantity of commodities to procure and determine when those commodities should be received to ensure adequate stocks throughout the country.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Describe the purpose and steps in procurement planning.
2. Identify the data necessary for calculating annual commodity supply requirements, the sources of these data, their possible limitations, and some possible remedies for these limitations.
3. Use the USAID tools currently available to develop an illustrative procurement plan for contraceptives.
4. Articulate the principles of shipment scheduling, including the sharing of data.
5. Prepare an illustrative commodity order for their country.
6. Discuss using PipeLine software as a resource for procurement planning and shipment tracking.

Lesson 16: Managing the Supply Chain for HIV and AIDS Commodities

Lesson Overview:

Participants will become familiar with the broad range of HIV and AIDS interventions and the commodities needed to support service delivery. They will be able to discuss key logistics implications for managing the supply chain for these commodities.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. List the range of HIV and AIDS interventions and the commodities needed to support these services.
2. Discuss the complexity of the environment in which logistics management of HIV and AIDS commodities takes place.
3. Identify specific characteristics of HIV test kits and antiretroviral drugs and how their use affects the management of the supply chain for these commodities.
4. Identify a set of tools and resource materials that can be used for guidance in managing HIV and AIDS commodities.

Lesson 17: Managing Supply Chain for Malaria and Other Commodities

Lesson Overview:

Participants will become familiar with the special logistics needs for malaria control and other projects that are relevant to their country. They will learn to apply general SCM principles to specialized projects, such as those used in a malaria control project.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. List the commodities required to operate a successful malaria control (and other specialized) project(s).
2. Discuss the special logistics needs for such projects.
3. Apply general health logistics principles to operate effective SCM of commodities for malaria control and other specialized projects.

Lesson 18: Routine Monitoring and Supervision

Lesson Overview:

Participants will understand the necessity and benefit of routinely monitoring logistics system activities and how to supervise people and staff using the SCM system.

Lesson Objectives

After completing this lesson, the participants will be able to—

1. Describe the difference between routine monitoring and supervision.
2. List five indicators to look for in the routine monitoring of activities in a SCM system.
3. Describe the purpose of supervision.

Lesson 19: Review of Commodity Security

Lesson Overview:

Participants will discuss the concept of commodity security and how it relates to their work.

Lesson Objectives:

After completing this lesson, the participants will be able to—

1. Identify challenges that countries have faced in achieving commodity security.
2. Identify strategies that countries have attempted to implement or have successfully implemented to promote or move toward commodity security.
3. Describe their own experiences related to promoting commodity security.
4. Identify interventions that can promote commodity security and have an impact on the focus areas of the logistics cycle and the commodity security framework.

Lesson 20: Field Visit

Lesson Overview:

Participants will gain practical knowledge of the SCM system currently established in their country; they will recommend improvements to strengthen commodity security.

Learning Objectives:

After completing this practical exercise, the participants will be able to—

1. List the major activities within the health commodity SCM system in their country and identify the different levels and staffing involved.
2. Recognize the type of system currently in operation (e.g., push versus pull) at different levels.
3. Identify the LMIS records and reports currently in use at all levels.
4. Examine the storage practices at all levels and list areas where gaps may exist.
5. Conduct physical inventory and stock assessment.
6. Identify how the LIAT and LSAT can be used in a practical setting to evaluate the health logistics system.
7. Identify the special considerations needed to plan and operate the logistics system in their country for HIV and AIDS, malaria, and other country program-specific commodities.
8. Analyze the functionality of the in-country logistics system; make specific recommendations in the areas listed above to improve commodity security.

Annex 5

Introduction to Adult Learning Theory

Adult Learning Theory

Adult Learning Theory (ALT) posits that adults learn differently from children. Teaching or training adults is more effective if ALT methodology is used instead of the traditional methodology that is used with children. The theory is increasingly being used around the world in training adults because of a growing body of research that demonstrates that it has more impact. Use ALT for impact.

Comparing Traditional Style Teaching and Adult Learning Theory

Traditional Style Teaching

1. Teacher focused.
2. Students with limited life experience.
3. One-way communication, mostly.
4. Limited learning from classmates.
5. Students often passive.
6. More theory than application.
7. The content is for the distant future.

Adult Learning Theory

1. Participant focused.
 2. Participants with much life experience.
 3. Multi-way communication.
 4. Can learn from colleagues.
 5. Very active.
 6. More application and experiential than theory.
 7. The content is for use very soon.
-

Curriculum is created, and courses are led taking these points into consideration. The more involved participants are in learning the better the content is absorbed. For example, lecturers may not always need to lecture students; sometimes it is better for them to simply facilitate discussions and allow students to express their ideas and explore their own thinking on a topic. Applying ALT may take longer to allow for learner participation, but the benefits are considerable. Elements of ALT include a) pairs and small group activities, b) student presentations, c) facilitated discussions led by lecturers or other students, d) simulations, e) role plays, f) case studies, g) out-of-class assignments, and h) field trips.

Annex 6

Guidelines for Site Visits

Taking students on a site visit will go a long way in explaining the principles of SCM. Site visits help students understand health commodities problems and issues that are difficult to recognize in a classroom set-up. In addition, participants get a chance to interact with the health community. These visits are always a course highlight for students and faculty.

Arrangements will need to be made ahead of time with health facilities; transportation will also need to be set up.

Preparations are required for field visits:

- Contact nearby health facilities to arrange for a visit. Discuss dates and purpose of visit.
- Arrange proper transport for students.
- Brief the students about the objectives, venue, and time of visit.
- Tell the students what is expected from them and how the flow of the visit will go.
- Explain to them the norms of the site/community they will be visiting, who they will meet, and what they can and cannot do.

Things to consider when setting up a field visit:

Proximity of facilities to the school – Transportation costs are lower and you save time if a nearby location can be found. More time can be spent at the facility covering issues than in transit.

Type of facility – A large facility can take more students than a small one. However, it comes down to who will be available to meet with you and show you how the site operates. Two facilities may need to be used to give students an engaged experience.

Consider splitting students into a few groups, so they can move more easily through the facility. If, for instance, a facility has three of its staff members meet with your class of 25, you can easily split students among them. Each group can cover a different area of the facility and logistics, while the other students are in other parts of the facility.

Give students tasks to do at the site. This can include a checklist of items to inquire about or look for. Consider providing a general introduction for all students and staff, when at the site, and then split the students into smaller groups for more focused discussions and investigations of SCM topics.

General topics to discuss at the site

- How many people work at this facility?
- What data are being collected for health commodities and for what use?
- What are the max-min stock levels for this facility?
- Does your supply regularly come on time? If not, how do you handle the situation?
- What are your most common challenges?
- How often are there stockouts?
- How often are physical inventories taken?
- What are you most proud of about your work/facility?

Facility Layout (e.g., warehouse and storeroom)

How are products arranged (e.g., commodity type or alphabetical order)? Is there enough space for picking and packing?

Storage Conditions

Which of the storage guidelines are being followed and which are not? Why not? Is there enough space? Is there a lot of clutter? How are high value products kept?

LMIS Forms

Are forms up-to-date? Are entries in proper order? Do quantities on the stockcards reflect what is on the shelves? Are the issue and receipt vouchers kept when stock comes in or is sent out?

Roles and Responsibilities for Logistics Functions

Does each staff member have clearly appointed tasks? Are SOP manuals or job aids available to help staff do tasks? What training has the staff received within the last two years? How often does the facility get supervisory visits? Can staff explain the procedures for receiving new goods or for filling orders?

Distribution

How often are supplies received and shipped out? How does the facility receive new supplies and what are the procedures for taking in new stock? What is the process for filling orders and how are they distributed? How are vehicles maintained?

Annex 7

Recommended Course Materials

1. Lecturers guide, including PowerPoint slides (hard and soft copies)
2. Student Workbook (hard and soft copies)
3. *The Logistics Handbook: A Practical Guide for the Supply Chain Management of Health Commodities* (hard copies)
4. *Pocket Guide for Managing Contraceptive Supplies* (hard copies)
5. Local examples of SOP manuals (tuberculosis, reproductive health, HIV and AIDS, and malaria)
6. Local examples of LMIS forms for all current logistics systems (hard and soft copies)
7. LIAT, LSAT, and other indicators forms
8. Laptop computer and projector for PowerPoint presentations
9. SCM course CDs
10. PipeLine software CDs

Annex 8

Sample Course Evaluation

Lecturers may wish to use the following evaluation to understand how the students experienced the course. This is voluntary, but it will help lecturers and administrators improve the course.

Understanding what the students found helpful or confusing or what they would like further instructions on can be quite useful. This assessment is just an example and can be adapted to fit the needs of the particular course.

Supply Chain Management Course

For each question below, rate your response on a 1 to 5 scale.

- 1 – Do not agree at all
- 2 – Do not agree somewhat
- 3 – Neither agree nor disagree
- 4 – Agree somewhat
- 5 – Agree completely

Question

Rating

1. I liked the Supply Chain Management course. 1 – 5: _____

2. The Supply Chain Management course sessions were informative. 1 – 5: _____

Circle the three course sessions that were **MOST** interesting to you:

Commodity Security	LMIS Records	Continuous Improvement
LMIS Summary and Feedback Reports	Storage	Monitoring and Supervision
Physical Inventory and Visual Inspection	Assessing Stock Status	Procurement
Max-Min Inventory Control	Quantification	Supply Planning and Shipment Scheduling

Circle the three course sessions that were
LEAST interesting to you:

Commodity Security	LMIS Records	Continuous Improvement
LMIS Summary and Feedback Reports	Storage	Monitoring and Supervision
Physical Inventory and Visual Inspection	Assessing Stock Status	Procurement
Max-Min Inventory Control	Quantification	Supply Planning and Shipment Scheduling

3. The Supply Chain Management course was well organized. 1 – 5: _____

4. Course materials were thorough and useful. 1 – 5: _____

Circle the two materials that were **MOST** interesting to you:

Logistics Handbook	Storage Guidelines	Course Notes and Handouts
Website Research	Other: _____	

Circle the two materials that were **LEAST** interesting to you:

Logistics Handbook	Storage Guidelines	Course Notes and Handouts
Website Research	Other: _____	

5. The lecturers were knowledgeable about the course content. 1 – 5: _____

6. How confident are you when it comes to defining these terms? Check whichever applies.

	Not at all confident	Somewhat confident	Very confident
Pipeline			
Lead time			
Pull systems			
Issues data			
FEFO			
Review period			
Max-min inventory control systems			
Consumption data			
Six rights			
LMIS			

7. How is average monthly consumption determined?

8. What areas of supply chain would you like to learn more about?

9. What recommendations do you have for improving the course?

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

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