



Unit 4

Managing a procurement system

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Cover photo: The health center pharmacy in Rwinkwavu, Rwanda
Courtesy of Laurie Wen



Unit 4

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Managing a procurement system

“The mountains will always be there. Just find a way around them.”

– Archie Ayeh, Program Manager, Bo-Mphato Litšebeletsong tsa Bophelo (PIH Lesotho)

INTRODUCTION

Every hospital, health center, and clinic requires stocks of medicines, equipment, and supplies to provide comprehensive care. An effective and efficient procurement system is essential because it will make available the tools that your staff need to provide high-quality services to patients. A program manager will inevitably be involved in helping to build a procurement system by setting up the necessary structures, processes, and procedures to ensure that it runs smoothly.

Many of the facilities that governments have invited PIH to support are initially understocked and lack essential supplies. In all the countries in which PIH works, we collaborate with the Ministry of Health (MOH) to institute a reliable mechanism for delivering supplies and we provide the resources to obtain those supplies. PIH's procurement system rests on three main principles: 1) understanding the needs of the community, 2) strengthening the public health system by working with the MOH and minimizing parallel supply chains, and 3) establishing longstanding relationships with local and international suppliers and manufacturers that sell high-quality products at low cost.

This unit offers information on identifying, obtaining, transporting, and distributing medical and nonmedical supplies, and on monitoring stock quantities and resupplying them as needed. PIH relies on a home office in the United States that manages in-kind donations and supports purchase and delivery of supplies to our sites. However, organizations that do not have a similar international structure can still benefit from the principles discussed here.

1. ASSESSING NEEDS AND RESOURCES

Understanding procurement needs for a health facility begins with an assessment of the landscape in which you will be operating. (See *Unit 1: Learning about the local context.*)

Areas of critical importance for procurement include:

- **Medical conditions:** Determining which medicines and supplies will be needed and in what quantities hinges on an understanding of the prevalence and severity of diseases in the catchment area. Consider the number of patients in the catchment area. Also factor in the likelihood of attracting patients outside of your catchment area, particularly if there are no other health facilities in the region or if existing facilities do not provide comprehensive care or are chronically understaffed or understocked. For some patients, a visit to your facility may be the first time they have ever been seen by a health professional, and so they may require care for a wide range of illnesses or injuries complicated by delays in treatment.
- **Infrastructure:** Before shipping, storing, and prescribing medicines and supplies, assess what infrastructure is already in place or will be required for managing and dispensing inventory, as well as for disposing of medical waste. Find (or build) and equip a storage space for storing stock and a pharmacy for dispensing medicines. Consider the layout of these spaces, allow for sufficient cabinets and shelving, and plan for refrigeration and temperature control of the storage space. You will also need to consider what Internet technology, computers, and software you will need for stock management. (See *Unit 3: Building site infrastructure.*)
- **Personnel:** Procuring and managing stocks of medicines and supplies requires staff with training in placing orders, organizing and tracking shipments, and storing and managing stocks.
- **National and international support:** Assess what resources are available and find out what funders your host government works with. Depending on the country, a health facility may be able to obtain medicines and supplies that are provided either by the host government or by international donors.
- **Legal and institutional framework:** Be aware of government rules and regulations. The MOH may be able to offer guidance on how to register as a nonprofit organization in-country and as an importer of medicines. When setting up a procurement system for a health facility, you should be aware of the national list of essential medicines (explained in more detail in *Section 4, Essential medicines* in this unit), as well as Ministry protocols and norms, which the MOH should provide.

One component of a successful procurement system is the ability to adapt or change methods as needed to deliver care. For example, snapshots of the methods used in the first six months, first year, and second year of a given project might reveal very different procurement procedures as a result of:

- Increased synchronization with MOH procurement systems and processes
- A better understanding of the local disease burden and resulting stock consumption rates
- A shift to larger, usually international stock purchases, based on more accurate stock consumption rates¹



PIH NOTE

Immediately after the January 12, 2010 earthquake struck Haiti, the Boston procurement team began organizing a huge number of cargo shipments of donated equipment and supplies for disaster relief. The procurement response to the earthquake was particularly challenging because we didn't know what infrastructure (air and sea ports, roads, etc.) remained functional following the earthquake. Communication with our contacts on the ground was limited, since the Internet and phone lines were down. We quickly determined that we would require external logistical support to manage both communications and our larger response to the disaster. We were able to meet this need in part through an expanded relationship with the Clinton Foundation in the Dominican Republic (DR). The collaboration allowed PIH to establish alternative supply chain mechanisms across the DR-Haiti border. Additional partnerships helped PIH secure warehouse space in both Miami and Port-au-Prince.

2. WORKING WITH THE MINISTRY OF HEALTH

Drugs, medical equipment, and supplies can be acquired through a variety of channels. Working with a country's MOH will acquaint you with national procurement mechanisms that are already in place, making it easier to follow national regulations and guidelines. For example, some governments have established procurement agencies for acquiring and importing medicines and health-related commodities. The agency structure is a way to ensure quality control, to encourage better technical support by concentrating expertise, and to benefit from bulk purchase of consumables and reagents.

If the MOH purchases and delivers a wide range of medicines and medical supplies to health facilities in the country, you can order supplementary medicines and supplies using a jointly managed logistical system (explained in more detail later in this unit). At other times it may be necessary to supplement government supplies in the event of a stock-out or emergency. While collaboration with the MOH is essential for avoiding the creation of a parallel procurement system, keeping other procurement channels open can help avoid stock-outs or delays.

¹ World Health Organization. (2004). *Management of drugs at health centre level*. Brazzaville, Republic of Congo: World Health Organization Regional Office for Africa. Retrieved online at: <http://apps.who.int/medicinedocs/en/d/Js7919e/>.



PIH NOTE

When PIH launched the programs in Rwanda in 2005 at the invitation of the Rwandan government, we established an independent supply chain and pharmacy system to serve the public hospitals and health centers in which we worked, because there was not a strong supply chain system at the national level. In the years since, we expanded services to support or operate more than 20 hospitals and health centers in 3 of Rwanda's 30 districts. As the effort grew larger, a problem arose. PIH-Rwanda and the Rwandan Ministry of Health were each developing their own health care-related supply chains—with separate providers, warehouses, and distribution systems. To reduce redundancies, save money, and help streamline Rwanda's healthcare system, the Ministry asked us to consolidate our distribution systems with those of the government. The result is a single system that will help strengthen the public sector by allowing for better forecasting and increased transparency. Under the new system, a district pharmacy orders medicines and consumables from the Ministry's central procurement agency for PIH-Rwanda facilities. Because the government procurement agency already supplies all of the Rwanda's public hospitals and health centers, this expansion allows a single government-owned and -operated facility to procure drugs and supplies for the entire country. In essence, the country now has a single supply mechanism that is owned and operated by the people of Rwanda.

3. BUILDING THE PROCUREMENT TEAM

Procurement for community-based health projects requires a well-trained team that can:

- Analyze procurement needs
- Solicit donations
- Receive and evaluate offers
- Purchase supplies from vendors
- Organize and track shipments
- Manage the arrival and storage of supplies
- Manage inventories
- Oversee the distribution of medicines and equipment to patients and clinics

Being able to draw on the resources of two procurement teams—one based in the United States and one in the country of operation—is helpful. U.S.-based staff have easier access to manufacturers, suppliers, donors, and shipping companies, while on-site staff can take the lead in placing supplemental orders locally—receiving, managing, and distributing stocks of medicines and supplies, and monitoring when new supplies must be ordered.

Below is a set of job descriptions that PIH has found to encompass the necessary skills for procurement personnel and the responsibilities involved in carrying out the work. Bear in mind that a small organization may rely on a single person to take responsibility for several of these jobs, while a large one may employ several people. It is essential to be aware of the range of tasks involved and to make sure that a capable person or team is responsible for each of them.

3.1 Procurement and operations manager

A procurement and operations manager is someone with experience in preparing purchase orders, dealing with vendors, managing competitive bids, and managing actual and projected budgets and inventories. Depending on the size and location of your organization, these responsibilities may be carried out on site or may be covered by a position based at a central location that coordinates purchasing across sites.

Responsibilities:

- Work with program managers to determine drug needs on a regular basis (semiannual or annual)
- Compile and analyze consumption data from each site and identify patterns of over- or underconsumption
- Monitor stock levels of essential drugs
- Manage/rotate stock to minimize expiry
- Secure stocks to minimize loss and damage
- Prepare purchase orders for vendors
- Track order progress through payment, shipping, and reconciliation
- Analyze spending patterns and make recommendations on cost-efficient procurement practices
- Manage communication between specialty projects (such as tuberculosis treatment or maternal health) and their funders or oversight committees
- Maintain a list of needed items and collaborate with the development team to identify and solicit equipment donors
- Work with medical supply recovery organizations (MSROs) to identify refurbished and donated medical equipment



Figure 1: A pharmacist checks stock at a PIH-supported health facility in Malawi

3.2 Logistics supervisor

A logistics supervisor should be someone who has experience in customs or shipping and can conduct business locally. This person should be able to split his or her time between the site(s) and the major port of entry into the country where your organization is working. The logistics supervisor, ideally a local national, may initially be hired on a contract basis and later employed in a full-time role as the organization's needs expand.

Responsibilities:

- Clear shipments through customs and work with customs agents as needed to resolve problems
- Monitor the movement of all products and equipment to the sites

- Coordinate with site-based staff to determine what items are most urgently needed
- Secure required documentation from the shipper or supplier (certificates of donation, packing lists, certificates of analysis, and airway bill or bill of lading)
- Stay up-to-date on all regulations regarding importing supplies
- Prepare necessary documents for customs officials in the port of entry
- Oversee local purchase of medicines and supplies



TIP: For organizations that are just beginning operations and have limited human resources, having a logistics supervisor—or another on-the-ground employee who can fill this role—is a top priority. As the organization grows, these responsibilities may be assumed by additional employees.

3.3 Pharmacy supervisor

Ideally, this position should be filled by a trained pharmacist with managerial experience.

Responsibilities:

- Develop a formulary of drugs and supplies in collaboration with clinical staff and Ministry protocols
- Manage pharmacy staff by developing a work plan and priorities
- Oversee training of staff and supervise the stock management system
- Develop systems and standards for the physical plant, inventory, and monthly reporting
- Ensure that monthly reports are generated and circulated
- Prepare periodic orders for general medicines and supplies
- Establish and maintain relationships with local vendors and suppliers
- Coordinate with the logistics supervisor and procurement manager (if these positions exist in your organization) in overseeing the placement, shipping, and receiving of all orders
- Prepare monthly and quarterly consumption and inventory reports for the project
- Prepare reports as needed for national programs (such as those concerning HIV, TB, malaria) and donor-funded initiatives
- Prevent stock-outs by monitoring stocks and reordering with ample lead time for delivery
- Monitor all sites to ensure that inventory is current and complete
- Oversee the physical movement of stock between sites
- If an electronic stock management system is used, oversee management of stock with help from the data manager
- Log incoming stock, outgoing stock, and electronic requests from sites

- Verify the physical stock management tools used by pharmacy personnel
- Provide stock cards and daily and weekly consumption report forms
- Verify that pharmacy personnel are preparing reports correctly
- Train pharmacy staff on physical stock procedures

3.4 Stock supervisor/warehouse manager

While this position is not required, it is helpful to have someone dedicated to managing stocks of nonmedical equipment and supplies.

Responsibilities:

- Manage inventory of equipment and non-pharmaceutical items
- Oversee and track intake of supplies
- Create and implement active distribution plans for distribution from warehouse to site(s)
- Oversee transport of supplies to site(s)
- Supervise warehouse staff



PIH NOTE

At the procurement warehouse for Abwenzi Pa Za Umoyo, or APZU (the PIH-supported site in Malawi), staff distribute food for patients, as well as materials and supplies that keep the program running, such as toiletries, cleaning supplies, and hardware. A rigorous system of checks and balances facilitates not only the tracking of stock, but also its distribution. One APZU staff member is in charge of receiving requisitions, another confirms requisitions, and a third signs out items to the recipient. The warehouse has round-the-clock security. We have found that this system helps prevent loss due to theft, damage, misuse, or spoilage.

3.5 Site pharmacist(s)

If a pharmacist is not available, this position can be filled by a nurse or other healthcare worker with pharmacy experience.

Responsibilities:

- Stock each hospital/clinic ward
- Stock the dispensary for outpatients
- Stock HIV/TB medicine to be given to community health workers (CHWs) in programs that rely heavily on CHWs to deliver community-based care
- Prepare orders for the site pharmacy stockroom
- Compile daily consumption reports and add up weekly totals

- Enter weekly consumption information into an electronic stock management system or, if using paper records, make sure that all paper inventory logs are kept up-to-date daily
- Compile monthly/quarterly inventories
- Compile reports as required by district or national authorities
- Supervise other pharmacy personnel
- Maintain stock cards
- Pre-pack medicines, removing the medicine from its bulk packaging and repackaging it for distribution to CHWs and patients

3.6 Dispensary clerk(s)

A trained pharmacy aide often fills this position. However, if such an aide cannot be hired locally a community member can be trained to fill the role.

Responsibilities:

- Submit orders to site stockroom for supplying the dispensary
- Dispense medicine to patients
- Instruct patients on how and when to take the medicines they receive according to the prescription and doctor's instructions
- Compile a daily consumption report
- Prepare a monthly inventory of dispensary stock and assist in site pharmacy inventory
- Maintain paper stock cards at the dispensary

3.7 Data manager

This position is relevant for organizations that use an electronic stock management system (ESMS) to manage inventories and prevent stock-outs. A comparable set of tasks should be defined and assigned for programs that use a paper-based system.

Responsibilities:

- Provide centralized oversight of inventory tracking and data entry at sites
- Train all pharmacy personnel on electronic stock management
- Check the system to verify weekly consumption per site and follow up with the site pharmacy if data are missing or incomplete
- Provide back-up data entry if the site network is down
- Enter stock arriving at the warehouse into the electronic stock management system
- Assist the warehouse manager with electronic stock management

4. ESSENTIAL MEDICINES

A critical step in ensuring quality of care for patients and for establishing an organization-wide procurement policy is developing a list of essential medicines. As defined by the World Health Organization (WHO), essential medicines are “those drugs that satisfy the health care needs of the majority of the population; they should therefore be available at all times in adequate amounts and in appropriate dosage forms, at a price the community can afford.”²



Figure 2: A village health worker's bag of drugs in Lesotho
Photo: Askar Yedilbayev

Most MOHs have developed and published their own lists of essential medicines that are adapted to address local medical conditions. These lists can generally be obtained on the national MOH website or in person at MOH offices. Some also have provincial or state lists. These MOH-generated lists also generally include medicines that can be imported easily. Be aware that customs clearance procedures tend to be more complicated for medicines that are not on the national list.

Most MOH lists of essential medicines are categorized by the level of facility, such as national referral hospital, district hospital, or health center. National referral hospitals and district-level hospitals offer a broader range of care and have a larger formulary than health centers do. The MOH lists also act as a control mechanism to make sure that sophisticated treatments or higher-risk products (for example, chemotherapy drugs or surgical instruments) are used only by properly trained medical staff. Health centers may have only a nurse present, whereas the district hospital would have more highly trained physicians and surgeons.

If you are operating in a country with an incomplete list or no list of essential medicines, you can develop your own based on the WHO list, which includes medicines that address most global priority conditions, including malaria, HIV/AIDS, tuberculosis, reproductive health, and, increasingly, chronic diseases such as cancer and diabetes. (See *Resources* at the end of this unit for more information.)



PIH NOTE

When PIH first began as a private charity hospital in 1983 in Cange, a remote village in Haiti's Central Plateau, we developed our own formulary of drugs and supplies based on patients' needs in Haiti and on the WHO essential medicines framework. As our sites evolved and expanded over the past three decades, we began collaborating with the Ministry of Health in each of the countries where we work. PIH's sister organization in Haiti, Zanmi Lasante, continues to use the formulary—with the knowledge and consent of the government.

² World Health Organization. (1983). *The use of essential drugs*. WHO Technical Report Series, no. 685. Geneva: World Health Organization. p. 9.

5. MEDICAL EQUIPMENT AND SUPPLIES

This section describes some important equipment and supplies that your organization will need for prevention, diagnosis, and treatment. Depending on the size and budget of your facility, some of the more expensive items discussed here, such as an x-ray machine, may not be supported by your facility's infrastructure, in which case patients will have to be referred to the nearest hospital or health center that can provide the required diagnostic testing and care. It is helpful to maintain a list of these facilities that offer more specialized care for referrals.

5.1 Laboratory equipment and supplies

A functioning laboratory is vital for testing, diagnosing, and tracking the health status of patients. Planning for laboratory equipment and consumable supplies must be done carefully, because a laboratory tends to be one of a program's biggest investments. Determine what supplies you will need to start providing primary health care in resource-poor settings, taking into account the size and health conditions of the population you will be serving and the services you intend to provide.

Supplies for rapid testing for high-prevalence diseases such as HIV and sexually transmitted infections (STIs), as well as for other tests (TB, malaria), may be a priority. If your host country has a national laboratory, its staff can provide guidance on which laboratory equipment is essential, such as microscopes, centrifuges, refrigerators, and blood chemistry and hematology machines. Microscopes and centrifuges are among the more durable equipment in the laboratory and require relatively little maintenance. They can sometimes be obtained for free or at a reduced price through donations or second-use suppliers. The MOH may have regulations on which manufacturers and models of equipment are permitted.

Laboratory machines and required reagents and consumables can be expensive, and they account for a large part of both initial and ongoing clinic costs. Many laboratory machines are designed to be used and maintained in developed countries and function best in clean, climate-controlled environments. Variable conditions in the field can cause these machines to require maintenance sooner than anticipated. Depending on the vendor, it may be possible to obtain a warranty or service plan when purchasing equipment. (Many warranties and service plans are not valid once a piece of equipment is shipped outside the country where it is purchased.) Identify reliable equipment by contacting the MOH, manufacturers, and other nongovernmental organizations in your host country. Your access to a reliable power supply will also affect your choice of equipment. If you have intermittent or no access to a central power grid, you will need a reliable generator or solar power to run some equipment. (See *Unit 3: Building site infrastructure* for additional information on electricity generation.)

Consider the total cost of supplying and maintaining a piece of equipment before purchasing. Remember that a lower-priced piece of equipment may incur high ongoing costs if there are problems obtaining consumables, parts, and maintenance locally. Important questions to ask include:

- What other machines and reagents are being used in your host country?
- Are reagents provided through national programs? If not, will you be able to purchase supplies locally or will you need to import them?

- How will you manage the stock of reagents (which are costly and have a short shelf life)?
- Are local technicians available to service the equipment? If not, does the manufacturer offer international repair services?

You may need to budget and plan for supplemental training so that your on-site staff know how to use and maintain the equipment. Some MOHs have a technical department with traveling technicians who support the entire country. Some medical supply companies also have technicians who travel to sites for annual service trips, but arranging on-site service in developing countries can be difficult. Many U.S. and European companies have restrictions on travel and will have concerns regarding safety and working conditions.



TIP: *Keep as much information as possible for each piece of equipment (make, model, serial number, and warranty details, if any) so that parts can be ordered quickly.*

5.2 CD4 machines

Determining sources of service, repair, and consumables is particularly important for expensive equipment, such as a CD4 machine, which is used to monitor the T-cell count of HIV-infected patients. Consult with your host country's MOH before acquiring a CD4 machine. MOH staff will likely know where such a machine can have the greatest impact, such as at a national or district-level laboratory or hospital. When possible, you should consider purchasing the same model of machine currently in use at MOH facilities.

Harmonization of equipment allows for easier access to maintenance, since there is typically a technician in-country who is trained to repair the equipment. Additionally, universal use of the same kind of equipment will result in a more consistent supply of reagents and consumables.

For many organizations, a piece of equipment costing more than \$30,000 is too expensive to consider. In this case, organizations offering HIV care may want to plan for transporting test samples to the nearest testing facility. If such an arrangement can be made, then budget for procuring the supplies needed to prepare samples properly and to facilitate transportation.

5.3 X-ray machines

An x-ray machine is critical for the provision of comprehensive primary care and for the diagnosis of infectious diseases like tuberculosis. If you are planning to purchase a new x-ray unit, use a local vendor, if possible. A local purchase reduces shipping costs and increases the likelihood that technical service will be available.

Hospitals in developed countries continually upgrade their equipment, so it is possible to find used and refurbished x-ray units if you cannot afford to buy a new machine. However, purchasing and shipping even a refurbished machine can still be expensive. If a refurbished unit is not in your budget, look into the possibility of a donated machine.

Apart from the initial cost, other important factors should be considered when deciding whether to acquire an x-ray machine, including:

- **How integral the x-ray machine is to providing care:** Consider whether your facility can still function while the x-ray machine is under repair, and if so, for what length of time.
- **Cost of transportation:** Transport of a donated x-ray machine requires crating, which can add over \$2,000 to shipment costs, depending on the location. However, it is probably still more cost-effective to ship a donated x-ray machine than to purchase a new one.
- **Availability and cost of local service technicians:** Used x-ray machines are more likely to break down than new ones. Both new and used machines are sensitive to environmental conditions and need preventive and restorative maintenance.
- **Space:** An x-ray machine requires adequate and appropriate space, including the necessary structures to contain radiation. (See *Unit 3: Building site infrastructure* for more information on installing x-ray machines.)
- **Power stabilization:** Unstable power conditions can compromise or break an x-ray unit.

Also keep in mind that a conventional radiology lab requires darkroom developing supplies and consumables, including:

- Processor (manual or automatic)
- Film, developer, and fixer for processing
- Protective clothing for patients and x-ray technicians (gloves, aprons, shields)
- Cassettes and hangers for drying or a film dryer
- Tank for developing film
- Envelopes and tape for storage

5.4 Supplies for treating malnutrition

Treating pediatric and adult malnutrition requires stocking therapeutic foods fortified with protein, such as nutrient-rich peanut butter paste or milk, as an essential component of the clinical formulary. Since malnutrition and diarrheal diseases are closely related, it is also important to stock oral rehydration solution (ORS). ORS should be considered an essential medicine and should be stocked whether or not an organization offers a comprehensive malnutrition program.

The source of these supplies will vary depending on your host country. See *Resources* at the end of this unit for more information on which organizations supply therapeutic foods and ORS.



Figure 3: Zamni Agrikol staff in Haiti sort ingredients for Nourimanba



PIH NOTE

PIH's approach is based on the training and employment of community health workers to deliver care. Building on that model, Zanmi Lasante in Haiti works in close partnership with the local agronomists of sister organization Zanmi Agrikol to recruit and train a cadre of local ajan agrikol (community agricultural workers) to assist families in improving their agricultural yield and ensuring food security. Many of the ingredients for Nourimanba, a ready-to-use therapeutic food (RUTF) made from peanut butter, milk powder, vegetable oil, sugar, and a specially formulated vitamin mix, and Nourimil, a dry cereal legume blend, are grown at Zanmi Agrikol's 35-acre farm or are bought directly from local farmers. Both Nourimanba and Nourimil are prepared and packaged in Zanmi Lasante's processing center, where local staff are employed and trained in the roasting, mixing, packaging, and distribution of these products. See Resources at the end of this unit for information on how to prepare products for treatment of pediatric malnutrition.

5.5 Surgical supplies

Providing surgical care in resource-poor settings is a complex endeavor, so most small primary healthcare projects do not include surgical care in their range of services, at least initially. Plan carefully before proceeding with this service.

Start by finding out what surgical referral sites are available within your catchment area. It might be possible to establish a process for referrals and patient transport so that emergency surgery needs can be addressed at larger, more centralized health facilities. Depending on the policy and strategy of the local MOH, primary care facilities may not have the capacity to provide surgical services; in some countries the healthcare system is stratified, with each type of facility (health center, district hospital, referral hospital) providing a defined range of care.

If your area has a need for surgical care that cannot be addressed at the regional or district level, start going down that road by preparing your facility for emergency surgery only, such as cesarean sections or trauma cases. Elective surgeries should wait until your program has built the required capacity, which involves identifying and hiring a qualified surgeon. Filling that position can be challenging in many resource-poor countries, although many physicians trained in Africa, for example, have some level of training in surgery and can perform emergency cesarean sections.

Additional staff required for surgical services includes:

- An anesthesiologist or nurse-anesthetist
- A scrub nurse
- Surgical technicians
- Staff to record and monitor supply usage

The appropriate space is required not only for the surgery but for pre- and postoperative care. The recovery space should be adjacent to the operating room and allow for easy transport of the patient and gurney, which means no stairs or narrow hallways. (See *Unit 3: Building site infrastructure* for more information on surgical suites.) Nursing

care for the postoperative ward should be provided around the clock, and procedures should be in place to monitor patients' vital signs, maintain wound cleanliness, and protect against infection.

The operating room itself requires sophisticated equipment, including the operating table and lights, anesthesia machine, suction machine, patient monitors, electrocautery equipment, sterilization equipment, and more. Your facility should have appropriate power and back-up generators to keep these machines functioning throughout a surgical procedure. (More information on generators is also available in the unit on infrastructure.) You should also consider the availability of qualified biomedical technicians to service and maintain this sensitive equipment.

Installing surgical suites requires procurement of a high volume of specific consumables and surgical supplies (such as instruments, sutures, and fluids). Some items are expensive, bulky, and require a large amount of storage space. Materials for surgery are highly specialized, and depot and pharmacy staff should be trained to distinguish between products. For example, there are multiple types and sizes of blades, sutures, and needles, and each needs to be maintained in inventory and recorded separately.

An alternative to providing full-time surgery at your site is to host visiting teams of surgeons and surgical care staff who can bring much of their own equipment and consumables, provide training to local staff, and assist with the establishment of more regular surgical care. However, even this option requires the kind of robust surgical infrastructure described above.

If your organization is unable to construct a surgical suite, you may want to consider building a procedure room, which will enable doctors to perform cesarean sections and other emergency surgeries that require less equipment.

6. SOURCING STOCK

There are multiple channels through which you can purchase drugs, medical equipment, and other supplies. Procurement decisions often balance the urgency of a given purchase against its cost. Start by looking into local suppliers and donations from medical supply recovery organizations or manufacturers before purchasing medical supplies in a developed country. Consider the long-term benefits of strengthening local capacity to meet local needs, as well as avoiding the additional cost of shipping abroad.



TIP: *Purchase reusable materials and equipment when possible, as opposed to single-use items. For instance, rather than using disposable surgical gowns, reusable cloth gowns can be washed and sterilized after each use and reused. In addition to conserving resources, purchasing locally made gowns is a way to invest in the local economy.*

6.1 Donations

Donations can be in the form of cash or as material “in-kind” donations. Financial donations can be used in a number of ways to support a project, but sometimes donors place restrictions on their use. Material donations are beneficial because they allow an organization to direct financial resources to other priorities. Donations of medicines and medical supplies can be obtained either through MSROs or directly from manufacturers. Purchases can also be made directly from manufacturers or through procurement agents that specialize in supplying high-quality, low-cost medicines and supplies for health systems and projects in developing countries. PIH has established three basic guidelines for handling material donations:

- Ensure that donations meet high, clearly defined standards for quality. The WHO has published drug donation guidelines. (See *Resources* at the end of this unit.)
- Establish clear guidelines on how to manage donations.
- Work with medical supply recovery organizations.

Establish a clearly stated policy of high standards from the beginning to avoid unnecessary confusion with donors about receiving donations that do not conform to your needs and standards. For example, you may want to specify that your organization does not accept expired medicines or short-dated pharmaceuticals, because medicines with short shelf lives might not be used before they expire. Some policies state that the organization does not accept hazardous materials or used prosthetics, and that all medical equipment must be in excellent condition, fully operational, and electrically compatible.

Good management of donations is important in building fruitful partnerships with other organizations and in preventing the environmental degradation or harm to patients, staff, and governments that may result from poor practices. “Dumping” is typically a charge leveled against the donor or corporation when it attempts to get rid of damaged products that it cannot sell to consumers in developed countries. Instead, these entities dump it on a resource-poor country for the purpose of receiving a tax benefit for their donation.



TIP: *Resource-poor settings often have inefficient modes of trash disposal. Establish a clear policy about what kinds of donations you accept to avoid having to dispose of unnecessary donations once they arrive in-country. If your organization chooses to accept donations, keep up-to-date lists of both received and needed donations.*

Accurate record keeping is essential to good donation management. Donors are often concerned about potential misuse of donations by the recipient NGO—that the materials could be resold for profit, sold on the black market, or lost or stolen. Documenting the customs clearance and storage process and keeping records about product distribution can reduce such skepticism.

MSROs specialize in accessing and redistributing to organizations the tons of excess medical supplies that are discarded in usable condition in industrialized countries every day. These organizations can help you acquire affordable medical consumables and equipment and also redirect unwanted donations.

When deciding which MSROs to work with, assess the level of detail in which the organization categorizes items and the total cost of the business transaction. The organization should provide detailed descriptions of each available item. For example, a Chromic Gut 4-0 suture and a Vicryl braided 1-0 suture are not interchangeable, so accepting donations from an MSRO that does not distinguish between the two could result in more work for your organization in the end.

Donations of expensive medical equipment also require careful consideration, particularly if a donor or MSRO is offering newer equipment that requires a certain level of infrastructure or maintenance. At the same time, consider the ramifications of accepting equipment that is either in poor condition or very old, because doing so may incur higher costs for repairs or parts that are difficult to replace. Before accepting a donation, ask the following:

- Do you have staff capable of using the equipment? (If not, can staff be trained to use it?)
- Is the equipment suitable for your environment and infrastructure? (For example, an x-ray machine is of little use if the health center does not have electricity.)
- Is it possible to procure consumables and replacement parts for the equipment relatively easily?
- Can more robust, less-advanced equipment achieve equivalent (or near equivalent) results more reliably or less expensively in your work setting?
- Given a limited budget and other priorities, is the equipment or service available to patients through a referral facility or network?

To determine the actual cost of receiving donated goods, ask about fees and expected shipping rates. Many of these organizations charge service fees. These fees may be a percentage of the value of the donated goods or a flat fee for the contents of a container. Shipping costs are an additional charge above the service fee.

6.2 Procurement agencies

Procurement agencies are organizations (both nonprofit and commercial) that facilitate the process of purchasing and shipping medicines and health-related commodities from manufacturers to client sites. The MOH in your host country may have its own established procurement body. Services provided by procurement agents include:

- Soliciting bids from manufacturers and securing the most competitive price (see *Unit 8: Establishing a financial system* for more on the bidding process)
- Providing quality assurance, including manufacturer auditing through factory visits and batch testing (testing a random sample from each batch provided by a manufacturer to detect counterfeit or flawed medicines)
- Helping prepare customs documents for imports and making transport arrangements for delivery to international sites

If you are purchasing products from multiple manufacturers, it is often easier to use a procurement agent than to have your organization make all the arrangements separately.

Procurement agents charge a nominal fee, so explore multiple options to find the best fit for your organization. It is sometimes possible to negotiate reduced prices with these vendors by educating them about the charitable aspects of your work, providing information about your expected spending, and soliciting multiple bids. Be aware that some suppliers may not be able to ship to certain countries because of patent laws or drug registration requirements.

The International Dispensary Association (IDA Foundation) in the Netherlands is a large nonprofit supplier of high-quality, low-cost generic drugs and medical supplies, including HIV drugs and testing supplies and first- and second-line tuberculosis drugs. It offers a wide range of products, specializing in the pharmaceuticals included in the WHO's Model List of Essential Medicines. Other suppliers provide similar services, either on a for-profit or not-for-profit basis. These include Imres in the Netherlands (which specializes in medical kits), the United Nations Children's Fund (UNICEF), and MSF Supply (a branch of Médecins Sans Frontières/Doctors Without Borders).



PIH NOTE

Staff at PIH's central procurement office in Boston have found that establishing a relationship with a qualified vendor for purchasing medicines, rather than dealing directly with a manufacturer, can yield substantial savings. Working closely with trusted vendors over a period of five to ten years has allowed us to gain access to volume discounts and receive better overall customer service, particularly when we need an item shipped right away.

6.3 International donor agencies

International donor agencies fund programs to purchase medicines and supplies. (These funders and others are discussed further in *Unit 9: Creating a development strategy*.) Bear in mind, however, that donors often impose restrictions on what can be purchased and where drugs can be sourced. Funding from the U.S. government normally involves strict and specific guidelines for procurement of drugs, medical supplies, and laboratory supplies.

Although it is possible to purchase both first- and second-line TB drugs on the open market, the WHO's Green Light Committee (GLC) Initiative makes reduced-price second-line drugs available to programs that demonstrate proven efficacy in the treatment of multidrug-resistant TB. The Initiative consists of a secretariat, the Green Light Committee (an expert review and WHO advisory body), and the Global Drug Facility (the drug procurement arm of the Initiative). Organizations apply to the GLC and, if approved, have access to lower-cost drugs.

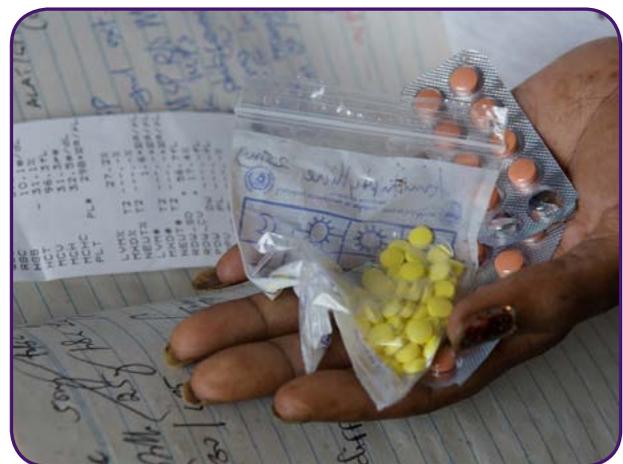


Figure 4: Dispensing drugs at a health center in Malawi
Photo: Craig Bender

Some major donors are:

The Global Fund to Fight AIDS, Tuberculosis and Malaria

The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) maintains a policy that regulates how the programs it funds may procure single- or limited-source products, such as some HIV and tuberculosis drugs. In general, procurement agents are aware of the GFATM rules and will provide quotes with detailed information about the supplier and how the supplier complies with the GFATM policy. Information specific to the procurement policy can be found on the Global Fund website (www.gfatm.org).

The United States President's Emergency Plan For AIDS Relief

The United States President's Emergency Plan for AIDS Relief, known as PEPFAR, was launched in 2003 as a five-year, \$15 billion global initiative to combat the HIV/AIDS pandemic. In July 2009, Congress reauthorized PEPFAR for an additional five years (through 2013) with an expanded budget of nearly \$50 billion. If your organization receives PEPFAR funding, find out about purchasing policies and restrictions from your in-country representatives. The PEPFAR website maintains a list of implementing agencies. Organizations or governments purchasing HIV drugs with PEPFAR monies or other funds from the United States generally have access to a broad range of approved products.

The William J. Clinton Foundation

The work of the Clinton Foundation has resulted in lower-cost antiretroviral (ARV) drugs, malaria medications, and cotrimoxazole, as well as lower cost diagnostic tests, for certain countries in Latin America and the Caribbean, Eastern Europe, and Africa. If the country in which you work is covered by the Clinton Health Access Initiative (CHAI), you may be able to access these products through a procurement agent such as UNICEF, the United Nations Development Programme (UNDP), or the IDA Foundation. (See *Resources* for more information.)

7. NONMEDICAL SUPPLIES

All health care facilities require equipment to support administrative operations, including information technology (IT) equipment, food and cooking supplies, and vehicles. If you have multiple sites, centralized purchasing of frequently ordered items can provide cost savings.

7.1 IT equipment

Communication plays a critical role in delivering health services, particularly in an international setting. IT procurement should be a part of an IT strategy that accounts for an organization's planned growth. Organizations whose size or budget does not warrant dedicated IT staff should consider assigning a knowledgeable staff member to provide first-level technical support and to interact with consultants. Similarly, you may want to create an IT committee that meets periodically to review needs and chart future strategy.

The location of your organization's home office affects the cost and means of purchasing of IT equipment. Although costly to import in resource-poor countries, IT equipment is generally less expensive in developed nations than in resource-poor countries.

With the exception of some telecommunications equipment, purchasing IT equipment in an industrialized nation and shipping it to the site may be more cost-effective than purchasing locally. The additional shipping costs are offset by the lower cost of purchasing from these vendors. However, additional costs may be incurred if your organization does not have duty-free status in the country that you are working in. Other purchasing practices that you can apply, irrespective of your location, are:

- Obtaining at least three quotes for all substantial purchases
- Encouraging competitive bidding from vendors
- Establishing and maintaining relationships with qualified vendors
- If you are operating multiple sites, standardizing equipment to lower purchase prices and maintenance costs—standardization of equipment is also an advantage from a training perspective because staff who rotate among facilities will always encounter the same equipment
- Staying abreast of any nonprofit tax exemptions for which you may qualify

Many vendors will not warranty IT equipment purchased in the United States for use overseas. When evaluating IT donations, carefully consider the hidden costs of compatibility, maintenance, and replacement parts before accepting the used equipment or software. (See *Unit 3: Building site infrastructure* for more information on choosing equipment and software.)

Local staff may be able to perform certain IT functions, such as adding new users to a local network or running virus scans, while major IT repairs or upgrades would have to be performed at a central office. Smaller organizations and those that do not have a central office should consider whether their organization has the need and capacity for an in-house IT manager. If you have more than 10 to 15 computers, hiring a system administrator either full or part-time is likely the most cost-effective long-term solution for regular maintenance needs. If you are not able to hire someone in-house, outsourcing IT support is an option, but finding IT support in resource-poor settings can be challenging.

Each country will have different policies and procedures regarding the import of electronics. Some countries have expedited import policies regarding IT equipment, which can be factored into your shipping plans. For instance, consolidating all of your electronics into a single shipment may enable you to get the shipment through customs more quickly than if your electronics are mixed in with other types of goods.

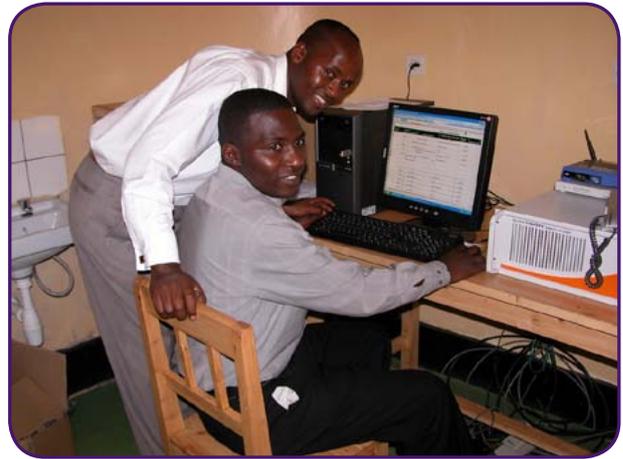


Figure 5: Staff using an EMR system in Rwinkwavu, Rwanda
 Photo: Beth Collins

7.2 Food, cooking supplies, and household items

As you estimate costs for food, cooking supplies, and household items for a site, it is important to consider both local availability and the cost of transporting food and supplies that are unavailable locally. Compare the costs of contracting with a local delivery service versus purchasing your own vehicles and hiring drivers.

Guidelines for weekly on-site food and supplies allowances are generally based on the current number of staff and/or patients, accessibility of grocery stores, and availability of bulk goods. If your organization offers food packages to patients or community members, partnering with dedicated hunger relief organizations can help offset these costs.



Figure 6: Distributing food for patients in Lesotho
Photo: Ilvy Njikiktjien



PIH NOTE

APZU in Malawi has a tender process for all major purchases, including locally purchased goods. For example, during banana season, the staff kitchen that provides lunch for administrative and hospital staff requires 25 kilograms of bananas every day. The members of the procurement committee—the procurement officer, project manager, project assistant, and two other staff members—decided that they wanted to purchase the bananas locally. The committee posted the call for bids on trees around town and asked vendors to drop off their anonymous bids in a box, indicating the cost per kilogram, how they were going to bring the bananas to the kitchen, and whether there was a minimum amount of bananas that had to be ordered to guarantee the price. The committee received eight bids and decided to make offers to the vendors with the four lowest prices. These four suppliers would rotate the weeks that they would provide the bananas. When it came to agreeing on a price, the committee didn't settle on the lowest bid but rather the middle one, because the committee felt it was fairer to the banana suppliers. When the process was complete and the four banana suppliers had accepted PIH's offer, the committee posted the names of these banana suppliers on trees around town so that everyone would know who PIH eventually chose to do business with.

To avoid high mark-ups at local stores, consider bulk shipments of items needed in large quantities, such as bedding, towels, toiletries, cleaning supplies, and fuel. Budget a monthly allowance for items not included in the bulk orders that cannot be purchased locally. Items that typically need to be replenished regularly include candles, matches, dish soap, all-purpose cleaner, laundry detergent, hand soap, toilet paper, and gasoline and propane.

7.3 Vehicles

In resource-poor settings, reliable vehicles and other modes of transportation—from airplanes and four-wheel-drive ambulances to buses and donkeys—are crucial to ensuring the safe transfer of both critically ill patients and supplies.

Purchasing a new vehicle requires identifying an authorized dealer who can assist with importing and outfitting the vehicle and can provide a steady supply of parts over the vehicle's lifecycle. Your work depends on available and reliable transportation, so it is advisable to establish a good relationship with a dealership. Your host country's MOH and other NGOs operating in the region may be able to refer you to a dealer who has experience working with NGOs and healthcare providers.

Common problems include flat tires, worn-out suspensions, and accidents.

To maximize the lifespan of your vehicles, have them serviced regularly according to the manufacturer's recommendations. Often, the manufacturer's authorized dealership can provide this service. It may be possible to arrange an annual contract with the dealer to maintain all your vehicles.

If you operate in a rural environment where roads are either nonexistent or poorly maintained, you should anticipate extreme wear and tear. It is important to have staff who are able to replace tires and conduct emergency repairs. Staff who have mechanical skills will become increasingly valuable as the vehicles age and require more frequent service and repair.



Figure 7: Poor road conditions are one of the biggest challenges for transporting goods in Lesotho
Photo: Askar Yedilbayev



PIH NOTE

After frustrating experiences with mechanics who overcharged or did poor-quality work, the APZU project manager in Malawi found an excellent mechanic who charged reasonable prices. However, when the new mechanic found out that the transportation officer at the site was HIV-positive, he referenced this fact in an insulting manner when the officer came to do business with him. The transportation officer reported the incident to the project manager, who was very distressed to learn what had occurred. The project manager decided that she could no longer give this man APZU's business. The search for an equally reliable mechanic—and one who shares PIH's values—continues.

8. INTERNATIONAL SHIPPING

Shipping and logistics account for a substantial part of the cost of delivering care abroad. Before you decide to ship an item, no matter what its weight or dimensions, check whether the item is available from a local supplier. In cases where the item has been donated from another country, is not available locally, or is only available locally at a substantially higher cost, international shipping is probably the best choice, although options for international shipping vary widely in terms of cost and delivery time.

8.1 Sea freight

In general, sea freight is preferable when shipping high volumes of nonurgent supplies or bulky or heavy pieces of equipment or furniture that cannot be sourced locally. If certain items in your host country are available but are very expensive or do not meet standards for quality, importing these items by sea freight may be your best option.

The materials to be shipped are put into sea containers, which are typically either 20-foot or 40-foot-long steel containers meant for ocean passage. The 40-foot container is more expensive but cheaper per square foot, so you may want to wait until you are able to fill the larger container. However, doing so requires a considerable amount of planning and coordination to avoid stock-outs or delays. The major drawback to shipping by sea is longer delivery time, depending on the destination country. For this reason, stock-out material should never be sent by sea.

If you are not able to use all the space in a sea container, sharing the container with other organizations in the region can help reduce shipping costs. In an emergency situation, such as a natural disaster, an in-country logistics cluster—a mechanism for interagency coordination of humanitarian assistance—may be able to coordinate quickly the transport of several sea containers for more than one organization. For example, such an agency might combine the contents of two 20-foot containers into a single 40-foot container, which translates into lower shipping costs for all parties.

If you are shipping an ocean container to or from a location that is not near a port, a freight forwarder can drastically reduce the amount of work that such a shipment would entail. Freight forwarders can arrange for drayage, which is shipment of a container from its packing location to the nearest port, and reserve space on a specific vessel.

Finally, if your organization is small and not able to fill a sea container quickly enough, sending supplies by air may be more efficient.

8.2 Air freight

Shipping by air generally costs much more than shipping by sea, but it is also considerably faster. Using a freight forwarder or doing a drop shipment can facilitate the shipment of large items. Alternatively, you can arrange your own shipment on a cargo airline.

Forwarders assume all responsibility for transporting the shipment from point of receipt to point of destination, including preparing and executing some of the documentation required by customs; however, your organization will still have to provide a packing list

and a certificate of donation or commercial invoice. Certain freight forwarders have divisions that specialize in international shipping for nonprofits and charitable organizations. Although they cannot guarantee cheaper prices, they are more likely to be aware of the specific needs and conditions of a nonprofit shipper.

A drop shipment involves paying the retailer to ship the item or items directly from the manufacturing plant to the airport of your host country. In a drop shipment, your organization does not take possession of the item until it

reaches its destination. If the item arrives damaged or is lost in transit, it is generally the responsibility of the vendor to fix or replace the items and file any necessary insurance claims. Doing a drop shipment is usually cheaper than using a freight forwarder.

It is also possible to arrange your own air shipment on a cargo airline. When you arrange your own shipment, it becomes the responsibility of the nonprofit, or of a contracted local transport company, to transport the items to and from the airport at both ends of the shipment. Check with the recipient country's major international airport to see which cargo lines operate frequently.

Security concerns since September 11, 2001, have resulted in closer scrutiny of cargo shipments, and many airports do not accept shipments from “unknown” shippers. To speed the processing of shipments through customs, countries have established lists of “known shippers.” Rather than establishing a shipper's identity each time their cargo arrives in a port, the identity is established one time before the cargo is shipped. Check with the freight company well in advance of your shipping date to determine what paperwork is required to become a known shipper. Normally a short application and credit check have to be completed. This method requires more work by your organization but can often save money.

8.3 Insurance

When shipping internationally, insure shipments to protect against loss, theft, or damage during transport or at the port of entry. The cost of insurance is generally calculated as a small percentage of the total value of the shipment.

International commerce terms, called “Incoterms,” define the point during the shipping process at which liability is transferred from the seller to the buyer. Incoterms are set by the International Chamber of Commerce (ICC) and are commonly used in international sales contracts. The ICC website (www.iccwbo.org) offers detailed information on transport obligations, costs, and risks. These terms will help you understand whether you will need to insure cargo for all or only some of its journey.



Figure 8: Transporting patients by plane in Lesotho
Photo: Pep Bonet

8.4 Registration

Import laws, customs procedures, and registration requirements for pharmaceuticals vary from country to country, so consult the appropriate government ministry or ministries in your host country to determine what options your organization has with respect to each type of regulation. In general, the manufacturer of a pharmaceutical product is responsible for registering that product in a given country. Most countries have a national drug regulatory authority (NDRA) that oversees product registration. Contact the MOH or NDRA in the countries where you work to learn more about the need for product registration and the registration status of the drugs you want to import.

The registration process can be long and bureaucratic. A registration dossier includes information on the active ingredient and finished product, including indications, dosing, stability, and bioequivalency results. The manufacturer must provide a Certificate of Good Manufacturing Practice (GMP) and a Certificate of Pharmaceutical Product (CPP). The packaging, labeling, and marketing of the product are also subject to review by the NDRA.

In the case of HIV drugs, some governments have declared health emergencies because of high rates of HIV infection. Where this has occurred, it may be possible to import unregistered drugs.

Additional flexibility can be found in the provisions of the World Trade Organization's Trade Related Aspects of Intellectual Property Rights (TRIPS) document and the related Doha Declaration. There are provisions allowing for compulsory licensing—when the government allows someone to produce the product or process without the consent of the patent owner—and/or parallel importing for certain countries. The rationale for parallel importing is to enable the import of patented products from countries in which they are sold at lower prices into those countries where the same product is being sold at a higher price. Parallel importing and resale may occur without the consent of the patent holder.

8.5 Customs

Customs clearance requirements vary from country to country and can be the most challenging part of international shipping. It is imperative that a representative of the recipient be at the port to receive the shipment. The representative can be an employee or a customs agent hired for the purpose of assisting with customs clearance. Some countries may require the use of a certified customs broker, but fees are often associated with this practice.

Documentation requirements vary, but normally a certificate of donation and packing list are required before the shipment leaves the port of departure. The airway bill or bill of lading should also be provided, as well as certificates of analysis for pharmaceutical products. A certificate of analysis is a document that an accredited firm or individual issues certifying the quality and purity of pharmaceutical products. Problems at borders are difficult to avoid entirely, but good documentation that includes a detailed list of boxes and their contents can help prevent unnecessary delays at border patrol/customs. Before leaving customs, take a box count and make sure that the delivery matches the bill of lading or airway bill, since these items list what was loaded at the port of departure.

Nonprofit organizations are generally tax-exempt and can import medicines and medical supplies free of duties or taxes with appropriate documentation. Registering as a nonprofit in your host country can qualify your organization for this exemption. (See *Unit 2: Understanding legal matters* for more information.)

9. DOMESTIC SHIPPING

After a shipment clears customs it must still be transported to the site. The transportation infrastructure of your host country will affect the efficiency of this process. Careful planning can help you avoid stock-outs or expiration of medicines and supplies arising from any delays at this stage of shipping. Other NGOs operating in the region may be able to offer advice on the best way to transport medical supplies within the country.

Delivery of large items, such as large generators, satellite dishes, and x-ray machines, usually requires hiring a local shipping company.



Figure 9: Supplies for earthquake victims at Port-au-Prince airport in Haiti



PIH NOTE

One of the PIH-supported outposts in Lesotho is routinely cut off from car or truck travel by high river levels. When large deliveries must be made during these times, we hire donkeys and guides to meet a delivery truck at the river, load the supplies onto the donkeys, and walk them the remaining distance to the health center. At the other sites in the mountains, government helicopters deliver equipment too large for transport by single-engine airplane, such as x-ray machines or refrigerators. Such helicopter deliveries are only possible as a result of PIH's collaboration with the government of Lesotho.

Each of these factors should be considered before shipping domestically:³

- Distance from the port of entry to the sites and, if applicable, from a central warehouse to the sites.
- Condition of transportation infrastructure, particularly in the rainy season or in winter.
- Condition and availability of delivery vehicles.
- Who has responsibility for transporting supplies to sites—is your organization solely responsible or can the MOH provide assistance? If so, does this assistance apply to all supplies or just certain medicines (such as ARVs)?

³ Adapted from World Health Organization. (2004). See footnote 1 and *Resources* in this unit.

- Workload at the central warehouse or distribution site—for example, how many workers are available to fill orders and how many sites are they serving?
- Availability of stock at the central warehouse or distribution site.
- Consumption rate of drugs per month, including seasonality of consumption rates of certain drugs, such as antimalarials during the rainy season.



Figure 10: PIH staff unload and receive food in Lesotho

Storage-related questions you will need to address in advance include:

- How much stock will you be procuring?
- Will you establish a delivery service to bring supplies to the sites, or will each facility be responsible for sending someone to a central facility to obtain its supplies?
- How much storage space do you have at your sites? Do the sites have storage capacity for all of your stock, or will warehouse space be necessary?
- If you have a warehouse, does it have the capacity to store large stock volumes (for example, six months of supplies)? If not, where will large shipments be broken down into smaller deliveries for each site?
- Do you need staff to handle receipt of goods and the necessary equipment to receive shipments, such as hand trucks, a forklift, pallet jack, etc.?
- Will any of the stock require refrigeration or other specialized handling?



PIH NOTE

In Haiti, where Zanmi Lasante collaborates with the MOH to operate 12 health facilities, an electronic medical record (EMR) system is essential to avoiding stock-outs and delays. At each of the 12 sites, a pharmacist sends requests for medicines and supplies to the central pharmacy using the EMR, which is accessed by satellite Internet in each of the clinics where it is used. Because of Haiti's erratic power supply, the EMR allows staff to enter data while disconnected from the Internet. It is then synchronized when the Internet is reconnected. At the central warehouse, the pharmacist receives orders via the EMR, and pharmacy assistants pull the orders and prepare shipments to the sites.

10. MANAGING STOCK

Managing the stock and supply of medicines requires an effective paper-based and, if possible, computer-based system. These systems are used for maintaining an accurate inventory of supplies as shipments of medicine arrive at a central storage facility and are then distributed to clinics and pharmacies.

10.1 Tracking consumption and forecasting

All healthcare organizations in developing countries need a system, whether electronic or paper-based, to track what drug supplies are currently available and to assess the quantities of medicine that will be needed for the next six months or a year. Stock forecasting can be one of the most challenging aspects of the procurement process because programs constantly change, grow, add new facilities, and reach more patients. The challenge is especially great when working with a limited budget, because you will want to avoid as much waste from overstock and stock expiration as possible.

WHO has developed a collection of drug stock management support tools, including stock cards for use at warehouses and dispensaries, and forms for daily use and annual inventories. Other WHO tools include a spreadsheet for forecasting stock requirements for ARVs. See *Resources* at the end of this unit for examples of stock cards and the WHO forecasting tool.



Figure 11: Staff in Lima, Peru inspect inventory at the warehouse before storing it
Photo: *Socios En Salud*

The standard approach to tracking the shipment and use of drug supplies, called the consumption method, is to calculate the amount of drugs that enter and leave the warehouse each month. This calculation is typically accomplished using standard WHO stock cards that record the stock level for each type of product and all stock movements. A separate card is maintained for each product and is updated every time a shipment is received or supplies are dispensed to the pharmacy. In addition, the daily or weekly consumption of medicines should be tracked in the pharmacies to help assess upcoming demand for the warehouse. A full inventory should be conducted annually or semiannually to reconcile the daily and monthly records and provide a reliable foundation for projections of orders and budgetary requirements.

10.2 Pharmacy stock management system

Managing medicine supplies in resource-poor settings can be challenging because of conditions that make transportation difficult, complicated import policies, and lack of good tracking systems. Although they cannot remove all barriers to effective pharmacy management, electronic medical record systems allow staff to monitor drug and medical supplies in order to request drugs, prevent stock-outs, and track shipments. If your organization does not have this expertise in-house, consider partnering with other organizations that do.

An electronic stock management system (ESMS) can also be used to forecast requirements and prepare orders for ARVs and TB drugs. Drug regimens are recorded for all patients receiving treatment, enabling the user to calculate the total requirements for a patient group for a specified period based on their prescribed regimens. This calculation is useful

when treating a large cohort with one disease type, especially when the number of treated patients is expanding rapidly. An alternative way to assess use is to calculate the amount of drugs that enter and leave the warehouse each month, typically with WHO stock cards.

An ESMS can support both of these methods. Recording drug regimens and monitoring use in one networked system allows automatic cross-checks of estimates from both methods and enables the geographically dispersed drug procurement team to share the same data and analyses. Based on the number of patients on regimens x, y, and z, you can tell how much medicine should be used in any given period. By monitoring the quantity of medicines actually used, you can identify discrepancies.

If you are operating more than one facility, having these data available, regardless of geographic location, is helpful in calculating the stock required by each facility. It is also important for preparing international orders and establishing a quantity of stock sufficient to accommodate the long lead times associated with international orders.

10.3 Lead time

The length of time it takes drugs and supplies to be ordered, delivered, and received at a site is called delivery time or lead time. Depending on the product and distance involved, lead time can be days, weeks, or even months. Particularly with international orders, the standard lead times are often long. Standard factors include the process of placing an order, the procurement agent or manufacturer's processing time to fill and pack an order, and then a long sea or land shipment. For large international orders, you may want to plan up to six months between order date and delivery.

Problems with clearing customs or extreme circumstances—such as a world supply shortage, poor weather (washed-out roads and bridges), vehicle breakdown, labor disputes, and armed conflict—are difficult to predict but can also affect supply chains. Although it may not be possible to account for every contingency, calculating adequate lead time can help avoid stock-outs or delays.

CONCLUSION

Implementing and managing an effective procurement system is essential to ensuring efficient delivery of health care in resource-poor settings. Procurement can be one of your most challenging tasks, especially as you build your program. At every step, it requires attention to detail and close coordination, both internally and with your outside partners. Done well, it knits together almost every other aspect of your operations and can make your organization a trusted resource in the areas in which you work. In the long term, an effective procurement team can be instrumental in offering ideas and advice regarding possibilities for strengthening local capacity, so that local production and service delivery can complement overseas assistance to create sustainable health delivery systems.



Resources

WORKS CITED

World Health Organization. (1983). *The use of essential drugs*. WHO Technical Report Series, No.685. Geneva: World Health Organization.

World Health Organization. (2004). *Management of drugs at health centre level*. Brazzaville, Republic of Congo: World Health Organization Regional Office for Africa. <http://apps.who.int/medicinedocs/en/d/Js7919e/>

SELECTED RESOURCES

Assessing Needs and Resources

Nachbar, N. et al. (2003). **Community drug management for childhood illness: Assessment manual**. Arlington, VA: Management Sciences for Health. http://pdf.usaid.gov/pdf_docs/Pnacy415.pdf

This step-by-step guide identifies strengths and weaknesses of a country's pharmaceutical system.

Building the Procurement Team

Management Sciences for Health. (2009). **A guide for implementing the Monitoring-Training-Planning (MTP) approach to build skills for pharmaceutical management**. Arlington, VA: Management Sciences for Health.

<http://www.msh.org/Documents/upload/MTP-Tool-for-Pharma-Mgmt.pdf>

MTP is an ongoing performance improvement approach to skills building that places training, tools, and responsibility for implementing the pharmaceutical management practices learned in the hands of local staff.

Essential Medicines

Partners In Health. **Drug and supplies formulary from Zanmi Lasante (PIH Haiti)**. http://model.pih.org/files/Haiti_formulary.doc

This list reflects a program that has been active for more than 20 years. New projects will have very different lists based on local disease profile, national drug lists, and budget restrictions. Medicines for your site should be selected by the responsible clinician(s) in conjunction with the regional or national Ministry of Health officials.

This list is not meant to serve as a prescribing guide; only experienced clinicians should prescribe medicines and instruct on dosage.

World Health Organization. (2009). **The selection and use of essential drugs.** WHO Technical Report Series, No.958. Geneva: World Health Organization.

<http://www.who.int/medicines/publications/TRS958June2010.pdf>

This report presents the summary of considerations and justifications for changes made to the WHO Model List of Essential Medicines by the WHO Expert Committee in 2009. Annexes include the latest Model Lists, and all items on the Model Lists sorted by their ATC classification codes.

World Health Organization. (2009). **Model lists of essential medicines for adults and children.**

<http://www.who.int/medicines/publications/essentialmedicines/en/>

This site includes the 12th through 16th editions of the Model List for adults and the 1st and 2nd editions of the Model List for children.

World Health Organization. (2010). **Model formulary for children.** Geneva: World Health Organization.

http://www.who.int/selection_medicines/list/WMFC_2010.pdf

As an extra resource for healthcare workers and national programs that supply medicines for children, this document was prepared, based on the 2nd edition of the Essential Medicines for Children, to provide prescribers with the best information about how to use the medicines included on the List. It is intended as a starting point for developing institutional or national formularies and can be used by groups who wish to develop their own version, by adapting the text or by adding or deleting entries to align the formulary to their own list of essential medicines.

Pharmaceutical Supply Chain Management

USAID/DELIVER PROJECT. (2006). **Assessing supply chains for HIV/AIDS commodities.**

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

This is a technical resource for assessing supply chain management systems for HIV/AIDS programs in the context of system design, implementation, and monitoring and evaluation. It is primarily for advisors and in-country partners to understand the various types of assessments that are undertaken to measure or monitor system performance, the purpose behind the different assessments, and the tools that are appropriate and valuable to use in the different circumstances.

USAID/DELIVER PROJECT. (2008). **Building blocks for logistics system design for HIV tests and ARV drugs.**

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

This paper includes inventory control systems, logistics management information systems, and storage and distribution; it is designed to help logisticians design logistics systems that are appropriate for managing these commodities.

Pharmacy Stock Management System

Berger, E. et al. (2007). **Implementation and evaluation of a web based system for pharmacy stock management in rural Haiti.** Boston, MA: Partners In Health.
<http://www.ncbi.nlm.nih.gov/pubmed/18693795>

This article describes PIH's web-based stock management system that supports clinics in rural Haiti. Building on experience with a web-based EMR system for HIV patients, PIH developed a comprehensive stock tracking system that is modeled on the appearance of standardized WHO stock cards. The system allows pharmacy staff at all clinics to enter stock levels and also to request drugs and track shipments.

John Snow, Inc./DELIVER PROJECT. **Health Supply Chains/Logistics.**

<http://www.jsi.com/JSIInternet/Resources/Publications/healthlogistics.cfm>

This site provides access to publications regarding health program supply chain efficiency and effectiveness in developing countries.

Management Sciences for Health. **Health manager's toolkit.**

<http://erc.msh.org/toolkit/>

The Drug and Supply Management chapter includes tools for forecasting, bidding, ordering, receiving, storing, and distributing pharmaceuticals.

World Health Organization. **Dispensing unit stock card.**

<http://model.pih.org/files/DispensingUnitStockCardTemplate.pdf>

PIH uses this card at program sites to record and track the dispensing of medicines to patients.

Sourcing Stock

William J. Clinton Foundation. (2010). **ARV suppliers and prices.**

http://www.clintonfoundation.org/files/chai_arv_priceList_april2010_english.pdf

The "Information Center Resources" section of the website provides access to the ARV suppliers and prices list, as well as other tools for drug access.

The Global Fund to Fight AIDS, Tuberculosis and Malaria.

<http://www.theglobalfund.org/en/>

The Global Fund provides grants and resources for safe and cost effective procurement of health commodities.

Management Sciences for Health. (2010). **International drug price indicator guide for 2009.**

<http://erc.msh.org/mainpage.cfm?file=1.0.htm&module=DMP&language=English>

This site includes procurement agencies and tools for price comparisons.

World Health Organization & United Nations Children's Fund. (2010). **Sources and prices of selected medicines for children.** 2nd ed.

http://www.who.int/medicines/publications/sources_prices/en/index.html

This resource offers up-to-date information on the availability and price of 240 drug items in 612 different pediatric formulations selected from the "WHO Model List of Essential Medicines for Children," therapeutic food, and vitamin and mineral supplements to treat major childhood illnesses and disease.

Tracking Consumption and Forecasting

Health Systems Trust. (1998). **Using stock cards to improve drug management.**

<http://www.hst.org.za/uploads/files/kwiksk13.pdf>

This site includes different types of stock cards, their functions, examples of how they are used, and potential problems.

USAID/DELIVER PROJECT

<http://deliver.jsi.com/dhome/>

The “Resources” section of this website provides access to a number of publications, tools, and links related to tracking drug consumption and forecasting, and other topics, searchable by term or country.

World Health Organization. **Forecasting Tool for ARV Stock Requirements.**

<http://model.pih.org/files/GenericARVForecastingTemplate.xls>

This tool provides the basis for ARV forecasting at the central or facility level, especially for facilities intending to start ART programs where consumption data are not available. Also, appropriately used, the tool can be used for subsequent year forecasts.

World Health Organization. (2006). **Handbook of supply management at first level health care facilities.** Geneva: World Health Organization.

<http://www.who.int/hiv/amds/HandbookFeb2007.pdf>

This handbook describes all major medicines and supply management tasks, known as the standard procedures of medicines supply management at first-level health care facilities. Each chapter covers one major task, explains how the task fits into the process of maintaining a consistent supply of medicines, and recommends which standard procedures to use. Annexes contain various checklists and examples of forms which can be introduced as needed at the healthcare facility.

World Health Organization. (2004). **Management of drugs at health center level.**

Brazzaville, Republic of Congo: World Health Organization Regional Office for Africa.

<http://apps.who.int/medicinedocs/en/d/Js7919e/>

This training manual includes templates of stock cards, inventory forms, financial records, and consumption reports.

Treating Malnutrition

Nutriset

<http://www.nutriset.fr/en/homepage-nutriset.html>

This is the website of the makers of Plumpy’Nut, Therapeutic Milk, Therapeutic CMV (mineral and vitamin complex) and ReSoMal (an oral rehydration solution).

Partners In Health. **Preparation of suggested products for treatment of pediatric malnutrition.**

http://model.pih.org/files/Preparation_of_suggested_products_for_pediatric_malnutrition.pdf

This is a quick reference adapted from WHO’s *Management of severe malnutrition: A manual for physicians and senior health workers* that describes the preparation of dry cereal blend, ready-to-use therapeutic food, rehydration solution for malnutrition, and therapeutic milk.