

CHAPTER 5

INFRASTRUCTURE

5.1 INFRASTRUCTURE CONSIDERATIONS FOR HEALTH CENTRES

This chapter addresses the challenges posed by a health centre's space, design, power, water, hygiene and sanitation and equipment requirements for it to be able to deliver quality HIV prevention, care and treatment services that are integrated with basic essential primary care services.

The physical work environment often influences (positively or negatively) the mindset of the service providers and their efficiency and ability to innovate in delivering expanded services. A good work environment can facilitate better HIV services and reduce workload. A disorganized work environment impairs the health centre team.

To improve the work environment, you need to start with improving how you use existing resources. This chapter should help you reorganize the existing space in your health centre and to consider important renovations and refurbishments. First, the chapter presents essential infrastructure requirements (sections 5.2 through 5.13; summarized in the table on the next page), followed by the infrastructure requirements for each area of the health centre (sections 5.14 to 5.21). The final section provides a quality management approach to developing an enabling physical work environment (the 5 Ss). However, the chapter does not deal with design and construction of new health centres.

The chapter will also provide guidance on improving infection control within your health centre. The emphasis is on preventing TB and HIV transmission; special sections are devoted to these subjects. The material also covers safe water, hygiene and sanitation to avoid transmission of enteric and other pathogens. This is essential to providing quality HIV services, as patients with suppressed immune systems are especially vulnerable to water and airborne contamination. The chapter material

Table 1. Essential infrastructure requirements



Space

Adequate space for HIV care integrated within primary care



Privacy and confidentiality

Protect the privacy of the patient's diagnosis and avoid stigma



TB infection control

Prevent TB transmission between patients and to health workers, without stigma



HIV infection control

Prevent HIV transmission through safe infections, phlebotomy, sharps disposal, gloves and other personal protection equipment



Water, sanitation and hygiene for infection control



Water supply

To provide safe drinking water



Hand washing, other hygiene practises and waste water

To provide sufficient quantities for handwashing, personal hygiene, laundry, cleaning and food preparation



Safe waste management at health centre

Sufficient quantities of safe water for handwashing, personal hygiene, laundry, cleaning and food preparation



Latrines/toilet

Patients, staff and care givers able to use a toilet without contaminating the health centre or its water supply



Cleaning

Visibly clean health centre



Communications

Phone or radio to communicate with district clinician and management team, mentor



Power

Electricity for essentials (mobile phone, microscopy, emergency lights)



Fire safety

Fire extinguisher or sand

reflects WHO essential environmental health standards for health care settings. Improving ventilation, cough hygiene and patient flow for TB infection control are particularly important and urgent since these interventions will also prevent the transmission of other respiratory infections. Most interventions for HIV infection control will also reduce transmission of other blood-borne infections such as hepatitis B.

These infrastructure interventions need to be accompanied by providing information about and promoting hygiene with staff, patients, and care givers so that they are knowledgeable about essential necessary behaviours to limit disease transmission at health facilities and in the home.

5.2 SPACE NEEDED FOR HIV SERVICES (INTEGRATED WITHIN PRIMARY CARE)

Determining the space requirements will depend on how many HIV patients you have or anticipate having, how many are on ART, and the room size. Based on the size of your HIV patient population and your staff, decide whether:

- outpatient HIV services will be fully integrated with other basic services (patients returning for chronic care are mixed with other patients attending for other problems), or;
- you will have a special ‘HIV clinic’ either full-time or part-time. For example, providing an integrated ‘HIV clinic’ one day a week for routine continuity of HIV services should be sufficient for 100 HIV patients. Additional HIV patients will require more HIV clinics per week, or more space.

This decision will dictate the amount of space required and how it is configured.

Planning for adequate space for HIV services within a health centre must accommodate the reality of existing basic clinical services. Table 2 (over) presents the suggested minimum space requirements. The *Operations Manual Adaptation Guide* provides additional details and guidelines for district planners and managers to determine optimal space use.

Table 2. Suggested space requirements for HIV/AIDS services at the health centre*

| Functional spaces | Quantity | Dimensions (minimum) | Remarks |
|---|---|--|--|
| Waiting area | One | | <p>Careful attention to ventilation required to minimize nosocomial transmission of TB</p> <p>Adequate waiting space for an additional 25 visits per 250 PLHIV in care, including room for stretchers and/or wheelchairs</p> <p>Additional waiting space may be needed near counselling, laboratory/phlebotomy and pharmacy venues if these are not near the OPD</p> |
| Registration/triage area | One | 1.5m x 1.5m (2.25m ²) minimum; optimal 9m ² | |
| Medical records/HMIS | One | 1.5m x 1.5m (2.25m ²) | |
| Consultation – exam rooms | Three minimum + one for every 250 to 500 additional HIV-positive patients | 3.0m x 3.0m (9m ²) minimum; optimal 16m ² | Consultation-examination rooms used for ANC, family planning, OPD, EPI, MCH, under-5, TB/DOTS and HIV services and counselling and testing |
| Labour and post-partum room | One | 3.0m x 6.0m (18m ²) | Small health centres may not have labour and delivery services |
| Delivery room | One | 3.0m x 6.0m (18m ²) | A bathroom should also be easily accessible |
| Counselling rooms – HIV counselling and testing (CITC, PITC), adherence, psychosocial support | Three minimum + one for every 250 to 500 additional HIV-positive patients | 1.5m x 1.5m (2.25m ²) | <p>Counselling requires visual and auditory privacy, but may otherwise include less formal spaces, such as booths, tents, and outside (covered) areas</p> <p>Testing and counselling may be conducted in a number of different private spaces, including allocated rooms and other spaces</p> |

| | | | |
|--|-----|--|--|
| Group counselling space | | Large room or covered outdoor space for 20–50 people | May be outside (covered) space or in waiting area. For group counselling, support group meetings, and peer education/ support groups |
| Laboratory – analysis of specimens | One | 3.0m x 3.0m (9m ²) | Minimum of one metre of working surface for each individual, each piece of equipment, and for staining. Rapid testing may be conducted in consulting or counselling rooms provided a work surface is available |
| Phlebotomy/side laboratory | One | 2.0m x 2.0m (4m ²) | May not be a separate room, but you need to identify sufficient space for phlebotomy and ensure its rational layout in relation to the laboratory and clinic |
| Specimen labelling, preparation, results | One | 1.5m x 1.5m (2.25m ²) | Usually within the lab |
| TB sputum collection | | Open air | Conducted in the open air |
| Pharmacy/dispensary | One | 3.0m x 3.0m (9m ²) | With compounding space, sink, dispensing/counselling area |
| Pharmacy stores | One | 1.5m x 1.5m (2.25m ²) | The store needs to be large enough to fit all supplies. It should be a room or, in the case of a very small health centre, a cupboard or cabinet that is kept locked |
| Toilets – staff | Two | 1.5m x 1.5m (2.25m ²) | |
| Toilets – patients | Two | 1.5m x 1.5m (2.25m ²) | Use one for urine collection |

* Adherence and psychosocial rooms can be used for counselling and testing during the initial scale-up of PITC before there is a large patient population in care and treatment.

5.3 PRIVACY AND CONFIDENTIALITY

Unfortunately, profound stigma continues to surround HIV infection, which means that attention to patient confidentiality is very important. It is important for health centres to maintain the privacy of HIV clinics and ensure that a person's HIV status is not identifiable to others in any way.

Examples include:

- Signage that is discreet, as well as clear and helpful. Patients may be more likely to attend a clinic labelled 'family care clinic,' 'comprehensive care clinic,' or even 'infectious diseases clinic' than one labelled 'HIV/AIDS clinic.'
- Appointment systems that shield patient's names from view (of the public/or other providers). Appointment books need to be considered private medical records, and whenever possible health centre staff need to avoid calling out patients' names in public areas such as waiting rooms. How is this possible? HIV-positive and HIV-negative patients need to be processed in the same manner (e.g. their names called out in the same way) so that their status is not identified by others in the waiting room.
- Medical records that minimize accidental or involuntary disclosure of HIV infection. A patient's HIV status needs to be clearly indicated on their medical charts; however, this marking needs to be discreet to avoid unnecessary disclosure. Patient medical records need to be secured at all times. Colour-coding or obvious marks that designate HIV status on patient-held records need to be avoided. In addition, written referrals to services such as radiology and laboratory testing need to look as much like referrals from other areas of the health centre as is feasible. For example, simple codes may be used to record HIV status, CD4 counts and ARV drugs dispensed on patient-held maternal health cards.

These concerns need to be balanced with the efforts to normalize HIV infection as a chronic disease and to emphasize the confidentiality that applies to all clinical care within a health centre.

- You are strongly encouraged to seek feedback from PLHIV on the issues of privacy and stigma. The ability to gain PLHIV input will vary from facility to facility. In some cases, including PLHIV on community advisory boards will be the best way to obtain information, while in others, focus groups or less formal methods may be equally revealing. See chapter 4, *Community* for more details.

5.4 TB INFECTION CONTROL



TB infection control at the health centre is a very high priority to prevent transmission of TB between patients and to health workers. WHO and the StopTB Partnership have just released a 10-step programme for TB infection control. The version below to health centres:

10 Essential actions for effective TB infection control: safety without stigma

- 1. Include patients and community in advocacy campaigns.** The community needs to be well-educated about TB infection, prevention and control. Patients need to understand that they will be better off if they know their HIV status, may be eligible for isoniazid preventive therapy (IPT), and have a right to rapid TB diagnosis and treatment. They need to know that TB can be spread by coughing, and to expect health settings and community services to require people who are coughing to cover their mouths when doing so. They need to understand that health workers may wear personal respiratory protection sometimes, or that patients may be asked to wear a mask in order to protect others. Safety without stigma should be the goal. A request to wear a mask or provide a sputum outside the centre, or in a well-ventilated room should not be stigmatizing, but should seem as part of a safer clinic for everyone. Patient and health worker safety may include receiving health care in the community to avoid unnecessary admissions to health care facilities. Information, education, and communication (IEC) campaigns need to include themes such as “Our community is TB-safe”, or “Our health facilities are stopping TB”.
- 2. Adapt an infection control plan.** Each health centre should have an infection control (IC) plan and a staff person or team responsible for IC. The plan identifies high-risk areas for TB transmission, and provides information on TB and HIV rates for health workers and patients. The plan provides area-specific infection control recommendations for the health centre, including special standard safety procedures for its laboratory.
- 3. Ensure safe sputum collection.** Sputum collection can be potentially hazardous for health workers and other patients. Workers need to explain to patients that safety without stigma is the goal of good TB infection control. They need to stress that sputum need to be collected outdoors if feasible (see chapter 8, *Laboratory*).
- 4. Promote cough etiquette and cough hygiene.** In at least the waiting area, every health centre should have a poster on TB infection control and cough

etiquette (see figure 3) When coughing, patients need to be instructed to cover their mouths and nose with hands, a cloth such as a handkerchief, a clean rag, tissues, or paper masks. All staff are responsible for safety and are advised to work together to help patients adhere to this practise.

- When tissues, cloths or face masks are not available, patients need to be instructed to lift their arm up and cover their nose and mouth with the inner surface of the arm or forearm when they cough or sneeze.
- No-touch receptacles for disposal of used tissues and masks should be available in the waiting areas.

5. **Triage TB suspects for ‘fast-track’ or separation (see also *Service integration chapter*).** Screen all patients on arrival for chronic cough (i.e. >two to three weeks), fever, weight loss, night sweats, haemoptysis, or contact with a person with TB. Explain to all health centre visitors that safety without stigma is the goal, and that the screening is part of quality care. Patients need to understand that it is in their interest to know their HIV status, that they may be eligible for IPT and have a right to rapid TB diagnostic services and treatment. Individuals suspected of having TB should be ‘fast-tracked’ for rapid diagnosis and care services, or should be asked to wait near an open window, or in a comfortable area separate from the general waiting room (outdoors when possible). When possible, use community-based treatment. Patients with known or suspected drug-resistant TB should be separated from other TB suspects.
6. **Assure rapid diagnosis and treatment initiation.** Patients suspected of having TB should move to the front of the queue for all services and need prompt evaluation for TB. (This preference does not put them before patients with emergency problems such as difficulty breathing or bleeding). Sputum collection should be done away from other people, and specimens sent to a quality-assured laboratory for AFB (acid-fast bacillus) smear and culture (when possible). Turn-around time for sputum AFB smear results should be no more than 24 hours if testing is done on-site. A patient-tracking system assures that TB suspects who are AFB smear-negative receive additional procedures (e.g. chest x-ray and referral visits), or treatment as quickly as possible. DOTS treatment for TB begins immediately when TB is diagnosed, and a plan for assuring adherence to treatment is developed. All people with HIV who are not TB suspects should be eligible to start on IPT.
7. **Improve room air ventilation.** Patient waiting areas should be open and well-ventilated. This includes leaving windows and doors open when possible

to maximize cross ventilation. Appropriately placed simple fans can assist ventilation. When weather permits, open-air shelters with a roof to protect patients from sun and rain are recommended. Patients should not wait for services in narrow, poorly ventilated corridors. When health centre renovations are being carried out, the management team should consider TB infection control as integral to new building plans.

8. **Protect health workers.** Health workers should know the symptoms of TB and be given a health assessment including screening for TB and HIV at least every year. All workers are encouraged to know their HIV status, and those with HIV infection should be given the opportunity to minimize exposure to people with TB, e.g. offered a change of duties. HIV-infected workers should be screened for isoniazid preventive therapy as part of basic HIV care and treatment.
9. **Capacity building.** All health workers should receive TB infection control training, and be engaged in improving their own and patient safety. This training may be combined with other infection control training (see *Human Resources* chapter).
10. **Monitor infection control practises.** Overseeing infection control practises should be a part of every supervisory visit. This should include a facility tour to check that IC is being implemented and that all essential IC supplies are available. At the very least, facilities should have an IC plan. When feasible, monitoring annual TB cases among health workers can also provide useful information on transmission of TB in facilities. Surveillance of TB disease among health workers is another means of evaluation. Additional on-site measures include examining medical records of a sample of TB patients, looking at the time interval from admission to suspicion of TB, time to ordering sputum for AFB, time from ordering to collection of sputum, collection of sputum to reporting of results, to initiation of TB treatment and interviewing patients to discuss their understanding of infection control, safety and stigma.

How to promptly identify TB suspects in the waiting areas

Before patients enter an enclosed part of the facility, a designated staff person should ask each adult and any child capable of coughing forcefully (usually age 14 or older) about symptoms or recent history of TB. The questioning should occur before patients wait in line for long periods to register or obtain services. Attention should be paid the patient's right to privacy, and screening should be conducted in a manner that is sensitive to the issues of stigma that may surround TB.

Simple screening questions are:

“Do you have a cough?”
If patient answers “yes”, ask:
“For how long have you been coughing?”

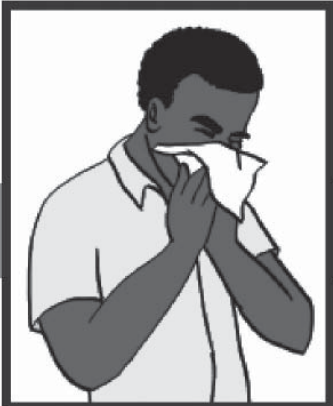

An adult who has coughed for two weeks or more may be considered a ‘TB suspect’ for pulmonary TB. To determine whether a patient may be under investigation, or is a diagnosed case of TB who may still be infectious, the staff member needs to ask:

“Are you being investigated or treated for TB?”

If the answer to either is “yes,” the person doing the screening classifies the patient as a TB suspect or case.

Protect Health Workers

Cover your cough or sneeze



Cough or sneeze into your arm **or** **Use a tissue and then throw away**

Figure 3. General medical out-patients waiting room

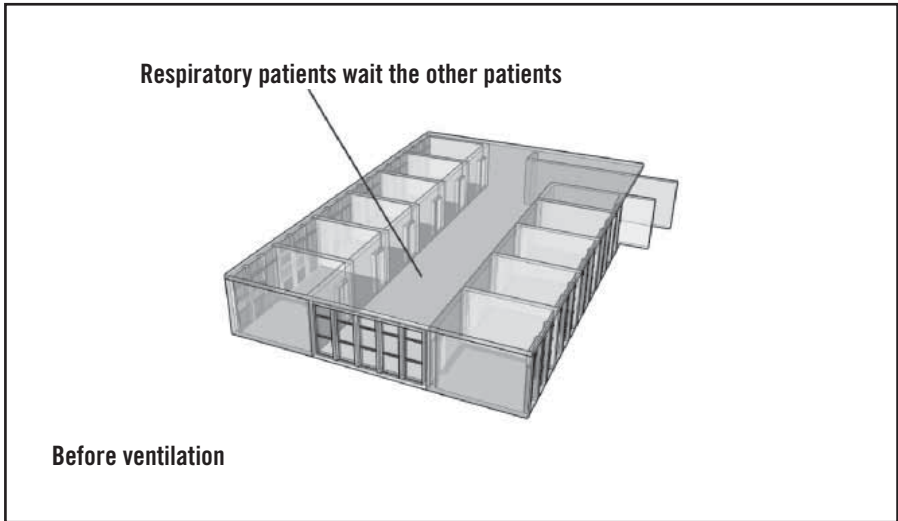
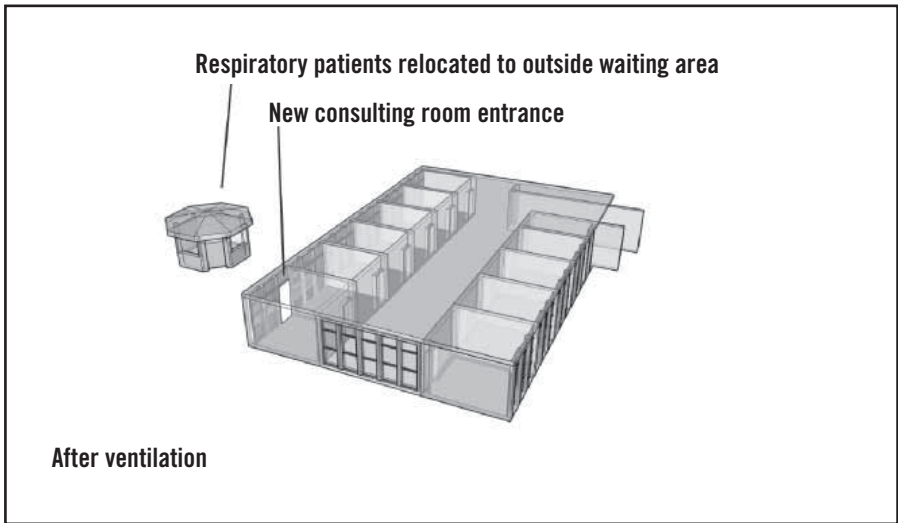


Figure 4. General medical out-patients waiting room



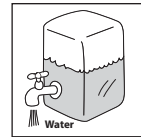
Courtesy of: Dr Rod Escombe; Imperial College London

5.5 HIV INFECTION CONTROL

Minimizing occupational and nosocomial exposure to HIV is also dependent on work practise and administrative controls, including training and supervision in injection safety, and in the safe and appropriate use and disposal of sharps. Additional environmental controls include ensuring adequate and appropriate space and layout for phlebotomy services and areas; accessibility of sharp disposal containers; personal protective equipment for staff; and the availability of post-exposure prophylaxis. More detail on this can be found in the *Human Resources* chapter.

5.6 WATER SUPPLY AND WASTEWATER

Both the quantity and quality of water and safe disposal of wastewater are important in health centres.



Water quantity

Water quality is a key element of infection control within health facilities. Particular care is needed to ensure that immunocompromised patients have access to safe drinking water, given their high susceptibility to infection. It is essential that the water presents no risk to health, and that it is protected from contamination inside the health setting. The following section assumes the health centre has a supply of safe water always available.

Provide safe drinking water from a protected groundwater source (spring, well or borehole), or from a treated supply, and keep it safe until it is drunk or used. Untreated water from unprotected sources can be made safer by simple means such as boiling or filtering, chlorination and disinfection.

Water quality is also important for food preparation, pharmacological and treatment applications, and for bathing.

It is particularly important to provide adequate water for hand washing at multiple sites in the health centre (see next section).

Non-potable water (water that is below drinking-water quality) should be used only for cleaning, laundry, and sanitation.

Water quantity

Water quantity is a major factor in meeting all essential needs of the health centre, especially those which require large daily supplies, such as laundry and basic floor, bed and clinical equipment cleaning.

The actual quantities of water required will vary depending on climate. But when considering local water-use practises for health centre infrastructure (toilets or latrines and laundry facilities), WHO estimates a health facility requires approximately five litres of water for every outpatient visit. This includes water used for all purposes: hand washing, cleaning, laundry and drinking. Water storage is also important and experience suggests that when possible, facilities should have a three-day supply of stored water (cistern or other).

| Minimum water quantity required ¹ | |
|--|---------------------------|
| Outpatients | 5 litres/consultation |
| Inpatients | 40–60 litres/patient/day |
| Operating theatre/maternity | 100 litres /intervention |
| Dry supplementary feeding centre (depending on waiting time) | 0.5–5 litres/consultation |
| Wet supplementary feeding centre | 15 litres/consultation |
| Inpatient therapeutic feeding centre | 30 litres/patient/day |

¹ These guidelines include water used for all purposes: hand hygiene, cleaning, laundry, drinking and cooking. The figures should be used to plan and design water-supply systems. The actual quantities of water required will depend on several factors such as climate, availability and type of water-use facilities (including type of toilets), level of care and local water-use practises.

An increase in water quantities may involve only minor modifications in piped supplies, or expansion of pumping rates. However, in many cases major supply increases may require costly infrastructure investments in new water sources (wells, boreholes, river intakes, etc.) or water collection facilities (ponds, reservoirs, storage tanks). Any decision to expand a water system will need to consider current and future needs, water quality, available water resources and costs.

Waste water disposal

Wastewater is produced from washbasins, showers, sinks, etc. (grey water) and from flushing toilets (black water).

- Wastewater should be removed rapidly and cleanly from the point where it is produced.

- Wastewater drainage from health settings should be built and managed to avoid contamination of the setting or the broader environment.
 - Wastewater should be removed in standard waste drainage systems to off-site sewers or on-site disposal systems.
 - It is best if the health centre wastewater can be connected to a properly built and functioning sewer system, which is in turn connected to an adequate treatment plant.
 - If the sewer does not lead to a treatment facility, an on-site retention system with treatment will be necessary before wastewater is discharged.
 - Open wastewater drainage systems should be covered to avoid the risks of disease vector breeding such as mosquitoes, and contamination from direct exposure.

- Small quantities of infectious liquid wastes (e.g. blood or body fluids) may be poured into sinks or toilets. Most pathogens are rendered inactive by a combination of time, dilution and the presence of disinfectants in the wastewater.

- Toxic wastes (e.g. reagents from a laboratory) should be treated as health-care waste. They should not be poured into sinks or toilets that drain into the wastewater system.

5.7 HAND WASHING AND OTHER HYGIENE PRACTISES

Provide water for hand washing after going to the toilet/latrine, before handling food, and before and after performing health care. This may be done using simple and economical equipment, such as a pitcher of treated water, a basin and soap or wood ash in some settings. This should be available for every clinical consultation room; in labour, delivery, postpartum, and other inpatient areas such as in the laboratory, near waste disposal areas and near the latrine/toilet.



Hygiene basics

- Basic hygiene measures by staff, patients and carers (hand washing in particular) should not be compromised by lack of water.

- Water (with soap or a suitable alternative) needs to be available at all critical points, and located close to users in order to encourage them to use water as often as required.

- Train staff on infection control procedures.

Infection control is a key component of health worker training and supervision. Hand hygiene is particularly critical, and should be facilitated by ensuring easy access to hand washing facilities and supplies (soap, disinfectants) and through ongoing education and surveillance. In larger settings, non-clinical staff such as cleaners, waste technicians, and kitchen staff are also responsible for infection control, and should be able to apply ITS basic principles to their daily work.

Promoting correct hygiene is important for staff, patients and care givers. All should receive ongoing reminders of the routine measures required to prevent the spread of infections, whether in the health facility or at home. This education may be as simple as identifying the location and correct use of toilets and hand washing points. Managers should stress that promoting hygiene is intended to change personal behaviours that enable the spread of infectious organisms. Without behaviour change by all stakeholders at the health facility, hygiene – both personal and institutional – will not lead to safe and healthy conditions.

5.8 LATRINES/TOILETS



This may entail measures as basic as digging simple pit latrines. (Note that the risk of transmission of soil-based helminths is increased with the use of defecation fields. Wearing shoes or sandals provides protection from hookworm infections).

Basic requirements for latrines/toilets at a health centre

- Number of latrines/toilets – four: one for staff (two if separate toilets are required for male and female staff); one for male patients; one for female patients; one for young children. In large health centres, more toilets or latrines are required. The number required depends on several local factors including the average time patients wait before consultations latrines/toilets.
- Design to respond to local cultural and social conditions (e.g. anal cleansing with water).
- Equip patient toilets to make them easy to use by people with physical handicaps, heavily pregnant women, elderly people and people who are sick².
- Children's toilets are particularly useful where latrines are used, and where the size of the drop-hole and the conditions inside a normal latrine are off-putting for children, or inconvenient for carers.

² See Jones and Reed 2005 for detailed design features.

- Signpost toilets/latrines clearly to help users find them.
- Water points, with soap and adequate drainage should be provided at the exit of all toilets, and their use should be actively encouraged.
- Design, build and maintain toilets/latrines so they are hygienic and acceptable to use and do not become a source for disease transmission:
 - Measures to control fly and mosquito breeding are needed;
 - A regularly monitored cleaning schedule is required.

Minimize the risk of violence (including sexual violence). Latrines/toilets should be carefully located, with locks for the user (to protect people while using them), and with lights for use at night (both the toilet and access areas).

5.9 CLEANING

Management needs to provide cleaning supplies that enable staff to routinely clean surfaces and fittings to ensure the health-care environment is visibly clean and free from dust and soil. Ninety per cent of microorganisms are present within “visible dirt”. The purpose of cleaning is to eliminate this dirt.



5.10 HEALTH CENTRE WASTE MANAGEMENT

- Use appropriate standard precautions at all times in handling wastes (see IMAI or IMPAC or other clinical guidelines).
- Segregate at the point of generation the four categories of waste (sharps, non-sharps infectious waste, non-sharp non-infectious waste, and hazardous waste):
 - Have three colour-coded containers at convenient locations in all work areas.
 - Keep hazardous waste containers in lab and pharmacy.
- Train all staff in waste management.
- Make sure waste treatment and disposal happen properly and consistently:
 - Properly identify waste packages to warn health personnel and waste handlers about their contents.
 - Locate the waste-disposal zone at least 30 metres from groundwater sources.
 - Fence off the waste-disposal zone.



- Put a water point with soap/detergent and disinfectant to clean and disinfect containers, next to the waste treatment and disposal area with a soak-away system or sewer for wastewater disposal.
- Discuss with the appropriate local authorities the efforts that are underway to reduce waste management risks, and try to obtain their support for additional measures if necessary.
- Health care waste workers should be immunized against HBV




Table 3. How to set up three colour-coded waste containers for most rooms in the health centre (plus a hazardous waste container in the pharmacy and laboratory only)

| Waste category | Segregate using colour-coded waste containers | Collect | Dispose |
|--|--|--|---|
| <i>Sharps</i> (needles, scalpels, etc.) – infectious or not | YELLOW Safe sharps container <ul style="list-style-type: none"> • puncture-proof • covered • closable • upright and stable during use • leakproof at sides and bottom • clear label for user | Close lid or cover, seal with tape, and submit for waste pickup when they are no more than $\frac{3}{4}$ full. Never overfill or force items into these containers Collect regularly for disposal | <i>Sharps</i> should be disposed of in a sharps pit (buried drum in small centres or emergency structures, concrete-lined sealed pit in other settings) Off-site disposal may be necessary for safe incineration at the district hospital (if available) or a private facility in charge of collection and treatment |
| <i>Non-sharps infectious waste*</i> (anatomical waste, pathological waste, dressings, used syringes, used single-use gloves) | YELLOW or RED bags or containers 15–40 litre capacity with lids | Should be collected, emptied, cleaned, disinfected and replaced after each intervention (e.g. in an operating or maternity unit) or twice daily The bags should not be cleaned and reused | <i>Non-sharps infectious waste</i> should be buried in a pit fitted with a sealed cover and ventilation pipe for on-site treatment in small health centre settings or, on-site or off-site high-temperature incinerated or steam sterilized. Special arrangements may be needed for disposing of placentas, according to local custom |
| <i>Non-sharp, non-infectious waste</i> (paper, packaging, etc.) | BLACK containers 20–60 litre capacity | Should be collected, emptied, cleaned and replaced daily; alternatively, plastic bags may be used inside the containers | Joins the municipal waste stream or buried in a pit, a landfill site or non-food and non-medical items recycled. If space is limited, it should be incinerated. Ashes and residues should be buried in a pit |

* Cholera stools, body fluids from other highly infectious diseases.

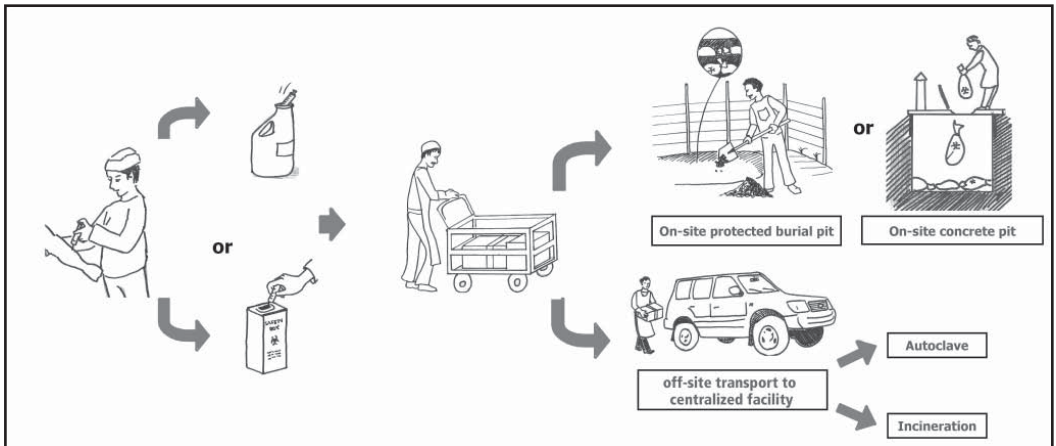
Table 4: Hazardous waste container

| Waste category | Waste containers | Collect | Dispose |
|--|---|--|--|
| Hazardous waste.*  | Appropriately labelled containers placed in secure location | Health centres produce very small quantities of this waste. These can be stored in a small, labelled container at the pharmacy | Send to district hospital or another central health facility for specific treatment and disposal Manage stock of chemicals and pharmaceuticals well to reduce waste quantities and save on purchase costs |

* Hazardous waste includes some outdated drugs, laboratory reagents, strong disinfectants; radioactive waste, batteries, mercury, etc. Each hazardous waste requires specific treatment and disposal methods based on national regulations.

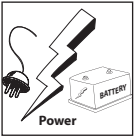
Transport sharps boxes to a treatment facility

High temperatures (e.g. steam or incineration) kill microorganisms and reduce the volume of waste. Some hospitals have on-site treatment facilities; health centres usually do not, but may be able to transport full sharps boxes for treatment elsewhere. Sharps disposal requires special facilities and personnel. Health facilities can try to use waste treatment options available at other facilities such as cement factories for incineration or municipal centralized facilities.



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5.11 POWER



All health centres need some electricity. Ambient light can be used during the day for most tasks, but emergency lights, electricity to charge a mobile phone, and (in health centres performing malaria or sputum microscopy) minimum levels of electricity for a microscope are required. These can be powered or recharged from the mains electricity supply or, if this is not available by:

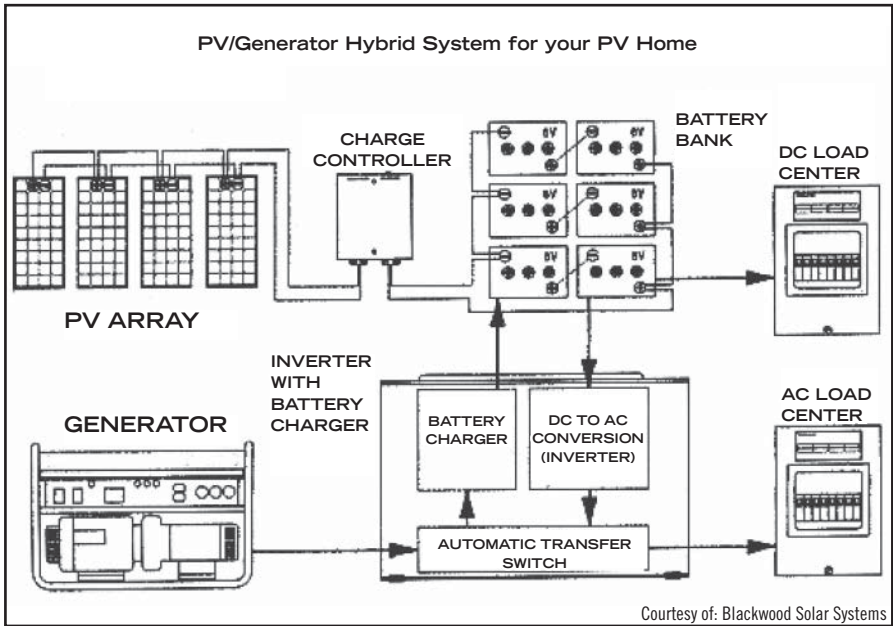
- solar panels;
- generator;
- using a vehicle battery. (This is an option when a vehicle is regularly available and a second battery can be installed).

How you achieve temperature control in your pharmacy storage area will also influence your power needs:

- First, use methods that do not require power: add ceiling and air vents; keep windows and doors open.
- Second, add a fan.
- If an air conditioner is needed, it will require significant energy.

The reagents for essential laboratory tests, and drugs required for services described in this *Manual* (including first-line ARV drugs) do not require refrigeration. If possible, avoid formulations and laboratory reagents which require refrigeration beyond what is needed for the cold chain for vaccines. If a refrigerator is required, it can be run on propane, or from a bank of batteries (referred to as a solar refrigerator).

Decisions need to be made based on the power required and the times of the day it is needed (total possible load). See Annex 5.1 for a guide to estimate the power requirements at your health centre.



If batteries are used as the main power source, decisions need to be made as to whether AC electricity is generated via an inverter (with about a 10% loss in energy) or direct current is used (see *Operations Manual Adaptation Guide*).

5.12 COMMUNICATION INFRASTRUCTURE

It is essential that the clinical team has the physical means to communicate with each member and to consult on side-effects, other complications, etc. The centre must have reliable distance communication between it and the district-based medical officer (also a part of the clinical team). Furthermore, clinical mentors need to be available to offer advice by cell phone, landline or radio.



This is particularly important when initiating ART in uncomplicated patients at the health centre, under the supervision/standing orders/prescription of the medical officer. In addition, if oral morphine is used in palliative care, communication may be needed between the palliative care nurse-specialist or district medical officer able to prescribe the drug, and health centre staff that are providing medical back-up to home-based care.

Distance communication is also important for transmitting management information and laboratory test results.

Ways to improve distance communication

■ Telephone:

- Mobile telephone networks are an alternative when landlines do not exist. If reception is poor, explore whether an antenna can augment the signal.
- Blocked SIM cards can be provided which only allow calls between the health team and the hospital clinician, district management team, warm lines (see below for explanation), etc. This can be an effective way to provide air time to health workers.
- Another solution is a system using SMS: you send an SMS to the district clinician or other mentor, who then calls you back and answers your question. SMS can also be used to transmit laboratory and other data. Computer systems exist which can organize SMS messages between the district hospital laboratory and sites.
- A warm line is a telephone number that you call and someone calls you back. Some countries have warm lines available for consultation on ARV therapy and OI management, poisons, palliative care, etc.
- A phone log should be kept to record clinical consultations.

■ Citizen's Band (CB) radio – a cheap and effective method of communication.

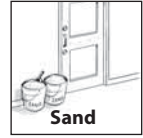
■ Runners – send messages with truckers and others regularly driving near the district hospital.

■ E-mail – may be feasible in some settings, but can be burdensome to health workers who are not used to typing, particularly if there is a language barrier with the mentor, and when internet connections are very slow.

Encourage health workers on your clinical team to use the above methods to ask questions about difficult cases. Provide clear instructions about when to consult and how to present the case (these are included in IMAI basic HIV/ART training). Confused presentations over a phone or radio can create frustration on both sides, with the result that the health worker becomes reluctant to continue calling for advice.

5.13 FIRE SAFETY

Make sure you have a functional fire extinguisher or at least buckets of sand.



How to use a fire extinguisher:



1) Remove safety clip



2) Aim at base of fire



3) Squeeze



4) Sweep

INFRASTRUCTURE BY HEALTH CENTRE AREA

For laboratory infrastructure, see chapter 8, *Laboratory Services*.

5.14 WAITING AREA INFRASTRUCTURE

Often HIV patients need to see several providers on a single visit, increasing their potential waiting time. Considerations for waiting area infrastructure include attention to space, ventilation, comfort and rational layout that facilitates links within the health centre, and decreases waiting time.

Ventilation: Well-ventilated waiting areas are a key element of the environmental control measures needed to minimize transmission of tuberculosis. If the climate permits, covered outdoor waiting space is preferred to enclosed indoor areas. The use of benches in unventilated hallways is particularly discouraged. If naturally ventilated space is not available, the addition of extra windows and/or the use of fans can be a simple and effective way to enhance ventilation. As described above, coughing patients with known or suspected TB should be separated and triaged for rapid evaluation to minimize their time waiting in crowded areas.

Comfort/safety/privacy: Attention to simple issues can have a significant impact on patient comfort. In many facilities, patient education, counselling and IEC materials are provided in waiting areas to enhance the patients' knowledge and skills and to minimize boredom. As noted above, thoughtful attention to issues of privacy and stigma is important throughout the health centre. For example, the use of a separate waiting area for patients with HIV can run the risk that their HIV status may be disclosed in an involuntary manner. The same caution applies to the practise of only calling HIV patients' names in the waiting area.

Waiting area infrastructure

| Comfort/safety/privacy | Furnishings | Equipment and supplies |
|---|---|--|
| Well-ventilated, covered outdoor waiting space, or very well-ventilated indoor area with adequate space, and windows with window fans. Coughing patients should be separated and triaged for rapid evaluation to minimize time in crowded waiting areas | Fan(s) if needed Sufficient bench space for patient load at peak times | Educational posters, written/pictorial IEC materials. Where available, TV/VCR with IEC materials |
| Effective roofing, shelter from sun as needed, and access to toilet and hand washing facilities | | Condom dispenser |
| Play area for children | | |

5.15 TRIAGE, REGISTRATION, PATIENT MONITORING INFRASTRUCTURE

Introducing HIV/AIDS care and treatment services into a health centre requires setting up (or expanding) appointment and registration systems. Patients must be identified, visit registers completed, and patient medical records folders retrieved and prepared. In addition, many clinics conduct initial triage at the time of registration by using a simple symptom checklist (often focusing on the presence/absence of cough or new symptoms or illness to determine fast track procedures), and by measuring vital signs.

Registration and triage may take place within the waiting area, or in a nearby room or rooms as space permits and privacy dictates.

Triage infrastructure

| Comfort/safety/privacy | Furnishings | Equipment and supplies |
|--|---|--|
| The ventilation, comfort and security issues described above apply equally to waiting and registration areas | Desk or table Two chairs Filing cabinets that can be locked, or similar shelving/storage to organize patient files. | See medical record supplies below When vital signs are taken at triage <ul style="list-style-type: none"> • adult and infant scales • thermometer • sphygmomanometer • stethoscope Condom dispenser |

An adequate patient monitoring system requires a designated desk or table space where patients are enrolled into HIV care. This is where a new medical record or patient card is opened for the patient being enrolled, and where information is transferred from the card to the registers simultaneously, or at the end of the day or week. This may be combined with the triage/registration area or be located near it.

Individual patient medical records should be organized in a logical way, generally by patient ID, whether unique or facility-specific. The records should be kept in locked filing cabinets or shelves in a room that can be locked. Registers should also be kept in a secure location (see chapter 6, *Monitoring Services* for a description of generic forms and registers, for country adaptation).

Registration for chronic HIV care and patient monitoring infrastructure

| Comfort/safety/privacy | Furnishings | Equipment and supplies |
|--|--|--|
| Locked storage | Desk or table | Blank patient cards (facility- and patient-held, as relevant for HIV care/ART, TB, ANC) |
| Visual and auditory privacy when patient information is being conveyed | Two chairs | Other forms such as laboratory requests, prescription forms, transfer or referral forms, etc |
| | Filing cabinets that can be locked, or similar shelving/ storage to organize patient files | Any and all facility-held registers, appointment books, blank reporting forms, etc |
| | | Calculator |

5.16 GROUP EDUCATION AND SUPPORT INFRASTRUCTURE

Experience shows that facility-based patient education and patient support groups can be highly effective means for providing pre-test information, support adherence, decreasing stigma, and transferring important ‘positive living’ skills. If possible, these groups need space at the centre for carrying out their work. If available, large rooms or covered areas with space for 20–50 people can be valuable resources for such group counselling and support services.

The availability of space for community NGOs active in providing home-based testing, care and treatment support is also desirable.

Group education and support infrastructure

| Comfort/safety/privacy | Furnishings | Equipment and supplies |
|-----------------------------|-----------------------|---|
| Comfortable seating | White- or black-board | Adapted patient information materials (posters, brochures, hand-outs) and counselling support tools (flip charts, diagrams) |
| Visual and auditory privacy | | Demonstration tools including male and female condoms and penis model |
| Well ventilated | | Condom dispenser |
| | | Adherence support tools (pill boxes, etc.) |
| | | Optional <ul style="list-style-type: none"> • TV/VCR • videotapes or DVD |

5.17 CLINICAL CONSULTATION ROOM INFRASTRUCTURE

The essential elements of a clinical consultation are a thorough medical interview and a complete physical examination.

Space requirements for clinical consultations: Most national and international guidelines recommend that patients with early HIV disease ('pre-ART' patients) return for clinical assessments every three to four months, and that patients with advanced disease and those on ART return monthly until stabilized on treatment; then after that, every three months. These recommendations enable some general estimates regarding patient load and visit frequency.

- Expect roughly 33–63 visits per week for each 250 HIV-infected patients enrolled in chronic HIV care.
- A single clinical consultation room, fully staffed and dedicated to HIV services five days a week, can accommodate roughly 125–150 patient visits/week, or – using the assumptions in chapter 1 – can handle a total of approximately 750 PLHIV who are receiving chronic HIV care.

These estimates provide the basis for the recommendation that a health centre providing HIV services should have, at a minimum, three consultation rooms for all outpatient services for general medical care, with an additional room for each additional 250 to 500 patients enrolled in HIV care.

A health centre providing HIV services to 250 patients can expect 7–13 extra visits a day for clinical services. Assuming some additional visits will be required for laboratory, pharmacy, and counselling purposes means that this number will increase to an extra 20–25 visits/day.

As you scale up PITC and have more patients enrolled in HIV care, the relative use of counselling rooms for testing and counselling will change, compared with use of the rooms for adherence counselling and psychosocial support.

Clinical consultation infrastructure

| Comfort/safety/privacy | Furnishings | Equipment and supplies |
|---|--|---|
| <p>Auditory and visual privacy</p> <p>Well- ventilated</p> <p>Sink for hand washing in the room or next to it</p> | <p>Desk with a drawer that can be locked</p> <p>At least three chairs</p> <p>Examination table with privacy screen</p> <p>Hand washing area</p> <p>Fan, if needed</p> <p>Additional light source (standing lamp), if needed</p> <p>Three colour-coded waste containers</p> <p>Easy access to hand washing</p> <p>Optional</p> <ul style="list-style-type: none"> • bookcase • additional storage • cabinet that can be locked | <p>Clinical support tools for provider (clinical algorithms, dosing guides, desktop guides, posters, textbooks, etc.)</p> <p>Basic diagnostic set (stethoscope, thermometer, sphygmomanometer, stadiometer), hand washing supplies. (This assumes adult and infant scales are in the triage area)</p> <p>MUAC tapes</p> <p>Patient education materials</p> <p>Wall charts on HIV prevention</p> <p>Condom dispenser</p> |

5.18 COUNSELLING INFRASTRUCTURE

The need for counselling space is often underestimated by managers, creating barriers and bottlenecks to HIV service delivery. Although some counselling is often provided in the course of clinical consultation, facilities providing HIV services require additional individual space for the large range of counselling required to ensure the delivery of quality HIV services (see list below). Additional counselling infrastructure is required, both to support the scale-up of treatment and care, and for prevention scale-up.

Counselling within HIV services includes:

- HIV counselling and testing, accompanied by post-test prevention messages
- Adherence counselling
- Reproductive choice and family planning counselling
- Partner and couples counselling
- Discordant couples counselling
- Safer sex and risk reduction counselling
- Disclosure support
- STI counselling
- Counselling on adult male circumcision
- PMTCT counselling
- Infant feeding and nutrition counselling
- Psychosocial support
- Counselling for children and their caretakers
- Post-rape counselling

Counselling space can be shared, and the relative proportion of use for various counselling purposes will vary over time. Counselling space can be less formal than the space needed for clinical, laboratory or pharmacy services. It requires only auditory and visual privacy, and room for several people to sit comfortably. Less formal spaces that can be used include booths, tents, and outdoor (covered) areas.

For facilities with larger numbers of PLHIV, the diverse space needs for counselling require at least one additional room or space. It is also extremely helpful if a larger area is available for group counselling, support group meetings and peer education.

Depending on catchment area and anticipated volume of HIV testing, most facilities will need additional space for HIV counselling and testing (CITC and PITC). This space is most useful if it is located next to the clinical consultation rooms. Space is required to support both group and individual pre-test information and post-test counselling for PITC, as well as ongoing pre- and post-test counselling for client-initiated counselling and testing (CITC).

Every patient on ART should receive adherence assessment and support at each visit. Adherence counselling requires personalized attention, time for questions, explanations, pill counts and a pharmacy review. So it can take as much or more time than the clinical examination, even for experienced patients. Most facilities find that at least one adherence counselling area is required for each clinical consultation room used for HIV care and treatment.

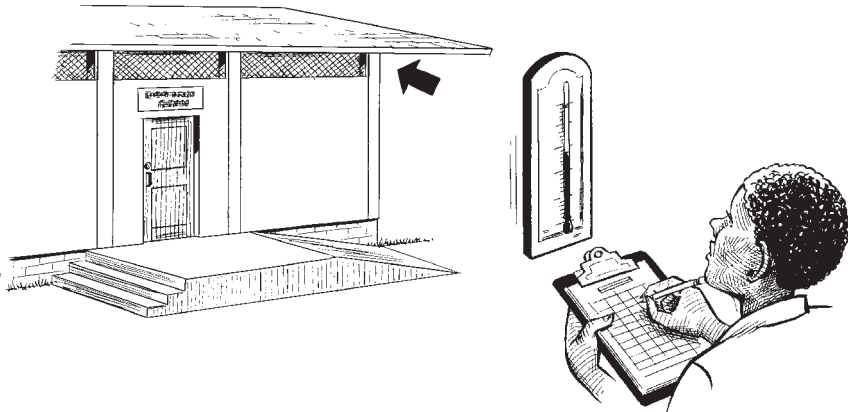
Counselling infrastructure

| Comfort/safety/privacy | Furnishings | Equipment and supplies |
|---|--|--|
| <p>Covered</p> <p>Well-ventilated</p> <p>Adequate lighting</p> <p>Space for at least three people to sit comfortably</p> <p>Protect privacy and confidentiality by</p> <ul style="list-style-type: none"> • good positioning within the facility – discreet signs • visual and auditory privacy | <p>Essential: Comfortable seating, fans (if needed), and supplemental lighting (if needed)</p> <p>Usually additional</p> <ul style="list-style-type: none"> • desk • bookcase • storage cabinets • white- or black-board <p>If offering point-of-service testing: chairs, desk or table for rapid testing and additional storage</p> <p>Three colour-coded waste containers</p> <p>Easy access to hand washing</p> | <p>Adapted patient information materials (posters, brochures, hand-outs) and counselling support tools (flip charts, diagrams, prevention wall charts)</p> <p>Demonstration tools including male and female condoms and penis model</p> <p>Condom dispenser</p> <p>Adherence support tools (pill boxes, etc.)</p> <p>Optional</p> <ul style="list-style-type: none"> • TV/VCR • Videotapes or DVD <p>Supplies for fingerstick testing and rapid HIV test and DBS collection in infants</p> |

5.19 PHARMACY/DISPENSARY INFRASTRUCTURE

The estimates in this category assume that HIV pharmacy services are integrated into the existing dispensary, with additional space for storing HIV-related drugs and supplies. It also assumes there is no refrigeration.

The pharmacy store has special requirements for the control of temperature, light, humidity/water, and pests:

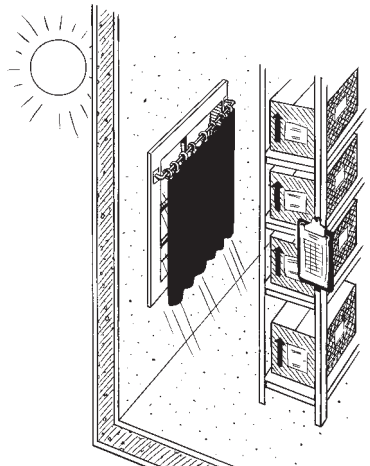


Control the temperature in the store

Check that there is a ceiling in the store. If there is no ceiling, build one. Consider using cardboard from discarded boxes. Allow warm air to escape by opening the door and windows while someone is in the store. Put air vents in the walls or ceiling. Depending on the temperature and humidity, a fan or air conditioner may be needed. Check the temperature twice a day and record the findings.

Control the light in the store

If direct light enters the store through windows, block it out by either painting the windows white or hanging curtains. Curtains should be white or reflective on outside rather than black or a dark color that absorbs heat.



Prevent water damage and control humidity

Check that there is good drainage. There should be drainage channels around your store. The roof should have gutters. Allow air to move freely. Secure the air vents and windows with bars embedded in cement or other security devices.

Keep the store free of pests including common pests such as rats, cockroaches, ants, bats and wasps. Spilled items may attract pests. Clean spills and remove broken containers immediately. Use metallic window screens to keep out insects. Keep boxes off the floor by storing them on shelves.

Pharmacy infrastructure

| Comfort/safety/privacy | Furnishings | Equipment and supplies |
|---|---|--|
| <p>Two locks on the room door, or a cabinet with different keys. Restrict access/limit the number of keys that are made, especially for areas where narcotics and expensive items are kept</p> <p>Inside the store, there should be an additional secured area where narcotics and expensive items such as antiretroviral (ARV) medicines are kept</p> <p>Additional private space for patient counselling by pharmacy staff in a dedicated counselling room adjacent to the dispensary, or private booths built at dispensary windows</p> <p>Special requirements for the control of temperature, light, humidity/water, and pests</p> | <p>Shelves to store supplies</p> <p>Shelves are an easy way to organize supplies*</p> <p>Three colour-coded waste containers</p> <p>Easy access to hand washing</p> <p>Hazardous waste container (expired drugs, laboratory reagents)</p> <p>Window screens</p> | <p>See detailed drug and commodity lists for health centre</p> <p>Condom dispenser</p> |

* If there are no shelves in your store, make temporary ones. Use cardboard boxes, stacked bricks and boards or pallets. Do NOT put boxes or boards directly on the floor as it may get wet.

5.20 OUTDOOR SPACE INFRASTRUCTURE

Ideally, the facility will also have sufficient outdoor space for parking/vehicle storage to support the diverse activities requiring transportation (community outreach, tracing patients who do not adhere to their medication regimens, specimen transport, supervisory visits, etc.). Outdoor space can also be used to provide surge capacity for emergencies, and to support the rapid growth of ‘informally housed’ services such as counselling, peer education, mobile health facilities, etc.

5.21 LABOUR AND DELIVERY INFRASTRUCTURE (FOR LARGE HEALTH CENTRES)

Labour, delivery, and post-partum care are not HIV-specific services, but integrated PMTCT interventions are crucial to HIV prevention.

Labour and delivery units in health centres should ensure they use strict standard precautions to protect patients and health workers from infectious diseases. Health workers should have access to protective shoes, gowns, and masks. Delivery areas should be able to be cleaned easily and quickly (e.g. use plastic-covered delivery beds that can be easily cleaned between patients). As deliveries can occur outside of normal clinic hours, there should be storage areas within or easily accessible to labour and delivery units, where drugs and supplies (e.g. rapid HIV test kits, ARVs for prophylaxis) can be readily obtained at all times. Rapid HIV testing in labour units requires an efficient set-up.

Labour and delivery unit infrastructure

| Comfort/safety/privacy | Furnishings | Equipment and supplies |
|---|---|--|
| <p>Warm and clean room</p> <p>Hand washing</p> <ul style="list-style-type: none"> • Clean water supply • Soap • Nail brush or stick • Clean towels <p>Sterilization</p> <ul style="list-style-type: none"> • Instrument sterilizer • Jar for forceps • Curtains if more than one bed | <p>Wall clock</p> <p>Delivery bed: A bed with removable stirrups that supports the woman who is semi-sitting, or lying in a lateral position</p> <p>Clean surface (for alternative delivery position)</p> <p>Work surface for resuscitation of newborn near delivery beds</p> <p>3 colour-coded waste containers</p> <p>Receptacle for soiled linens and a bowl or plastic bag for placenta if not mixed with infectious waste</p> <p>Easy access to hand washing</p> | <p>Equipment</p> <ul style="list-style-type: none"> • blood pressure machine and stethoscope • body thermometer • fetal stethoscope • baby scale • self inflating bag and mask – neonatal size • mucus extractor, suction tube • light source: torch with extra batteries, bulb • heat source if needed • room thermometer • delivery instruments • sterile scissors • needle holder • artery forceps or clamp • dissecting forceps • sponge forceps • vaginal speculum <p>Supplies</p> <ul style="list-style-type: none"> • clean bed linen • gloves: utility, sterile or highly disinfected, long sterile for manual removal of placenta • long plastic apron • urinary catheter • syringes and needles • IV tubing • suture material for tear or episiotomy repair • antiseptic solution (iodophor or chlorhexidine) • spirit (70% alcohol) • swabs • bleach (chlorine-base compound) • clean (plastic) sheet to place under mother • sanitary pads • clean towels for drying and wrapping the baby • cord ties (sterile) • blanket for the baby • baby feeding cup • impregnated bednet <p>Medical records</p> <ul style="list-style-type: none"> • partograph • labour record • L&D register |

5.22 HOW TO CREATE AN ENABLING PHYSICAL WORK ENVIRONMENT

Work Environment Improvement (WEI) is an important foundation for delivering quality health services. It also provides a basis for higher productivity. The 5 Ss (which stand for **SORT, SET, SHINE, STANDARDIZE, SUSTAIN** – see summary on next page) are a simple, standardized and universal managerial tool that can help your health centre team conduct Work Environment Improvement as a part of their routine work during working hours. This is one approach that can be adapted to the specific circumstances of a health centre.

Tips for improving your health centre work environment using the 5 Ss

- Mobilize all staff to participate.
- Explain advantages: workload reduction and avoiding unnecessary difficulties at work.
- Managers should take the initiative by doing small-scale WEI in their own office.
- Use non-monetary incentives.
- Avoid too much new information or too many sessions or additional hours after work.
- Start with a limited number of offices or rooms – make a showcase to demonstrate the advantages.
- Appoint a 5 S manager (this person should NOT be the actual health centre in-charge): one person should be the responsible person for the entire process of 5 S activities. Also appoint a committee.
- Avoid the usual hierarchy; construct a “sham-flat-organization”(all staff as peers). The 5 S manager should assess every area in the health centre, even that of the health centre manager.
- Top management and the 5 S manager can announce that a specific time in working hours, in most cases, the first 10 minutes of the morning, is called “the daily 10-minute 5 S time”.

- Praise people if the performance is excellent.
- Use evaluation from outside of the organization as an incentive for the staff. A 5 S day (festival) should be arranged as a day for publicity on 5 Ss.
- Take photos to demonstrate the change achieved with 5 Ss.
- No-Blame policy. Blaming staff, particularly in front of other people, should be avoided if they do not participate in 5 S activities.
- Recognize you are on the upward spiral of development. Even if you are a bit tired, you have to continue this movement.
- Develop a learning culture within the organization using 5 S activities.
- Use 5 S as a preparatory stage for future problem-solving processes (see chapter 11, *Quality Improvement*).

5.23 5 Ss: SORT, SET, SHINE, STANDARDIZE, SUSTAIN*

S1 SORT — *SORT the essential from the unnecessary and unused*

The starting point of workplace improvement is removing unnecessary and unused items and clutter from the workplace. **Sort** the essential items from the unnecessary. First, tag them (for example, with a red sticker). You may not be able to immediately discard most of the unnecessary items since they may be government property. Establish an ‘unwanted items’ store’ to accommodate the removed items. Remove tagged items one by one, and send them to the ‘unwanted items’ store.

S2 SET — *SET items in proper order*

After you remove the unwanted items, **set** (put) the remaining essential items for work in order. Encourage staff to check the sequences and processes by which they work, and assign the best location and orderliness to each item in order. This can significantly reduce the workload and minimize the time cycle of the work. Identify a specific place for storing each item. This helps reduce the time of routine work. This step is the occasion to re-think work efficiency without discussing the aspect of quality of service. A comfortable and efficient working environment is a key concept to grasp at this stage. For example, this will help address, clients’ waiting time which is part of quality of service and is important for client satisfaction.

*Courtesy of: JICA –Kenya

S3 SHINE — *SHINE and maintain cleanliness throughout the workplace*

A clean and dustless environment is a precondition for good health service delivery. 'Shine' should become a part of workplace culture to maximize the effects of S1 and S2. (It is also important to know that carrying out cleaning without first doing S1 and S2 is not useful). Maintaining a clean workplace cannot be achieved without full participation by both management and technical staff. Laboratory staff need to clean their equipment; the manager needs to clean his/her desktop and drawers. All staff, who have a specific working territory should be responsible for keeping it clean. A routine short 10-minute cleaning session before starting work in the morning is the basis to maintain cleanliness throughout the workplace.

S4 STANDARDIZE — *Make SORT, SET and SHINE routine throughout the workplace*

Steps S1 to S3 can easily be conducted in an *ad hoc* manner, but systematic participation by all staff is not easy to maintain in an ongoing fashion. To ensure the continuity of 'Sorting', 'Setting' and 'Shining', leaders of 5 S activities should:

- Make the 5 S concept visible throughout the workplace (use posters, leaflets, stickers and a logo) to cultivate an atmosphere supporting 5 S performance.
- Create a competition between different sections of the health centre in terms of S1 to S3. The role of management is very important in this step. Praise successful sections in front of the others.
- Institute a simple but regular monitoring system. Carry out supportive supervision by designated 5 S committee members during working hours; report back in team meetings; perhaps every two weeks.

S5 SUSTAIN — *Improve discipline for conducting SORT, SET, SHINE, and STANDARDIZE*

Provide periodical learning opportunities for all categories of the staff. Plan both monthly and small *ad hoc* sessions. Provide feedback and implement ideas offered. People have to be praised if their performance is excellent. Institute an annual 5 S festival with external evaluation. Grant small awards to teams to improve their working environment (such as a table for tea or utensils). Steps S1 to S3 remove all barriers and make hidden undesirable conditions visible. Now there can be a transition to quality improvement activities.