- Assistance points on the road (food, fuel, mechanic's services, etc.) should be previously identified. Critical points (security wise) should be identified as well (i.e., bad condition stretches, landslide territory, robberies, etc.).

- The staff on the convoy must always carry basic tools to face any difficulties on the route, as well as personal survival items, especially water and food.

- When transporting people (i.e. refugee's evacuation), water, food provisions and other supplies to their protection and well being should be taken along. In this case, would be necessary to arrange medical escort on the convoy.

- Co-ordination for laisser-passer in restricted transit or access areas should be done previously.

Any change or special situation on the road should be communicated immediately to the base (either departure or arrival point).

3.2.11. Security measures for transport operations

- From a security point of view, it is better to travel during the day.

- Frequent checking on mechanical conditions and general maintenance of vehicles being used to transport.

- Security rules and watchwords must be implemented in order to protect the staff and the supplies (staff behaviour, maximal speeds, routing and resting times, check points crossing, relation with military authorities, etc.)

- Determine when an escort for the transports on the operation is needed.

- Transport must have reliable means of communication with departure and destination points.

- Depending upon the situation it must be decided whether the trucks with provision will be identify or not. In some circumstances (war, assaults, looting, etc.) this is not recommended.

- Driver should have a copy of the cargo contents (manifesto) and the official authorisation to transport, so they can be shown to the authorities at any control point on the road.

- Border crossing: previous arrangements should be done with authorities (both countries) for border crossing. Check for any incompatibilities (international conflicts, tensions, enmities, etc...) for the vehicles' staff to drive in on a neighbouring country. People, vehicles and cargoes papers should be in order and available to be shown to the authorities.

3.2.12. Managing a charter operation

This will require a lot of preparation and devoting work and a specifically designated and experienced person should manage it. Even though there are some important things to know:

- **A place to land:** an airport (in the best of the cases) or a place to land must be found. The length, width and general conditions of the runway should be good enough for the hired plane to land. Get all the information about the characteristics of the runway (location, orientation, long, weight, construction material...), ground services (lighting, fuel...), and any other important available information about the landing site, and transmit it to the aircraft contacts. Maybe some repairing or conditioning shall be needed to make it functional.

- **Preparing for arrival:** all details about formalities for clearance to land should be checked with local authorities. It is necessary to determine if ground equipment and support, and/or labour to unload the plane would be needed. Details about present and forecast weather would be important for the aircraft contacts.

- **Date and ETA:** the date and estimated time of arrival (commonly "ETA") must clearly established. It is important to know if the planes would need to refill, which is an extra logistical problem because fuel for aircraft and equipment to pump it is not always locally available.

- **Security for landing:** the flight's responsible (or a designated person) must arrive to the airstrip earlier before the landing to check and clear the runway from people, animals and objects, and to ensure the safety to land.

Table 4

Approximate aircraft load carrying capacities (*)

Aircraft	*Load capacity*	*Airstrip length Requirements*
B747	100 MT/460 m^3	3000 m
DC10/30F	65 MT/340 m^3	3000 m
DC8/63F	44 MT/240 m^3	2300 m
B707/320C	40 MT/165 m^3	2100 m
CL44	26 MT/180 m^3	1900 m
L-100-30 Hercules	21 MT/120m^3	1500 m
DC9/33F and B737/200	14 MT/105 m^3	1700 m
DC3	3 MT/40 m^3	1200 m

(*) Extracted from *Emergency handbook. UNHCR.. 1982, Geneva*

3.3. Warehousing

These are the actions to store and protect the supplies by an organised system until the assistance is delivered, and to foresee the stock endowment for subsequent needs..

3.3.1 Types of warehouse

By its use it is possible to distinguish several types of warehouses. Very often on the field, these types are mainly functions of the same warehouse because the availability of space, the size and length of the emergency operation, etc.

- **General dispatch warehouses:** these are the kind of long-term warehouses or where the items are waiting to be sent to a secondary warehouse for distribution or storage. These can be considered as central warehouses and normally are located at the country capital or regional central points.

- **Stable stocks:** where non-vital or slow turnover items are stored, such as mechanical spares, equipment, reserve items which normally do not have a daily consumption or are not yet allocated.

- **Fast running stocks:** where daily or very often consumption items are stored.

3.3.2. Choosing the site

Very often on emergency situation we do not have many choices of places to store the provisions, and the storage sites may be temporarily constructed out of tents, plastic sheeting, wood and metal sheets, trailer containers, etc. These types of construction are intended to be useful on the initial face of the emergency and should not last too long. In any case, to choose a site we need to keep on mind the following aspects:

- **Type of provision to be stored:** drugs and food need a fresh, ventilated and dry environment; even, some of them would need a controlled temperature. Other items, such as clothes, equipment and material do not necessarily need it. Nevertheless, most of the time the supplies to be stored are of various kind.

- **Convenience of the site:** size, space capacity and possibility to extend the space are conditions to take into account. As a principle, it is always better to have a place bigger than what we really need. The location with respect to distribution places is a concern to have in mind.

- **Internal conditions (structural and non structural):** ideally, the building should be constructed on concrete and to be in good maintenance conditions (at least it does not need a big repairing to be functional). Roof and doors are a must. The building need to have good ventilation, adequate lighting and accessibility for transport.

- **External conditions (topographic and social surrounding):** look for natural risks (i.e. landslides or flooding areas). Stagnating water, dumps, bushes and other environmental deficiencies must be eliminated from the surroundings before using the place. The social surrounding is important to measure up in terms of potential security disturbance.

3.3.3. Organisation and management of the warehouse

- **Warehouse's staff**: Only one person will be responsible for the administration accordingly with the working shifts. A maintenance team to handle the provisions (unloading, moving and loading) inside the warehouse will be needed. A watchman is also desirable. Volunteers from organisations or the community may compose this maintenance team. The modality of food for work may be also applied. Both alternatives help to reduce operational costs, but they are not trouble-free related to security and staff instability. In any case, the administrator must be paid because the nature of his functions and responsibilities.

- **Equipment and material for the warehouse:**

  Indispensable: water, electricity or generator, pallets, tools to open and seal boxes, first aid kits, extinguishers type ABC, stationary and forms to keep records, cleaning material and products, locks on the door…

  Desirable: packing labels, adhesive tape, scales, load lifters, carry-on carts, forklifts, weight and measures conversion table, metric label, staircase, refrigeration devices, shelves…

- **Basic rules for the warehouse:**

  The space use for the allocation of the diverse goods in the warehouse should be planned before the arrival of the consignments.

  Never mix products from different nature in the same pile, pallet or lot.

  Chemical, flammable or other dangerous products must be stored on a different warehouse or as far as possible from human consumption products.

- **Pilling up the products:**

  Floor must be clean and dry before pilling up the provisions.

  To avoid moisture and other inconveniences, products should not be on direct contact with the floor, the roof or the walls. Pallets should be used to pill up the stacks. Supplies must be together accordingly with their nature.

  The height of the piles should take into account the packing material resistance (or the storing instructions on the boxes if there are). Normally not higher than 2.5 m

  The location, height and distance between piles must allow the natural lighting from windows to come inside.

  Distance between piles is about 0,70 to 1 m to allow the movement of people on maintenance or control tasks. If there are handling cargo machines (load lifters, forklifts), the space between piles should be enough to permit it movements. Free air circulation should be ensured as well.

  Every stack must be clearly identified with the name of the kind of goods containing.

- **Movement areas and sectors in the warehouse**

  To make it wiser and practical, some movement areas and specific identified sectors are recommended inside the warehouse:

  Arrivals area: to handle the provision incoming (unpacking parcels, checking contents, sorting, selecting, etc.) before to store.

  Delivery area: to locate provisions ready to dispatch. These provisions should be pilled up on separated pallets and labelled by destination.

  Storing area: where the stock material and/or provisions without current destination are stored. This area is divided accordingly with the type of supply (food, clothes and household goods, medical products, etc.).

  Packing sector: it is a working place to prepare deliveries. Empty boxes and carton to be reused are located in this sector as well.

  Administration sector: it could be a single desk and a file holder (with lock) to manage the administrative tasks.

- **Reception and dispatching procedures**

  Reception and dispatching areas in the warehouse should be clearly defined as mentioned above.

  Procedures and tools for reception and dispatching of supplies must be clearly established (authorisation forms, receipts...) and verified that they are understood for the person in charge. It is especially important to clearly point out the person authorised to release any supplies from the storage.

  Every cargo entering on the warehouse must be counted and inspected in terms of quantity and quality. Contents may match with the documents beside. Once the verification of the incoming supplies is done, these should be registered immediately to the stock inventory.

  When receiving food (i.e. cereals, powder milk, sugar...) the checking should be also leaded to determine the state of conservancy and whether any treatment would be needed. If any infestation is detected on incoming products, these must not be stored together with the products in good condition. Only a trained person must do treatment.

  Products on deteriorated or broken packing should be repacked and/or distribute as soon as possible if the damage does not represent a danger for human consumption.

  Stock rotation is made out the principle "first in, first out": products that came in first are delivered before than the products just arrived. Products with nearest expiring date should be located in front to ensure their first departure and fresh entering products will be located behind, waiting for it turn. In equal expiring date, products with longer stay on the warehouse goes first. Products with damaged packing should be delivered as soon as possible, whenever there is no a health danger to the population.

- **Controlling and monitoring stock**

  A clear system to register and control the incoming, outgoing and stock supplies must be established. Some actions to help the control and monitoring are:

  Every single cargo must be registered since its arrival to the warehouse. A written record of entries must be always available for control.

  Each type of good is controlled by a "store card" kept by the storekeeper, that should match with the "stack record card", which is stuck to the respective pile or stack. Both of them reflect the movements of every particular good, and should match with the official issuing authorisations.

Date of entry of goods to the warehouse and expiring dates needs a very careful control. This may appear both in the stack record card and in the store card.

Perform physical inventories regularly to keep up dated stock cards and printed inventory.

Storekeepers must prepare a weekly report of activities, including the latest inventory.

Clear and updated register and control of losses and destruction or disposal certificates (expired and deteriorated products). The disposal or destruction of damaged goods should be only under official written authorisation.

Forms specifically designed must be used to record all movements of supplies in the warehouse (request, incoming and deliveries). Every form must have consecutive numbers, date, name of the persons involved (senders, transport, recipients...) and other information intended to track the supplies.

3.3.4. Determining size and store capacities

The size is always depending of the amount of the consignments expected, but as said before, it is always better to have a bigger place rather than a just or smaller place. Normally, from the total space available, 70% will be used to store and a 30% as working space (passage, packing, access...).

Table 5

Determining of warehouse capacity needs (*)

Must know	***Examples***
Population to be served	Expected influx of 30,000 persons
Proposed distribution	One tent per family (average of 6 persons per family)
Frequency of distribution	On time only
Period of required supply	3 months
Weight / Unit volume of goods	1MT = 25 tents = 5m3
Reserve supply	10%

Calculations

Quantity of tents to be store = $\frac{30,000}{6}$ x 5,000 + 10% = 5,500 tents

Volume of tents = $\frac{5,500}{25}$ x 5 m^3 = 1,100 m^3

At a height of 2 metres, floor area required = $\frac{1,100m3}{2m}$ = 550m^2

Check floor loading = $\frac{5,500 \text{ tents}}{25 \text{ tents/MT}}$ = 220MT

$\frac{220MT}{550 \text{ m2}}$ = 0.4MT or 400 kg/m^2 (acceptable)

Allocate 550m2 + 20% for access and ventilation = 660 m^2 of floor space

(*) Extracted from *Supplies and Food Aid Field Handbook. UNHCR. Geneva, June 1989*

3.3.5. Cold chain

Some drugs and medical products need specific stable and controlled temperature conditions. To store this kind of goods it would be necessary to have the appropriate refrigeration equipment and a reliable source of energy to keep it running during power cuts. Normally these equipment works with batteries needing some surveillance (recharging or maintenance), so one person must be designed to do it. The ideal temperature of these products must be kept even (and specially) during it transportation. In order to do this they must be transported inside of cool boxes cooled by plastic containers with frozen water that fits into these cool boxes. Therefore, it is needed to ensure the availability of these tools as well. Nevertheless.

take notice that the chilling action does not remain forever, so the transport/delivery timing is very important at this respect.

3.3.6. Maintenance and hygienic measures

Maintenance: regular inspection in the building conditions should be done, especially for electrical installations, ceiling and roof and the general physical structure. Any repair must be done as soon as possible to avoid small damages become bigger.

Hygienic: the surroundings must be kept on good cleanness condition and free of dumping, stagnant water, bushes and any other elements that lead to the proliferation of insects or rodents. A cleaning plan of the warehouse must be designed, including daily cleaning and a periodical general cleaning of the whole facility, inspection of the stacks of goods, corners and sectors of the building. The main measure to avoid infestation is to prevent it. No animals should be allowed to enter in the warehouse. Accumulating waste disposal or materials without control should be avoided. Do not mix any food suspected of infestation with other food products. Spraying and chemical measures in the warehouse are common practices to fight against pests, but trained staff must carry out these duties.

3.3.7. Security and safety measures

- Only the staff in charge should have free access to the warehouse's facility.
- Day and night watchmen should be displayed.
- Regular checking of the conditions of gates and doors locks.
- All the staff should be aware about hazards and safety measures to avoid accidents, and should know how to use the different protection devices.
- Marks and signs advising hazards should be visibly displayed.
- Warehouse is a non-smoking site.
- Use of back/waist protection and gloves for heavy duties, as well as any other protection equipment and tools for the workers.
- Fire extinguishers and first aid kit should be visibly located on an area always clear of obstacles.

3.3.8. Storing of dangerous goods

They should be stored in a different place rather than in the general warehouse. Law, norms and procedures for manipulation and storing dangerous goods must be checked to minimise hazards.

3.3.9. Temporary emergency warehouse

If there is not an appropriate structure to install the warehouse (i.e. displaced-refugees camp), it is possible to build a temporary warehouse either with hard material (wood, metallic sheets) or plastic sheeting (type MSF-OXFAM). In any case, the same conditions in terms of location and convenience must be taken into account to choose the site.

3.3.10. Staging areas

In some cases the situation in the affected country or region may not allow the direct arrival of the supplies and a "staging area" should be needed. This is a temporary or transit storage in a neighbouring country or region.

3.3.11. Emergency stockpiles

Some UN and other international relief organisations maintain stockpiles in different regions of the world, containing supplies to be used when a disaster occurs in any neighbouring country. The WHO pre-set health kits (mainly drugs and medical items) are stored at the OCHA (Office for Co-ordination of Humanitarian Assistance) stockpile in Pisa, Italy. This is a general stockpile and not only emergency items. Detailed features of the emergency health kits can be found as Annexe 1 of these guidelines.

Keeping an emergency stockpile obeys to several criteria such as increasing the time's response capacity to deliver relief provisions on a sudden disaster situation or unavailability or difficulties for an immediate delivery of certain relief items in a given region.

The items stored at these stockpiles are mostly equipment, non-perishable or long lasting items. Drugs and health equipment is often stored, but a strict control on expiring dates and stock rotation must be observed. Pro and cons about such stockpiles are always in discussion: i.e. having all that material sitting on a warehouse, waiting for a probable disaster one day, somewhere, is a critic to the emergency stockpiles. But according to it defenders, the advantage is that basic material they need to face the impact of a sudden emergency is at hand, ready to use and do not need to wait for days or perhaps weeks to start helping. In any case, emergency stockpiles are quite useful if:

- they are meant to serve on a regional basis, and not only to the country where they are based;

- they are open to provide with goods to other organisations and not only to the owner;

- they are based on a safe and appropriate location, in terms of the disaster risks found at the base country and they have the capacity to reach affected countries from the storing site.

3.4. Distribution

Is the main objective of the whole Health Logistics Management and is intended to bring the assistance to the people affected, through a proportional and controlled delivery to avoid abuses and waste.

3.4.1. Basic Principles

Distribution should not be a generalised and indiscriminate action. The entire contrary is proportional and controlled to avoid abuses and wastes. Some basic principles that should lead the distribution activities are:

- It is pertinent to the needs and appropriate to the cultural and environmental context.
- Only products and items strictly necessaries to cover basic needs for survival or improving basic life conditions should be distributed.
- Given only to the population that really needs it, proportionally to their need.
- It is complementary and is not intended to solve ALL the needs of the population but the most urgent and vital.
- This assistance is intended to help the affected population on basic and vitals needs on a situation of sudden and temporary break down on their capacity of provision. Therefore must be immediate to cover critical moments of need, but...
- it is temporary to avoid the long-term assistance that could generate dependence from external aid and does not stimulate the economic recuperation of the affected area. This is different in cases of long term displaced, such as war refugees, but even in these cases, the self-sufficiency activities should be supported.