

June 8, 2017, Copenhagen

# Procurement of Complex Medical Equipment

...selection, installation, training,  
after sales service, maintenance

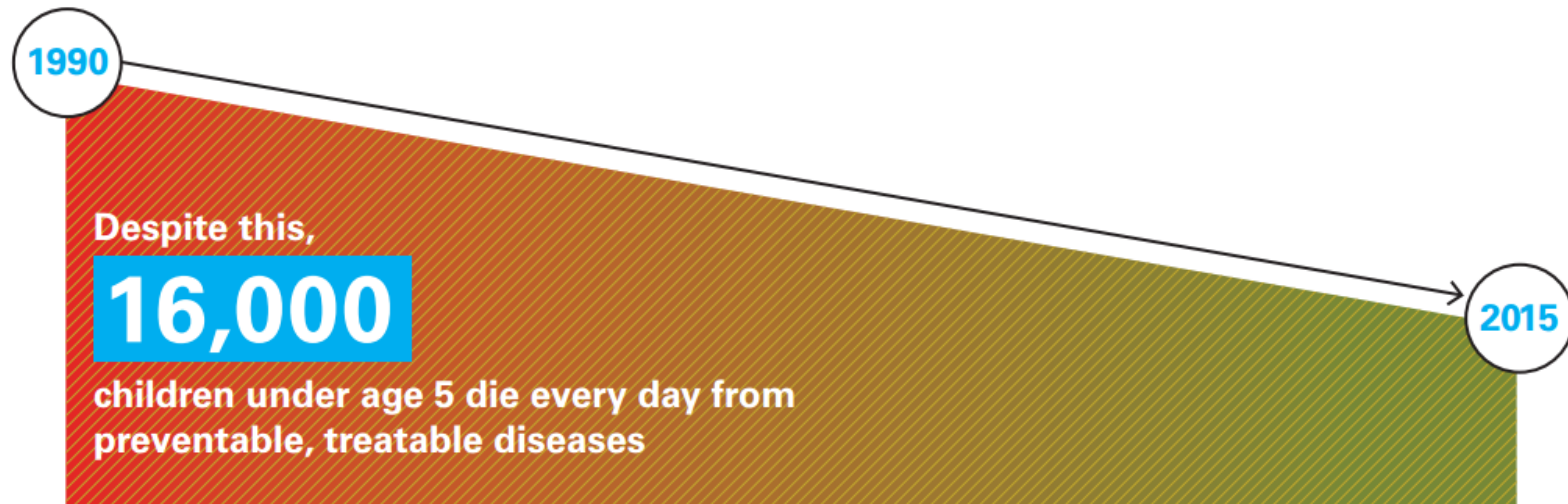
Paul LaBarre

unicef  | for every child

# Good news / bad news

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The number of children who died before turning 5 fell by more than 50 per cent worldwide between 1990 and 2015

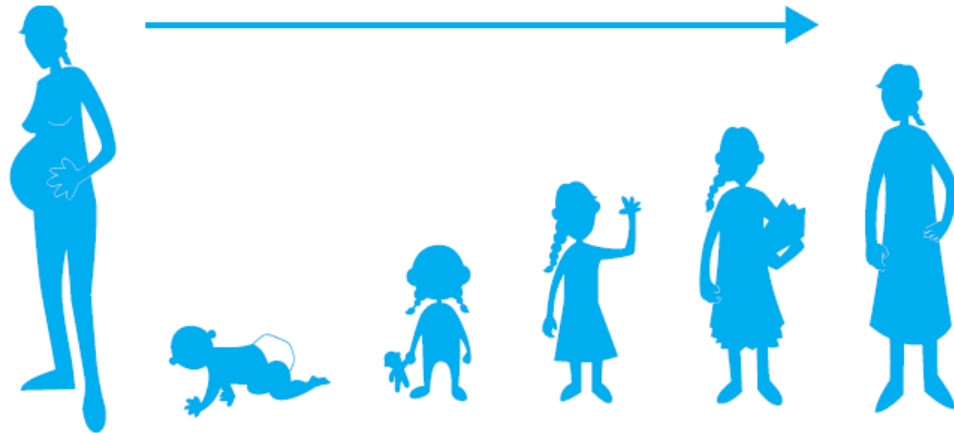


# UNICEF Mission



**SURVIVE**  
FROM ARRIVAL

**TO THRIVE**  
INTO ADULthood



# UNICEF Supply catalogue

**Products**

- Bednets/Insecticides
- Clinical Laboratory
- Cold Chain Equipment
- Communication Equipment
- Diagnostic Test Kits
- Education Supplies
- Medical Kits
- Medical Equipment
- Medical Renewable
- Nutrition
- Pharmaceuticals
- Power Generation
- Printing
- Shelter/Field Equipment
- Vaccines
- Visibility (Identification) & Signage
- Water and Sanitation



<https://supply.unicef.org/>

## Supply Catalogue

### Welcome to UNICEF Supply Catalogue





The Supply Catalogue contains specifications for over 2,000 commodities that respond to the needs of children and their families. The Catalogue is designed to help you identify the most appropriate supplies for your programmes, assist you in your supply planning, delivery and monitoring, and help maximize your collaboration with UNICEF Supply Division.

To find supply items and descriptions, please click on the specific product category or use the "Search" function. If you cannot find an item, go to ["Help"](#).

UNICEF Country Offices, National Committees, and Procurement Services partners can initiate orders for supplies. Please click on ["How to Order"](#).

Country Offices can access an order tracking module by logging in at the top-right navigation bar on this page.

**NB:** Prices that appear in the Catalogue are indicative only. Actual prices may vary, depending on individual suppliers.



### In Focus


### Procurement Services

Find out about UNICEF Procurement Services and how to become a partner on [UNICEF website](#).

### For Suppliers

Find out about UNICEF procurement policies and how to become a supplier on [UNICEF website](#).

### Related info

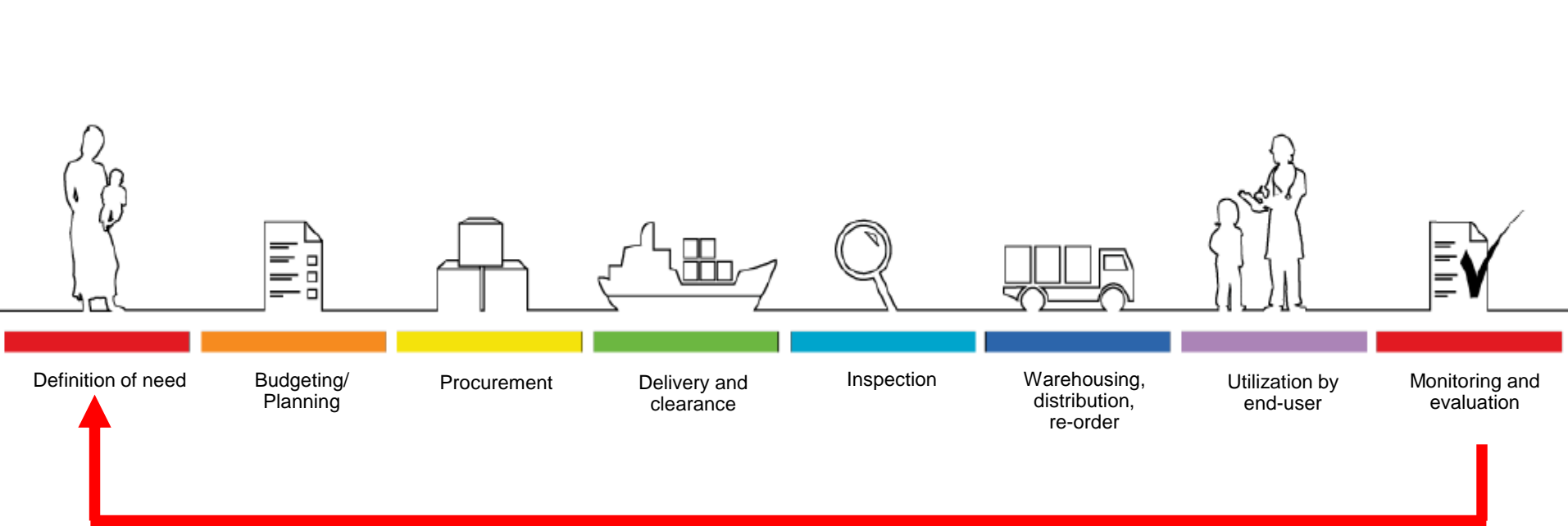


**SUPPLY ANNUAL REPORT**



**PROCUREMENT SERVICES**

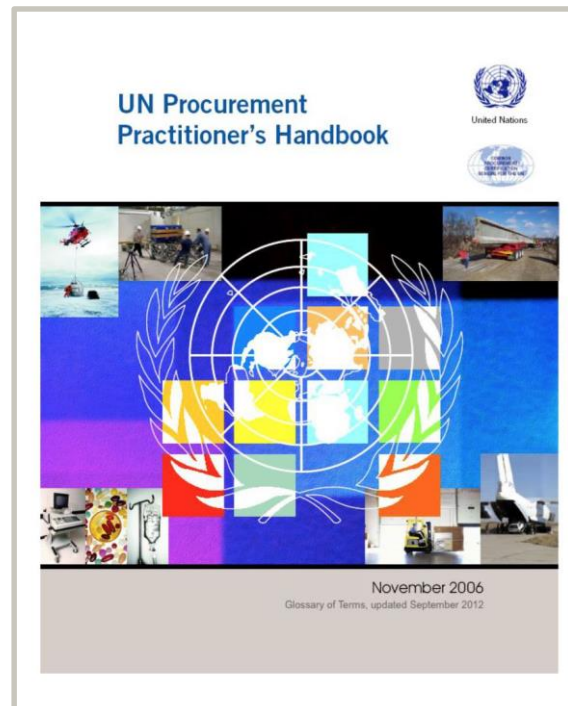
# UNICEF Supply Division: The supply chain



# Guiding principles

- **promotion of UN objectives**
- **fairness, integrity and transparency through competition**
- **economy and effectiveness**
- **best value for money**

[http://www.unicef.org/supply/index\\_39627.html](http://www.unicef.org/supply/index_39627.html)



# 1st Global forum

## Director General, 1<sup>st</sup> Global Health Forum; 2007:

- 70% of medical equipment in hospitals does not work
- 10—30% donated equip never becomes functional
- Dr Malkin's paper: 38% equip out of service



# Where are we today?

- At least 40%<sup>1</sup> of medical equipment is out of service (many studies cite 50-80%)<sup>2</sup>
- Up to 80% of medical equipment in many sub-Saharan African countries is donated or funded by foreign sources<sup>3</sup>
- 70-90% of donated equipment is never operationalized<sup>4</sup>
- Only 19 BME teaching units in sub-Saharan Africa (2000)<sup>5</sup>
- 2 sub-Saharan main-land countries have a registered BME Professional Association<sup>6</sup>

1 The Lancet Commission: Technologies for Global Health, P. Howitt et al., Aug 2012

2 EMRO Technical discussions, "The role of medical devices and equipment in contemporary health care systems and services", June 2006

3 T. Judd, J. Dyro, and J. Wear, "Advanced health technology management workshop," in Clinical Engineering Handbook, J. Dyro, Ed. Elsevier, 2004

4 CHA Medical Surplus Donation Study: How Effective Surplus Donation Can Relieve Human Suffering, April 2011

5 M.Glouhova et al., "International Survey on the practice of clinical engineering: Mission, structure, personnel and resources." Journal of Clinical Engineering (2000)

6. IFMBE and WHO country data (2015)

*Slide content adapted from A Worm, The (improved) status of medical equipment in sub-Saharan Africa Healthcare Technology Management, 2017*

# Complex medical equipment

- Physical Absorptive capacity
- Personnel & Training
- Process
- Organizational behavior:

*Biomedical engineering is seen as an expense center rather than a necessary investment to protect valuable infrastructure.*



Photo: UNICEF/Paul LaBarre

# Readiness

## The issues

- Sufficient electrical hook-ups
- Sufficient medical gas hook-ups
- Adequate floor space
- Adequate access

## Solution?

- Planning checklist co-developed by suppliers



Photo: UNICEF/Paul LaBarre

# Dirty electricity

## The issues

- Fluctuations
- Brownouts
- Blackouts

## Solution?

- Monitoring electrical levels
- Voltage regulators
- UPS + back-up generators

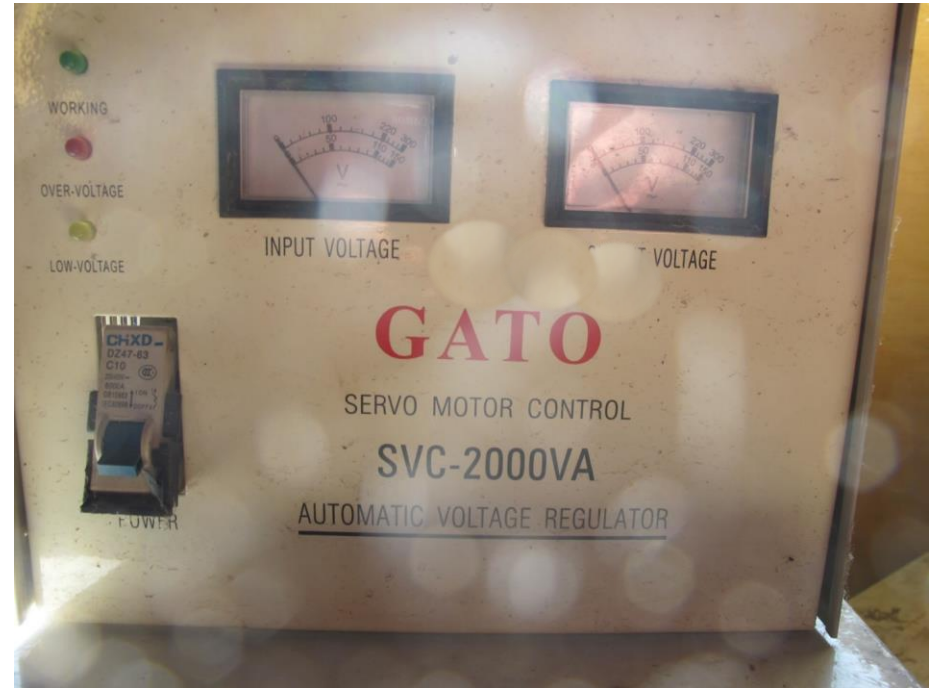


Photo: UNICEF/Paul LaBarre

# Staffing

## The issues

- Undertrained, under-motivated staff

## Solution?

- Clearly defined job descriptions
- Jurisdiction & Accountability
- Training on new equipment



Photo: UNICEF/Paul LaBarre

## The issues

- ## Solution?

- | MEDICAL EQUIPMENT INVENTORY FORM |                  |              |              |            |                   |                       |   |                                      |    | BY :- BIOMEDICAL ENGINEERING CASE TEAM        |  |
|----------------------------------|------------------|--------------|--------------|------------|-------------------|-----------------------|---|--------------------------------------|----|---|--|
| HOSPITAL MEDICAL COLLEGE         |                  |              |              |            |                   |                       |   |                                      |    |   |  |
| DATE : DEC, 16/2016              |                  |              |              |            |                   |                       |   |                                      |    |   |  |
| Department                       | Equipment Name   | Inventory No | Model        | Serial No  | Country of Origin | Year of manufacturing | Operational Condition   |                                      |    | USER  | SERV   |
|                                  |                  |              |              |            |                   |                       | Functional/Non functional<br>Repairable/Non-REPAIRABLE/USE/How often use/ | Spare part availab<br>ility(YE S/NO) |    | AND<br>TECH<br>NICIA<br>L<br>TRAINING<br>UNIT | ICE*/<br>USER<br>MAU<br>AL(J<br>S)<br>OR<br>NO |
| NEONATE                          | VENTILLATOR      | NO10701      | IS215        | AGKGJ01356 | USA               |                       | F   |                                      | NO | U   | NO   |
| NEONATE                          | SUCTION          | NO10201      | DSU10101     | 98047      | INDIA             |                       | F   |                                      | NO | T   | S  |
| NEONATE                          | AIR COMPRESSOR   | NO10604      | 3874         | KD100734   | USA               |                       | F   | DAILY                                | NO | U   | NO   |
| NEONATE                          | PHOTOTHERAPY     | NO10301      | B-LCD FORCE  | 1984       | BRAZIL            |                       | F   | DAILY                                | NO | NO  | NO   |
| NEONATE                          | RADIANT WARMER   | NO10502      | PM75-1       | YG17426    | USA               |                       | FR  | DAILY                                | NO | NO  | S  |
| NEONATE                          | RADIANT WARMER   | NO10501      | OHMEDA       | AANW00344  | USA               |                       | F   | DAILY                                | NO | U   | NO   |
| NEONATE                          | INFANT INCUBATOR | NO10103      | 1186         | 3562       | BRAZIL            |                       | NFNR  | DAILY                                | NO | NO  | NO   |
| NEONATE                          | INFANT INCUBATOR | NO10104      | 1186         | 3513       | BRAZIL            | UNKNOWN               | FNR   | DAILY                                | NO | NO  | NO   |
| NEONATE                          | INFANT INCUBATOR | NO10106      | 1186         | 3119       | BRAZIL            | UNKNOWN               | F   | DAILY                                | NO | NO  | NO   |
| NEONATE                          | PHOTOTHERAPY     | NO10304      | 3006BTP      | MAJ15617   | BRAZIL            | UNKNOWN               | F   | DAILY                                | NO | NO  | S  |
| NEONATE                          | PHOTOTHERAPY     | NO10305      | 3006BTP      | MAJ15651   | BRAZIL            | UNKNOWN               | FR  | DAILY                                | NO | NO  | S  |
| NEONATE                          | INFANT INCUBATOR | NO10102      | 1186         | 3120       | BRAZIL            | UNKNOWN               | FR  | DAILY                                | NO | NO  | NO   |
| NEONATE                          | PHOTOTHERAPY     | NO10306      | 3006BTP      | MAJ15527   | BRAZIL            | UNKNOWN               | F   | DAILY                                | NO | NO  | S  |
| NEONATE                          | PHOTOTHERAPY     | NO10303      | 3006BTP      | MAJ15527   | BRAZIL            | UNKNOWN               | F   | DAILY                                | NO | NO  | S  |
| NEONATE                          | SUCTION          | NO10203      | F-606        | 140234     | ITALY             | UNKNOWN               | F   | DAILY                                | NO | NO  | S  |
| NEONATE                          | SUCTION          | NO10202      | DSU10101     | 98077      | INDIA             | UNKNOWN               | F   | DAILY                                | NO | NO  | S  |
| NEONATE                          | INFANT INCUBATOR | NO10105      | 1186         | 3130       | BRAZIL            | UNKNOWN               | F   | DAILY                                | NO | NO  | S  |
| NEONATE                          | INFANT INCUBATOR | NO10107      | BARY NEST I- |            | TURKEY            | UNKNOWN               | F   | DAILY                                | NO | NO  | S  |

UNICEF Procurement of complex medical equipment – Paul LaBarre

# Preventative Maintenance

## The issues

- PM not integrated into most health systems
- Expense center?

## Solution?

- Establish culture of PM
- Necessary investment protects infrastructure
- Integrate with HTM

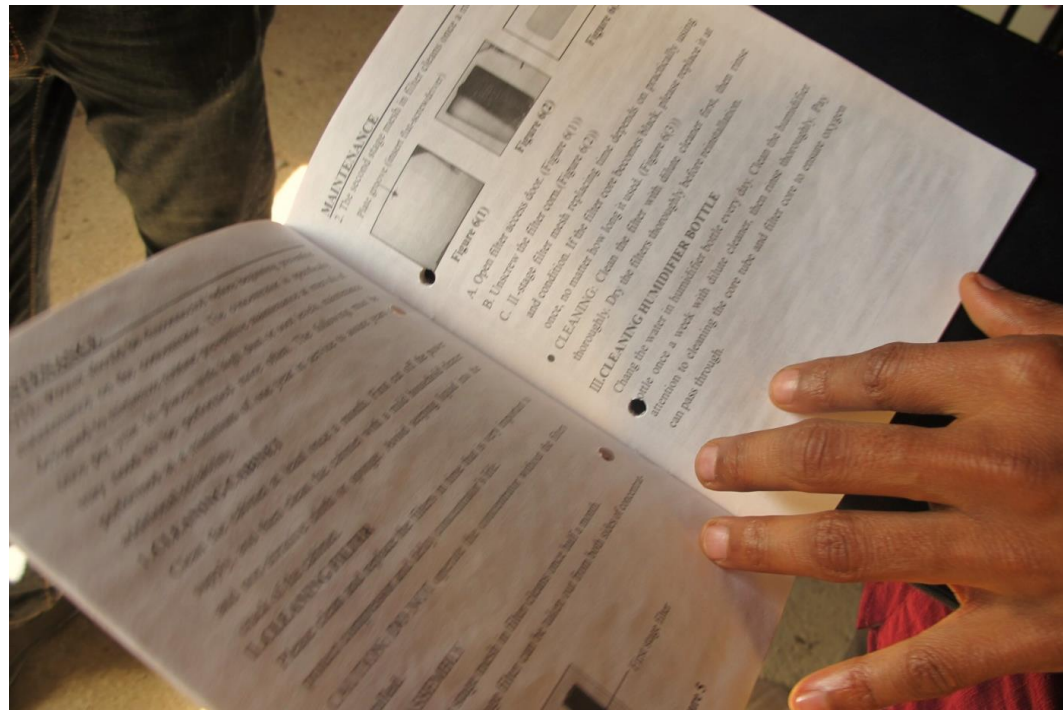


Photo: UNICEF/Paul LaBarre

# Corrective maintenance

## The issues

- CM not integrated into most health systems

## Solution

- Establish processes for PM
- Clearly defined KPIs

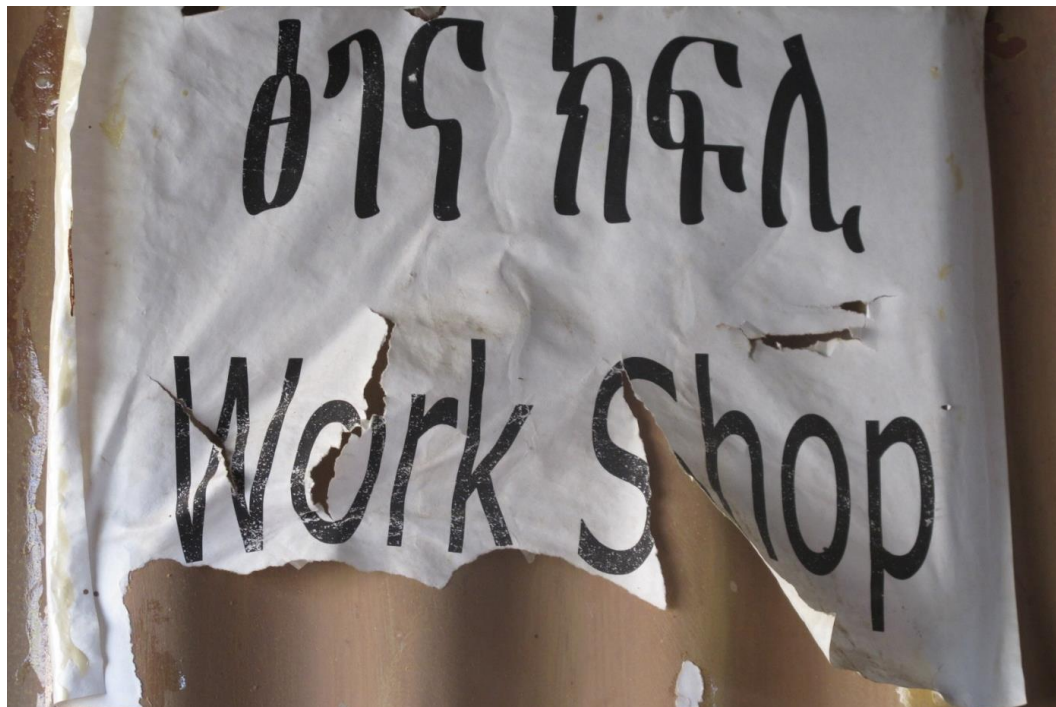


Photo: UNICEF/Paul LaBarre

# Spare parts

## The issues

- No spare parts kept on site
- No mechanisms to procure
- No budgets

## Solution?

- Include sufficient spare parts with every capital expenditure
- Integrate spare purchase into procurement process



Photo: UNICEF/Paul LaBarre

# Basic BMET tools

## The issues

- Most often supplied with small useless set

## Solution?

- Defined standard
- Procurement mechanisms established for full set of tools



Photo: UNICEF/Paul LaBarre

# Advanced BMET tools: analyzers/calibrators



Photos: UNICEF/Paul LaBarre

# Warranty

## The issues

- 1 yr standard is often not enough

## Solution?

- 2 and 3 year options should be considered in context of internal capability to maintain equipment and lifespan KPIs.
- Clear understanding of warranty terms



Photo: UNICEF/Paul LaBarre

# After sales service

## The issues

- Some facilities lack BME/BMET staffing altogether

## Solution?

- Consider ASS as a means to maintain high level of “in-service” equipment during and after warranty



Photo: UNICEF/Paul LaBarre

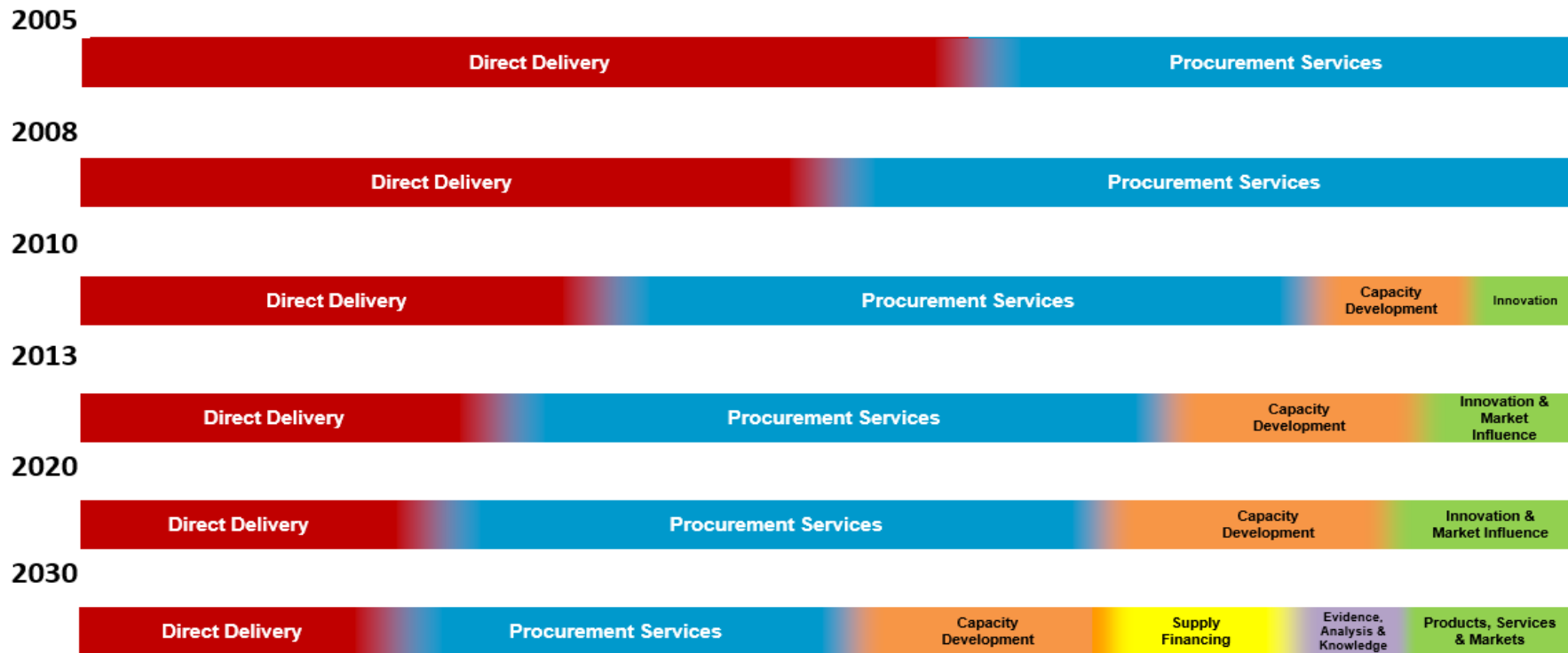
# Equipment disposal plan



Photos: UNICEF/Paul LaBarre



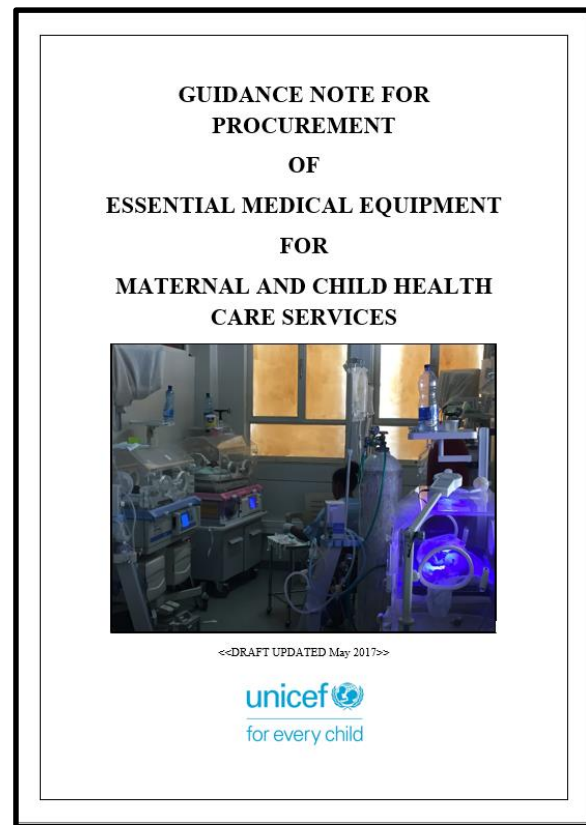
# UNICEF's supply function vision



# UNICEF Technical Guidance

## Quick reference to LTA's for sophisticated equipment:

- Outpatient, inpatient, and diagnostic equipment
- Sterilization equipment
- Operating theater equipment
- Resuscitation, ventilation, oxygen therapy
- Thermotherapy equipment



# Installation and training (clinical and maint)

## Quick reference to:

- Installation
- Clinical training
- Technical training

Code	Item Description	Installation	User training	Technical training
S0002020	Sterilizer,steam,20L,electric,w/access	recommended	strongly recommended	strongly recommended
S0002022	Sterilizer,steam,40L,electric,w/access	recommended	strongly recommended	strongly recommended
S0002044	Sterilizer,steam,90L,electric,w/access	recommended	strongly recommended	strongly recommended
S0002046	Anaesthesia machine,closed circuit,w/acc	strongly recommended	strongly recommended	strongly recommended
S0002026	Light,examination,mobile,w/access	not required	recommended	recommended
S0002027	Light,oper.room,mobile,w/access	recommended	recommended	recommended
S0002024	Light,oper.room,ceiling,w/access	strongly recommended	recommended	strongly recommended
S0002023	Light,examination,mobile,LED,w/access	not required	recommended	recommended
S0002070	Light,oper.room,LED,mobile,w/access	recommended	recommended	recommended
S0002071	Light,oper.room,LED,ceiling,w/access	strongly recommended	recommended	strongly recommended
S0002025	Electrosurgical unit,w/access	recommended	strongly recommended	strongly recommended
S0002028	Pump,suction,surgical,1 bottle,w/access	recommended	recommended	recommended
S0002029	Pump,suction,surgical,2 bottles,w/access	recommended	recommended	recommended
S0002031	Monitor,patient,portable,w/access	recommended	strongly recommended	strongly recommended
S0002033	Pulse oximeter,portable,w/access	not required	recommended	recommended
S0002036	Pulse oximeter,spot-check,w/access	not required	recommended	recommended
S0002035	Table,resusc,newborn,w/access	recommended	strongly recommended	strongly recommended
S0002060	Warmer system,newborn,basic,set	recommended	strongly recommended	recommended
S0002065	Warmer system,newborn,radial,w/access	recommended	strongly recommended	recommended
S0002064	Incubator,automatic,basic,w/access	recommended	strongly recommended	strongly recommended
S0002032	Photo therapy unit,w/access	recommended	strongly recommended	recommended
S0002018	Phototherapy irradiance meter	not required	recommended	recommended
S0002019	Ventilator,medical,adult-child,w/access	strongly recommended	strongly recommended	strongly recommended
S0002047	Oxygen concentrator/SET	recommended	strongly recommended	strongly recommended
S0002052	Flow splitter,for oxygen concentrator	not required	recommended	recommended
S0002034	Infusion pump,with accessories	recommended	strongly recommended	strongly recommended
S0002017	Syringe pump,with accessories	recommended	strongly recommended	strongly recommended
S0002063	Scanner,ultrasound,mobile,w/access	recommended	strongly recommended	strongly recommended
S0002061	Doppler,FHR detector,w/access	not required	recommended	recommended
S0002069	CTG monitor,with accessories	recommended	strongly recommended	strongly recommended
S0002021	Pump,breast>manual,w/access	not required	recommended	not required
S0002062	ECG recorder,portable,w/access	recommended	strongly recommended	strongly recommended
S0002059	Defibrillator,basic,w/access	recommended	strongly recommended	strongly recommended
S0002058	Defibrillator,AED,w/access	not required	strongly recommended	strongly recommended
S0002057	Nebulizer,electric,w/access	not required	recommended	recommended
S0002042	Ventilator,medical,new-born,w/access	strongly recommended	strongly recommended	strongly recommended
S0002048	CPAP,bubble,medical,new-born	recommended	strongly recommended	strongly recommended
S0002049	Cell,saver,medical,w/access	strongly recommended	strongly recommended	strongly recommended

# Raising awareness

## Workshops for hospital managers

- Example: Nov 2015 workshop in Senegal organized by JICA

## Messaging:

- Maintenance is a necessary investment to protect valuable infrastructure.
- Needs to be modeled and repeated!



Reference: <https://www.hospihub.com/actualites/les-directeurs-d-hopitaux-africains-sensibilises-a-la-maintenance-des-equipements>



Thank you!

