

**Rwanda Biomedical Centre**

**Ministry of Health**

**CCE rehabilitation and expansion plan, equipment selection, deviation plan, maintenance plan and decommissioning plan**

**CCEOP Application, April 2023**

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**List of Acronyms**

|  |  |
| --- | --- |
| oC | Degree Celsius |
| CCE | Cold Chain Equipment |
| CCEOP | Cold Chain Equipment Optimization Platform |
| CDC | Centre for Disease Control |
| CVS | Central Vaccine Store |
| DH | District Hospital |
| DVS | District Vaccine Store |
| EPI | Expanded Programme on Immunization |
| FT2 | Fridge Tag Type2 |
| Gavi | Global alliance for vaccines and immunizations |
| HC | Health Centre |
| HF | Health Facility |
| HP | Health Post |
| HPV | Human papilloma Virus |
| HSS | Health System Strengthening |
| ICC | Inter-Agency Coordinating Committee |
| ILR | Ice-lined Refrigerator |
| IMT | Inventory Management Tool |
| LD | Lowest Distribution |
| LSP | Local Service Provider |
| MoH | Ministry of Health |
| ODP | Operational Deployment Plan |
| OPV | Oral Polio Vaccine |
| PMT | Project Management Team |
| PQS | Product Quality and Safety |
| PR | Primary store |
| RBC | Rwanda Biomedical Centre |
| RTMs | Remote Temperature Monitors |
| RTMD | Remote Temperature Monitoring Devices |
| SD | Supply Division |
| SDD | Solar Direct Drive |
| SIA | Supplemental Immunization Activities |
| SP | Service Point |
| TCO | Total Cost of Ownership |
| Td | Tetanus diphtheria |
| UCC | Ultra –Cold Chain |
| UNICEF | United Nations Children Funds |
| WHO | World Health Organization |
| WICR | Walk In Cold Room |
| WIFR | Walk In Freezer Room |

## Introduction

The major aim of GAVI Cold Chain Equipment Optimization Platform (CCEOP) is to support countries to upgrade their cold chain system through acquiring better performing cold chain equipment to replace non-performing and/or obsolete ones. The platform also provides means of scaling up storage capacity needs for the countries as well as acquisition of efficient Remote Temperature Monitoring Devices for new and existing equipment. There is also provision for service bundle that takes care of in-country storage, logistics, installation, and commissioning. Training on basic maintenance is also included.

Rwanda as an applicant for this support presents this document with details on the above-mentioned strategies. The document provides detailed information as to how the country plan to use and maintain the requested equipment as well as how to remove and decommission obsolete and non-performing ones. This platform will cover all areas with gap to assure zero dose children and missed communities are reached.

Choice of equipment takes into consideration the situation in the country as well as the guidance given by the platform that covers energy availability, operating cost, net storage volume, temperature range, equipment holdover time among others.

## Chapter 1: Cold Chain Rehabilitation and Expansion Plan

Immunization activities in Rwanda are fully integrated into the primary healthcare services within each health facility. Routine immunization is intended to reach all infants under two years of age with twelve available antigens to protect them from vaccine preventable diseases. In addition, all adolescent girls 12 years of age are targeted to be protected from cervical cancer with human papillomavirus (HPV) vaccine, pregnant women to be protected from tetanus, during the antenatal care visits with tetanus diphtheria(Td and recently the Covid-19 vaccine is being given to different age groups of the general population and fully integrated in existing supply chain management of vaccines.

Comparative analysis of available and required capacities is done taking into consideration future schedule for adequate capacity to appropriately store all the vaccines at all levels of the immunization supply chain. In this regard the country has carried out cold chain inventory assessment at all levels in November 2022 to develop appropriate cold chain expansion and replacement plan. The assessment further discovered many obsolete and non-optimal equipment that are due for replacement, removal, and decommissioning.

### 1.1 Analysis of vaccine storage capacity and plan for future schedule

Cold chain capacity gap analysis was conducted for all levels taking into consideration the major parameters such as target population, country immunization schedule, annual national forecasting plan, vaccines characteristics and planned new vaccine’s introduction. Other considerations include vaccine presentation, stock level and equipment management policies. The analysis further assumes that all vaccines are stored at +2oC to +8oC, except for OPV at national level and some COVID-19 vaccines.

At national level, there are 12 WICR/FRs used for storing vaccines and 8 UCC freezers all of which are functional.

Ten cold rooms provide a total net positive (+2oC to +8oC) capacity of 98,780 liters while the two freezer rooms have 11,896 liters of net negative (-25oC to -15oC) capacity (grossing factor between 3.0 and 4.2). There are also 698 liters of UCC (-70oC) capacity at the store.

Analysis at district level also reveals adequacy of capacity for storage of vaccines at both positive and negative temperatures, except for Ruhango district store where there is a gap of freezing capacity. *(Ref: Page 25 cold chain inventory assessment report November 2022*)

At service level, there are 1,169 service point (511 HCs & 658HPs), of which 721 have adequate electricity supply and the remaining without. 508 of the health centres have cold chain equipment while 661 are not equipped. Most of the unequipped service points are health posts that support large health centres towards increasing coverage for immunization service. In terms of cold chain capacity, all service points with equipment have adequate capacities provided by the single equipment installed. Capacity gaps exist at health centres without equipment, and these are to be prioritize for extension to enable them store vaccines for effective service delivery. They are also CCE that are due to replacement at some health centres, these are planned for replacement. *(Ref: Page 26 cold chain inventory assessment report November 2022)*

The CCE installation though the platform will not cover all HPs, only those ones located in remote areas and those that are highly populated to ensure zero dose children are prioritized. The ones that are located closer to borders with neighboring countries are also prioritized ensuring that none is left behind.

### 1.2 Plan for Replacement

**Table 1: Available vs. Required Capacities at LDs**

From the general review of the cold chain gap analysis, national store has adequate capacity for both positive and negative temperatures for storage of vaccines and freezing of icepacks. All district hospitals (LDs) have adequate positive capacity for storage of vaccines and negative for icepack freezing except in Ruhango district where there is freezing capacity gap. Although there are refrigerators identified by the IGA for replacement, there capacities do not have impact on adequacy of capacity. This is because the remaining refrigerators provide adequate storage capacities required by the districts. This therefore makes replacement intervention at LDs not a matter of priority.

CCEOP 2 will hence focus on intervention at service level giving priority to health centres/posts with geographic challenges, low coverages and high number of unimmunized children.

**Figure 1: Positive Capacity Adequacy at LDs**

However, at service level, cold chain storage capacity extension is required in order to provide equipment to health post that do not have equipment. This is in order to reduce equity gap and increase coverage for immunization. As identified by the IGA, there are 663 health posts at SP level without cold chain equipment among which 215 have electricity supply and 446 without electricity. Furthermore 26 health centres have been identified by the IGA with equipment that are due for replacement. In total 663 facilities at service points require intervention in form of extension, expansion and replacement. The figure below shows the segmentation of health facilities’ needs.

**Figure2: Facility Segmentation at SP level showing Availability of CCE and Energy**



To address the gaps identified, cold chain expansion and replacement plan has been made upon considerations of the following parameters:

1. Type of storage capacity gap (positive or negative) and icepack freezing need
2. Net storage capacity requirement by facility (storage or service delivery)
3. Energy availability
4. Vaccine schedule

Based on these major and other considerations, an intervention plan has been developed with a view to systematic replacement, extension, and expansion where applicable.

Due to limited availability of funds and programme priorities, intervention will be selective giving priority to areas that will make more positive impact to the system. Therefore, CCEOP 2 intervention will focus on unequipped health posts in order to bridge the equity gap for cold chain equipment and to increased effectiveness for immunization service delivery by maintaining the high coverage of vaccination and targeting zero dose children. In this regard 28 HCs were prioritized for intervention to replace existing CCE, extension and expansion while 112 CCE are planned for the extension in health post. A comprehensive ODP has been developed for centres/post which limits the budget within the country financial ceiling. Other health centres/posts and districts that require any form of intervention will be supported through Africa-CDC.

Below is the summary of sites requiring intervention by number, level and type of intervention from which the prioritized sites will be selected.

**Table 2: Number of sites for different types of intervention by levels of iSC**

|  |  |
| --- | --- |
| **Types of Intervention** | **No of sites** |
| **Primary store (CVS)** | **Lowest Distribution (DVS)** | **Service Point (HCs & HPs)** |
|  Replacement Electric  | 0 | 0 | 22 |
|  Extension Electric  | 0 | 0 | 217 |
|  Expansion Electric  | 0 | 1 | 4 |
|  Replacement Solar  | 0 | 0 | 0 |
|  Extension Solar  | 0 | 0 | 446 |
|  Expansion Solar  | 0 | 0 | 0 |
|  No Intervention  | 1 | 45 | 518 |

### 1.3 Funding, procurement, and commissioning

This application will be funded through joint investment, the total cost for the CCEOP grant will be $1,152,710. From the total amount, $960,592 will be funded by Gavi while the Government of Rwanda will provide the sum of $192,118 as 20% country joint investment. The source of this country's joint investment is secured and reflected on RBC’s annual plan starting July 2023- June 2024.

All procurement processes for the **140** CCE, **264** RTMs and In-person RTMD system, technician and general training on refrigerators and freezers will be made in the first year of 2023, through UNICEF SD. Service bundle will be included to carter for in-country logistics, installation, and commissioning of all equipment. Details of cost associated with the replacement plan is in the attached budget template. The platform will cover a service bundle costs for procurement, transportation, and installation as well as user training. Training of staff on remote temperature monitoring system is also included which will allow visibility of the cold chain performance for better CCE maintenance. The supportive supervisory team for the CCEOP implementation will monitor the decommissioning process of the outdated CCE in the system to ensure its implementation is smoothly done.

### 1.4 Supply Chain System Design

Rwanda immunization supply chain system design is structured as a three tier system. Primary Store(PR) known as Central Vaccine store (CVS**)** operates under Vaccine Programs. This works under Rwanda Biomedical Centre which is an implementing agency of the Ministry of Health. The Lowest Distribution(LD) level is known as the District Vaccine Store (DVS)and is operating under the leadership of the District Hospital. The third level is the Service Point(SP) that includes both Health Centres(HC) and Health Posts(PH)

The Primary store holds a six months’ stock following the supply plan (2 times a year), at Lowest Distribution Level a three months’ store is distributed 4 times a year and one-month store at Service Point is distributed eve ry month The system re-design in 2019 showed benefits of vaccines distribution at lower levels including cost reduction and increase of time for other activities of a healthcare provider. This modeling type required proper readiness to implement since CCE and transportation means (refrigerated trucks for CVS and pick-up for DVS) need to be in place. The plan began using available items and infrastructure in place where quarterly direct delivery (between central and districts) and monthly pick-up (health facilities from districts), was implemented. Route optimization for the deliveries at the district level using refrigerated trucks was applied which reduced distribution cost up to 37%(Mudaheranwa et al., 2021). Furthermore, it is expected that once this plan is fully implemented at LD and HC levels, will reduce stock outs at all levels and  will have a big impact on Zero-dose children decrease.

## Chapter 2: Cold Chain Equipment Selection

Under this platform, the country chose two types of the equipment based on the facility need, technology, cost, and previous experience on the equipment performance. TCW 2000 AC and VLS 054A SDD with RTMS (Own integrated) are selected as the first option as indicated in the attached CCEOP budgeting tool where all the three preferences were detailed.

The country preferred the CCE combined ice lined refrigerator/waterparks freezer (TCW 2000 AC for health centers, HBC-260, HBC-150 and HBD-116 depending on the facility’s need) and HBC-260, HBD-286 were preferred for the district stores. Furthermore, the selection also considered equipment’s holdover time that enables them to withstand power outage lasting for a day and the fact that they are bundled with the RTMD.

The equipment was selected to equip 140 SPs among them 112 health posts that require cold chain extension will be equipped and 28 will be installed in Health Centres to replace existing CCE in 22 HCs, extension in 2 and expansion in 4 HCs. The choice of TCW 2000 AC to equip the Health Centres is because of the need for capacity for freezing of icepacks in addition to vaccine storage capacity. For the sites without electricity SDDs are preferred hence the choice of VLS 054A SDD. Table below shows equipment options selected for the intervention by type, energy, and levels.

**Table 3: CCE Options**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | **Energy** | **Type** | **SP** | **LD** |
| **Option 1** | On-grid | ILR |  TCW 2000 AC |  - |
| Freezer |   |  - |
| Off-grid | ILR | VLS 054A SDD with RTMS |  - |
| Freezer |  - |  - |
| **Option 2** | On-grid | ILR | TCW 20000 AC |  - |
| Off-grid | ILR | TCW 40R SDD |  - |
| Freezer |  - |  - |
| **Option 3** | On-grid | ILR |  TCW 2000AC |   |
| Off-grid | ILR | HTC 110 SDD with RTMS (Haier U-Cool bundled) |  - |
| Freezer |  - |  - |

### 2.1. Overview and lessons learned.

The equipment selection in the previous proposal to Gavi was based on facility need depending on the power supplied in that area, population size and the latest technology of CCE that would keep vaccines potent. Prior to selection and proposal application, an assessment of cold chain equipment was conducted to identify the situation to ensure the facility have received the right cold chain equipment. Using the WHO PQS catalogue, ILRs for facilities powered by electricity and/or generators that runs for more than 8 hours per day were selected. It has been proven that, that types of refrigerators can holdover the temperature for hours e when the power failed.

For the facilities that were not connected to the national grid, or with power supply less than 8 hours, solar direct drive refrigerators were chosen. Another point that was considered, is the health facility related storage capacity need on both refrigeration for vaccines and freezing capacity for the water packs.

The procurement of the selected CCE was done through UNICEF SD including service bundle activities. This means that transport and installation was done by suppliers who contracted a local service provider in the country to proceed with the implementation which was smoothly completed under government’s supervision. The implementation was fully facilitated by member of PMT drawn from RBC (MoH) and partner agencies.

## 2.2 Temperature Monitoring system

RTM system is installed at national store, with a device called Thermotrack which accommodates all the CCE at this level. At District stores FT2 devices are used to monitor temperature while at the SP, equipment from B Medical are equipped with integrated RTMDs. However, equipment from other manufacturers at SP level do not have RTMDs, With the opportunity provided by this CCEOP 2 platform, the country planned to acquire 407 Haier U-Cool RTMDs to equip the remaining equipment at SP level with RTMDs which has been included in the budget.

## Chapter 3: Deviation plan

Based on the last CCEOP implementation experience, there were not many deviations occurred (less than 1%), with this experience it is expected to be more minimized with an informed deployment plan.

## 3.1 Overview of operational deployment plan

The procurement of the equipment is done through UNICEF based on the memorandum of understanding between UNICEF and the Ministry of health. The Ministry of Health has developed an Operational Deployment Plan of the equipment selected which will be submitted alongside with the application form and will then be shared to UNICEF SD. After submission of the ODP, an order will be made to selected suppliers and the cost of the order should include the service bundle, where transportation from supplier to the destination of every equipment (Health Facility), in country storage, installation and user training.

The Government will oversee the customs clearance process which will be done prior to arrival of the equipment to avoid delays and unnecessary charges at port of entry. Ministry of health will avail to the clearing agent the shipping documents and the tax waiver exemption documents once the shipment arrives in Dar-es-salaam port as the clearing process begins from there. It is also the country's responsibility to ensure that the LSP is supported enough to deliver and install the CCE at the designated health facilities. Furthermore, the PMT will closely monitor all activities related to the CCEOP implementation to ensure its effectively completed.

### 3.2 Deviation plan to manage deviations on the ODP.

During the last CCEOP exercise, PMT oversaw monitoring of all deviations related issues which successfully helped in avoiding many deviations due to the proactive efforts of the team. Although there were some deviations during the implementation of the previous CCEOP, such as lack of adequate information which delayed the procurement process before updates were done, they will serve as lesson this time as efforts will be made to guard reoccurrence. This time the PMT will ensure the ODP is up to date by the time of deploying the CCE for installation. A supervision will be conducted to all HF planned to receive CCE to ensure their readiness and all required preparations will be made prior to arrival of the CCE. This will minimize risks of deviation and if this happens unfortunately, the government will take charge of any incurred cost.

The risks that are most likely to happen are those related to the customs clearance and site readiness. This will require the team to closely monitor and work proactively to ensure that those risks are avoided by leasing with customs clearance agents and updating the ODP for accuracy. The below table shows the likelihood of the risk management to happen and those shown as most likely to happen will be being monitored by the concerned team to minimize or even avoid them to happen.

**Table 4: Risk Assessment Matrix**

|  |  |  |  |
| --- | --- | --- | --- |
| Risk | Probability | Impact | Management Strategy |
| Customs clearance documentation not in place | Medium | High | Liaise with Customs Officials and ensure all documentation is in place |
| Clearing agent not assigned | Medium | High | Liaise with MoH and ensure a clearing agent is assigned before arrival of goods |
| CCE deployed to incorrect site | Medium | High | Carry out comprehensive review of ODP and ensure submission of an accurate plan |
| Equipment delivered after hours | Low | Medium | Liaise with vendor on operating hours of facilities and contact health workers at the base to plan for receiving the equipment |
| Appropriate staff not available for training | Medium | High | Ensure HWs are aware of when vendors will be doing the installation & training |
| Roofing cannot hold solar panels (SDDs) | Medium | High | Ensure a quality HF assessment |
| No electrical sockets available (ILRs) | Medium | High | Ensure a quality HF assessment |
| Site already has a functional vaccine refrigerator | Low | High | Ensure a quality HF assessment |

## Chapter 4: CCE Maintenance Plan

Effective preventive maintenance system is a critical factor for continuous operation of cold chain equipment. The country has in place a system that outline time bound tasks, roles and responsibilities for technicians. Through this system cold chain equipment are maintained by technicians at various levels. Complex repair works are done by more skilled technicians at national level and sometimes by a third party maintenance service provider under supervision of national officers to whom such tasks are outsourced.

## 4.1. Overall maintenance strategy and structure

A systematic programme for maintenance, care and repair of cold chain equipment is critical to ensure effective immunization service delivery with potent vaccines. Therefore, a comprehensive preventive maintenance plan which includes capacity building for technicians, supervisory visits, and an effective system to respond on maintenance requests for CCE from lower levels should be made a priority. Additionally, operational training of routine users of the cold chain equipment must be put in place. Implementing this plan significantly minimizes the equipment failures.

In Rwanda, there is a public medical maintenance service known as Medical Technologies Division under Rwanda Biomedical Centre, which is responsible for maintenance of medical equipment and health infrastructure including Cold Chain Equipment for vaccines. The division is responsible for the training and supervision of technicians in charge of medical equipment maintenance at district level. Specifically, EPI has an engineer in charge of preventive and curative maintenance of cold chain equipment for central vaccine store and district stores. At District levels, there are at least one (1) biomedical technician in charge of all medical equipment and infrastructure including cold chain equipment at hospitals and Health Centres in their respective catchment areas, where there is at least one refrigerator and other medical equipment. All biomedical technicians at lower level have at least an advanced diploma in either biomedical engineering, electrical or electronics engineering. Currently engineer at central vaccine store in charge of cold chain equipment and infrastructure is master’s degree holder in biomedical engineering. Technicians are equipped with basic maintenance tool kits and refresher training is being provided for them annually.

The Biomedical engineer at Central Vaccine store is the one that oversees all CCE in the system and works closely with the DH staff to ensure all CCE at all levels is performing effectively. Furthermore, a private company is hired by RBC through Medical Technology Division to provide more complex preventive maintenance service for medical equipment at Central level including cold chain equipment. The basic preventive maintenance is performed by a trained staff at facility level and the curative maintenance is done by and biomedical engineer located at DH levels supported by the CVS cold chain engineer and the Medical Technologies Division in RBC.

Although the management of the Medical Technology Division is well structured, there are some challenges that hinder carrying out routine preventive maintenance of cold chain equipment at central and district levels. The major ones being inadequacy of both financial and human resources. For example, there is only one technician (Biomedical Engineer) at central level who is supposed to oversee maintenance of CCE at central and district levels.

However, some of these constraints are being addressed in GAVI HSS grant II where an equipped mobile workshop has been procured and now in service focusing on preventive and curative maintenance support of cold chain equipment at peripheral levels. Budget for refresher training of the biomedical technicians is secured in the GAVI-HSS.

To achieve this, a yearly budget has been proposed to enable technicians at central and district levels to move around for CCE maintenance support. (*Ref: – See page 9 of*  *Rwanda cold chain equipment maintenance and decommissioning plan)*

All health facilities have contingency plans in place where the agreement between two neighboring health facilities is done for keeping vaccines of the facility in case of cold chain failure. The job aids and SoPs for the CCE maintenance are in place to help personnel keep the CCE maintained for better performance.

### 4.2 Preventative maintenance

At service point level/health Centre level, a daily maintenance of refrigerators keeping vaccines is performed by the vaccination focal personnel at this level who is responsible for temperature recordings daily, clean dust from refrigerators and some other minor activities related to preventive maintenance.

District Biomedical Technicians conduct a quarterly preventive maintenance, the main tool used includes, Job aid card clearly indicating what was performed, name of technician, contacts and next service date and is attached to the front of refrigerator or freezer. In addition to job aid cards, a simplified inventory tool is provided and used to collect quarterly data related to the status of cold chain equipment at health facilities, the tool is being used by District Biomedical technicians and shared to National level for quarterly updates of cold chain data.

For corrective maintenance, a claiming form has been developed and shared to District Level here, at service point level request for support whenever there is an issue of cold chain breakdown using the claiming form and technician at District level support according to the request. After each intervention report is being developed and filled for feature use. During supervision, the planned preventive maintenance is verified and a developed report of performed activities in relation to the plan is checked to ensure the maintenance is being performed. It is therefore mandatory for each facility to have in place this plan.

In relation to spare parts availability, there is a stock of spare parts at central level. All DH requests for the spare parts depending on the need for all facilities in their respective catchment areas. However, there is a minimum stock of spare parts at District Level to help in case of need.

To ensure the implementation of planned preventive maintenance, the central level conducts supportive supervision where the documents at district level related to the planned preventive maintenance are checked including reports, job aids and even visual check on the status of the refrigerator. Country has also developed SOPs for vaccine management and guidelines for cold chain equipment management, which cover all brands of equipment used in the immunization supply chain.

### 4.3 Corrective maintenance

A refresher training is organized for biomedical technicians at district level on annual basis, but with pandemic challenges related to COVID-19, the last one took place in November 2020. The training is very important due to the various brands of new cold chain equipment and a number of staff turnover. Central level staff organizes the training related to cold chain management and it includes maintenance and repair of CCE and vaccine management in general. The last one continued both District Biomedical technicians and vaccines focal personnel at health facilities. There were two sessions for the two audiences. One was related to the refresher training was separated into two sessions where first was for District Biomedical technicians and included both preventive and curative maintenance while the second session was focused on basic preventive maintenance of the CCE.

At central level, a store of spare parts is available to maintain frequent emergencies at all levels. There is a budget allocated to ensure availability of the spare parts on an annual basis. At DH stores, a minimum list of spare parts is available through the request sent to central level together with the report of currently used spare parts and full identifications of CCE being maintained. Here the engineer at central level analyzes the report and provides the spare parts according to the mostly used spare parts at facilities and quantification is based on the number of health facilities within the catchment area. For the major repairs central level is responsible for the repairs. Where the refrigerant/Gas, brazing rods and torch for brazing are being used by central level staff (engineers), for the monitoring purpose.

For spare part inventory, a quarterly basis inventory is being conducted and the report is submitted to EPI manager for further decision.

### 4.4 Other considerations

A micro planning for immunization activities is developed every quarter and it includes CCE maintenance and repairs where transportation and mission fees for the staff are allocated from both government finds and HSS In addition a country wide periodic inventory for CCE is being conducted, the rehabilitation and expansion plan is implemented using the same source of funding. In relation to the post installation activities of CCE, the supplier provides a two years’ warranty where the supplier is responsible for all failures of the CCE within that period. Health care provider in charge of vaccination activities is one responsible for the CCE at facility level. They are therefore informed about the scope warrant, and they are provided with the full contact of the personnel from the supplier side to ensure timely resolution of the issue.

## Chapter 5: CCE Decommissioning Plan

Decommissioning of any assets shall be undertaken in accordance with the designated public laws, regulations, and accounting practices in the country. Specifically, the Cold Chain Equipment disposal procedure shall align with the government procedure on e-waste and any law on Environment Protection. The equipment must be correctly decommissioned and decontaminated prior to transfer or disposal (National E-Waste Management Policy for Rwanda, 2015).

The obsolete and non-functional medical equipment including cold chain equipment from health facilities are decommissioned with the Ministry of health guideline developed and shared to all health facilities (Ministry of Health, 2017). Therefore, it is a responsibility of the facility to dispose the outdated technologies regarding this guideline. From that, all the old CCE equipment that are still functional to be removed from the cold chain system to be used for other purposes (donated to other programs that are in need). Non- functional and beyond repair cold chain equipment are removed to the program and kept to a separate warehouse waiting for the final disposal.

The process of removing equipment to the service is conducted by the biomedical equipment in charge of all medical equipment together with the hospital logistic committee. After deciding what equipment to be disposed of and what to be donated to the other programs, the hospital logistic committee has the full responsibility to decide on the way forward. Once a decision is made, the committee writes a letter to the public waste disposal agency named enviro serve informing them the availability of the equipment to be disposed of and give the copy to Rwanda Housing Authority which in turn charges in public buildings and Asset Management and Rwanda Environment Management Authority. Enviro serve collect and transport the equipment for free toward to site for recycling and other processes.

The Ministry of Health through a letter written by the General Director of RBC informed all health facilities about this process informing them about the outdated equipment disposal policy and requested for all concerned HFs to act whenever needed. The guideline is also published on the Ministry’s website for the public.

There about 475 CCE to be removed from the inventory system and of these, 450 to be discarded and 25 to be replaced. All this equipment is outdated CCE and most of them have been replaced through CCEOP1 and Covax-CCE. Though decommissioning instructions had been provided from central level, the implementation process was delayed and among the reasons includes an emergency response the country was going though that response was the priority considering that the 1st batch was received in July 2020 and the second in 2021 which was the difficult moment to everyone.

RBC is closely following up to ensure all the outdated cold chain equipment is disposed following the guideline.

## Chapter 6: Performance Framework

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***Indicator*** | ***Definition*** | ***Data Source*** | ***Reporting frequency*** | ***Baseline 2023*** | ***Target 2024*** | ***Target 2025*** |
| 1. ***CCE Replacement /rehabilitation in existing Equipped sites:***
 | *Percentage of existing sites with (non)functional and/or obsolete non-PQS and PQS equipment to be replaced with platform eligible ILR, SDD or long-term passive devices (including equipping sites with a larger equipment)* | Inventory and Gap Analysis Tool | *annual* | *Numerator = 22 Denominator = 140*   *Percentage = 15%* | *Numerator = 0* *Denominator = 0*  *Percentage = 0* | *Numerator =0*  *Denominator =0*  *Percentage =0*  |
| 1. ***CCE extension in unequipped existing and/or new sites:***
 | *Percentage of previously unequipped sites (providing immunization services or not, including existing sites without active devices) and new service sites being equipped with Platform eligible equipment.* | Inventory and Gap Analysis Tool | *annual* | *Numerator =* 114*Denominator =140*  *Percentage =81.4%* | *Numerator =*  *Denominator =*   *Percentage =*  | *Numerator = 0Denominator =*  *Percentage =*  |
| 1. ***CCE expansion in existing equipped sites:***
 | *Percentage of existing sites being equipped with ADDITIONAL pieces of equipment for new vaccine introduction and/or to serve an increasing population;* | Inventory and Gap Analysis Tool | *annual* | *Numerator =* 4 *Denominator =140**Percentage =2.8%* | *Numerator = 0 Denominator =0 Percentage =0* | *Numerator = 0 Denominator =0 Percentage =0* |
| 1. ***CCE Decommissioning***
 | *Percentage of CCE Decommissioned and removed from the inventory* | *CCE Decommissioning Plan* | *Annual* | *Numerator=450**Denominator=475**Percentage=94.7%* | *Numerator=25**Denominator=475**Percentage=5.3%* | *Numerator=0**Denominator=0**Percentage=0* |

## References

1. Ministry of Health (2017). Guidelines for Decommissioning and Disposing Healthcare Equipment in Rwanda.
2. Republic of Rwanda (2005). National e-waste Management Policy for Rwanda.
3. WHO (2018). Decommissioning and safe disposal of cold chain equipment
4. MOH (2018). Standard operating procedures for District Hospital and health Centre cold chain. Unpublished
5. MOH (2018). Standard operating procedures for central vaccine store cold chain. Unpublished
6. Ministry of Infrastructure (2014). Fleet Policy of Government of Rwanda.

Mudaheranwa, E., Stany, S., Sibomana, H., Hitimana, R., & Nzayirambaho, M. (2021). Cost Analysis of Current Distribution and Redesigned Distribution Systems for Vaccines in Rwanda. *Rwanda Journal of Medicine and Health Sciences*, *4*(2), 207–221. https://doi.org/10.4314/rjmhs.v4i2.2

This, C. (n.d.). *Rwanda Cold Chain Equipment Maintenance Plan*. 1–10.