



## Cold Chain Optimisation Platform Application for September 2016 (only)


This application is prepared for countries applying for the Gavi CCE optimisation platform ('the Platform') support in September 2016.

**In filling this application form, countries are expected to consult the following documents and resources:**


	Application Guidelines for countries wishing to request HSS support is available here: <a href="http://www.gavi.org/support/apply">www.gavi.org/support/apply</a>
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	Application Instructions for countries wishing to request CCE optimisation platform support is available here: <a href="http://www.gavi.org/support/apply">www.gavi.org/support/apply</a>
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	Technology guide for equipment selection for counties wishing to request CCE optimisation platform support is available here: <a href="http://www.gavi.org/support/hss/cold-chain-equipment-optimisation-platform/">http://www.gavi.org/support/hss/cold-chain-equipment-optimisation-platform/</a>
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	Extensive technical resources relating to vaccine cold chain equipment management are available on TechNet-21: <a href="http://www.technet-21.org/en/resources/cold-chain-equipment-management">http://www.technet-21.org/en/resources/cold-chain-equipment-management</a>
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*Additionally:*

	This signals important information that is provided within this application form
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## 1. APPLICANT INFORMATION

<b>Country</b>	<b>CAMEROON (CMR)</b>	
<b>Date:</b>	2 September 2016	
<b>Contact name</b>	Dr KOBELA Marie, Permanent Secretary of the EPI-TAG.	
<b>Email address</b>	mariekobela2006@yahoo.fr	
<b>Phone number</b>	(+237) 699567425	
<b>Total funding requested from CCE optimisation platform (US \$)</b>	US\$ 11,373,087	
<b>Does your country have an approved Gavi HSS support on-going?</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	Indicate the anticipated <b>final year</b> of the HSS: 2021	
<b>Proposed CCE optimisation platform support start date:</b>	Indicate the month and year of the planned start date of the support, based on the strategic deployment plan: 1 August 2017	
<b>Proposed CCE optimisation platform support end date:</b>	Indicate the month and year of the planned end date of the support, based on the strategic deployment plan: December 2021	
<b>Signatures</b> Include signed (and official) CCE optimisation platform application endorsement by: <ul style="list-style-type: none"> <li>a) Minister of Health and Minister of Finance (or <u>delegated authorities</u>)</li> <li>b) Members of the HSCC/ICC or equivalent committee and signed minutes of meetings where the application was endorsed</li> </ul> In case of HSS and CCE optimisation platform requests, minutes must reflect that both were discussed and endorsed.	We the undersigned, affirm the objectives and activities of the Gavi CCE optimisation platform proposal are fully aligned with the national health strategic plan (or equivalent) and that the funds for implementing all activities, including domestic funds and any needed joint investment, will be included in the annual budget of the Ministry of Health:	
	<b>Minister of Health</b> <b>(or delegated authority)</b>  Name:     Signature:    Date:	<b>Minister of Finance</b> <b>(or delegated authority)</b>  Name:     Signature:    Date:

## 2. NATIONAL STRATEGIES AND PLANS RELEVANT TO SUPPLY CHAIN AND REQUESTED SUPPORT

How do the following national strategies, country plans and documents inform plans to strengthen the country's supply chain, and how do they inform the request for CCE optimisation platform support. These documents are **mandatory**, must be attached to your application, and they must be **final** and **dated**.

No	Strategy / Plan / Document <i>*All documents are mandatory. Only complete applications will be assessed.</i>	Attached Yes/No	Final version (dated)	Duration	<u>Comments</u>
1	<b>Signature sheet for the Minister of Health and Minister of Finance, or their delegates</b>	Yes	September 2016	-	
2	<b>Signature sheet for HSCC/ICC or equivalent committee endorsement and minutes of meetings</b>	Yes	2 September 2016	-	
3	<b>National Health Sector Development Plan</b>	Yes	2016	5 years (2016-2020)	
4	<b>cMYP</b>	Yes	February 2015	years (2015-2019)	
5	<b>EVM Assessment</b>	Yes	August 2013	-	
6	<b>EVM Improvement Plan</b>	Yes	January 2014	5 years (2014-2018)	
7	<b>EVM Annual Workplan AND Progress Report on EVM Improvement Plan<sup>1</sup></b>	Yes	September 2016	12 months (1 January-31 December 2016)	<b>The EVM Annual Workplan is included in the EPI AWP</b>
8	<b>CCE Inventory Report<sup>2</sup> AND Facilities Segmentation Plan</b>	Yes	August 2016	-	
9	<b>Cold Chain Rehabilitation and Expansion Plan, AND Equipment Selection and Strategic Deployment Plan</b>	Yes	September 2016	5 years (2017-2021)	
10	<b>Maintenance Plan with financing</b>	Yes	September 2016	5 years (2017-2021)	
11	<b>Proof of status for CCE tariff exemptions waiver</b>	Yes	April 2016	One year (2016)	
12	<b>OTHER RELEVANT DOCUMENTS</b>				

**13. How do the above strategies, plans and documents inform the CCE optimisation platform support request ('initial support' and 'scale-up support')? Countries are encouraged to reference relevant sections of the above documents as much as possible.**

Provide approximately 1 page

This proposal is perfectly in line with the national policy and strategy documents (2016-2027 Health Sector Strategy, 2015-2019 cMYP), and the Health Sector Strategy is consistent with the Sustainable Development Objectives on mother and child health (SDO 3.1 and 3.2). This proposal also takes into account the activities planned within the framework of Health Services Strengthening (HSS2), the observations and suggestions from the EPI and EVM

<sup>1</sup>The EVM IP and annual work plan progress report must have been updated within three (3) months of applying for Platform support.

<sup>2</sup>The CCE Inventory must have been updated within no more than one (1) year of applying for Platform support.

assessments in 2013, and the conclusions in the 2016 Gavi country evaluation.

Using these documents helped identify bottlenecks; an in-depth analysis of the causes led to defining objectives in the proposal.

The overall EPI objective is to reach immunisation coverage of at least 90% by 2019, in accordance with the 2015-2019 cMYP. To reach this objective, the country must have a reliable supply system to ensure the availability of quality vaccines at all levels. The 2015-2019 cMYP will be revised in 2017 to include activities in the platform. The EVM assessment (2013) showed weaknesses in the supply chain. To mitigate these weaknesses, an EVM improvement plan was drawn up and is currently being implemented.

In addition to the 2013 EVM, Cameroon carried out an inventory of cold chain equipment and vehicles in December 2015 and January 2016. The analysis of this inventory indicated gaps, some of which will be resolved as part of this platform. To fill these gaps, the country has established a rehabilitation and expansion plan for 2017-2021. To ensure proper equipment functioning, the country has developed a plan to address preventive and corrective maintenance problems. A deployment plan has also been drawn up to follow implementation and monitor equipment purchases.

### 3. APPLICATION DETAILS



Please review [Section 6](#) of the Platform [Application Instructions](#) for complete information on phased support and application requirements.

#### 3.1 Application requirements overview

Aligning with the Gavi HSS support, the CCE optimisation platform will provide phased support (for a maximum duration of 5 years) which includes: 'initial support' (Approximately years 1-2) to address country's most urgent CCE needs; and 'scale-up support' (Approximately years 3-5) to address additional CCE needs as part of transforming the supply chain to support sustainable achievements of coverage and equity targets.

- **Countries must make a single application to the CCE optimisation platform, requesting support for both the 'initial' and 'scale-up' phases.**
- Sufficient, well-functioning cold chain equipment is one "fundamental" prerequisite for an effective immunisation supply chain, complementing the other "fundamentals" comprised of: supply chain managers; data for management; optimised & efficient design of the distribution system; and a continuous improvement process over time.
- **Support from the CCE optimisation platform should be demonstrated to complement investments from other sources in these fundamentals**
- **Countries should also demonstrate, in their application, how the Platform support will contribute to sustainable improvements in immunisation coverage and equity, consistent with country targets.**

#### Executive Summary:

Organisation and administration of Cameroon's vaccine supply chain is based on the EPI organisation chart. It is strategically steered by the Interagency Coordinating Committee (ICC), which is chaired by the Minister of Public Health. Implementation of ICC guidelines is handled by: (1) a National Technical Group headed by a Permanent Secretary, who is

assisted by a deputy and five sections, including the routine immunisation and supply chain sections. Within this section is a supply chain management unit that handles implementation of supply chain activities at the national level; (2) Ten regional units, each headed by a Unit Chief assisted by a supply chain manager, who coordinates supply chain activities at this level; (3) In the 189 health districts, the Health Bureau Chiefs manage the supply chain; (4) in the 1,779 health areas and functioning health facilities (about 4,379), the managers are in charge of managing the cold chain. The EPI programme must overcome several challenges in order to achieve its goals for coverage and equity, among them supply chain strengthening.

Cameroon's EPI programme currently has 12 antigens and the Country is considering the gradual introduction and scaling-up of three more between now and 2021 (MR2, HepB, MenAfriVac and HPV).

The 2013 EVM assessment and the CCE inventory of Dec 2015-Jan 2016 helped identify weaknesses in the supply chain. These weaknesses are: (1) At the central level: the gap in terms of net capacity will be around 70,000 l in 2021. Therefore, around eight cold rooms of 40 m<sup>3</sup> will be needed to provide sufficient storage space. The lack of a dedicated EPI warehouse for consumables, malfunctions and breakdowns in the obsolete cold rooms, and inadequate capacities for managing supplies and vaccine stocks are other problems identified at this level. (2) At the intermediate and peripheral levels: an inadequate storage capacity, a shortage of vehicles for supervisory visits, the lack of a formal information and logistics management system (SIGL) (2013 Effective Vaccine Management assessment report), inadequate coverage of logistical needs for delivery of primary healthcare services to marginalised or hard-to-reach populations, the existence of non-approved refrigerators in 93% of health facilities, the lack of a formal system for maintaining the cold chain in 70% of health facilities and buildings in 80% of these facilities, the non-existence of an adequate waste-disposal system in 73% of health facilities, and non-compliance with standards pertaining to managing immunisation waste. Where financing is concerned, although there has been a clear increase since 2010, the State's financial contribution to immunisation remains insufficient (12% in 2013). The State has always honoured its commitment to purchasing vaccines, but there are still delays in the availability of its financial contributions. Furthermore, non-optimal programme management can be noted, this due to the inadequate managerial capacity of the EPI, especially at the national and regional levels; inadequate coordination of activities at the regional and district levels; and low incentive levels in personnel at the local level. Additionally, the EVM evaluation and supervisor reports from the field have shown the obsolete condition of the cold chain equipment, the lack of personnel training on preventive maintenance, prolonged and repeated shortages of petrol and spare parts, and prolonged failures because of the lack of qualified technicians. It should also be indicated that the lack of updated standardised operating procedures and shortcomings in monitoring of the temperature of cold chain equipment constituted significant weaknesses which led to the preparation of the improvement plans.

To address the main bottlenecks, the country, with the support of its partners, launched a reinforcement of the supply chain in 2014 by implementing activities from the EVM improvement plan, in particular: the purchase and installation of eight cold rooms at the national and regional levels and 121 solar refrigerators for the health facilities, the purchase of a refrigerated truck for transporting vaccines, as well as remote temperature-monitoring devices and 3,000 Fridge-tag devices, the improvement of dry storage space at the national level, and the launch of an invitation to tender for the construction of a national EPI depot.

Cameroon has decided to submit its proposal to the Gavi supply chain optimisation platform to support the purchase, transport and installation of 3,086 refrigerators (solar and electric)

for the districts and health facilities, 299 spare parts kits, 4 freezers and 2,126 Fridge-tag devices.

The following considerations were included in selecting the equipment type: (i) Gavi's "Cold Chain Equipment Optimisation Platform" technology guide, (ii) lessons learnt in the purchase, installation and use of solar refrigerators in the Country, (iii) technical guidelines for choosing platform-eligible equipment and (iv) guidelines from the Ministry of Public Health for standardising the stock of CCE.

This proposal will enable Cameroon to strengthen its supply chain through: (i) Equipping all the HD and health facility storehouses in urban and semi-urban areas that immunise without approved and functional CCE. This will require the redeployment of available uninstalled equipment and repair of out-of-order equipment, as follows: (ii) Providing approved CCE to all the health facilities in rural areas that immunise without functional CCE. (iii) Replacing non-compliant equipment (e.g. absorption refrigerators more than 10 years old and domestic refrigerators). (iv) Replacing absorption refrigerators less than 10 years old and/or CCE that is pre-qualified but more than 10 years old. (v) Equipping health facilities that currently have sufficient capacity but that will present gaps in CCE from 2019, in order to guide them in the introduction of new vaccines. (vi) Equipping health facilities that do not currently offer immunisation services but have indicated intention to include immunisation in their activities. In addition, 2,126 Fridge-tag devices will be purchased to replace those that will be purchased during the 2017-2021 period.

The monitoring and evaluation activities relative to cold chain equipment optimisation are in line with those of the HSS2 programme. Indeed, the activities of Objective 2 of the HSS2 proposal and those of the current proposal are complementary and even dependent on one another. The monitoring and evaluation duties will be taken care of by the following organs and bodies: (i) At the operational level by the health districts, health areas and health facilities that have CCE. All the refrigerators used for vaccine storage will have to be equipped with Fridge-tag 2 devices or a remote monitoring system, to allow regular monitoring of the cold chain. The remote temperature monitoring system already implemented will be spread to certain health districts. (ii) At the regional level by the EPI Regional Units. All the cold rooms will be provided with remote and real-time temperature monitoring systems. (iii) At the Central level by the EPI supply chain management committee, which brings together experts in immunisation, supply chain managers as well as the partners (UNICEF, WHO, CHAI, etc.). Its main role is to give technical advice to the EPI managers and decision-makers. However, the team overseeing HSS2 management will be closely linked to this activity. The cold rooms at this level will be equipped with the same system as those of the regional level. Monthly reports will be produced and shared with all the partners. These reports will take stock of the progress made in the planned activities. They will also bring to light the points on various indicators to analyse. For collection, processing and analysis of data on how the installed equipment is working, tools will be developed to facilitate monitoring. A system of monthly and periodic data reporting will be established. The database of the national inventory of CCE available at the central level and in all the regions will be regularly updated with data on the functioning of the CCE. This database will be updated monthly and will make it possible to report on and analyse the supply chain data.

Studies and surveys outside the EPI will also be conducted, e.g. a Service Availability and Readiness Assessment (SARA) and national surveys (inventory of CCE, EVM, ICS, DHS, MICS, etc.). The results of these evaluations will help decisions to be taken, such as revision of health sector strategic documents, priority programmes and improvement plans for healthcare provision performance. In addition, as the programme is in line with HSS2, it will

benefit from the Gavi HSS2 mid-term evaluation and final evaluation, which will be carried out in 2019 and 2021, respectively.

#### 4. APPLICATION REQUEST

*This section gives an overview of the types of information the IRC will anticipate from countries in their application for CCE optimisation platform support.*

##### 4.1. Situation analysis and requested support

*This section must be filled with appropriate reference to the country documents listed in Section 2. Countries are required to provide a narrative in response to the following questions.*

Section	<i>Required information</i>
<p data-bbox="76 1160 242 1429"><b>Situation analysis of country's supply chain and CCE</b> (number, distribution, functionalities etc.)</p> <p data-bbox="76 1464 201 1525"><b><u>Provide 3 pages</u></b></p>	<p data-bbox="284 656 1070 678"><b>1. <i>How is the country's immunisation supply chain administered?</i></b></p> <p data-bbox="284 696 1544 864">Administration of Cameroon's vaccine supply chain is based on the EPI administration and organisation chart. It is strategically steered by the Interagency Coordinating Committee (ICC), which is chaired by the Minister of Public Health. This committee is the consultation, coordination, orientation, resource-mobilising and strategic decision-making body when it comes to immunisation. Implementation of ICC guidelines is handled by:</p> <ul data-bbox="331 887 1544 1234" style="list-style-type: none"> <li>❖ A National Technical Advisory Group headed by a Permanent Secretary, who is assisted by a deputy and 5 sections, including the routine immunisation and supply chain management sections. This section includes a supply-chain unit that ensures the implementation of supply-chain activities at the central level. The supply-chain unit is headed by a Unit Chief and assisted by two warehouse managers (health logisticians) and two inventory clerks.</li> <li>❖ There are also ten regional units, each headed by a Unit Chief assisted by a supply chain manager, who coordinates supply-chain activities, and an inventory clerk;</li> <li>❖ In the 189 health districts, the Health Bureau Chiefs manage the supply chain;</li> <li>❖ In the 1,779 health areas and functioning health facilities (about 4,379), the managers are in charge of managing the cold chain.</li> </ul> <p data-bbox="331 1267 1544 1361">Vaccines and other immunisation inputs are delivered quarterly to the regional depots by the national level. The districts, health areas and health facility depots receive a monthly supply from the next level up.</p> <p data-bbox="284 1395 1155 1417"><b>2. <i>What weaknesses have been identified in the country's supply chain?</i></b></p> <p data-bbox="284 1440 1544 1742">The most recent complete inventory of CCE reveals that 42% of the health facilities do not have functioning CCE. They are supplied on immunisation days by a nearby facility and generally organise one immunisation session per month. The inventory has also shown that the equipment includes several brands of equipment, 33% of which is made up of domestic refrigerators. This situation makes supply chain management difficult (e.g. ordering spare parts, maintaining equipment, monitoring the cold chain, etc.). More than 92% of all refrigerators are not approved and expose vaccines to heat and/or frost. A temperature-monitoring study conducted in 2015 and 2016 in 24 HDs in five of Cameroon's regions showed that 44% of SIBIR-brand refrigerators expose vaccines to frost and 68% of domestic refrigerators expose them to heat. The weaknesses in the supply chain can thus be summarised by level:</p> <p data-bbox="284 1753 523 1776">At the national level:</p> <ul data-bbox="284 1809 1544 1955" style="list-style-type: none"> <li>➤ An inadequate vaccine storage capacity (a shortage of four 40 m<sup>3</sup> cold rooms in 2016) and a lack of dedicated EPI warehouse for consumables;</li> <li>➤ Malfunctions and breakdowns in the cold rooms;</li> <li>➤ Inadequate capacities for managing supplies and vaccine stocks (with a high wastage rate as a result);</li> </ul> <p data-bbox="284 1989 770 2011">At the intermediate and peripheral levels:</p> <ul data-bbox="284 2022 839 2078" style="list-style-type: none"> <li>➤ Inadequate storage capacity;</li> <li>➤ Shortage of vehicles for supervisory visits;</li> </ul>

- The lack of a formal information and logistics management system (SIGL) (2013 Effective Vaccine Management assessment report);
- Weak coverage of the logistical needs required for primary health care services for remote or marginalised populations (2016 inventory report on cold-chain equipment, 2013 report on Effective Vaccine Management Assessment);
- The existence of non-approved refrigerators in 93% of health facilities;
- The lack of a formal system for maintaining the cold chain in 70% of health facilities and buildings in 80% of these facilities;
- The non-existence of an adequate waste-disposal system in 73% of health facilities;
- Non-compliance with standards pertaining to managing immunisation waste.

When it comes to human resources, the following was noted at all levels of the health pyramid:

- Insufficient quantity and quality of personnel, particularly in management of the supply chain and logistics;
- Low wages and incentive levels among human resources in health care and non-equitable distribution in the country of the different categories of health professionals (2011 General Census Report on Ministry of Health Personnel);
- Low rate of completion of capacity-building activities for EPI human resources. As an example, in the health facilities (HFs), 90% of healthcare workers in charge of immunisation are not trained. Likewise, there is not enough supportive supervision from the regions to the districts and the districts to the health centres (2013 external EPI assessment).

For financing, recent evaluations have shown that:

- Although there has been a clear increase since 2010, the State's financial contribution to immunisation activities remains insufficient (12% in 2013; 2013 Activity Report and 2014 AWP).
- The State has always honoured its commitment to purchasing vaccines, but there are still delays in the availability of its financial contributions.

Furthermore, non-optimal programme management can be noted (2016-2019 cMYP), this due to the inadequate managerial capacity of the EPI, especially at the national and regional levels; inadequate coordination of activities at the regional and district levels; and low incentive levels among personnel at the operational level.

### *3. Through what interventions are these weaknesses currently being addressed?*

To address the problems that have been identified, Cameroon implemented the activities in the EVM improvement plan below, with support from the partners, between 2014 and 2016 (with funding from Gavi-HSS1, Elma, UNICEF and CHAI):

At the national level:

- Purchase and installation of four cold rooms (Elma funds);
- Purchase of a refrigerated truck for transporting vaccines (Elma funds);
- Purchase of five remote temperature-monitoring devices (Elma funds);
- Improvement of the dry storage space at the national level (CHAI);
- Launch of an invitation to tender for the construction of a national EPI depot (State and Gavi).

At the Regional, district and health-facility levels:

- Purchase of four cold rooms for the Northwest, Southwest, Adamawa and Littoral regions (Elma funds);
- Purchase of a remote temperature-monitoring device for the Northwest depot;
- Purchase of 121 solar refrigerators for the health facilities (Elma and HSS1 funds);
- Purchase and distribution of 3,000 Fridge-tag devices to the regions, HDs and health facilities for temperature monitoring (Elma and UNICEF funds);
- Planning for other purchases (5 cold rooms, 680 refrigerators and 5 generators) with HSS2 funds.



When it comes to maintenance, contracts have been signed at the central level with service providers. To develop expertise in this area, a Unit is being created within the EPI-TAG, and technician pools are also being created in the regions. With support from the AMP, a team of national technicians received training on installing and maintaining solar refrigerators. Additionally, a maintenance campaign for broken-down equipment is being organised.

With regard to personnel capacity-building, supply chain managers from the central and regional levels received training in supply chain management. This activity was extended to warehouse managers from 25 other HDs. There are plans in the HSS2 to continue this activity down to the health area level.

#### *4. Describe challenges that are hindering the implementation of these interventions.*

The main challenges that are hindering the implementation of these interventions are:

- Delay in the installation of equipment, caused by the non-involvement of manufacturers in the installation process.
- Inadequate user training, because only workers at the national and regional level received training on this equipment.
- Lack of segmentation of health facilities. Some electrical equipment was sent to areas without electricity.
- Some health facilities are built with temporary materials and cannot receive equipment;
- Inadequate financing for maintenance.
- Lack of technicians and spare parts, especially at the local level.
- Insecurity in the East, Adamawa and Far North regions.
- Inadequate monitoring and supervision.

#### *5. Describe lessons learnt from recent supply chain related support that inform the current request for CCE optimisation platform support.*

Recent support for the supply chain (C2D, Reprogramming of HSS1, Elma and UNICEF) have helped identify the need to:

- Involve manufacturers in the process of installing equipment, all the way down to the operational level. The country will help with this.
- Conduct an initial cold chain equipment inventory before submitting anything for the supply chain;
- Carry out segmentation of health facilities in order to prepare an equipment deployment plan; this will prevent equipment being sent to areas where it cannot be used due to a lack of electricity;
- Organise preliminary visits to the sites before the arrival of the installation teams, for the success of the installation plan for new equipment;
- Incorporate skills transfer to the local team into the process of installing cold chain equipment;
- Train the users of this equipment in preventive maintenance;
- Draw up and implement a monitoring and evaluation plan.

#### *6. What percentage of facilities have reliable access to grid electricity for up to or more than 8 hours per day?*

- According to the latest cold chain equipment inventory (2016), 59% of facilities have reliable access to electricity.

#### *7. Please give the quantity and percent of current CCE that is: a) functional; b) PQS-approved; c) non-PQS-approved; and/or d) obsolete.*

In the last inventory, 4,001 cold chain equipment items were listed; the quantities and percent requested are as follows:

- a) *Functional: 2,720 (68%)*
- b) *Obsolete: 756 (19%)*
- b) *PQS-approved (performance, quality, security): 504 (7%)*

d) non-PQS-approved: 3,497 (93%)

8. *What percent of the birth cohort is served by effectively functioning, PQS-approved CCE currently?*

- ✓ Total population served by PQS equipment: 784,454
- ✓ Cohort served with PQS equipment =  $784,454 \times 3.8\% = 29,800$
- ✓ Country's birth cohort = 853,682
- ✓ % Cohort served by PQS equipment in 2016 =  $\frac{29,800}{853,682} \times 3.8\% = 3.5\%$

9. *What are the bottlenecks that CCE can address in the current supply chain set-up (for example, capacity and technology constraints)?*

The bottlenecks that CCE can address in the current supply chain set-up are:

- weak capacities and performances of the supply chain, in vaccines and other inputs. As it stands now:
  - o Approximately 4,114 health facilities do not have adequate storage capacity (no functional or approved equipment).
  - o 42% (1,493/3,570) of health facilities that immunise do not have functioning CCE and organise, in general, one single immunisation per month. This affects about 33% of immunisation targets. The purchase of this equipment will reduce the high dropout rate problem as well as lost opportunities, thereby improving immunisation coverage and equity.
  - o Approximately 93% of equipment is non-PSQ-approved, including 55% SIBIR brand (absorption refrigerators), 33% domestic and 5% Electrolux and Zero brand.
  - o Inadequate temperature monitoring (insufficient quantity of Fridge-tag devices, and personnel inadequately trained).
  - o The operating cost of gas refrigerators is high. An analysis has shown that in 2015, roughly US\$ 500,000 was spent for gas purchase. Moreover, gas shortages are frequent in some areas.

10. *Describe any other supply chain challenges that CCE optimisation platform support will assist in mitigating?*

The purchase and installation of new equipment with platform support will make it possible to:

- Raise rates of coverage in approved CCE in health facilities from 7% to 80% by 2021 (2015-2019 cMYP objectives);
- Strengthen maintenance of cold chain equipment;
- Build capacities of users and technicians;
- Establish a system of management for spare parts;
- Improve the system of monitoring CCE;
- Reinforce the system of temperature monitoring and control.

11. *What are the overall CCE needs?*

*The overall CCE needs are:*

- **Equipment needs and types at the central level**
  - Eight 40m<sup>3</sup> cold rooms, which will be purchased with HSS2 funds and the MR leftover funds (not eligible for the platform);
  - One freezer room (not eligible for the platform).
- **Equipment requirements and types at the regional level**
  - Four cold rooms (not eligible for the platform);
  - Four electric freezers.
- **Equipment requirements and types in the district depots.**
  - 34 solar refrigerators;
  - 205 electric refrigerators.

- **Equipment needs and types at the health facilities**
  - 1,350 solar refrigerators;
  - 1,491 electric refrigerators;
  - 1,275 coolers will be purchased with HSS2 funds (not eligible for the platform).

12. Which of the CCE needs identified in the situation analysis are urgent, and why, and therefore should be addressed in the urgent scale-up phase? (E.g. type of equipment, model, capacity, number etc.)?

The installation of new refrigerators and the replacement of existing ones will take place following five priorities. The first two priorities will be addressed in the urgent phase.

- The first concerns all the health districts without functional CCE as well as the health facilities of urban and peri-urban areas that immunise but do not have functional CCE available. This will reduce the CCE gap, help reduce dropout rate and improve immunisation service in the health facilities that cover around 13% of the immunisation target.
- The second priority concerns the health facilities in rural areas that immunise without functional and approved CCE. This intervention will help improve vaccine quality and immunisation coverage.

The characteristics and numbers of equipment items selected for this phase are summarised in the table below:

**Table 1: List of refrigerators to order during the emergency phase**

Fabricant/Modele	2017		2018		Total	
	Nombre	Cout (\$)	Nombre	Cout (\$)	Nombre	Cout (\$)
VESTFROST MF 314	4	7 944	-	-	4	7 944
VESTFROST VLS 200A Green Line	205	427 630	189	394 254	394	821 884
VESTFROST VLS 300A Green Line	68	153 816	38	85 956	106	239 772
VESTFROST VLS 350A Green Line	159	377 784	10	23 760	169	401 544
VESTFROST VLS 054 Green Line SDD	113	603 420	393	2 098 620	506	2 702 040
SUNDANZERBFRV-55 SDD	43	238 607	166	921 134	209	1 159 741
VESTFROST VLS094 Green Line SDD	36	205 848	46	263 028	82	468 876
Piece de rechange	71	18 460	86	20 640	157	39 100
<b>TOTAL USD</b>		<b>2 033 509</b>		<b>3 807 392</b>		<b>5 840 901</b>

13. What percent of the birth cohort will be served by effectively functioning CCE when the Platform equipment is deployed?

- ✓ Total population covered by PQS equipment = 21,680,888
- ✓ Cohort covered by PQS equipment = 21,680,888 \* 3.8% = 823,873
- ✓ Country's birth cohort = 853,682
- ✓ % Cohort that will receive CCE when platform is rolled out =  $\frac{823,873}{853,682} \times 3,8\% = 96.5\%$

14. Explain how these urgent needs relate to the current bottlenecks (as outlined in the preceding section)?

Providing CCE in this first phase will help identify the coverage in CCE at the health facilities and to gradually replace the non-compliant refrigerators. Equipping the neediest facilities this way will enable them to more easily reach the 33% of children who have been poorly or not at all provided service up to now, due to their isolation or lack of CCE. An improvement in accessibility (increase in Penta1 immunisation coverage), use (decrease in dropout rate) and quality of immunisation services (quality vaccines) is also expected. In addition, this activity will reduce the frequency and cost of supplying

**Country's urgent and scale-up CCE needs** (number, distribution, functionalities etc.)  
**Provide 1 page**

vaccines and will enable healthcare personnel to increase the number of immunisation sessions.

15. *How will the requested Platform support concretely contribute to addressing identified geographic and socio-economic inequities and gender barriers to sustainable improvements in coverage and equity of immunisation? Examples may include (not exhaustive):*
- a. *Geographically remote districts or those with low coverage*
  - b. *Poorer communities (e.g. in the poorest 10 % of the population)*
  - c. *Communities where gender barriers are significant and/or where low levels of female education is common (as this is often associated with lower coverage)*

In 2015, the national immunisation coverage objectives were 90% and 85%, respectively, for Penta3 and MCV. These objectives were not met; national coverage was 84% for Penta3 and 79% for MCV.

With regard to immunisation equity, 33% (63/189) of functional health districts had Penta3 immunisation coverage below 80%, and three of these health districts (Abo and Ndom in the Littoral region and Bali in the Northwest) had immunisation coverage rates below 50% (2015 EPI activity report and JRF).

Immunisation equity remains low. Cameroon has never had more than 80% of its health districts with a coverage rate above 80% for Penta3, as is recommended by the GVAP.

**Table 2:** Proportion of health districts with immunisation coverage below 80% for Penta and MCV and without a functional CC

Region	% HDs with coverage in Penta3 <80%	% HDs with coverage in MCV <80%	% Health facilities (HFs) without functional CCE
Adamawa	-	56	28
Centre	43	67	43
East	-	7	40
Far North	27	43	40
Littoral	50	50	26
North	27	40	27
Northwest	79	84	35
West	25	35	57
South	30	70	67
Southwest	17	44	41

There are also economic disparities. According to the PETS 2, 60% of the population is not able to meet healthcare expenses. The rate of full immunisation coverage is 32.3% in families of the poorest quintile, compared to 70.3% in the wealthiest quintile (2011 DHS-MICS).

The five groups of populations or communities affected by inequitable access to immunisation services are: (i) The Mbororo communities made up of nomadic pastoralists spread out around the country. They generally live away from cities and far from sedentary peoples, making their access to basic health services difficult. (ii) The Pygmy communities (the Bakas, the Bagyelis and the Bedzan), characterised by a lifestyle marked by conservation of their ancestral traditions. Their camps are located considerable distance from health facilities, thereby representing an obstacle to their access to health services. (iii) The “Kirdis” mountain peoples, who live in the Mandara Mountains in the Far North region. (iv) The island communities off the seacoast in the Littoral region, and those in peninsulas in the Southwest region and Lake Chad in

**Expected immunisation coverage, equity and sustainability results**

**Provide 2 pages**

the Far North. (v) The populations living in insecure zones, in the Far North and East regions. (The mapping of these insecure zones is provided in detail in the equipment roll-out plan appended to this form.) However, there is no problem of gender discrimination in the access and use of immunisation services (2011 DHS-MICS).

From among the other reasons for poor performance, the following can be highlighted:

- difficulty reaching remote populations due to lack of vehicles and CCE;
- repeated gas shortages;
- frequent equipment breakdowns due to age and dilapidation;
- the lack of spare parts;
- inadequate maintenance of CCE, often leading to stockouts and vaccine wastage.

In this proposal, priority will be given to coverage of these special populations, to the health districts not having functional CCE and to health facilities immunising without CCE, this in accordance with the criteria below.

Priority 1: Equip all the HD warehouses and the health facilities in urban and semi-urban areas that immunise without approved and functional cold chain equipment. This will involve redistribution of available, non-installed equipment and repair of broken-down equipment.

Priority 2: Provide approved CCE at all the health facilities in rural areas that immunise without functional CCE.

In addition to the priorities listed above, immunisation equity will be ensured by providing refrigerators to health facilities in rural areas that are very remote or quite far from health area depots, as well as the health posts near national borders and in the refugee camps, regardless of their target. The proposal will finally enable the Country to proceed with progressive replacement of obsolete equipment and equipment not meeting the PQS standards.

Providing solar refrigerators to the health facilities that receive less than eight hours of electricity per day (41%) will give them more opportunity to immunise on a daily basis and will help reduce the vaccine wastage rate. Furthermore, the platform will make it possible to purchase and install approved equipment that will no longer expose vaccines to frost or heat. This grant will also enable the health facilities to limit supplies and related costs.

*16. What analyses<sup>3</sup> have been made, or what plans are underway, to optimise the design of the supply chain distribution system<sup>4</sup> in order to improve the efficiency of the supply chain and contribute to achieving coverage and equity goals?*

As part of the response to health emergencies, new vaccine submissions and HSS, Cameroon has conducted a study to identify hard-to-reach areas and populations.

Two new activities are planned starting in 2017; these are: computerised stock management and a “redesign” of the distribution system in order to optimise it. This will help: (i) establish a real-time inventory system, as well as an on-line database to monitor equipment, stock levels and performance indicators for logistics and the cold chain; and (ii) review the mechanism for vaccine distribution and reorient it towards a system where the regions supply the districts and the districts supply the health areas. The results of these activities could influence CCE requirements for years 3, 4 and 5.

Furthermore, to optimise the effectiveness of the supply chain, the country has decided to divide health facilities needing storage capacity of less than 15 l into two groups:

- (a) The health facilities located less than 5 km away, with good geographical accessibility, will obtain supplies from the health-facility leader of the health area and will benefit from ice boxes (passive containers) for vaccine conservation.
- (b) The health facilities located less than 5 km away but with poor geographical accessibility and the health facilities located more than 5 km from the health facility leader will benefit from an appropriate

<sup>3</sup>These plans can vary from desk reviews to complex modelling of the country’s supply chain system and distribution that help in identification of ways to increase supply chain efficiency, in order to deliver potent vaccines.

<sup>4</sup> NOTE: Activities to optimise the design of supply chain distribution systems are NOT funded by Platform-support.

refrigerator (capacity of 55 to 60 litres, SDD or electric).

*17. How have these system design considerations impacted the choice of CCE to be supported by the Platform?*

These studies, plus the results of the CCE inventory of Dec 2015-Jan 2016, enabled us to finalise the classification (segmentation) of the health facilities with a view to more efficient equipment allocation. These studies also made it possible to develop the CCE expansion plan.

The number of equipment items to be purchased has been reduced through grouping together health facilities needing storage capacity of less than 15 l.

The redesign of the supply chain will also affect the role of the districts. Needs for years 3, 4 and 5 will thus be determined based on the results of this study, and Cameroon is aware that the amount approved by Gavi will not be revised upwards. The country will look for financing in case there is a need for it.

*18. Concretely, how will Platform support help improve the sustainability of the supply chain system?*

Financial sustainability:

- The platform will enable the country to reduce the cost of purchasing domestic gas, estimated at US\$ 2.5 million for 2017-2021. The estimated cost of replacing all gas equipment with solar refrigerators comes to US\$ 2.4 million.
- It will also help reduce operating costs for maintenance of absorption refrigerators and obsolete refrigerators.
- According to the CCE maintenance plan, the country is committed to increasing the budget allocated to maintenance each year by 5%.

Programming sustainability:

- The health facilities that immunise will improve the frequency of immunisation sessions, which will lower the dropout rate and missed opportunities and, as a result, increase immunisation coverage.
- With the availability of optimal equipment, the risk of exposure to heat and frost will be reduced, as will the wastage rate of unopened vials.
- To improve immunisation equity, the health facilities not carrying out immunisation will be given suitable CCE.
- For the health facilities that immunise without equipment, being given CCE will lead to improved personnel efficiency.

*19. How will the country ensure that aspects of maintaining the cold chain are addressed (e.g. preventive and corrective maintenance, monitoring functionality, technicians, financing for maintenance, etc.)?*

During the EVM assessment conducted in 2013, criterion E5 (Maintenance) received low scores: 57% at the region level and 54% at the HD and health-facility level, compared to a minimum 80% expected. This is a sign of poor organisation of the maintenance system. The inventory also noted that in addition to a lack of financing, the lack of spare parts and the low numbers of technicians are the main reasons the refrigerators at the operational level are not functional.

To mitigate these problems, the country has developed a budgeted maintenance plan for 2017-2021 that includes, among other things: the creation of a pool of technicians in charge of corrective maintenance in each region, implementation of a system for managing spare parts and capacity-building in preventive maintenance for equipment users. The country has also agreed to increase the budget allocated to CCE maintenance by 5% each year. Implementation of this plan will be handled by the EPI-TAG Maintenance Unit.

Preventive or routine CCE maintenance will essentially be handled by users at all levels. These personnel are thus responsible for the proper functioning of the CCE on a daily basis.

*a. What is the frequency of preventative and corrective maintenance that the country commits to (supported by partners)?*

- Routine preventive maintenance is carried out daily by the main user. Activities that can be noted include:
  - Twice-daily temperature readings;

**Maintenance plan (and its source of funding) and equipment disposal**

**Provide 2 pages**

- Organisation of vaccines, solvents and ice packs;
  - Daily equipment maintenance (cleaning and defrosting).
- The so-called systemic preventative maintenance is carried out by a technician.

Corrective maintenance of refrigerators is handled by a qualified service provider at the national level and in the regions. The table below shows the maintenance frequency.

Table 3: Frequency of maintenance by equipment type

Equipment	Frequency of maintenance		
	Preventive maintenance		Corrective maintenance
	Routine maintenance	Systems maintenance	
Cold room	Daily	Every three months	As needed
Refrigerator	Daily	Every three months for the first year	As needed
		Every six months after the first year.	

*b. What technical support is anticipated for maintenance?*

Technical support anticipated for maintenance includes:

- User and technician training by the manufacturer;
- The development and monitoring of the implementation of Standardised Operating Procedures (SOP) for maintenance;
- Establishment of a system to monitor maintenance activities;
- Availability of spare parts;
- Technical assistance from the partners and manufacturers to ensure the sustainability of maintenance;
- Implementation of maintenance management tools (logs, etc.);
- Close supervision from the national level to the regions and the regions to the health districts;
- Decentralisation of the management of spare parts so technicians from the pools can act quickly in order to limit the down time of the CCE;
- Management of complex interventions by the national technicians or in partnership with the private sector.

*20. How will the country monitor the completion of preventive and corrective maintenance?*

*a. Which source(s) of funding will be used for maintenance, and to what extent are they assured?*

Preventive and corrective maintenance activity reports will be drawn up by the person in charge of the activity (personnel and technicians), signed by the manager of the facility in question and sent to the hierarchy within one week. These reports will be sent to the EPI-TAG maintenance unit. Furthermore, administrative data on the operational state of the CCE (temperatures, alarms, breakdowns, etc.) will be produced by the facilities and health services according to monitoring for action guidelines. These data will be validated and consolidated in a monthly activity report and sent up to the next level in the hierarchy. Once they have been validated by the regions during CC performance review meetings, the data will be sent to the national level (Maintenance Unit) for strategic steering.

Standardised Operating Procedures (SOP) prepared and displayed at each depot will guide the user on what to do in case of an abnormal situation with the CCE. A schedule for updating is also prepared.

Funding for the maintenance plan will be covered by the Ministry of Public Health and its partners (WHO, UNICEF and CHAI). Each year, the State allocates funds to the EPI National Technical Advisory Group for maintenance of cold chain equipment (US\$ 70,000 – 90,000). These funds are not enough to cover

maintenance needs all the way down to the health-facility level. High-level advocacy will be conducted to mobilise resources to cover needs in the regions, districts and health areas. A budgeted maintenance plan has been developed for this purpose.

**21. How will the country dispose of obsolete and unrepairable equipment replaced by CCE optimisation platform equipment?**

Once it has been purchased, cold chain equipment is the property of the State and is treated as such. Theoretically, this equipment is amortised annually until the point where it can no longer be used. It is removed from the system and handed over to the relevant Ministry (Ministry of State Property and Land Tenure), where it is sold at auction or decommissioned for disposal. Equipment that is functional but not approved (SIBIR, etc.) will be sent to other departments (laboratories, maternity, etc.) to store drugs and reagents. Obsolete equipment to be replaced during this project will follow the same procedures.

**22. How will the country facilitate the manufacturer's or representative's role in equipment purchase, distribution and installation?**

The country will supply manufacturers with certain information to facilitate planning installation and user training activities, in particular:

- The roll-out plan (list of beneficiary facilities);
- Characteristics of the area where installation will take place (accessibility, state of roads, etc.);
- The list and number of users and technicians to be trained;
- Technical support for equipment delivery;
- The schedule for delivery, installation and training;
- Facilitation of procuring entry visas for international technicians;
- Assurance of safety for team members;
- Exemption from import duty.

**23. What is the source of the joint investment? Is the country's joint investment secured?**

The joint investment for the cold chain equipment platform will come from Cameroon and its partners. During the ICC meeting of 2 September 2016, at which the proposal was approved, the country invited all of the partners to contribute matching funds. The total amount to be mobilised for the country's contribution is US\$ 5,686,543. These funds will come from the State budget for 2017-2020 and from the Gavi-HSS2 window. The sum of US\$ 260,417 was planned in the 2017-2019 Medium-Term Expenditure Framework budget for the gradual replacement of cold chain equipment. These funds will be transferred to UNICEF to purchase CCE. Cameroon's other TFPs are prepared to help it in this activity but for now do not know the exact amounts of their respective contributions.

The country and its partners (WHO, UNICEF and CHAI) will also finance activities in the maintenance plan, the purchase of cold rooms and the purchase of vehicles.

	Sources of funding	Amounts in US\$
	Government of Cameroon	260,416
	Gavi/HSS2	5,426,127
	Gavi-platform	5,686,544
	<b>Total</b>	<b>11,373,087</b>

**24. Has the country secured import tariff exemptions for CCE? If yes, attach proof.**

All equipment purchased by the State through its technical and financial partners will be exempt from customs duty and taxes. Within the framework of this project, the equipment will be purchased through UNICEF, which is a United Nations agency receiving customs exemptions for importing medical equipment and products into the Cameroon. (See the 2016 exemption letter in annex.)

Other implementation details

Provide 1 page



## 4.2 Initial support phase

*This initial support is designed to address urgent CCE needs through years 1 and 2.*

Provide maximum 3 pages, comprising:

- **2 to 4 prioritised URGENT CCE needs** as identified in the 'CCE rehabilitation and expansion plan, equipment selection and strategic deployment plan requirements' (see Annex 3 of the Application Instructions),

The Dec 2015-Jan 2016 CCE inventory reveals that only 68% (2,499/3,675) of the country's available refrigerators are functional. Nearly 42% of the health facilities do not have functional CCE. They are supplied on immunisation days by a nearby facility and generally organise one immunisation session per month. This is also a major reason why immunisation coverage and equity objectives have not been reached. In this proposal, activities in the first phase are focused on health facilities and health districts that have a great need for cold chain equipment, based on the criteria below:

- Priority 1: Provide functional approved cold chain equipment to the health districts without functional CCE or non [sic] approved CCE as well as to the health facilities in urban and peri-urban areas that immunise without functional CCE.
- Priority 2: Provide approved CCE to the health facilities of rural areas that immunise without a functional cold chain.


In addition to the priorities listed above, immunisation equity will be ensured by providing health facilities in rural areas that are very remote or quite far from the depots in the health areas, as well as marginalised urban areas, with refrigerators, regardless of their target.

- **Description** of planned or ongoing activities related to other supply chain "fundamentals".

On-going or planned activities related to other "fundamentals" in the supply chain and written into the EVM improvement plan and the cMYP are:

- Improvement to the dry storage capacity for consumables in the national and regional depots;
- Improvement of procedures for receiving and delivering vaccines and inputs;
- Personnel capacity-building on the supply chain;
- Reinforcement of maintenance through signing contracts with private service providers;
- Reinforcement of the system of continuous recording and temperature monitoring at all levels;
- Implementation of procedures for customs clearing and rapid collection of this equipment;
- Regular supportive supervision of good quality at all levels of the supply chain;
- Development of and/or making available standardised operating procedures for health workers at various levels;
- Providing fire extinguishers to the regional and district depots.

### 4.2.1 Prioritised URGENT CCE needs

 <b>Budgets <u>not inclusive of</u> operational cost</b> <i>(Operational costs to be financed by Ministry of Health or other partners)</i>	
<b>Prioritised (URGENT) CCE need 1:</b>	<b>1. The need</b> Please include: Type of activity (e.g. replace obsolete CCE, extend CCE to unequipped facilities, etc.); specific CCE site (facility); type of equipment required; quantity of equipment items.

<p>(Required information )</p>	<p>Provide <b>192</b> solar refrigerators and <b>432</b> electric refrigerators to the health districts without functional CCE and to the health facilities of urban and peri-urban areas that immunise but do not have functional CCE.</p> <p><b>2. Explanation</b>  Please include: Reasons for urgent need (e.g. low CCE and/or immunisation (Penta3) coverage area, gender barriers, mobile population, etc.); current CCE and immunisation (Penta3) coverage in the population area.  The district depots oversee the resupplying of the health facilities of their coverage zones. It is important that they have functional and approved CCE. These health facilities of urban and peri-urban areas cover a large population and are more accessible. They immunise but do not have functioning CCE. They are supplied on immunisation days by a nearby facility and generally organise one immunisation session per month. This is a major reason why immunisation coverage and equity objectives have not been reached. It is necessary to equip them with CCE; their accessibility will facilitate activities such as installation, training and monitoring of preventative maintenance during this first year of the project.</p> <p><b>3. Expected outcome</b>  Please include: Anticipated increase in CCE and immunisation coverage (Penta3); anticipated progress against identified inequity (describe, in alignment with country Performance framework).</p> <p>Providing these health facilities and health district depots with CCE will help reduce the vaccine wastage rate, make managing personnel work time more efficient, optimise the yield and increase the frequency of immunisation sessions. All of these factors will help reach our objectives for equity and for immunisation coverage (at least 92% coverage in Penta in 2019).</p>
<p>Total CCE Budget:</p>	<p>'Total budget' includes Gavi and country joint investment share: <b>US\$ 2,033,509</b></p>
<p>Prioritised (URGENT) CCE need 2:</p>	<p><b>Need:</b> Equip the health facilities of rural areas that immunise without functional and approved CCE (605 solar refrigerators and 237 electric refrigerators).</p> <p><b>Justification:</b> The CC equipment inventory showed that approximately 93% of existing refrigerators are not of optimal quality (Sibir-brand (55%), domestic (33%) and Electrolux and Zero-brand (5%) refrigerators). These refrigerators expose vaccines to frost and/or heat.</p> <p><b>Expected outcome:</b>  The replacement of this non-compliant equipment will help (i) improve coverage in approved equipment, thus reducing the risk of exposure to heat and frost, and (ii) reduce the vaccine wastage rate. Immunisation coverage and equity objectives can be reached.</p>
<p>Total CCE Budget:</p>	<p><b>US\$ 3,807,392</b></p>
<p><b>GRAND TOTAL CCE BUDGET: 'Initial support' (Years 1 and 2 )</b></p>	<p><b>US\$ 5,840,901</b></p>

#### **4.2.2 Ongoing or planned activities around other supply chain fundamentals in the initial support phase**

**In this section, linkages must be drawn between requested CCE Optimisation Platform support, on-going Gavi investments (especially through the Health Systems Strengthening support) and other partner supply chain support.**

*Describe planned or ongoing activities related to other supply chain “fundamentals” (see section 3 of the Application Instructions) during the initial support phase, including their sources of funding. Responses to this section should be linked to the EVM Improvement Plan.*

##### **Supply chain managers**

*Provide description of all planned or ongoing activities related to improving the availability and performance of supply chain managers, their sources of funding, and partner support.*

Within the framework of purchasing CCE through Gavi-HSS1 and Elma funds, the country and its partners launched the following activities in 2015:

- Capacity-building for managers in the national and regional depots and for equipment users;
- Since 2014, the country has received support from the LOGIVAC programme to train health supply chain managers. This activity was planned in the HSS2 so that all regional depots can have trained supply chain managers.
- A survey is also underway to identify needs for personnel capacity-building, including for those in charge of managing the cold chain. The results of this survey will be used to develop a personnel-strengthening plan, which will be implemented with support from the partners.
- In addition, manufacturer training for users of the new equipment is now included in the purchase plans for all equipment.

##### **Data for supply chain management**

*Provide description of all planned or ongoing activities related to data for management, their sources of funding, and partner support. In particular, please provide information explaining how improvements to the functionality of logistics management systems will improve the visibility of up-to-date and accurate vaccine stock records at each level of the vaccine supply chain.*

Data will be collected within the health facilities using logs. Periodic summaries will be sent using forms with a printed copy. The summary and data transmission are carried out within the coordination facilities (districts, regions and national level) with the aid of summary sheets and input/analysis software. The DHIS2 (District Health Information Software 2) is being developed at the MoH, as is the cartography for the healthcare service offer using the geographic information system (GIS). The bottlenecks lined to data and data quality are: (1) the lack of a strategic document for information system development, (2) the fragmentation of the health management information system with a multitude of data collection tools, (3) inadequate production of routine data due to low computerisation of HMIS at all levels, (4) difficulty in producing reliable information products that can readjust the programme objectives or guide appropriate policy decisions and (5) inadequate data reporting from the health facilities to the districts.

Management of supply chain data is incorporated into the HMIS. Data collection for routine activities will be done by the facilities, in accordance with the HMIS. Data collection and transmission will be done using monitoring forms and activity implementation reports after endorsement at all levels and following a “bottom-up” approach. A dashboard will be used at all levels to rapidly identify gaps in implementation, bottlenecks and deviations. A system of feedback will help in decision-making at all levels. Administrative data on the operational state of the devices (temperatures, alarms, breakdowns, etc.) will be produced by the facilities and health services according to monitoring for action guidelines. These data collected in the health facilities with physical materials (temperature-monitoring sheets, etc.) will be endorsed and consolidated in a monthly activity report and sent to the health district for consolidations in electronic tools (DHIS2 or DVDMT). The data obtained will be analysed at all levels and sent simultaneously with the district monthly activity reports (in physical and

electronic format) to the regional level for endorsement, analysis and operational decision-making. Once endorsed by the region, the data will be sent to the national level for strategic steering. In addition to these activities, emphasis will be placed on using the zero-cost telephone stock and teleconferencing equipment for active collection of data on the status of vaccine storage and supply chain monitoring.

### **Optimised, efficient design of distribution system**

*Provide description of all planned activities related to distribution system design optimisation, their sources of funding, and partner support.*

As part of HSS2, the country has planned an exercise on the “redesign” evaluation of its distribution system with a view to optimising it. This study will be carried out in two regions, with the support of the partners (WHO, UNICEF, CHAI and CDC) and Gavi funding. The idea is to reconsider how the vaccines are distributed in Cameroon and to switch the distribution chain over to a system in which the regions supply the districts and the latter supply the health areas. This will make it possible to:

- Guarantee regular distribution of vaccine stocks to the lower levels;
- Combine the distribution of vaccines to the lower levels with supportive supervision and preventive maintenance sessions.

### **Continuous improvement process**

*Provide description of all planned or ongoing activities related to continuous improvement processes, their sources of funding, and partner support.*

The planned or on-going activities related to continuous improvement processes are:

#### ➤ Improved storage capacity and conditions:

Within the framework of reinforcing vaccine storage capacity and equipment maintenance, the country proposes (in addition to the CCE platform) to:

- Close the gap in vaccine storage capacity at the national and regional levels by purchasing five cold rooms with a capacity of 40 m3 each;
- Ensure the continuous functioning of CCE by purchasing 40 Kw standby generators and voltage stabilisers;
- Improve working conditions and conditions for storing vaccines, inputs and other supplies by building a modern depot for the national level.

These purchases will enable storage of all necessary vaccines, diluents and injection materials for the national immunisation programme; improvement to the availability of quality vaccines; and supervision of vaccine management and injection safety, especially in the districts targeted by HSS2.

#### ➤ Assurance of proper functioning of equipment items throughout their lifespan

A maintenance plan for cold chain equipment has been drawn up. Its implementation will be financed by the State and its partners. This will ensure that the continuity of services is not compromised by recurrent break-downs.

#### ➤ Continued capacity-building for personnel involved in vaccine management at all levels:

This activity will ensure the proper availability of quality vaccines through the establishment of a pool of national trainers, revision of the "standards and procedures for management of the supply chain" document, and the creation of training modules for service providers at all levels though financing from Gavi HSS and other partners.

#### ➤ Management of two new activities: computerised stock management and a “redesign” of the distribution system in order to optimise it

The EPI must make progress on two fronts if it is to be modernised:

- a) Implementation of a real-time inventory system, as well as an on-line database to monitor stock levels and performance indicators for logistics and the cold chain;
- b) Implementation of the “redesign” system.

### 4.3 Reviewing implementation of initial support activities

*Support for approximately years 3 onwards will be contingent on reporting and performance of activities implemented during the initial support phase.*

Reviewing the implementation of the initial activities (urgent phase) in this proposal will be included in the annual Gavi-Country joint appraisal. This will make it possible to:

- ensure that objectives have been reached and that vaccines of good quality are available at all levels;
- ensure that problems relating to isolated areas and equity have been removed;
- assess the impact of this support on the system and the efficiency of the system;
- assess the system for monitoring supply chain data;
- identify the persistent problems that prevent reaching objectives to improve the supply chain and particularly to improve immunisation coverage and equity;
- identify areas where greater investments and efforts, as well as technical support, are needed;
- examine the means of optimising this support, which should serve as a catalyst for reinforcing immunisation services.

### 4.4 Scale-up support phase

*This second phase of Gavi CCE optimisation platform support will be provided for approximately year 3 onwards.*

Provide maximum 3 pages, comprising:

- **2 to 4 prioritised ADDITIONAL CCE needs** as identified in the ‘CCE rehabilitation and expansion plan, equipment selection and strategic deployment plan requirements’ (see Annex 3 of the Application Instructions),

The CCE inventory shows that more than 92% of all refrigerators are not approved and expose vaccines to heat and/or frost. A temperature-monitoring study conducted in 2015 and 2016 in 24 HDs in Cameroon showed that 44% of SIBIR refrigerators expose vaccines to frost and 68% of domestic refrigerators expose them to heat. This is why it is important to replace this equipment and strengthen the temperature-monitoring system.

In this proposal, the activities in the second phase are directed at resolving problems at the priority 3, 4 and 5 facilities, as described below:

- Priority 3: Replace non-compliant equipment (eg absorption refrigerators more than 10 years old and domestic refrigerators).
- Priority 4: Replace the absorption refrigerators less than 10 years old and/or CCE that is pre-qualified but more than 10 years old, and equip health facilities that currently have sufficient capacity but that will present gaps in CCE from 2019, in order to guide them in the introduction of new vaccines.
- Priority 5: Equip health facilities that do not currently offer immunisation services but have indicated an intention to include immunisation in their activities.


*Description of planned activities related to other supply chain “fundamentals”.*

*Planned activities related to other supply chain “fundamentals” are:*

- User updates of CCE inventory data at each level;
- Reinforcement of the mechanisms for monitoring CCE ordering and purchase;

- Implementation of activities from the 2017 EVM plan:  
An EVM assessment is planned during the first half of the year

#### 4.4.1 Prioritised ADDITIONAL CCE needs

 Budgets <u>not inclusive of</u> operational cost (Operational costs to be financed by Ministry of Health or other partners)	
Prioritised (ADDITIONAL) CCE need 1: (Required information)	<p><b>1. The need</b>  <i>Please include: Type of activity (e.g. replace obsolete CCE, extend CCE to unequipped facilities, etc.); specific CCE site (facility); type of equipment required; quantity of equipment items.</i></p> <p>Replace non-compliant equipment (eg absorption refrigerators more than 10 years old and domestic refrigerators) with 192 solar refrigerators and 468 electric refrigerators.</p> <p><b>2. Explanation</b>  <i>Please include: Reasons for additional CCE need (e.g. low CCE and/or immunisation (Penta3) coverage area, gender barriers, mobile population, etc.); current CCE and immunisation (Penta3) coverage in the population area.</i></p> <p>The inventory noted that more than 92% of all refrigerators are not approved and expose vaccines to heat and/or frost. Moreover, 19% of the refrigerators are obsolete. It is thus necessary to replace them with approved equipment.</p> <p><b>3. Expected outcome</b>  <i>Please include: Anticipated increase in CCE and immunisation coverage (Penta3); anticipated progress against identified inequity (describe, <a href="#">in alignment with country Performance framework</a>).</i></p> <p>The gradual replacement of this equipment will help both increase coverage of needs for approved CCE and reduce the risks of exposure to heat and frost as well as vaccine wastage, in order to improve immunisation coverage and equity.</p>
<b>Total CCE<sup>5</sup> Budget:</b>	<b>US\$ 2,092,174</b>
Prioritised (ADDITIONAL) CCE need 2:	<p><b>The need:</b>  <i>(See guidance as per prioritised need 1, above)</i></p> <p>Replace the absorption refrigerators less than 10 years old and/or CCE that is pre-qualified but more than 10 years old; equip health facilities that currently have sufficient capacity but that will present gaps from 2019, in order to guide them in the introduction of new vaccines; and equip health facilities that do not currently offer immunisation services but have indicated an intention to include immunisation in their activities. In addition, 2,126 Fridge-tag devices will be purchased to replace those that will be purchased during the period.</p> <p><b>Rationale:</b>  <i>The inventory noted that more than 92% of all refrigerators are not approved and expose vaccines to heat and/or frost. Moreover, 19% of the refrigerators are obsolete. It is thus necessary to replace them with approved equipment.</i></p> <p>The inventory was a way of taking a census of constructed health facilities that do not offer immunisation services. They will need to</p>

<sup>5</sup>The Budget does not include the operational cost to be financed by Ministry of Health and other partners.

	<p>be provided with CCE. This is also true for facilities that will be created during the planning period or that will develop gaps.</p> <p><b>Expected outcome:</b>  <i>The gradual replacement of this equipment will help increase coverage of needs for approved CCE and reducing the risks of exposure to heat and frost as well as vaccine wastage, in order to improve immunisation coverage and equity.</i></p> <p>All the health facilities offering immunisation services are equipped with ECF. This will improve the availability of good-quality vaccines, the number of immunisation sessions, immunisation coverage and immunisation equity.</p>
<b>Total CCE Budget:</b>	<b>US\$ 3,440,012</b>
<b>GRAND TOTAL CCE BUDGET: 'Initial support' (Years 3, 4, 5 )</b>	<b>US\$ 5,532,186</b>

#### 4.4.2 Planned activities around other supply chain fundamentals in the scale-up

**In this section, linkages must be drawn between requested CCE Optimisation Platform support, on-going Gavi investments (especially through the Health Systems Strengthening support) and other partner supply chain support.**

*Describe planned activities related to other supply chain “fundamentals” (see section 3 of the Application Instructions) during the scale-up support phase, including their sources of funding. Responses to this section should be linked to the EVM Improvement Plan.*

##### **Supply chain managers**

*Provide description of all planned activities related to improving the availability and performance of supply chain managers, their sources of funding, and partner support.*

*Within the framework of purchasing CCE through Gavi-HSS1 and Elma funds, in 2015 the country and its partners launched activities to build capacity among national and regional depot managers as well as equipment users. A survey is also underway to identify needs for personnel capacity-building, including for those in charge of managing the cold chain. The results of this survey will be used to develop a personnel-strengthening plan, which will be implemented with support from the partners. Since 2014, the country has received support from the LOGIVAC programme to train health supply chain managers. This activity was planned in the HSS2 so that all regional depots can have trained supply chain managers. In addition, manufacturer training for users of the new equipment is now included in the purchase plans for all equipment.*

##### **Data for supply chain management**

*Provide description of all planned activities related to data for management, their sources of funding, and partner support. In particular, please provide information explaining how improvements to the functionality of logistics management systems will improve the visibility of up-to-date and accurate vaccine stock records at each level of the vaccine supply chain.*

Data collection is carried out in the health facilities with the help of registers that are not always harmonised, whilst the transmission of periodic summaries is carried out using printed copies of forms. The summary and data transmission are carried out within the coordination facilities (districts, regions and national level) with the aid of summary sheets and input/analysis software. The DHIS2 (District Health Information Software 2) is being developed at the MoH, as is the cartography for the healthcare service offer using the geographic information system (GIS). The bottlenecks linked to data and data quality are: (1) the lack of a strategic document for information system development; (2)

the fragmentation of the health information management system (poor integration with data from the different programmes) with a multitude of data collection tools; (3) inadequate production of routine data due to low level of computerisation of HMIS at all levels; (4) difficulty in producing reliable information products that can readjust the programme objectives or guide appropriate policy decisions; and (5) inadequate data reporting from the operational level to the peripheral level.

Management of supply chain data is incorporated into the HMIS. Data collection for routine activities will be done by those in charge of the activities, who will conduct regular monitoring with reporting to the EPI-TAG via the Logistics Group. This data collection and transmission will be done using monitoring forms and activity implementation reports after endorsement at all levels and following a "bottom-up" approach. A dashboard will be used at all levels to rapidly identify gaps in implementation, bottlenecks and deviations. A system of feedback will help in taking corrective action at all levels. Administrative data on the operational state of the devices (temperatures, alarms, breakdowns, etc.) will be produced by the facilities and health services according to monitoring-for-action guidelines. These data collected in the health facilities with physical materials (temperature-monitoring sheets, etc.) will be endorsed and consolidated in a monthly activity report and sent to the health district for consolidations in electronic tools (DHIS2 or DVDMT). The data obtained will be analysed at all levels and sent simultaneously with the district monthly activity reports (in physical and electronic format) to the regional level for endorsement, analysis and operational decision-making. Once endorsed by the region, the data will be sent to the national level for strategic steering.

### **Optimised, efficient design of distribution system**

*Provide description of all planned activities related to distribution system design optimisation, their sources of funding, and partner support.*

Implementation of the recommendations made following the evaluation of the vaccine distribution system (redesign) will take place during this phase.

### **Continuous improvement process**

*Provide description of all planned activities related to continuous improvement processes, their sources of funding, and partner support. An EVM assessment will be conducted in 2017 and the improvement plan will be implemented in this second phase in addition to the activities planned as part of HSS2.*

The planned or on-going activities related to continuous improvement processes are:

➤ **Improved storage capacity:**

Within the framework of reinforcing vaccine storage capacity and equipment maintenance, the country proposes for this second phase (in addition to the CCE platform) to:

- Ensure the continuous functioning of CCE by purchasing voltage stabilisers;
- Improve working conditions and conditions for storing vaccines, inputs and other supplies by building a modern depot for the national level.

These purchases will enable storage of all necessary vaccines, diluents and injection materials for the national immunisation programme; improvement to the availability of quality vaccines; and supervision of vaccine management and injection safety, especially in the districts targeted by HSS2.

➤ **Assurance of proper functioning of equipment items throughout their lifespan**

Reinforce maintenance of cold chain equipment. This will ensure that the continuity of services is not compromised by recurrent break-downs.

➤ **Continued capacity-building for personnel involved in vaccine management at all levels:**

This activity will ensure the proper availability of quality vaccines through the establishment of a pool of national trainers, revision of the "standards and procedures for management of the supply chain" document, and the creation of training modules to train service providers in all districts though financing from Gavi HSS and other partners.

➤ **Management of two new activities: computerised stock management and a "redesign" of the distribution system in order to optimise it**

Ensure the scaling-up of the new vaccine distribution system.





## 5. BUDGET TEMPLATES

This section details the number of requested equipment items and equivalent budget. A maximum investment amount (and indicative number of equipment items) corresponding to the phased support request will be considered for recommendation of approval by the IRC and subsequent decision by Gavi.

However, in consultation with the Secretariat and in-country partners, the number of equipment items may be modified when the detailed operational plan is developed subsequent to the Platform proposal and the support may vary within the limit of the approved maximum amount.

Budgets must be completed in the embedded budget template, and with reference to the [CCE optimisation platform Application Instructions, Gavi CCE optimisation platform Technology Guide and CCE planning prices and TCO analysis tool.](#)

<i>CCE optimisation platform -Budget Template 01 (strongly encouraged)</i>	
<div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-bottom: 5px;">i</div> <b>Important information: selection of budget template</b>	
<p>➤ <b>Countries can fill <u>one of two</u> CCE optimisation platform Budget Templates:</b></p> <ul style="list-style-type: none"> <li>○ <b>Either</b> budget template number 01;</li> <li>○ <b>Or</b> budget template number 02</li> </ul>	
<p><i>To be filled by countries that have selected generic equipment categories that best suit their CCE needs (e.g. 'ILR 90L' i.e. Not specific model or make).</i></p> <p><i>Planning price ranges are provided in this template.</i></p>	 <b>Modèle de bugétisation 01.xlsx</b>
<i>CCE optimisation platform - Budget Template 02</i>	
<p><i>To be filled by countries that have selected specific equipment that best suit their CCE needs (e.g. specific model and make).</i></p> <p><i>Countries will plan with indicative PQS prices and corresponding service bundle estimates (depending on equipment being on/off-grid and estimated costs of service bundle).</i></p> <p><i>Planning price ranges are provided in this template.</i></p>	 <b>CMR_Revised_Budg et de la plateforme c</b>

## 6. PERFORMANCE FRAMEWORK

**Countries must include CCE Optimisation Platform indicators into the *Performance Framework* for the current and/or proposed Gavi HSS support, after Platform proposal approval.**

According to their specific context, countries are required to consider the most appropriate data sources to report on programme implementation and progress against the targets set. This should be discussed with partners (which may provide technical assistance) and the Gavi Secretariat.

Programmatic reporting updates, as well as targets and indicator updates, will be made as part of the Gavi performance framework and annual Joint Appraisal process. Countries are expected to consider relevant smart indicators to be monitored and reported against, in terms of intermediate results or outcomes/impact.

### Data sources

The following data sources are examples that countries may want to choose from when establishing performance framework indicators and targets:

- DHIS2
- DVD-MT
- HMIS
- WHO/UNICEF joint reporting form (JRF)
- Health facility assessments that include cold chain
- Vaccine stock ledgers
- Wastage reporting tools
- Cold chain equipment inventories
- On-site assessments of equipment functioning
- Routine monitoring with continuous temperature monitoring devices

### Indicator monitoring and reporting requirements

As a *minimum*, countries need to monitor and report on:

- **3 MANDATORY intermediate results indicators; and**
- **1 to 3 ADDITIONAL intermediate results indicator(s)**

**MANDATORY intermediate results indicators** (must include baseline, data source, targets and frequency of reporting):

1. Number of equipped facilities replacing CCE (if applicable) with any platform-eligible ILR, SDD or long-term passive devices, and irrespective of their funding source;
2. Number of facilities previously without equipment, newly equipped with platform-eligible equipment (i.e. ILRs, SDDs or long-term passive devices); and
3. Well-defined indicator proposed by country to reflect appropriate maintenance of equipment; for example percentage of equipped facilities with functioning cold chain<sup>6</sup>, such as demonstrated by remote temperature monitoring.

The key indicators chosen by the country are:

- number of equipment items purchased for health facilities that immunise but do not have equipment;
- number of equipment items purchased as a replacement;
- number of users trained;
- number of temperature-monitoring systems installed;
- number of service providers trained in using the temperature-monitoring systems;
- availability at all levels of guidelines (SOP) on maintaining the newly purchased equipment;
- availability at all levels of updated EPI norms and standards;
- availability of maintenance contracts with terms of reference incorporated;
- number of beneficiary health facilities having received supervision;

<sup>6</sup>**Indicator definition** % CCE functioning = (# functioning CCE devices) / (total # of CCE devices designated for use). CCE devices considered for this indicator include all refrigerators, fixed passive storage devices, walk-in cold rooms and freezers designated for string vaccines. Both the numerator and denominator should be collected from the same geographical area / period in time and should not include decommissioned equipment. Functionality of CCE is broadly defined to mean that the device is operable at a particular point in time for storing vaccine.

- availability of specific tools at all levels.

**ADDITIONAL intermediate results indicator(s):** *Countries are required to suggest 1 to 3 intermediate results indicators to track performance of rehabilitation, expansion, maintenance and/or other supply chain fundamentals (include baseline, data source, targets and frequency of reporting):*

*Examples of additional intermediate results indicators options are:*

1. Functional status of cold chain equipment: Ratio of functional CCE and ratio of districts with at least 90% functional equipment;
2. Closed vial wastage: Rate at a national, district and facility level;
3. Ratio of actual usage compared to forecast (vaccines);
4. Full stock availability: Ratio of facilities/districts without any stockout;
  - a. Stocked according to plan: Percentage of facilities/stores/districts that have stocks levels between set minimum and maximum stock levels;
5. Temperature alarms: Frequency and magnitude of heat and cold alarms per monitoring period (i.e., temperature excursion) and number of CCE devices with more than a certain level of temperature excursion;
6. Rate of health facilities dashboard use, timely analysis and use for decision making;
7. On-time and in-full (OTIF) delivery: Ratio of order completely delivered on time; **or**
8. Number of health managers trained and despatched for supply chain oversight function and rate of reported monitoring activities.

The intermediate results indicators chosen by the country are:

- Number of equipped facilities replacing CCE (if applicable) with any platform-eligible ILR, SDD or long-term passive devices, and irrespective of their funding source;
- Number of facilities previously without equipment, newly equipped with platform-eligible equipment (i.e. ILRs, SDDs or long-term passive devices);
- Number of health centres sending monthly activity reports with information about temperature monitoring;
- % of health facilities equipped with a functioning cold chain;
- Frequency and magnitude of heat and cold alarms per monitoring period (i.e., temperature excursion);
- Number of CCE devices with more than a certain level of temperature excursion;
- % of health facilities that provide temperature data;
- % of stores (national and regional) that have stocks levels between set minimum and maximum stock levels.

### **1- Bodies and facilities involved in Monitoring and Evaluation (M&E):**

The monitoring and evaluation activities relative to cold chain equipment optimisation are in line with those of the HSS2 programme. Indeed, the activities of Objective 2 of the HSS2 proposal and those of the current proposal are complementary and even dependent on one another. The monitoring and evaluation duties will be taken care of by the following organs and bodies: (i) At the operational level by the health districts, health areas and health

facilities with CCE. All the refrigerators used for vaccine storage will have to be equipped with Fridge-tag 2 devices or a remote monitoring system, to allow regular monitoring of the cold chain. The remote temperature monitoring system already implemented will be extended to certain health districts. (ii) At the regional level by the EPI Regional Units. All the cold rooms will be provided with remote and real-time temperature monitoring systems. (iii) At the Central level by the EPI supply chain management committee, which brings together experts in immunisation, supply chain managers as well as the partners (UNICEF, WHO, CHAI, etc.). Its main role is to give technical advice to the EPI managers and decision-makers. However, the team overseeing HSS2 management will be closely linked to this activity. The cold rooms at this level will be equipped with the same system as those of the regional level. Monthly reports will be produced and shared with all the partners. These reports will take stock of the progress made in the planned activities. They will also bring to light the points on various indicators to analyse. For collection, processing and analysis of data on how the installed equipment is working, tools will be developed to facilitate monitoring. A system of monthly and periodic data reporting will be established. The database of the national inventory of CCE available at the central level and in all the regions will be regularly updated with data on the functioning of the CCE. This database will be updated monthly and will make it possible to report on and analyse the supply chain data.

## **2- Mechanisms and tools used:**

Two groups of activities will be carried out; these are: (i) Routine monitoring activities (progress monitoring and performance monitoring) and (ii) Evaluation activities (or strategic monitoring and evaluation).

- ***Progress monitoring activities:*** This will involve monitoring the implementation of planned activities. Those in charge of the activities will conduct regular monitoring with reporting at all levels (HF, HA, HD, Regional, National). Data collection and transmission will be done using monitoring forms and activity implementation reports after endorsement at all levels and following a “bottom-up” approach. A dashboard will be used at all levels to rapidly identify gaps in implementation, bottlenecks and deviations. A system of feedback will help in taking corrective action at all levels.

The system for monitoring activities will be supplemented by monitoring, supervision and quality control missions.

- ***Performance monitoring activities*** (all levels): This will involve monitoring the meeting of objectives. Administrative data will be produced by the health facilities and services according to the RED approach “monitoring for action” guidelines. Data collected in the health facilities with physical materials (logs, immunisation scorecards, inventory cards, temperature-monitoring sheets, temperature reading report, etc.) will be endorsed and consolidated in a monthly activity report and sent to the health district for consolidation in electronic tools (DHIS2 or DVD-MT). The data obtained will be analysed at all levels (HF, HA, HD, Regional, National). At the district level, data review meetings will lead to decisions on improving performance and will be subject to data review reports. These reports will be sent simultaneously with the district monthly activity reports (in physical and electronic format) to the regional level for endorsement, analysis and operational decision-making. Once they have been endorsed by the region during data review meetings, the data will be sent to the national level for strategic steering. The frequency of transmission of these data will be daily, weekly and monthly, depending on the level and the equipment. With the participation of all of the country’s stakeholders, mini-evaluations will be carried out (annually, within the framework of the joint appraisal with monitoring of the implementation of the action plan stemming from the recommendations from the EVM and EPI monitoring & evaluation meeting). These evaluations will help to assess the state of progress and performance and to formulate recommendations for improving the process of optimising cold chain equipment.

- **The evaluation activities:** Studies and surveys outside the EPI, combined with administrative data, will also be conducted, eg a Service Availability and Readiness Assessment (SARA), national surveys (annual inventory of CCE, EVM assessment, ICS, DHS or MICS), occasional surveys on coverage and household satisfaction, KAP surveys and surveys to identify causes of non-immunisation, etc. The results of these evaluations will help decisions to be taken, such as revision of health sector strategic documents, priority programmes and improvement plans for healthcare provision performance. In addition, as the programme is in line with HSS2, it will benefit from the Gavi HSS2 mid-term evaluation and final evaluation, which will be carried out in 2019 and 2021, respectively.

### 3- Sources of data used:

The mechanisms for monitoring and evaluating the proposal will be based on the following two sources of data, as described in the performance framework: (1) Administrative data (routine EPI) collected through the HMIS placed under the responsibility of the EPI and the MoH Health Information committee and (2) Data collected through surveys and studies, operational research etc. under the responsibility of the Health Information committee in collaboration with the development partners and the country's research institutions, as outlined in the framework below:

**Table 4:** Surveys / evaluations / studies plan

Surveys/Studies	2014	2015	2016	2017	2018	2019	2020	2021
Annual inventory of CC Equipment	X	X	X	X	X	X	X	X
Immunisation coverage					X		X <sup>7</sup>	
MICS	X			X			X	
DHS			X					X
DQRC				X	X	X	X	X
SARA				X		X		X
EVM				X		X		X
Health sector review				X	X	X	X	X
External EPI evaluation					X		X	
Satisfaction and KAP survey					X		X	
Mid-term HSS evaluation						X		
Final HSS evaluation								X

### 4- Method for completing evaluations (mid-term and final)

As the platform is in line with HSS2, so the evaluation methods are in line with the one in HSS2.

<sup>7</sup> This coverage survey will be combined with the 2020 MICS and funded by the State and UNICEF.

The mid-term evaluation will focus on the following aspects: analysis of previous monitoring and evaluation reports, verification of the results indicators for the period in question, analysis of the relevance of planned activities to achieving the expected outcome, report on the use of resources and analysis of the balance between the resources used and the level of results obtained, analysis of intervention strategies, analysis of the level of involvement and degree of satisfaction of the beneficiaries (community), identification of difficulties encountered in carrying out the project/programme, proposals in the form of recommendations to various stakeholders, all with a view to improving or modifying the project in order to guarantee results.

The indicators to be monitored and analysed are described in the results chain presented below:

<b>Results chain</b>			
<b>Objective 1: → By 2021, deploy the selected CCE in the health facilities (HFs)</b>			
<p><b>Key activities:</b></p> <p><b>Activity 1.1:</b> Provide approved equipment to the HFs that immunise but do not have functional and approved equipment.</p> <p><b>Activity 1.2:</b> Replace non-compliant equipment.</p> <p><b>Activity 1.3:</b> Train users at each level.</p>	<p><b>Intermediate results:</b></p> <ul style="list-style-type: none"> <li>▪ IR1: The HFs have CCE suited to their geographical situation with sufficient storage capacity.</li> <li>▪ IR2: The CCE users are trained at each level.</li> </ul>	<p><b>Immunisation Outcomes:</b></p> <ul style="list-style-type: none"> <li>▪ <u>Immunisation coverage is improved.</u></li> </ul> <p>Pentavalent3 immunisation coverage</p> <p>MR immunisation coverage</p> <p>Penta1/Penta3 drop-out rate in the targeted areas</p>	
<p><b>Related Key Activities Indicators:</b></p> <ul style="list-style-type: none"> <li>▪ AI1.1: number of equipment items purchased for HFs that immunise but did not have equipment</li> <li>▪ AI1.2: number of equipment items purchased as a replacement</li> <li>▪ AI1.3: number of users trained</li> </ul>	<p><b>Indicators Related to Intermediate Results:</b></p> <ul style="list-style-type: none"> <li>▪ Number of equipped facilities replacing CCE (if applicable) with any platform-eligible ILR, SDD or long-term passive devices, and irrespective of their funding source</li> <li>▪ Number of facilities previously without equipment, newly equipped with platform-eligible equipment (i.e. ILRs, SDDs or long-term passive devices)</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Immunisation equity is improved</u></li> </ul> <p>Proportion of targeted districts with Pentavalent3 immunisation coverage ≥95%</p> <p>Proportion of targeted districts with Pentavalent3 immunisation coverage ≥80%</p> <p>Proportion of targeted districts with pentavalent 3 immunisation coverage ≥50% and &lt;80%</p> <ul style="list-style-type: none"> <li>▪ <u>Storage volume is</u></li> </ul>	

			<p><u>increased</u></p> <p>Storage volume is improved to 100% for the HFs during the period.</p>
<p><b>Objective 2:</b> → By 2021, extend cold chain monitoring systems to centres that are currently not equipped</p>			
	<p><b>Key activities:</b></p> <p><b>Activity 2.1:</b> Provide newly purchased temperature monitoring system equipment to centres not currently equipped</p> <p><b>Activity 2.2:</b> Train service providers at the HFs in how to use the temperature-monitoring systems</p>	<p><b>Intermediate Results:</b></p> <ul style="list-style-type: none"> <li>IR2.1: The centres that are currently not equipped will have a temperature-monitoring system.</li> </ul>	<p><b>Immunisation Outcomes:</b></p> <ul style="list-style-type: none"> <li><u>Immunisation coverage is improved.</u> Pentavalent3 immunisation coverage MR immunisation coverage</li> <li><u>Decrease in children lost to follow-up</u> Dropout rate for Penta1/Penta3</li> <li><u>Immunisation equity is improved</u> Proportion of targeted districts with pentavalent 3 immunisation coverage ≥95% Proportion of targeted districts with pentavalent 3 immunisation coverage ≥80% Proportion of targeted districts with pentavalent 3 immunisation coverage ≥50% and &lt;80%</li> <li><u>Storage volume is increased</u> Storage volume is improved to 100% for the HFs during</li> </ul>
	<p><b>Related Key Activities Indicators:</b></p> <ul style="list-style-type: none"> <li>AI2.1: number of temperature-monitoring systems installed</li> <li>AI2.2: number of service providers trained in using the temperature-monitoring</li> </ul>	<p><b>Indicators Related to Intermediate Results:</b></p> <ul style="list-style-type: none"> <li>IR2.2: number of health centres sending monthly activity reports with information about temperature monitoring</li> </ul>	

	g systems		the period.
<p><b>Objective 3: → By 2021</b>, make sure the equipment receives regular and constant maintenance to maintain vaccine strength</p>			
<p><b>Key activities:</b></p> <p><b>Activity 3.1:</b> Update and disseminate the guidelines (SOP) on preventive maintenance of the newly purchased equipment;</p> <p><b>Activity 3.2:</b> Update and disseminate the EPI norms and standards, aligned with the revised SOPs, on maintenance of CCE;</p> <p><b>Activity 3.3:</b> Develop the ToR for maintenance contracts</p> <p><b>Activity 3.4:</b> Carry out supportive supervision to ensure preventive and corrective maintenance of CCE</p> <p>Activate the maintenance unit at the national level...</p>	<p><b>Intermediate Results:</b></p> <ul style="list-style-type: none"> <li>▪ IR3.1: Managers apply operational guidelines (SOP) and the revised norms and standards.</li> <li>▪ Temperature alarms are analysed.</li> </ul>	<p><b>Immunisation Outcomes:</b></p> <ul style="list-style-type: none"> <li>▪ <u>Immunisation coverage is improved.</u></li> </ul> <p>Pentavalent3 immunisation coverage</p> <p>MR immunisation coverage</p> <ul style="list-style-type: none"> <li>▪ <u>Decrease in children lost to view</u></li> </ul> <p>Dropout rate Penta1/Penta3</p> <ul style="list-style-type: none"> <li>▪ <u>Immunisation equity is improved</u></li> </ul> <p>Proportion of targeted districts with Pentavalent3 immunisation coverage ≥95%</p> <p>Proportion of targeted districts with Pentavalent3 immunisation coverage ≥80%</p> <p>Proportion of targeted districts with Pentavalent3 immunisation coverage ≥50% and &lt;80%</p>	
<p><b>Related Key Activities Indicators:</b></p> <ul style="list-style-type: none"> <li>▪ <b>AI3.1: availability at all levels</b> of guidelines (SOPs) on maintaining the newly purchased equipment</li> <li>▪ <b>AI3.2: availability at all levels</b> of updated EPI norms and standards;</li> </ul>	<p><b>Indicators Related to Intermediate Results:</b></p> <ul style="list-style-type: none"> <li>▪ IR3.1: % of facilities equipped with a functioning<sup>8</sup> cold chain</li> <li>▪ Frequency and magnitude of heat and cold alarms per monitoring period (i.e., temperature</li> </ul>		

<sup>8</sup>**Indicator definition:** % CCE functioning = (# functioning CCE devices) / (total # of CCE devices designated for use). CCE devices considered for this indicator include all **equipment selected** and designated for string vaccines. Both the numerator and denominator should be collected from the same geographical area / period in time and should not include decommissioned equipment. Functionality of CCE is broadly defined to mean that the device is operable at a particular point in time for storing vaccine.



<ul style="list-style-type: none"> <li>▪ <b>AI3.3: availability of maintenance contracts with ToR incorporated</b></li> <li>▪ <b>AI3.4: Number of beneficiary HFs having received supervision</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ excursion)</li> <li>▪ number of CCE devices with more than a certain level of temperature excursion</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Storage volume is increased</u></li> </ul> <p>Storage volume is improved to 100% for the HFs during the period.</p>
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**Objective 4: → By 2021, make the supply chains more effective through equipment that is better suited to needs**

<p><b>Key activities:</b></p> <p><b>Activity 4.1:</b> Update and disseminate data management tools for temperature-monitoring systems</p>	<p><b>Intermediate Results:</b></p> <ul style="list-style-type: none"> <li>▪ Specific tools at each level are filled in</li> <li>▪ Vaccine inventory at the national and regional levels complies with the procurement plan</li> </ul>	<p><b>Immunisation Outcomes:</b></p> <ul style="list-style-type: none"> <li>▪ <u>Immunisation coverage is improved.</u></li> </ul> <p>Pentavalent3 immunisation coverage</p> <p>MR immunisation coverage</p> <ul style="list-style-type: none"> <li>▪ <u>Decrease in children lost to follow-up</u></li> </ul>
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<p><b>Related Key Activities Indicators:</b></p> <ul style="list-style-type: none"> <li>▪ <b>Availability of specific tools at all levels</b></li> </ul>	<p><b>Indicators Related to Intermediate Results:</b></p> <ul style="list-style-type: none"> <li>▪ % of HFs that provide temperature data</li> <li>▪ % of stores (national and regional) that have stocks levels between set minimum and maximum stock levels</li> </ul>	<p>Dropout rate Penta1/Penta3</p> <ul style="list-style-type: none"> <li>▪ <u>Immunisation equity is improved</u></li> </ul> <p>Proportion of targeted districts with Pentavalent3 immunisation coverage <math>\geq 95\%</math></p> <p>Proportion of targeted districts with Pentavalent3 immunisation coverage <math>\geq 80\%</math></p> <p>Proportion of targeted districts with Pentavalent3 immunisation coverage <math>\geq 50\%</math> and <math>&lt; 80\%</math></p> <ul style="list-style-type: none"> <li>▪ <u>Storage volume is increased</u></li> </ul> <p>Storage volume is improved to 100% for the HFs during the period.</p>
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**IMPACT:** Reduction of infant and child morbidity and mortality

### ASSUMPTIONS

List any assumptions:

- Social, economic and political stability is guaranteed.
- Security is improved throughout the country.
- The situation of refugees from neighbouring countries subject to conflicts, the evolution of which cannot be foreseen at present, is controlled.
- Availability of funds from the State and from other development partners to fill in the programme gaps (complementarity and synergy) is ensured.
- Recruitment, optimal use, and loyalty of healthcare personnel are ensured (national plan for development of human resources).
- Good governance and transparency in the overall management of funds complies with GAVI and Cameroonian requirements.
- CSOs, CBOs, ASLO (local associations) and other community groups effectively participate in implementing the programme.

- Technical support from the EPI's traditional partners is maintained.
- The activities planned in the following documents are implemented:
  - An NHDP and an integrated monitoring and evaluation plan covering the period 2017-2021;
  - A maintenance plan for 2017-2021;
  - An equipment rehabilitation plan for 2017-2021;
  - The revised EPI Norms and Standards document.

These project monitoring and evaluation activities will be incorporated into the monitoring and evaluation plan of the other EPI activities and will not require supplementary costs.