Cold Chain Technician Mentorship

and Supportive Supervision



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OVERVIEW

The CCT Mentorship and Supportive Supervision prototype was developed to address a common gap in maintenance systems: knowing what to do does not always translate into being able to do it effectively in real-world operational settings.

In Malawi, many CCTs are Disease Control and Surveillance Assistants (DCSAs), frontline public health workers who support a range of community health and immunization activities. DCSAs assume cold chain maintenance responsibilities through task-shifting and on-the-job training rather than formal refrigeration engineering training. While formal training remains important, technicians often have limited opportunities to apply their knowledge through structured, hands-on learning focused on real maintenance challenges.

The approach strengthened technician capacity through mentorship, practical problem-solving, peer learning and field-based supportive supervision. Although direct mentorship focused on district-level CCTs, the approach was designed to enable mentored technicians to cascade skills and knowledge to health facility personnel through routine supervision activities.

Effective cold chain equipment (CCE) maintenance depends not only on having trained personnel, but also on their ability to apply knowledge and skills in real-world operational settings. This technical brief describes the Rapid Response and Repair (R3) cold chain technician (CCT) Mentorship and Supportive Supervision approach developed and tested in Malawi to strengthen practical maintenance competencies through coaching, peer learning and field-based support.

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RATIONALE FOR CCT MENTORSHIP AND SUPPORTIVE SUPERVISION

Consultations conducted during prototype development highlighted two key challenges: limited opportunities for practical, hands-on skill development and supervision approaches that did not consistently support technical learning. As a result, some technicians lacked confidence in diagnosing, troubleshooting and resolving complex CCE issues, particularly when faced with unfamiliar equipment problems.

Health facility staff and district stakeholders described many supervision visits as focused primarily on documenting equipment status and completing checklists rather than strengthening problem-solving skills and maintenance practices. These visits were often viewed as compliance activities rather than opportunities for coaching, mentoring and continuous learning.

To address these challenges, the pilot tested a mentorship model centered on practical, field-based learning. Four national-level mentors, representing Ministry of Health (MoH) Expanded Programme on Immunization (EPI), Lilongwe Technical College and VillageReach, were paired with seven district CCTs across two implementation districts. During facility visits, mentors provided hands-on coaching while CCTs applied maintenance skills in real-world conditions.

The mentored CCTs subsequently used the same mentorship approach and tools during supportive supervision visits with health facility staff, extending learning beyond the initial mentees. Through this cascading model, mentorship activities ultimately reached 167 health workers across fourteen facilities and two district hospitals. During scale-up, the approach was expanded to eighteen additional districts, with an average of three CCTs mentored per district.

Field-based mentorship strengthened CCT problem-solving skills and created a scalable model for practical coaching, strengthening technical skills and extending learning across districts.

APPROACH

How it Works

The prototype was designed around key design principles:

- Learning should be linked to real maintenance challenges.
- Mentorship should identify specific knowledge gaps and track progress toward competency over time.
- Data should guide where and what type of support is provided.
- Learning should continue beyond formal site visits for it to be impactful.

The prototype incorporated structured preparation, field visits, follow-up activities, peer-learning mechanisms and competency assessments. Existing supervision tools were reviewed and consolidated into a technically focused mentorship checklist. WhatsApp groups were established to facilitate peer exchange among technicians and EPI facility personnel. It involves:

Preparation

Mentors and technicians review maintenance information from Inventory Management Tool (IMT), ColdTrace, QR-code systems, DHIS2 and other available sources to identify facilities requiring support. Site selection and visit planning are informed by equipment status, anticipated repair needs and available resources.

Field Mentorship

Mentors accompany technicians during facility visits, providing opportunities for troubleshooting, preventive maintenance, diagnostics, repair activities and review of maintenance practices. The visits emphasize hands-on engagement rather than classroom instruction.

Follow-Up and Peer Learning

Progress monitoring discussions, competency assessments and peer-learning platforms help reinforce learning between visits and support continued problem-solving.

Audience

The prototype involved seven district technicians, four national mentors, district EPI teams, health facility staff and maintenance personnel across fourteen health facilities and two district hospitals.

How it Can Be Used and Sustained

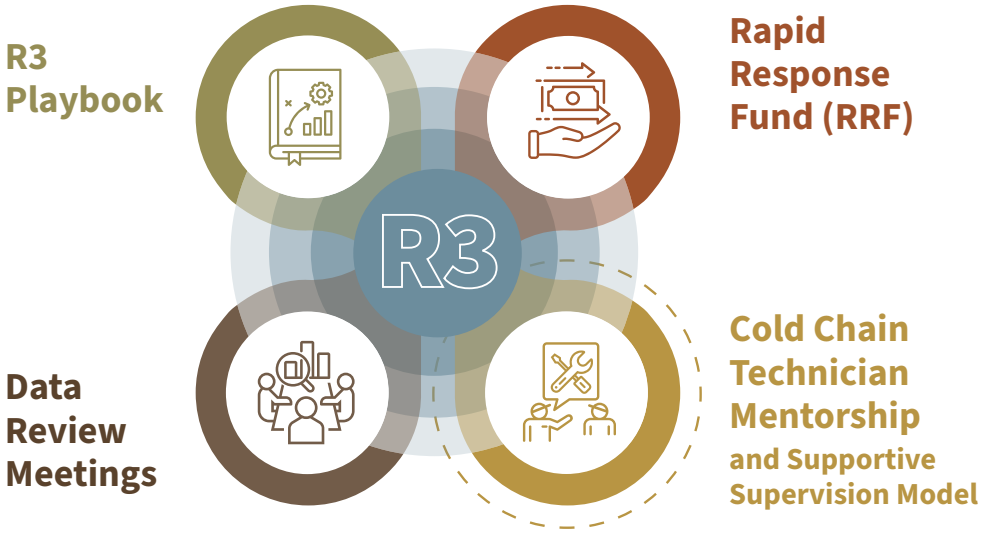
Mentorship is designed as a recurring process rather than a one-time training event. The model is designed around repeated field engagements, follow-up discussions and progress monitoring to support continuous skill development over time. The MoH also uses WhatsApp groups primarily for communication and information sharing across peers. These platforms could also be used to share technical updates and support ongoing learning. Continued implementation will depend on integration within existing supervision and workforce development structures and ongoing support for peer-learning and mentorship activities.

"This is the first time in my district having all CCE in a functional state and also having almost 100% of our RTMDs transmitting data. I call it an amazing development. This must go on and on!"

- District Cold Chain Technician

Relationship to Other R3 Components

The prototype was intentionally linked to other R3 components to help ensure that issues identified during mentorship visits could be addressed. Maintenance problems observed during facility visits could be escalated through the Rapid Response Fund (RRF) process when additional resources were required. Maintenance data reviewed through Data Review Meetings also helped inform mentorship priorities and site selection. The Playbook provided reference guidance on competencies, maintenance workflows and troubleshooting approaches that reinforced mentorship activities.



EXPECTED OUTPUTS AND RESULTS

The mentorship approach provides technicians with structured opportunities to apply maintenance knowledge in real-world settings. Implementation generates mentorship records, facility assessments, competency assessments and follow-up action plans that can be used to monitor progress and identify ongoing learning needs. The approach is intended to strengthen practical maintenance competencies while supporting ongoing supervision and professional development of personnel responsible for CCE management.

LESSONS FROM MALAWI

Implementation of the mentorship and supportive supervision model generated several lessons that may be useful for countries seeking to strengthen cold chain maintenance capacity. These lessons reflect practical experiences from implementation in Malawi and highlight important considerations for adaptation, sustainability and scale-up.

KEY LESSON 1

Hands-on mentorship is more effective than classroom-style supervision.

Stakeholders consistently valued opportunities to learn through real maintenance challenges. Direct engagement during facility visits allowed technicians to strengthen practical troubleshooting, preventive maintenance and repair skills in ways that traditional supervision approaches could not.

KEY LESSON 2

Maintenance data enables targeted technical support.

Remote temperature monitoring (RTM) and maintenance data helped identify facilities experiencing the greatest equipment challenges, allowing mentorship activities to be directed where support was most needed. Using data to prioritize visits improved efficiency and relevance of technical support.

KEY LESSON 3

Mentorship expands learning across the system.

Direct mentorship focused on district-level CCTs, who subsequently applied the same tools and approaches during supportive supervision visits with facility staff. This cascading model extended learning beyond the original cohort of mentees and created opportunities for ongoing knowledge transfer throughout the system.

KEY LESSON 4

Mentorship is most effective when linked to broader maintenance systems.

The greatest value was achieved when mentorship activities were connected to maintenance financing, data review and issue-resolution mechanisms. Linking technical support to systems capable of addressing identified challenges increased the likelihood that maintenance issues would be resolved.

ASSOCIATED TOOLS AND TEMPLATES

The tools listed below were developed or adapted to support implementation in Malawi and include structured supervision resources, maintenance data systems and peer-learning mechanisms used to strengthen field-based capacity. While some tools are specific to Malawi's context, they illustrate the types of resources countries may consider when adapting a similar mentorship approach.

Core Implementation Tools	Purpose
CCE Supervision and Mentorship Checklist	Guiding questions and an accompanying guidance narrative of the foundational elements that need to be considered in supervision execution.
Mentorship Visit Planning Guide	A compilation of key issues that need to be considered in planning for the mentorship visit.
Pre- and Post-Mentorship Assessment Tools	Highlights key expectations before mentorship visit and how those expectations are met by facility staff including any existing gaps.
Mentorship Visit Report Template	Provides a snapshot into the major highlights of how the visit was received by the CCTs.
Facility Action Planning Tool	Captures identified actions, accountability and execution timelines.

Data Sources Used to Guide Mentorship	Description
ColdTrace Dashboard	A real-time temperature monitoring platform managed by Nexleaf Analytics.
IMT Equipment Database	An Inventory Management Tool which compiles the list of all CCEs in an ecosystem and its related spares and accessories and their quantities.
QR-Code CCE Tracking System	A system that is designed to keep all critical information about CCEs (e.g. installation year, location of installation, manufacturer details, maintenance and repair history) and this information can be retrieved upon scanning a unique QR code assigned to any individual CCE.
DHIS2 Data Sources	Digital Health Information System, which contains service data which could also include cold chain related information.
CCE Maintenance Log	A manual document physically attached to each CCE, documenting when fixes occurred and any spare parts replaced.
Monthly CCT Reporting Form	Documents key CCE technical areas for progress consideration.

Peer-Learning and Follow-Up Mechanisms	Description
CCT WhatsApp Learning Group	A WhatsApp group that has all CCTs from different districts, set up as a platform for peer-to-peer learning.
EPI Focal Person Learning Group	A WhatsApp group that has all EPI focal persons from different health facilities, set up as a platform for peer-to-peer learning.
Progress Monitoring and Follow-Up Tools	Documents designed to track the progress made on any agreed actions after scheduled visits to different health facilities.

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