

Evaluation of M-Tech and Paper Enumeration of Social Cash Transfer Beneficiaries in Zambia

Implementation Guide

Prepared for Zambia's Ministry of Community Development,
Mother and Child Health, World Food Programme, and Other
Cooperating Partners

FINAL

25 November 2015



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ACRONYMS

CP	Cooperating Partner
DSA	Daily Subsistence Allowance
DSWO	District Social Welfare Officer
GRZ	Government of the Republic of Zambia
HQ	Headquarters
MCDMCH	Ministry of Community Development, Mother and Child Health
MIS	Management Information System
ODK	Open Data Kit
PSWO	Provincial Social Welfare Officers
QA	Quality Assurance
SSWO	Senior Social Welfare Officer
SCT	Social Cash Transfer
WFP	World Food Programme

ABOUT IDINSIGHT

IDinsight helps clients generate and use evidence to improve social impact. Depending on client needs, we diagnose systems, design and test potential solutions, and operationalize those solutions found to be most impactful. We believe that client-centered, rigorous, and responsive evaluation is essential to help managers maximize program impact. Our team has collectively coordinated over 25 impact evaluations in Africa and Asia, and works on-site with client organizations to efficiently answer important program questions.

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EXECUTIVE SUMMARY

Zambia's Ministry of Community Development, Mother and Child Health (MCDMCH) is considering replacing the paper-based enumeration and registration system with a mobile data collection ("m-tech") system for its Social Cash Transfer (SCT) program. When well implemented, m-tech enumeration has the potential to improve data quality, reduce the time needed to identify beneficiaries, and strengthen accountability.

In October 2014, the World Food Programme (WFP) engaged IDinsight to evaluate a pilot m-tech enumeration and registration system for the Government of the Republic of Zambia's (GRZ's) SCT program. The mixed-methods evaluation consisted of an impact evaluation, process evaluations, and a stakeholder analysis. The evaluation findings inform this Implementation Guide and are detailed in a separate Technical Report.

The evaluation found that, due to critical but surmountable challenges, the m-tech system did not outperform the existing paper system in a small-scale pilot. Chief among these challenges were:

- 1) A programming decision to separate the household characteristics and household roster sections of the form which created errors and inconsistencies in the data.
- 2) Logistical challenges as a result of poor power and mobile network.
- 3) Poor compatibility between the m-tech database and the pre-existing MCDMCH management information system (MIS), which caused delays exacerbated by coordination and communication challenges between partners.

If these challenges are addressed, the m-tech system has the potential to outperform the paper system and significantly improve the enumeration and registration process. Additionally, there is widespread consensus among stakeholders across all levels of the Social Welfare Department and among cooperating partners (CPs) that m-tech should be adopted.

Once the three critical challenges outlined above are addressed and robust systems to manage all aspects of data collection are put in place, the potential of mobile data collection to improve accuracy, quality, and speed of SCT enumeration and registration can be realized. This document describes eight action areas to improve m-tech performance. Three priority action areas address the three critical challenges that hindered optimization of the m-tech system in the pilot, and five action areas focus on building systems that will facilitate a successful m-tech enumeration process.

Actions to Address Critical Challenges

- **Application design:** Addressing issues with the design and programming of the application will improve consistency and accuracy of data collection.

- **Network and electricity safeguards:** Providing equipment to connect reliably to the internet at district offices and employing better electricity safeguards will optimize the m-tech system.
- **Data management:** Aligning the m-tech system with the MIS and enabling remote access to the data will streamline data analysis and use.

Actions to Build an Effective System

- **Roles and responsibilities:** Establishing clear roles and responsibilities will facilitate manageable workloads, accountability, and effective implementation.
- **Training:** Creating training modules with m-tech components targeted at each level of the SCT personnel will enable smoother implementation.
- **Equipment management:** Developing equipment procurement and maintenance protocols will enhance accountability and reduce risk of leakage.
- **Scheduling and duration of enumeration:** Carefully planning enumeration schedules and developing transparent compensation protocols will encourage enumerators to complete their caseloads faster and more accurately.
- **Supervision and quality assurance:** Using m-tech to strengthen supervision and quality assurance (QA) mechanisms will improve accuracy and fairness of the SCT program.

This document describes recommended steps to address each action item. This document is not intended to be a comprehensive plan.

APPLICATION DESIGN

Current Situation

A few elements related to the design of the m-tech application resulted in errors and inconsistencies in the m-tech data.

SCT Form 1

Several elements of the “Register a New Household Member” component of SCT Form 1 application were cumbersome, confusing, and lacked sufficient data checks to ensure consistency.

- While the paper survey includes a section for household characteristics and a household roster in a single form, the m-tech application separated these two components into different forms. This separation likely caused errors since it required enumerators to remember to complete both forms.
- Enumerators were required to link the household members to the household by selecting the correct parent record from a list of all households in their caseload. This exposed the process to the risk of linking household members to the wrong households. Further, this step had to be executed for each household member, which was cumbersome for enumerators.
- The household roster section of the application did not have a built-in check requiring that a single household member be identified as the head of the household. This led to many records for which no member was identified as the head or multiple individuals were identified as the head, an inconsistency that created problems when merging the data into the MIS.
- The GPS feature was a required field; if enumerators could not take a GPS point, they were unable to complete the form. This delayed enumeration in numerous cases while enumerators waited to be able to take a waypoint. In other cases, enumerators would record GPS points wherever they could get a satellite connection, undermining the quality control purpose of this feature.

CWAC Form 2

The ordering of questions on the electronic version of “CWAC Form 2”¹ also exposed the process to error, since it was different than the ordering on the paper version.² While this change reduced the amount of data that needed to be entered, the different question order required the enumerator to reorder the responses when entering, which may have introduced errors that affected which households qualified for enumeration.³

¹ The official name of this form is Form 8 CWAC 02, but it is commonly referred to as “CWAC Form 2” or “Form 2”.

² This decision was made so that households with no fit for work members would qualify for enumeration after inputting only one data point.

³ The process evaluation did not find this to be a significant source of error in the pilot; however, it still poses a risk to data accuracy.

Supervision and Quality Assurance Applications

The design of some of the supervision and QA features of the m-tech system was impractical for the field. For example, the supervisor application reported the number of forms submitted rather than the number of households the enumerator completed. Since an additional form was required for each household member, the number of forms completed per household varied depending on the size of the household. This made it difficult for supervisors to track enumerator progress and to verify that enumerators had completed their caseloads.

Software Developer Capacity

Many of the design problems that emerged with m-tech only became apparent once the application was being used in the field. Without a full time staff member from the developer exclusively dedicated to troubleshooting for the m-tech pilot, it was difficult to address these issues as they emerged.

Recommended Situation

MCDMCH should engage a developer that is able to devote a sufficient number of full time staff members to the SCT program to design and iterate the application and to respond to technical problems as they emerge in the field.⁴ MCDMCH should liaise with this software developer to resolve the issues that became apparent with the CWAC Form 2 and “Register a New Household” applications. Steps should be taken to prevent design and technical challenges in the future and to enable a prompt response when they emerge. District level staff should be engaged to test all applications in a field setting, before they are finalized and adopted.

Finally, while working with an external software developer, MCDMCH should build its own officers’ technical skills so that they are able to modify any m-tech applications that are introduced or developed. This will support the transition of full SCT implementation ownership from CPs to MCDMCH.

Actions

- **Reprogram the application to integrate all forms completed in a visit into a single form.**
The software developer should reprogram the application so that the household characteristics and household members sections of the survey are combined into a single form, as is the case with the paper form.
- **When using m-tech applications for data entry, ensure that the flow of questions on paper and electronic versions are identical.**

⁴ IDinsight does not have a recommendation on the developer that MCDMCH should use going forward. However, IDinsight does believe that careful consideration should be given to selecting a developer with sufficient in-country capacity to provide robust support to MCDMCH as well as the ability to understand MCDMCH’s m-tech needs.

If Form 2 continues to be collected on paper and then transferred to the tablet, the two forms should be aligned. This requires either a redesign of the paper form or a reprogramming of the m-tech form.

- **Ensure that features requiring a mobile data or satellite connection link are not required fields in the application without providing an “opt-out” function.**

Having required fields that rely on a mobile or satellite connection, such as the GPS point without providing an “opt-out” function, can slow enumerators’ progress when they are in areas with poor coverage. If enumerators are able to opt-out of taking a waypoint, they can also be required to provide an explanation for opting out, and supervisors can follow up with enumerators who frequently opt-out.

- **Engage software developers in contracts that allow for ongoing support.**

MCDMCH should carefully consider which organization develops and modifies the application, and engage the developer in a contract that provides for ongoing engagement. Consistent support from software developers will give MCDMCH the resources that they require to make modifications to their applications as new needs and challenges emerge.

NETWORK AND ELECTRICITY SAFEGUARDS

Current Situation

Mobile network coverage was inconsistent in the pilot areas and is likely to be inconsistent in many other rural areas in Zambia. As a result of poor network coverage:

- Some enumerators experienced significant delays in completing their caseload, since tablets became slower to load as the number of un-synced forms increased. These delays typically lasted an hour or two, though one enumerator reported a delay of 24 hours. This became frustrating both for enumerators and for potential beneficiaries being interviewed.
- Due to delayed syncing, supervisors were unable to access a real time picture of the data or of the completed caseload.

Even when network coverage was reliable, many enumerators struggled with insufficient airtime to sync forms. Airtime allowances were set before enumeration commenced based on anticipated need. However, these projections were often off-target,⁵ since the size of files to be uploaded depended on the specific household sizes in an enumerator's caseload and could not be accurately forecasted.

Procurement and distribution of airtime was coordinated by a service provider overseen by a WFP representative in Lusaka. Relying on one remotely-located person to oversee the needs of all three pilot districts proved burdensome and impractical. District Social Welfare Officers (DSWOs) were often the first ones that enumerators called when data ran out, but they were unable to address the situation themselves. The number of requests for additional airtime was substantial and created a bottleneck for m-tech enumeration. This situation was exacerbated by challenges with the service provider contracted to distribute the airtime.

Finally, the solar chargers provided to enumerators were impractical and rarely used. By design, they needed to sit in the sun for six to seven hours to fully charge before they could be used to charge the tablet. As a result, enumerators were required to wait while they were charging or to leave them unguarded while they were enumerating, neither of which was a viable option in many cases. Additionally, this required extra vigilance and foresight by the enumerator, since he or she could not quickly charge the tablet if it ran out of battery in the middle of an interview. Furthermore, due to voltage mismatches, the chargers were not able to charge tablets after the tablet battery was fully empty. Finally, some enumerators reported that their chargers did not hold charge or had inoperable solar charging components.

⁵ During the pilot, each enumerator was allocated 75 MB of data. In Shiwa N'gandu District, this allocation was insufficient in 26.3% of cases, while in 42.1% of cases enumerators required less than 25 MB.

Recommended Situation

District Social Welfare Offices should be well-equipped with internet and data to provide back stop options when enumerators run out of data or are unable to find network coverage in the field. Despite advances in network coverage in Zambia, many of the areas where SCT program enumeration takes place will continue to have poor network coverage over the coming years. Setting up internet connectivity points in District Social Welfare Offices can mitigate this challenge by providing an alternative hotspot connection for enumerators to sync their tablets. While these hotspots may also be subject to variations in network quality, they will be permanently located in population centers, which are likely to have more consistent signal than the remote areas in which enumerators may be working. These hotspots can serve as backup in cases when enumerators run out of data bundles.

DSWOs should be authorized to supply airtime to enumerators according to their caseloads and to resupply on an as-needed basis. This will require the development of guidelines for data allocation based on caseloads and provincial- and district-level systems to facilitate the purchase of airtime and verify appropriate usage of internet bundles.

External batteries should be provided to the enumerators as an alternative to solar chargers. External batteries could be charged during the evenings and can be carried with enumerators in the field as a backup power supply that is immediately available if the tablet runs out of battery in the middle of enumeration. These batteries would have enough voltage to power the tablet back on in the event that it turns off completely. Additionally, external batteries are less expensive than solar chargers.⁶

Actions

- **Set up an internet hotspot at every District Social Welfare Office.**
Enumerators will have a location within the district to sync tablets even if their personal data bundles are exhausted or if network is poor in more remote areas.
- **Enable data bundle purchase and distribution to be managed by DSWOs on an as-needed basis.**
This will facilitate a faster response to data-related challenges. Additionally, DSWOs are in a better position to ensure that these bundles are being used appropriately for enumeration activities.
- **Provide external batteries for the tablet to enumerators.**
Batteries will be more reliable and more feasible in the field. They will also extend the time available between charging.

⁶ There may be other solar chargers available that could serve the needs of enumeration better than those used in the pilot. These chargers would need to be able to charge in less time than the current chargers and with intermittent exposure to the sun, be more durable than the current chargers, and have a voltage output high enough to power the tablets when their batteries are completely exhausted.

DATA MANAGEMENT

Current Situation

For the purpose of the pilot, a separate Open Data Kit (ODK) database was constructed to aggregate the data collected on tablets. The m-tech developers designed the ODK database with integration with the MIS in mind, and the MIS developers built a program extension to allow the MIS to import data from spreadsheet files. However, the system was not tested in advance, and some of the MIS formatting requirements were not communicated to the m-tech developers until after enumeration was complete. These compatibility issues were exacerbated by communication challenges and poor definition of roles and responsibilities between MCDMCH, CPs, and contractors.

Additionally, the MIS could only import data that were organized in a very specific way. As a result, manual data processing and manipulation were required after enumeration, including export to .xls or .csv files, data reformatting, and import into the MIS. These manual processes caused delays and exposed the data to unnecessary risk. At national scale, such an approach would be unsustainable. Regardless of the current challenges with integrating the two databases, requiring a manual step can prohibit instant access to the data - one of the main benefits of an m-tech system.

Design of the MIS began three to four years prior to this m-tech pilot with a paper-based system in mind. While the system does have the ability to sync between multiple servers, it is not mobile compatible and does not have a mechanism to integrate data directly from tablets into its database. This means that any data collected or modified on a mobile device cannot update the MIS in real time and requires manual manipulation and uploading before it reflects in the MIS. Many partners envision expanding the use of m-tech to additional functions such as continuous registration, record updates, and a grievance mechanism. However, the optimal functionality of applications would all be inhibited by the inability of the MIS to update in real time.

Recommended Situation

MCDMCH should have a data management system with the capability to meet all of its ambitions for the use of mobile data collection systems in the SCT program. A wide range of other m-tech uses beyond enumeration have been suggested by MCDMCH and CPs including continuous registration, a systematic grievance mechanism, linkages to other social services, and expanded real time monitoring of field activities. Building and operating any of these additional components of m-tech will require a data management system that can be seamlessly queried and modified via mobile devices. Before expanding the use of m-tech, the MIS should be updated or replaced to meet these needs.

Actions

- **Assess MCDMCH’s priorities for the use of mobile data tools, and update the MIS to meet those needs, or introduce a new data management system that is better equipped to do so.**

The MIS is not currently compatible with mobile devices and unlikely to support desired functions like continuous registration, grievance mechanisms, or mobile updates to existing forms. MCDMCH should consider the trade-offs of keeping the current, already-developed MIS versus investing in a mobile-compatible system that could adapt to MCDMCH’s evolving needs.

- **Establish full and seamless integration with a centralized database.**

New software tools for the MIS or mobile application should be developed so that data collected on the tablets can automatically sync directly into the MIS, without any need for manual modifications or actions. A fully automated system that syncs data to the MIS would eliminate the delays and risk of error that were experienced during the pilot and result in a smoother and more robust data management system for MCDMCH.

ROLES AND RESPONSIBILITIES

Current Situation

Responsibilities are unevenly distributed across MCDMCH staff and, in a few areas, roles and responsibilities are not well-defined between MCDMCH and CPs. For example, as previously mentioned, imbalanced or unclear division of responsibilities during the m-tech pilot resulted in some delays and confusion in data processing and analysis.

Regardless of the system that is scaled, the allocation of human resources within MCDMCH is unsustainable. The brunt of the management work associated with enumeration and registration is conducted by one individual at Headquarters (HQ) who has expertise in data management. As a result, he is often required to generate monitoring reports and respond to one-off data queries that could easily be handled by other officers if they had the proper training. The SCT program also overburdens district staff who must manage enumeration logistics and verify data quality while maintaining their regular responsibilities.

For the pilot, the services of the software developer responsible for building the application were procured by a CP on behalf of MCDMCH. As a result, many aspects of the administration of the application were managed solely by the CP and the developer.

Recommended Situation

MCDMCH

Within MCDMCH, more responsibilities should reside with provincial officers and fewer responsibilities should be borne by HQ and district staff. This will clarify the chain of command, relieve pressure on specific individuals, and empower provincial and district staff to more effectively manage program execution. Stakeholder interviews revealed that provincial staff are eager for deeper engagement in the registration process. Finally, complete ownership of the m-tech system by MCDMCH would facilitate a more streamlined system that can adapt to MCDMCH's evolving needs.

- **Headquarters**

HQ staff responsibilities should solely consist of management and oversight of the enumeration and registration process. For an m-tech system, this would include oversight of application development, management of the m-tech interface with the MIS, facilitation of m-tech training, and development and enforcement of equipment procurement and maintenance policies. Finally, with more real time data available, HQ can monitor enumeration activities, increase accountability of district and provincial officers, and efficiently alter operations in response to emergent information.

- **Provincial Social Welfare Office**

Provincial Social Welfare Officers (PSWOs) should be involved in training district staff, maintaining m-tech equipment, and ensuring adherence to protocols. By shifting these responsibilities from HQ to the PSWOs, HQ workloads can be alleviated while enabling enhanced management of district-level activities. PSWOs are well placed to carry out monitoring and implementation support due to their proximity to and frequency of interaction with district staff. If an m-tech system is adopted, PSWOs should also be responsible for monitoring data as they are being collected, and flagging inconsistent or problematic records for follow up. Developing and rolling out a user friendly dashboard that summarizes the data points provincial officers should monitor and flags problematic cases will enable them to provide this oversight. Shifting the responsibility for data quality monitoring to provincial officers can help relieve the burden from districts.

- **District Social Welfare Office**

District-level staff should supervise and manage enumeration and registration logistics and should monitor enumerators to ensure that they are completing their full caseloads. This includes training enumerators and providing on-site support for any challenges that arise. An improved Supervisor Application and a desktop-based dashboard can help facilitate this oversight.

Cooperating Partners

CPs should continue to provide procurement support, especially for capital investments like technical equipment. They also should provide technical support and guidance as MCDMCH continues to establish and refine m-tech systems. However, wherever possible, CPs should shift programmatic responsibilities to MCDMCH. Examples of programmatic tasks that should sit within MCDMCH include directing program developers in the design of mobile applications and managing and cleaning data from mobile applications. This will ensure that all applications are consistent with MCDMCH priorities and changes are made in response to shifting government needs and interests. Additionally, it will facilitate clearer lines of communication between the end-users – primarily MCDMCH – and the service providers.

External Contractors

The role of specific contractors engaged with the SCT program may evolve over time, but certain functions will likely continue to be provided by external support. These functions include:

- **MIS Support**

It is likely that the MIS will continue to be supported by an external contractor who should focus on facilitating integration of the MIS with the m-tech platform.

- **Software Development**

The software developer selected to design the application used at-scale will primarily be involved on the front end. A contractor that is able to devote significant human resources to the SCT program would be ideal. The developer should work closely with MCDMCH to fully understand its data needs within the SCT program. The developer's role should be focused on developing the

application(s), assisting with the development of training protocols, and being available for troubleshooting. The developer will need to be engaged throughout the scale-up to support the implementation of the new software, address design challenges that emerge, and assist with troubleshooting and capacity building. The level of engagement can wane over time once the application is stable and MCDMCH officials are able to make basic modifications to the application and handle routine troubleshooting. We do not recommend that MCDMCH hires an in-house developer for this role, as the need for intensive coding and development skills is unlikely to extend beyond the scale-up. Instead, existing MCDMCH officials can be trained in basic upkeep and modifications of the application.

Table 1 outlines a division of responsibilities that would facilitate manageable workloads, accountability, and a smoothly functioning system.

Table 1. Current and Recommended Roles and Responsibilities

Stakeholder	Unit	Current Responsibilities	Recommended Responsibilities	Key Changes
MCDMCH	HQ ⁺	<ul style="list-style-type: none"> MIS oversight and maintenance Training of all SCT personnel Equipment management and procurement 	<ul style="list-style-type: none"> Management of relationship with software developer Management of interface between mobile data collection and MIS Equipment management and policy development Management of training of all staff 	<ul style="list-style-type: none"> Direct liaising with software developer Development of new policies for equipment management
	Province ⁺⁺	<ul style="list-style-type: none"> Provision of oversight and policy guidance to district staff 	<ul style="list-style-type: none"> Data monitoring Troubleshooting Management of supply of tablets, related equipment Training of district officers 	<ul style="list-style-type: none"> Responsibility for data monitoring, corrections, and some queries Assistance with troubleshooting Management of supply of tablets and related equipment
	District	<ul style="list-style-type: none"> Assignment of enumerator workloads Oversight of CWAC Form 2 enumeration Organization of transport and DSAs Monitoring of workflow Troubleshooting Supervision and quality assurance Enumeration of households 	<ul style="list-style-type: none"> Oversight of CWAC Form 2 enumeration Maintain responsibility for enumeration logistics Monitoring of a select few data points related to logistics of enumeration Training of enumerators 	<ul style="list-style-type: none"> Reduced responsibility for data monitoring No longer participate in enumeration as enumerators
Cooperating Partners	WFP	<ul style="list-style-type: none"> Implementation of m-tech pilot Procuring mobile application development Liaising between software developer and MCDMCH and MIS management contractor 	Assistance with: <ul style="list-style-type: none"> Procurement of additional software development services Developing training modules Building out practical guidelines, protocols, and procedures 	<ul style="list-style-type: none"> Transition from implementation to advising
	UNICEF	<ul style="list-style-type: none"> Support of certain logistical components of paper system, e.g. procurement of forms, data entry services, and quality assurance services 	<ul style="list-style-type: none"> Support of the development of training modules Support of training and capacity building Exploration of other uses for mobile technology in the program 	<ul style="list-style-type: none"> Transition from implementation to advising
	Donors	<ul style="list-style-type: none"> Procurement of technical assistance and one-off costs investments Policy guidance 	<ul style="list-style-type: none"> Procurement of tablets and equipment Capacity building for specific ministry staff Procurement of software development services 	<ul style="list-style-type: none"> Continue to support technical capacity building Provide one-off procurement assistance

⁺ Added responsibilities may require support from additional staff

⁺⁺ Extra personnel only required for provinces currently without a Senior Social Welfare Officer for Non-Statutory Service

Actions

- **Train staff at all levels to use the MIS, and shift monitoring and data verification responsibilities from HQ to the provincial and district level staff.**

Plans to conduct trainings to enable other MCDMCH staff to use the MIS should be accelerated. This will relieve the workload of the Senior Social Welfare Officer (SSWO) for Management Information Systems and facilitate better management and evidence-based decision-making at lower levels. The SSWO for Management Information Systems is also responsible for making manual changes to household records. The responsibility for many of these modifications can be shifted to provincial and district level staff who are likely in a better position to respond to them.

- **Shift monitoring responsibilities from the district to the provincial level.**

The role of the DSWOs should be simplified so they can focus on managing logistics and ensuring that every household that qualifies for enumeration is enumerated, while responsibility for reviewing data as they are submitted to the server and checking for errors and inconsistencies should be shifted to the provincial offices. While district officers are capable of managing on all of these tasks, shifting some responsibilities to the provinces will facilitate more even distribution of the work and ensure districts are not overburdened. Additionally, DSWOs should no longer be personally responsible for enumerating, as this distracts from managerial tasks. Making this transition will require developing mobile application tools that facilitate timely provincial monitoring and feedback, training provincial officers in their use, and ensuring that there is robust and frequent communication between provincial and district staff.

- **Shift the role of CPs toward capacity building and advising.**

Throughout the m-tech pilot, CPs have been heavily involved in planning and implementation. As a result, at times it has been unclear where their responsibilities end and those of MCDMCH begin. As the SCT programs moves to the scale-up phase, CPs should focus on shoring up systems and shifting programmatic responsibilities to MCDMCH. A first step could be for CPs and MCDMCH to develop time-bound goals for hand-off of particular programmatic functions.

- **Make data available via user-friendly dashboards that are tailored to provide the information relevant to fulfillment of roles and responsibilities at each level of the system.**

A user-friendly dashboard, customized based on the roles and responsibilities at each level of the system, will provide MCDMCH staff with the data they need to fulfill their responsibilities. This in turn will increase accountability and yield higher quality data by allowing officials to efficiently address any issues that may arise during enumeration.

TRAINING

Current Situation

Enumerators were trained on the paper process in Lusaka in July 2014. This training took place before the decision was made to carry out an m-tech pilot, so the training was structured solely around the paper-based process without any adaptations to m-tech needs.

While some districts began enumeration immediately, other districts did not start until October or November of 2014.⁷ The evaluation team observed enumeration activities that began in November and found many instances in which enumerators were not following enumeration procedure correctly. Issues such as asking leading questions, suggesting answers to respondents, skipping questions, and gathering respondents in one place to be enumerated were all observed.

Supervisor and enumerator m-tech pilot trainings were held sequentially over a one-week period immediately prior to the start of m-tech enumeration. Supervisors were trained over two days on the use of the tablet and navigation of the m-tech system by WFP, the program developer, and the SSWO for Management Information Systems. Immediately following supervisor training, the same facilitators led a three-day training for enumerators, with supervisors facilitating some sessions. The m-tech-adapted enumerator training included 1) a review of the SCT targeting methodology and enumeration; 2) a tutorial on uses of the tablet; 3) explanation of the m-tech application; and 4) data entry of Form 2s.

Enumerators indicated that the training facilitators were largely effective. However, many enumerators also commented that they felt under-prepared to fill out Form 1 in the field, since they had not simulated this task during training. Many believed that the training could have benefited from more time and more practice in real-life situations. Finally, some enumerators said that supervisors were not effectively equipped to respond to technical questions or challenges that arose in the field.

Recommended Situation

MCDMCH should develop one combined training that addresses both the general enumeration process and the specific benefits and challenges of m-tech. Training modules for supervisors should emphasize the importance of enumeration protocols and highlight some available tactics with m-tech for ensuring that these protocols are followed. Similarly, modules for enumerators should examine difficult questions in detail and provide specific guidelines for how these questions should be phrased.

For scale-up with m-tech, a “cascade” training approach should be taken such that each level within the SCT program is responsible for training the levels below it. Standard training modules should be developed

⁷ This delay was due in part to the fact that pilot districts had to wait for the final preparations for the m-tech to be completed before they could begin enumeration.

to ensure that all personnel are receiving the same level of training nationwide. The training cascade should be timed so that enumeration commences as soon as possible after enumerator training.

A cascade training model has several advantages. It facilitates buy-in and investment at all levels of the system. Additionally, it reinforces learning among trainers. When supervisors are responsible for training, they are required to answer emergent queries from their staff and to develop a deeper understanding of the material. Finally, it makes effective use of resources by commissioning existing officers to lead trainings rather than hiring large teams of external trainers.

Actions

- **Develop training modules for all levels.**

Table 2 outlines the recommended training modules and logistics that should be in place for each level of SCT program personnel.

Table 2. Proposed Training Schedule by MCDMCH Level

	Provincial staff	District staff	Enumerators
Training modules	<ul style="list-style-type: none"> • Use of all applications • Full features and capabilities of the cloud-based platform • Adding new district staff users to the system and managing district staff permissions • Introduction to monitoring role and training in use of monitoring tools designed by the software developer for provinces and for districts • Extensive troubleshooting • Running district and enumerator trainings • Registering and loading SIM Cards 	<ul style="list-style-type: none"> • Use of the enumeration applications • At least one day of practical field experience using the application • Use of the supervisor application and its monitoring features tool designed by the software developer for districts • General troubleshooting • Running enumerator trainings • Registering and loading SIM Cards • Adding new enumerator users to the system and managing enumerator permissions. 	<ul style="list-style-type: none"> • Use of the enumeration application • At least 1 day of practical field experience working with application • Basic troubleshooting • Use of all ancillary equipment (i.e. solar chargers, battery packs)
# of days	5	5	At least 5
Training staff	Led by HQ staff and the software developer	Led by provincial staff with support from HQ and the software developer	Led by district staff with support and oversight of Provincial staff

- **Train the SSWO for Training on m-tech.**
She should become an authority on the tablet and associated applications so that she can guide development of training modules and troubleshoot m-tech training concerns that have been elevated to the national level.
- **Update training protocols to address proper ways to ask questions.**
The SSWO for Training should ensure that training protocols emphasize the importance of asking questions as they appear on the tablet, without rephrasing them in a way that could distort their meaning or influence the way the respondent answers.
- **Training should emphasize the importance of following all protocols throughout enumeration.**
Trainings should instruct supervisors to look for protocol deviations when supervising enumerators in the field.

EQUIPMENT MANAGEMENT

Current Situation

In preparation for the m-tech pilot, WFP procured and managed inventory of the tablets, related equipment, and data bundles. Few formal protocols were in place for managing technology-related equipment. On a small scale, ad hoc systems can be maintained. However, once the system expands beyond three districts, more robust inventory, maintenance, and accountability systems will be required.

Recommended Situation

Equipment management protocols should be developed by HQ, and clear chains of accountability between the provincial office, district office, and enumerators should be established.

Provincial offices should store the technology and should “loan” the equipment to the districts for enumeration. The provincial offices should be in charge of tracking equipment and maintaining protocols.

Actions

- **Procure tablets and accompanying equipment.**
HQ and CPs should determine what specific equipment should be procured and complete the purchase. Considerations for which equipment to purchase should include:
 - Durability in field conditions and ease of maintenance
 - Operating system compatibility with enumeration software
 - Functionality and data capabilities
- **Develop clear equipment management protocols.**
Protocols should exist on the following topics and procedures:
 - Inventory of equipment
 - Security⁸
 - Data management and data security
 - Procurement, maintenance, and upkeep of equipment
- **Establish accountability structures to ensure that all protocols are being followed.**
HQ and provincial staff should develop systems to ensure that all protocols are being followed.

⁸ While the majority of enumerators felt safe being in the field with the tablet, some expressed concern when potential beneficiaries got upset by the use of the tablet. Additionally, using this technology in remote areas may leave the enumerators vulnerable to thievery. These threats should be fully assessed prior to the start of enumeration and treated seriously if and when they arise.

SCHEDULING AND DURATION OF ENUMERATION

Current Situation

Many enumerators faced time pressure in completing their caseload. Some of the pressure was due to weather, with many enumerators being anxious to finish ahead of rainy season. Enumeration also took place during an exam period, so teachers who were working as enumerators wanted to finish enumeration as quickly as possible to return to their students.

Other time constraints were programmatic in nature. Enumeration in some districts started later than planned, leading to condensed schedules for individual enumerators. Additionally, enumerators had an incentive to rush, because initially they received a daily subsistence allowance (DSA) for a fixed number of days regardless of the size of their caseload. DSA was later provided for extra days worked, but at the start of enumeration, it was unclear if they would be compensated for this extra time.⁹

Pressure on enumerators to complete the enumeration quickly was problematic because it may have encouraged enumerators to skip households or to report households as “not able to be found.” Additionally, the evaluation team observed enumerators trying to save time by gathering households together to be enumerated at a central place, which violates enumeration protocol.

Recommended Situation

The time permitted for each enumerator to complete his or her workload should reflect the number of households that need to be enumerated and the distances between areas that need to be enumerated.

Additionally, clear guidelines should be established and communicated to enumerators regarding DSAs. Incentives should be structured for enumerators so that they are encouraged to finish their work efficiently, and confusion surrounding DSA should be eliminated to avoid encouraging enumerators to take shortcuts.

Finally, Social Welfare staff should take logistical considerations into account when determining the timing of enumeration and the individuals to employ as enumerators. Enumeration should not be scheduled close to or during rainy season, and officials should avoid engaging teachers who are likely to rush enumeration in order to return to their classrooms.

⁹ The evaluation team observed these challenges taking place in Shiwa N’gandu District.

Actions

- **Refine and clearly communicate DSA guidelines for enumerators.**
Provincial officers should establish and clearly communicate guidelines for distributing DSAs that allow the number of days of enumeration to vary between enumerators.
- **Set realistic timelines for enumeration which are informed by local context.**
DSWOs should set realistic timelines that account for the number of households that qualify for enumeration in an area, availability of local transport, and distance between households. Enumeration during the rainy season should be avoided.
- **Employ enumerators who are able to commit enough time to enumeration.**
Teachers in some of the pilot districts were under time pressure to return to their jobs, since enumeration occurred close to exam time. As a result, DSWOs scheduled enumeration around teachers' schedules, which led all of the enumerators, including those who were not teachers, to face additional time pressure. DSWOs should keep these considerations in mind when deciding who will participate in enumeration.

SUPERVISION AND QUALITY ASSURANCE

Current Situation

Supervision and QA functions were built into the m-tech application. Quality was improved by pre-programmed forms that required fields to be completed and automated skip patterns. However, m-tech enumeration still leaves room for error, and there remains a need for enhanced QA systems. Commonly observed mistakes included diversions from enumeration protocol and errors in filling out the m-tech forms. Additionally, many supervision and QA tools required frequent syncing of the tablets, and inconsistent network coverage rendered many of these tools ineffectual.

The process evaluation found that in both paper and m-tech enumeration many households that should have been enumerated were left out. This problem may have been exacerbated by the fact that the supervisor application did not sufficiently support monitoring of caseloads. Under the paper system, enumerators were given lists that had both households that qualified and households that did not qualify on the same list, which also complicated tracking and may have introduced confusion for enumerators.

Furthermore, enumerators used a variety of phrases when translating questions into local language, and translations were often inaccurate or unclear. This could have resulted in inaccurate responses from potential beneficiaries. Other enumeration issues included phrasing questions in a leading way, skipping questions, and combining questions together. These challenges arose with similar frequencies in both the paper and m-tech systems and can result in low quality data.

Recommended Situation

Pre-programmed checks such as required responses and restricting values can help improve the quality and consistency of data but do not address challenges that result from poor translations or inappropriate enumerator practices, which need to be monitored on a continuous basis. Systems should be built that take advantage of m-tech capabilities to ensure that enumeration practices are adequately monitored. MCDMCH should integrate new features into applications that facilitate consistent translations and adherence to all protocols and allow supervisors to evaluate enumerators' performance on an ongoing basis. To mitigate the data accuracy challenges that emerge with m-tech, MCDMCH should work with developers to design easy-to-use monitoring tools that flag illogical, unlikely, or out-of-range values.

Actions

- **Develop a standardized translation of the survey in major local languages and include both English language and local language versions of questions on the tablet.**

Including both English and local language translations, and giving enumerators the option of switching back and forth between the different languages as they enumerate, will provide a guide for all enumerators to follow on how to translate problematic questions, while not requiring that

they read everything in the local language. These translations should be done in consultation with local residents to understand some of the nuances in language that might be specific to an area.

- **Use voice-auditing capability to enhance quality assurance.**

The applications can be programmed with a voice-auditing feature which records small portions of the interview at random times. Voice-auditing can allow supervisors to provide more comprehensive feedback to enumerators without accompanying enumerators in the field, which can be time-consuming and may result in enumerators changing their behavior when accompanied. It can also help ensure that enumerators are translating questions correctly and consistently. Finally, it can serve as a useful quality check to ensure that forms are filled out by the enumerator with someone else actually providing responses.

- **Develop an easy to use tool for district officials to monitor enumerators' workflow and ensure that full caseloads are completed.**

MCDMCH should work with the developer to build an application that helps district supervisors monitor enumerators' work and ensure that they are completing interviews with all of the households that they have been assigned.

- **If the paper system continues to be used, provide enumeration lists that only display those households that qualify for enumeration.**

If the paper system is used in the future, the enumeration lists that enumerators work from should be designed so that they only include households that qualify for enumeration. This will make it easier for the enumerator to plan their workflow and for the supervisor to confirm that an enumerator has completed all of their households.

- **Develop easy to use diagnostic tools for provincial supervisors that flag problematic observations.**

M-tech enumeration is prone to certain types of data accuracy problems, such as accidental entry of out-of-range values, and accidental selection of incorrect geography. MCDMCH should work with the developer to build diagnostic tools that provincial supervisors can easily use to review data and correct these mistakes.

CONCLUSION

Using mobile data collection to implement the scale-up of the SCT program has the potential to increase the efficiency and improve operations. However, three critical but surmountable challenges – a design flaw in the application, logistical challenges with network and power, and compatibility challenges between the m-tech database and MIS – prevented the m-tech system from outperforming the paper system in the pilot.

To realize the full potential of the m-tech system, MCDMCH and partners should take immediate actions to address the three critical challenges identified in the evaluation before continuing m-tech enumeration. In addition to addressing these challenges, MCDMCH and partners should take steps to build robust and effective data collection systems that fully leverage the potential benefits of m-tech. Table 3 summarizes the recommendations detailed in this Implementation Guide and notes the degree of difficulty to implement and potential impact of each.

Table 3. Summary of Recommendations

	Recommendation	Anticipated difficulty	Anticipated impact
Critical actions before scale-up	Address issues with the design and programming of the application		
	Equip district offices with tools to connect to the internet and improve power safeguards provided to enumerators		
	Align m-tech and MIS systems and enable remote access to data		
Steps to a fully leveraged m-tech data collection system	Clarify definitions of roles and responsibilities. Modify roles of some MCDMCH staff and partners		
	Develop and execute m-tech training modules		
	Develop an equipment management system		
	Standardize duration and compensation of enumeration		
	Use m-tech to strengthen and firmly imbed quality assurance mechanisms into the SCT program		

 Low
 Medium
 High

Before moving forward with a scale-up, MCDMCH should ensure that the design challenges with the application are addressed, and appropriate steps are taken to mitigate power and network risks. MCDMCH should carefully evaluate priorities for the use of mobile data collection tools in the SCT program. Taking full advantage of all of the capabilities of a mobile system requires a strong database infrastructure that can be fully integrated with mobile technology. MCDMCH should assess whether the

current design and function of the MIS meets these needs and, if it does not, alternative data management options should be considered.

Once these three problems are addressed, MCDMCH and partners can turn their attention to building systems that facilitate the effective implementation of m-tech data collection. This will require effort by all partners to more clearly define roles and to transfer critical programmatic functions to the government. MCDMCH, should begin making investments in developing robust systems to train the personnel, manage the equipment, set enumeration schedules, supervise and assure the data quality, and mitigate the unique challenges associated with mobile data collection.

While we recommend that MCDMCH scale-up with the m-tech system, many of our recommendations would remain relevant if MCDMCH decides to scale-up using paper enumeration. If scale-up took place with paper, MCDMCH should still carefully consider the role of the MIS in the program and expedite the roll-out of key features like decentralization. Scale-up with paper will also be an intensive activity, and roles and responsibilities within MCDMCH and between MCDMCH and CPs would need to shift to alleviate pressure on over-burdened individuals and ensure that roles are clearly defined between MCDMCH and CPs. The training recommendations outlined in this guide would continue to be relevant as new districts are brought onto the program. Similarly, the scheduling and duration of enumeration recommendations remain relevant – regardless of the enumeration method used, MCDMCH should ensure that consistent rules for timing and staffing are in place. Finally, the MCDMCH should consider alternate solutions for quality assurance with the paper, as the current mechanisms overburden personnel.

M-tech remains a promising instrument for improving the accuracy and speed of enumeration, but realizing this promise will not occur automatically. Addressing the urgent problems that limited the benefits of m-tech during the pilot and building systems that will strengthen the data collection system on the whole will allow MCDMCH to fully harness the potential for m-tech for SCT enumeration and registration.