



MyChild Solution in Afghanistan:
An External Evaluation - Transfer of Work Processes to Existing Health System

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Glossary & Abbreviations

Fixed session: An immunisation session that occurs within a health centre/clinic.

Outreach session: An immunisation session that occurs outside of a health centre/clinic. During outreach sessions, health workers will generally travel to rural or underserved parts of the district.

EPI: The Expanded Programme on Immunisation developed by the World Health Organisation in 1974 with the goal of reducing child morbidity and mortality by making immunisation services available for all children.

EPI Dashboard: An online platform where clinics report details and indicators from their immunisation sessions are visualised. All planned, held, and missed sessions are displayed on the EPI Dashboard. Only data for clinics that are using MyChild Solution is displayed in the EPI Dashboard.

MCC: MyChild Card, the paper home-based child health card used within MyChild Solution.

SPF: Smart Paper Forms are the forms/vouchers are used to capture health information. These forms/vouchers can be scanned and digitised.

SCA: The Swedish Committee for Afghanistan, a non-governmental organization responsible for healthcare provision in Laghman Province, Afghanistan.

Abstract

Background: Shifo has recently implemented MyChild Solution, a health information management system designed for child health, within Mehterlam District in Afghanistan. This report, written by an external evaluator, will provide an analysis of which, and to what extent, work processes related to MyChild Solution are being transferred to specific facility and municipal levels of the health system structures in Afghanistan.

Objective: This evaluation first outlines the Standard Operating Procedures needed for the transfer of MyChild Solution to Mehterlam District. This study then seeks to discover what essential processes have been transferred, and to assess the *accuracy* and *sustainability* of these transferred processes.

Methods: This is a qualitative study, focused on semi-structured interviews conducted with health workers at several clinics within the Mehterlam District. Interviews are analysed using a narrative analysis approach. To support interviews, research access was granted to supporting documents from Shifo. These documents include receipts, printing orders, stock cards, data completeness reports, and verification logs.

Results: The results of this external evaluation indicate that a significant portion of processes essential to MyChild Solution - 95% - have been transferred to the local level in Mehterlam District. In most cases where these processes have been transferred, they are being performed in a way that is both accurate and sustainable. All remaining processes are planned to be fully transferred to Mehterlam by the end of 2018.

Introduction

MyChild Solution, a health information management system designed for child health, developed by Shifo Foundation, has been implemented and evaluated in Afghanistan (Mehterlam District). One critical step to fully integrating MyChild Solution within the current health system structure is the transfer of essential tasks and routines to the local level. After training health workers in this new health delivery/data collection system, project's goal is to gradually transfer processes connected with the intervention and allow MyChild Solution to be sustainable at the facility and district levels. This report, written by an external evaluator, will provide an analysis of which, and to what extent, work processes related to MyChild Solution are being transferred to specific facility and district levels of the health system structures in Afghanistan.

Background

MyChild Solution was introduced in Afghanistan in October 2016 within Mehterlam District, located in Laghman Province. MyChild Solution was designed as a replacement for the previous health management information system (HMIS), which was primarily paper-based and involved a significant burden of administrative paperwork for health workers. MyChild Solution was intended to ease this burden of paperwork, combining a paper child health card (MyChild Card) and a digital component based on Smart Paper Technology.

Health workers enter information about the services provided to each child on Smart Paper vouchers in MyChild Cards, just as it would be normally done with regular paper using ballpoint pens. At the end of the immunisation session, the nurse compiles all the vouchers from the day into a 'session bundle'. Following this, the vouchers are scanned at the scanning station situated at Mehterlam District, which has electricity and internet connectivity. The data is uploaded onto a secure server where an electronic medical record is created for each child (Anderson et al 2017).

While the introduction of MyChild Solution has been shown to reduce administration time for health workers, and has received positive feedback (see Anderson et al 2017), there is a need to ensure that this new health information management system has been implemented properly and sustainably.

Research Questions

1. What are the required work processes associated with operations of MyChild Solution in Mehterlam District (Afghanistan)?
2. In Afghanistan, how many of the required work processes for MyChild Solution have been successfully transitioned to the local health system structures?
3. To what degree are these processes being performed in a manner that is accurate and sustainable within the local health system?

Evaluation Structure and Framework

The major processes and sub-processes listed here have been adapted from a document on Standard Operating Procedures provided by Shifo. The Standard Operating Procedures document details the standard operating procedures for MyChild Solution, including all the work processes that are essential to the full functioning of MyChild Solution. Each of these tasks has been categorized into five broad

types (or *major processes*). The tables below list the major processes (and their relevant sub-processes) that need to be verified in Afghanistan.

1. Major process: Procurement and supply management

This major process involves the negotiation, purchase, and consistent supply of all materials used for MyChild Solution.

Table 1

Sub-processes
Procurement of MyChild Cards/Smart Paper Forms (MCC/SPF)
Purchasing internet services
Purchasing equipment (scanners)
Supply and stock management of MyChild Cards (MCC)/Smart Paper Forms (SPF) at district level
Supply and stock management of MCC/SPF at health centre level

2. Major process: Data entry

This major process involves the daily entry of patient (child) data onto MyChild Cards and Smart Paper Forms, as well as their delivery to scanning stations. Data entry is most often done by a vaccinator.

Table 2

Sub-processes
Data entry using MCC/SPF
Delivering MCC Vouchers/SPF to designated scanning stations
Continuous feedback and improvements on data entry tools

3. Major process: *Scanning operations*

After data entry and the delivery of Smart Paper Forms, the Forms need to be scanned and archived at scanning stations at the district level.

Table 3

Sub-processes
Receiving Smart Paper Forms and vouchers from health centres
Scanning and archiving Smart Paper Forms and vouchers
Operational maintenance of required scanning stations

4. Major process: *Data processing*

After being scanned, patient data from Smart Paper Forms is processed and saved digitally within the local health system. While some of this major process is automatic, there is manual work needed to verify any data that could not be automatically recognised due to poor handwriting.

Table 4

Sub-processes
Automatic image processing of handwritten text and check marks
Data verification
Reporting on technical errors and system improvement

5. Major process: *Monitoring and evaluation*

This major process involves monitoring of data quality using a range of indicators and reports that are produced by the system. This process ensures that reports are complete and timely. Any errors or inconsistencies can be detected, and feedback is provided to the health workers.

Table 5

Sub-processes
Ensuring data completeness
Timely reporting
Analysing data recording errors
Printing and handing over paper-based reports to health centres
Finding personal data of a child from the electronic register when parents lose child health cards
Providing facility based Key Performance Indicators via SMS to health workers

Methods

Study Setting & Design

This external evaluation is conducted for clinics in Mehterlam District, Afghanistan. MyChild Solution covers 141 health service delivery points in Mehterlam, among which, there are 8 fixed health service delivery points, 105 outreach health service delivery points and 28 mobile health service delivery points.

This is a qualitative study, focused on semi-structured interviews conducted with health workers at several clinics within the Mehterlam District. To support interviews, research access was granted to supporting documents from Shifo. These documents include receipts, printing orders, invoices, monthly reporting forms, data completeness reports, and verification logs. In addition, supporting media files (videos and photos of daily operation within clinics) were provided by SCA.

Study Participants

The first point of contact is a MyChild Solution (MCS) Senior Officer working in SCA Mehterlam Liaison Office. MCS Senior Officer responsible for immunisation information management and coordination at the provincial level for facilities that use MyChild system. After an initial Skype call on April 23rd, the evaluator received contacts of study participants that could provide details of how each work process has been transferred and is being performed at the local level. To protect their privacy, all participants are referred to by their titles rather than their names. Table 6 below provides a list of these contacts.

All health workers selected for this study satisfy the following criteria:

- They are recommended by an MCS Senior Officer as representative of MyChild Solution processes within Mehterlam District; AND
- They are responsible for MyChild Solution and/or immunisation supplies in Mehterlam District; OR
- They have been engaged in routine immunisation at a health centre for at least 1 month

Table 6

Major Process	Relevant Person(s)	Contact	Clinic placement	Interview date
Procurement and supply management	MCS Senior Officer		Mehterlam Liaison Office	April 23rd
Data entry	Vaccinator (1)		Mehterlam CHC (1, 2)	May 9 th (1)
	Vaccinator (2)		Baba sahib BHC (3)	May 9 th (2)
	Vaccinator (3)		Shamati BHC (4)	May 16 th (3)
	Vaccinator (4)			May 16 th (4)

Scanning	MCS Senior Officer	Mehterlam Office	Liaison	April 23rd
Data processing	MCS Senior Officer	Mehterlam Office	Liaison	April 23rd
Monitoring and evaluation	MCS Senior Officer	Mehterlam Office	Liaison	April 23rd

Data Collection

Given the inability to travel to Afghanistan (due to security limitations) for interviews and participant-observation, semi-structured interviews were conducted over Skype. Open-ended questions (see samples below) were asked regarding each work process from the respective health workers, with specific attention paid to where there have been inconsistencies or challenges encountered in the transfer process of MyChild Solution. In some cases, interviewees were asked to visually demonstrate how particular processes are performed (e.g., for data entry). All conversations were recorded on video to make transcription and subsequent analysis more reliable. Each interview ranged from 20 minutes to 70 minutes, with an average time of approximately 40 minutes. All interviews were conducted in English in the Mehterlam District Office (where there was the most consistent internet connection available).

Open-ended interview questions that were asked to all participants include:

What is your role within the clinic/office and within MyChild Solution?

How long have you been working within your role?

What daily/weekly/monthly tasks are you responsible for?

Do you have any feedback on the processes you work with?

Have there been any problems adapting to MyChild Solution?

If needed, would you be able to teach a new health worker the steps you perform?

Data Analysis

Interviews were constructed with the intention of both confirming the processes carried out by staff in Mehterlam and discovering if these tasks could be passed on or taught to potential incoming staff. Regarding the research questions, *accurate and sustainable processes* are defined as the following:

1. Accuracy: Processes are performed in a manner that encompasses all steps and sub-processes essential for the functioning of MyChild Solution (see *Evaluation Structure and Framework* for more details).
2. Sustainability: Processes are well-understood by health workers and receive consistent feedback. Staff feel comfortable performing these processes on their own and teaching them to others.

Regarding *accuracy*, the aim is to determine the extent to which each major process has been transferred to the local health system structure in Mehterlam. Within the results, for each major process and sub-process, a percentage is assigned. This percentage indicates whether the process has been evaluated as fully transferred (100%), not transferred at all (0%), or partially transferred. Ideally, all processes under evaluation should be fully transferred to Mehterlam District; 100% is the goal in all categories.

Regarding *sustainability*, staff were asked questions to ascertain how well they understand MyChild Solution and how comfortable they would feel explaining/teaching their role to auditors and new staff.

Interviews were analysed using a narrative analysis approach (see Chase 2005). Each interview was viewed multiple times, as the evaluator looked for the 'story' of the interviewee's daily routine. These narratives, taken together, were used to give a holistic picture of how MyChild Solution operates in Mehterlam on a daily basis. Within the Results, the evaluator has aimed to represent the interviewee in their own words, using the same terminology that they employ in their descriptions. Time stamps were used in each video to create reference points that could be easily returned to during the analysis.

Ethical Considerations

Prior to the interviews, all objectives of this evaluation were explained to participants. All interviewees were informed that participation in this evaluation was voluntary. They were also assured that they had the right to withdraw or refuse to answer questions at any stage of the interview. Recorded interviews, transcriptions, and notes were only accessible to the external evaluator. To ensure confidentiality, no specific details of financial transactions (e.g., from receipts or order transcripts) have been included here.

Results

The results of this evaluation, including a breakdown of the transition status for every major process and subprocess, are available in a series of tables below. The evaluator's understanding of the accuracy and sustainability of each major process is also included in the text below each table. The descriptions of the sub-processes also serve as an answer to the first research question in this text: *what are the required work processes associated with operations of MyChild Solution in Mehterlam District (Afghanistan)?* A more general summary of the results is included at the end of this section.

1. Procurement & Supply Management (100% transferred)

Table 7

Process	Description	Transition Status	Supporting Document(s)	Results
Procurement of MCC/SPF	Negotiating and contracting printing companies to supply MyChild Cards and Smart Paper Forms to clinics	Transferred (100%)	Receipts from the Kabul office of the SCA confirming purchase of MCC/SPF throughout 2017	Supporting documents indicate successful transfer
Purchasing internet services	Negotiating and contracting an internet service provider for scanning stations	Transferred (100%)	A contract between the SCA and Afghan Telecom confirming internet services in Mehterlam District Office	Supporting documents indicate successful transfer
Purchasing replacement equipment (scanners)	Negotiating and contracting Smart Paper scanners and replacement rollers	N/A	N/A	Scanners are estimated to last for 7 years, while rollers need to be replaced annually.
Supply and stock management of MCC/SPFs at district level	Monitoring stock and securing deliveries of MyChild Cards and Smart Paper forms to individual clinics	Transferred (100%)	Receipts from the Kabul office of the SCA confirming purchase and delivery of MCC/SPF	Supporting documents and interview indicate successful transfer

			throughout 2017	
Supply and stock management of MCC/SPFs at health centre level	Monitoring stock and securing deliveries of MyChild Cards and Smart Paper forms to individual clinics	Transferred (100%)	Receipts from the Kabul office of the SCA confirming purchase and delivery of MCC/SPF throughout 2017	Supporting documents and interview indicate successful transfer

Healthcare in Mehterlam District, Afghanistan is delivered by the Swedish Committee for Afghanistan (SCA), which has its head office in Kabul. The Kabul office is responsible for several aspects of procurement for Mehterlam, namely printing of MCC/SPF, distribution of MCC/SPF, and purchasing internet services. The MCS Senior Officer is an employee of the SCA, primarily placed at the regional (Laghman) and district-level (SCA Mehterlam liaison/coordination) offices, where he is responsible for immunisation information management and coordination in facilities that use MyChild Solution at the Provincial level.

At the time, he is not facing any printing shortages, but the printing company tends to be late with supplies. The company often claims they will supply it in one month, but often deliveries can take up to 3 months. However, even with these delays, stock is still sufficient, and the cards are printed well. He puts vouchers and cards in Stock Cards, supplies are distributed to health facilities once a month. Health facilities are using them properly, and these facilities contact the MCS Senior Officer when more supplies are needed.

2. Data entry (100% transferred)

Table 8

Process	Description	Transition status	Supporting Document(s)	Results
Data entry using MCC/SPF	Recording personal details of children onto MyChild Cards; recording daily and monthly vaccine use	Transferred (100%)	Data completeness reports generated by the system; links to EPI Dashboard	Supporting documents and interview indicate successful transfer
Delivering MCC Vouchers/SPF to	Bringing smart paper forms and vouchers	Transferred (100%)	Data completeness reports generated	Supporting documents and

designated scanning stations	for scanning to the scanning station at the end of the month		by the system; links to EPI Dashboard	interview indicate successful transfer
Continuous feedback and improvements on data entry tools	Sending feedback to Shifo regarding the use of MyChild Cards and Smart Paper Forms	Transferred (100%)	N/A	Interview indicates successful transfer

Data entry in Mehterlam is completed by vaccinators. For this evaluation, interviews were conducted with 4 vaccinators from three different clinics. These vaccinators fill in registration, give vaccines, and attend both fixed and outreach sessions. Vaccinators showed how they filled out each paper (proof of ID, registration paper, parents' names, date of birth, etc). Registration vouchers are then put in the data box and kept for one week. Feedback from the health workers is very positive; the burden of administration is greatly reduced in comparison to the previous health information system. Individual (5-10 min) and group counselling (30 min) tasks are performed.

However, the vaccinators had also encountered several challenges within the data entry processes. Primarily, mothers are sometimes afraid to give mobile numbers or husbands' work information out for security reasons. Sometimes parents also do not receive SMS due to poor mobile network coverage. Another problem is that, because registration information is confidential and only available to the MCS Senior Officer, patient data cannot always be retrieved by vaccinators themselves. If the MCS Senior Officer is not in the office (e.g., on Saturdays), then sometimes patients who have lost a child health card cannot be helped. This lack of coordination in working hours between vaccinators and the MCS Senior Officer can occasionally be frustrating for the vaccinators. Often, mothers must travel a long way through dangerous areas to get to the clinic - it is therefore very problematic if their visit to the clinic is not successful.

3. Scanning operations (100% transferred)

Table 9

Process	Description	Transition status	Supporting Document(s)	Results
Receiving Smart Paper Forms and vouchers from health centres	Receiving and organizing MyChild Card vouchers for scanning	Transferred (100%)	Data completeness reports generated by Shifo; links to EPI Dashboard	Interview and supporting documents indicate successful

				transfer
Scanning and archiving Smart Paper Forms and vouchers	Running Smart Paper Forms through the scanner and ensuring that their files are received and processed by the office laptop	Transferred (100%)	Data completeness reports generated by the system; links to EPI Dashboard	Interview and supporting documents indicate successful transfer
Operational maintenance of required scanning stations	Cleaning and changing scanner rollers once a year; clearing paper jams; ensuring laptop functionality; internet maintenance	Transferred (100%)	N/A	Interview indicates successful transfer

The MCS Senior Officer is responsible for all scanning, and he receives session vouchers from each facility at the end of each week. Once a week, the MCS Senior Officer does voucher scanning, synchronizing, and verification of all data. The process is so simple that he can cover all health facilities by himself. After one week, they are wrapped with a rubber band and the MCS Senior Officer collects them. He brings them into his office and scans all of them.

Regarding equipment, two scanners have been received from the MyChild project. As long as they are maintained properly (e.g., replacing rollers annually), these scanners should work for up to 7 years. Shifo delivers new parts for the scanners.

4. Data processing (83% transferred)

Table 10

Process	Description	Transition status	Supporting Document(s)	Results
Automatic image processing of handwritten text and check marks	Handled by software (Smart Paper Technology Engine)	Transferred (automatic) (100%)	N/A	This is handled automatically by Smart Paper Technology Engine

Data verification	Checking and correcting for flagged errors/marks/bad handwriting in vouchers scanned by Smart Paper Technology Engine. This involves two steps: <i>primary verification</i> and <i>master verification</i>	Partially transferred (50%)	Verification logs from October 2017 - present	Primary data verification is done by the MCS Senior Officer, which was confirmed via interview and supporting documents. However, master verification (a second step where any further flagged errors are corrected) is planned to be transferred by end of year 2018. At present, master verification is still performed by Shifo staff, in order to analyse errors and improve machine learning algorithms and validation rules.
Reporting on technical errors and system improvement	Sending feedback to Shifo regarding any technical problems with software and suggestions for improvement	Transferred (100%)	N/A	Interview with the MCS Senior Officer indicates successful transfer

After scanning, the MCS Senior Officer performs the process of primary data verification, checking for data entry errors in MyChild Cards. An extensive verification log file confirms that the MCS Senior Officer has been processing documents and verifying fields flagged for review since October 2017. He has no complaints with the process and is very familiar and comfortable with data verification. He is confident he could teach these steps to any incoming health worker.

The only complaint brought up by the MCS Senior Officer was with the slow internet connection in his district office – it takes a long time for scanned vouchers to synchronize. Some tasks are delayed or encounter problems due to this poor internet connectivity. New internet options would be ideal.

Data verification is only halfway transferred (50%), since the crucial second step of Master Verification is still done by Shifo. However, Master Verification is on course to be transferred to Mehterlam District by the end of year 2018, at which point data verification should be 100% transferred.

5. Monitoring and evaluation (90% transferred)

Table 11

Process	Description	Transition status	Supporting Document(s)	Results
Ensuring data completeness	Measured by comparing the number of immunisation sessions (both fixed and outreach) captured in electronic reports to the number of sessions that were planned to be held according to facility schedules. In the possible case of a missed session, the responsible person must call the health facility and clarify whether the session took place or why it was cancelled or missed.	Transferred (100%)	Access to EPI Dashboard and data completeness reports showing that missing data for fixed/outreach sessions are being noted and reported	Supporting documents and interview indicate successful transfer
Timely reporting	Ensuring that all electronic HMIS reports are available to the district health offices by the 5th of every month. The EPI Dashboard and email	Transferred (100%)	Logs confirming that reports from Mehterlam have been reported on time	

	are used as platforms for sharing reports.			
Analyzing data recording errors	Ensuring that any recording errors made by health workers are analysed and that any related feedback is passed on to health workers	Transferred (100%)	Access to an <i>operations issue register</i> which confirms that recording errors are being logged and analysed	Supporting documents and interview indicate successful transfer
Printing and handing over paper-based reports to health centres	After electronic reports are generated, the reports are printed and shared with facilities that do not have access to electronic reports	Transferred (100%)	N/A	Interview indicates successful transfer
Extracting personal data of a client from electronic register when parents lose child health cards	Properly retrieving any needed personal data from the clinic's system when a parent's MyChild Card has been lost	Transferred (100%)	N/A	Interview indicates successful transfer
Providing facility based Key Performance Indicators via SMS to health workers	The system can generate new Key Performance Indicators (KPIs) that facilitate monitoring and evaluation of EPI performance at the facility level. KPIs are sent by SMS to health workers monthly. KPIs are plotted and followed up on the monitoring boards by health workers every month.	Partially transferred (38%)	N/A	Interview data and communication with Shifo indicate that this subprocess is currently being piloted in 2 clinics out of the 8 fixed facilities (38%) totally operating in Mehterlam District

The MCS Senior Officer goes to health facilities every month to supervise the MyChild work process. He shares activities, teaches them how to fill in cards, detach vouchers, how to administer vaccines, etc. He is very comfortable training new staff. The MCS Senior Officer also checks monthly activity reports, registry reports, follow-up lists, and tally reports for any discrepancies. Any findings are shared with health workers.

In addition to these steps, the MCS Senior Officer analyses monthly reports, checks coverage of all vaccines, and evaluates wastage. Some issues are related to health worker error and others (rarely) to system error. System errors are shared with Shifo. The MCS Senior Officer and Shifo are in contact at least once a week to discuss feedback and any problems that may have come up.

Other problems are shared with the health workers themselves. Otherwise, all activities are recorded in EPI Dashboard. All fixed and outreach sessions conducted per week are recorded. Any missed or cancelled sessions are mentioned. These processes are all going well. It is a significant improvement to the previous system, where monthly evaluation was much more tedious and time-consuming and had to be done manually. All reports can now be generated electronically.

Overall Transfer

In total, this study estimates that 95% of processes essential for the proper functioning of MyChild Solution have been transferred to the existing health system structure in Mehterlam District in Afghanistan (see Table 12).

Table 12

Major Process	Percentage Transferred
Procurement & supply management	100%
Data entry	100%
Scanning operations	100%
Data processing	83%
Monitoring & evaluation	90%
Total for MyChild Solution	95%

Conclusion

The results of this external evaluation indicate that a significant portion of processes essential to MyChild Solution - 95% - have been transferred to the local level in Mehterlam District. In most cases where these processes have been transferred, they are being performed in a way that is both accurate and sustainable. All interviewees stressed that they were comfortable in their roles, appreciated the ease and convenience of working with MyChild Solution, and expressed their ability to teach incoming staff these processes if needed. Only two sub-processes - *Data verification* and *Providing Key Performance Indicators* - were not entirely transferred to Mehterlam District. All these subprocesses are planned to be fully transferred to local level in Mehterlam District by the end of 2018.

Limitations

Despite the generally positive trend of these findings, there are several limitations of this study that should be considered by readers. These are:

1. Due to security constraints, all interviews were conducted through Skype and Slack. The ability to observe work processes in action was greatly diminished over a video call (as compared to being on-site), and it was occasionally difficult to get a sense of how MyChild Solution had been integrated within day-to-day actions and routines.
2. Challenges in communication and translation. Although all interviews were conducted in English, in most cases, English was not the native language of interviewees. In all interviews with vaccinators, the MCS Senior Officer had to act as a translator. This opens the possibility for misunderstandings and mistranslations that might have affected results.
3. The low number of interviewees. Out of 8 fixed facilities in Mehterlam District using MyChild Solution, the evaluator was only able to interview health workers from 3 fixed facilities. While not ideal, time constraints made it difficult to conduct a more expansive study and acquire a more representative sample of health workers from across Mehterlam.

These limitations highlight the need for a further on-site evaluation of work process transitions at a later date in 2020 or 2021, when the solution is scaled up to the whole Laghman Province.

References

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