Collaborative community checklists for immunisation: a feasibility and acceptability study in rural Myanmar

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Formative evaluation report

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About this formative study

This formative evaluation was submitted in partial fulfilment of the requirements of grant TW10.1117 awarded under the Innovations in Increasing Immunisation Evidence Programme. 3ie is publishing this report on our website as we received it from the authors. It has not been copy-edited.

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Summary

Background

Despite good progress in increasing immunization coverage, missed opportunities for vaccination, sub-optimal care-giver knowledge and conflicting priorities (Favin et al., 2012, Sridhar et al., 2014) mean 20% of children globally continue to miss out in many settings. International research suggests that improved community *engagement* is key to addressing vaccine hesitancy and increasing coverage (LaFond et al., 2015).

There is global evidence that the use of **quality checklists by health providers** can improve service quality and health outcomes (Gawande 2010). The World Health Organization (WHO) has developed service quality checklists for use by health providers in surgery, safe motherhood and most recently immunization (Van Klei et al., 2012, Spector et al. 2012, WHO 2015). Operational research also suggests that **community scorecards** can increase health service transparency, accountability and help build collaborative relationships between health providers and communities (Post and Venugopal, 2014).

In Myanmar, health authorities are committed to increasing vaccination in all settings, especially hard-to-reach communities. Therefore, they agreed to test a new approach that combines both checklist and community feedback mechanisms, as a complement to other continuing work to improve immunization service quality and access.

Formative evaluation design

In 2016-17, the Burnet Institute collaborated with the Myanmar Expanded Programme on Immunization (EPI) to **explore the feasibility and acceptability of a new approach to improve community engagement** with and uptake of immunization in hard to reach communities. This new approach is called the Collaborative Community Checklists for Immunization (CCCI) project and utilises both community- and provider-oriented immunization quality checklists.

The formative evaluation was implemented in three rural villages of Ngaphe Township, Magway Region, Myanmar. The primary aim of the study was to test **the feasibility and acceptability** of the CCCI intervention. In addition, we also sought to assess community and immunization providers' **perceptions of the effect of the intervention on: community immunization knowledge**; **immunization service uptake**; and whether the intervention **enables communities and providers to work together** to identify and address local barriers to immunization. The CCCI formative evaluation study was a pre-post- design, using mixed methods to collect qualitative and quantitative data at baseline and at endline.

CCCI intervention

The CCCI intervention comprises three key components:

- **Development and use of a Providers' Checklist for Immunization:** Project staff worked with immunization providers (the cadre termed 'midwives') and Township Health Authorities to adapt a WHO Immunization Session Checklist to the local

context. Providers were trained and supported to use this Provider Checklist during immunization sessions.

- **Development and use of a Community Checklist for Immunization:** Project staff also supported community members to identify barriers to immunization uptake and design a Community Immunization Checklist that included items that the community thought were important in a quality immunization service. This also drew on new communication materials, from the national immunization program, to provide a reminder of the immunization schedule. Caregivers of young children were then encouraged and supported to use that Community Checklist when attending immunization sessions.
- **Training and supervision of volunteer Checklist Assistants to:** support caregivers in using the Community Checklist at immunization sessions; collate results of completed Community Checklists; and collaborate with Village Health Committee (VHC) members, immunization providers and community members to discuss any issues that arise. During supervision visits, project staff also provided **monthly Health Education sessions** in each project village to: build caregiver understanding of the need for vaccination and quality immunization services, educate caregivers on use of the Community Checklist and to encourage regular Checklists use.

Key findings

The CCCI intervention is **feasible in rural low-resource settings**. Participation in the intervention by community members and immunization providers was high. Over 160 community members across three villages participated in design of the Community Checklist and 84% of caregivers of young children surveyed at endline had used the Checklist to assess immunization services at least once. Caregivers reported the Community Checklist was quick, easy to use and was not overly burdensome. Development of the Provider Checklist attracted substantial participation by immunization providers and Township Health Authorities. All immunization providers in the project area used the Provider Checklist in planning and delivering immunization services.

The combination of monthly education sessions, and post-vaccination completion of a Community Checklists by community members, also proved **acceptable to both community members and immunization providers**. Concerns that it may be socially unacceptable to appear to critique services were cited as not proving a significant problem during implementation by caregivers and providers involved in the study; although concerns were reiterated by reviewers during dissemination meetings.

Midwives also found use of the Provider Checklist acceptable. All participating midwives reported that using the checklist was relatively **easy and helped them remember** items to be prepared and actions to take before, during and after an immunization session.

Caregivers, Midwives and VHC members participating in this study reported a number of **benefits** associated with the CCCI intervention, including perceived improvement in:

- **Community knowledge** regarding immunization, including what vaccinations are given at what ages; why vaccines need a cold-chain; possible AEFI; and the elements of a quality immunization service.

- **Quality of immunization services**: including improved notification of sessions and improved communication between immunization providers and clients; probably as a response to Checklist development workshops and early deployment of the Checklists, rather than in response to community feedback.
- **More active care-seeking** for childhood vaccination: including greater caregiver commitment to vaccination and greater confidence in engaging with service providers.

Important limitations relate to the localised scope and predominantly qualitative methods, which increased the risk of social acceptability bias influencing responses. It is also important to note that other initiatives were active at the time of the study, including a national immunization advocacy campaign and broader development inputs to strengthen maternal and child health services. Acknowledging these study constraints, there remains sufficient evidence of feasibility, acceptability and potential benefit to warrant impact evaluation of the CCCI intervention, with modification based on these findings.

Key modifications include:

- Harmonisation of any Provider Checklist with other supervision approaches in use in Myanmar;
- Adapting Community Checklist processes and tools so that they focus on improved understanding of the immunization service and the family's role in actively supporting vaccination;
- A continued commitment to regular, participatory community health education to build basic immunization knowledge, increase understanding of the communities role in supporting routine services and increase awareness of their right to a quality vaccination service;
- Greater emphasis on regular, participatory community discussion of Community Checklist data in order to identify ways that community members can further support immunization services and to foster collaborative action by community members and providers in addressing local immunization barriers.

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Glossary of abbreviations

AEFI	Adverse Event Following Immunization
AMW	Auxiliary Midwife (a trained, community-based health volunteer)
CCCI	Collaborative Community Checklists for Immunization
EPI	Expanded Programme on Immunization
FGD	Focus group discussion
IDI	In-depth Interview
KII	Key informant interview
RHC	Rural Health Centre
Sub-RHC	Rural Health Sub-Centre
VHC	Village Health Committee
WHO	World Health Organization

1. Introduction

1.1 Background and evidence base

Immunization is one of the most cost-effective ways of preventing death and disability from infectious diseases. There has been significant progress in recent decades in increasing immunization coverage. However, in many countries coverage of key vaccines has stagnated at roughly 80% or has even started declining (Favin et al., 2012). This is attributable to problems on the supply-side: problems in reliability and quality of services, as well as missed opportunities for catch-up vaccination; and on the demand side: where gaps in practical knowledge, conflicting priorities when seeking preventive care, or vaccine hesitancy remain pressing issues (Favin et al., 2012).

International research shows that community knowledge of immunization and trust in immunization services affect vaccination coverage (Favin et al., 2012, Jain et al., 2015, Rainey et al., 2011). Further research shows that community engagement is more effective than community education alone in addressing vaccine hesitancy (Sabarwal et al., 2015, Peters, 2009). But while the need to engage communities is clear, there are many gaps in the evidence base (Sabarwal et al., 2015) and a recent Cochrane review has called for implementation research into the optimal mechanisms to achieve community engagement, especially in resource-poor settings where coverage is lowest (Saeterdal et al., 2014).

Meanwhile, there is increasing evidence that the use of quality checklists by health providers can improve service quality and improve health outcomes. The World Health Organization (WHO) has capitalised on these findings by working with stakeholders to develop checklists for use by providers involved in surgery, safe motherhood and most recently immunization (Haynes et al., 2009, Spector et al., 2012, Gawande, 2010, van Klei et al., 2012). Reflective practice, with regular review of system and health worker performance, was also identified as a driver of stronger routine immunization in the African setting (LaFond et al., 2015).

Health development project evaluations and some operational research have also shown that community scorecards, which community members can use to monitor health services, can increase health service transparency, accountability (Post, 2014) and provide a structured space for productive conversations between communities and the health system (Ho et al., 2015). These concepts build on the findings, across World Bank health projects, that mechanisms for community feedback and accountability were among the strongest determinants of a successful development initiative (Peters, 2009). Case studies of good routine immunization in Africa echo this in that three of the four direct drivers of strong immunization systems they identified relate to community connections; including: partnerships between system and community, tailoring of services to community needs, and the involvement of community-oriented staff (LaFond et al., 2015).

What has not previously been attempted is to synchronise quality improvement and community education around the same core tool, to focus the community engagement effort on a better understanding of good quality service provision. A new WHO quality checklist helps make this possible, in that it represents a concise, evidence-based

presentation of the most important elements in providing an immunization service to clients. This checklist was developed by WHO immunization staff through a rigorous review of the most important programmatic errors to be avoided, and good practices to be promoted, during immunization sessions. It has a strong focus on resource-constrained settings, and was included in the latest update of the WHO Immunization in Practice global guidance (World Health Organization, 2015).

1.2 The novel CCCI approach

In Myanmar, national vaccination coverage for key vaccines are relatively high, but like elsewhere in the world, in many communities (particularly those in hard to reach areas) vaccination coverage continues to hover at roughly 80% (Myanmar Ministry of Health, 2011). The Government of Myanmar is committed to increasing vaccination in these communities in order reach optimal vaccination coverage (Myanmar Ministry of Health, 2011), and agreed to test a new approach that combined the evidence for quality checklists with a strategy to improve community engagement.

The Collaborative Community Checklists for Immunization (CCCI) intervention was designed to combine evidence for quality checklists with that on community accountability and engagement through a linked set of tools, based on the WHO Immunization Session Checklist. The CCCI adaptation of a Provider Checklist was intended to largely follow the intent of the WHO Checklist, noting that Myanmar was, in 2016, completing its national adaptation of the Immunization in Practice guidance. The CCCI approach to developing a Community Checklist aimed to use the adapted WHO checklist as a starting point for education of community members regarding acceptable service quality, combined with a collaborative development of other service elements felt important to communities. This quality-driven approach to community education aimed to be linked to a mechanism for non-confrontational reporting of community assessments, using community-based volunteers and the VHC, to construct a mechanism for fuller engagement of care-givers, and other stakeholders, in the immunization service.

1.3 Evaluation aims and objectives

The formative evaluation of the CCCI concept was implemented in a rural area of Magway Region, Myanmar. The study supported community members and immunization providers to develop and use client- and provider-orientated immunization quality checklists, with the aim of increasing community engagement with immunization services and building better, more collaborative relationships between immunization providers and communities that would allow these stakeholders to jointly address local barriers to immunization. To our knowledge, this is the first attempt to deploy immunization quality checklists for use by both immunization providers *and* clients, in order address both supply- and demand-side barriers to immunization.

The primary objective of this study was to test the feasibility and acceptability of the CCCI intervention. In addition, we also sought to assess community and immunization providers' perceptions of the effect of the intervention on: community immunization knowledge; immunization service uptake; and whether the intervention enables communities and providers to work together to identify and address local barriers to immunization. This was intended to inform future use of this approach in Myanmar, and also inform global

immunization stakeholders on feasible and acceptable approaches to improving community engagement.

This report presents the findings of our formative evaluation of the CCCI intervention. Section 2 describes the intervention context, Section 3 outlines the intervention, Sections 4 and 5 lays out the evaluation methodology, Section 6 illustrates the study timeline, Section 7 presents findings and Section 8 and 9 address the implications of study findings and major challenges encountered.

2. Context

The CCCI formative evaluation was implemented in Ngaphe Township, Magway Region, in Myanmar's central dry zone (Figure 1). The project was implemented in three rural villages (Thar Yar Kone, Sone Kone and Zin Pyun), the three Subrural Health Centres (sub-RHCs) serving these villages, and Zin Pyun Rural Health Centre (RHC), which oversees our three project Sub-RHCs.

As discussed in our proposal documents, government measures of immunization coverage for Zin Pyun RHC are lower than elsewhere in Magway Region: 73% for tetanus toxoid, 74% - 84% for pentavalent vaccine, and 91% - 100% for measles vaccine. Local stakeholders suggested that actual coverage is lower than this, because unreached children and mothers are not included in coverage estimates. While social and geographic factors are important, physical access is not the over-riding constraint (as illustrated by high coverage with some vaccines) and a lack of engagement with the RHC on the part of families, health committees and health volunteers needs urgent attention. The Myanmar Ministry of Health, and the relevant regional authorities, are committed to reaching the last 20% of children currently unvaccinated, and are encouraging exploration of how volunteers and community members at the most peripheral levels can support improved coverage.

Figure 1: Map of Myanmar - study region. Map courtesy of CartoGIS (2012).

Baseline data collection indicated that the three sub-RHCs in the project area have satisfactory systems and practices for the provision of scheduled (monthly) immunization services, with reasonable scope for identifying children or pregnant women who have missed vaccination.

The facilities operate in a mode that in other settings would qualify as ‘outreach’ points; they are dependent on monthly vaccine supplies that must be collected by health staff from Township stores. Baseline data collection found little evidence for mishandling of vaccine supplies, nor of serious stock-outs.

The monthly scheduling dominates service provision, meaning that there are very few other opportunities for catch-up vaccination or integration of immunization with other care. Individual-, community- or health facility-level measurements of vaccination timeliness are currently time-consuming to calculate and are not tracked over time. Defaulter tracking also seems largely dependent on the efforts of health staff to derive accurate due lists from registry data.

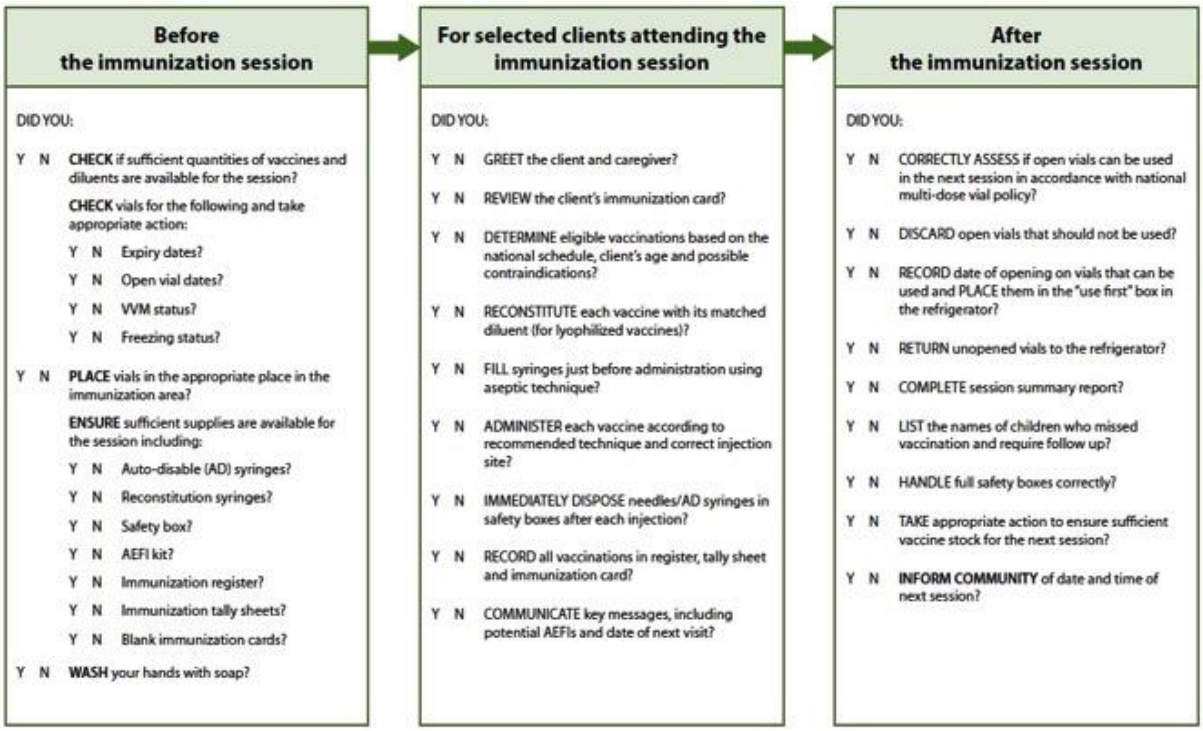
3. Intervention description

3.1 CCCI Components

The CCCI intervention (‘the intervention’) included three key components:

1. Development and use of a Providers’ Checklist for Immunization:
Following advocacy at the national and townships levels, project staff supported township health authorities, health supervisors and immunization providers at Zin Pyun Rural Health Centre (RHC) to adapt the WHO Immunization Session Checklist (refer Figure 2) to the local Myanmar context. This adaptation took place during a one-day participatory workshop attended by the Township Medical Officer, the Regional EPI Team Leader, health supervisors and immunization providers, including the Midwives providing services in the Sub-RHC in our project villages. Workshop attendees received travel reimbursements.

Figure 2: The WHO Immunization Session Checklist



Before the immunization session

DID YOU:

Y N **CHECK** if sufficient quantities of vaccines and diluents are available for the session?

CHECK vials for the following and take appropriate action:

- Y N Expiry dates?
- Y N Open vial dates?
- Y N VVM status?
- Y N Freezing status?

Y N **PLACE** vials in the appropriate place in the immunization area?

ENSURE sufficient supplies are available for the session including:

- Y N Auto-disable (AD) syringes?
- Y N Reconstitution syringes?
- Y N Safety box?
- Y N AEFI kit?
- Y N Immunization register?
- Y N Immunization tally sheets?
- Y N Blank immunization cards?

Y N **WASH** your hands with soap?

For selected clients attending the immunization session

DID YOU:

Y N GREET the client and caregiver?

Y N REVIEW the client's immunization card?

Y N DETERMINE eligible vaccinations based on the national schedule, client's age and possible contraindications?

Y N RECONSTITUTE each vaccine with its matched diluent (for lyophilized vaccines)?

Y N FILL syringes just before administration using aseptic technique?

Y N ADMINISTER each vaccine according to recommended technique and correct injection site?

Y N IMMEDIATELY DISPOSE needles/AD syringes in safety boxes after each injection?

Y N RECORD all vaccinations in register, tally sheet and immunization card?

Y N COMMUNICATE key messages, including potential AEFIs and date of next visit?

After the immunization session

DID YOU:

Y N CORRECTLY ASSESS if open vials can be used in the next session in accordance with national multi-dose vial policy?

Y N DISCARD open vials that should not be used?

Y N RECORD date of opening on vials that can be used and PLACE them in the "use first" box in the refrigerator?

Y N RETURN unopened vials to the refrigerator?

Y N COMPLETE session summary report?

Y N LIST the names of children who missed vaccination and require follow up?

Y N HANDLE full safety boxes correctly?

Y N TAKE appropriate action to ensure sufficient vaccine stock for the next session?

Y N **INFORM COMMUNITY** of date and time of next session?

The locally adapted version of the Provider Checklist was then reviewed and approved by the nation EPI Program Manager and pilot-tested during a monthly immunization session. The Myanmar Providers' Immunization Checklist was similar to the existing WHO immunization Session Checklist and included 35 items in short written form that should be addressed before, during and after an immunizations session.

Immunization staff ('midwives') from Zin Pyun RHC, including those providing services to project villages, and township level supervisors were trained to use the final version of the Provider Checklist during immunization service provision. The Implementation Team conducted monthly visits to immunization service providers to assist providers in using the Checklist and address any implementation challenges. The Implementation Team did not collect data on Provider Checklist use and did not otherwise monitor Provider Checklist use. Midwives did not receive incentives to use the Provider Checklist.

2. Development and use of a Community Checklist for Immunization

Project staff also supported each project village to develop a Community Checklist that included items that community members thought were important in a quality immunization service and that immunization clients could use to monitor the quality of services received. Adult community members, with an emphasis on pregnant women, parents of young children and Village Health Committee (VHC) members were invited to participate in Community Checklist design workshops in each village. Local immunization providers (midwives) that provide services at local Rural Health Sub-Centres and Auxiliary Midwives were also invited to participate. This involved 164 participants across the three villages, comprising 34 pregnant women (21%), 100 mothers of children aged less than 2 years (61%), 10 fathers (6%), and 20 other participants (12%) including Auxiliary Midwives, VHC members, village leaders and other community volunteers.

Design workshops were facilitated using small- and large-group games and activities to encourage participation and aimed to:

- Provide basic information about immunization, including service quality (Figure 3).
- Help community members identify barriers to immunization uptake, and work with providers to identify practical solutions to these barriers.
- Facilitate design of a Community Immunization Checklist that includes items that the community thinks is important in a quality immunization service.
- Train community members to use this Community Immunization Checklist during or after an immunization session.

Figure 3: Caregivers learning about immunization at a design workshop

Community members contributed ideas on which elements were of most interest to them, such as communications around timing, and which elements represented new information, such as observation for adverse events, and correct handling of injection waste.

The Community Immunization Checklist developed in this workshop was then pre-tested for comprehension with community members at a monthly immunization session. At a subsequent community-based workshop, caregivers of young children, pregnant women and VHC members were trained to use the Community Checklist. Pregnant women, husbands of pregnant women and parents of children aged two years or less were encouraged to use the Community Checklist when they attend immunization events[*]. Ultimately, Community Checklists (see Figure 7 below) included 12 items that assessed immunization service quality. As these items were similar across all three project villages, and to reduce printing costs, one Checklist that included all items selected across the three village sites was produced. Participants in Community Checklist design workshops received a small gift for participation (usually a small bar of soap).

National immunisation programme managers noted that the the Community Checklist also provided an opportunity to disseminate new communication materials developed to educate communities regarding the standard immunisation schedule. To accommodate this, a graphic from these materials was added to the reverse side of the Community Checklist (see Figure 7 below). This meant that the checklist had a clear educative function, in addition to the aim of promoting better engagement with the tasks of the immunisation provider.

3. Training and supervision to Village Health Committees to support checklist use
Implementation Team staff worked with the VHC in each project village to identify a local volunteer Checklist Assistant who would attend monthly immunization sessions and assist pregnant women and caregivers of young children to complete the Community Checklist after receiving immunization services. In each site, a member of the VHC was selected as a Checklist Assistant. Checklist Assistants received a small amount as incentive and compensation for travel to monthly immunization sessions (30,000 kyat, approximately USD23). These assistants were selected on the basis of sufficient literacy, availability to serve, and having no other role in provision of immunization services. Two villages had female Checklist Assistants and one village had a male Checklist Assistant. The role of the Checklist Assistant was to:

- Assist community members attending immunization sessions to complete the Community Checklist.
- Collect completed Community Checklist and collate results of these Checklists into a Monthly Community Checklist Register template.
- Meet with VHC members, community members and local immunization providers (midwives) to communicate monthly results in a respectful and collaborative manner that enables VHC members, other community members and Midwives to collaboratively address any issues identified in Community Checklist feedback.

Implementation Team staff conducted monthly supervision visits to Checklist Assistants in all three sites (total 6 visits per village).

During supervision visits to Checklist Assistants, Implementation Team staff also conducted community Health Education sessions on immunization and use of the Community Checklist. This activity was added after baseline findings indicated low immunization

[*] For readability, pregnant women and parents using the Community Checklist are referred to as ‘caregivers’ in this report.

knowledge, among caregivers and local health volunteers. Health education sessions were held monthly in each village (total 6 visits per village). Attendees received a small gift (usually a small bar of soap). There was very high attendance at these sessions by caregivers (approximately 90% of whom were mothers) and pregnant women at these sessions, along with other interested community members. The education sessions used participatory activities and visual aids prepared by hand by implementation team staff, based on resources provided by the national immunization program and generic WHO guidance.

3.2 Hypothesis and theory of change

This intervention sought to promote a more intense involvement in understanding of what is required for a good quality immunisation service than usual community education sessions, by actively involving community members in observing and reflecting on the conduct of the session, with the knowledge of the midwife provider.

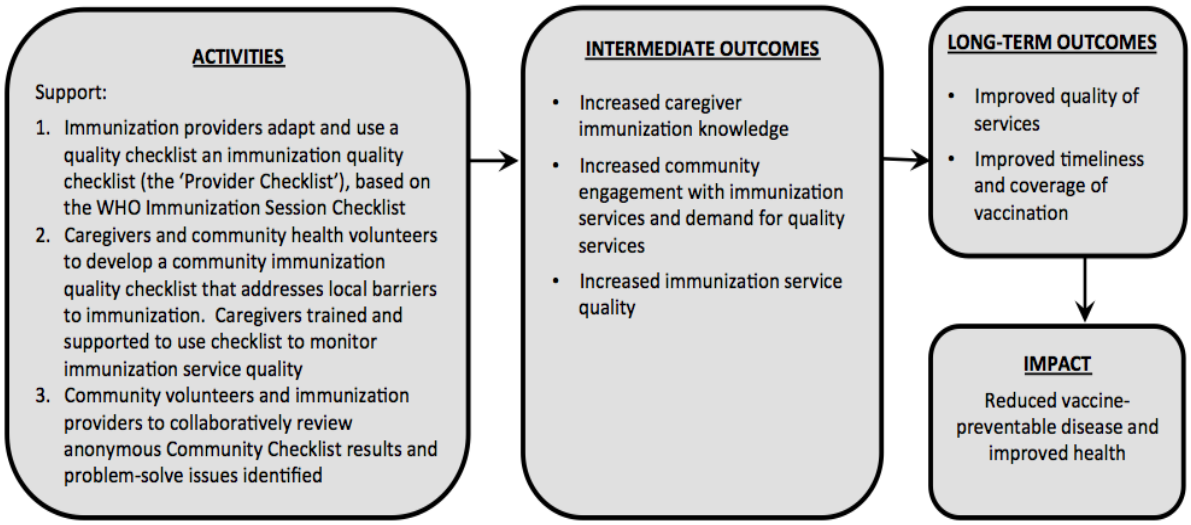
Perceived quality of service (such as staff attitudes or availability) is a strong driver of utilisation (LaFond et al., 2015) but our baseline assessments (see below) and other information from Myanmar (Myanmar Ministry of Health, 2011) suggested communities in settings such as rural Myanmar rarely have a strong or complete understanding of what actually constitutes good quality care. The intervention started with facilitated community dialogue on local barriers to immunization, identification of specific immunization service actions or qualities that are important to local client satisfaction (the Community Checklist items), and then supports immunization clients to assess immunization services against these local quality criteria (Figure 4). The involvement of health volunteers as Checklist Assistants, reporting to a VHC that already had a role in oversight and support to the RHC, was intended to provide an indirect, non-confrontational means of collating, discussing and using feedback on the Community Checklists. The intention of this feedback was primarily intended to increase community support for vaccination services, including the identification and removal of local barriers to access. It was also intended to help reinforce community understanding of the extent of midwives' duties. Simultaneously, the Implementation Team supported immunization providers to develop and use a Provider Checklist that includes items globally and locally recognised as important in providing quality immunization services. The aim of this Provider Checklist was to provide Midwives with tools to assess and improve their own practice, while increasing the acceptability of use of the Community Checklist by immunization clients.

Figure 4: Caregivers using Community Checklist at an immunization session

As presented in Figure 5, we hypothesised that this process of synchronised deployment of both Community and Provider Checklists (the activities) will contribute to intermediate outcomes of: increased community immunization knowledge (including what constitutes a quality service); improved communication between staff and clients; increased community support and demand for quality immunization services; and some local problem-solving, based on this improved shared understanding. Our assumptions included: that communities will be interested in the identification of barriers to immunization and in developing the Community Checklist; that health staff will work collaboratively with VHCs and that at least some problems with provision of quality services can be solved at the local level. We anticipate that while some barriers to immunisation may be beyond the control of the local level, many factors contributing to under-immunisation will be locally modifiable.

We further hypothesise that intermediate outcomes of improved knowledge, demand, community support for and greater provision of quality immunization services will contribute to longer term improvements in service quality and increased coverage and timeliness of vaccination. Assumptions include that immunization providers and community members implement their respective Checklists as planned; that clients and VHCs are reflective and responsive in their review of Community Checklist items, and that at least some immunization barriers are locally modifiable.

Figure 5: Theory of Change for the Collaborative Community Checklist Intervention



4. Evaluation study objectives and measures

The primary objective of the CCCI study was to:

1. Test the feasibility and acceptability of the Collaborative Community Checklist intervention ('the intervention') for both immunization providers and communities.

Secondary objectives were to:

1. Assess community and immunization providers' perceptions of the effect of the intervention on community knowledge regarding immunization services.
2. Evaluate whether the intervention enables providers and communities to jointly identify barriers to immunization, and engages community members in addressing these barriers.
3. Assess community and immunization providers' perceptions of the effect of the intervention on immunizations service uptake.

Table 1: Key study measures

Evaluation question	Study measures
Primary evaluation question: Was the intervention feasible and acceptability to immunization providers and communities?	*Participation* • Proportion of VHC members, immunization providers and care-givers of young children involved in Community Checklist design • Proportion of pregnant women/caregivers that report Community Checklist use • Frequency of use of the Community Checklist by caregivers to review immunization experiences • Participation of local immunization providers in design and use of Provider Checklist *Resources required and feasibility of use* • Time, money and other resources required to use Provider and Community Checklists in immunization sessions *Acceptability* • Perceived ease of use of the Community Checklist by caregivers • Perceived satisfaction/comfort of immunization clients using Community Checklist to assess quality of immunization service • Reported likely use of Community Checklist at future immunisation • Suggestions for improved deployment of checklists • Implementation of meetings to discuss Community Checklist findings with immunization providers and community
Secondary evaluation question 1 What was the perceived effect of the intervention on knowledge and attitudes (among caregivers and providers)?	• Perceived changes in knowledge of and attitudes to immunization before and after the intervention
Secondary evaluation question 2 What was the perceived effect of the intervention on immunization service quality and uptake (among caregivers and providers)?	• Perceived changes in quality of immunization services before and after the intervention • Perceived changes in usage of immunization services before and after the intervention • Vaccination status of pregnant women and children under 2 years
Secondary evaluation question 3 Does the intervention help providers and communities to identify barriers to immunization, and engage community members in addressing these barriers?	• Barriers to and enablers of both provision and usage of immunization services, • Barriers to compliance with the WHO Checklist that can and cannot be overcome within local resources.

5. Evaluation study design and methods

5.1 Study design, setting and participants

The Collaborative Community Checklists for Immunization study was a pre-post-intervention mixed-methods study of feasibility and acceptability, with the qualitative component as the primary focus.

Qualitative methods were used to explore: knowledge of and attitudes to immunization, including the elements of good quality services; barriers and enablers to immunization; awareness and potential uses of checklist approaches in general (baseline); resources invested in design and use of Checklists; participation in the project; and acceptability of Checklist use.

Quantitative data collection methods were used to assess supply-side determinants of quality and access to services, immunization usage rates, usage of Community Checklist by caregivers and experiences of Checklist use.

Data were collected in all three project villages (Thar Yar Kone, Sone Kone and Zin Pyun) and the corresponding Rural Health Sub-Centres at both baseline and endline.

5.2 Data collection

A summary of data collection methods and participants is shown at Table 2.

The following qualitative data collection methods were used in all three project villages at both baseline and endline:

- Key Informant Interviews (KIIs) with local midwife (1 per village)
- KII with VHC members (including the Checklist Assistant), community leaders, Auxiliary Midwives (3-7 per village)
- Focus Group Discussions with fathers of children aged less than 2 years (1 per village)
- FGD with mothers of children aged less than 2 years (1-2 per village at endline only)
- In-depth Interviews (IDIs) with pregnant women and new mothers: 2-4 per village
- IDI with mothers young children (2 per village)
- KII with Township Medical Officer (Township-level, 1 only)

Quantitative data collection consisted of:

- Collection of health facility and Midwife-held immunization register data of immunization service provision and coverage (baseline and endline)
- Community survey of all pregnant women and primary caregivers of children aged 2 years or less (endline only)

All data collection tools were developed in English and then translated into Myanmar language. All tools were refined and adapted to the Myanmar context in consultation with the in-country Evaluation Team and partners, and following pre-testing with VHC members, mothers and fathers in rural villages not participating in this study.

FGDs and interviews were conducted by an experienced facilitator in Myanmar language and took between 1 hour and 1.5 hours to complete. All focus groups and interviews were recorded using digital audio recorders and key points of discussions were captured by a dedicated note-taker.

The community survey was verbally administered by trained data collectors and participants' responses entered into electronic tablets containing a REDCap[†] software version of the survey instrument. Completion of the survey took approximately 1 hour.

Table 2: Summary of data collection methods and participants

Method	Baseline				Endline			
	Number sessions per village	Total number sessions	Participants per session	Total participants	Number sessions per village	Total number sessions	Participants per session	Total participants
Qualitative								
FGD mothers of young children	-	-	-	-	1-2	5	7-10	40
FGD fathers of young children	1	3	7-8	22	1	3	7-8	23
IDI first-time pregnant women and new mothers (babies 1 month old or less)	2-4	8	1	8	3	9	1	9
IDI mothers of children aged 1 month to 2 years who have used immunization services	2	6	1	6	3-4	11	1	11
KII VHC members, community leaders, auxiliary midwifes	3-5	12	1	12	6-7	19	1	19
KII immunization providers/midwife	1	3	1	3	1-2*	4	1	4
KII Township Medical Officer	NA	1	1	1	-	-	1	1
Quantitative								
Midwife-held immunization register data (number registers)	1	3	NA	NA	1	3	NA	NA
Aggregate data on immunization service provision and coverage (number health facilities)	1	3	NA	NA	1	3	NA	NA
Community survey	-	-	-	-	32-51	133	1	133
TOTAL PARTICIPANTS			**Baseline**	52			**Endline**	173

NOTE: The midwife providing immunizations in one project village was replaced during the implementation provider. We interviewed both the previous midwife and her replacement.

[†] See https://projectredcap.org/

5.3 Data analysis

All FGDs and interviews were transcribed verbatim from audio recordings into Myanmar language before translation into English. Note-takers and facilitators checked the Myanmar and English transcripts for accuracy.

Qualitative data were analyzed thematically by two researchers to identify key themes and sub-themes and relationships between these. Transcripts were initially reviewed based on broad themes of interest, namely: barriers and enablers to immunization uptake, barriers and enablers to immunization service provision, perceived elements of quality immunization service, participation in intervention and resources required, acceptability of intervention and perceived effect of the intervention. Subsequent analysis of transcripts involved inductive data-driven coding of the text to identify and synthesise recurrent issues in the data. The software package NVivo 10[‡] was used for data management.

Transcripts were read and re-read to develop an initial coding frame. Researchers then individually coded transcripts and met regularly to review the coding frame and refine and add new codes as needed. These codes formed the final coding framework. Transcripts were then coded line by line and a summary of the data entered into the framework. The coding framework was then reviewed by all researchers to identify key themes and sub-themes and relationships between these. Quotes were recorded to illustrate key themes.

Quantitative data was compiled in Excel by the field evaluation team and reviewed by three members of the research team.

Qualitative and quantitative data have been analysed separately with integration of findings at the interpretation phase. Findings have been validated with the field research team and in-country members of the research team.

5.4 Participant and stakeholder consultations on preliminary study findings

Following preliminary analysis of qualitative and quantitative data analysis, field staff facilitated community and individual meetings in each project village to discuss preliminary findings with study participants. Field staff verbally presented key initial findings, requested participant feedback on these findings, and requested clarification on any unresolved questions that arose during analysis of endline findings. Participant feedback from these meetings with communities and local health staff did not alter researchers interpretation of study findings. Where participant feedback on initial study findings is presented in this report, this information is clearly attributed to these community consultations.

A large dissemination workshop was held in the national capital on 24th May 2017, at which preliminary results were presented and their implications discussed. This was chaired by the Director of Child Health and Development of the Ministry of Health, and included four senior national immunisation programme managers (two of whom are

[‡] See http://www.qsrinternational.com.

named investigators on this study), four other national programme staff, 14 sub-national immunisation managers, four other subnational health managers and two staff from the study township. Technical advisors from country offices of WHO and UNICEF also attended. There was extensive discussion at this workshop with many suggestions for intervention improvement. These have also been presented in Section 7.8.

5.5 Ethical considerations

The study protocol, consent forms and data collection tools were approved by the Department of Medical Research Ethics Review Committee in Myanmar and the Alfred Health Human Ethics Committee in Australia.

Permission to conduct this study was obtained from the Ministry of Health and Sports, the national Department of Public Health and the Township Medical Officer. Written voluntary informed consent was obtained from all participants. All field researchers received intensive training on research ethics, including research with young people. No personal identifying details were recorded. All documents, including consent forms, questionnaires, audio recordings and transcripts were securely stored in locked filing cabinets and/or password-protected computers accessible only to authorized members of the research team.

6. Evaluation study timeline

This study was implemented in 2016 and 2017 and spanned 19 months, including protocol and data collection tool development (1 month); ethical approval, site preparation, training of implementation and evaluation staff (2 months); baseline data collection and analysis (4 months); Community and Provider Checklist development and training (2 months); Community and Provider Checklist use (6 months); endline data collection (1 months); data analysis and reporting (1 month); consultation with key stakeholders on initial findings and dissemination (2 months). Refer to Figure 6 for detailed timeline.

Figure 6: Collaborative Community Checklist for Immunization study timeline

	Month																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Phase 1: Inception																			
Stakeholder engagement and planning	■	■	■	■															
Protocol and tools developed	■	■																	
Ethics approval in Myanmar & Australia	■	■	■	■	■														
Phase 2: Baseline data collection																			
Training of Implementation & Evaluation Teams				■		■													
Data collection							■												
Baseline data analysis							■	■	■										
Phase 3: Implementation																			
Immunization providers workshop							■												
Community workshops							■												
Checklists production and training								■	■										
Use of Checklists										■	■	■	■	■	■				
Supervision field-visits and HE sessions										■	■	■	■	■	■				
Phase 4: Endline data collection																			
Data collectors training & field testing														■					
Data collection															■				
Endline data analysis																	■		
Phase 5: Dissemination																			
Present initial findings to stakeholders																		■	
Final report distributed																			■

7. Analysis and findings

7.1 Baseline and endline participants

A total of 52 and 107 community members and immunization providers participated in qualitative data collection at baseline and endline, respectively. At endline, a total of 133 parents of children aged 2 years of less and pregnant women participated in a community survey (Table 3). Of these, 81% were mothers of children aged 2 years of less, 5% were fathers of children aged 2 years or less and 19% were pregnant women.

The majority (71%) of participants reported that the head of household worked as a farmer and a substantial proportion (29%) reported that their household had insufficient income for basic needs and were in debt. One in 13 participants (7.5%) self-reported that they could neither read nor write.

Table 3: Socio-demographic characteristics of survey participants

Socio-demographic characteristics	n(%) (n=133)
Age, mean years (SD)	30 (6.4)
Type of participant	
Mother of child less than 2 year	108 (81.2%)
Father of child less than 2 years	7 (5.3%)
Pregnant woman	18 (13.5%)
Occupation of head of household	
Farmer	95 (71.4%)
Car driver	7 (5.3%)
Work overseas	4 (3.0%)
Miner or oil worker	4 (3.0%)
Other*	23 (17.3%)
Literacy	
Illiterate	10 (7.5%)
Can read	14 (10.5%)
Can read and write	109 (82.0%)
Income	
Not enough income and in debt	38 (28.6%)
Not enough but not in debt	10 (7.5%)
Enough but cannot save	51 (38.4%)
Enough and can save	34 (25.6%)

* NOTE: Other occupations included government service, teacher mill worker, police and housewife (1-2 participants per 'other' occupation)

7.2 Feasibility of the intervention

7.2.1 Implementation fidelity

Overall, nearly all project activities were implemented as designed (refer Section 4), with five exceptions.

Firstly, low community immunization knowledge impeded community-led identification of barriers to immunization uptake and design of Community Checklist. In facilitated Community Checklist design workshops, community participants (primarily caregivers of young children and pregnant women) found it difficult to identify local barriers to immunization. To overcome this challenge we used baseline findings to facilitate discussions on factors likely to influence timely immunization and community priorities for immunization service delivery. Through this discussion community members identified some local barriers to immunization uptake (refer Section 7.7). We then used items intended for use *during* an immunization session from the WHO Checklist (middle box, Figure 2) and asked caregivers which items they thought would be most useful in a Community Checklist to assess immunization quality. In this way, participants selected and agreed on items for inclusion in the Community Checklist. Selected items were similar across all three project sites; we therefore collated Checklist items into one Community Checklist for use across the three sites.

Second, the baseline assessment demonstrated a clear need for additional direct community education on immunization to supplement the checklist intervention. This was addressed, as described below, by including in the Community Checklist national immunisation program communication materials depicting the standard schedule, and by implementation team staff providing monthly health education sessions when visiting for project monitoring.

Third, after identification of local volunteer Checklist Assistants, it became clear that they may require additional support to overcome social, cultural and educational barriers in order to collate Community Checklist results and to feedback these results to the local Midwife. To address this challenge project Implementation Team staff assisted with collating Checklist results and facilitated the feedback meetings between the Checklist Assistants, other members of the VHCs and the local Midwife in order to discuss Checklist results. Over the implementation period, responsibility for collation of Community Checklist data and facilitation of feedback meetings was gradually passed over to Checklist Assistants.

Fourth, our intention was for the collated Checklist results to be communicated back to community members by Checklist Assistants and the VHC during regular community meetings. While VHC members and some other community members did attend monthly Checklist feedback sessions, regular feedback of Checklist results to the broader community did not occur in a systematic way.

Finally, while we originally intended Community Checklist items to be represented pictorially, budget constraints and initial reports of high literacy levels in project villages (later established as inaccurate) resulted in Checklist items being represented in written form only.

7.2.2 Participation in design and use of Community Checklist

As reported above, 164 community members participated in workshops in each project village to design the Community Checklist (Figure 7). The estimated total number of children aged less than 2 years permanently residing in project villages was approximately 180 (Ministry of Health 2015 village profile figures), suggesting that most children had a parent participate in Checklist design. Mothers showed strong recall of the process and recognition of the tool at endline:

> I recognize it… I know it… At first, they hosted meetings… And then, they collect information from the mothers…. This card [Checklist] was made by the mothers... yes… I was in it too... It is used on the immunization day… We have to tick it while we were waiting half an hour after being immunized." — Mothers IDI, Site 1

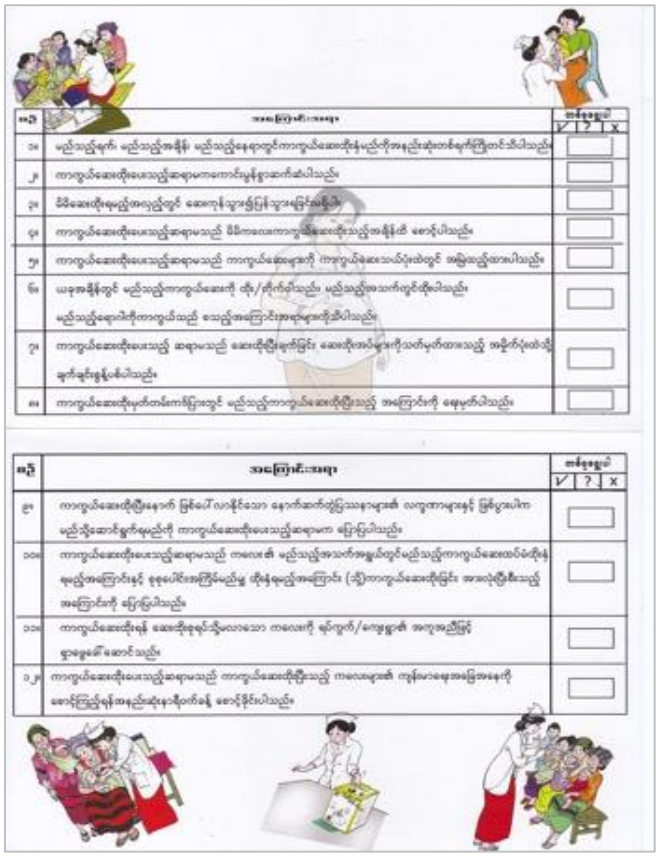
> It started when mothers, pregnant women and [the Implementation Team] gathered and discussed at the beginning. We consulted which facts were good in this card or which facts were suitable. Yes. First, it is better to know vaccination day one day in advance. It is better to know about the communication of midwife. It would be good if we knew she treated well. Those kinds of things we suggested; whether vaccines are kept in the ice-box. It was good to know. Whether they knew children were requested to wait for half an hour. If it was good to know this fact. We discussed. Then, we developed this card [Checklist] like this. — Mothers FGD, Site 2

Local midwives were invited to attend Community Checklist design workshops; due to time constraints, they were unable to do so, but midwives in each village did participate in training sessions to teach caregivers to use the Community Checklist. At endline, almost all (96%) survey participants recognized the Community Checklist (Figure 7). Most (84%) parents with a child aged 2 years or less had used the Checklist, as had the majority (12/18) of pregnant women. Reported Checklist usage (number of times Checklist used) was highest among parents of children aged approximately 8 to 11 months (Figure 8). This is consistent with a national EPI schedule of vaccinations at 2, 4, 6 and 9 months of age, as children in this age bracket are likely to have attended more immunization sessions.

The reverse of the Community Checklist displayed a new graphic developed by the national immunisation programme, presenting the standard immunisation schedule.

This addition was proposed by national immunisation managers in order to ensure that the intervention was linked to a national immunisation communications initiative that was carried out in 2016.

Figure 7: The final Community Checklist



English translation:

Item 1. Did you know one day in advance when and where the immunization would be held?

Item 2. Did you feel the immunization provider treated you respectfully?

Item 3. Did the immunization provider have enough vaccine vials for the session?

Item 4. Did the immunization provider wait for the latecomers?

Item 5. Did the immunization provider keep the vaccines in vaccine carriers all the time?

Item 6. Did you understand which vaccinations you/your child was given (that is: against what diseases)?

Item 7. Did the immunization provider discard the syringes into safety box immediately after vaccinating?

Item 8. Was the vaccination/s you received recorded on your vaccination card?

Item 9. Did the immunization provider tell you about possible side-effects of the vaccination received?

Item 10. Did the immunization provider tell you when you/your child should come back for the next vaccination?

Item 11. Did the immunization provider gather all the children to immunize through the VHC members?

Item 12. Did the immunization provider tell you/your children to wait at least 30 minutes for AEFI observation?

Figure 6: (continued) Reverse of Community Checklist

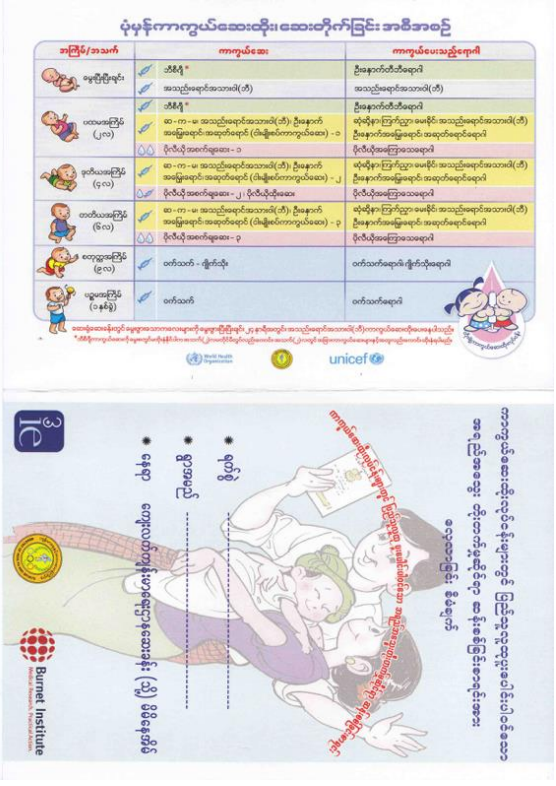
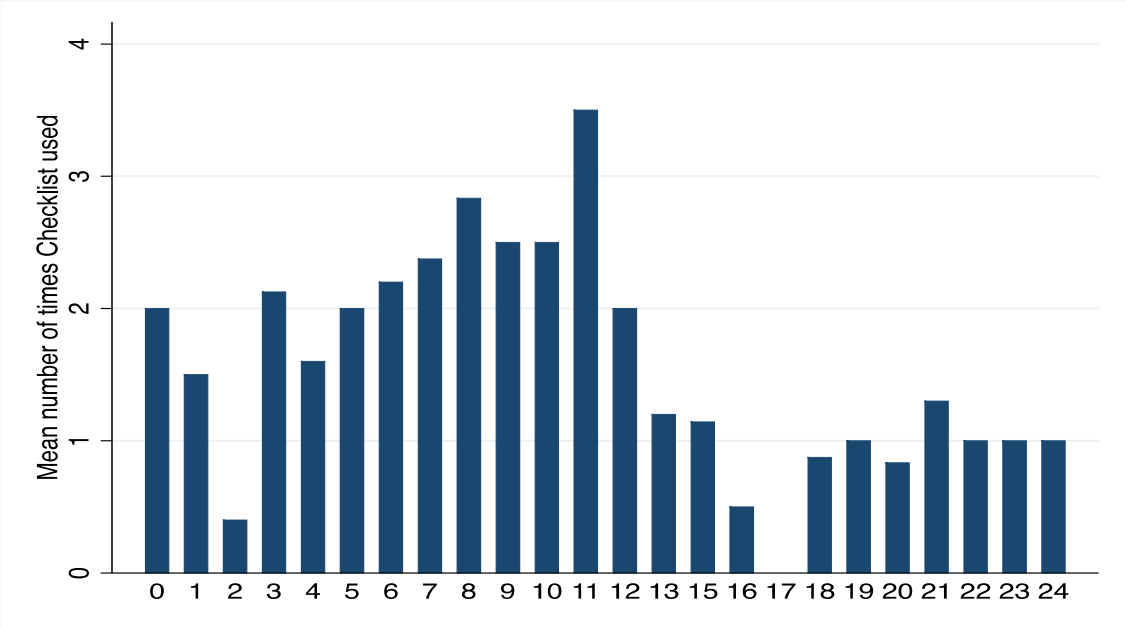


Figure 8: Mean number of times Checklist used by child's age in months



7.2.3 Participation in design and use of Provider Checklist

The initial workshop to design the Provider Checklist was also well attended; 33 health providers, comprising the Regional EPI Team Leader, three township-level health manager (including the Township Medical Officer), six RHC-level EPI supervisors, and 23 immunization providers. The three Midwives responsible for immunization services in the project villages and the Lady Health Visitor from Zin Pyun RHC attended this workshop and participated in design of the Provider Checklist.

> At the township, they [the implementation team] collected this information from us [Midwives)] and they arranged a small group discussion about barriers and what should be included in the Checklist. — Midwife KII, Site 1

All midwives in the project sites interviewed at endline reported using the Provider Checklist for planning and implementation of the monthly immunization session (Figure 9).

Figure 9: Provider Checklist in poster format in RHC

7.2.4 Resources required and ease of use

Overall, the **intervention cost** USD66,776, including field staff and supervisors in Yangon (USD38,264), project travel (USD7,068), and field office costs and equipment (USD21,444). These costs included incentives and supervision of a local volunteer Checklist Assistant in each village to support caregivers and pregnant mothers to use the checklist after receiving immunization services, and support visits to local Midwives to support Provider Checklist use. These covered a 12 month implementation period, including field set-up, implementation (Checklist development and use) and wind-down/handover period of support to community partners to continue Community Checklist activities.

Checklist Assistants and mothers participating in endline FGDs and interviews reported that **completing the checklist took approximately 15 minutes** for most caregivers. By endline, most (74%) caregivers surveyed that had used the Checklist reported that the Checklist was “easy” to complete. Nearly all others in the survey said it was “OK” to complete (Table 4). No caregivers reported that the Checklist took too much time, even when specifically invited to comment on this.

Table 4: Ease of Community Checklist use

Ease of Checklist use	n(%) (n=109)
Easy	81 (74.3%)
OK	27 (24.8%)
A little difficult	1 (0.9%)

Nearly all mothers, fathers, and VHC members participating in endline FGDs and interviews could explain very well when and how the Checklist should be used, including describing the correct use of ‘tick’, ‘cross’ and ‘question’ marks in responding to Checklist items.

In each site, a separate room was arranged for caregivers to complete the checklist. This was not requested by the implementation team but was organized spontaneously by Checklist Assistants in discussion with midwives and health volunteers.

For illiterate caregivers, the Checklist took approximately 30 minutes, including time for the Checklist Assistant to read each Checklist item aloud and time for the caregiver to complete each item privately. Mothers, fathers and Checklist Assistants consulted at endline generally thought this arrangement acceptable. However the non-pictorial nature of the Community Checklist clearly added a time burden on Checklist Assistants and is likely to have undermined the caregivers’ complete understanding of Checklist items.

> Now, during this seven months, what I see is that I need to give a lot of time to those three who cannot read. Sometimes, if I do not notice that the mothers who come out behind them haven’t filled the checklist yet, they might go back without filling the checklist and some mothers in the register might be lost. There are three people who I need to explain for a long time in our village, mothers, three of them. I have to read them sentence by sentence… it feels wrong because they are confused. I have to give them a lot of time. — Checklist Assistant KII, Site 2

> Some don't know how to fill in the checklist, a bit confusing. Some mothers are illiterate. Some mothers even don't know how to tick. They asked me to help them tick. But I cannot tick on the card for them. I can only read out the sentences. Implementer asked me to do like this. To read out loud. When they understand the sentences well, I explained how to make a tick on the separate paper. — Checklist Assistant KII, Site 3

Midwifes reported that the Provider Checklist was easy use and did not take much time.

> There is no inconvenience to use it. — Midwife KII, Site 1

7.3 Acceptability of the intervention

7.3.1 Community attitudes to assessing immunization sessions

Caregivers and Checklist Assistants reported some initial discomfort and confusion regarding the Community Checklist. This reluctance was attributed to lack of familiarity with the concept of a Checklist to monitor health service and initial beliefs that Checklist feedback would be attributed to individual caregivers.

> At first, they thought their [the mothers'] names were recorded on it [the Checklist]... That checklist was this person's and something like that…. I told them that they didn't need to mention their name on it and I explained to them that there was nothing related to their name recorded. Then they felt safe…. However, they were still worried about it in the first couple months. — Checklist Assistant KII, Site 2

> At the beginning, I heard that one or two people said that kind of thing [they felt that it was inconvenient for them to do the Checklist]. But later I didn't hear that kind of thing because I paid attention to those who said something like that. Maybe their knowledge was improved. — Checklist Assistant KII, Site 2

However, participants reported that these concerns were quickly resolved. At endline, although very few participants reported concerns regarding the quality of immunization services, some caregivers reportedly appreciated the *opportunity* to provide feedback on service provision.

> I feel satisfied when I tick that I really did know about the session prior to the date. And it is written about keeping [the vaccine] in the ice-box and I tick it as I saw it. I feel satisfied. — Pregnant Mother IDI, Site 2

> If [hypothetically] the Midwife did not treat them well, it is wrong…It cannot be said out loud if it is like that. They [immunization users] are thankful and happy because they have the opportunity to say this [sort of thing] secretly. — Auxiliary Midwife KII, Site 2

Most caregivers who had used the Checklist also reported that they felt able to provide negative feedback via the Checklist (by putting a cross in the response column next to a quality item). However, most mothers also reported that there was no need for immunization clients to provide negative feedback as all of the Checklist items had been properly implemented.

> When we read [the item] and it is right, we tick “right”. If it’s not correct, then we tick “wrong”. There is nothing wrong. All [items] are correct. The Midwife also tells us to tick according to our opinion. They told us like that. Midwives told us not to tick “right” because we’re afraid of Midwives or other people. They told us to do it according to our opinion. — Pregnant Mother IDI, Site 2

Review of Community Checklist results by the Implementation Team and Checklist Assistants confirmed that the vast majority of Checklist users provided positive feedback; of over 3,100 Checklist item responses across the three project sites, 99% of responses were positive.

Completion of some Checklist items suggests caregivers may give positive responses to items that the Midwife was unable to complete or that the caregiver was unable to observe. For example, Checklist item *‘8. Was the vaccination/s you received recorded on your vaccination card?’* received only positive responses, despite the endline finding that some caregivers do not have an immunization card. Similarly, Checklist item ‘*4. Did the immunization provider wait for the latecomers?’* also received only positive responses despite the endline finding that most caregivers did not stay until the end of the session and so are unlikely know if the Midwife waited for latecomers.

Despite accurate knowledge of when the Checklist should be used during an immunization session, most community members had an incomplete or inaccurate understanding of the process for collation of Community Checklist results for discussion with VHC members and the local Midwife. Some community members believed that Completed Checklists were given straight to the Midwifes superiors.

7.3.2 Caregiver reports of benefits of Community Checklist use

Reported benefits of Community Checklist use (see Table 5) by endline participants included:

- Learning about immunization (81%);
- Feeling that Checklist completion was helping the Midwife or immunization program (16%);
- Being able to give feedback/thinking feedback will help improve the service (11%);
- ‘Other’ benefits (5%, including feeling involved in the session, feeling more motivated to get immunized, and Checklist use encouraged Midwife to be nice to client).

Few endline survey participants reported any disadvantages of Checklist, even with encouragement. Those who did describe disadvantages reported not wanting the Midwife to know they were completing the Checklist (4% of all Checklist users), difficult to manage Checklist completion and a crying baby (1 participant). No participants indicated that they felt embarrassed completing the Checklist.

Among endline survey participants, 97% reported that they would use the Community Checklist again and 95% reported they would recommend to other parents.

Table 5: Perceived benefits of using community checklist

Perceived benefits	n(%) (n=109)
Learned about immunization generally	88 (80.7%)
Know more about immunization services	103 (94.5%)
Felt like I was helping the Midwife or the immunization program	17 (15.6%)
Liked being able to give feedback	12 (11%)
Feel more confident using services	103 (94.5%)
More satisfied with immunization services	97 (89.0%)

7.3.3 Immunization provider and health authority attitudes to Community Checklist use

All immunization providers consulted at endline were aware that caregivers were completing Community Checklists after receiving immunization services. All providers reported that they felt comfortable with community members using this Checklist. They also reported perceived benefits of the CCCI intervention (checklist plus health education sessions), particularly related to increased community knowledge and more active care-seeking for immunization (refer Section 7.4 and 7.6). However, most providers did not actively participate in promoting the Checklist.

> I just looked at it [the Community Checklist] once, but I didn't go there [the room where caregivers completed the Checklist] because I am afraid they won't tick what they think if I am there. I told them to go to Village Health Committee member [the Checklist Assistant] for ticking the Checklist. — Midwife KII, Site 1

> One villager told me that there was someone from higher level came to ask about you and then someone answered like this while someone answered like that. So I told them that they should answer honestly and that the team is a research team and they don't come here to badmouth me. Tell them truth. You don't need to tell them only good things about me. — Midwife KII, Site 3

7.3.4 Provider reports of benefits of use of the Provider Checklist

All midwives reported using the Provider Checklist. Midwives reported that using the checklist **helped them to remember** things that needed to be prepared before, during and after an immunization session (see also findings below in relation to perceived changes in service quality).

> Since it is a guide, it can point out what I have missed — Midwife KII, Site 1

In some cases the Provider Checklist played a similar role in **encouraging good practice** to that of the presence of a supervisor.

> And the habit to mark the date on the vaccine vial was quite uncommon here [before]. In situations like "mop up" [campaigns], measles campaigns, we were afraid [of making a mistake] so I marked the time of opening on the vial. … With this guideline, I do these things carefully now. — Midwife KII, Site 1

Midwifes reported that use of the Provider Checklist increased their **confidence** in providing immunization services.

> I started using it [the Provider Checklist] in September. It is convenient to use and I like it. We don't have very excellent memories, so, sometimes we can forget things if we have a family matter or business. However, this checklist can guide us not to miss out the preparation. So, it is great… I gained confidence that I do not miss anything after using the checklist. I believe myself that I am doing my job very well and safe. — Midwife KII, Site 1

> In this checklist, the contents are included for all stage like before, during and after the immunization session. So, it is perfect and there is nothing that I miss. Therefore, I am confident doing my job. — Midwife KII, Site 2

The Township Medical Officer also reported support for the Provider Checklist.

> I think that there is something changing. And it [The Provider Checklist] is a benefit for them [immunization providers] because it will remind them to do what is needed. — Township Medical Officer KII

7.4 Perceived effect on community immunization knowledge

Most (95%) endline survey participants that had used the Community Checklist reported that they knew more about immunization after the project (Table 5). Key areas of improved caregiver knowledge described in FGDs and interviews included knowledge related to:

- What vaccinations are given;
- The ages they are given and what diseases they protect against;
- Why vaccines need to be stored in the cold-chain;
- Possible AEFI and the need to observe for possible AEFI following vaccination; and
- Things that the Midwife has to do to provide a quality immunization service (particularly washing hands, storing vaccine in the ice-box and syringe disposal).

> [Previously] When the vaccine was injected, she [the Midwife] said 'this is Polio vaccine'. But, I did not keep it in my mind. I brought my child when she called. I brought immunization card when she called. Then I neglected this card when I arrived home. I did not know anything. — Mothers FGD, Site 2

> It is good that [the Implementation Staff] come. Before when they asked us to come for the vaccine injection we would just go. We didn't know what vaccine they injected. But these days we know more. We know what injection they give, which diseases it protects our children from and all that. — Mother IDI, Site 1

> Before we didn't know that there are ten kinds of diseases. We just went there because they ask us to come and get vaccinated. Now we know when our children should be vaccinated, with what and we also know how many time the pregnant women should be vaccinated. We know what vaccine we have to take, and why we take. — Mother IDI, Site 1

> Now, the Midwife and also the [Implementation Team] explains. So we understand more, know more... We didn't know anything before. We didn't know what syringes they are using. Didn't know about the ice-boxes. They ask us to wait for 30 minutes after injection to check the situation. Crying? Pain? Getting red? Papules? We got to know that they ask us to wait for these reactions. We got to know about keeping vaccines in the ice-box. This is knowledge that we didn't have before…It's like awakening from sleeping. — Mothers FGD, Site 3

Perceived improvements in community immunization knowledge are supported by qualitative analysis of baseline and endline FGD and interview data. Baseline findings identified low knowledge regarding immunization generally, including some misconceptions regarding the health benefits of vaccination, and extremely low knowledge regarding elements of an immunization service. At endline, the overwhelming majority of participants in FGDs and interviews could name vaccines in childhood and pregnancy and name a range of vaccine-preventable diseases. The majority of participants could also describe key elements of a good quality immunization service, in line with the 12 items on the Community Checklist.

During community consultations on preliminary endline findings, study participants attributed new knowledge to (in order of perceived relative importance):

- Monthly health education sessions held by implementation staff;
- Reading and responding to the 12 Community Checklist items; and
- Lastly to the immunization schedule on the back of the Community Checklist.

Caregivers and Midwives also reported that caregivers were more likely to **notice** all the things that the Midwife has to do to provide immunization services (e.g. putting vaccines in vaccine cooler, washes hands, disposing of used syringes in bin).

> In the past, we went back after immunization was given. If they give medicine, we give to the child. There is like that. When these things are added, we know to wait for half an hour, we look for Sayarma [Midwife] washing her hands, and we ticked the marks in the blank. — Mother of child aged 2 years or less IDI, Site 1)

> As for community, at the beginning, they asked me sayarma (Midwife) where I discarded the syringes. — Midwife KII, Site 3

7.5 Perceived effect on quality of immunization services

7.5.1 Improved communication between providers and community

In all villages, the CCCI intervention reportedly motivated the Midwife and VHC to provide **earlier notification and more frequent reminders** regarding forthcoming immunization sessions. Pregnant women and caregivers of children due for vaccination were notified via a list of names written on a white-board outside the Midwife's house in one site and via community loudspeaker announcements and individual home visits by VHC members in all three sites. Community members, VHC and Midwifes also reported that VHC members were more active in following up children who didn't arrive at immunization sessions on time.

> Village health committee changed a lot. Before they didn't help us at EPI days, now they get to know they should help and participate in it. — Midwife KII, Site 1

Some immunization providers and mothers participating in endline interviews and FGDs also reported that the Midwife now takes **more time to explain** to caregivers what she is doing during an immunisation session, the vaccinations being given and when the child should come for subsequent vaccinations.

> [Now] she [the Midwife] says which vaccine she would provide today… to the left thigh… right thigh like that… Then, pentavalent… after explaining everything like that... she explained to us patiently. — Mothers FGD, Site 3

During consultation meetings with endline participants to seek feedback on preliminary findings, Midwives at all three sites confirmed that the intervention had improved their communication with immunization clients, noting that they spoke more politely to immunization clients and/or that they took more time to explain things to clients. Midwives attributed this change both to the knowledge that clients would assess their behaviour in the Community Checklist and to reminders in the Provider Checklist regarding client communication.

7.5.2 Improved attention to elements of service quality

Some Midwifes reported that they find it easier to remember to do things like **handwashing** or writing vaccination details in a **client's vaccination card**. Midwives and community members participating in endline FGDs and interviews frequently reported that Midwives were more diligent in **reminding immunization clients to wait** after vaccination to observe for potential AEFIs and that clients themselves were also more likely to wait as they now understand why this is important.

> Interviewer: "Has the Midwife changed anything from in the past compared to now? For example, have their been any changes in the way the midwife talks about immunization
>
> Participant: "In the past, she [the Midwife] let us go home straight after immunization… but now, we have to wait for half an hour and have to tick [the Checklist] too." — Mother IDI, Site 1

Midwives reported making changes to the way they conducted immunization sessions in response to deployment of the checklist, including more regular hand washing, improved stock management practices and preparation for sessions.

> Since it is a guide, it can point out what I have missed. I have never encountered an AEFI, so, sometime I forgot to prepare for that case. Now, the checklist is in my hand and it is like a guideline for me that I need to prepare for it [an AEFI]… On EPI days [monthly immunizations sessions], I didn't usually mark the date; even if I had to wait for people, it would be the last time I use this vial... So, I didn't mark it. As I didn't [ever] use if more than 6 hours after vaccine preparation, I didn't mark it. With this guideline, I do these things carefully now. There are changes like these now. — Midwife KII, Site 1
>
> Before vaccination, I read the checklist. I read the things I should do before giving vaccination at first. Then, I made the checklist by myself. I washed my hands. First, I provided HE [health education]. After HE, I cleaned hands before giving

vaccination. I checked the vaccine bottles before immunization. Firstly, whether the dates are good. Then, due-list. I recorded due-list at the back of my book. I recorded every month separately. It includes date, log numbers, expired date and manufacturing company. I noted all of them down. — Midwife KII, Site 2

"For example, hand washing… previously, I just handled the vaccines thinking that I already washed my hands … now, I noticed that point … and I prepare for the immunization session the night before instead of preparing in the morning in a rush … I prepared due list and vaccine cards at night … I prepare to write down the date, checking on the due list and make preparations … and also prepare for the EPI boxes … previously, I prepared within such as short time before starting … then, checking the vaccines and diluents.. Previously, I thought we made order to RHC and just took back just as they give... Now, I brought along my stock card and checked the stocks…. I come back satisfactorily … before, sometimes we have to run back to RHC because diluents are not enough." — Midwife KII, Site 3

7.6 Perceived effect on up-take of services and care-seeking

7.6.1 More active care-seeking

Many endline participants involved in FGDs and interviews reported more active care-seeking for vaccination as a result of the CCCI intervention, in particular the monthly education sessions. In particular, community members and Midwives reported that the project encouraged **caregivers to attend immunization sessions on time** (earlier in the day) and to **r**eceive **vaccination on the due month** rather than postponing. Attending an immunization session at the allotted time of day was usually attributed to greater understanding of limited potency of vaccines once outside the cold-chain, while attending immunization sessions in the correct month was usually attributed to increased immunization knowledge and great caregiver commitment to immunization.

Sometimes in the past, I was late in some occasion. We have some thoughts that, 'other people are not yet going, so I will not go too'. But then, I changed like, 'whoever goes or not, I will go'. These are the changes… The [Implementation Staff] explained that the vaccine in the icebox at low temperature is most effective and it is not good if we are late because injecting when the vaccine is at a higher temperature is not as effective for us…I don't want such kind of situation. — Pregnant Mother IDI, Site 1

Before I had to wait for 12 noon, and also I went to their home to call them to get immunization if they (mothers) don't come to immunization session. Now, I do not need to wait them (mothers) anymore, they come earlier than the announced time and wait for me. — Midwife KII, Site 1

They (mothers) came to immunization sessions at the right time and if they can't come one time then they made sure to come next time. Sometimes, they came to me directly from their farm and they didn't even wash their legs, which were covered with mud because sayarma (midwife) told them to come… Now they came to receive immunization not because they had to but because of their changed attitude. — Midwife KII, Site 3

Caregivers also reported **actively searching** for their child's name on lists of children to be immunized at the next session and asking the Midwife if their child was due for vaccination.

> …….Their (mothers') knowledge of immunization has improved a lot. Now they can tell us about the vaccine's name and the months to receive. They know which vaccine they received and which one they have to get. They can explain it now but not in the past... Before they think the immunization is totally the responsibility of the sayarma (Midwife) and now they regard it as a whole community responsibility. All, all… parents … community…. Now they understand to achieve success in immunization, they all need to cooperate. — Midwife KII, Site 2

> Also, [now] I don't need to go to their home [to remind them to come to the immunization session]… I write immunization name list on the whiteboard and I put it in front of my house. And they (mothers) came to ask me if their children were not on the list. They came to be interested in it. They came to ask me why, if their child was the same age as the other child who was on the list, but their child's name wasn't [on the list]. — Midwife KII, Site 1

> Now, some (mothers) called me and asked me the date of immunization because I don't live in the clinic. They asked me via phone "Sayarma (midwife) when will you provide immunization and am I on the list." They became more interested." — (Midwife KII, Site 2)

7.6.2 Vaccination status at endline

Vaccination records assessed at endline suggest most children receiving timely vaccination of pentavalent vaccine (Table 7). However, data collectors did not have permission or were unable to locate vaccination records for 13% (15/115) of children aged 2 years or less, suggesting that actual coverage may be lower.[§]

Table 6: Proportion of children that have received timely pentavalent vaccine

Timely vaccination	n(%)
Penta1 (between 7 and 12 weeks of age)	83/99 (83.8%)
Penta2 (between 7 and 12 weeks after Penta1)	86/88 (97.7%)
Penta3 (between 7 and 12 weeks after Penta2)	69/78 (88.5%)

Even these optimistic data, however, demonstrate close to 20% of children are receiving the critical first dose of combination vaccine later than optimal. As noted in the protocol

[§] Of the 115 caregivers surveyed at endline, 60 had their child's immunization card with them on the day of data collection. An additional 50 caregivers gave permission for data collectors to view their child's vaccination record at the Sub-RHC, but we were only able to locate 40 records. Five parents refused permission for data collectors to view their child's record at the Sub-RHC. In total we collected data from 100 child immunization records (60 immunization cards and 40 from the Sub-RHC register).

and limitations section below, this formative evaluation was not designed to have statistical power to compare coverage before and after the intervention.

7.7 Addressing local barriers and change in community commitment

7.7.1 Use of the intervention to jointly identify and address barriers to immunization

As discussed above, the baseline findings of extremely low community immunization knowledge, passive caregiver attitudes to immunization care-seeking, and poor community understanding of what to expect in a quality immunization service made it difficult for community members to actively participate in identifying local barriers to immunization. At Community Checklist design workshops, Implementation Team staff facilitated community discussions on barriers to immunization, informed by findings from the baseline study. Key barriers identified included: late and ineffective notification of immunization sessions, long waiting times, insufficient vaccine stocks, AEFI (e.g. fever) following vaccination, transportation difficulties and long distances for some immunization clients, and lack of vaccine storage, waiting spaces and sufficient staff at the Sub-RHC.

As participants at Community Checklist design workshops were reluctant to identify their own Checklist items, we used items from the WHO Checklist to facilitate discussions on the items caregivers thought most important for immunization quality. In this way, some of the Checklist items do respond directly to identified local barriers to immunization uptake; particularly those related to notification of immunization sessions.

This formative evaluation suggests that the CCCI may have assisted collaborative action between immunization providers and community members to address at least one barrier to immunization identified by communities at Checklist design workshops, namely poor notification of immunisation events. Participants in endline FGDs and interviews described better notification of forthcoming immunization sessions by the Midwife (e.g. through posting information on community whiteboards and notifying the VHC of an immunization session earlier) and more concerted effort by VHC members and others to notify caregivers that their child is due for vaccination.

Some barriers to immunization identified in our baseline study were not identified by community members. One of the most significant of these related to families' heavy reliance on health staff to identify whether and when a pregnant woman or infant was due for vaccination. At baseline there was an over-riding sense of passivity among immunisation service clients, with few expressing either knowledge or attitude consistent with themselves actively identifying when vaccination was needed and seeking it. The evidence above suggests that the heightened community engagement through CCCI processes can make families more active participants in their or their child's immunization.

Another key barrier at baseline related to poor caregiver knowledge of the timing and number of vaccines required, limiting the ability of families and community members to actively identify and seek timely vaccination. As discussed in Sections 7.5 and 7.7, the CCCI intervention may have contributed to improved caregiver knowledge and more active care-seeking for immunization.

7.7.2 Change in community commitment to immunization

The intervention may have contributed to **greater caregiver confidence in engaging with**, and providing feedback to, the Midwife. Almost all caregivers involved in FGDs and interviews, when asked what they would do if they believed their child was due for immunization but was not on the list, reported that they would ask the Midwife why there child wasn't listed. This is in marked contract to findings from baseline data collection when most caregivers reported that they would wait for the Midwife to call their child.

> ….It has changed. Even though we gave them health education, they didn't remember it well because they wanted to go back home soon and sometimes they were thinking about their job. So, they didn't remember what we told them. We told them while we gave immunization but they didn't listen to us and just [focused on] caring for their crying child. So, we couldn't tell them much at that time. Now they can answer when I ask them, 'Sayarma [Midwife] my child needs to be injected with IPV because he/she is now 4 months and why don't I give injection'. That is a dramatic change. Before, they didn't know they should ask that kind of questions. — Midwife KII, Site 1

Some endline participants also reported **greater father support** for vaccination as a result of the intervention.

> Now the husbands are changed... Even when we went for the immunization, he was like 'Don't go…It affects the [child's] sleep.' Now, he's like… 'Go, go, go... Even if it affects the sleep, it's only one night, you can sleep after that — Mothers FGD, Site 3

> …their husbands also know now. Before, the husbands were not interested and asked why does the immunization service call you so frequently… — Midwife KII, Site 3

Overall, **increased caregiver commitment** to vaccination was commonly identified as the most significant change resulting from the intervention by mothers and fathers participating in endline FGDs.

> Participant: "…the desire to have vaccination, that, "I will go for vaccination, I must get vaccinated". … I think this decision is important."
>
> Interviewer: "Regarding the immunization services, among the changes now and before [the intervention], which one do you think is the most important?"
>
> Participant: "For me, that desire to receive vaccination on time is the biggest change. Because it is best not to be late." — Pregnant Mother IDI, Site 1

> Their [community members'] mindset changed, that they need to provide immunization to their children no matter what happens. — VHC member KII, Site 3

7.8 Participant and stakeholder suggestions for intervention improvement

7.8.1 Suggestions from study participants

Endline participants were also asked about aspects of the Community Checklist intervention that could be improved in future iterations. Caregivers and Checklist Assistants highlighted Community Checklist items that would benefit from revision (refer Table 7). These items both related to aspects of service quality that most caregivers were unable to directly observe because they left the immunizations session before all clients had been vaccinated.

If vaccine stock-out is an issue, resulting in delayed immunization, a corresponding Checklist item such as *"At the last immunization session I attended, there were enough vaccine stocks for me/my child to receive all the vaccines I needed*" may be more appropriate than one that asks caregivers to assess vaccine stocks at the current session.

Midwives participating in endline interviews also noted that some Provider Checklist Items were not relevant to service provision in a rural area such as the project villages. However, they did not wish to remove these items, as they would still be relevant to immunization providers working in larger, more urban health facilities with cold-chain storage.

> I don't want to remove some items from this [Provider] Checklist … because I think [even items not relevant to me] would be useful for others … Like here 'Send back the unopened vial to Township level', I didn't get any extra vials, so I leave it blank…. — Midwife KII, Site 1

> …. But some question like 'send back the vial to Township' and 'Put the used vial back in refrigeration', these are not in my work… For the question 'Check it again for opened vial that can be reused or not', I don't need to check it because I don't have refrigeration here and so it can't be reused. Apart from these two questions, I think the Checklist was perfect. — Midwife KII, Site 2

7.8.2 Suggestions from stakeholders in the national dissemination meeting

Following a presentation of the intervention, evaluation and key findings, there was an extensive discussion involving sub-national and national health managers, including leaders of immunisation programmes and those with broader health management responsibilities.

Many managers raised their concern that a Community Checklist should not be seen as a tool for assessing health worker performance, due to the risk of harming provider-client relationships. Some mentioned the differences in knowledge making it difficult for community members to accurately judge some service issues. Staff from the study site acknowledged this had been an initial concern, but reported that by the end of the study, their observation was that midwives viewed the intervention as supportive of their practice; that is: increased community knowledge and engagement stimulated by the checklist increased community understanding of, and support for, their work. Many in the meeting noted that this supportive approach to engagement must be a priority for future work.

This group identified the role of education sessions, and the communications graphic on the Community Checklist, as being likely mechanisms to influence community knowledge. Several managers suggested that a future focus of a Community Checklist could be to review the client's self-knowledge on items such as awareness of which vaccines were given, or when the next session is.

Many managers noted similarities between the Provider Checklist and supervision tools in use in Myanmar and suggested future harmonisation with supervisor checklists. Staff from the study site noted that they had themselves undertaken some *ad hoc* adaptation of the Provider Checklist for use in supervision.

Some managers noted that the practice of providing incentives to volunteers working as Checklist Assistants may be appropriate to a study setting but would be difficult to sustain on broader scale-up. Similar concern regarding the need for cost effectiveness analysis was raised regarding the physical cost of a paper-based community checklist.

This group also recognised study limitations (discussed below), including: as a formative evaluation coverage was not measured and there was no control group; work was in a specific location and testing in different settings may be needed; and that evaluation findings are based on interview data, with the usual potential for bias in reporting. A range of specific suggestions were made regarding details of the Community Checklist. These have been combined with those from study participants (mentioned above) and listed in Table 7.

Table 7: Community Checklist items suggested for revision

Checklist Item	Revision suggestion
Item 1. “Did you know one day in advance when and where the immunization would be held?	Stakeholders suggested revision to simplify the language used.
Item 3. “Did the immunization provider have enough vaccine vials for the session?”	Caregivers who did not receive vaccinations due to stock-out would not have a chance to complete this item. Other caregivers may have no way of knowing if there were sufficient vaccines for remaining clients. This may also be unnecessary in a Community Checklist, although it is clearly important for providers and supervisors.
Item 4. “Did the immunization provider wait for the late comers?”	Most caregivers are unable to answer this as they did not stay to the end of the session. Stakeholders also suggested the language could benefit from revision.
Items 5. “Did the immunization provider keep the vaccines in vaccine carriers all the time?”	Stakeholders suggested this may be more appropriate to a supervisor and provider checklist
Item 6. “Did you understand which vaccinations you/your child was given?”	Stakeholders suggested revision to simplify the language used.
Item 7. “Did the immunization provider discard the syringes into safety box immediately after vaccinating?”	Stakeholders suggested this may be more appropriate to a supervisor and provider checklist
Item 8. “Was the vaccination/s you recorded on your vaccination card?”	Stakeholders suggested this was more appropriate to provider or supervisor checklists. However study participants appreciated being reminded of the importance of the vaccination card.
Item 11. “Did the immunization provider gather all the children to immunize through the VHC members?”	Stakeholders suggested revision to simplify the language used.

7.9 Limitations

This study aimed to assess feasibility of implementing the CCCI intervention and acceptability of this intervention to community members and health workers. This study was not designed to evaluate the effect of the intervention on community knowledge, use and coverage of immunization services or service quality. We did, however, use qualitative methods to describe study participants perceptions regarding various effects of the intervention. Interventions such as CCCI entail relatively prolonged engagement and effort by both community members and health workers, and may contribute to friction in relationships between these stakeholders. In such interventions, *perceived* effects of the intervention are likely to influence acceptability of the intervention (particularly whether effort and risk of relationship friction is perceived as worth potential

benefits) and the feasibility of sustaining participant engagement during longer impact studies and ongoing programming. Perceived effects of the intervention are therefore an important measure for this formative evaluation, and give important information on *possible* effects of the intervention, but this study is not able to describe actual effects of the intervention on measures such as immunization knowledge, usage, coverage or service quality.

Our assessment of perceived effects of the intervention and other study measures, are also likely influenced by social desirability bias, because participants in endline focus groups and interviews will feel some social pressure to report positively on the intervention. There is also some possible social desirability bias in the caregiver completion of checklist items, as discussed in section 7, especially noting the high proportion of items ticked as having been done. However, as discussed below, this aspect of social desirability may not affect the mechanism by which the Community Checklist affects provider-client engagement.

In addition, our study sites were purposefully selected to balance need for community engagement regarding immunization (accounting for lower immunization coverage and larger populations sizes) with feasibility of conducting a formative evaluation within limited timeframes and budgets. As a result our findings are not directly generalizable to other settings in Myanmar. Diverse factors such as population density, geography, ethnicity, socioeconomic status, education levels, the checklist items that the community chooses for the Community Checklist, presence of a VHC, political factors and health service factors are likely to influence feasibility and acceptability of the intervention.

Finally, this formative evaluation was not designed to assess sustainability of the CCCI intervention. Some aspects of the intervention as implemented, particularly the use of incentives to encourage participation and the frequency of health education sessions and supervision visits by project staff, raise concerns regarding sustainability and these should be specifically addressed in future impact evaluations.

8. Implications of the formative evaluation

8.1 Review of our theory of change

8.1.1 Role of health education

Very low levels of immunization awareness at baseline necessitated the addition of monthly health education sessions, supplementing those the midwife was conducting. Many care-givers referred to these as helpful, raising the possibility that these education sessions were the key factor in improved care-seeking and attitudes, rather than the Checklists. However review of the endline survey, discussion and interview data shows many incidences where the reported changes in attitudes or behaviours were directly attributed to the mechanisms of iterative review inherent in completing the Community Checklist. Our findings demonstrate three mechanisms at play: education sessions, the educative graphic on the Community Checklist, and the action of completing the Community Checklist after each session. This last element may promote more active learning through the step-by-step process of working through a checklist. All appear to contribute to the reported changes in understanding of the immunisation service, commitment to vaccination, and in attitudes to care-seeking.

Several evidence reviews on communication for immunization note the importance of directing education at both groups (Saeterdal et al., 2014) and individuals (Kaufman et al., 2013), the latter review recommending that education be incorporated into the health encounter, as the CCCI does. Our formative data at endline suggest that the Community Checklist also acted as a home-based educational aid, a function demonstrated effective in improving coverage in other research (Oyo-Ita et al., 2012). Our design of the Community Checklist includes information on the vaccination schedule, linked to a government communications initiative by including a graphic of the schedule. In this way, the Community Checklist fulfilled a similar educational function as that intended by home-based records, important when close to half of the care-givers surveyed did not have access to their child's immunization card because it was held at the Sub-RHC. Overall, it seems likely that the CCCI mechanism of action was not only through increased accountability seen in care-givers' critiquing a session, but also through other roles as a reminder and as an individually-targeted educational tool; all of which were complemented by the enhanced group education sessions.

8.1.2 Role of collation, analysis and usage of checklist feedback

As reported in Section 7.2, there was only limited implementation of the intention that Community Checklist feedback be collated, analysed and used for structured feedback by VHCs, supported by Checklist Assistants. Monitoring information and qualitative endline data suggested this did take place to some degree, particularly later in implementation, but we did not find evidence that feedback relayed via VHCs to the Midwife played a strong role in the reported improvement in quality of care. This difficulty in promoting local analysis and usage of data is a persisting brake on immunization services on the supply-side as well (World Health Organization, 2016), and it is likely that it needs more time and sustained effort than was available in this study. Our intervention did seem to support good quality provision of services, but through more immediate and direct mechanisms. Firstly, the Provider Checklist acted as a point-of-care reminder to the Midwife (especially for communication actions); and secondly, the providers and care-givers were stimulated by the Community Checklist to give close consideration to certain aspects of the service, such as waiting for observation of AEFIs and the need to understand when the next vaccination was due.

Although there is potentially some social desirability bias, as discussed above, that meant a very high proportion of actions were ticked as completed, this would not necessarily impede this latter mechanism from operating to improve engagement; that is: there would be a sense of greater community attention to specific aspects of the service generated simply by the educative nature of iteratively checking the items on the Community Checklist, regardless of how they actually scored those items.

The Checklist Assistants and VHCs did play an important role in supporting outcomes, although the mechanism was somewhat different than in our original theory of change. Qualitative data at endline suggested that the support of the Checklist Assistant was important to enabling care-givers to understand the elements of an immunization services as they completed the Community Checklist. More importantly, the process of collection of checklists and reporting to the VHC did create a perception, among caregivers and providers, of more active and informed community interest in, and support for immunisation services. Both providers and caregivers noted the additional importance of this being seen as indirect and non-confrontational, and ensuring

anonymity; something that Checklist Assistants needed to continue to reinforce through their work.

8.1.3 Role of identification of local barriers

Our theory of change included actions by community members, VHCs and health staff to jointly identify and address local, soluble barriers to immunization service provision, through the initial community workshops and through VHC feedback on Community Checklist data. This aspect, as reported in Section 7.2 and discussed immediately above, did not transpire as intended, in large part because immunization providers and community members in our project villages face significant social, cultural and educational barriers to working collaboratively to improve the immunization service. Our implementation team's monitoring data suggests the biggest obstacle to this were the low baseline levels of community understanding of what immunization is, and what is needed for an effective service.

As reported in Section 7, the CCCI intervention did successfully identify and help overcome some barriers, such as ineffective notification of when sessions were scheduled; but this was done through our own analysis of baseline findings, reference back to the evidence-base of WHO Immunization Session Checklist, and other generic resources. The potential for CCCI to help identify local barriers to service provision was recognised by health staff and community members in endline discussions as outlined in Sections 7.4 and 7.6. The CCCI did show promise in addressing key barriers to immunization identified during baseline data collection, by increasing caregiver immunization knowledge, including knowledge of what to expect in a quality immunization service, increasing caregiver awareness of immunization provider practices, increasing demand for quality immunization services, increasing caregiver confidence in engaging with immunization providers, and improving notification of immunization events through volunteers. It is likely that joint identification of local barriers is a function takes longer than our study allowed, and perhaps needs to be preceded by an improvement in community awareness, knowledge and attitudes, before it can take place.

8.2 Implications for re-shaping the CCCI intervention

Overall, the CCCI intervention has proven to be feasible in rural Myanmar in its use of paper- based, scalable tools that are consistent with new national resource materials, and other low-cost inputs that all work within existing structures, including: Checklist Assistants, a role assigned to current health volunteers, VHCs review of the process, and monthly health education. It has also proven acceptable, with strong evidence that the checklist mechanism of reminder, review and accountability is a driver of change, and has proven acceptable to providers and caregivers, through provision of feedback that is anonymous, non-confrontational and indirect.

The formative evaluation suggests a number of important revisions to the CCCI intervention that are necessary prior to further implementation, including:

- Harmonisation of any Provider Checklist with existing supervision approaches, as highlighted in Section 7.8;

- More emphasis on **building caregiver knowledge** (including knowledge regarding completeness and timeliness of their own child's vaccination status) incorporated into the CCCI, especially early in the process, including:
    - Community Checklists should be re-shaped as Community Education Tools that include essential information in order to provide immediate educational effect in the home and during immunization sessions, and to reinforce the family's role in supporting immunization services;
    - Regular group health education using participatory methods and building on the community engagement needs identified by the National Immunization Programme;
    - Knowledge building that precedes and then explicitly leads to meaningful engagement of community members in identification of local barriers to immunization.
- Ensure Community Education Tools have **pictorial elements** to account for low literacy; noting that between 8% and 11% of caregivers in our study had insufficient functional literacy (approximately 5% more than we had anticipated).
- Ensure that Community Education Tools relate to **actions directly relevant to the caregiver** before or during the immunization session and can be meaningfully answered by the caregiver.
- Retain some form of checklist structure in Community Education Tools to promote iterative reflection but reshape items so that the **emphasis is on caregiver knowledge and the family's role in supporting immunization.** Retain items that promote good communication and good understanding of the vaccination process, but reword them so that they cannot be misinterpreted as an assessment of health staff performance; that is: with an emphasis on self-knowledge; and
- Greater emphasis on **regular, participatory community discussion of Community Checklist data** in order to identify ways that community members can further support immunization services and to foster collaborative action by community members and providers in addressing local immunization barriers.

As noted in the national dissemination meeting, addressing sustainability and affordability requires further work. The incentives offered to Checklist Assistants in this study were consistent with normal practice in Myanmar for such formative studies, however these may pose a barrier to larger scale-up. The Myanmar health system has a well-established semi-formalised engagement with a wide range of community health organizations that manage a volunteer workforce and it would be beneficial to explore future integration of checklist support with such agencies. The affordability of a paper-based Community Education Tool also needs consideration; one avenue may be to ensure it is consolidated with other national programme promotional materials and that efficiencies of media and volume are pursued.

Other formative findings relate to extensions of the CCCI process into other areas of the health system, as described below.

8.3 Implications for further research

A full impact evaluation of a modified CCCI approach to support immunization strengthening is warranted, given this demonstration of feasibility, acceptability and potential benefits in improving both community engagement and quality of care.

8.3.1 Impact evaluation questions

The primary research question for an impact evaluation would be:

- "Does the CCCI intervention effect coverage, completeness and timeliness of vaccination for children and pregnant women?"

Key outcomes of interest for impact evaluation will include:

- Timeliness (% children who received each vaccine dose within the recommended timeframe, i.e. 1 week before to 4 weeks after the recommended age on national schedule),
- Coverage (% all children who received each vaccine dose) and completeness (% children who received all vaccine doses) for key vaccines (2 doses tetanus toxoid, 1 dose BCG, 3 dose Penta, 3 dose OPV, 1 dose IPV)
- Changes in caregiver knowledge of immunization and immunization services, satisfaction with service provision, support for and commitment to immunization,

Important process measures to build into future impact evaluations include those already incorporated in this study, with some key areas of focus highlighted in our discussion in Section 8.1 above. The tools of realist inquiry and qualitative measures are likely to be helpful in distinguishing the various mechanisms at play including:

- Educational mechanisms,
- Mechanisms that improve community engagement in support for routine immunization,
- On-the-job decision support from Provider Checklists,
- Ensuring local and national resourcing is affordable and sustainable, and
- Local problem solving.

8.3.2 Extensions to other health system functions

During CCCI implementation, considerable interest was expressed by government partners regarding the potential for the Provider Checklist to be adapted for use as a supervisory tool. This seems to offer promise, particularly if this extension can accommodate educational functions as well as accountability and perhaps employs smart technologies to support this. The findings of this formative evaluation suggest that the greatest effect would be obtained if strengthened supervision is supportive, promotes on-the-job training, and is synchronised with interventions such as the CCCI that promote community engagement.

9. Major challenges and lessons learnt

A number of challenges were encountered during this formative work and the most important have been incorporated into the discussions in the sections above. In particular the sub-section on Implementation Fidelity in Section 7.2 describes the adjustments that were needed in response to major challenges. In summary, the challenges met were in four categories, outlined below.

Context challenges:

- **Low community immunization knowledge and understanding of immunization quality** made community-led identification of barriers to immunization uptake and design of community checklist difficult. This was met, as described above by making good use of baseline findings and reference to the WHO Checklist and other resources.
- In particular, we referred to the items in the 'During an Immunization Session' section of the WHO Checklist and asked caregivers which items they thought would be most useful in a Community Checklist to assess immunization quality.

Tools and processes:

- High levels of **caregiver illiteracy** also made it difficult for some caregivers to complete the Community Checklist; noting 7.5% of caregivers surveyed at endline could neither read nor write.
- While our original plan was to have a fully pictorial Community Checklist, time and resources made this impossible to achieve.
- We were able to ensure Checklist Assistants gave extra time to help illiterate caregivers in completing the checklist, although (as noted above) further development of the CCCI intervention including changes to the format of community workshops and modification of the community checklist for low-literacy caregivers could boost timeliness and other outcomes.

Timing challenges:

- The project experienced mild to moderate delays in implementation at various times due to:
  - Timing of ethical review procedures in Myanmar and Australia
  - Weather events, including monsoonal floods, disrupting travel
  - Myanmar's implementation of new government arrangements
- These were all included in planning, however the exact effect on schedules could not always be anticipated. It is noted that the project has now been completed within agreed extended deadlines.

Measurement challenges:

- At endline, more than expected caregivers **did not have their child's immunization card**, due to cards often being retained by staff at the Sub-RHC. This presented a challenge for collecting data on vaccination timeliness. Use of a combination of Midwife immunization registers and caregivers' immunization cards were sufficient for the purpose of this formative study, but these approaches to data collection proved insufficient to reliably measure vaccine timeliness, completeness and coverage and therefore should be amended for any future impact evaluations.
- Lack of **accurate population figures** and **population mobility** resulted in participant numbers that were lower than expected in community survey at endline. This was not felt to significantly affect our findings on feasibility and acceptability because we still did manage to interview some caregivers that were less frequent users of immunization services. This would however be an important consideration in a larger impact evaluation.

10. Conclusion

Checklists work when they represent an evidence-based distillation of what is most important in a good quality service and this seemed to be what made the Provider Checklist beneficial. The CCCI theory draws on this, leveraging the strength of the WHO Immunization Session Checklist and Myanmar's national technical guidance. There was less evidence that the mechanisms of community accountability produced the gains in care-seeking seen in the CCCI intervention; rather these were likely to be driven by the regular health education sessions coupled with the engagement stimulated by community workshops convened to discuss and develop ideas for a Community Checklist. Where the Community Checklist did show value was in its action to help caregivers reflect after each session: on what it takes to provide a good service, on the need to wait for an observation period, and the importance of knowing when the next vaccination was due. This value was enhanced by the inclusion of the National Immunization Programme educational graphic on the vaccination schedule. This conclusion lead to the recommendation to reshape the community-directed element to a Community Education Tool that aims to improve caregiver knowledge and the family and community role in working for access to vaccination services for their children.

Recent work on a taxonomy of immunization communication interventions (Kaufman et al., 2017) notes seven distinct communication purpose categories: "'Inform or Educate'; 'Remind or Recall'; 'Enhance Community Ownership'; 'Teach Skills'; 'Provide Support'; 'Facilitate Decision Making' and 'Enable Communication'" and it is noteworthy that the CCCI intervention has been shown to touch on many of these.

The evaluation suggests that is it feasible and acceptable in rural Myanmar to deploy a synchronised set of actions comprising:

- Provider Checklist for on-the-job quality support;
- Collaboratively designed Community Education Tool that integrated education with engagement; and
- Health volunteers (that is: those who were titled "Checklist Assistant" in the CCCI intervention) expanding immunization support activities, providing regular support to clients before and after vaccination sessions.

Our formative evaluation data suggest that the CCCI intervention has potential to promote community engagement, and encourage some quality improvements. What is not yet demonstrated is the effectiveness of the CCCI intervention in promoting local problem-solving to overcoming barriers to good quality services; although the CCCI has shown potential to support this.

Perhaps most importantly, there was a major increase in community commitment to immunization reported by providers and caregivers at baseline. Our findings suggest that the CCCI intervention may in some cases have contributed to more equitable and collaborative relationships between immunization clients and providers, which could be leveraged in future project phases to collaboratively identify and address barriers to immunization uptake.

Before they thought that immunization was totally the responsibility of the sayarma (Midwife) and now they regard it as a whole of community responsibility. All all… parents… community… now they understand that to achieve success in immunization, they all need to cooperate. — Midwife KII, Site 2

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