Promoting safe and equitable CFM in rural Solomon Islands research project

RESEARCH REPORT

A pilot study of behaviour-change activities for increased safe transport and disposal of children's faeces in rural villages in Solomon Islands

SEPTEMBER 2022

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Support This project was supported by the Australian Government Water for Women Fund and implemented by the International WaterCentre at Griffith University, Australia from 2019 to 2022. Water for Women is the Australian Government's flagship WASH program and is being delivered as part of Australia's aid program.

Acknowledgements The research team would like to thank the research communities for welcoming us into their villages, the participants for their time and keen interest in the project, and the village research assistants for their help during data collection. Special thanks to Pauline Soaki for her Gender Equity, Disability and Social Inclusion (GEDSI) expertise, Angellah Anisi from Plan International, Kylie Tovosia and Brendon Teava from Live & Learn Environmental Education Solomon Islands, Bala Gopalan and Nipa Desai from Upward Spiral, Edith Kamundi and Mohammad Kadir from Griffith University for their valuable time, insights, and contributions during the BCD process, and for providing logistical support during data collection.

Suggested citation Sanderson, R.P., Biran, A., Lopez, L., Bugoro, H., Lifoia, C., Funubo, S., Keboy, J., Maneniaru, D., Shrestha, S., Lui, G., Blamoli, L., Oku, G., Gegeo, D., and Souter, R.T. (2022). A pilot study of behaviour-change activities for increased safe transport and disposal of children's faeces in rural villages in Solomon Islands. International WaterCentre / Griffith University: Brisbane, Australia

Version history V2, September 2022

Cover image Father and child, Guadalcanal Province. Credit: C. Lifoia, Solomon Islands National University

Full research title Promoting Safe Child Faeces Management: Behaviour change interventions that leverage local ways-of-knowing and address inequitable WASH gender norms in Solomon Islands.

CONTENTS

ACRONYMS AND ABBREVIATIONS

AR	Associate researcher
CFM	Child faeces management
CLTS	Community-led Total Sanitation
CSO	Civil society organisations
FGD	Focus group discussion
HH	Household
JICA	Japan International Cooperation Agency
JMP	Joint Monitoring Programme for Water Supply and Sanitation
KII	Key informant interview
LLEE	Live & Learn Environmental Education
MHMS	Ministry of Health and Medical Services
NGO	Non-governmental organisation
NOD	No open defecation
RWASH	Rural Water, Sanitation and Hygiene (of the MHMS of Solomon Islands)
SIG	Solomon Islands Government
SINU	Solomon Islands National University
OD	Open defecation
VRA	Village research assistant
WASH	Water, sanitation and hygiene
WHO	World Health Organisation
WSP	Water and Sanitation Program

1. INTRODUCTION

1.1. CHILD FAECES MANAGEMENT IN SOLOMON ISLANDS

The lack of safe infant and child (under 5 years old) faeces management (CFM) is a critical issue in Solomon Islands, as it is in many countries (WSP, 2015). Unsafe CFM, or the failure to separate and contain the faeces of young children, causes significant health risks to Solomon Islanders because of a confluence of situational factors. These include overall inadequate water, sanitation and hygiene (WASH), including low rates of access to safe sanitation facilities, varying knowledge and beliefs around the safety of the faeces of children, and the higher potential for transmission of pathogens from faeces to children because of their playing behaviours in their environment, which brings them in contact with contaminated surfaces and objects.

A complicating factor for improving child faeces management is that it is likely that women and older children, usually siblings, have primary responsibility for childcare activities. As such, an improvement in CFM practices could further increase the burden of work and responsibility on women and children. However, challenging entrenched gender norms is a long and slow process and, in some contexts, can create a risk to women and children of harmful male backlash if not done safely. Severe backlash – rejection by men that the responsibility for safe CFM should be shared with them and which results in abuse could be exhibited by some men, who may reject modernisation of gender roles and associated changes in the dynamics of interpersonal power.

Recent advances globally in designing behaviour change intentions for sanitation and hygiene have replaced or complemented educational approaches with a systematic consideration of technological, psychosocial and contextual determinants. But the lack of consideration of epistemologies, or local-ways-of-knowing, and the missed opportunity to disrupt gender inequitable CFM roles through CFM interventions, has been criticised (Cavill et al., 2018; Zakiya, 2014).

The Solomon Islands Government (SIG) is committed to improving sanitation across all rural areas and implementing demand-based approaches, particularly Community-Led Total Sanitation (CLTS). At present, the Solomon Islands CLTS approach does not explicitly address CFM, and there is an opportunity to incorporate a CFM component or implement a subsequent intervention that complements CLTS to address CFM explicitly.

The safety of CFM is particularly relevant in the Solomon Islands because:

- Diarrhoea is a leading cause of childhood mortality, causing ~25% of childhood deaths,
- Child malnutrition and stunting affects 33% of children, and
- 80% of the population live in rural areas, where there is 80% open-defecation, and only 16% have a handwashing facility with soap (Government of Solomon Islands, 2015)

The National Sanitation Plan (Government of Solomon Islands, 2017a) and community engagement guidelines outline the approach to improve sanitation and hygiene. However, they do not currently address CFM despite young children comprising 15% of the population (Government of Solomon Islands, 2009). There are no locally relevant communication materials for CFM.

1.2. DEFINING "SAFE CHILD FAECES MANAGEMENT"

There are multiple definitions of what constitutes safe child faeces management, with some definitions focusing on the end disposal site of the faeces and others focusing on the whole process of managing faeces, including cleaning and handwashing. Safe CFM is intended to reduce the transmission of faecal pathogens and while it is recognized that to do so, requires consideration of a range of risk exposures (Government of Solomon Islands, 2015, 2017a) end disposal can be a key point of transmission. This research adopted the World Health Organization (WHO) definition for safe CFM, which recognises disposal in a latrine or toilet as the only safe disposal method in the absence of formal solid waste management systems (WHO/UNICEF, 2018).

2. RESEARCH PURPOSE AND APPROACH

2.1. RESEARCH OBJECTIVES

This research aimed to answer the question: how can an intervention based on psycho-social, technological and epistemological determinants improve safe IFM by Solomon Islanders and change inequitable CFM gender norms? This overarching research question was supported by five sub questions:

(i) How do locals create knowledge relating to new ideas about WASH and gender?
(ii) Which psycho-social drivers can be leveraged to improve CFM?
(iii) What infrastructure/objects facilitate safe CFM?
(iv) How can men be involved to improve inequitable CFM gender norms, in a do-no-harm way?
(v) Will an intervention based on these insights improve CFM?

The research was conducted in two phases. Phase 1 comprised formative research in five villages across two provinces. The methods and approach to this formative research are reported elsewhere (Sanderson et al., 2021).

The formative research sought to understand the motivations and social norms influencing the CFM behaviours reported in rural communities. Findings from this phase included identification of some safe CFM practices by some caregivers, though a large proportion demonstrated unsafe management options. Within the study communities, most children younger than five years who were mobile (walking) were likely to defecate outside on the ground or in the latrine. Strong domestic gender norms within households were registered, and many perceived child faeces management as primarily the responsibility of women, though it was widely held that male participation in CFM could be praiseworthy. Further, the predominant motivations identified by both mothers and fathers in practicing safe CFM were related to nurture for their children and disgust at the sight and smell of other's faeces.

Using the findings of the formative research, in Phase 2 the researchers followed a Behaviour-Centred Design (BCD) process (Aunger & Curtis, 2016) to conceive and execute a series of behaviour change activities to promote safe and equitable CFM in rural Solomon Islands. The BCD process is described in the following section. The intervention activities were piloted in rural villages and evaluated using a controlled before and after study, described in Section 6. Monitoring and evaluation of the effects of the intervention activities on program outcomes was conducted using time-series monitoring with household surveys and key informant interviews.

2.2. INTEGRATION INTO CLTS AND OTHER SANITATION PROGRAMMING

The Solomon Islands Rural Sanitation Policy was designed to address the broader sanitation situation in the country, and is based on sanitation promotion through Community Led Total Sanitation (CLTS) (Government of Solomon Islands, 2017b). This participatory approach has been described in detail elsewhere (Kar & Chambers, 2008; Venkataramanan, Crocker, Karon, & Bartram, 2018). It uses community visits by facilitators to raise awareness of the need for sanitation ('triggering') and, post-triggering, to support communities working towards declaration of 'open defecation-free' status (known in SI as 'No Open Defecation' (NOD)). Experience elsewhere has been that improvements to household sanitation have a minimal effect on CFM practice (e.g., Freeman et al., 2016) and it has been argued that efforts are required to actively integrate promotion of safe CFM within sanitation programmes (Sahiledengle, 2019)

Given the widespread use of CLTS in Solomon Islands, all activities designed under this CFM intervention are intended to fit within the CLTS framework and combine the CLTS approach with the outcomes from the formative research regarding motivations and social norms. All villages participating in this pilot are engaged in a broader CLTS program implemented by a locally led Civil Society Organisations (CSO).

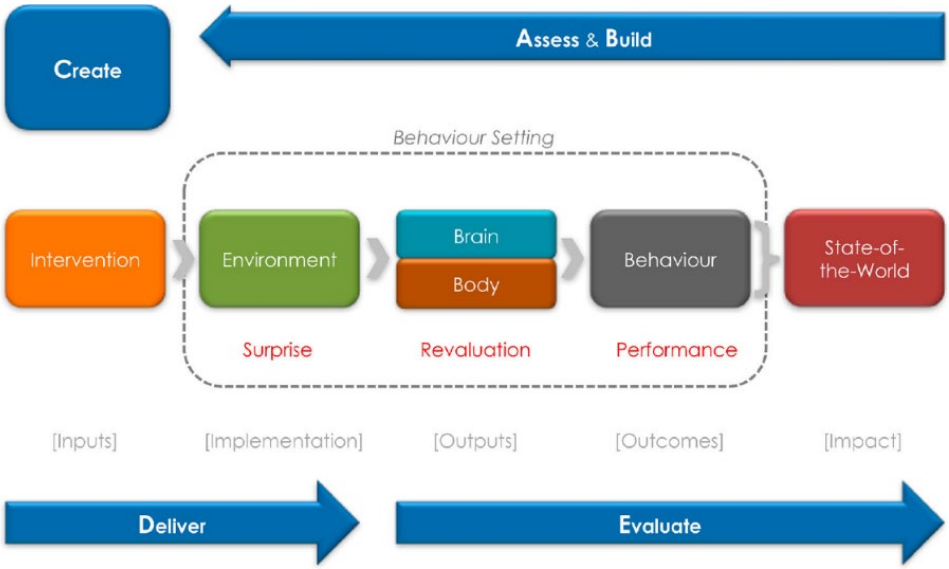
3. BEHAVIOUR-CENTRED DESIGN PROCESS

3.1. THEORY

In the Behaviour-Centred Design approach (Aunger & Curtis, 2016), the concept of the behaviour's 'setting' is explored further, in that each behaviour occurs in a different setting with a prescribed set of behaviours for those participating. Everyone entering that space is expected to adhere to these behaviours. The setting includes the *objectives, routines, roles, stage, infrastructure, props, competencies,* and *norms* (Curtis et al., 2019).

Influencing the behaviour setting includes the elements of *surprise*, *revaluation,* and *performance* whose interactions, as described in the Evo-Eco model above, leads to the desired behaviour change (Figure 1). In this way, the behaviour change challenge is that *"perception must be linked to action through reward in specific settings"* (Aunger & Curtis, 2016).

FIGURE 1: THE BEHAVIOUR-CENTRED DESIGN APPROACH AUNGER AND CURTIS (2016 AND)



An important part of this framework is to understand that within the brain, there are three main drivers behind people performing particular behaviours: reactive behaviours, motivated behaviours and planned behaviours (Aunger and Curtis, 2016). New WASH behaviours, such as safe CFM, are not reactive – they do not occur instantly and without consciously thinking about them, though with time and lots of repetition, they may become habits. Planned behaviours can be influenced by encouraging people to evaluate the medium and long-term benefits of adopting a new behaviour, but planned behaviours appear to be limited to very particular and unusual types of situations – and haven't been particularly useful in influencing WASH behaviours. Motivated behaviours are those that are performed in response to psychological mechanisms – or motives. Motives influence behaviour towards those that provide benefits that help people to achieve survive and reproduce – which is the evolutionary goal of humans. Aunger and Curtis (2016) identified 15 motives underpinning most motivated human behaviours:

- Fear, Disgust, Hunger, Lust and Comfort (which are the most primitive of motives, and common to all animals)
- Affiliation, Nurture, Attraction, Love and Play (common to all mammals)
- Status (common to primates)
- Justice (common only to humans)

The formative research confirmed that nurture and affiliation were two strong motives influencing safe CFM amongst those who do practice it. These motives formed the basis of the CFM intervention piloted here.

3.2. INTERVENTION DESIGN APPROACH

3.2.1. Aim

The aim of the intervention was to create behaviour change communication activities to promote safe disposal of child faeces and increase active male involvement in managing their children's faeces.

3.2.2. Current practice

Young, ambulatory children usually defecate on the ground close to their house, while infants defecate inside on a cloth or on the ground (inside and outside). Faeces are picked up using leaves, cardboard, old cloth or a spade. Some children actively use a latrine, and some carers/parents dispose of children's faeces in a latrine following open defecation by the child (safe CFM). However, faeces are also thrown in garbage heaps, into the bush or gardens surrounding the compound, or into a water course or the sea, if close by. If a house is close to the sea or a watercourse, the child may be taken there to defecate directly into the water. If a child defecates in clothing, the faeces may be disposed of with the laundry water after washing the clothes.

Cleaning up and disposing of children's faeces is regarded as a part of childcare and is generally performed by women, usually by the children's mothers. Some fathers participate in CFM, but generally only when their wives are away or are clearly occupied with another work activity. However, some parents (both fathers and mothers) suggested that a man who is involved in CFM is a supportive and good husband and father.

3.2.3. Desired practice

It is recognised that safe CFM has multiple components and requires a sequence of behaviours including: all faeces being disposed of in a functioning latrine, cleaning or disposing of materials or utensils used for transporting faeces, washing the child, and washing the child and carers hands following defecation and cleaning. However, given the challenges of addressing multiple behaviours in a communication campaign with limited resources, and in view of the CLTS context with its focus on increasing latrine coverage, it was proposed that the intervention focus mainly on the final disposal practice.

The behavioural objectives were:

1. All faeces to be disposed of in a latrine. For example, when children do not directly defecate into a latrine, parents/carers would specifically move the faeces from the ground to the latrine. Another example is that young children might be encouraged to use a latrine directly.
2. There is more practice of safe child faeces management by fathers (more fathers, more often).

3.2.4. Target audiences

Primary and secondary target audiences were identified for the intervention activities (Table 1). Primary audiences would be directly targeted, while secondary audiences would be consulted and monitored for spill over effects.

TABLE 1: TARGET AUDIENCES FOR THE CFM BEHAVIOUR CHANGE INTERVENTION

Target			Objectives	Communication Channels
Primary	**Parents** and carers of young (mobile) children	Mothers Tended to be aged 20-34, though some older. Education levels tend to be partial completion of secondary school (Grades 9-11). Many mothers are involved in gardening and marketing of fresh produce such as vegetables and fish.	Always use the latrine when disposing of children's faeces Increase fathers' active involvement in CFM	• Community meetings • Mothers group meetings (incl. church groups) • Health clinics/nurses • Discussions at village shared infrastructure (like tapstands) • Grandmothers/other mothers
		Fathers Tended to be older on average than mothers, 25-45, with similar levels of education (partial completion of secondary school). A mix of income but fishing and gardening common.		• Community meetings • Health workers/nurses • Local meeting points • Chiefs/role models
Secondary	**Village leadership** (Chief, Chairperson, Church) Almost all adult villages attend church. Chief is main leader, while chairperson is usually elected and a more administrative role		Discourage unsafe CFM in common areas Encourage, endorse and potentially role-model the active involvement of fathers in safe CFM	• Community meetings • Individual meetings • Official letters • Signboards

3.2.5. Behaviour-change levers identified

Based on the outcomes of the formative research, there appeared to be widespread awareness of germ theory and disgust related to the potential role of flies in infection transmission from faeces in the environment. It was determined that should be restated and reinforced as a starting point or foundation, but communication needs to go beyond this type of messaging to generate surprise and bring about revaluation of the behaviour.

Nurture (care for their child) emerged as the motive most strongly and plausibly associated with timely and safe CFM, particularly when carers can extend their awareness of care to a future event where their child may interact with uncontained faeces in the environment. Nurture was additionally identified as an important motive that contributed to fathers' involvement in CFM.

Some features of the domestic environment (or setting) where CFM takes place may discourage safe practice. These include inconveniently positioned latrines, latrines that are unsuitable for young children to use, lack of stored water at the latrine for flushing, lack of dedicated, convenient tools or materials for transporting faeces. Changes to the setting may therefore play a role in making the desired practice more likely.

Men who engage in child faeces disposal may be seen as higher status, educated, enlightened and hardworking. However, a man who picks up children's faeces while his wife is present and apparently able to do so, may also be seen as weak and his wife as lazy or incompetent and this may be socially sanctioned through laughter, negative gossip, and loss of status.

3.2.6. Communication channels and touchpoints - within CLTS programs

As per the research approach, all intervention activities were designed to be adoptable into a CLTS program. CLTS facilitators visit communities several times, sometimes over consecutive days, to promote sanitation and latrine construction. Usually, there are one or two days of "triggering" and village activities, followed by facilitator visits fortnightly or monthly to monitor the community's progress. Facilitators would have the opportunity and motivation to include messages on CFM. CLTS involves civil society organisations and village leadership to identify community champions to be a focal point for village activities.

Communities in rural Solomon Islands tend to be small, have different levels of social cohesion, and have a mix of local leadership arrangements, in the Chief/Elders, the Chairperson and the Church. Community leadership must be engaged with at the initial stages of any activities. Almost all adults attend church regularly, and almost all households will attend community meetings when convened. Village committees, when active, tend to be strong touch points for communities (church committee, water committee, general village committee). Such committees tend to disseminate messages to individual households and host meetings on specific topics.

Based on the formative research findings, rural health workers are trusted people for both mothers and fathers, with respect to information and advice about their children. Health workers tend to in rural clinics and generally villagers interact with them when they visit the clinic. However, occasionally a health program will be run by nurses in a community.

Village residents tend to have access to radio, and many Solomon Islanders have mobile phones, but reception and internet connection are variable. Villages often have signboards that display community messages.

3.2.7. Communication parameters

The following parameters were adopted for the design process:

- Needs to be surprising and not primarily a health education communication. Can convey some health education messages with friendly authority to legitimise the intervention, particularly for men.
- Needs to make use of nurture as a motive for prompt and safe CFM by fathers and mothers.
- Could make use of disgust, particularly with respect to unsafe CFM in public places where contamination may impact others.
- Could make use of affiliation and status with respect to pulling together as a whole community, impacting your neighbours, and not leaving faeces around for other people to encounter.
- Needs to be in an accessible format. Visual communication is favoured over written communication in Solomon Islands, particularly in areas where education levels vary (e.g., Figure 2). Solomon Islands Pijin should be used for any key written messages and/or for verbal communication.
- Need to have reminders in appropriate places to encourage follow-up. Could be objects or people (for reminding).

Figure 2: Community signboard in rural location (l), community discussions using visual and oral means (r)

3.2.8. Constraints

The following constraints to the design process were identified:

1. Over the long-term, the activities are intended to be implemented by a third-party Civil Society Organisation or Government, not IWC/SINU. Thus, any intervention will be ideally developed with input from implementing CSOs (e.g., Plan International, Live and Learn Environmental Education (LLEE), Caritas, Red Cross etc) and sensitised through their facilitators.

2. The intervention will be integrated within the CLTS program, as well as potentially broader programs by CSOs. For example, Plan International have a series of programming that includes community needs assessments, gender components, CLTS and Drinking Water Safety and Security Planning (DWSSP) over several months. Thus, this intervention will not be stand-alone, which is a constraint (may only have space for 4-5 activities, need to think about when and how they integrate with the broader program) and an opportunity (can assume some previous knowledge and interaction with concepts such as handwashing, gender norms, and sanitation in general).
3. CLTS implementing agencies tend to be resource and time constrained, so large outlays on supporting materials and resources may not be feasible. However, there is likely capacity for the provisioning of some resources as required (i.e., laminated posters, paints, paper, pens, projectors, screens, etc etc.). For all potential intervention activities, the required resources should be made clear, and these will be pre-tested with implementing agencies.
4. CLTS programs tend to run over a 6-month period from start to finish, though this can be longer or shorter depending on the community. CSOs typically make fortnightly or monthly follow-up visits over that period.
5. While Pijin is considered the national language of Solomon Islands and is widely spoken in rural areas, there are more than 70 indigenous languages throughout the country, and this combined with lower rates of higher education can impact the capacity of people to read and understand written messages.

3.2.9. Activity development process

The behaviour change activities were developed using an inclusive team process that sought input from across the international research team, as well as external advisors and stakeholders with expertise in GEDSI, CLTS, sanitation marketing, creative ideation, and Solomon Islands culture. Further, the development of one of the tools, the motivational video, was completed with input from community members themselves from a community that participated in the formative research. Their recorded responses were not scripted but were edited to produce the final produce.

The activity development process comprised the following steps:

1. Preparation of a creative brief, identifying the target audience, the current behaviour, the desired behaviour, communication channels and constraints (reported above).
2. Creative brainstorming, where the project team across different institutions undertook facilitated brainstorming sessions for activities that met with the requirements of the brief. An example of the discussion process is included in Figure 2.
3. Prioritisation of the activities to select activities that were highly ranked, actionable and appropriate.
4. Execution phase – video storyboarding, gathering of video footage, drafting of role-play scenarios, editing, preparation and gathering of resources.
5. Harmonisation of activities – once reviewed, the final activities were
6. Pretesting of resources – resources such as the video and workshop approach were shared with external stakeholders in particular CLTS implementers as part of the Solomon Islands Sanitation Technical Working Group for feedback and discussion.
7. Revision of tools and resources
8. Pilot within communities, including M&E activities.
9. Refinement of activities and toolkit.

The final list of activities and approach is described in relation to the Behaviour-Centred Design components in Table 2.

FIGURE 3: EXAMPLE OF CREATIVE BRAINSTORMING DISCUSSIONS

TABLE 2: INTERVENTION COMPONENTS, AS PER BCD FRAMEWORK (AUNGER & CURTIS, 2016)

Facet	Feature	BCD component	Intervention activities
Touchpoints	Time/ place	Environment	1. Session A - Group meeting / workshop of parents during a CLTS post-triggering monitoring visit. Held in a community meeting place. 2. Session B - Follow-up visit to parents' homes, to reinforce learning in the environment in which the behaviour occurs.
Activity	Situation or context	Behaviour setting	Session A 1. Drawing activity – parents to draw or describe their families 2. Motivational video. Screen video using projector. Video follows a small introduction to the session but does not give out specific messages. Following video, discussion to draw out what people got from the video. 3. Role-playing scenarios used to act out different child defecation events. 4. Discussion to follow to create a facilitated household plan and "pledge" to arrange all the necessary setting modifications to accommodate their safe CFM plan. Session B 1. Follow-up visit to parents' homes to reinforce individual accountability and discuss barriers.
Channel	Information transmission modality	Body	Video – visual and aural Role-playing with props – tactile Home visit – one-on-one discussion and communication
Behaviour change technique	Psychological mechanism	Brain	Promoting linkage between nurturing your child and putting faeces into latrine. Draw on family connectivity and community affiliation Some disgust elicitors

4. THEORY OF CHANGE

A theory of change was developed for the research project and intervention approach. It represents the broader intervention, and not just the piloted activities. The program outcomes were defined to test psycho-social changes as well as changes in the target behaviour.

5. BEHAVIOUR CHANGE ACTIVITIES PILOT – CONTROLLED BEFORE AND AFTER PILOT

Following the design of the CFM behaviour change activities in Phase 2, the research team wanted to pilot the activities and evaluation their success against the desired outcomes. This pilot, and its outcomes, are reported in the following sections.

5.1. STUDY SETTING AND POPULATION

The pilot study was conducted in Guadalcanal province, in the Solomon Islands. Twelve villages were selected from within the implementation schedule of Plan International and Live and Learn Environmental Education (LLEE) – the CLTS implementing CSOs in Guadalcanal province. The research team consulted the Solomon Islands Ministry of Health and Medical Service's Rural Water, Sanitation and Hygiene (RWASH) Unit's database of communities that have participated in CLTS to guide the selection of provinces and villages.

- Enrolled on the CLTS list for a CSO (Plan/LLEE) in the Solomon Islands RWASH database
- Within predefined project province/s and CLTS region (i.e., Guadalcanal)
- Village population greater than 15 households
- Preference villages with 10 or more households with children less than five years
- Villages must be accessible to the M&E team
- Has been "triggered" under the CLTS program (i.e., community has been engaged with and participated in the first set of sessions to encourage latrine construction) and is either:
    - Declared NOD or
    - Participating in post-triggering follow-up visits (i.e., triggering occurred greater than two months prior)

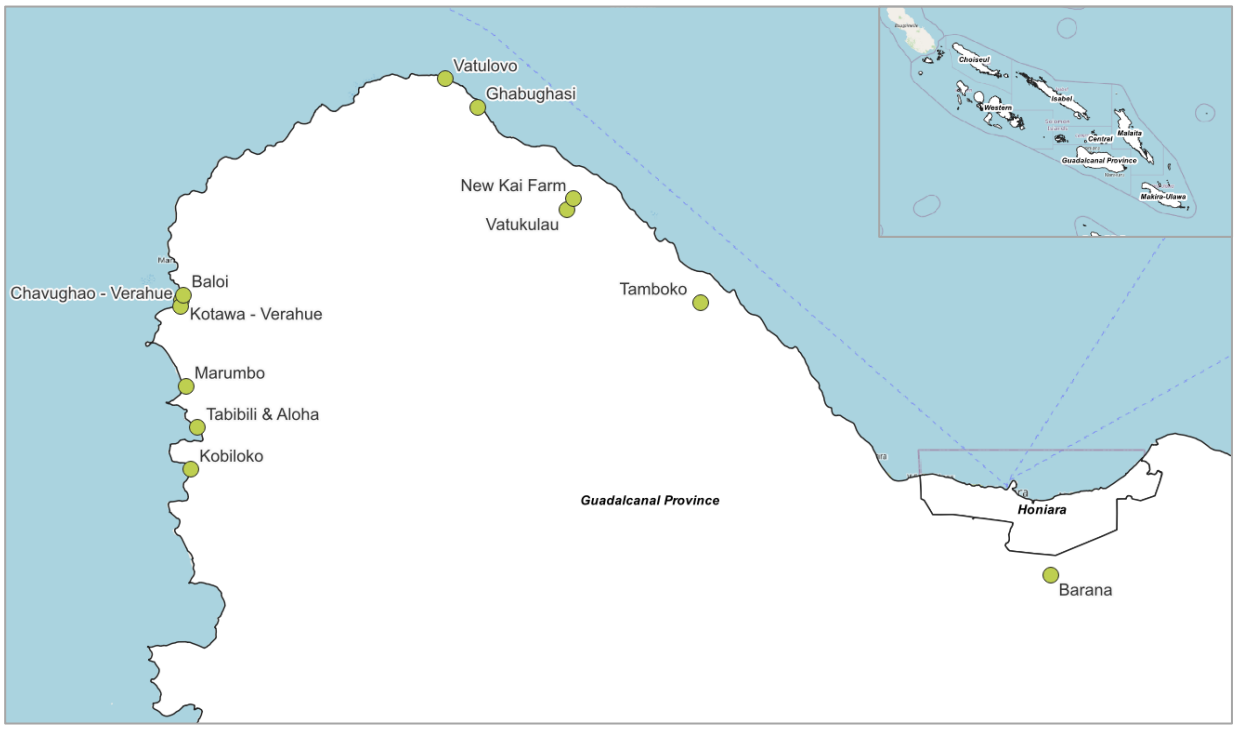
Twelve villages across north-west Guadalcanal were enrolled in the study, as show in Table 3 and Figure 4. The village populations varied between 16 and 67 households, according to the data sources reviewed (SIG, 2020). In each village, all households with children under five years old were identified by the village chief or a village research assistant (VRA) engaged for the project. The households were invited to participate, and only respondents older than 18 years were enrolled in data collection activities.

TABLE 3: VILLAGES SELECTED TO PARTICIPATE IN THE PILOT STUDY

No.	Project	Ward	# HH	Month & Year CLTS Triggered*	Source
1	Vatukulau	Saghalu	66	Oct 7 2020	RWASH
2	New Kai Farm	Saghalu	42	Sept 27 2020	RWASH
3	Ghabughasi	Saghalu	35	Sept 9 2020	RWASH
4	Vatulovo	Saghalu	28	August 4 2020	RWASH
5	Kobiloko	Savulei	53	October 8 2020	RWASH
6	Tabibili & Aloha	Savulei	30	Mar 20, 2021	mWATER
7	Kotawa – Verahue	Savulei	25	Sept 7 2020	RWASH
8	Marumbo	Savulei	24	Mar 16, 2021	mWATER
9	Chavughao - Verahue	Savulei	20	Sept 11 2020	RWASH
10	Tamboko	Tandai	67	Mar 14, 2021	mWATER
11	Barana	Tandai	66	July 2020	RWASH
12	Baloi	Savulei	16	September 2020	mWATER

* Note – no villages selected were NOD declared, as the total number of such communities in Guadalcanal at the time of study was very limited.

FIGURE 4: MAP OF THE STUDY AREA



5.2. THE BEHAVIOUR-CHANGE INTERVENTION

The intervention pilot comprised two sessions each with several activities. The delivery and implementation guide for these activities is available via the International WaterCentre website (www.watercentre.org/research/cfm).

Implementation comprised 3 stages (Figure 5). Following engagement with the village leadership (a written letter and an initial conversation), Session A was conducted in community workshops where parents of children younger than five years old, both mothers and fathers, were invited to attend. Attendance was not restricted, so other family and community members occasionally also participated. The facilitated workshops included three participatory group activities (drawing activity, role play, video screening and discussion) and one group discussion with a parent commitment at the conclusion. Session B was conducted on a household level, with facilitated, semi-structured discussions and reminders of the workshop activities. During this visit facilitators were instructed to respond to and discuss barriers that households and individuals were experiencing in practicing safe and equitable CFM. These visits were conducted approximately one week following Session A.

The intervention activities were delivered by two teams of two researchers, one male and one female in each team. The facilitators were trained CLTS facilitators, however, were primarily researchers, and not primarily community facilitators. Each team conducted the intervention activities in three villages each.

FIGURE 5: THREE STAGES OF CFM BEHAVIOUR CHANGE PILOT

5.3. MONITORING AND EVALUATION APPROACH

5.3.1. Study design

To evaluate the effects of the intervention activities, a controlled before-and-after (CBA) study was conducted. Of the twelve villages enrolled in the study, six were randomly assigned to the intervention group using a random number generator in MS Excel. The remainder were assigned to the control group. All villages were monitored at baseline and endline irrespectively of treatment group.

The study used mixed methods including qualitative (key informant interviews) and quantitative (immediate participant survey; household survey) to explore the effects of the intervention on reported outcomes, in accordance with the program's theory of change (pg. 14).

5.3.2. Data collection

The study comprised baseline, immediate, and endline monitoring conducted across the villages in December 2021, June and July 2022 respectively, and intervention activities occurring in June 2022. Endline monitoring was timed to allow for at least three to four weeks post-intervention.

Four researchers (two female) collected data in two teams across the twelve villages. The teams were intentionally diverted from collecting M&E data in villages in which they conducted the intervention activities, except for one village (Kobiloko). Data were collected through immediate participant surveys to assess immediate outcomes and elicit process feedback (n = 29), key informant interviews (n = 105) and household surveys (n = 313). During household surveys, some households consented to a spot-check inspection of sanitation facilities (n = 119).

The specific M&E questions from surveys and interviews were mapped to program outcomes (refer to Theory of Change) and are presented in Table 4.

Table 4: Data collection tools mapped to program outcomes

Outcome		Household survey question	Key informant interview question
Parents will:			
PO1a	More commonly practice safe CFM	Thinking about the last time (name of child) defecated, was the faeces moved from where it was? Where was it moved to? When your youngest child defecates, how often would you throw the faeces into a toilet? Where do most people in this community dispose of their child's faeces? Do you use any tools when moving or disposing of your child's faeces? Thinking about the last time (name of child) defecated, where did he/she do it?	How about helping young children with defecation? Is that something you are involved with? Tell me about what happens when a young child in your family poos including where it happens and what you do. Do others in your family do it differently to you? Do you think anything has changed in the last 6 months with what other people in this community think should be done with young children's poo? Do you think anything has changed in the last 6 months with how do most people in this community really dispose of young children's poo? Do you have any future plans to change your behaviour when it comes to CFM? What are the barriers from making this happen now?
PO1b	Consider latrine disposal as the best CF disposal option.	What do you think would be the BEST thing to do with your child's faeces? How easy is it for you to use a latrine for disposing of your child's poo?	What do you think would be the BEST thing to do with your child's faeces? What do you feel when you see a child that is not yours pooing on the ground?

Outcome		Household survey question	Key informant interview question
PO1c	Understand the need to manage CF for improved child health and happiness	Why is this the best? As a parent, how important do you think it is to put your child's faeces in the toilet?	Why is this the best?
PO1d	Have an increased awareness/belief by parents of the health risk posed by children's faeces	Which of these is most dangerous for health – adult faeces, children's faeces, or they both pose a similar risk?	
Fathers will:			
PO2a	Develop the perception of fathers' involvement in CFM for their children as a positive social norm	How often does your husband / do you usually deal with your child's faeces? How important do you think it is that fathers are involved in their children's defecation? Do many fathers in this community put away their child's faeces?	What can you tell me about the role of fathers in this community for looking after their children? How important do you think it is that fathers put away their children's faeces safely? Why do you think this?

5.3.3. Data recording and analysis

Immediate outcomes and process feedback were captured through rapid surveys conducted with participants immediately following Session A, and data was either scribed by the teams or through participants directly filling out the forms.

Household surveys were conducted using SurveyCTO and handheld tablets. Interviews were recorded, transcribed, and translated from Pijin to English by the data collection team.

Quantitative household survey data was downloaded and analysed using statistical analysis software (SPSS) and MS Excel. Descriptive statistics for the entire cohort and sub-cohorts were computed. For evaluation against primary and secondary outcomes, a difference-in-difference methodology was applied Table 5). Initially, datapoints for specific outcomes were converted to binary outcomes using a dummy variable. For example, a survey question with a categorical response inclusive of nine different options of where children's faeces were disposed of was converted into a binary *did dispose to latrine // did not dispose to latrine*. The proportions of survey respondents in each of these binary categories, across the two time points (baseline and endline) and treatment groups, (control and intervention) were analysed to assess any changes that may be attributable to the intervention activities.

During the analysis, 27 data points were removed from the household survey dataset as those participants reported they engaged in CFM intervention activities with other organisations (majority LLEE) during the intervention period. These were excluded to avoid further confounding of our dataset. One datapoint was removed because they did not fit the age eligibility criteria (less than 18 years old).

Table 5: Difference-in-difference methodology (A, B, X, Y represent statistics for a range of outcome measures, captured either at baseline or endline in either control or intervention communities)

	Baseline	Endline	Difference
Control	A	B	B-A
Treatment	X	Y	Y-X
Difference	X-A	Y-B	
		D-i-D	(Y-X)-(B-A) OR (Y-B)-(X-A)

At the same time, qualitative key informant interview data was loaded into analysis software (NVivo version 1.6.2) for thematic inductive coding. A comparison using coding between the baseline, endline, control and intervention groups was conducted.

Data for both control and intervention groups was analysed separately to identify common patterns (Braun and Clarke 2006). Generally, thematic analysis is used to identify relationships across data sets. Patterns such as these reflect what is meaningful to people and researchers for a few specific topics. In addition, they reflect barriers and enablers to changing current behaviours, in this case specifically regarding CFM.

Codes were derived from the data itself. For this case, NVivo software was used to organize and analyse the data from the baseline and endline interviews. NVivo content is generated from participant-derived data rather than researcher assumptions. After importing the data from interviews into NVivo, the coding process started using cases and classifications of attributes. To follow these some queries, summaries and references are compiled to identify and discuss similar themes identified from the data.

5.4. RESEARCH ETHICS

This research was conducted in compliance with the Australian National Statement on Ethical Conduct in Human Research and IWC's Child Protection Policy. The project was granted ethical approval by: Solomon Islands Health Research and Ethics Review Board (SIHRERB) of the Ministry of Health and Medical Services (Ref No: HRE001/20, dated 19/02/2020), Human Research Ethics Committee of Griffith University (Ref No: 2019/873, dated 20/12/2019) and Ethics Review Board of London School of Hygiene and Tropical Medicine (Ref No: 17978, dated 02/09/2020).

Informed consent was obtained from all subjects involved in the study. Permission to undertake the research was obtained from the village chief from each village prior to data collection activities. All participants were read a standard, participant information sheet and provided informed verbal consent. This included informed consent on participation for video subjects where anonymity was voided.

Research participants received no remuneration for their participation in the research activities. Two village research assistants in each village were paid for their time and involvement.

6. PILOT RESULTS

6.1. INTERVENTION ACTIVITY PARTICIPATION AND MESSAGE RECEPTION

A total of 95 participants attended the Session A workshops conducted in the six communities (Table 6). Of these, approximately 25% were fathers, 66% mothers and the remainder comprising grandmothers, youths, and village leadership. The number of households visited during Session B varied depending on the availability of participants in their homes at the time. In some cases, household visits were conducted with individuals who did not attend Session A.

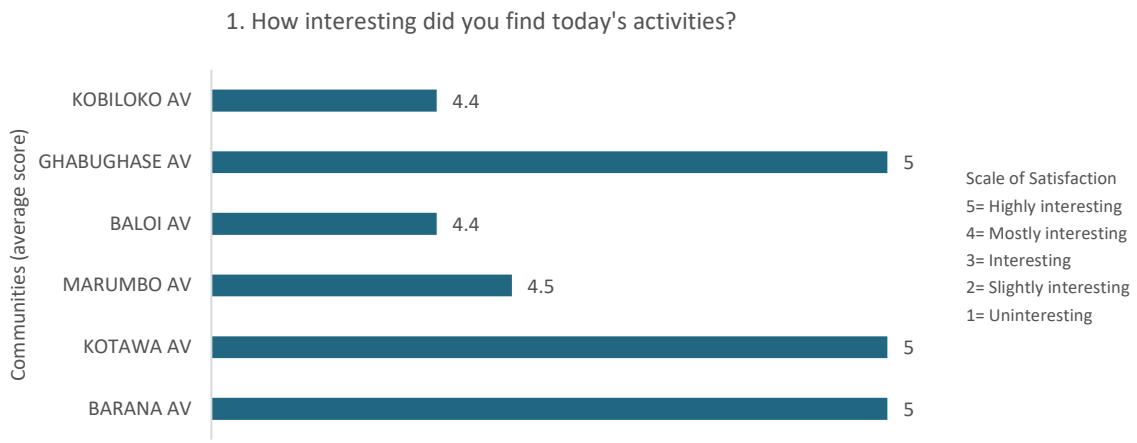
TABLE 6: INTERVENTION SESSION A PARTICIPANTS

	Total participants	Fathers	Mothers	Couples	Others
Kobiloko	17	6	11	2	
Baloi	16	2	10		4
Ghabughasi	12	5	7	2	1 grandfather
Barana	25	1	24	0	Some older women
Kotawa - Verahue	10	3	5	3	2
Marumbo	15	7	6	3	
Total	95	24	63	10	6

Session facilitators reported broadly positive engagement with the activities, with parents participating in the discussions and role play and actively watching the video. The CFM workshops were highly rated by participants from the intervention group.

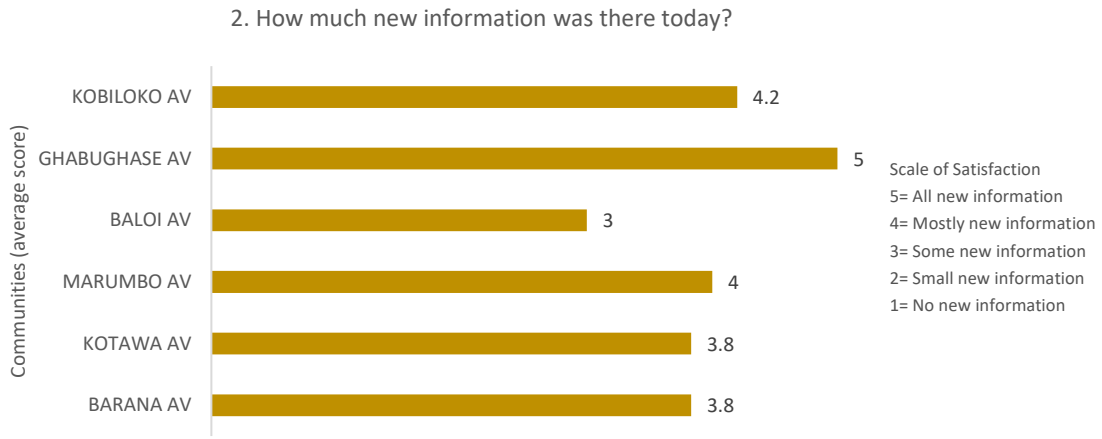
The immediate participants survey conducted after session A shown the proposed activities were considered in the two higher scales of satisfaction ("mostly interesting" to "highly interesting") among the six intervention villages. The values in Figure 6 and Figure 7 corresponded to the average (AV) obtained per village from participants perspectives.

FIGURE 6: IMMEDIATE PARTICIPANT SURVEY RESULTS - HOLDING ATTENTION



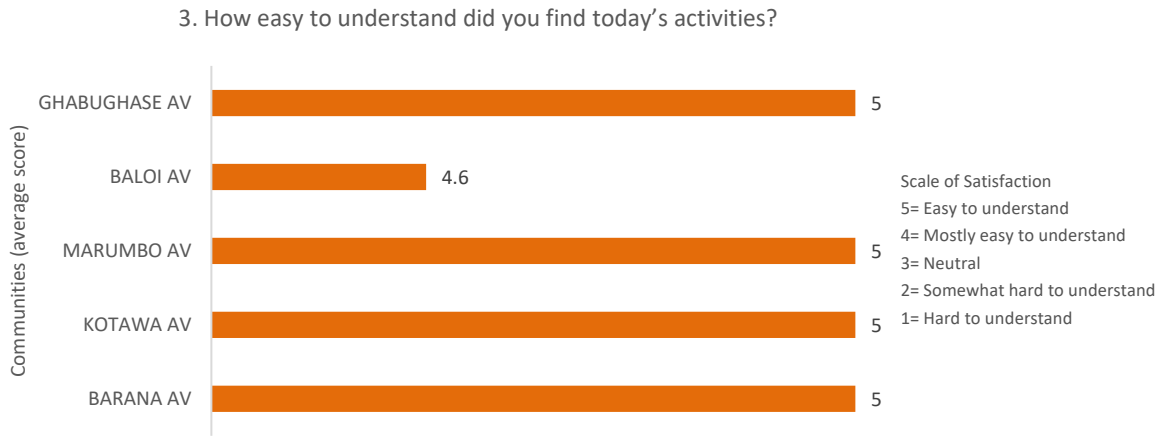
Additionally, in Figure 7 below, participants stated the information provided during session A included "some" and "mostly" new information during the activities. Supplementary information was provided during the workshop to leverage the message and make it more interesting for participants.

FIGURE 7: IMMEDIATE PARTICIPANT SURVEY - NOVELTY OF INFORMATION



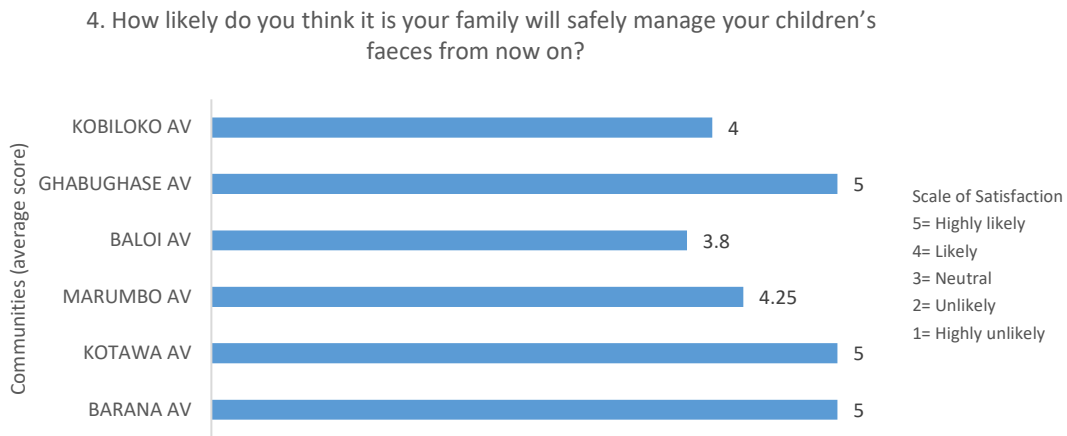
In general, the average (AV) for comprehension of the activities (Figure 8), indicates participants considered the activities easy to understand. This indicates that the information presented "made sense" to their local context.

FIGURE 8: IMMEDIATE PARTICIPANT SURVEY - COMPREHENSION



Regarding the likelihood that participants will implement safe CFM following the intervention (Figure 9), most attendees were at least immediately motivated to take actions. The sustainability of this commitment is further explored and described in Section 6.2.

FIGURE 9: IMMEDIATE PARTICIPANT SURVEY - WILLINGNESS TO PRACTICE SAFE CFM



Some participant feedback included:

> *"We want our community to practice all the right behaviours that was said in the video". – Mother, Kotawa-Verahue*
>
> *"It will motivate us to build toilets- what LLEE have been promoting. It reminds me that sanitation should be my priority." – Father, Marumbo*
>
> *"Generally, I have being practicing the safe ways to manage children's poo, so I relate well with all the testimonies. I will continue with the right practice." – Mother, Barana*
>
> *"This video will aid my advocacy for sanitation in my community." – Father, Kotawa-Verahue*
>
> *"The stories (in the video) are real, and it has motivated me to practice better way to manage young children poo." Mother, Marumbo*

6.2. BASELINE AND ENDLINE DESCRIPTIVE STATISTICS

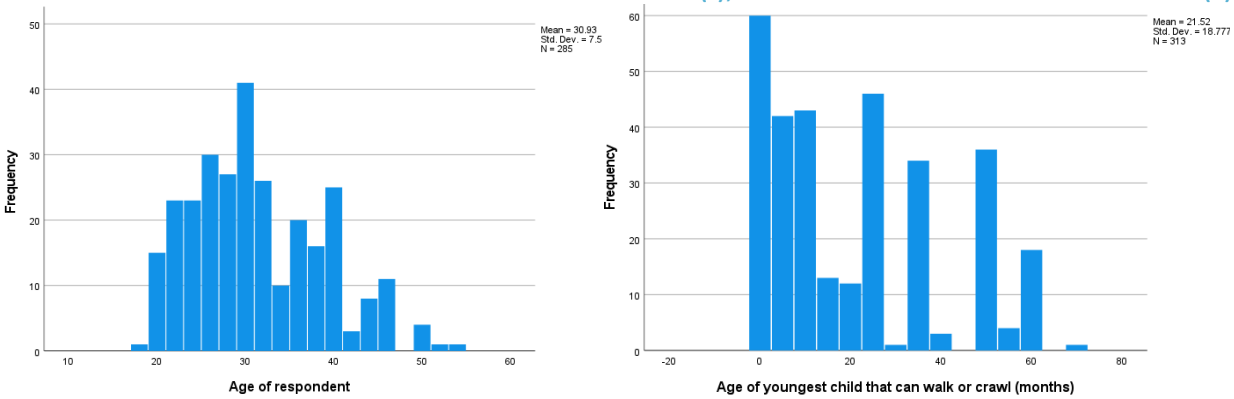
6.2.1. Household survey respondent characteristics

The survey included 286 caregiver respondents, all of which had at least one child less than five years old. There were 136 individual respondents at baseline and 130 individual respondents at endline. Of these, thirteen individuals were matched across baseline and endline, the remainder varied. Of these respondents, approximately 63% were female, 37% were male, with the exact numbers reported in Table 7. The age of respondents varied between 18 and 54 (Figure 10). The age of the respondents' youngest children ranged between 0 to 72 months (Figure 10).

TABLE 7: GENDER DISAGGREGATION OF SURVEY RESPONDENTS

Group	Timepoint	Gender of respondent		Total eligible respondents
		Male	Female	
Control	Baseline	29	45	74
	Endline	21	41	62
	Total	50	86	136
Intervention	Baseline	32	49	81
	Endline	23	45	68
	Total	55	95	149
Total	Baseline	61	95	155
	Endline	44	86	130
	Total	105	181	285

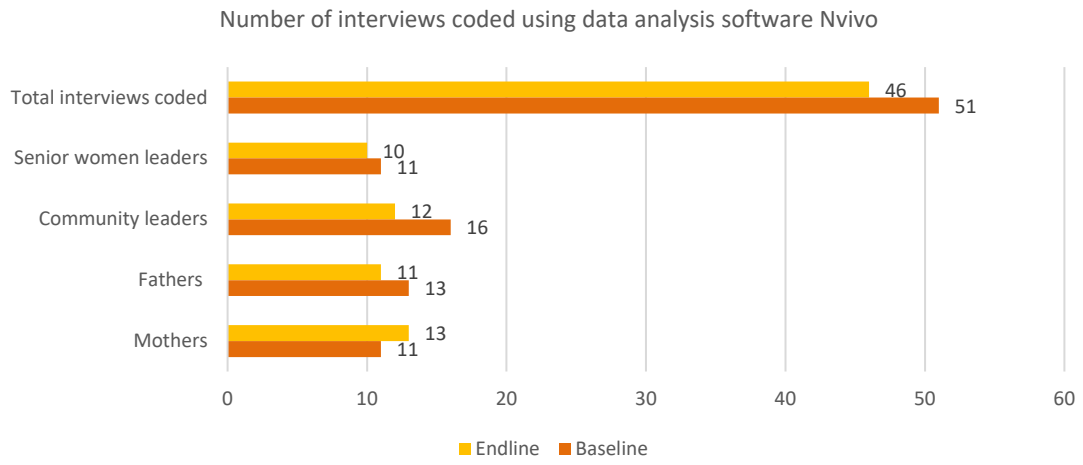
FIGURE 10: AGE DISTRIBUTIONS IN THE HOUSEHOLD SURVEY - CAREGIVERS (L), AND YOUNGEST CHILD THAT CAN WALK OR CRAWL (R)



6.2.2. Interview respondent characteristics

A total of 51 interviews were conducted during the baseline, across all 12 villages, and 46 at the endline (Figure 11). The characteristics of community leaders corresponded mostly to those of chiefs and church members of the community. In contrast those of senior women pertain mostly to women leading in church service.

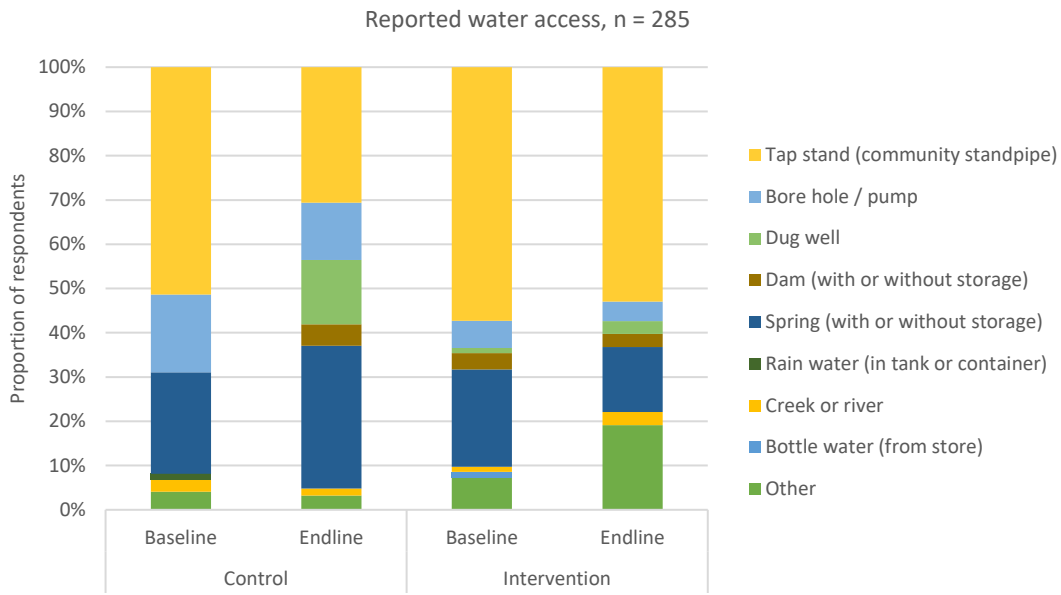
FIGURE 11: DISTRIBUTION OF INTERVIEW RESPONDENTS



6.2.3. WASH Status

The status of water, sanitation and hygiene varied across the twelve villages, and between the different cohorts. The predominant water source at baseline for the control group was community tap stands or standpipes, and this was consistent across the intervention group at both baseline and endline. At endline for the control group, a greater proportion of respondents reported the use of spring water (with or without storge) as their primary source of water (Figure 12).

FIGURE 12: REPORTED WATER SOURCES FOR HOUSEHOLDS IN THE STUDY



Respondents were asked where they defecated, if they had access to a latrine or toilet and whether it was shared, and, if they had access, what type of toilet it was. Approximately 60% of respondents reported open defecation practices (Figure 13); this was slightly higher than the proportion that reported they had a household toilet, indicating the possibility that some adults openly defecate even when the own a toilet (n = 6) (Figure 13, 14). More

households reported no access to toilets than any other access types, across both treatment groups and time points (Figure 14). The number of households reporting no toilet access and open defecation also increased in both treatment groups from baseline to endline. For households with access to a latrine or toilet, the predominant toilet type varied between flush or pour flush to a septic tank, and dry pits without slabs or lids (Figure 15).

FIGURE 13: REPORTED OPEN DEFECATION IN ADULTS (CAREGIVERS)

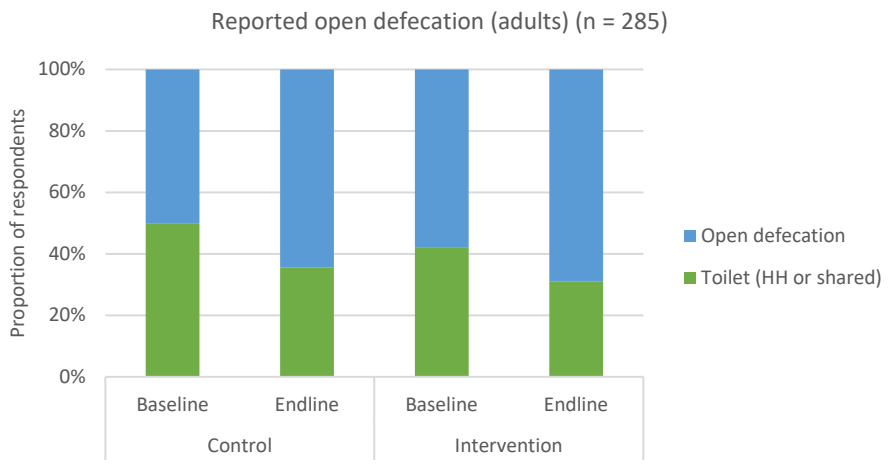


FIGURE 14: REPORTED HOUSEHOLD ACCESS TO TOILET

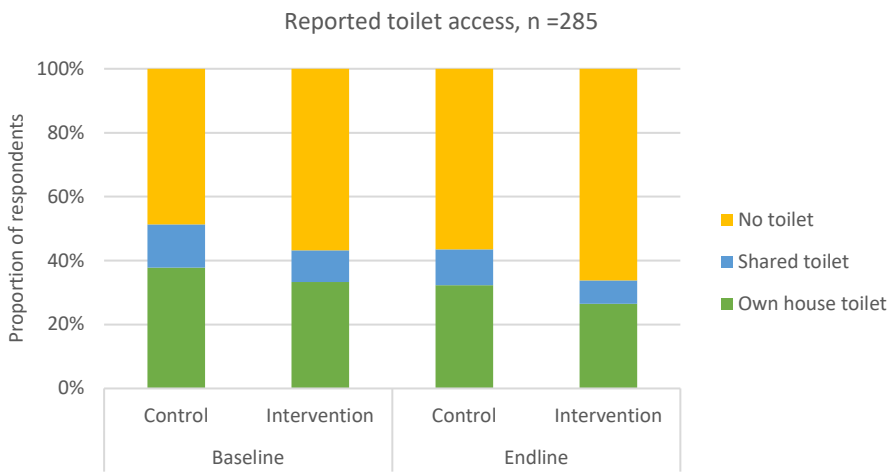
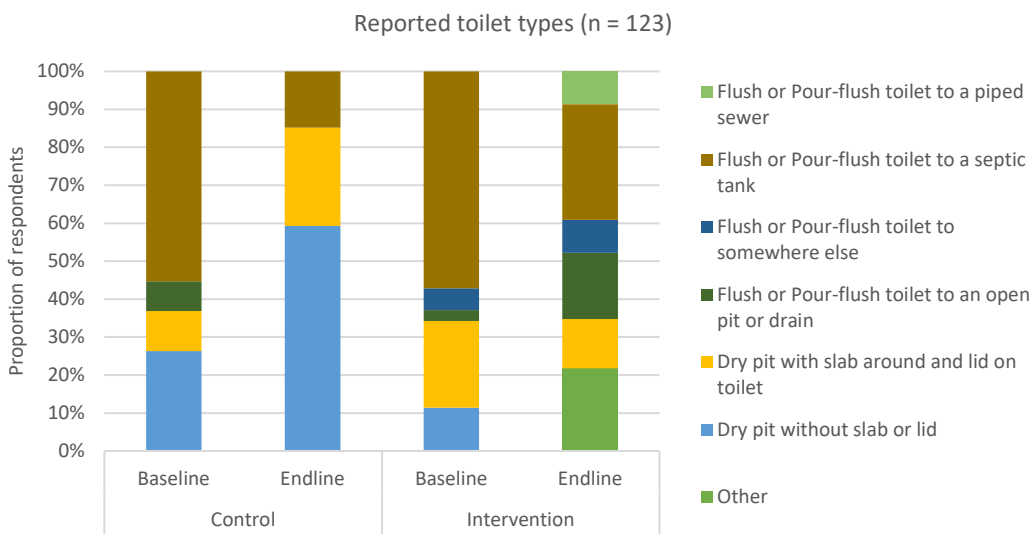
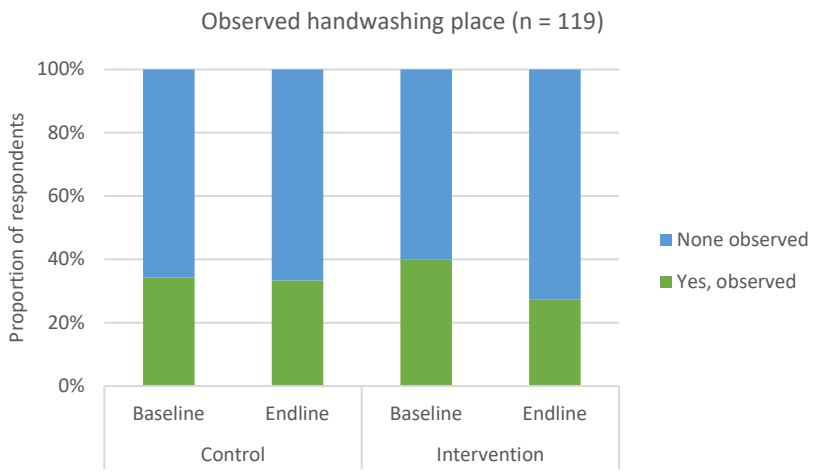


FIGURE 15: REPORTED TOILET TYPE WITHIN HOUSEHOLDS WITH ACCESS



Access to a handwashing place associated with latrine access was observed by the researchers for by a subset of the respondents that consented to spot-check inspections (Figure 16) . Of those, a handwashing place could not be observed for approximately two-thirds of households, consistently across the groups and time points. Of the handwashing places that could be observed, most had water available (85%) while only half had observable soap.

FIGURE 16: HOUSEHOLD HANDWASHING FACILITY (OBSERVED)



6.2.4. HH Survey participation in intervention activities

Table 8 presents the survey respondents who reported participation in the SINU-facilitated CFM training. In the intervention group, 43 individuals reporting participating, which represents 43% of the total participants recorded by the facilitators (95). Some individuals in the control group reported participating in the intervention activities, however it is unknown if this represents individuals who were travelling to other villages at the time, a misremembering, or misunderstanding of the question. Thirty-one people could name SINU as the organisation conducting the CFM training (Table 9), while 27 remembered LLEE. As previously noted, these were excluded from the data analysis for outcome evaluation.

TABLE 8: SURVEY RESPONDENTS WHO REPORTED PARTICIPATING IN INTERVENTION ACTIVITIES

Have you or a family member participated in any CFM-specific training in the last 6 months?								
			Yes, me	Yes, me and a family member	Yes, a family member but not me	No	Can't remember	Total
Endline		Control	7	5	9	50	5	76
		Intervention	24	19	1	36	1	81
	Total		31	24	10	86	6	157

TABLE 9: SURVEY RESPONDENTS REPORTING THE ORGANISATION CONDUCTING THE TRAINING

Which organisation conducted the training?						
			None or other	SINU	LLEE	Total
Baseline		Control	74			74
		Intervention	82			82
	Total		156			156
Endline		Control	60	2	14	76
		Intervention	39	29	13	81
	Total		99	31	27	157

6.3. SAFE CFM OUTCOMES

6.3.1. Practice, attitudes, and knowledge outcomes for parents

In interviews with parents and caregivers, it was reported that the CFM workshops provided participants with opportunities to reflect upon their own knowledge, attitudes, and practices in child faeces management, and that of their families and communities. Within the intervention group, it was reported that participants noted and participated in discussions about the long-term harm of open defecation and exposure to faeces, even if these effects cannot be immediately seen. Some respondents discussed changes following the workshops: using toilets themselves more often; teaching their children to go to the toilet to defecate directly; and noticing less faeces in community areas. Some participants reported being motivated by the workshop such that they started building toilets immediately following the workshop, and in a limited number of cases (2) those toilets in construction could be shown to the M&E researchers at endline.

> *"The* changes *are the children no longer poo in any place they want to like before. Now when they want to poo, they go to the toilet straight away." Kobiloko-Mother-EL*

> *"I went home after session A and taught my son how to use the toilet and about hand washing." Barana-Mother*

> *"Those that attended the workshop decided to build their toilets now." Marumbo-Father-EL*

It was also noted that the CFM activities reinforced the messages shared by other CLTS practitioners, particularly LLEE, during previous interventions.

Based on the household survey data, difference-in-difference estimates were calculated for each of the program outcomes (Table 10). An improvement in the outcome for the intervention group at endline, compared to a lesser or nil improvement in the control group, is highlighted in green, and represents possible areas of influence by the intervention activities. These outcomes are discussed in greater detail in the following sections.

TABLE 10: DIFFERENCES OBSERVED IN PROGRAM OUTCOMES ACROSS INTERVENTION AND CONTROL GROUPS, INCLUDING DIFFERENCE-IN-DIFFERENCE ESTIMATES

Outcomes	Control			Intervention			DID estimate
	Baseline	Endline	Difference	Baseline	Endline	Difference	
PO1a. Increased practice of safe CFM							
Disposal of children's faeces by caregivers to latrine compared to other locations	16.1%	22.2%	6.2%	7.4%	9.6%	2.3%	-3.9%
Caregivers self-report "almost always" or "always" dispose children's faeces to latrine	23.0%	17.7%	-5.2%	13.4%	19.1%	5.7%	10.9%
Caregivers self-report on community child faeces disposal location (to latrine)	6.8%	6.5%	-0.3%	6.1%	11.8%	5.7%	6.0%
Increased use of tools to move children's faeces	73.0%	90.3%	17.3%	88.9%	76.5%	-12.4%	-29.8%
Child open defecation reported by caregivers*	62.2%	66.1%	4.0%	60.5%	51.5%	-9.0%	-13.0%
Direct use of latrine by child	13.5%	8.1%	-5.4%	13.4%	11.8%	-1.6%	3.8%
PO1b. Consider latrine best disposal option							
Caregivers attitude that disposal of children's faeces to latrine is the best option	59.5%	46.8%	-12.7%	48.8%	57.4%	8.6%	21.3%
Caregivers attitude that disposal of children's faeces to latrines is easy	68.9%	56.5%	-12.5%	69.5%	76.5%	7.0%	19.4%
PO1c. Understand the need to manage children's faeces							
Caregivers attitude that disposal of children's faeces to latrines is important	95.9%	87.1%	-8.8%	96.3%	94.1%	-2.2%	6.6%
PO1d. Increased awareness of the health risk posed							
Caregivers knowledge that children's faeces is as harmful as adults	73.0%	62.9%	-10.1%	89.0%	79.4%	-9.6%	0.5%

* the expected outcome is reverse of all other outcomes, i.e., a decrease in the measure represents an improvement in the outcome

6.4. PRACTICE OF SAFE CFM (DISPOSAL TO LATRINES)

The primary outcome measured of *reported disposal of children's faeces to a latrine* was seen to increase in both treatment groups from baseline to endline in the household survey data. This indicates there was likely no measurable improvement attributable to the intervention – this could be due to an insufficient sample size to overcome other differences and confounding factors, or because the intervention did not lead to change.

However, this was not seen consistently across the villages. In the intervention group, Ghabughasi and Barana villages reported increases in parents reporting disposal of children's faeces to a latrine at endline (Figure 17). In the control group, two villages (Vatukulau and New Kai Farm) also had reported increases, though notably both also had higher levels of safe CFM practice at the baseline (greater than 30%) (Figure 18).

Aside from disposal to the latrine, there were no notable trends for changes to other disposal places across all villages, between baseline and endline in both groups.

FIGURE 17: REPORTED DISPOSAL LOCATIONS ACROSS CONTROL GROUP VILLAGES

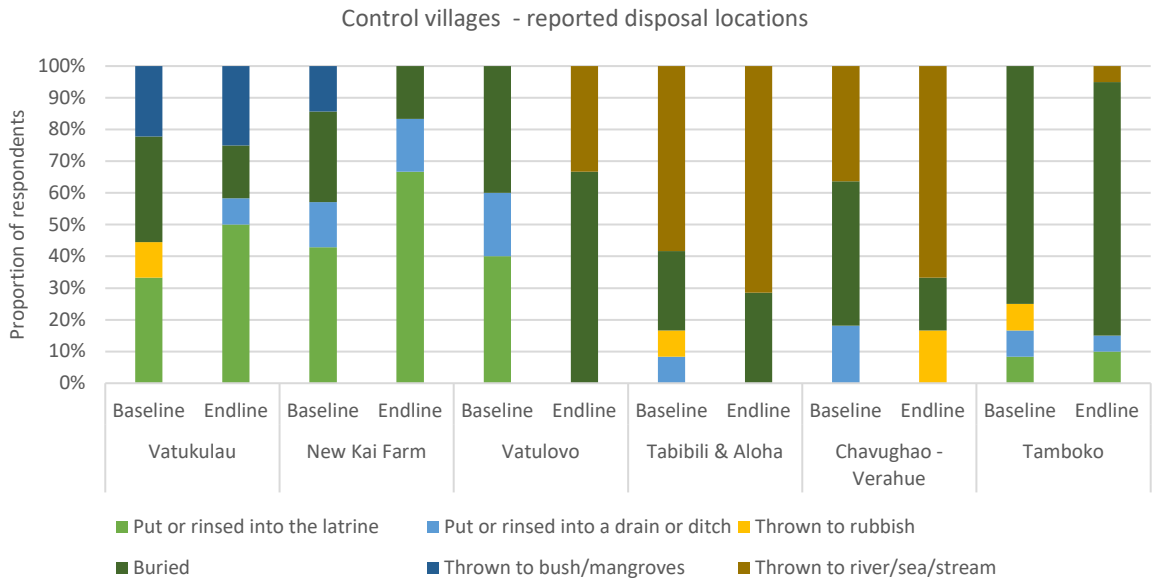
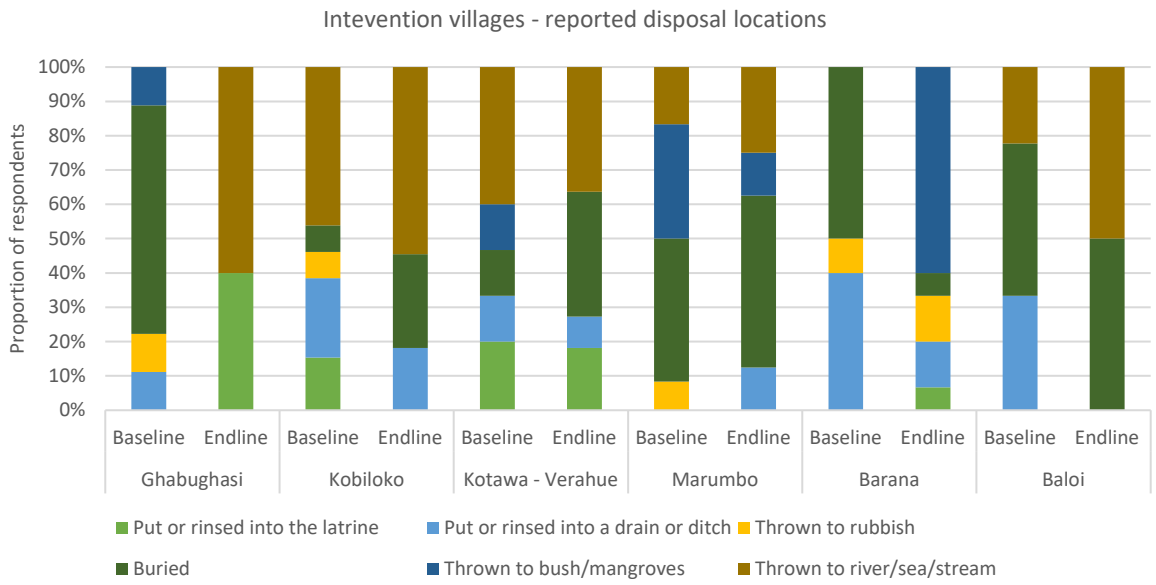
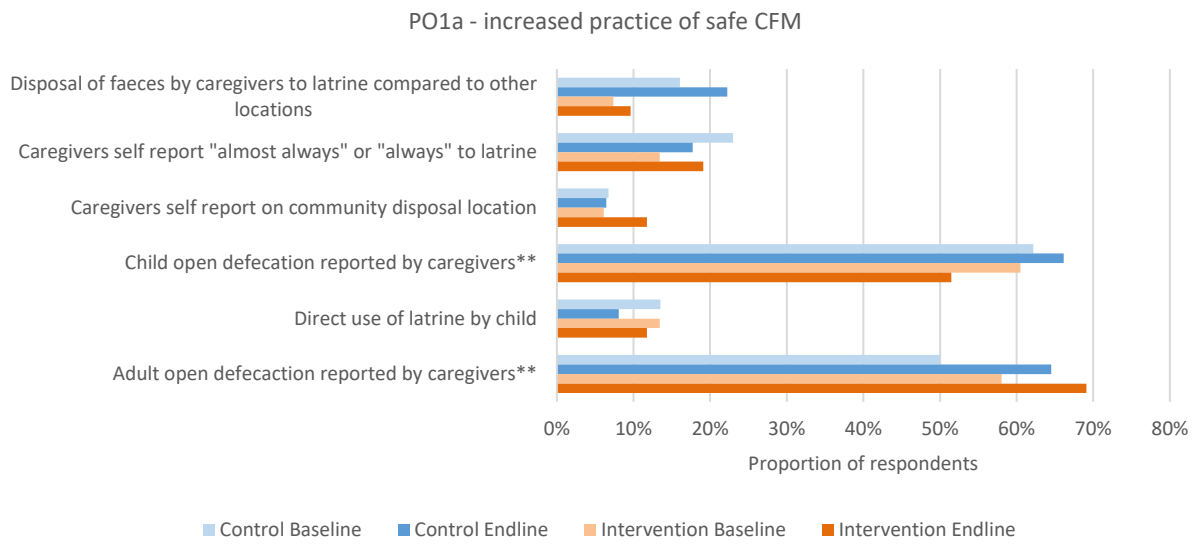


FIGURE 18: REPORTED DISPOSAL LOCATIONS ACROSS INTERVENTION GROUP VILLAGES



Practice improvements were seen in other outcomes for intervention villages at the endline, including a reduction in open defecation by children, caregivers reporting that they always or almost always used 'disposal to latrine' for children's faeces, and the reported perception from caregivers on other community members disposing to latrine, resulting in small but positive difference-in-difference estimates (Figure 19). Interestingly, this overall decrease in open defecation in the intervention group (61% to 52%) was accompanied by an observed overall increase in reported adult defecation in the intervention group, from 58% at baseline to 69% at endline. It was also found that more parents within the intervention group at endline reported using disposable diapers and reusable nappies (12% change) than the control cohort (no change).

FIGURE 19: OUTCOME PO1A – INCREASED PRACTICE OF SAFE CFM BY PARENTS



** note these measures are the inverse of other outcome measures in the graph – a decrease over time is sought while for other measures, an increase is sought.

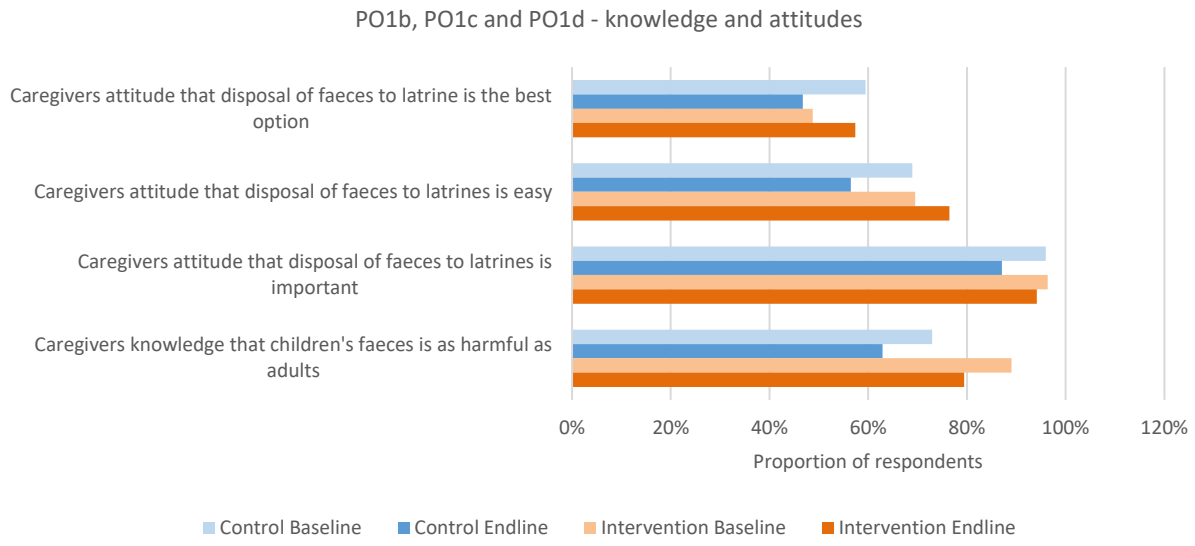
6.5. ATTITUDES, AWARENESS AND UNDERSTANDING OF THE NEED FOR SAFE CFM

There was a substantial increase in the proportion of parents reporting an attitude that disposal to latrine is best option across the intervention group at endline (Figure 20). A large difference was also seen in reports that disposal to latrines is an easy option for the same group. Similar proportions of caregivers reported an attitude that disposal of children's faeces to the latrine is important across both groups and both timepoints.

> *"To me, it's good your team come around to do awareness on how to manage child's poo. Because sometimes we tend to forget, or we know but did not practice it. So, it's good your team comes so that it will help reminds us to do the right thing" Barana-Catechist-EL*

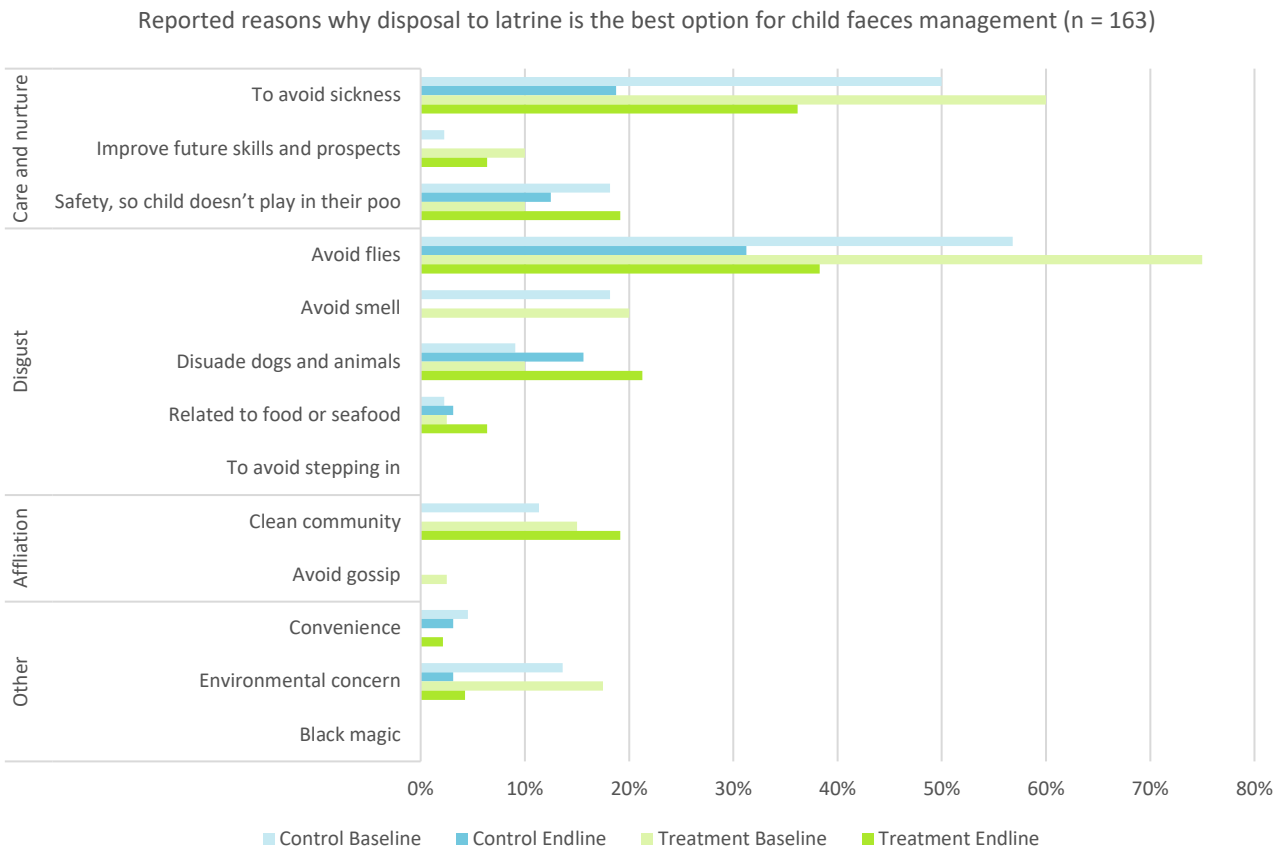
Knowledge about the relative safety of children's faeces compared to adult faeces (both of similar concern) did not appear to increase overall in response to the intervention. The preferred sanitation approach named was the use of toilets and its relationship with health is clear. However, in interviews, parents and informants indicated that while knowledge of sickness and health is known, the longer-term wellbeing-related issues around poor sanitation, such as effects to children's education and future prospects, was a highlight of the intervention activities discussions.

FIGURE 20: OUTCOMES PO1B, PO1C, AND PO1D - PARENTS WILL CONSIDER, UNDERSTAND AND HAVE INCREASED AWARENESS OF SAFE CFM



Parents were asked to describe the different reasons why they thought disposal to latrines or toilets was the best option for child faeces management disposal, even when they may not have access to household latrines personally. The different responses were interpreted into one of thirteen different themes, as shown in Figure 21. Common reasons given included to avoid flies and avoid sickness for their families or for children. The largest changes in the intervention group from baseline to endline, compared to the control group, were observed in the prevalence of responses relating to 'safety' (that children don't play in, step in, or eat faeces); to dissuade or avoid dogs and other animals; and to achieve a clean community environment. These motivations were interpreted as care and nurture, disgust, and affiliation motives respectively.

FIGURE 21: HOUSEHOLD SURVEY RESPONSES FOR WHY DISPOSAL TO LATRINE WAS CONSIDERED THE BEST OPTION



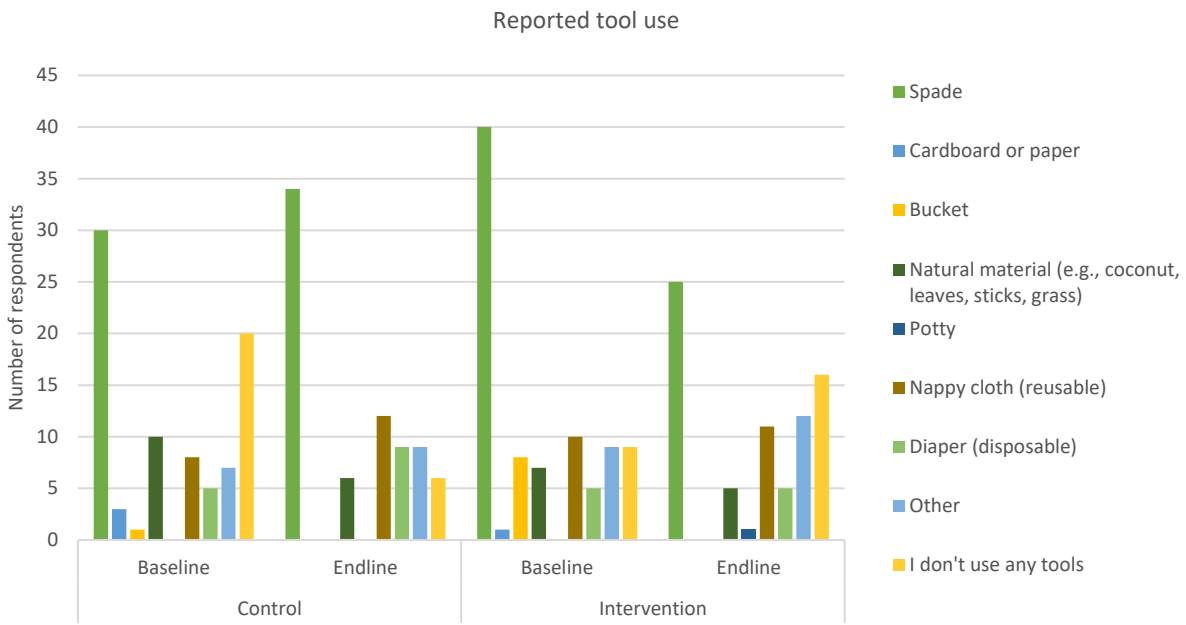
6.5.1. Use of tools for managing faeces

The most commonly reported tool used to move and transport children's faeces was spades, across both treatment groups. However, the reported use of all tools for such purposes, including spades, decreased more between baseline and endline in the intervention group, compared to the change in reported use from baseline to endline in the control group (Figure 22). Notwithstanding, the demonstration of the use of tools for transporting faeces to the toilet was a message that resonated with some intervention activity participants:

> *"After attending the CFM training I now realize that putting the poo in the toilet is the right thing to do in order to keep the children from getting sick. Just last week I have bought new spade carry the faeces and dispose it in the toilet." Baloi-Mother-EL*

> *"The spade I bought was after the workshop to assist us parents on burying the children poo, also toilet papers." Barana-Mother-EL.*

FIGURE 22: REPORTED TOOL USED FOR MOVING / TRANSPORTING CHILDREN'S FAECES



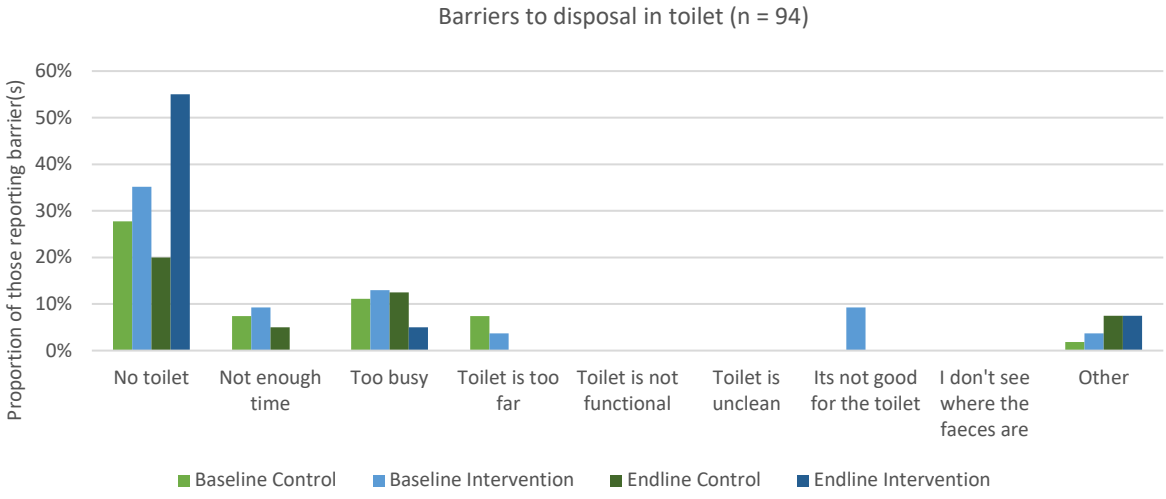
6.5.2. Barriers to practice

Barriers to practicing safe CFM were documented across the treatment groups in the pilot study, as well as changes to reported barriers that might have occurred over the time series. The most common barrier reported was no access to a toilet, across all groups and time periods (Figure 23). One respondent noted that although no having a toilet meant that CFM was not being done 'properly', some households had tried to improve safety by burying deeper holes for disposal by digging:

> *"Many people are yet to do things properly or in a best way, but they started digging deeper holes to bury the poo" Marumbo-Father-EL*

For those with a reported toilet, the most common barriers were "too busy" and "not enough time"; notably, these barriers reduced in prevalence in the intervention villages, following the intervention.

FIGURE 23: REPORTED BARRIERS TO DISPOSING CHILDREN'S FAECES IN A TOILET OR LATRINE



6.6. EQUITABLE CFM

Across the quantitative dataset, there was a small increase in the proportion of caregivers that thought fathers' involvement in CFM is important (Figure 24). But there was no reported increase in practiced involvement by fathers in CFM across either group.

There was a large increase in both groups across the timepoints of caregivers who thought fathers in their community were involved in CFM, though this was seen across both control and intervention group (slightly more strongly in the intervention group, resulting in a positive DiD estimate) (Table 11).

FIGURE 24: OUTCOME PO2A - FATHERS WILL DEVELOP POSITIVE ATTITUDES TOWARDS, AND AN INTENTION TO PRACTICE, SAFE CFM

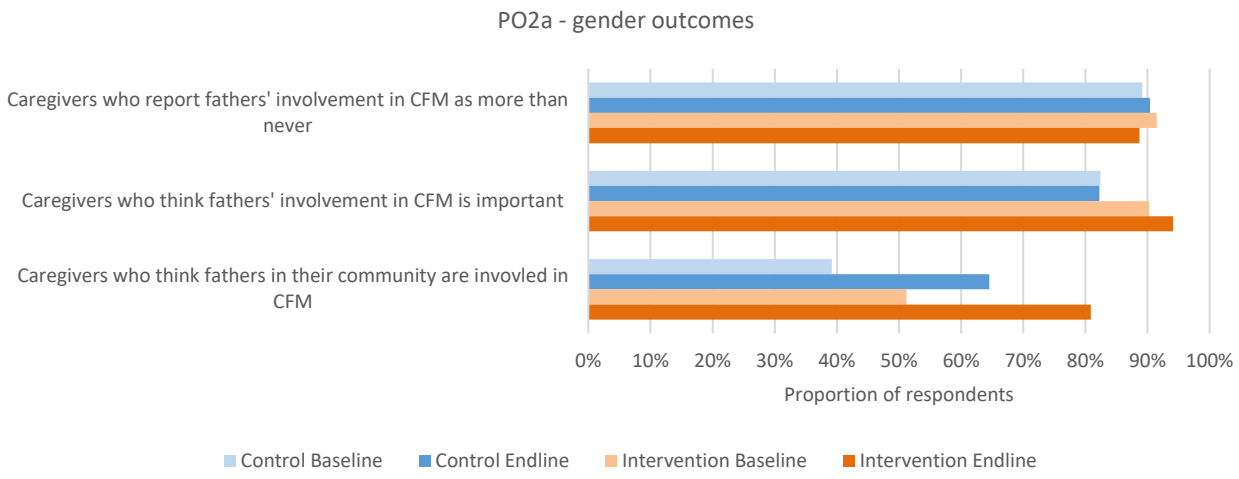


TABLE 11: DIFFERENCE-IN-DIFFERENCE ANALYSIS FOR GENDER OUTCOMES

Outcomes	Control			Intervention			DID estimate
	Baseline	Endline	Diff	Baseline	Endline	Diff	
PO2a. Develop positive attitudes and an intention to practice							
Caregivers who report fathers' involvement in CFM as more than never	89.2%	90.4%	1.2%	91.5%	88.7%	-2.8%	-3.9%
Caregivers who think fathers' involvement in CFM is important	82.4%	82.3%	-0.2%	90.2%	94.1%	3.9%	4.0%
Caregivers who think fathers in their community are involved in CFM	39%	65%	25.3%	51%	81%	29.7%	4.3%

The qualitative data however indicates some improved equitability of CFM between mothers and fathers, and other male family members.

> *"After that workshop, I started to share responsibilities with my sons and dad (husband) do take care of the children" C-Barana-Mother-EL*
>
> *"I can also involve in managing my child's faeces" Baloi-Father-EL*

Fathers reported being more motivated and more likely to be involved in their kids' waste disposal after attending the workshops.

Some participants reflected that cultural beliefs and social norms continue to hinder equitable CFM, while others reflected that customs are changing, and there is more confidence (of some women) to discuss these changes with male family members.

> *"Father sometimes not 100 % follow the right way or safe way of disposing the poo. They can only bury but not wash the child's bottom if the child was a girl". Tamboko-SeniorWomen-EL-f*
>
> *"I encourage my husband to involve more in CFM so that he will* [become] *familiar with* [the] *practice and do away with anything that can stop the husband from involving* [himself] *in CFM.* [Like examining] *cultures and believe* [beliefs] *that hinder my husband to do* [practice CFM]*." Baloi-Mother-EL*
>
> *"I have seen my husband taking care of the children and helping me a lot nowadays. In jobs like cooking, washing and especially with removing our children's waste properly" C-Kotawa-Mother-EL*
>
> *"I think fathers are now changing unlike before where fathers do not touch the faeces. Today fathers can do that because I think they have come across lot of groups that talks about sanitation and hygiene practice" Baloi-SeniorWoman-EL*

A range of reasons were given for the increasing involvement of fathers in CFM. The most common was that a parenting is seen as a joint or shared responsibility between mothers and fathers - it is a father's "duty of care" to share responsibilities with the mother as part of his parental role. Fathers are expected to help mothers if the mothers are busy with other chores or absent from the house, but in many cases their responsibility wasn't considered to be limited to when mother's a busy.

Disaggregating the data for primary outcome (safe faeces disposal behaviours) by gender indicated differences between mothers and fathers from baseline to endline. In the control group, mothers improved more in disposing of faeces to latrine at endline, while in the intervention group, fathers showed the greatest improvement (Figure 25 and Figure 26)

FIGURE 25: DISAGGREGATING PRIMARY OUTCOMES BY GENDER - CONTROL VILLAGES

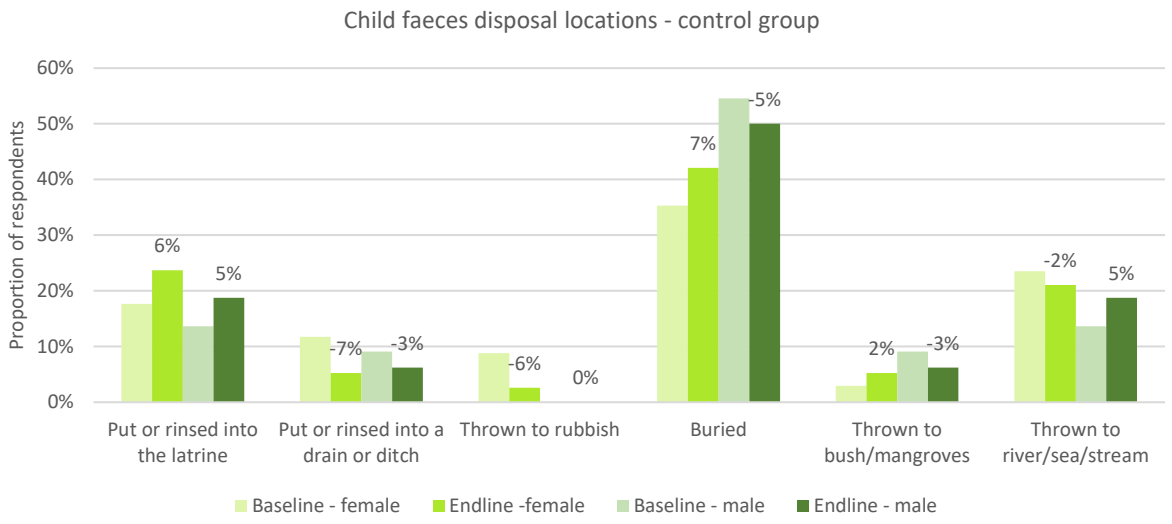
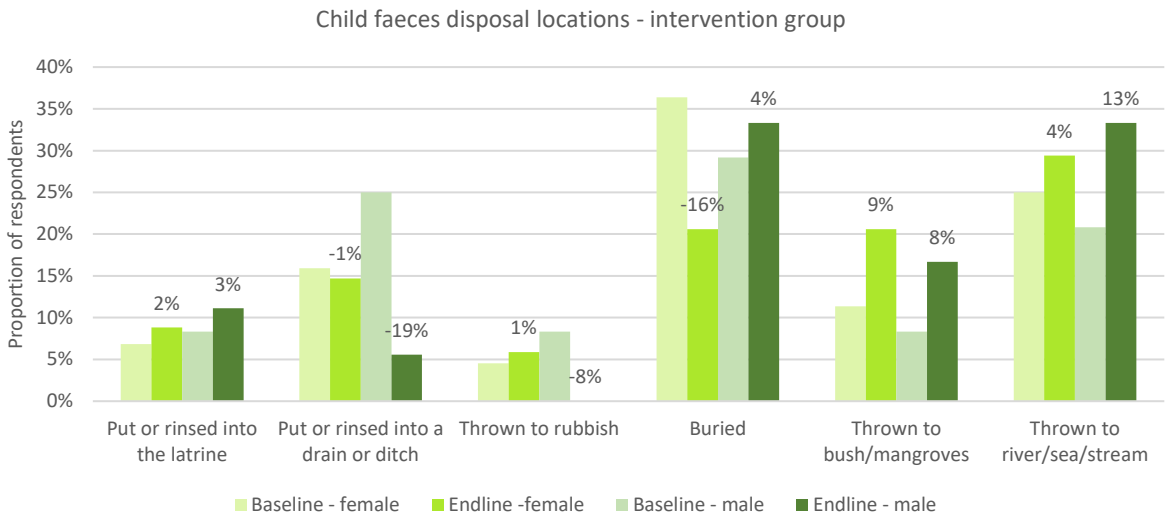


FIGURE 26: DISAGGREGATING PRIMARY OUTCOMES BY GENDER - INTERVENTION VILLAGES



The difference-in-difference analysis was also repeated for the gender disaggregated data. This indicated some gender-linked differences in the outcomes (Table 12). For example, more males reported an increase in knowledge about the relative safety of children's faeces to adults (i.e., that children's faeces are no less harmful than adults). Females reported more frequently that disposal to latrine is both *the best option* and *easy,* compared to males, while more males thought disposal to latrine was *important*. The practice outcomes improved more in the female cohort except for disposal of faeces to the latrine, while substantially more males thought the involvement of fathers in CFM was important.

TABLE 12: GENDER-DISAGGREGATED OUTCOME MEASURES FOR THE INTERVENTION

Outcomes	MOTHERS (FEMALE)							FATHERS (MALE)							DiD (ALL)
	Control			Intervention			DiD	Control			Intervention			DiD	
	BL	EL	Diff	BL	EL	Diff		BL	EL	Diff	BL	EL	Diff		
PO1a. Increased practice of safe CFM															
Disposal of children's faeces by caregivers to latrine compared to other locations	17.6%	23.7%	6.0%	6.8%	8.8%	2.0%	-4.0%	13.6%	18.8%	5.1%	8.3%	11.1%	2.8%	-2.3%	-3.9%
Caregivers self-report "almost always" or "always" dispose faeces to latrine	26.7%	14.6%	-12.0%	12.0%	15.6%	3.6%	15.6%	17.2%	23.8%	6.6%	15.6%	26.1%	10.5%	3.9%	10.9%
Caregivers self-report on community child faeces disposal location (to latrine)	11.1%	2.4%	-8.7%	4.0%	13.3%	9.3%	18.0%	0.0%	14.3%	14.3%	9.4%	8.7%	-0.7%	-15.0%	6.0%
Increased use of tools to move children's faeces	60.0%	68.3%	8.3%	65.3%	53.3%	-12.0%	-20.3%	65.5%	61.9%	-3.6%	53.1%	47.8%	-5.3%	-1.7%	-29.8%
Child open defecation reported by caregivers**	68.9%	79.8%	10.9%	89.8%	92.7%	2.9%	-8.0%	79.3%	83.6%	4.3%	87.5%	85.7%	-1.8%	-6.1%	-13.0%
Direct use of latrine by child	40.0%	63.4%	23.4%	51.0%	73.3%	22.3%	-1.1%	65.5%	66.7%	1.1%	68.8%	60.9%	-7.9%	-9.0%	3.8%
PO1b. Consider latrine best disposal option															
Caregivers attitude that disposal of children's faeces to latrine is the best option	58.6%	52.4%	-6.2%	53.1%	56.5%	3.4%	10%	58.6%	52.4%	-6.2%	53.1%	56.5%	3.4%	9.6%	21.3%
Caregivers attitude that disposal of children's faeces to latrines is easy	51.7%	66.7%	14.9%	46.9%	69.6%	22.7%	8%	51.7%	66.7%	14.9%	46.9%	69.6%	22.7%	7.7%	19.4%
PO1c. Understand the need to manage children's faeces															
Caregivers attitude that disposal of children's faeces to latrines is important	96.6%	81.0%	-15.6%	96.9%	95.7%	-1.2%	14%	96.6%	81.0%	-15.6%	96.9%	95.7%	-1.2%	14.4%	6.5%
PO1d. Increased awareness of the health risk posed															
Caregivers knowledge that children's faeces is as harmful as adults	68.9%	63.4%	-5.5%	90.0%	77.8%	-12.2%	-6.7%	79.3%	61.9%	-17.4%	87.5%	82.6%	-4.9%	12.5%	0.5%
PO2a. Develop positive attitudes and an intention to practice															
Caregivers who report fathers' involvement in CFM as more than never	84.4%	85.4%	0.9%	86.0%	88.9%	2.9%	2.0%	96.6%	95.2%	-1.3%	100%	87.0%	-13.0%	-11.7%	-3.9%
Caregivers who think fathers' involvement in CFM is important	77.8%	82.9%	5.1%	92.0%	91.1%	-0.9%	-6.0%	89.7%	81.0%	-8.7%	87.5%	100%	12.5%	21.2%	4.0%
Caregivers who think fathers in their community are involved in CFM	24.4%	65.9%	41.4%	32.0%	77.8%	45.8%	4.4%	62.1%	61.9%	-0.2%	81.3%	87.0%	5.7%	5.9%	4.3%

6.7. VILLAGE LEADERS AND ELDERS

The pilot intervention was not specifically designed to engage with village leaders or elders in delivering the intervention. Although this remains an important recommendation based on the formative research, the pilot activities were constrained and thus focused on directly engaging with parents and did not include activities specifically targeting leaders and elders.

Despite this, interviews with village leaders and elders were conducted, in part to determine whether there had been any spill over change to their attitudes and awareness about CFM.

The village leaders from intervention villages were supportive of CFM piloting messaging. The data indicated that Chiefs, leaders and elders were considered, by themselves and others in the village, to be appropriate agents to involve in CFM training and promotion. This is because they can reinforce the message of parents' roles and responsibilities in safe CFM, but they also feel some responsibility to support health outcomes for children in their villages.

> *"It* [CFM training] *is relevant* [to us leaders]*. Because, as I have said earlier, if we did not put the poo in the right place, it will cause sickness to our children." C-Barana-Catechist-EL*

Chiefs mentioned the CFM pilot could help parents to become more knowledgeable and motivated about safe faeces disposal, while improving their children's health. Additionally, leaders mentioned seeing improvements in community advocacy for safer disposal of children's faeces.

> *"I think it's very important because it keeps on reminding the families on how to live healthy and care for our children" Baloi-Chief-EL*

> *"The community are advocating to do the right thing with their young children's poo". Kotawa-Chief-EL*

> *"This kind training is very helpful because some of as in the community do not know about what we did is right or wrong or what is the direct impact of our doings." Ghabughase-Chief-EL-F*

Leaders also considered the training and activities provided during the CFM intervention to be useful in reinforcing key sanitation messages that may have been forgotten or misunderstood during the CLTS intervention – that having a toilet or progressing the construction of one is considered a necessity by community leaders.

> *"Yes, since the last group came a few months ago, I've seen how some of our families try to adopt and follow what was shared on how to properly manage our toilets and not defecate all over the place." Marumbo-Catechist-EL*

> *"I think it's due to the fathers hearing about a lot of children experiencing diarrhea and due to the constant visits by the LLEE that emphasized on the importance of having a toilet" BaranaVG-Womens Group Member*

6.8. PROCESS MONITORING AND CLTS PRACTITIONER FEEDBACK

To assist in refining the intervention so that it can be easily adopted by practitioners, process monitoring was conducted. This constituted feedback by participants about the process of the intervention, reflections by the CFM intervention facilitators, and feedback from CLTS practitioners and stakeholders (after consultations on the intervention).

A summary of the participants reactions and key observations from facilitators about Session A are described in Table 13, and the same for Session B in Table 14.

CFM facilitators described the implementation of activities as easy to follow. They noted there were some difficulties presented for some participants in session A with limited reading and writing literacy, as this activity required some of both reading and writing.

TABLE 13: INTERVENTION SESSION A - FACILITATORS AND PARENTS REACTION

Activity / component	Facilitators' observations and opinions (summary)
Overall	· Participants were curious about the workshop activities. · There was a good turnout of participants who showed interest in the workshop content and activities. · When women only participated in the discussion, they feel they can speak freely otherwise male often dominated the conversations. · In the presence of a majority of women, some men decided to leave the session early
Session Introduction	· Facilitators noted this aim of the workshop was well-understood and well-received by participants
Children come first (drawing)	· This was an activity and engaging among the participants. Promoting talking between them.
Video	· The video attracted participants' attention · The video was emotionally appealing to attendees.
Role Play	· The most fun activity reported by facilitators based on parents' reactions. · Promoted confidence in safe CFM behaviours
Discussion	· Participants were looking forward to the next visit

The participation of fathers also presented challenges in some situations, requiring very skilled facilitation and suggesting that some separate male and female discussion may be helpful in some situations.

> *"I have so much to say today but because my brothers were also present, I can't speak out. However, if it was only women, I will dominate the discussion." – Mother, Kotawa-Verahue*

After implementing session B facilitators described most of the activities as easy to follow and the challenge was related to the final meeting with community leaders, as they are busy and devoting time to meeting was difficult, and therefore often informal.

TABLE 14: INTERVENTION SESSION B - FACILITATORS AND PARENTS REACTIONS

Activity / component	Facilitators' observations and opinions (summary)
General Feedback Session "B" Results	· Participants from session "A" attended also session "B" and were highly engaged. · Low turnout of fathers in this session. · Participants felt encourage and empower to look after their children health by building toilets · Plan commitment was challenging for them for writing and reading (illiteracy levels) · Lack of toilets were named as a barrier for CFM practice; however, participants were motivated to act.
Semi structured discussions on CFM behaviours	· Facilitators noted this activity triggered CFM discussion among participants. They were highly engaged and really want to build new toilets.
Video	· This activity reinforced sessions "A" activities but also appealing emotions about nurturing and protecting children
Household commitment	· The commitment attracted participants' attention but still a bit shy, sometimes writing is challenging for them. (Illiterate)
Meeting with village leader	· This activity reflects chiefs' desire to have more sanitation programs in their villages. However, these meetings were more about informal conversations prior to workshop sessions rather than a plan or structure meetings.

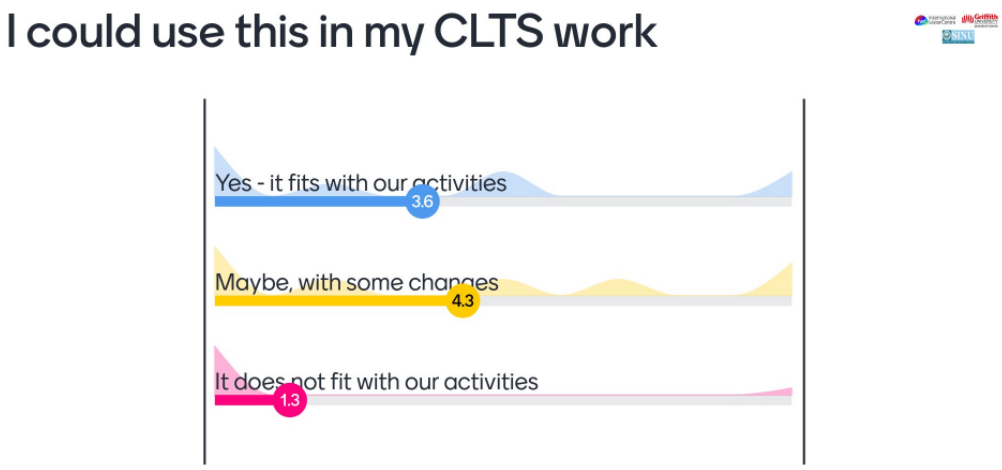
Participants reported that the activities facilitated good discussions, appealed to parents' emotions, and motivated them.

> *"The people running the training were very good at implementing the training and it is very interesting to listen to them." Ghabughase-Mother-EL*

Consultations with CLTS facilitators involved discussing research findings of the formative research, seeking specific input to the design of an intervention and reviewing intervention resources and activities.

During a workshop with facilitators, they were asked whether they could use this CFM intervention in their CLTS programs (Figure 27).

FIGURE 27: FEEDBACK ON THE USABILITY OF THE CFM INTERVENTION, FROM CLTS FACILITATORS IN SOLOMON ISLANDS



During further discussion, two main reasons were given for the interest to use the CFM intervention:

- Open defecation by young children has been frequently observed by CLTS facilitators and recognised as not being currently addressed by the CLTs activities, and
- CLTS involves follow-up visits to re-enforce and continue to promote safe sanitation, however these are mostly unstructured, and facilitators would prefer to include some structured activities to 'anchor' their visit to the community. Having specific follow-up activities to conduct would also provide greater motivation to facilitators to conduct follow-up visits.

7. CAN AN INTERVENTION BASED ON UNDERSTANDING PSYCHO-SOCIAL DRIVERS & SOCIAL NORMS IMPROVE CFM BEHAVIOURS IN SOLOMON ISLANDS?

Following the first 'formative' phase of research (Sanderson et al., 2021), this phase of the research sought to design behavioural intervention activities targeted at promoting safe and equitable child faeces management (CFM), that build on the ways-of-knowing and communication channels relevant to rural Solomon Islander communities for those activities, that target parents, communities, village leaders, and are adoptable by CLTS implementers. This phase also sought to evaluate the effects of those intervention activities on parents and community members' knowledge, attitudes and practices.

The research developed a theory of change to guide the development of the CFM intervention, ensuring that the intervention activities addressed specific determinants and barriers, and were designed to link to specific desired outcomes and longer-term impacts. The focus was on psycho-social determinants together with the suggestion that simple and common 'tools' to overcome existing barriers. Using a theory of change also helped to broaden the evaluation of the intervention from only assessing the change in the primary outcome behaviour (safe disposal of children's faeces), to include assessing specific changes to determinants of this behaviour, or short-term outcomes, in particular psycho-social factors (as recommended by Aunger and Curtis (2016); Peters, de Bruin, and Crutzen (2015). Thus, the pilot measured changes in attitudes, motivations, and knowledge as well as practice.

The outcomes of the project were evaluated based on two groups of villages (control and intervention villages), as discussed further below. Although the villages were allocated to these groups based on whether the CFM intervention was piloted with them or not, we recognise there are many other differences between villages – each is unique in its social and environmental histories and situations, which affects the way people choose to, or are able to, respond to such interventions. To overcome these variations in village contexts, the pilot would need to be expanded to a full trial, with a much larger number of villages. Before investing is a large-scale trial, there is value in using the resources available to pilot test a CFM intervention – this allows testing for immediate and short-term responses and outcomes arising from an intervention and includes assessing the implementation processes – both types of assessments are used to further refine the intervention and are important steps in the development of interventions.

Similarly, some parts of the theory of change for the developed for the intervention were not tested through this pilot study; these include the long-term impacts of the intervention and changes to national government policy and the implementation practices of CLTS facilitators. The stakeholder engagement conducted throughout the research project was intended to facilitate uptake in these areas, however the time required to realise those longer-term outcomes and impacts as beyond the timeframe of this research project.

7.1. WERE THERE CHANGES IN CFM KNOWLEDGE, ATTITUDES AND PRACTICE?

A range of responses to the CFM intervention was observed across the twelve study villages, with some exhibiting better outcomes than others, and different opportunities and barriers presented for practicing safe CFM.

While all twelve villages were participants in a CLTS program which stipulated regular, supportive follow-up visits on the pathway to achieving broader improved sanitation outcomes, it was evident that this planned follow-up support had not yet been realised for many of the study villages. Therefore, the progress of each village towards ending open defecation was different and, by the time the CFM intervention commenced, none had achieved NOD status. This meant that a significant barrier to practicing safe CFM - access to a household toilet – remained for many families in the study villages.

Through discussions with CLTS implementers and feedback from community members who were motivated to construct a household latrine over the course of the CFM project, it was clear that implementing the CFM activities as part of broader sanitation programming such as CLTS, which relies on consistent message (i.e., that latrines or toilets are important for whole-of-community health and wellbeing) can have the benefit of reinforcement and cross promotion. This can be beneficial to achieving improvements in both CFM and the sanitation behaviours of adults and older children at the same time.

The intervention focussed on the transporting and disposal steps of the CFM behaviour sequence (Biran et al., 2022). For those steps, a range of questions within the household survey and the interviews were used to triangulate parents' CFM behaviours and associate them with changes in psychosocial drivers.

Based on this mixed methods dataset, there were demonstrated improvements in knowledge, attitudes and practice across the whole study population and in different subgroups of the respondents. In particular, attitudes about the importance and ease of using a latrine for child faeces disposal, contributing to outcome PO1b *Parents will consider latrine disposal as the best child faeces disposal option*, increased substantially more in the intervention group than the control group, as did reports of 'always' or 'almost always' disposing of faeces to a latrine. Parents reported feeling *motivated*, and *emotionally connected* to the intervention activities and its messages. The formative research had indicated that these psychological changes were required to support the desired outcome of improved safe CFM behaviours; this is aligned with WASH behaviour theories (Aunger & Curtis, 2016).

The reasons given by parents in support of practicing safe CFM, and for fathers to be involved in CFM, focused mostly on their responsibilities as good parents, to nurture the health and wellbeing of their children, now and for the future.

This intention to practice however, was not accompanied by a noticeable shift in reported practice in the overall study population. This may be indicative of a variation of other village-specific factors influencing CFM behaviours, and/or, the presence of additional barriers to safe CFM practice beyond the psycho-social and faecal-transport tools that were targeted by this intervention. The common barrier of lack of access to a toilet is noted above. For those with access to a toilet, its location being too far was frequently reported by parents. They also reported time-related barriers, such as being too busy and not having enough time for safe CFM, which could reflect a lower value of safe CFM by parents compared with other tasks, and/or the burden of the extra time required to access inconveniently located toilets. Placing additional burdens of time and energy on parents, particularly mothers, is a concern. Given that there is limited capacity for supervision, disposal and toilet etiquette training, in resource poor settings, open defecation for children is often the most practical method as it creates less laundry work for the caregiver and less water utilisation for the household (Gil et al., 2004). This intervention was designed to attempt to influence parents' value of safe CFM, and this measurably improved. The lack of NOD achievement following CLTS implementation created the unplanned barrier of no access to a household toilet. The inconvenience of access toilets emerged more clearly as a remaining barrier – this barrier may also be significantly reduced with successful CLTS implementation.

For parents who did report disposing of the faeces to latrines, the reasons given were illustrative of the motivations and barriers identified during the formative research and formed the basis of the intervention theory of change, and thus illustrative of the messages exposed to during the intervention. In the intervention group, following the intervention there were more parents who wanted their children to have a clean and safe environment to play in, clearly demonstrating a nurture motive. A desire for a clean community also increased in the intervention group compared to the control group; this is related to the motive of affiliation (the desire to fit in and belong with others). These two motives were the base of our intervention, so this provides evidence that the intervention messages were noted, absorbed and made sense to participants.

Interestingly, there was a small but observable increase in the number of parents reporting, after the intervention, that the reason they disposed of children's faeces into the latrine was because it was convenient. This agrees with

the substantial increase in measured attitude of ease of disposal to latrine in the intervention group compared to the control group. Thus, parents who participated in the intervention activities more commonly recognised the convenience of the latrine as a disposal option. This observation gives further indication that once toilets are more widespread amongst households, such as following successful CLTS implementation, disposing of children's faeces into a latrine will not be considered inconvenient.

The target behaviour – disposing faeces to a latrine - for these activities is relatively simple in comparison to other WASH behaviours which are often comprised of a complex of behaviours. Establishing and communicating this as a simple behaviour emerged as an important element of the behaviour change messaging.

There were several reports in interviews from parents about their increased focus on training their young children to use the latrine. This was not strongly reflected in the household survey, with no observable increase in direct latrine use across, however there was a sizable reduction in reported open defecation by children (defecating on the ground outside, in the bush, by the sea or other public places), accompanied by increase in defecation to and use of nappies and diapers.

Further, mothers in the intervention group reported higher levels (compared to reports by fathers, and to the female control group) of direct use of the latrine by their children following the intervention. Researchers elsewhere have found that decision-making on purchasing of diapers and nappies is by a combination of both parents when traditional domestic/breadwinner roles are established, while the decision about when to commence latrine training is mostly the decision of the primary caregiver (Majorin et al., 2019). This might offer one explanation as to the shift away from open defecation amongst young children towards nappies and diapers rather towards the use of the latrines by those children - men manifest their motivation to improve CFM through the mechanism most common to them, supporting the purchase of nappies/diapers rather than latrine training of their children.

In adults, we found that open defecation was still preferred in absence of "proper" toilets, with the sea as the most common disposal location due to its ease of access, convenience, and absence of economic factors. Such high levels of open defecation and lack of access to latrines is common across rural Solomon Islands, where overall 80% of the rural population practices open defecation and only 14% have access to improved sanitation (SIG, 2016). Promoting and achieving the safe disposal of children's faeces to latrines will continue to be a challenge in an environment of such extensive open defecation.

7.2. WERE THERE CHANGES IN GENDER OUTCOMES?

7.2.1. The approach to challenging gender norms

This project intentionally, and with evidence from the formative research phase, sought to challenge social norms around gender roles relating to safe CFM, by using positive messaging to encourage both parents to see the behaviour as their responsibility. Unlike research from Papua New Guinea (Kamundi et al., 2016), this research indicated that at least in these study areas within Solomon Islands, there appeared a low risk of harm to women or mothers if fathers and men are encouraged to take on active roles in safe CFM. There was no evidence that women within the research villages were fearful of backlash, from men or other women (such as older women), or, were concerned with involving men in their families and communities in CFM; in fact, during the formative, baseline and endline activities, women regularly and confidently called for more involvement by men, both privately and publicly (during intervention activities). This provided confidence that a 'Do No Harm' approach that did actively challenge social norms, could be pursued – this is a key principle outlined in the guidance for WASH practitioners in *Shifting Social Norms for Transformative WASH* (Water for Women, 2022). The intervention guidance includes instructions for implementers to pay close attention to gender norms when they are engaging on WASH programs, and to be alert to potential risks that might arise from overtly promoting the involvement of fathers and men in CFM; in this case this intervention is not recommended, and instead greater attention on addressing inequitable gender norms, through targeted gender and social inclusions strategies.

The approach to gender in this intervention was to mainstream it with the CFM activities, rather than conduct gender-focused (not CFM-specific) activities. In part this is because many sanitation programs already include activities specifically targeting broader gender norms and roles, and because of the intention to develop a simple intervention that can be incorporated into existing programs. The mainstreaming approach to influencing gender norms involved improving the voice of women specifically relating to CFM and to parenting young children, and, providing a shared space for parents to talk about a shared domestic issue so that men were more equipped and confident to engage in conversations around CFM. Following the intervention there were reports that women were able to speak more to their husband about the issue, and that within the community it was more acceptable for men to discuss and promote safe sanitation and CFM.

Other important principles recommended by Water for Women (2022) as effective for shifting social norms for transformative WASH include 'holding ourselves accountable', 'understanding and challenging norms around power and privilege', and 'placing the right people at the centre'. Although these principles were published after the completion of this research, a post-hoc assessment indicates these principles were indeed abided.

Regarding holding ourselves accountable, the research team actively sought out and supported the participation of female researchers in the team, including advocating for greater employment of female researchers more broadly. And annual training was conducted with all team members on GESI issues – both relating to female researchers in the workplace and to conducting gender-sensitive research activities in communities. The team's gender specialist examined and influenced the research process, reviewed the results, and challenged the conclusions drawn, all with a gender lens.

Regarding understanding and challenging norms around power and privilege, the formative research was designed to understand these norms in relation to CFM, and based on this understanding, the intervention sought to challenge these norms (safely). The formative research indicated there was strong gender-based norms in rural communities around domestic labour, for example, in almost all cases men in families would not undertake domestic tasks such as clothes washing. However, responsibilities around childcare were seen to be much more shared or were acceptable to be shared. The motivations for childcare around nurture and disgust were shared between men and women. Many expressed how times were changing – that in the past while men might have been shunned for being involved, now the expectation is that they are involved. However, some expressed concern men were more troubled by alcohol and drugs nowadays, and this was associated with their neglecting their responsibilities.

Rather than accepting that CFM was a role predominantly undertaken by the women of the household and focusing the intervention on improving the safe CFM practices of those who currently have CFM responsibilities, the project intentionally addressed the motivational activities towards parents/caregivers. This included the clear message that safe CFM is the responsibility of parents, who are both men and women, rather than suggesting that men should be doing a female role. In this way, the program seeks to challenge traditional heteronormativity that wasn't necessarily held tight in modern times by the communities anyway.

This project, and the design of the intervention, used a strengths-based approach which focused on parents performing safe CFM – these placed parents (who were both men and women) who already practice safe CFM, at the centre of the approach. The project also utilised positive role models in the messaging and behaviour change activities – fathers who spoke openly and emotionally about their children, their practices, and the reasons they believed in practicing safe CFM. This is the fourth of the principles recommended for shifting social norms for transformative WASH (Water for Women, 2022).

However, the assessed changes to safe and equitable CFM practices (summarised below) indicate that more is needed – there were several demonstrated improvements in attitude but less evidence of practice change, and it is unclear how sustained those changes will be over time. It is possible that the approach to influencing gendered CFM norms described above were insufficient to substantially change practice, it is also possible that other, non-gender-related barriers, also, or instead, emerged as the main reasons safe CFM was not more widely adopted.

7.2.2. Effects of the intervention on gender-related CFM

In this pilot study, gender-related outcomes were quantitatively and qualitatively assessed before and after implementation of the CFM intervention.

The results in terms of the practice of safe CFM were variable. There was a small reduction in parents reporting involvement of fathers in CFM, however there was increases in attitudes that such involvement is important, and that fathers in their community were involved. There was a persistent message across the study that assistance by fathers was acceptable, but normally only when mothers were busy or absent. Nonetheless, sharing of responsibility was the most common reason given by parents of both genders for thinking it was important for the male to be involved in CFM in their family.

In terms of the other determinants relating to attitudes and knowledge, the research found that men in the intervention group demonstrated substantially larger improvements in the attitude that fathers' involvement is important, compared to women in the intervention group, and to the control groups. This was also true of the attitude that disposal to latrines is easy. It was also clear that more men increased their knowledge about the harm of children's faeces in the intervention compared to women. Men in the intervention group were more disparaging about the behaviours of others in the community with respect to faeces disposal, than were the women and the control groups, indicating an overall decrease in a perception of the spread of the behaviour. These measured differences in the male cohort demonstrate some important areas where behaviour change approaches might diverge for different genders in this context, though additional testing would be required. For example, it may be that a more educational approach would be effective with men, given the benefit observed in the measured knowledge outcome. Conversely, affiliation may not be as motivating for men as it appeared to be for women.

Some parents suggested culture was a leading reason for CFM to be the responsibility of mothers, and this was raised by both men and women. This includes a perception that culture or kastom dictated a man should not be involved in CFM and doing so may lead to witchcraft or black magic outcomes. However, there was some indication of changing social gender norms related to CFM – these were not initiated by the intervention activities, but these activities reinforced these changing attitudes and beliefs. A number of fathers and mothers suggested that the involvement of men in childcare had changed over time, sometimes in response to the presence of the Church. Following the intervention, women reported greater confidence to discuss these changes with male family members.

7.3. WHAT WAYS-OF-KNOWING AND WAYS-OF-SEEING WERE EFFECTIVE?

The intervention activities were designed to make use of locally appropriate ways of seeing and knowing. Based on the formative research (Sanderson et al., 2021), priority was placed on visual and tactile activities, media and resources shared by local people (such as role-modelling and video storytelling), and less on written information that required comprehension.

The activities placed parents together in a shared setting intentionally as a way of encouraging collective seeing and knowing, in the hope the information would be translated, as needed, to appropriate forms by participants and shared. *Tok stori*, as defined by Sanga, Reynolds, Paulsen, Spratt, and Maneipuri (2018) is a range of activities including jokes, gossip, and anecdotes as well as storytelling traditions, that engage people as groups and that is central to Solomon Islander village life and custom (Talanoa and Development Project, 2005). In this sense, by inviting participants into the workshop space, encouraging discussions, and sharing stories through the video and roleplay, and through conducting the entire process in local language, the facilitators were inviting *tok stori* to occur around the topic. It may be, given this context, attempts by cultural outsiders to lead these activities would require a higher level of skill to be able to defer to and encourage local practices to dominate the engagement process, in comparison to facilitators who can engage on this level.

By also inviting the primary agents of change in CFM, i.e., mothers and fathers, to undertake this workshop together, the activities sought to facilitate a publicly open but safe space in which to discuss a topic normally regarded as a household topic (Biran et al., 2022). Whether this was effective or not is circumstantial, as some (female) participants still reported not being as vocal as they would like in group discussions because their male relatives were present. However, others reported that discussions were more open as a result of the intervention.

The role and value of other change agents, such as grandmothers, chiefs and health professionals, in effecting behaviour change outcomes for CFM, is an area of interest that was indicated in the formative research, but not properly explored in this pilot.

The sequence of the intervention was intentional – firstly to get parents foregrounding their children and the love they hold for them; next triggering parents emotionally with the video that included connections between nurturing children and the target behaviour; and finally, the role play to encourage action and facilitate parents connecting the target behaviour to their own situations. The video triggering was intended to help with seeing what to do, while the role play was intended to help with knowing that it could be done.

Community members demonstrated an awareness that CFM is important to know about and discuss more frequently. The message of using toilets as the preferred approach was reinforced and newly married couples or recent parents appeared to be keener to follow CFM workshop advice, potentially reflecting a way of knowing that is still being formed and thus able to be influenced.

CFM workshops were appreciated and well received by community members. The workshops helped participants connect with their emotions through group discussion and activities such as the video and role play which sought to trigger action. However, the need for infrastructure provision is becoming increasingly important, with the lack of “proper” and convenient toilets emerging as one of the most important barriers to adopting or changing CFM and indeed all sanitation behaviours.

The positive responses received by intervention participants about the activities and discussions, both immediately after the sessions and in endline monitoring efforts, indicate people felt good about discussing the program and the topic, had fun and were amused by some of the activities, and were more inclined to speak. There were no negative emotional responses to the intervention activities. It is documented in behavioural research that when people feel good while being exposed to intervention messages (as was described for activities such as the role play and the video), their attitudes are more approving, and they tend to be more open to change (Borden & Suggs, 2019; Guan & Monahan, 2017).

The activity design process was intended to be inclusive of many different perspectives, from researchers with significant experience in behaviour change research and WASH behaviours, field-based staff with exposure to the target communities on the ground, gender expertise from within Solomon Islands and outside the country, and CLTS implementers and policymakers both inside and outside Solomon Islands. Further, as mentioned, the perspectives and words of community members themselves was incorporated into the intervention activities and resources (in particular the motivational video). Three implications can be drawn from this. Firstly, including perspectives both internal and external to the Solomon Islands was more likely to bridge the gap between local epistemologies and ways-of-knowing, and global bodies of knowledge on behaviour change more broadly. This two-way sharing of knowledge was important for a more complete outcome. Secondly, including CLTS implementers and policymakers in the design process may result in it being more likely that the findings of the research would be adopted on a larger scale. Finally, feedback from participants in the intervention highlighted how important it was to see people just like themselves role-modelling, talking about and demonstrating safe and equitable CFM behaviours. This allowed participants to identify with the messages being promoted and imagine themselves into that role.

This research didn’t use fear (of poor health consequences) or shame, because behaviour change theory suggests that for effective behaviour change based on fear (or shame), the audience must (1) perceive a severe threat (2) be able to link that threat to themselves (3) believe there is an effective response to the threat (4) believe they

themselves are able to enact this response (Witte, 1992). There is evidence to suggest that in instances where the first two criteria are met but the final two are not, behaviour change communication is unlikely to be effective, and may even have negative consequences (Peters, Ruiter, & Kok, 2013).

7.4. LIMITATIONS

As noted above, the study was designed to pilot a CFM intervention that could be integrated into sanitation programming, such as CLTS. the decision to pilot, rather than trial the CFM intervention was two-fold (i) resource and time constraints required to conduct a rigorous trial were beyond the scope of this research project, and (ii) before investing in costly trials, a pilot provides important feedback on the immediate and short-term responses and outcomes arising from an intervention – if these do not arise as planned then longer-term impacts are highly unlikely and the theory of change or implementation design may need revision.

A disadvantage of the pilot design is the difficulty in statistically detecting change with confidence, because the smaller sample size is insufficient for the effects of the intervention to be detectable above background variation and effects of other local factors, such as social and environmental histories and situations which may also affect the way people choose to, or are able to, respond to such interventions.

The shorter timeframe of the pilot also means it is not possible to assess the sustainability of any changes detected.

Apart from pilot-design related factors as described above, two additional limitations are important. Due to a lack of capacity amongst existing CLTS implementers to take on the role of implementing the CFM intervention, related in part to covid-19 restrictions limiting the time available for in-community work, the CFM intervention was delivered by remembers of the research team. This created a potential bias associated with respondents giving overly positive feedback during the endline because of the familiarity with the implementers-researchers and a willingness not to disappoint them. This potential bias was reduced by the endline monitoring being conducted by different researchers to those that implemented the intervention.

Finally, amongst the qualitative data there was an indication that at least some respondents in control villages had heard news of the intervention being conducted in other communities. This could have created biases in either direction (negative due to unhappiness with the researchers at missing out on the intervention, or positive due to an increased awareness of the desired outcomes). Of these two possibilities, the data would indicate the latter is more likely, and may help to explain the lack of differences in change between control and intervention villages.

8. Conclusions and Recommendations

Phase 2 of this research project sought to understand whether an intervention based on insights from the formative research could improve CFM. Based on the results of the intervention pilot controlled-before-and-after evaluation, it is concluded that such intervention activities can positively affect attitudes and social norms, however such a standalone intervention may not have affected the practice of safe CFM in the long term.

It was concluded:

- The intervention had a positive overall influence on:
    - Perceptions about safe CFM being important, easy and the responsibility of both parents.
    - Knowledge in fathers about the relative harm of children's faeces compared to adults, dispelling some of the misconception about it being safer.
    - Reducing open defecation in children through using other tools like diapers and nappies.
    - Perceptions about the behaviour of the community as a whole, and the importance of a clean community.
- Nonetheless, it was also found that:
    - Direct positive effects of the intervention on self-reported disposal of faeces to latrines could not be detected, though there are likely several confounding factors that influence this. Some of these factors have been explored (such as barriers to practice and message effectiveness), while likely some remain unexplored.
    - A standalone intervention such as this is unlikely to full address persistent gender social norms present in Solomon Islands society, and norms that are harmful need to be addressed with further work. Nonetheless, the CFM workshops can provide a unique and non-threatening opportunity to reduce this gender imbalance by motivating men to be more involved in CFM for the benefit of their children.
    - Convenience is important, and when CFM behaviours are simplified and convenience is highlighted, this barrier to adoption can be transformed into an opportunity.
    - It is difficult to practice safe CFM in the absence of a functional and accessible latrine.
- Theory of change proved useful in focusing the intervention activities on specific determinants and barriers to the focused behaviour of disposing of children's faeces into latrines, as well as guiding the detailed design of baseline and endline assessment needs.

Following the pilot, the CFM intervention guide has been updated and a more comprehensive implementation guide with accompanying resources has been produced (IWC, SINU & LSHTM, 2022). This is available from www.watercentre.org/research/cfm

The following recommendations, for policymakers, practitioners and the sanitation community, are made based on the findings of this research

1. Attention to and addressing of child faeces management is often a gap in sanitation programming, and it is important to address it to reduce pathogen transmission pathways in communities. Achieving SDG6.2 to end open defecation also requires consideration of the defecation practices and exposures of young children.

2. The use of *tok stori* in community engagement in rural Solomon Islands is a culturally appropriate and participatory way of addressing issues such as CFM.

3. A behavioural approach that targets parents with positive messaging, to influence the psycho-social drivers of their behaviour can be effective in changing perceptions and attitudes, but knowledge of the pre-existing conditions and drivers is required to tailor the approach.

4. Affirmative messages, positive motivations and use of humour compared to negative (shame-based) behavioural interventions should be pursued for CFM where possible.

5. Where possible, CFM interventions should leverage existing programs, policies and approaches. It is important to nuance the approach as mentioned above, but where possible the benefits of building on existing systems, rather than standalone approaches, makes it more likely that the messaging and activities will be adopted and used.

6. Further, such behavioural CFM approaches should be embedded in a broader sanitation program. This has multiple benefits:
    - The benefit of integration and common messaging, where the package of activities mutually reinforce the different messages. For example, a CFM approach that focuses on disposal to latrines also reinforces the importance of households owning a latrine.
    - Follow-up CLTS visits are important to maintain the motivation and sustainability of the sanitation demand approach. Where possible, the follow-up should be structured, allowing implementers and community members to have a clear and achievable direction for these visits.

7. Mainstreaming gender approaches in sanitation programs is important and can be effective. CFM interventions are a good vehicle for addressing issues around gender imbalances because commonly, the care of one's children tends to be both a positive and universally accepted responsibility. Nonetheless, there remains a critical need for strategies and activities to specifically address foundational gender inequalities in society, as mainstreamed gender approaches such as this – on their own - may not address all manifestations of gender imbalances.

8. Theories of Change, that are specific to a program or intervention are strongly encouraged – they provide a participatory way to sense-check that programs and interventions contain sufficient and appropriate activities to address key determinants that underly desired behaviours. And they guide program-specific monitoring approaches to ensure programs can measure resultant change.

9. Further research is required to investigate the effectiveness of targeting other agents of change for improved CFM outcomes, such as grandmothers and chiefs.

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