"It was like we prepared for a battle that never came!"[1]

EVALUATION OF SAVE THE CHILDREN'S COMMUNITY CARE CENTERS IN DOLO TOWN AND WORHN,

MARGIBI COUNTY, LIBERIA

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[1] Focus Group Discussion with CCC Staff

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Acronyms

CCC	Community Care Center
CDC	U.S. Centers for Disease Control
CHT	County Health Team
ETU	Ebola Treatment Unit
EVD	Ebola Virus Disease
FGD	Focus Group Discussions
gCHV	general Community Health Volunteers
GOL	Government of Liberia
HCW	Health care worker
IFRC	International Federation of the Red Cross
IMC	International Medical Corps
IPC	Infection Prevention and Control
KII	Key Informant Interviews
MoH&SW	Liberian Ministry of Health and Social Welfare
OFDA	Office of U.S. Foreign Disaster Assistance
PHC	Primary Health Clinic
PPE	Personal Protective Equipment
SCI	Save the Children International
WHO	World Health Organization

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We would like to thank Save the Children International for the extraordinary steps that it took to ensure that both its Ebola response, and this evaluation process was successful. We are particularly grateful for the attention, support, and energy that it focused on ensuring that this rapid evaluation initiative was successful. For their time, we thank the patients, caregivers and other community members in the Dolo Town and Wohrn communities, SCI staff members and volunteers; and the Liberian government and INGO representatives involved in the Ebola response in Margibi County. We thank our field team leaders, Edwin Moses Chea and Dexter Merchant Jr. for the time and energy that they put into training a novice research team staff, coordinating a complex and detailed healthcare delivery study, and for their timeliness and accountability. We appreciate the rapid, detailed, and excellent data collection efforts achieved by our research assistants. We conclude these acknowledgements by thanking the SCI staff in Monrovia for their efforts with coordination. We extend our regards and appreciation to all of these participants in this study, and wish best wishes for future healthcare endeavors in Margibi County.

Executive Summary

This report documents how Save the Children International (SCI) responded to the West African Ebola epidemic in Liberia during 2014/2015. Specifically, it analyzes how Community Care Centers (CCCs), built and run by SCI in Margibi County, were conceptualized, developed, operationalized, and modified as the crisis unfolded. As part of a large-scale investment in the Ebola response, CCCs reveal the potential but also the tension between rapid response to urgent public health needs in crisis conditions and long-term health systems strengthening goals and investments within international development and humanitarian assistance. Through the CCC model and other aspects of SCI's Ebola response, we found that SCI provided two excellent interim CCC structures, engaged with local and government health sectors, supported survivors, created the conditions for the restoration of basic clinical services, and raised awareness. However, we also found that, due to issues with project scope and the speed of implementation, it is unlikely that the CCC program itself had a marked impact on the course of the Ebola epidemic in Margibi County.

SCI's CCCs were funded by the U.S. Office of Foreign Disaster Assistance (OFDA) and were open for approximately 6 months: Dolo Town CCC opened on November 17, 2014, while Worhn village CCC opened on December 5th, 2014, and both facilities were scheduled to close in May, 2015. During this time period, the CCCs triaged or provided care to 364 documented individuals, including 250 individuals who were triaged but not admitted, and 114 individuals who were admitted and tested for Ebola across both CCC catchment areas.

In interviews, surveys, and focus groups in SCI CCC catchment areas, County Health Teams (CHTs), SCI and CCC staff, and community members consistently commented that the SCI CCC model was implemented too late to impact the course of the Ebola epidemic in Margibi County. However, the data also indicate the sheer competency of the CCCs – in particular the provision of a safe and supported context for Ebola triage, testing, and referral – creating a context for health systems reopening and revitalization. This may have led to public health protective effects by encouraging Margibi county residents to seek healthcare from both primary healthcare and CCC facilities; dispense with concealment behaviors, and engage with the county health system with a renewed level of confidence.

This evaluation found key **strengths in SCI's CCC model and implementation**:

- Save the Children's negotiations to establish the CCCs may have strengthened the relationships between the Ministry of Health and Social Welfare (MoH&SW), the County Health Team (CHT), and local hospitals and Primary Health Clinics (PHCs), especially in terms of local institutional and epidemiological surveillance and oversight.
- The process of establishing the CCCs in partnership with the Ministry of Health and Social Welfare (MoH&SW) and the County Health Team (CHT) has provided the operational basis for a broader strengthening of local Primary Health Clinics (PHCs) throughout Margibi County, currently outlined in a new 3-year MoU between these parties.
- Staff at CCCs and local clinics received robust training and supervision in IPC methods that will likely transfer to heightened standards of care in PHCs and hospital facilities.
- The CCCs achieved the following aims:
    - Decreased the issue of fear and stigma in local communities by providing testing and documentation that proved individuals *do not* have Ebola.
    - Localized the experience of isolation, testing, and referral in ways that increased community trust and acceptance of Ebola prevention and control measures.

- Expanded access to healthcare by creating a 'protective buffer' between the local community and primary healthcare facilities and hospitals during the end of the epidemic.
- Helped strengthen referral practices between healthcare institutions in Margibi County.
- Were well-designed and staffed, sanitary, and accessible to the community. As a result, the CCCs were regarded as a "clinic" rather than as a 'holding center.' This was consistent with the preferences of the Liberian Ministry of Health and Social Welfare (MoH&SW), the County Health Team, SCI staff, and local community members.
- Were viewed positively by patients and their caregivers.
- Helped to treat infectious disease issues like pneumonia, malaria, and underlying bacterial infections with medications, and respond to other diseases by providing triage, testing, referral, and community education.
- Provided community caregivers (mainly family members) with controlled access to patients and appropriate on-site training in Prevention and Control (IPC) methods.

This evaluation found key **lessons to be learned** from the CCC model during the Ebola epidemic:

- When the CCCs were first built, they were little trusted and little used by the community. This is a result of a lack of community engagement and education during the CCC construction process. Social mobilization is a key factor in CCC success.
- If one compares the CCCs to a hypothetical flexible, rapid, mobile response structure with rapid testing facilities that can reach out to remote rural areas, the CCC is an inferior model that requires expensive investments of time, infrastructure, and labor. These investments can divert organizational attention from community-based responses to ongoing epidemic trends and community needs.
- National governments may mandate that SCI expand its CCCs beyond intended structural investments, prolong full-staffing beyond that which is required to meet demand, and prevent the closures of ETUs and CCCs. The CCCs are now closed and are in the process of being decommissioned; but it is important to recognize that partnerships with the MoH&SW significantly impacted project scale and duration in ways that were unanticipated during CCC planning phases.
- Local government structures like the CHTs have the capacity to disrupt SCI's efforts at community health education by strictly controlling the recruitment and hiring of general Community Health Volunteers (gCHV). This national policy imposes substantial limitations on INGOs' flexibility in recruiting, training, and employing staff for healthcare, health facility management, and public health education.
- CCCs are intended for emergency conditions of epidemic escalation. The presence of CCCs under non-emergency conditions may impact local healthcare markets.
- Under non-emergency conditions, the clinical care costs associated with the suboptimal level of care at CCCs (e.g., long waits for testing, no access to "wet" healthcare treatments like intravenous medications) may not justify the public health gains achieved.
- CCC operations that exclude the delivery of IV fluids are not consistent with current research on Ebola virus treatment. Current research demonstrates that the early administration of IV fluids to Ebola patients can markedly improve survival. The limitations of CCC IPC measures need to be balanced against current knowledge about infectious disease treatments and outcomes, and IPC measures taken for risk management may need to be re-calibrated on an ongoing basis against known and ongoing clinical research and clinical outcomes throughout the period of implementation.
- Under non-emergent conditions, the CCCs were redundant with the ETU operating in Margibi County.

Looking to the future, it is necessary to consider the value of CCCs in the context of what they can and cannot do:

- The process of establishing the CCCs in partnership with the Ministry of Health and Social Welfare (MoH&SW) and the County Health Team (CHT) has provided the operational basis for a broader strengthening of local Primary Health Clinics (PHCs) throughout Margibi County, currently outlined in a new 3-year MoU between these parties.
- If a "CCC + ETU model" is introduced early in an epidemic, CCCs and ETUs can form a frontline for epidemic response community-based triage, testing, and referral to secondary health facilities whose operation parallels public healthcare infrastructure. This can allow primary healthcare facilities to remain open, protect national healthcare workers (HCWs), and inhibit community-based behaviors like hiding the sick; as well as facilitate reporting, surveillance, and transparency. This can improve *overall* morbidity and mortality rates across the healthcare system under epidemic conditions.
- Community engagement and community mobilization is vital for the success of the CCC model. Community engagement activities need to take place throughout the process of site identification, construction, and opening.
- The CCCs studied in this case required substantial investments in WASH, sanitation, infrastructure, staffing, training, and community outreach. Future CCCs will have to accept the tradeoffs associated with providing a lower standard of care than conventional clinical services to its patients in a context of high-cost investments.
- Save the Children's experience in Liberia suggests that CCCs will not be able to operate as a mobile rapid response structure unless rapidly worsening epidemic conditions justify the clinical tradeoffs and increased risks that the CCC model poses. To be more rapidly deployable, changes in design and protocols may be needed, possibly including attaching CCCs to PHCs. The specific characteristics of an epidemic like an emerging, unidentified zoonotic disease may justify the involvement of a CCC, while a local outbreak of cholera may not justify such an intervention. This question will require further review.
- Regardless of the intent that CCCs offer a "mobile" response, community members who live in contexts of weak health systems are likely to regard CCCs as much-needed permanent supplements to existing weak health infrastructure. A more mobile CCC model that deploys tents, ambulances, and contact tracers may be more appropriate, but it also may be less popular, and less supported by the government.
- By the standards of this epidemic, the financing, planning, and construction of CCCs occurred on a slow timeline that failed to keep pace with changes 'on the ground.' In order to offset timeframe and logistics costs, SCI may need to invest in standing rapidly deployable CCC "kits" (following the MSF model). This will result in a different standard of IPC protocols.
- CCCs were introduced after local communities had engaged in their own processes of identification, triage, and isolation/quarantine. It is likely the case that these practices, along with robust behavioral changes and adoption of IPC protocols at the community-level, slowed or stopped the epidemic in Margibi County. SCI requires a strategy for supporting community-based response during epidemic outbreaks prior to the provision of ETUs and CCCs.
- SCI requires the legal and financial capability to pay local workers hazard pay to conduct community identification and outreach in the midst of an epidemic. National and regional policy issues need to be addressed in partnership with national and county government officials.

1. Introduction

The Ebola outbreak in West Africa has been the deadliest to date, killing over 11,000 people, more than all previous known outbreaks of the virus combined. While the first case occurred in Guinea in December 2013, the extent of the problem only came to light in March 2014, when the World Health Organization (WHO) reported an outbreak in Guinea with suspected cases in neighboring Liberia and Sierra Leone. The Liberia outbreak began in Lofa County, and emerged sporadically in March-June 2014. Most presumed that the epidemic was contained in Liberia until the epidemic surged in July 2014.

Save the Children's Liberia Country Office redirected funds to respond to the Ebola Outbreak in July 2014. The WHO declared an international emergency in August 2014, at which point the international community began scaling up its response. In September 2014, Save the Children declared the Ebola crisis a Category 1 emergency.

To respond to the Ebola outbreak, Save the Children developed the Community Care Center (CCCs) model to complement the overwhelmed hospital and Ebola Treatment Units (ETUs) system that was regarded as the priority for Ebola response in Liberia. CCCs were developed as smaller facilities that provided diagnosis, isolation and early treatment. Patients were usually admitted with a caretaker, often a household member or close relative. CCCs sought to provide earlier isolation and care closer to home, thereby reducing transmission and possibly improving outcomes through early care. Save the Children opened the Dolo Town CCC on November 17, 2014, and the Worhn CCC opened on December 5th, 2014.

The objectives of this evaluation are to examine three main aspects of the CCCs:

1. How local communities and County Health Teams perceived the CCCs; how they came to know about CCCs and their involvement in its set-up and design; which aspects of community messaging were successful and which aspects needed strengthening.
2. Whether the CCCs had any effect on Ebola transmission; health outcomes of patients after they left the CCCs.
3. How CCCs were implemented in comparison to the CCC concept that was originally submitted to OFDA and the MoH&SW; which aspects of the CCC were successful and which aspects needed strengthening.

1.1. Background: The Ebola Epidemic in Margibi County, Liberia

Margibi county is made up of 4 districts: Kakata, Gibi, Firestone and Mambah-kaba (est. pop. 237,802). The districts are composed of cities like Kakata, larger peri-urban centers, and smaller villages that are comprised of small clusters of several dozen thatch-roofed homes. The presence of Firestone Rubber Plantation in the county gives the area an unusual settlement pattern relative to other rural areas in Liberia. Firestone attracts significant migrant labor populations to conduct rubber tapping and supportive functions, and provides semi-autonomous healthcare and public health interventions to their labor pool. Dolo Town, the site of the first SCI CCC, is a large town in Mambah-kaba district that is reputed to have 36 internal communities with approximately 17,000 people. Worhn, the site of the second SCI CCC, is a small village that is the capital of Gibi district, and is approximately 90 minutes drive from Kakata, the capital of Margibi Country. Margibi County's healthcare system has been underdeveloped during the post-war period.

According to Liberia's Ministry of Health and Social Welfare (MoH&SW), Margibi was a "hard hit" county in the Ebola epidemic, with 1,373 confirmed Ebola cases, 527 suspected cases, 437 probable cases, and 590 deaths (MoH data, April 17, 2015). The first known case of Ebola entered Margibi in March 2014, when a man who had traveled from Lofa died in the Firestone District Duside Hospital. With support from the U.S. Centers for Disease Control (CDC) and the WHO, the outbreak was initially effectively contained. The Government of Liberia and the MoH&SW anticipated that the outbreak would resolve rapidly in several weeks, as it had elsewhere, and sustained surveillance, but few additional interventions were taken. When the Ebola epidemic resurged in late July in Margibi County, the trend of the epidemic following the trend of the epidemic across Liberia but affecting HCWs and facilities first; then spreading through urban centers, and then transmission to rural areas. Without an effective ambulance service, sanitation and water supply, information, resources, training, or PPE, Rennie Hospital (the only tertiary facility in Margibi) and primary health care facilities were soon overwhelmed, and many closed or refused to accept patients. Ultimately, seventy-one Margibi County health care workers contracted Ebola, and thirty-eight died.

Save the Children played a key role at this phase of the epidemic by providing support to the International Medical Corps (IMC) for the establishment of ETUs, and it later increased the number of staff serving Margibi County from 20 to 250.[2] With the support of INGOs and the MoH, community leaders directed the introduction of infection prevention and control (IPC) measures, community hand-washing stations, quarantines, and holding centers in local communities. All evidence suggests that when the Community Care Centers were conceptualized and designed, Margibi County was in the midst of an uncontrolled Ebola epidemic.

2. Methodology

2.1. Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs)

The research team consisted of one international consultant / lead field researcher, two local field team leaders, and eight data collectors; two additional international consultants contributed to all facets of the work, virtually. The field team conducted 45 key informant interviews to assess qualitative experiences of the CCC initiative's conceptualization, construction, management, and community engagement in Margibi County and Monrovia, Liberia, and remotely (see Appendix A). Key informants were selected based on the basis of unique information, experience, or conceptual linkages with the development and implementation of the CCC model. All held key roles in government, SCI, other INGOs, and the fact that they were directly involved in CCC design and operations, and are authoritative sources for events, process and technical detail. The team also completed nineteen focus groups with 249 participants, including seven FGDs with HCWs, four FGDs with community leaders, and twelve FGDs with community members. In all, FGDs included 111 men and 138 women. (See Appendix B for further descriptive details.)

2.2. Patient Surveys

According to Save the Children's records, 364 people sought help at the Worhn and Dolo Town CCCs, combined, and we interviewed approximately 2/3 of all patients in both communities (see Table 1).

[2] Margibi SCI office recalled staff and began to hire new staff in mid-September. Before this time, there was very little direct community engagement. Additional CCC staff and others were hired in October. Before then, activities were mostly done through CHTs. SCI hired a Liberian community mobiliser (Dec 8), and then mobilization efforts increased.

Table 1: Number of Patients Admitted, Not Admitted, Survey Interviews

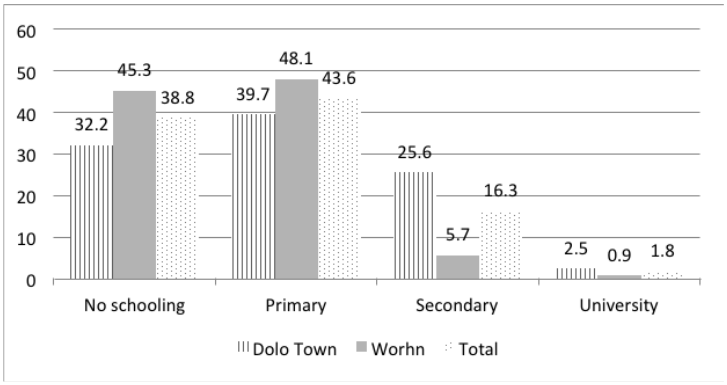
	Admitted	Patients Not Admitted	Interviewed	% Interviewed
Dolo Town	67	126	121	63%
Worhn	47	124	106	62%
Total	114	250	227	62%

In our sample, 41.9% of respondents were patients, and 58.1% of our respondents were caregivers who had brought a family member to the CCC. Nearly all accompanied patients were family members. Among those patients brought to the CCC, 62.8% were children, 21.2% were adults, and 16.0% were elderly (see Annex C for additional socio-demographic data separated by CCC).

2.2.1. Ethnicity and Educational Attainment

Compared to Worhn village, Dolo Town's population has higher educational attainment and greater ethnic diversity, perhaps due to its urban profile. Respondents were mainly from the Bassa (40%), Kpelle (23%) and Loma (12%) ethnic groups, with nearly 25% of survey respondents indicating that they were from another ethnic group.[3] Respondents fell into four main religious affiliations: Pentecostal (52.9%), mainline Protestant (28.6%), Muslim (11%) and Catholic (7%).

Figure 1: Educational Attainment



2.2.2. Gender

Across both communities, 33.3% of our respondents were male, and 66.7% of respondents were female. The skew towards female respondents can be attributed to two likely causes: (a) men were unavailable for interviews due to agricultural cycle; and (b) women constitute a disproportionate part of the sample of caregivers who brought dependents to the CCC. However, we believe that the distribution itself is an accurate reflection of CCC service utilization. We attempted to correct for this imbalance by ensuring the equal representation of men and women in focus group discussions and key informant interviews. There was also a notable gender bias in the patient/caregiver interviewee population, with women accounting for 2/3 of the total patient/caregiver population sampled. Women were more than twice as likely to seek help at the Worn and Dolo Town CCCs; and women were also more than twice as likely to be either patients or caregivers (see Annex C). There was little to no variation in gender distribution across CCC locations.

2.3. Site Visits and Participant Observation

To evaluate if the CCC structures, layout, and capacities were consistent with OFDA and MoH guidelines, the Lead Researcher conducted participant observation and a structured site visit at both CCC sites. As part of these visits, the Lead Researcher interviewed staff, surveyed physical structures, and completed a site visit checklist (see Appendix D). Additionally, to evaluate Save the Children's interaction with the community at a public event, the Lead Researcher conducted participant observation at the Worhn CCC decommissioning event. This included observing Save the Children staff interactions with the Worhn-area community as they explained the closure of the CCC and responded to community concerns.

[3]Americo-Liberian, Gbandi, Grebo, Gio, Mano, Kru, Kissi, Gola, Krahn, Mende/Mandingo, and Vai

2.4. Study Limitations

Our goal was to interview all prospective and admitted patients at both CCCs, but we encountered difficulty in tracing specific individuals due to issues with patient tracing and identification, distance, and erroneous CCC documentation.[4] Although we sought information about mental or physical disabilities, evidence suggests that the data collected was faulty. Therefore, we cannot assess the impact of CCCs on the disabled, nor how disability impacted CCC utilization.

While the CCCs did not formally include a child protection program, Save the Children considers children's input and opinions to be an important part of collecting feedback/data even when programs do not include a child protection component. Due to time constraints surrounding CCC decommissioning, it was not possible to include children's perspectives in a responsible manner, which would have required a more rigorous ethical review of protocols to ensure their safety. Caregivers (mainly mothers) were used as a reporting proxy for understanding children's experiences in and around the CCC. However, children's resources were integrated into the site visit evaluation, and a brief summary of child protection-related findings are included in Appendix E.

3. Findings

3.1. Did Local Conditions Support the Establishment of the CCCs?

3.1.1. The Burden of Disease at the Height of the Epidemic

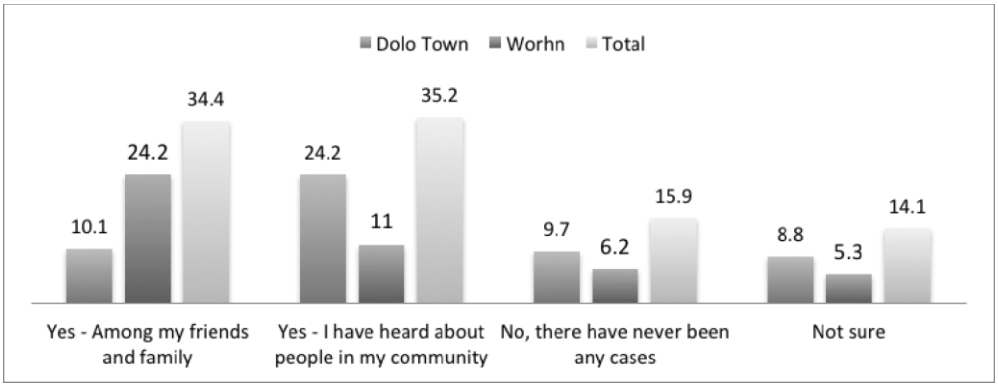
At the height of the epidemic from July to September 2014, **Ebola severely impacted local communities in and around Dolo and Worhn**[5]. In Dolo and Worhn, 34.4% of survey respondents indicated that there had been cases of Ebola among family or friends, 35.2% indicated that there had been cases in their communities, and 15.9% indicated that there has not been any cases. 14.1% of all respondents indicated that they were not sure if Ebola had affected their communities for several complex reasons[6].

[4] Documentation issues included inaccurate recording or misspelling of 18 names of patients in Dolo Town and 13 names of patients in Worhn; and inaccurate recording of 25 home villages and communities in the Worhn catchment area.

[5] Data from a range of informants provided estimates of 160-300 Ebola attributed deaths in Dolo Town and 50 in or near Worhn village. The accuracy of these figures is difficult to confirm.

[6] Nearly 16% of survey respondents did not know if there had been any cases of Ebola *in* their communities, and 14% did not know if there were cases of Ebola among their friends, families, or in their communities. This information gap may be attributed to the following causes: (a) respondents were seeking help from outside of their "home" communities; (b) many cases were hidden from the public; or (c) a good number of respondents who utilized CCC services were not present in their communities at the height of the epidemic, from July through September 2014.

Figure 2: Have there been Ebola cases in your community?



Community-based focus groups and key informant interviews augment this picture of the **burden of Ebola in local communities prior to the establishment of the CCCs**.

> *"The clinic was abandoned. If you had any of the symptoms, you would hide yourself at home and people would avoid you. If you had red eyes, you're vomiting or toileting. But there are so many diseases that have those symptoms, so it was creating confusion for people. If somebody was sick you would give them food with a stick, using a stick to push the food towards them."*—FGD, Community Members

A brisk trade in "Ebola business"—plastics and chlorine—emerged, with local vendors raising prices. Holding centers were called "Ebola camps" in local communities, and **community members in both Dolo Town and Worhn recalled that their communities resembled a war zone, with behaviors resulting from fear, hiding, and distrust of neighbors and outsiders**. The name "Ebola camps" was later used locally to describe the CCCs. During the quarantine period, many Ebola cases were hidden from authorities and community members because referral services from holding centers to hospitals were haphazard; there was widespread fear and uncertainty about the treatment of patients and cadavers at ETUs; and the social and economic consequences of an Ebola diagnosis within a household could be devastating. ***Externally imposed* quarantines were hugely unpopular, and local communities doubted their effectiveness; but *locally imposed* isolation and quarantine procedures may have played a significant role in reversing the epidemic in Margibi County.**

3.1.2. EVD Infection Prevention and Control Before the CCCs Were Built

Prior to the establishment of the CCCs, community-based responses, community holding centers, and the PHC system constituted the frontline of Ebola control in Dolo and Worhn. While Ebola spread rapidly throughout these communities in July and August, entire families were wiped out. Community leaders and village chiefs worked with community members and volunteers to distribute hygiene kits, situate bleach water hand-washing stations, and implement isolation and quarantine. They also spread Ebola prevention messages, such as the 'Ebola 10 Commandments' (Appendix F). With just one or two ambulance services in the county, accessing holding centers through safe modes of transportation was nearly impossible. Household quarantines required extensive community support for fuel, sanitation, food, and health surveillance. There were no local testing capabilities, and information regarding EVD signs and symptoms was flawed. Referral networks between local communities and hospitals were fragmented by the limited operations or closure of the public health system. Communities urgently needed rapid testing, transportation, referral, household quarantine, and community information resources.

"Holding centers were coming up throughout the country [with Ebola]. They were scary. Churches, hospitals, schools, abandoned buildings…holding centers had no food, latrines, nurses, or water. This was an organic way of isolating people. So the CCC model was to empower them to organize this space, and have family visit [to reduce fear]." – KII, SCI Staff

In focus group discussions, community members reported that **there were practical reasons to resist going to quarantines and holding centers**. Quarantines disrupted access to farms and markets, and people couldn't work or get food. In focus groups in Worhn, for example, people knew that "when a mother of a child or children [become] sick, the children will be separated from the mother." Communities installed hand-washing centers, and later introduced an unpopular and painful system of quarantines and holding centers based at schools and government offices (see Appendix G). The practice of isolation is believed to have been effective in slowing the epidemic, but it was also seen as a cruel and terrifying practice that drove cases of Ebola underground, into hiding.

Village chiefs worked with general Community Health Volunteers (gCHVs) to enforce isolation. gCHVs worked reluctantly – reputed to run away from communities that had Ebola. They were sometimes equipped with gloves and long sleeves, and they were supposed to provide food to isolated community members [on sticks], buckets, chlorine, PPEs, soap, and hygiene kits.[7] gCHVs complained that they were paid poorly, and given insufficient protective equipment and training, which led many to quit.

HCWs described gaps in IPC resources within the primary healthcare system. They noted that the absence of infrastructure like vehicles, toilets, incinerators, supplies, and staff training was the primary cause for the spread of Ebola within healthcare facilities, and they recognized that **the PHC system itself was playing a role in the spread of Ebola within local communities.** Without instructions from the government about how to manage the situation, staff at Worhn PHC decided to close its doors.

"Before we closed, we had one man who we thought had Ebola. He came and we gave ORS and sent him home. We had no PPE at the time; we were telling people to not come close to us in the clinic and to wash their hands. But they were not listening. We had to make our own decision; The government was confused. There was no training for staff. We were not sure how many people were going to die." – FGD, Worhn Village PHC

In Dolo Town, the PHC facility remained open, with a tightly reduced staff. Working with a low training and knowledge base (a half-day training course and information from the internet), staff provided ORS and occasional IV fluids to patients as they sought to prevent the spread of infection.

"There was so much bleeding everywhere; people were just messing in the latrine; it was bodily fluids all over the place; we would just throw chlorine all of the walls and floors. We would put everything into bags and burn them." – FGD, Dolo Town PHC

The County Health Team represents the official management of the Liberian MoH in every Liberian county. In Margibi, the CHT was unable to provide full support. The Dolo Town PHC staff commented,

"The CHT was afraid of us. They would come and stay in their car, throwing PPE at us and running away. We had some gloves, boots and PPE but never enough; and they came late." – FGD, Dolo Town PHC

[7] These provisions, supplies by the CHT and NGOs including SCI, were limited during the peak of the epidemic.

3.1.3. The CCC Concept and Save the Children International

According to key informant interviews, the CCC model originated with Francesco Cheechi and Ron Waldman at SCI in late July/early August 2014. Epidemiological models were forecasting pandemic rates of 10,000 new cases per week in sub-Saharan Africa, and SCI was confronting an out-of-control epidemic in Margibi County, where PHCs and Rennie Hospital were unable to keep pace with the demand for beds.

The CCC model was characterized as a "leaky" model that would serve public health by removing infectious individuals from the community, while keeping suspected or confirmed patients in the care of their family members. By removing issues of separation, fear, and stigma from the process of seeking healthcare, and by moving triage, testing, and referral closer to the community, the CCCs were intended to correct flaws in community holding centers. Within SCI, the model was also regarded as a test case for understanding SCI's new medical humanitarian/ rapid deployment capabilities.

At a managerial and organizational level, SCI's field, national, and international offices struggled to keep pace with the epidemic. Despite a recent merger with the emergency medical NGO Merlin, SCI had not completed establishing emergency health units or developed the logistical and material capabilities for rapidly deploying an ETU. As many key informants and humanitarian analysts have noted, just one organization --Médècins Sans Frontiérs—had developed that capacity, which could reportedly be done in 10 days. Key informants across the SCI system described a lack of leadership in the SCI national offices due to continued staff turnover. They observed that there was a lack of health sector expertise and public health leadership in Monrovia, and that SCI struggled to fill knowledge and capability gaps.

SCI compensated for these gaps by rapidly mobilizing a "surge capacity" for Ebola response from the USA and the UK, but key actors regarded the surge capacity deployed to Monrovia as fragmented and inconsistent. One senior international SCI official who was closely involved in the design and implementation of the CCC system in Liberia described SCI's centralized procurement system for labor, financial, and material resources as "bottlenecked" in London. This senior official described a system of distribution that disproportionately allocated labor, finance and materials to the SCI ETU program in Sierra Leone to the detriment of Liberian operations.

From August to September 2014, SCI entered into negotiations over the design of the CCC model with MoH&SW, other INGO partners, ETU designers, and infectious disease experts while it solicited financing from OFDA for the establishment of 10 CCCs in Margibi. Early models envisioned temporary thatch-roof hut structures with mattresses and mosquito nets. During this period, however, **the model changed from 'a temporary holding center structure with limited staff, testing, and transportation access—perhaps once per day' to a 'mini-ETU model' in which fulltime nursing staff were present during the day, and staff and caregivers were provided with full PPE, supportive material, and IPC infrastructure** (SCI KII). SCI and its governmental and INGO partners ultimately determined that the initial concept of a transitional isolation structure that could be deployed in under a week lacked critical IPC safeguards and posed an unreasonable risk to SCI and CCC staff. Key informants also expressed concerns that a 'barebones' CCC model had ethical and clinical implications, and they determined that a 'less leaky' model was needed. The OFDA proposal specified the infrastructure required for the 'mini-ETU model,' and construction began in October 2014.

But importantly, **representatives from the Liberian MoH and the CHT in Margibi reported that they felt there had been an adequate process of consultation**; that MoH and CHT direction had been heard and heeded; and that they had played a strong role in establishing CCC policy. **SCI demonstrated strong ability to respond to changing priorities, governmental leadership, and conditions on the ground during this**

process of negotiation. Many actors were involved in determining the format and priorities for the CCC model, including SCI, OFDA, the Liberian MoH, and the CDC. Health expert negotiations took place, and each held distinct and well-articulated positions regarding public health, clinical care, medical ethics, and the protection of national HCWs. The Liberian MoH prioritized the establishment of large permanent structures similar to ETUs. OFDA regulations imposed some key restrictions on the establishment of permanent structures, and funding expenditures for equipment and ambulances. SCI itself had conceived of small, transient facilities with no more than 15 beds. Other NGOs sought to establish CCCs on PHC land; others felt that this promoted cross-infection with PHCs, and wanted a separate location.

However, changing conditions on the ground also required an ongoing reconsideration of CCC priorities. As the epidemic slowed, it was increasingly difficult to justify exposing HCWs to a heightened level of risk. As ETU capacities expanded, CCCs still in planning stages already seemed to be redundant. Throughout the construction process, planners continued to debate the number of CCC zones (two zones with wet and dry areas vs. three zones with suspect, probable, and confirmed), flow of patients, water systems, types of floors, doors, and roofs, which slowed down construction and implementation. Once construction began, **continuous rotations in senior management complicated coordination between field, national, and international offices**. International expatriates working in the field felt that they were excluded from key meetings held over Skype due to communications and IT technology limitations; while local staff often found themselves confused by conflicting guidelines and mandates. These conflicts slowed down SCI's ability to build and deploy quickly, and to respond to the epidemic at its peak.

3.1.4. Site Selection Criteria

During the period when SCI was planning the CCCs there was a clear justification for a robust intervention to slow down the course of the epidemic in Margibi County. According to OFDA proposal guidelines, SCI was committed to consulting with local communities to identify CCC sites that were in close proximity to communities, were near primary health care facilities, and were established through consultation with community leaders. SCI built the Dolo Town and Worhn CCCs from October-November 2014, during the first phase of construction of what was anticipated to be ten CCCs in Margibi County. The first CCC to open was built in Dolo Town, a peri-urban community within commuting distance to Firestone and Kakata. Dolo has a large market and consistent transportation access to Kakata. Its official population is 8,256, but it lies in close proximity to other large towns, thereby forming a nexus in a broader urban environment with an estimated population of 17,000. The Worhn CCC, was built in Worhn village, a remote rural area with an estimated population of 10,081. While Worhn's official population estimates are larger than Dolo's, it is situated further from urban areas and peri-urban areas, and is therefore regarded as a 'small' and remote rural area. The total catchment of both CCCs was 83,000 Margibi residents, or approximately 35% of the total population.[8]

3.1.5. The Issue of Timing

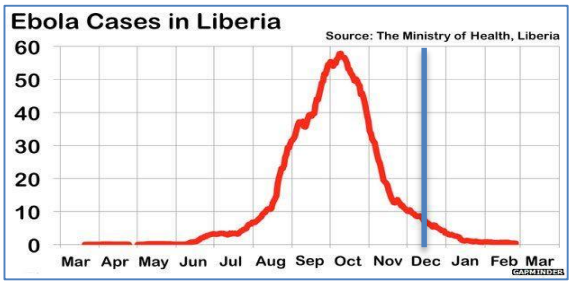
SCI expatriate and local staff and key partners agreed that the CCCs were implemented too late in the epidemic, and 69% of patients respondents to the CCC survey reported that Ebola had either peaked or stabilized by the time the CCCs were opened.[9] The many actors involved, and the diverse viewpoints and sources of resources, were all seen as having slowed down the process of CCC implementation

[8] The Dolo Town and Worhn CCCs had an estimated catchment area of 45,900 and 37,100 respectively. This is based on the total catchment area of the two PHCs next to the CCCs. However both CCCs were meant to serve catchment areas beyond local communities, and the total population served by each was higher as some patients came from outside this immediate area.

[9] 34% of surveyed patients attending to Dolo Town (10%) and Worhn (24%) CCCs believed that Ebola had peaked when the CCCs opened, and 35% (24% in Dolo and 11% in Worhn) believed that the epidemic had stabilized A total of 16% considered that Ebola was still getting worse (10% in Dolo and 6% in Worhn) while 14% did not know (9% in Dolo and 5% in Worhn).

substantially**. The CCC design, construction, and implementation took approximately 18-20 weeks which was far longer than the 10-day implementation that original plans had described** (see Appendix H for Timeline). By the time the SCI CCCs were ready to open, the epidemic curve for the Ebola outbreak had shifted due to the widespread implementation of community-based prevention, identification, and response measures (see Figure 4). **The sole ETU operating in Margibi County, the Kakata ETU run by IMC, had a surplus capacity** from its opening on November 22, 2014, and its own transportation and identification systems were well in place. Due to the perception that there was an excess of clinical capacity within ETUs and hospitals, SCI and IMC attempted to close the CCCs and ETU in February/March, but were instructed by the MoH and the CHT to remain open. SCI honored the MoH's request, and remained open through May 2015. SCI also worked with the OFDA to modify SCI's original proposal from the construction of 10 CCCs to the construction of 2 CCCs with SCI support for PHC and hospital health systems strengthening and expansion of IPC capacity and resources.

Figure 3: CCC Introduction (indicated by the blue line) during the Ebola Epidemic in Liberia[10]



3.1.6. Expectations for Standards of Care

Most agreed that, by design, ETUs could provide a superior standard of clinical care to the CCCs. The CCCs--conceived of as a public health intervention, and not a clinical intervention – were intended to function as a community frontline for triage, testing, and referral, but not as a site for clinical care. Therefore, they did not provide IV fluids, pay clinical personnel to monitor patient health overnight, or provide most primary healthcare services. Over time, planned CCC services and capacity became disconnected from emerging research on supportive care for Ebola patients, which had demonstrated that early intervention with IV fluids could improve outcomes in early-stage Ebola patients[11], which were those patients most likely to seek care at CCCs.[12] The CCC model was designed for a context of epidemic surge, not epidemic decline. The clinical tradeoffs that may have been acceptable or necessary in August

[10] The table, provided by MoH, is slightly inaccurate as Dolo CCC opened Nov 17; Worhn CCC on Dec 5.

[11] The need for IV fluids early in the treatment of IV disease was a matter of some debate between two prominent clinical providers-MSF and Partners in Health. Emerging research supports that use of intravenous therapeutics. (see, McNeil, D. G., Jr. 2015. Ebola doctors are divided on iv therapy in Africa. *New York Times*, January 1. Available at: http://www.nytimes.com/2015/01/02/health/ebola-doctors-are-divided-on-iv-therapy-in-africa.html; and Qureshi, A. I., Chughtai, M., Bah, E. I., Barry, M., Béavogui, K., Loua, T. O., & Malik, A. A. (2015). High Survival Rates and Associated Factors Among Ebola Virus Disease Patients Hospitalized at Donka National Hospital, Conakry, Guinea. *Journal of vascular and interventional neurology*, *8*(1.5), S4; Qureshi, Adnan I., Morad Chughtai, Tokpagnan Oscar Loua, Jean Pe Kolie, Hadja Fatou Sikhe Camara, Muhammad Fawad Ishfaq, Cheikh Tidane N'Dour, and Kezely Beavogui. "Study of Ebola Virus Disease Survivors in Guinea."*Clinical Infectious Diseases* (2015): civ453.)

[12] Earlier in the response, it was unclear if IV and ORS support had a meaningful impact on survival rates. By the time that the CCCs were established, extensive research had demonstrated that early intervention with IV fluids could have a meaningful impact if delivered early to a patient with Ebola.

or September 2014 in order to provide minimal access to community-based isolation, triage, testing and referral were no longer acceptable in December 2014, when a higher standard of care was regionally available.

Local residents' and SCI's understandings of CCC capabilities and responsibilities also shifted in response to changing local conditions on the ground. At the time of our study, when the epidemic was fully contained in Margibi County, community-based focus group participants expected that the substantial resources required to build the CCCs justified shifting its function from Ebola response to primary healthcare. HCWs felt empowered to demand better HCW protections and a higher standard of clinical care from the CCCs.

3.2. Community Engagement

3.2.1. Overview

Prior to the Ebola outbreak, the structure of epidemic management and response in Liberia had changed little since the end of the war in 2003. Epidemics are, and have been, an endemic feature of public health in Liberia. When cholera, yellow fever, or Lassa fever epidemics emerged, state and NGO-run clinics and hospitals coordinated epidemic response through medical humanitarian and MoH&SW networks. Medical humanitarian networks temporarily mobilized community education resources in order to address behavioral issues fueling local epidemic outbreaks, but non-medical organizations rarely became involvement in epidemic control. **Non-medical INGOS like SCI had rarely deployed their social mobilization capabilities for epidemic response prior to the Ebola outbreak**.

During the Ebola epidemic, however, social mobilization for the purpose of promoting community-based IPC measures constituted SCI's first foray into emergency health response in Liberia. This evaluation examined the SCI community mobilization approach, and found that s**ocial mobilization activities were inconsistently applied, but highly successful when they were well supported by the SCI organization**. Specifically, during the early phases of the Liberian Ebola outbreak, SCI followed the lead of key international partners in making decisions about how to prioritize social mobilization resources and objectives. Nearly all of SCI's international partners demonstrated a delayed and disorganized community mobilization response to the Ebola outbreak, and SCI's response was commensurate.

Once the severity of the Ebola epidemic became apparent, SCI coordinated with local, national and international actors to promote community-based mobilization and response.[13] In Margibi County, SCI played an important role in distributing information and resources to local and regional partners. However the scope of the response during this period was limited, due to a lack of public health expertise in SCI's Liberia office, and widespread concerns about staff risk. At the end of 2014, during CCC construction, SCI engaged key stakeholders like CHTs, village leaders, and landowners, but did not engage in community sensitization and education activities to mobilize support for the CCCs. Technical and logistical concerns were prioritized during the construction phase. After SCI opened the Dolo Town and Worhn CCCs, communities demonstrated that there was a lack of community support for the "Ebola camps" by refusing to visit the CCCs. **By February 2015, SCI had deployed a robust community mobilization effort in Worhn, Dolo Town, and other high-risk communities in Margibi County. This reduced fear surrounding the CCCs, improved health-seeking behavior, and enhanced Ebola prevention practices at the local-level.**

[13] A consortium of organizations including SCI, the World Food Program and IMC provided food and non-food items while Concern International and the WHO conducted contact tracing.

3.2.2. Community Engagement Prior to Construction

Local, non-SCI efforts to mount a community mobilization response to Ebola were not successful. For example, in March 2014 the Margibi County Health Team requested US $67,000 from the MoH&SW for the purpose of community mobilization against Ebola, and the request was rejected.

> *"After the March case we had a technical team come from the national level. We were seeing that Ebola was really a community issue. We put a work plan together for community engagement. But they rejected it; it was in April that we made this work plan. It was for a $67,000 budget and it concentrated on the lower end, on Dolo Town. But it was rejected…I think looking back we could have prevented a lot of Ebola deaths if we had done more effective community engagement earlier."*- Margibi CHT Interview

At this time, Ebola was regarded as a medical issue, rather than an issue of general concern. Following signals from the MoH&SW, the CDC, and the WHO, SCI was not engaged in community education and mobilization around Ebola from March-July 2014. In general, local communities were in denial about the presence of Ebola, and both NGOs and local communities lacked the information and confidence to advance a coherent Ebola response strategy. Community members, in particular, reported confusion around recognizing and responding to symptoms of Ebola.

In July 2014, the epidemic surged in Margibi County, and communities developed local mechanisms for outreach in a context of increasing militarization of the response, mandatory curfews and quarantines, and local rumors. Local chiefs, village heads, and town leaders took an aggressive role in implementing Ebola infection control, and a community Ebola Team was established in Dolo Town. SCI also took a more active role, and collaborated with the Margibi County Health Team to provide basic flyers, radio broadcasts, pay town criers to make announcements, and help health volunteers spread Ebola-related messages. Some of these efforts were criticized by community members for promoting distortions and inaccuracies. SCI and local communities improved the quality of community messaging over time[14]. SCI drew upon pre-existing relationships with local communities to mobilize education and support, despite internal staff reductions that were implemented to protect personnel. A coherent community mobilization response was under development from the end of September.[15]

3.2.3. Community Engagement During Construction

While the CCCs were being built, SCI community engagement efforts focused on coordination with local leaders in order to obtain permission to build the CCCs and use community lands. SCI staff struggled to identify appropriate community leaders and community partners during this critical time. They felt strongly compelled to support the County Health Team in order to demonstrate a strong partnership with the MoH&SW in Margibi County. In interviews, some SCI staff suggested that the County Health Team determined SCI's community engagement response, and decided to follow a more restricted engagement strategy. The high-level technical demands of CCC construction, staffing, and training seems to have overshadowed a more inclusive community mobilization approach. **This preliminary process was widely regarded by community members in both Worhn and Dolo Town as exclusionary.**

[14] Many community members recalled that initial community outreach efforts by the CHT were inadequate, focused disproportionately on not eating monkey and bat meat and the more frightful clinical symptoms of Ebola, e.g. profuse bleeding. This confused people and contributed to the perpetuation of rumors that 'Ebola is not real.'

[15] In mid-August, SCI only had 7 staff in Margibi with very limited field movement. They recalled their original staff (20) in mid-September. The work before that was through CHTs, with some SCI financial support. SCI-directed social mobilization was initiated in October with the CCC construction/stakeholder engagement process, and became adequate in December (see timeline in annex).

"When the CCC was first getting under way, there was a mass meeting to explain things to people. But then the process of land negotiation and construction was not open to the community; it was closed with only a few people. To me, the CCC concept was from a higher authority." – FGD, Community Members

The lack of transparency compounded existing, and widespread, conspiracy rumors about Ebola and the dubious intentions of government, international agencies and NGOs in Liberia. In Worhn, for example, a rumor that the district commissioner was selling the blood of tested patients went without response, and exacerbated community distrust. Community members felt that SCI's relationships with village chiefs, the CHT, the town chiefs and district commissioners were privileged, and they remarked in numerous focus groups that SCI had failed to engage women, youth, traditional birth attendants, traditional healers, members of community-based Ebola Task Forces, as well as certain clans, some religious leaders, and other local representatives.

Mothers, in particular, complained during focus groups that they had not been brought together to consult with SCI about the CCCs. This is particularly significant, since CCCs were intended to address the concerns of familial caregivers—usually mothers-- about taking loved ones to the frightening-seeming ETUs. One focus group of women in Dolo Town, reiterating points made by most community members, leaders and SCI staff, reported that, "the CCC didn't use the right people to get to the community. Awareness was not carried out [at the beginning]. People were not informed."

Furthermore, **there was a lack of clarity about the intended beneficiaries of CCC services**. Community engagement activities tended to be narrowly focused on Worhn and Dolo Town populations, rather than broader catchment areas. Neighboring communities believed that they were not allowed to use the CCCs — they had not been built 'for them.' **Community members also believed that SCI's chosen partners (CHT and village and Town chiefs) were failing to distribute key information, goods, and resources** provided by NGOs during this time. This contributed to rumors about resource gatekeeping by these local leaders, although no confirmed evidence of local corruption relating to any SCI operations was found. At the peak of the Ebola crisis, community expectations were heightened due to fear of infection as well as the proliferation of NGOs.[16] With local communities acting in the frontline of the response; communities felt that they required more support from SCI.

"SCI should have come and ask[ed] us what we needed when Ebola was really raging; hired local people, given the jobs to local people; should have given more education to the health volunteers and the traditional leaders - we were not involved as we should have been." – FGDs, Community Members

3.2.4. Community Engagement During Operations

The limited community engagement process described above was implemented in an epidemic context with substantial risk and confusion, even at the highest levels of decision-making authority. This influenced how communities first responded to the CCCs. When the Dolo Town and Worhn CCCs first opened, SCI had not initiated community engagement efforts. From December 2014, **SCI implemented a robust community engagement plan that used a number of strategies (community meetings, public events with dance, song and theater, flyers, radio announcements, trainings and workshops and house-to-house messaging) to reach out to urban and rural communities** (see Appendix I & J). Alongside the overall reduction of Ebola cases overall, these activities **altered community perceptions about the role**

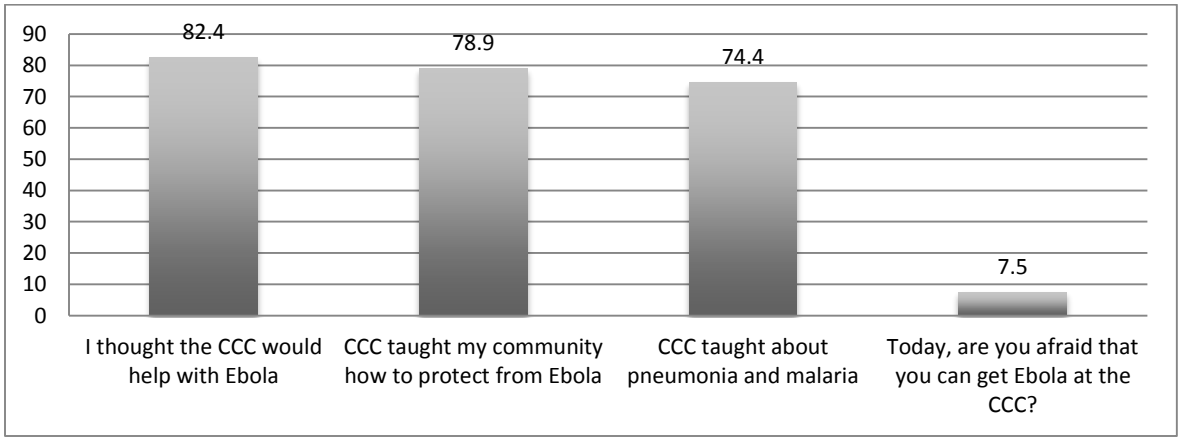
[16] From our interviews, we were able to identify at least eight major NGOs operating in Worhn in Ebola-related issues: Save the Children, Red Cross (Liberian Red Cross and ICRC), The Carter Center, Living Water, ZOA, UNICEF, NRC, and AEC in Worhn. It is unclear, from this interview, to which 'Red Cross' the respondent refers. An equal number were operating in Dolo Town.

and function of the CCCs, and generated widespread community acceptance by the time of decommissioning in May 2015.

Communities initially appear to have transferred their fears and anxieties about holding centers and ETUs to the CCCs. They distrusted the CCCs when they first opened, and they were confused about the services it provided. According to patient surveys, **61.7% were afraid that people could get Ebola at the CCC when it first opened; and 55.9% believed that the CCC had medicine for Ebola**. In Dolo Town, the CCC was open for four days before the first patient arrived. In Worhn, the CCC was open for two weeks before the first patient arrived. Focus groups in Worhn and Dolo Town both confirm that patients believed a number of erroneous ideas about the CCCs: that the CCCs would bring Ebola to their communities; that the CCCs had drugs that would kill people; and that the CCCs were hiding bodies in water trucks and water containers. These suspicions persisted into January 2015.

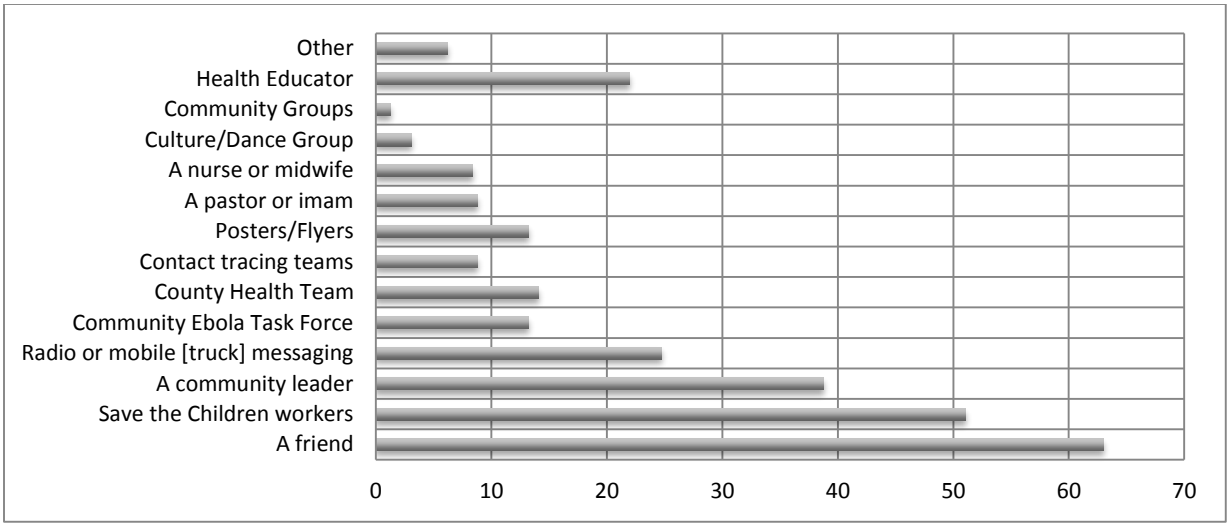
This changed once the CCCs were opened. During our evaluation, rumors and suspicions had ceased, and most community members had positive impressions of the CCCs. By May 2015, 82.4% of patients and caregivers overwhelmingly identified CCCs as sources of help with Ebola; 78.9% of patients and caregivers recognized the CCC as educators about Ebola; and the CCC had taught 74.4% of patients and caregivers about confounding diseases like pneumonia and malaria. Few respondents (7.5%) continued to be afraid that they could become infected with Ebola at the CCC.

Figure 4: Perceptions and Experiences of CCC



Focus groups with community members also showed that outreach activities played an important role in disseminating Ebola transmission and prevention information. This reduced fear surrounding the CCCs, improved health-seeking behavior and assisted in spreading Ebola prevention practices. We also asked how patients had learned about the CCCs and where they had received information about Ebola in their communities. Our survey results showed that patients and caregivers learned about the CCCs mainly from friends (63%), SCI workers (51%), community leaders (39%), radio and loudspeaker messages (25%), and health educators (22%).

Figure 5: How did you learn about the CCC?



3.2.5. Differences in Community Outreach by CCC Location

There were substantial differences in community outreach efforts between Worhn and Dolo Town. Time and distance limited SCI's reach in villages outside Worhn. **Dolo Town CCC patients had better access to radio messages, county health teams, contact tracing teams, and community-based Ebola task forces.** For each method used to communicate news and information about the CCCs to local communities, there appeared to be more messaging in Dolo Town than in Wohrn that ultimately reached those who visited the CCCs. Community members in the villages outside Worhn reported that they did not receive any community mobilization until February 2015. Surveys with patients and caregivers at the Worhn CCC indicated that overall outreach was achieved at a much lower rate, and the utilization of different kinds of outreach measures was less varied and diverse. A dozen survey respondents from Worhn indicated that they learned about the CCC from "other:" in the market, in Kakata, or by witnessing the CCCs construction (see table below).

Table 2: "I learned about the CCCs from…" (multiple choices allowed)

	Dolo		Worhn	
	%	#	%	#
A friend	71%	86	54%	57
Save the Children workers	57%	69	44%	47
A community leader	49%	59	28%	30
Radio or mobile [truck] messaging	32%	39	16%	17
Community Ebola Task Force	23%	28	2%	2
County Health Team	17%	20	11%	12
Contact tracing teams	16%	19	1%	1
Posters/Flyers	13%	16	13%	14
A pastor or imam	13%	16	4%	4
A nurse or midwife	13%	16	3%	3
Culture/Dance Group	5%	6	1%	1
Community Groups	2%	3	0%	0
Other	2%	2	11%	12
Total respondents		121		106

It may be inferred that these casual informants picked up their messages through more formal outreach mechanisms; indicating that there was a network effect operating through SCI's messaging efforts that may have had a positive compounding effect. However, as a later section Accessibility indicates high proportion of patients residing outside of Worhn village and Dolo Town also reflected the fact that community messaging had penetrated to more distant communities over time (see next section).

3.2.6. Stigma and Survivors in Community Messaging

People who had survived Ebola in the ETUs and returned to their communities were reported to have played a pivotal role in persuading communities that the CCCs were legitimate (see Appendix K). Furthermore, **SCI's decision to hire Ebola survivors to be attendants at the CCCs was an important strategy for community outreach**.

> *"People were still doubting Ebola here in Dolo. But they knew my story…they started to trust the news. If there were no patients around, we would go out into the community to educate them about the CCC; since many didn't know about it –People were afraid to go to CCC so [we] have to explain. We have gone more than 100 times into the community to educate: like go around with community mobiliser and gCHVs. We discuss with community about hygiene, we can show our PPE and tell them about CCC."* – KII, Survivor/CCC Attendant's Account of Community Outreach in Dolo Town

A large focus of SCI's community engagement strategy was to address community stigma towards Ebola survivors through the media and at social mobilization events. Anti-stigma jingles played on the radio, the song "Don't Run from Ebola Victim and their Family Member" and the drama "Stop Neglecting Ebola Victims" were performed throughout Margibi district, and slogans like "I am a Liberian and not a virus" were circulated widely. **These efforts had a positive impact, and survivors appear to have faced little long-term community stigma in CCC catchment areas**.

3.3. Structure, Operations, and Healthcare Delivery at the CCCs

3.3.1. Overview

A key concern in the establishment and management of the CCCs was to ensure that the facilities were well-designed, sanitary, accessible, and integrated into the Liberian health system. In this section, we outline three key aspects of the CCC: the CCC structure, CCC operations, and the quality and standard of care provided by CCC staff. Our key findings for this section are summarized below:

1. The CCC structure, infrastructure, supplies and materials, and access to resources were sufficient to meet the CCC objectives. The CCC was more accessible to urban communities than remote rural areas. Overall, the existence of the CCC benefited community health and enabled the resumption of normal operations at local area PHCs and hospitals.
2. CCC operations were adequate for infection control and prevention, but they were inadequate for the delivery of clinical healthcare. While this is consistent with the goal of the CCCs, it was seen as a serious shortfall by patients, prospective patients, staff, and area healthcare experts.
3. CCC staff members were well-trained, disciplined, engaged with patients, and conscientious about IPC techniques.

3.3.2. Construction and Maintenance of the CCCs

The CCC model deployed by SCI in Dolo Town and Worhn was designed to retain many of the functions of an ETU (see Appendix D for Site Visit Evaluations). They were consistent with both OFDA guidelines and, to a considerable extent, MoH guidance for ETUs. We found that **triage areas were well organized,**

suspect zones were well furnished and had good sanitation capacities, confirmed zones had sufficient toileting facilities for patients, and safe support areas were well prepared to accommodate caregivers.

The CCC structures were consistent with OFDA requirements that the CCCs be transient structures, rather than permanent structures (e.g. cement walls and a complete roof, but no permanent walls). Electricity was provided through a generator at both CCCs, and the Worhn CCC had a refrigerator to store blood samples. Signs and instructions were present; there was little opportunity for over-crowding; hand-washing stations were available throughout; and internal and perimeter fences were clearly demarcated and in good condition. Buildings were cleaned regularly; water pipes were clearly differentiated by function and by appropriate levels of chlorination; drainage was sufficient to accommodate heavy rainfall; and water storage facilities were all adequate. Both facilities had working incinerators and fuel. All data forms were present and in order in both CCCs, and the CCCs were very well supplied with medications (cephaline, azithromycin, malaria medications, and pain medications) and medical materials. The NGO *Global Communities* was tasked with all Ebola-related burials.

3.3.3. Integration into Existing Health Systems

SCI integrated the CCCs into existing healthcare infrastructure by building effective referral systems between the CCCs, ETUs, Rennie Hospital, and local PHCs. SCI provided material support to the PHCs, and the PHCs in turn worked collaboratively with the CCCs.

> *"We worked together with the CCC. If they needed some medicine or IV fluid we would give it to them… We would refer people to the CCC if they had Ebola symptoms. And then they would come back after they were negative. The only problem is sometimes these people took a long time at the CCC, like three days to one week. So this could delay their treatment."* – KII, Primary Health Care staff

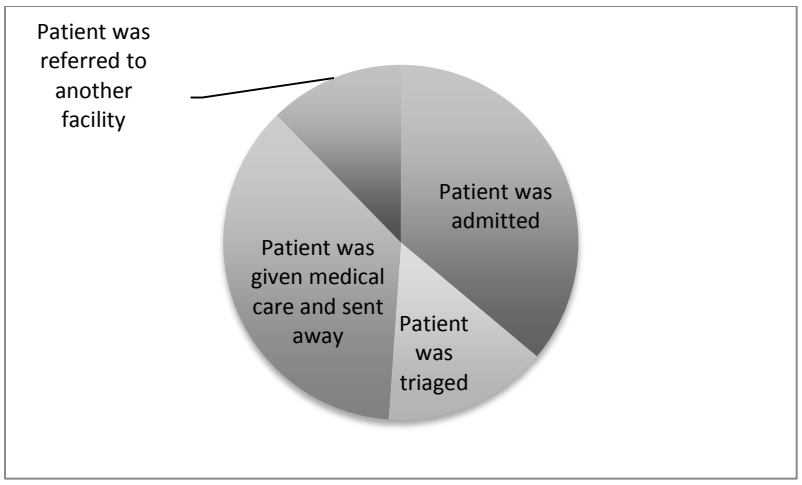
PHC staff in Dolo Town received training in IPC procedures in October, waited for PPE supplies to arrive, and reopened local PHCs with sufficient staff and materiel in mid-November, just as the Dolo Town CCC was being opened. The presence of the CCCs was reassuring to the PHC staff, and they assured the evaluation team that there was a good collaborative relationship and a secure process of co-referrals between the CCC and the PHC. PHC workers also mentioned that HCWs had confidence in the CCC referral slips confirming that patients had tested negative for Ebola.

However, PHC workers in both Worhn and Dolo Town felt that the CCC itself was not intrinsically necessary to prevent the spread of Ebola. Worhn staff believed that they could have handled the situation themselves, with additional structural investments in the PHC building to prevent the spread of infection. **Dolo Town PHC workers expressed doubt about the purpose of the CCC**, and claimed that it had been poorly integrated into PHC processes and capacities. Furthermore, at the Dolo Town PHC and in other communities initially planned for CCC construction, PHC workers and community members complained that initial plans for CCC sites had been changed after work had been done to ready the area.

3.3.4. Basic Package of Health Services

In our survey, 36% of all patients were admitted and put "on bed"; 37% of patients were triaged, given basic medical care and sent away; 15% of patients were triaged and not given any medical care; and 12% were referred to another facility. **No patients reported that they were sent away without an explanation**. No patients reported being provided with transport to another facility.

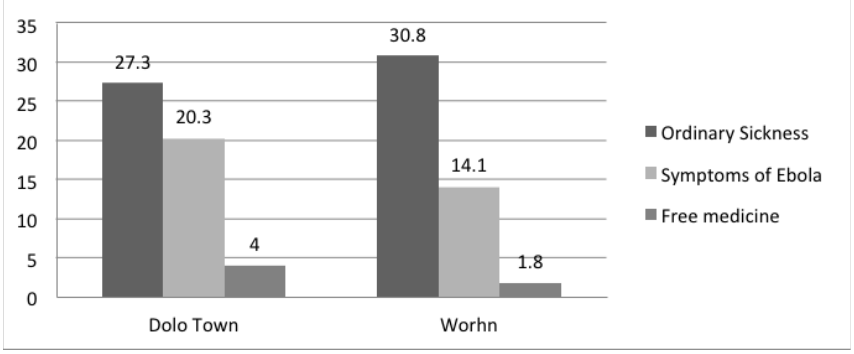
Figure 6: Admission, Triage, and Referral (%)



Surveys of patients and caregivers found that on average, **respondents graded their experience with the CCCs as a 4.4 out 5**. **Nearly all (99%) reported that they had a good understanding of how to prevent infection from Ebola upon discharge**. Patient reports and site visits demonstrated that the **CCCs were known to have a good quality of care within the limits of the CCC mandate** (See Appendix L for an example).

A majority of patients who sought care at both the Dolo Town and Worhn CCCs sought assistance with non-Ebola related issues. In Dolo Town, 27.3% of respondents sought help with routine sicknesses, 20.3% sought help with symptoms of Ebola, and just 4% sought medication. In contrast, in Worhn, nearly 31% sought help with routine illnesses, just 14.1% sought help for symptoms of Ebola, and less than 2% sought access to medications. Even with less access to healthcare and community messaging overall, Worhn residents were only slightly more likely to seek care at the CCC for ordinary sickness (30.8% as compared to 27.3%), and slightly less likely to seek care for symptoms of Ebola (14.1% as compared to 20.3%).[17] Less than 2% of respondents said that they went to the CCCs because they were forced to, because they needed transportation elsewhere, or because their usual clinics were closed.

Figure 7: Patient reason for seeking care at CCC, Survey



[17] Hence differences identified in community messaging between Worhn and Dolo (noted above) appear to have had limited influence on patients' goals and expectations when they sought care at the CCCs.

Survey results show very positive experiences at the CCCs. Patients were satisfied with the level of access to furniture, sanitation supplies, food and water, basic medicines and other supportive infrastructure and care (see Appendix M). In focus groups and key informant interviews, community members and HCWs shared critical descriptions of a number of incidents of individuals being turned away from the CCC, as well as one recurring account of a woman who died at the CCC due to a lack of access to healthcare overnight.

While experiences in the CCC were overall positive, community members and HCWs regarded the scope of the CCC mandate as insufficient for providing an acceptable quality of care under non-crisis conditions. They wanted access to medications, IVs, and nighttime medical supervision at the CCCs. A primary feature of CCC design stipulated a lower standard of clinical care than PHCs, ETUs, or hospitals could offer. Patients, caregivers and community members complained that the CCC did not have access to most forms of medication and that clinical staff were not allowed to stay at night. Less well known, but also highly criticized, was the fact that expatriate medical supervisors were not allowed into the CCC to care for patients at night.[18] However, **many felt that the quality of care they did received at the CCCs was better and more reliable than the services offered at the PHC**. For example, one elderly patient who tested negative for Ebola and was referred to the PHC reported to have pleaded with CCC staff to be re-admitted because of the higher quality of care provided.

3.3.5. Staffing & Training

Overall, the CCCs had robust IPC procedures in place that were regularly followed and well-known by staff. Trainings, standards and knowledge of staff were all deemed to be adequate, and were consistent with WHO/MoH guidelines. While not commonly reported, one former nurse supervisor recalled observing some IPC protocol breaches:

1. Sprayers walking from the green to the red zone without PPE to collect water.
2. Mixing chlorine without gloves or a facemask.
3. Wearing jewelry underneath PPE.
4. Leaving the CCC for lunch without notifying anyone
5. "If I was not there, I think they would not always spray at the PPE-off station".

She elaborated:

> *"With time it was clear that they did not always do the IPC procedures properly. It's not that they forget, it's that the risk of Ebola is so low they just become careless. X used to do lots of drills. They could explain things to visitors. There were lots of ex-pats who came to the CCCs to be shown around and the staff would do drills and tell them about IPC procedures. The staff knows their stuff."* – KII, CCC Nurse

The CCCs were supervised by two nurse supervisors and one expatriate clinical officer until March 2015 when these roles all fell under the authority of one expatriate. SCI and MoH&SW ensured that the CCC staff (hygienists, triage nurses, unit nurses, lab technicians, medical sprayers and community attendants) were well trained in IPC, PPE, and other CCC and ETU protocols. Community attendants—including several Ebola survivors-- manned an outside fence and did a peremptory triage process when patients arrived, did light PPE training when necessary, and oversaw the patients who stayed overnight. Attendants

[18] CCC policy was that expatriate staff were not allowed into the suspected/confirmed zones under any circumstances, even if called during a medical emergency at night.

functioned as security guards, but they also interviewed new arrivals, registered patients, took their temperature, and reminded patients of sanitation protocols (e.g. hand-washing).

Staff felt confident in their skills and abilities. They received robust training and supervision in IPC methods, including learning how to work in pairs, putting on and removing PPE, using complex sanitation infrastructure, and testing and documentation. But due to the lack of demand, **CCCs were over-staffed, which led to low morale**. Local community members noticed the surplus labor, and complained that **jobs were being given to staff from elsewhere**—they were correct. SCI, in partnership with the CHT, prioritized keeping local HCWs in the PHC system. All nurses and medical sprayers were from outside Dolo and Worhn, mostly from Kakata and Monrovia, and commuted daily from SCI's office in Kakata in a SCI vehicle.

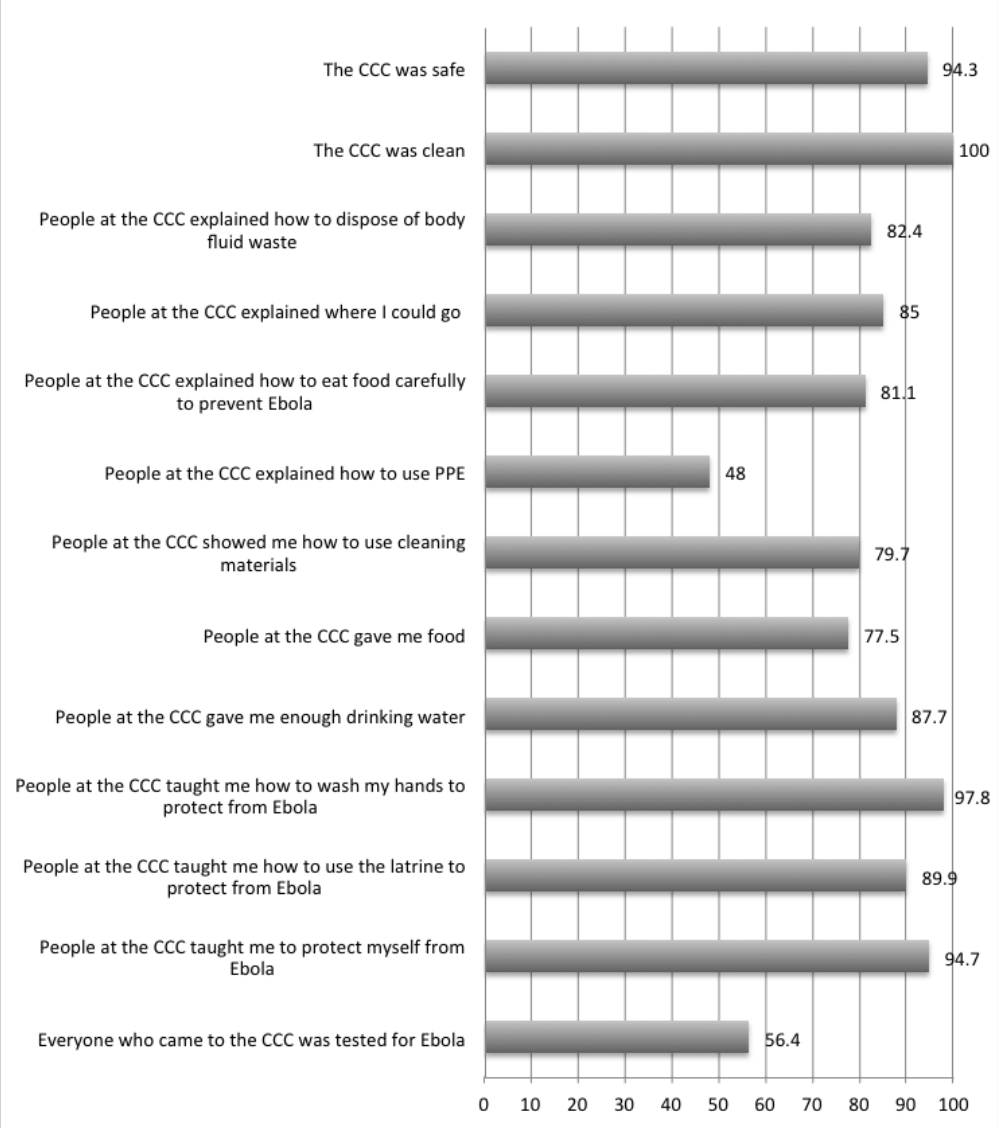
> *"We were afraid and not sure if we would survive from this work, come out or not. Daily fear….then we did the training and got ready but faced another problem: there was no patients coming. It was like we prepared for a battle that never came!"* – FGD, CCC Staff

There were a number of negative aspects of working in the CCC. CCC staff members were given NGO salaries, but that came at the cost of social stigma for some of these workers. Staff complained about recent salary reductions, the lack of psychosocial services, overall boredom, and a lack of gratitude or appreciation from SCI staff ("They didn't even say thank you."). They also were unhappy with recent SCI protocols for transitioning employment from the CCC to the PHC after closure. **These issues did not interfere with patient care** – patient surveys, focus groups, and key informant interviews all support the conclusion that **CCC staff in both locations treated patients with dignity and respect.**

3.3.6. Monitoring & Quality Assurance

Patients agreed that the standard of care was high at the CCCs. Survey findings indicate that patients and caregivers overwhelmingly agreed that the CCC was safe (94.3%) and clean (100%). **They also agreed that CCC staff gave detailed instructions to prevent infection**, including: explaining how to dispose of body waste (82.4%), explaining where patients and caregivers could go (85%), explaining how to eat food carefully so as to prevent the spread of Ebola (81.1%), explaining how to use PPE (48%) and explaining how to use cleaning materials (79.7%).

Figure 8: Experience at the CCC



Obtaining test results took, on average, 1-2 days, with 57.7% of respondents reporting that they received their test results the same day, 32.6% the next day, and 9.7% having to wait two days or more. Staff reiterated this high standard of care, agreeing that they worked hard to be sympathetic and supportive to patients: "We had to learn how to talk to patients to get them to comply with things; we cannot force them." Patients concurred:

> *"I took my child to the CCC [on] Feb 27. I took 2 kids. I was really fearing the first time I went. But the nurses were encouraging, they were counseling me and helping me so much. We like the CCC more than the clinic; at the clinic it takes long to get medicine. But the CCC people they respond so quickly to your needs. They are like lightening. The PHC is so slow, and they are sometimes very rude!"*—KII, Woman Caregiver, Dolo Town CCC

Throughout the CCCs' operation, just one positive case of Ebola was recorded—a 10-year old child who survived. The parent of the child recounted that both the parent and the child were quarantined, and were given food and non-food items while the parent stayed with the child in the CCC for three days. The parent recalled, "I gave [the patient] medicine, peanut butter and biscuits as contact tracers were going around and quarantining us…they built me a toilet and bathroom."

For many patients and community members, getting a 'paper' from the CCC offered proof that they had tested negative for Ebola. In focus groups, community members commented that Ebola symptoms like diarrhea and vomiting resembled the symptoms of many other diseases, and people assumed that you had Ebola until you had proven otherwise. One man explained his decision to take his brother to the CCC:

> *"I wanted to have him tested to make people accept him; people were trying to isolate him. It was not clear what sickness he had and the sickness was getting much worse. I also began to fear that maybe it was Ebola; he started vomiting very badly."* – FGD, Caregiver

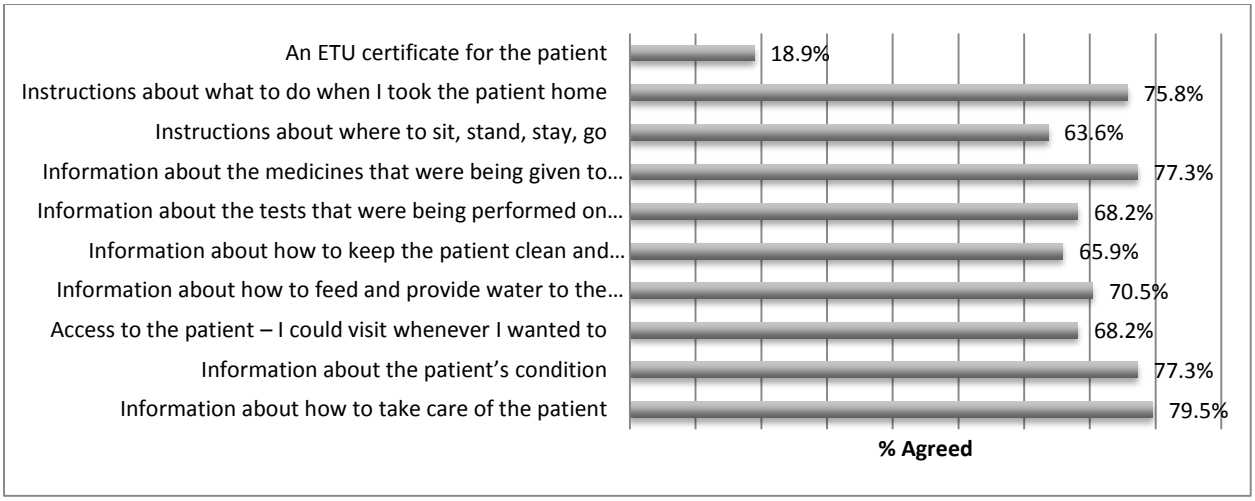
3.3.7. CCC Accessibility

By placing CCCs closer to the community than remote and distant ETUs, SCI experts believed that community members would be better able to physically access facilities, and to see and provide care for their family members and loved ones. Survey data show that the **CCCs did improve local access to quarantine and testing**, with more than **half of all patients accessing the CCC on foot in less than 30 minutes.**[19] On the other hand, the fact that **41.5% of patients resided one or more hours walk** from the CCC **reveal that community messaging had penetrated to more distant communities, and that people valued the CCCs both in, and around, Worhn village and Dolo Town**.

The CCC model was oriented to allow family and caregivers to see, access, and care for relatives. We found that **caregivers had very positive impressions of the supportive environment of the CCCs**. Survey results indicate that a substantial majority were provided with information, instructions, materials, food, water, and additional caregiving guidance during their stay at the CCC.

[19] 83% of patients waited 2 days or less to go to the CCCs. Answers to the question 'how long did it take you to go to the CCC?' showed that 27.5% went right away, 27.5% waited one day, 28% two days, 9.2% one week and 7.7% longer than one week.

Figure 9: Support for the Caregiver at the CCC ("Caregiver was provided with…")



The CCC policy of "caregivers can care without touching" was impractical. HCWs commented, "that was the idea of the CCC but that can never work."

"The idea was to have 'no-touch' support, which is nice on paper, but it's impossible in practice. What do you do at night? How do you monitor people? These people only know the basics of Ebola. They will touch their child if the child [is] sick or their mother. You can't prevent that. They are taking on and off PPE by themselves; they're bound to make a mistake. You would see a sick baby on the lap of the mother without any PPE after you explained to her that the baby could have Ebola and she needed to put PPE on! I think if we had this model at the peak of the outbreak this would not have worked at all with the caregivers. It would spread the infection to the community. You had caregivers leaving the CCCs or being there for only part of the time. They would go home and come back. You could not control them. If a mother was caring for one child at the CCC her other children were at home. She would have to go back and cook for them and then come back to the sick patient at the CCC. So I disagree from practical observation about how CCCs can reduce Ebola. We can try and teach them but we're not there all the time." — FGD, CCC HCWs

3.4. Community Attitudes Towards the Decommissioning of the CCCs

The decommissioning of the CCCs offers a window into how the CCCs affected local communities. As has been observed in other regions that have been highly affected by Ebola (the Western Areas in Freetown, Kambiah), the Worhn and Dolo Town communities overwhelmingly valued the CCCs. **Among patients and caregivers surveyed, 84% of former patients and caregivers wished that the CCC would remain open.** When asked to specify why, respondents said that they wanted the CCCs to defer closure until 'Ebola is finished for good,' or that they wanted the CCC to be turned into a permanent health or community structure, a community clinic, a hospital, an orphanage, or a child-focused healthcare facility. A major concern was that the closing of the CCCs was going to directly lead to the end of support for survivors and orphans. This population, to varying degree, will likely suffer from long-term health and income impacts (See Appendix K).

Communities were concerned that Ebola had become endemic. They expressed fears that Ebola was impossible to prevent; that Ebola will return with the rainy season, or with population movement from Guinea and Sierra Leone after the CCCs were decommissioned. In KIIs, **some local community leaders used threatening language** when asked about whether the CCCs should be closed and destroyed. For

example in Worhn, one said, “The CCC is built on traditional land; there is a shrine, they should not burn it; the devils will grab them.” In Dolo Town one said, “[The] landowner says she will consult her lawyer.” **Efforts by SCI have sought to address this** by dividing resources between the landowner, the local PHC and SCI. To address community concerns, SCI has highlighted to community members that the closing of the CCC dos not mean that they are ‘leaving the community…we will still be here to help you.’ **A 3-year MoU signed between SCI and the CHT will provide support for temporary, self-contained holding facilities, ambulances, and referral services on the grounds of county PHCs and at Rennie Hospital**. An outcome of SCI’s strengthening of their relationship with the CHT due to the Ebola response, **this partnership will provide a range of support to the health system to address post-Ebola challenges, including IPC capacity**.

4. Lessons Learned

Overall, SCI should recognize that the establishment of the CCCs had a positive impact on the communities where they were introduced. We identify the following contributions:

This evaluation found key **strengths in SCI’s CCC model and implementation**:

- Save the Children’s negotiations to establish the CCCs may have **strengthened the relationships** between the Ministry of Health and Social Welfare (MoH&SW), the County Health Team (CHT), and local hospitals and Primary Health Clinics (PHCs), especially in terms of local institutional and epidemiological surveillance and oversight.
- The process of establishing the CCCs in partnership with the Ministry of Health and Social Welfare (MoH&SW) and the County Health Team (CHT) has **provided the operational basis for a broader strengthening of local Primary Health Clinics (PHCs)** throughout Margibi County, currently outlined in a new 3-year MoU between these parties.
- Staff at CCCs and local clinics received **robust training and supervision** in IPC methods that will likely **transfer to heightened standards of care** in PHCs and hospital facilities.
- The CCCs achieved the following aims:
    - **Decreased the issue of fear and stigma** in local communities by providing testing and documentation that proved individuals *do not* have Ebola.
    - Localized the experience of isolation, testing, and referral in ways that **increased community trust and acceptance** of Ebola prevention and control measures.
    - **Expanded access to healthcare** by creating a ‘protective buffer’ between the local community and primary healthcare facilities and hospitals during the end of the epidemic.
    - **Helped strengthen referral practices** between healthcare institutions in Margibi County.
    - Were **well-designed and staffed, sanitary, and accessible** to the community. As a result, the CCCs were regarded as a “clinic” rather than as a ‘holding center.’ This was consistent with the preferences of the Liberian Ministry of Health and Social Welfare (MoH&SW), the County Health Team, SCI staff, and local community members.
    - Were **viewed positively by patients and their caregivers**.
    - **Helped to address confounding disease issues** like pneumonia and malaria by providing triage, testing, referral, and community education.
    - Provided community caregivers (mainly family members) with **controlled access to patients and appropriate on-site training** in Prevention and Control (IPC) methods.

This evaluation found key **lessons to be learned** from the CCC model during the Ebola epidemic:

- When the CCCs were first built, they were little trusted and little used by the community. This is a result of a **lack of community engagement and education during the CCC construction process**. Social mobilization is a key factor in CCC success.
- If one compares the CCCs to a hypothetical flexible, rapid, mobile response structure with rapid testing facilities that can reach out to remote rural areas, the **CCC is an inferior model that requires expensive investments of time, infrastructure, and labor**. These investments can divert organizational attention from community-based responses to ongoing epidemic trends and community needs.
- National governments may mandate that SCI expand its CCCs beyond intended structural investments, prolong full-staffing beyond that which is required to meet demand, and prevent the closures of ETUs and CCCs. The CCCs are now closed and are in the process of being decommissioned; but it is important to recognize that **partnerships with the MoH&SW significantly impacted project scale and duration in ways that were unanticipated during CCC planning phases**.
- **Local government structures like the CHTs have the capacity to disrupt SCI's efforts** at community health education by strictly controlling the recruitment and hiring of general Community Health Volunteers (gCHV). This national policy imposes substantial limitations on INGOs' flexibility in recruiting, training, and employing staff for healthcare, health facility management, and public health education.
- CCCs are intended for emergency conditions of epidemic escalation. The **presence of CCCs under non-emergency conditions may impact local healthcare markets**.
- **Under non-emergency conditions, the clinical care costs** associated with the suboptimal level of care at CCCs (e.g., long waits for testing, no access to "wet" healthcare treatments like intravenous medications) **may not justify the public health gains achieved**.
- **CCC operations that exclude the delivery of IV fluids are not consistent with current research on Ebola virus treatment**. Current research demonstrates that the early administration of IV fluids to Ebola patients can markedly improve survival. The limitations of CCC IPC measures need to be balanced against current knowledge about infectious disease treatments and outcomes, and IPC measures need to be calibrated against ongoing research throughout the period of implementation.
- Under non-emergent conditions, the **CCCs were redundant with the ETU operating in Margibi County.**

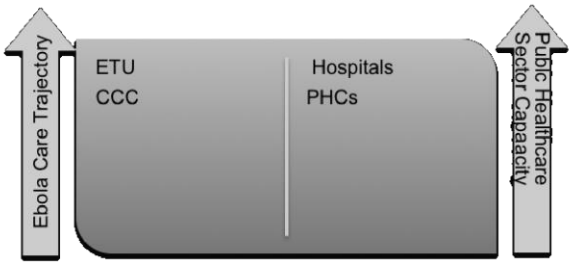
4.1. Implications for Future Responses

SCI is often compelled to reckon with statements like "Save the Children should have come and asked us what we needed when Ebola was really raging." **These statements need to be balanced against a meaningful consideration of SCI's experience and capacity prior to the Ebola outbreak**, and its entrée into the healthcare sector during the Ebola crisis. Prior to the outbreak, SCI did not contribute to health care provision in Liberia, but it did have a long history of humanitarian assistance that served the organization well as it geared up to work on the Ebola response. Today, SCI has taken an active role to support health systems strengthening in Liberia, and in Margibi County. It is supporting the renovation of 11 PHCs, building triage and isolation facilities at every Margibi PHC, established a strong relationship with the Margibi CHT, and it has signed a three-year MoU with the MoH&SW.

Looking to the future, it is necessary to consider the value of CCCs in the context of what they can and cannot do (see Figure below). **When the CCC model is introduced earlier in an Ebola epidemic, and it is designed to have a good integration of services with ETUs, the triage, testing, and referral processes that the CCC/ETU system creates may protect existing healthcare infrastructure, and permit the**

continued operation of healthcare facilities for non-Ebola needs. CCCs, in partnership with ETUs, can form an institutional frontline for epidemic response that parallels the structure of the public healthcare infrastructure for community-based testing, triage, and referral to secondary health facilities (ETUs). This will have a protective function for PHCs and hospitals. Moreover, it will build the confidence of local HCWs, and it will improve overall morbidity and mortality rates during epidemics by freeing the public healthcare sector to give attention to *overall* morbidity and mortality across the healthcare system. **In order for CCCs to work in this way, they will require similar investments as ETUs in WASH, infrastructure, staffing, training, and community outreach**; and tradeoffs will have to be accepted with providing a lower standard of care than conventional clinical services to its patients.

Figure 10: How ETUs and CCCs function as a parallel structure to protect public healthcare sector capacity



SCI's experience in Liberia, however, suggests that **CCCs will not be able to operate as a mobile rapid response structure unless rapidly worsening epidemic conditions justify the clinical tradeoffs and increased risks that the CCC model poses**. To be more rapidly deployable, **changes in design and protocols may be needed.** Physically attaching CCCs to PHCs may provide significant benefits in speed, community acceptance and long-term capacity building. The specific characteristics of an epidemic like an emerging, unidentified zoonotic disease may justify involvement of a CCC model; while a local outbreak of cholera may not. This question will require further review, and is beyond the scope of this study: Will governments or national healthcare workforces be willing to tolerate the "leaky" model that the original CCC structure called for? This experience suggests that they will not. Will Save the Children seek to invest in making CCCs rapidly deployable, like MSF's "pre-packaged" ETU boxes?

CCCs were introduced after local communities had engaged in their own processes of identification, triage, and isolation/quarantine. It is likely the case that these practices, along with robust behavioral changes and adoption of IPC protocols at the community level, slowed or stopped the epidemic in Margibi County. **SCI requires a strategy for supporting community-based response during epidemic outbreaks prior to their construction of ETUs and CCCs**. By the standards of this epidemic outbreak, the financing, planning, and construction of CCCs occurred on a slow timeline that failed to keep pace with changes 'on the ground.' CCCs promised to operate on a rapid deployment model, but the model itself fell victim to mission creep while an alternative model of rapid deployment of five to ten beds to an emerging hotspot, rapid testing, and heightened mobility emerged in parallel. **CCCs cannot substitute for a rapid, mobile, and flexible community-based response.** Such a response needs to provide the materiel for community-based IPC; offset the food and material loss costs of isolation and quarantine; expand transportation access (like ambulances) for people in remote communities to secondary facilities. SCI also needs to have the legal and financial capability to pay local workers hazard pay to conduct community identification and outreach in the midst of an epidemic, and a process for engaging with novel groups of people within the population to promote surveillance and reporting.

4.2. Save the Children's Response to Rapidly Changing Conditions

Save the Children demonstrated a strong ability to adapt to changing circumstances. Although it was clear during the CCCs construction that the epidemic had slowed, there were valid reasons for continuing with a more limited vision of CCC implementation. Several opportunities to prevent the spread of the epidemic had already been missed, and it remained unclear if SCI was displaying an excess of caution or responding to future uncertainty. The decision to build two CCCs rather than ten CCCs, and to redirect drug supplies, IPC training and infrastructure (temporary triage facilities) towards existing PHCs, proves to have been prescient. In a context of uncertainty, SCI minimized investments in restricted CCC services while keeping CCCs available in case of a future outbreak, but it also redirected needed resources into strengthening existing long-term infrastructure.

Our key informant interviews suggest that SCI staff were somewhat **skeptical about the value and impact of the CCCs, given their delayed implementation relative to the course of the epidemic**. Indeed, it would be correct to assert that the **CCCs did not achieve their initial public health goals**. Many HCWs, local leaders and community members believed that the **sustainability of CCC infrastructure and capacity would have, in hindsight, been better facilitated by physically attaching the CCCs to PHCs**.[20] Within the "mini-ETU model," potentially permanent infrastructure like boreholes, latrines, fences, and physical spaces for isolation and triage was developed for a short-term, temporary structure that is likely to be torn-down. Communities and PHC staff are conscious of the costs spent to build this infrastructure, and are critical of demolishing expensive and needed infrastructure due to closure imperatives. There were local costs to the implementation of CCCs. Resources and labor was diverted from other activities, and road infrastructure damaged (at least in Dolo) during construction. **We recommend future research to support a comprehensive cost-benefit analysis to assess if the epidemiologic and health systems capacity gains were justified by local and international expenditures**.

[20] This had been done in CCC designs implemented by other NGOs in Liberia, including PSI and OXFAM.

5. Appendices

5.1. Appendix A. Key Informant Registry

Table 3: Key Informant Registry

Informant category	Location	#	Description
Save the Children, Field staff	Margibi, Worhn and Dolo Town	9	Area manager, FOM, health officer, CCC coordinator, WASH staff, Community mobiliser, logistics staff, MEALS officer, Child protection officer.
SCI Country Office	Monrovia	3	Health director, MEALS coordination, Operations manager
Former SCI Staff	Remote	5	Advisory, Implementation, Health Direction, Country Director (past)
Community members	Margibi	6	CCC landowner, 2 gCHVs, 1 Ebola Task Force volunteer, a police commander and a teacher
Patients and Family Members	Worhn and Dolo Town	4	Relatives of 3 patients who died at the CCC and one patient who tested positive for EVD at Dolo CCC
CCC attendants, HCWs	Worhn and Dolo Town	6	2 attendants, a nurse, cook and hygienist
Ministry of Health and Social Welfare	Margibi, Monrovia	5	2 PHC staff, 3 CHT staff based in Margibi and 1 MoH official in Monrovia
Other INGO	Margibi, Monrovia	6	Major INGOs involved in CCC implementation
Community Mobilizer	Worhn	1	Ever Young Entertainment employed by SCI
Total		45 Interviews	

5.2. Appendix B. Focus Group Discussion Inventory

We conducted a total of 19 FGDs with 249 participants, including 111 men and 138 women participants These included FGDs with HCWs, community leaders and community members.

Table 4: FGD Inventory

Location	Type of FGD	Age group	# Men	# Women	Total
Dolo Town	CCC staff	Mixed	7	9	16
Dolo Town	Town leaders	35-60	9	5	14
Dolo Town	PHC staff	Mixed	5	4	9
Dolo Town	Traditional leaders	35-60	10	3	13
Dolo Town	Community members	35-60	0	16	16
Dolo Town	Community members	18-34	4	3	7
Peter Town	Community members	18-34	15	0	15
Peter Town	Community members	35-60	0	15	15
Unification City	Community members	18-34	0	10	10
Cotton Tree	Community members	18-34	15	0	15
Cotton Tree	Community members	18-34	0	9	9
Worhn	CCC staff	Mixed	5	8	13
Worhn	Community leaders	35-60	10	0	10
Worhn	Community leaders	35-60	20	0	20
Worhn	Community members	18-34	0	15	15
Pleemu Village	Community members	Mixed	5	6	11
Garbaye Town	Community members	Mixed	6	10	16
Peter Town	Community members	35-60	0	10	10
Layinge Village	Community members	18-34	0	15	15
Total:		18-34 FGDs: 7 35-60 FGDs: 7 Mixed FGDs: 5	111	138	249

5.3. Appendix C: Comparison of Dolo Town and Worhn CCCs

Table 5: Patient Demographics, Dolo vs. Worhn

Query	Dolo Town	Worhn
Gender [of respondent]	Male (16.7%) Female (36.6%)	Male (16.3%) Female (30.4%)
Most common livelihoods		
Student	**15.4% (35)**	7.9% (18)
Farmer	2.2% (5)	**22.9% (52)**
Market seller	**12.3% (28)**	7.5% (17)
No job/unemployed	**14.1% (26)**	5.2% (11)
Still a child	**7.8% (17)**	2.6% (6)
The patient I brought to the CCC was…		
Myself	21.1% (48)	20.7% (47)
Another child	20.7% (47)	15.9% (36)
Another adult	8.4% (19)	4.0% (9)
An elderly person	3.1% (7)	6.2% (14)
Total	53.3% (121)	46.9% (106)

5.4. Appendix D: Dolo Town and Worhn CCC Site Visit Checklists

Table 6: Dolo CCC Site Visit Checklist

Category	(Check)	Characteristics and procedures	Field observations
1. Location of site	X	A. No surface water run-off	• Site sign with SCI logo present • But lack of community messaging signs on the exterior of the CCC
	X	B. Close to PHC	
	X	C. Perimeter fence	
	X	D. Clearly marked signs? Good verbal instructions?	
2. Triage	X	A. Reception/ registration area	• Ebola posters are very small in size • White board with important phone numbers • Screen and high counter separating triage nurse from patient • A small hole in the screen allows the nurse to take temperature and give drugs
	X	B. Touchless thermometer	
	X	C. Ebola posters	
	X	D. Flow chart	
	X	E. Chairs 3ft apart	
	X	F. Hand washing station	
	X	G. Prepackaged medicines	
		H. Latrine	
		I. Suggestion box	
	X	J. Clearly marked signs? Good verbal instructions?	
	X	K. Practice: No physical contact	
	X	L. Practice: Triage staff do not go to other zones	
3. Data forms (mostly in Triage)	X	A. Triage register	• Forms are photographed using tablets and sent to a server Additional forms include: • Staff registry • Inventory of drugs • Daily drug consumption sheets • Nighttime screening forms • Daily symptom tracker • Daily patient notes
	X	B. Does not meet case definition slip	
	X	C. MOH case investigation form	
	X	D. SCI admission form	
	X	E. SCI caretaker form	
	X	F. Contact listing form	
	X	G. Patient chart	
	X	H. CCC exit form	
	X	I. MOH outcome form	
	X	J. Ebola certificate	
	X	K. Daily/weekly summary forms	
	X	L. Tablets to take photos of forms	
	X	Clear organization of forms? Good verbal or written instructions?	
4. Suspected zone	X	A. Latrine	• Latrines are present in every room. • The suspected zone is divided into 2 buildings of 10 rooms each • There is a wet and dry building, which are physically separate. • No showers are present; buckets are provided for bathing with piped water in each room
	NA	B. Clear gender separation of latrines	
		C. Toilet bucket empty point	
	X	D. Cubicles with mattress, chair, bucket, sheets	
		E. Patient shower	
	X	F. Hand washing station	
		G. Soap at all relevant points	
	X	H. Presence of potable water?	
		I. Patients not to stay over 24 hours	
	X	J. Caretakers can't eat	

			• Some patients stay longer than 24 hours (see patient survey) • Caregivers do not eat in the suspected zone
5. Confirmed zone	X	A. 1 latrine for 5 patients in confirmed zone (30m from groundwater and 1.5m above water table)	• Hand washing station is located outside the cubicle
	X	B. Bathing area in each cubicle	
	X	C. Hand washing station	
		D. Soap at all relevant points	
	X	E. Clearly marked signs? Good verbal or written instructions?	
6. Safe support zone	X	A. Undressing area for patients or staff or both?	• There is a caregiver zone and a safe support zone. • The caregiver zone has separate sleeping, undressing and eating area as well as a latrine. • Dressing area for staff is gender divided • Laundry area is in a separate building • Staff latrines are very smelly
	X	B. Dressing area	
	X	C. Laundry area	
	X	D. Medical storage	
	X	E. Washing area	
	X	F. Latrine	
	X	G. Hand washing station	
	X	H. Clearly marked signs? Good verbal or written instructions?	
7. Separation of zones	X	A. Internal fence between safe, confirmed and suspected zones	
	X	B. Clearly marked signs? Good verbal or written instructions?	
8. Electricity	X	A. Small generator for water pumps and/or solar lights & phone chargers	• No refrigerator seen • Back-up generator availab
	X	B. Consistent electric supply	
		C. Refrigerator (what goes in refrigerator? Same for food/water as blood samples, or different?	
	X	D. Clearly marked signs? Good verbal or written instructions?	
9. Water system	X	A. Tanks for contingency supply (48 Hours supply)	• Borehole with water pump in place • 84 taps in total • 2 day supply in place • 6 water tanks of 1,000 gallons each • Drinking water stations are not used for drinking but bathing; bottled water is given instead • Boot cleaning stations are in use
	X	B. Clear entrance for water truck	
	X	C. Three line pipe system to clinical areas with color coded taps	
	X	D. Clearly marked drinking stations (0.0005%)	
	X	E. Clearly marked handwashing stations (0.05%)	
		F. Hand washing station next to every latrine	
		G. Water towels next to all hand washing stations	

	X	H. Clearly marked laundry stations (0.05%)	• Hand washing stations are outside the cubicles of all 30 rooms, one station for 2 to 3 cubicles
		I. Clearly marked boot cleaning stations (0.5%)	
	X	J. Clearly marked WASH disinfection station (0.5%)	
		K. Showers connected to pipes (Need 100L treated water per day for patient and 5 for caregiver)	
10. Drains and wastewater	X	A. Showers drain into pits (30m from groundwater and 1.5m above water table)	• Waste drains follow natural flow of the groundwater system
	X	B. No water waste leakage	
	X	C. Bucket system drains into septic tank for bodily fluids (both suspect and confirmed zones)	
	X	D. Latrines drain into septic system (Handling liquid waste requires: bucket with closed lid for vomit and excreta, adding .5%, wait 15 min, etc…)	
	X	E. Practices: (Never dry sweep)	
	X	F. Practices: Always soak liquid waste up and double bag	
11. Toilets	X	A. All toilets to be 30m from water source	
		B. If possible, have plastic squatting slabs	
	X	C. Line with cement and plastered if water table is high	
	X	D. Separate toilets for staff, patients and family	
	X	E. 1 latrine to 20 caregivers and gender separated with signs.	
	X	F. Practice: (Regular cleaning with 0.5% chlorine)	
	X	G. Sufficient sanitary supplies (toilet paper, soap, menstruation products?)	
12. Incinerator	X	A. Size (2+2+5m)	• Observed waste had been left overnight and was half-burnt • Metal grate was laid over the incinerator
		B. Availability/Use of ash/dirt	
	X	C. Available/Sufficient fuel	
	X	D. Location in confirmed zone	
		E. Practice: Waste must never be left unburnt overnight	
	X	F. Practice: Move waste from suspected area to confirmed area only	
	X	G. Practice: Nothing leaves the CCC	
	X	H. Practice: Double bag, spray 0.5% and then transport for burning	

	X	I. Practice: Need full PPE to burn and leather gloves)	
13. Cemetery/ morgue	X	A. Cemetery within 1km	
14. Soakpits	Unclear	A. 30m from underground water	
	Unclear	B. At least 1.5 m down	
	Unclear	C. Used for mortuary, shower, laundry and kitchen water	
15. Sharps and Sharps Containers	No	A. Are any sharp objects seen that are not protected?	
	X	B. Box marked by words SHARP and labeled with infectious substance symbol	
	NA; facility is closing	C. Number of containers……	
	NA	D. System for sanitary disposal outside of facility?	
	No	E. Evidence of sharps polluting area around CCC?	
16. Children		A. Recreational material for children	• Lack of children-friendly material
		B. Child friendly posters and drawings	
17. Storeroom	X	A. Supplies and inventory: Bleach Needles Soap Alcohol Sanitary supplies Cleaning material PPE Gloves ORS Malaria medicine Antibiotics Other_____	• All necessary supplies are present, some stored in a locked tent and others in various storage cupboards
	NA; facility are closing	B. Sufficiency of supplies for x days	
	X	C. Clear inventory records	
	NA	A. Locked motorcycle storage containers	

18. Testing infrastructure	X	B. Separate Icebox	• Iceboxes are present • No motorcycles are present
	X	C. Purple EDTA tube (Need 2-4ml of blood per patient & 2 members transport blood at all times)	
19. Transport		A. Availability of ambulance to transfer patients	• No ambulances are present • SCI vehicles are available to carry non-EVD suspected cases during the day
		B. Availability of motorcycles to transfer patients	
	X	C. Consistent fuel supply with records	
	X	D. Transport staff	
20. General Impressions	Unclear; facility is closing	A. Number and location of post-discharge packages	
	X	Is overall facility structure in good condition (Walls, roof/tarps) or is it leaking or broken?	
	X	Is furniture sufficient/in good condition?	
	X	Is facility well-lit and inviting?	
	X	Is it well staffed?	
	NA	Are there obvious material or equipment shortages?	
	X	Is there a functioning pharmacy with sufficient supplies?	
	See KII notes	Is there a referral system in place for child welfare?	
	X	Is there a private location for interviewing people requiring confidentiality?	

Table 7: Worhn CCC Site Visit Checklist

Category	**(Check)**	**Characteristics and procedures**	**Field observations**
1. Location of site		A. No surface water run-off	• One open run-off pit next to the water tanks • Site sign with SCI logo present • But lack of community messaging signs on the exterior of the CCC
	X	B. Close to PHC	
	X	C. Perimeter fence	
	X	D. Clearly marked signs? Good verbal instructions?	
2. Triage	X	A. Reception/ registration area	• Ebola posters are very small in size
	X	B. Touchless thermometer	
	X	C. Ebola posters	
	X	D. Flow chart	

	X	E. Chairs 3ft apart	• White board with important phone numbers • Screen and high counter separating triage nurse from patient • A small hole in the screen allows the nurse to take temperature and give drugs
	X	F. Hand washing station	
	X	G. Prepackaged medicines	
		H. Latrine	
		I. Suggestion box	
	X	J. Clearly marked signs? Good verbal instructions?	
	X	K. Practice: No physical contact	
	X	L. Practice: Triage staff do not go to other zones	
3. Data forms (mostly in Triage)	X	A. Triage register	• Forms are photographed using tablets and sent to a server Additional forms include: • Staff registry • Inventory of drugs • Daily drug consumption sheets • Nighttime screening forms • Daily symptom tracker • Daily patient notes
	X	B. Does not meet case definition slip	
	X	C. MOH case investigation form	
	X	D. SCI admission form	
	X	E. SCI caretaker form	
	X	F. Contact listing form	
	X	G. Patient chart	
	X	H. CCC exit form	
	X	I. MOH outcome form	
	X	J. Ebola certificate	
	X	K. Daily/weekly summary forms	
	X	L. Tablets to take photos of forms	
	X	Clear organization of forms? Good verbal or written instructions?	
4. Suspected zone	X	A. Latrine	• Latrines are present in every room. • The suspected zone is divided into 2 buildings of 10 rooms each • There is a wet and dry building, which are physically separate. • No showers are present; buckets are provided for bathing with piped water in each room • Some patients stay longer than 24 hours (see patient survey) • Caregivers do not eat in the suspected zone • Hand washing station is located outside the cubicle
	NA	B. Clear gender separation of latrines	
		C. Toilet bucket empty point	
	X	D. Cubicles with mattress, chair, bucket, sheets	
		E. Patient shower	
	X	F. Hand washing station	
		G. Soap at all relevant points	
	X	H. Presence of potable water?	
		I. Patients not to stay over 24 hours	
	X	J. Caretakers can't eat	
5. Confirmed zone	X	A. 1 latrine for 5 patients in confirmed zone (30m from groundwater and 1.5m above water table)	• Hand washing station is located outside the cubicle
	X	B. Bathing area in each cubicle	
	X	C. Hand washing station	
		D. Soap at all relevant points	

	X	E. Clearly marked signs? Good verbal or written instructions?	
6. Safe support zone	X	A. Undressing area for patients or staff or both?	• There is a caregiver zone and a safe support zone. • The caregiver zone has separate sleeping, undressing and eating area as well as a latrine. • Dressing area for staff is gender divided • Laundry area is in a separate building
	X	B. Dressing area	
	X	C. Laundry area	
	X	D. Medical storage	
	X	E. Washing area	
	X	F. Latrine	
	X	G. Hand washing station	
	X	H. Clearly marked signs? Good verbal or written instructions?	
7. Separation of zones	X	A. Internal fence between safe, confirmed and suspected zones	
	X	B. Clearly marked signs? Good verbal or written instructions?	
8. Electricity	X	A. Small generator for water pumps and/or solar lights & phone chargers	• Two generators, one is for • Refrigerator is for storing i used in transporting blood samples
	X	B. Consistent electric supply	
	X	C. Refrigerator (what goes in refrigerator? Same for food/water as blood samples, or different?	
	X	D. Clearly marked signs? Good verbal or written instructions?	
9. Water system	X	A. Tanks for contingency supply (48 Hours supply)	• Hand washing taps outside each suspect and confirmed cubicle • Borehole with water pump in place • 82 taps in total, color coded • 2 day supply in place • 6 water tanks of 1,000 gallons each • Drinking water stations are not used for drinking but bathing; bottled water is given instead • Boot cleaning stations are not in use, but have been used in the past
	X	B. Clear entrance for water truck	
	X	C. Three line pipe system to clinical areas with color coded taps	
	X	D. Clearly marked drinking stations (0.0005%)	
	X	E. Clearly marked handwashing stations (0.05%)	
	X	F. Hand washing station next to every latrine	
		G. Water towels next to all hand washing stations	
	X	H. Clearly marked laundry stations (0.05%)	
		I. Clearly marked boot cleaning stations (0.5%)	
	X	J. Clearly marked WASH disinfection station (0.5%)	
		K. Showers connected to pipes (Need 100L treated water per day for patient and 5 for caregiver)	
10. Drains and wastewater	X	A. Showers drain into pits (30m from groundwater and 1.5m above water table)	• One open run-off pit next to the water tanks
		B. No water waste leakage	

	X	C. Bucket system drains into septic tank for bodily fluids (both suspect and confirmed zones)	• Waste drains follow natural flow of the groundwater system
	X	D. Latrines drain into septic system (Handling liquid waste requires: bucket with closed lid for vomit and excreta, adding .5%, wait 15 min, etc…)	
	X	E. Practices: (Never dry sweep)	
	X	F. Practices: Always soak liquid waste up and double bag	
11. Toilets	X	A. All toilets to be 30m from water source	
		B. If possible, have plastic squatting slabs	
	X	C. Line with cement and plastered if water table is high	
	X	D. Separate toilets for staff, patients and family	
	X	E. 1 latrine to 20 caregivers and gender separated with signs.	
	X	F. Practice: (Regular cleaning with 0.5% chlorine)	
	X	G. Sufficient sanitary supplies (toilet paper, soap, menstruation products?)	
12. Incinerator	X	A. Size (2+2+5m)	
		B. Availability/Use of ash/dirt	
	X	C. Available/Sufficient fuel	
	X	D. Location in confirmed zone	
	X	E. Practice: Waste must never be left unburnt overnight	
	X	F. Practice: Move waste from suspected area to confirmed area only	
	X	G. Practice: Nothing leaves the CCC	
	X	H. Practice: Double bag, spray 0.5% and then transport for burning	
	X	I. Practice: Need full PPE to burn and leather gloves)	
13. Cemetery/ morgue	X	A. Cemetery within 1km	
14. Soakpits	Unclear	A. 30m from underground water	
	Unclear	B. At least 1.5 m down	
	Unclear	C. Used for mortuary, shower, laundry and kitchen water	
15. Sharps and Sharps Containers	No	A. Are any sharp objects seen that are not protected?	
	X	B. Box marked by words SHARP and labeled with infectious substance symbol	

	Unclear	C. Number of containers……	
	NA	D. System for sanitary disposal outside of facility?	
	No	E. Evidence of sharps polluting area around CCC?	
16. Children		A. Recreational material for children	• Lack of children-friendly material • Some old, dirty and broken toys
		B. Child friendly posters and drawings	
17. Storeroom	x	A. Supplies and inventory: Bleach Needles Soap Alcohol Sanitary supplies Cleaning material PPE Gloves ORS Malaria medicine Antibiotics Other_____	• All necessary supplies are present, some stored in a locked tent and others in various storage cupboards
	NA; facility is closed	B. Sufficiency of supplies for x days	
	X	C. Clear inventory records	
18. Testing infrastructure	NA	A. Locked motorcycle storage containers	• Iceboxes are present • No motorcycles are present
	X	B. Separate Icebox	
	X	C. Purple EDTA tube (Need 2-4ml of blood per patient & 2 members transport blood at all times)	
19. Transport		A. Availability of ambulance to transfer patients	• No ambulances are present • SCI vehicles are available to carry non-EVD suspected cases during the day
		B. Availability of motorcycles to transfer patients	
	X	C. Consistent fuel supply with records	
	X	D. Transport staff	
20. General Impressions	Unclear, as facility is closed	A. Number and location of post-discharge packages	

	X	Is overall facility structure in good condition (Walls, roof/tarps) or is it leaking or broken?	
	X	Is furniture sufficient/in good condition?	
	X	Is facility well-lit and inviting?	
	X	Is it well staffed?	
	NA	Are there obvious material or equipment shortages?	
	X	Is there a functioning pharmacy with sufficient supplies?	
	See KII notes	Is there a referral system in place for child welfare?	
	X	Is there a private location for interviewing people requiring confidentiality?	

5.5. Appendix E: Child Protection and the CCCs

Throughout the Ebola epidemic, the SCI field office in Margibi County sustained a robust child protection capacity. The child protection program was involved in approximately 43 family reunifications between ETU patients and their families (number from CCCs is unknown). SCI child protection services also provided psychosocial support and food and non-food items to children affected by Ebola throughout the county.

In the course of Save the Children's rapid preparation to finance, plan, and construct the CCCs, SCI leadership decided to prioritize public health and clinical issues over secondary programs, like child protection and gender security. Therefore, SCI's engagement with child protection issues through the CCCs needs to be considered through several frameworks:

1. Formal Integration of Child Protection measures at the CCC
2. Informal Integration of child protection services and responses at the CCC and in the communities
3. The integration of Institutional/Infrastructure capabilities for integrating child needs and child protection issues

We emphasize that this evaluation was not targeted towards appraising Save the Children's child protection programs within the CCC program. However, field-based concerns raised by field and national staff have prompted the following summary of findings and analysis.

1. Formal Integration of Child Protection measures at the CCC

SCI's initial proposal to the OFDA prioritized Ebola-related child protection issues. Key priorities were unaccompanied children and orphans.

CCC protocol required that CCC staff contact SCI child protection services for all patients under 18 years of age. CCC and child protection staff report that this seldom happened, as both health and child protection staff were often "overwhelmed" with executing their routine responsibilities.

More than one-third of triaged and admitted CCC patients were children.

Parent's and caregivers' attitudes towards CCC responses to child patients were mixed.

- Among mothers who had taken their children to the CCCs, mothers reported that positive experiences, including staff spending time comforting children and caregivers and providing food. (Patient interviews and focus groups)
- Parents (mothers and fathers) reported several incidents of seeking medical help for sick children, and being turned away from the CCC. One example included a child who was turned away while convulsing.
- CCC staff lacked sufficient support to follow up on IPC-related child protection issues. CCC staff reported one example of a child who had met case definition criteria for Ebola, but was removed from the CCC because the parent refused to give permission for a blood test. CCC lacked the ability to find the child, educate the family, and return the child to the CCCC.

Due to practical efforts to restrict Ebola infection across CCC patient flow areas, toys and 'child-friendly' areas were not provided in the CCCs. The inclusion of these areas was stipulated in SCI's original OFDA proposal. The decision to exclude toys and child-friendly areas is consistent with necessary IPC requirements, and was a sound innovation in the course of planning and construction.

2. Informal Integration of child protection services and responses at the CCC and in the communities

There were reported incidents of unaccompanied children or orphan patients [without extended family members] seeking help from the CCCs. When unaccompanied children came to the CCC, CCC staff searched for parents and relatives via phone or home visits. Details of these cases were not documented.

- SCI provided care and transport to child patients in both Kakata and Bong ETUs.
- To provide SCI health staff with training and information about child protection, SCI used a brief child safeguards presentation during training. Child protection training was seen as insufficient by SCI health staff.
- SCI communication and outreach activities targeted whole communities, rather than specific target populations like children or mothers. In Liberia, SCI has historically used schools as an important communications pathway for communicating with children and families. In the context of the Liberian Ebola epidemic, this option was not viable because all schools were closed.

3. The integration of Institutional/Infrastructure capabilities for integrating child needs and child protection issues

Coordination and systems for integration between health and child protection services were seen as weak and 'ad hoc' by members of both STI Health Teams and STI Child Protection Teams.

The timeframe for child reunification efforts was ill-matched to the CCC patient triage and treatment timeline. CCC staff reported that patients might stay at the CCC for less than 48 hours; and SCI's child protection could not be effectively involved within such a short timeframe. Similar problems arose around child protection and reunification issue timelines between the Kakata ETU and SCI's child protection office. The Kakata ETU noted that SCI often failed to collect children in a timely fashion; while the SCI staff noted that the Kakata ETU lacked an understanding of the lengthy timeframe required for patient reunification with family members.

5.6. Appendix F: The Ebola 10 Commandments[21]

1. Thou shalt not HIDE ANY SICK person even family member or friend;
2. Thou shalt not SHAKE HAND or TOUCH someone with high fever who is very sick;
3. Thou shalt not TOUCH DEAD BODY even if it is your family member or friend who has died;
4. Thou shalt not PUT MAT DOWN for dead people not even your family member
5. Thou shalt not EAT or DRINK from the same pan, place or cup with family member, friend or anybody.
6. Thou shalt not allow anybody even family friend to spend time (with the infected).
7. Thou shalt not HAVE SEX with strangers; be very careful of the person you have sex with, they could have the EBOLA virus -- no sleeping around. Stick with the person you know very well.
8. Thou shalt not PEE PEE OUTSIDE, use a plastic bottle and wash your hands;
9. Thou shalt not TOILET OUTSIDE; use a plastic bag and wash your hands.
10. Thou shalt call this Telephone Number 4455 for Response Centre #1 right away when you have a sick person or a dead body in your house.

[21] Nikiforuk, Andrew."The Ten Commandments of Ebola – Where the Choices Could Be Life or Death." http://www.alternet.org/world/ten-commandments-ebola-where-choices-can-be-life-or-death. Last accessed 24 May 2015.

5.7. Appendix G: Ebola Quarantines in Margibi: Implementation and Consequences

Quarantines were a major response strategy used in the Ebola response in Margibi County. Our fieldwork identified four different types of quarantines: the military quarantine of Dolo Town; village quarantines coordinated by the Paramount Chief of Gibi District; quarantines of "hotspot" Ebola villages by the CHT and INGOs; and those implemented by Firestone Tire and Rubber Company. These typically lasted 21 days, but sometimes extended to 30 days.

The large-scale quarantine of Dolo Town began on August 19 after mounting Ebola cases linked to a large funeral and pastor's conference a few weeks before. People in Dolo still had a large degree of skepticism about whether Ebola was "real" and initially thought the outbreak was cause by food poisoning or witchcraft. The 17,000 inhabitants of Dolo were quarantined together by military, police and immigration officers at the same time as West Point slum was quarantined in Monrovia; however in contrast to West Point, there were no overtly violent protests in Dolo. As one informant recalled:

> *"They quarantined the town at night…[we] were really scared; there was no war but it looked like one. They were saying that everyone had Ebola in the town but not everyone was seeing people dying from Ebola; so they were suspicious."* – KII, Anon.

During this time, Dolo was referred to as the "Ebola jail." Soldiers patrolled the streets and the periphery of the town; anyone caught trying to escape was reportedly beaten-up. The overriding feeling of community members was a sense of disempowerment and fear. There was poor planning and a lack of resources, such as food, medicines and hygiene kits. Food distribution was handled by WFP and the Red Cross, but limited supplies and accusations of local corruption led many to rely on outside family members bringing supplies to the town checkpoint. The CHT depended on the Dolo Town Emergency Ebola Task Force (DOTEE), a group of local leaders and health volunteers (gCHVs) formed in July, to conduct case identification, contact tracing, distribute health messages and assist with the distribution of chlorine at centralized points. People showing any Ebola-like symptoms were moved to holding centers, sometimes in wheelbarrows. These were located at Petertown School and Dolo PHC, which remained nominally open during the quarantine. There was a significant lack of resources and trained clinical staff, and referral services from holding centers to ETUs were haphazard.

The quarantine system used in Gibi district was different, although in many ways the consequences were the same. Many villages are a few hours walk from Worhn village (Gibi's capital) in dense jungle; fewer people have radios and cellphone reception is often unavailable. The two PHCs in Gibi District (which serve 15,000 people) remained closed from August to November, with staff departing to Monrovia. Worhn itself was never quarantined, although many villages in the surrounding areas were. Quarantines in Gibi were coordinated and implemented by Paramount Chief Peter Banyou using his network of village chiefs. This included decrees on movement restrictions, which were followed with occasional punishments if villagers were hiding relatives from neighboring areas without permission. Trainings were done with gCHVs and village chiefs on Ebola prevention and contact tracing by the CHT, who also provided a limited amount of PPE and hygiene equipment like buckets and chlorine. But supplies were limited and ran out quickly. Localized quarantines of whole villages with suspected Ebola cases began in early September. This occurred in at least 7 villages, including Pleemu village and Zio village visited during our fieldwork. Surrounding communities would stigmatize villagers from these locations, which served to isolate communities even further. As the leader of Zio village, where 14 people died from Ebola, stated:

"We had a serious problem. People were abandoning us…not accepting money from us; they were not trading with us or eating with us. We were alone…contact tracers were helping [to impose the quarantine]. No one was allowed in or out."- KII, Community Leader

These quarantines contrasted with those done in Firestone district by the Firestone Health Services as well as by the CHTs in collaboration with INGOs. Firestone's well-resourced and multipronged approach included a large focus on supporting and monitoring voluntarily quarantined Ebola contacts. Strict movement regulations on company land and housing units were also put into place. Similarly, a more coordinated response system was put into place by the CHTs together with SCI, IMC, CDC, WHO, UNICEF and WFP. This was used on 4 separate occasions in response to Ebola cases treated at the ETU in Kakata in December 2014. A localized quarantine of 410 people was implemented in Dolo Town surrounding the household of a positive case identified through the Dolo CCC. Another quarantine took place in Lonfaye Town in Gibi District after family members were discovered to have disguised the body of a relative who had died of Ebola and transported it back from Monrovia in a taxi to evade checkpoints. At each of these quarantines, gCHVs were used as contact tracers (and given PPE, phones and a $50 salary) while local leaders, volunteers and police were used to ensure movement restrictions. Education was provided to villagers, sometimes using Ever Young Entertainment employed by SCI to dramatize songs and dance. All households were given an IPC kit (buckets, waste bags, heavy duty gloves, apron, soap, and masks) as well as food and non-food items by the various INGO partners. Latrines were also constructed, if needed.

Our fieldwork identified some significant consequences of quarantines for community member, particularly those imposed in Dolo Town and Gibi district. As one local leader said: "Ebola left so many wounds: orphans, affected families, survivors, unemployment, closed clinics, and the quarantine. So many hardships on us." Quarantines were widely recognized as contributing to heighted fear, suspicion and stigma in a context of considerable uncertainty. Sick people were isolated and stigmatized, at holding centers or at home. This increased community mistrust of medical staff and increased people's fear of ETUs and clinics. As one participant noted in Worhn: "[quarantines are times] when a mother and child will be separated." This contributed to people concealing their illnesses from their family, friends and medical staff:

"If you had any of the symptoms, you would hide yourself at home...If you had red eyes, you're vomiting or toileting. But there are so many diseases that have those symptoms, so it was creating confusion for people." – FGD, Community Members

Stigma and the fear of contagion enacted a certain degree of collective trauma. People were occasionally driven away from their homes or villages. Sometimes this was due to fear of infection, but concerns that suspected cases would precipitate a village-wide quarantine also played a role. This was because quarantines had major economic consequences for people; airport workers and firestone employees were reportedly fired from their jobs in Dolo Town while crop fields were left to deteriorate in Gibi District. There were no support systems in place to assist with these consequences, which generated resentment when Ebola survivors (viewed as the cause of the quarantines) returned and benefited from NGO funds.

The quarantines impacted on CCC implementation in a number of ways. Most importantly, they contributed to an atmosphere of distrust between community members, their leaders and government officials, including medical staff and NGOs. Rumors that Ebola was a government conspiracy were still strong after the Dolo Town and Gibi District quarantines. In this way, quarantines contributed to community fear and distrust of the CCCs when they were first opened, which were known as "Ebola

camps." It took nearly 4 days for the first patient to come to Dolo CCC and two full weeks at Worhn CCC. In Worhn, no Ebola survivors would join the CCC staff because of community fears and ongoing stigma issues. Community members, observing the construction of the CCCs, circulated various rumors about them at the time that illustrates this: the CCCs were built by the government to spread Ebola; CCC staff were hiding bodies in the water-tanks and storage containers; and "yellow pills" given by CCC staff were being used to kill people, among other things. Community leaders who had supported quarantines and then accepted the CCCs were implicated, and accused of being paid to spread the virus and kill people. For example, a widely circulated rumor was that the commissioner of Gibi District had established the CCC to sell blood and spread Ebola. Concerns for future quarantines and stigma also caused some CCC patients to not report their correct names or villages of origin to CCC staff in case identification forms.

5.8. Appendix H. Timeline of the Ebola Epidemic in Margibi County

March 2014

- Save the Children International (SCI) begins internal conversation about the EVD response.
- First case is reported in Margibi. The patient came from Lofa and died at Duside Hospital in Firestone.

April

- CHT puts in a small community engagement workplan ($67,000) that is rejected by the MoH.

May

- CHT does IPC training with PHC staff, including Dolo and Worhn PHCs.

July

- The large-scale outbreak in Dolo Town begins.
- HCW become infected at Rennie Hospital.
- Schools close in Liberia.
- SCI donates roughly $8,000 of IPC supplies to the CHT in Margibi.
- Transmission happened through a case of Ebola infection in Dolo Town that was misinterpreted as food poisoning
- A funeral in Dolo Town expanded the network of infection
- A pastor's conference at Dolo Town where many people shared food spread EVD farther
- 300 people die of Ebola in Dolo Town

August

- WHO declares Ebola an international public health emergency.
- SCI re-categorizes Ebola as a level 1 emergency.
- Mandatory cremation policy implemented by Liberian government.
- Dolo Town quarantine begins on August 19.
- Margibi SCI office stops going to field and reduces staff to 7
- Worhn PHC closes
- SCI agrees to construct the Kakata ETU.

September

- ETUs in Liberia are full.
- Rennie Hospital re-opens.
- Ron Waldman and Francesco Cheechi conceptualize the CCC model
- Quarantines are implemented in Zio village near Worhn by Paramount Chief Peter Banyou
- The Bong ETU constructed by SCI and managed by IMC opens (September 15)
- Margibi SCI office recalls staff and begins to hire new staff (Mid-September)
- September 22, OFDA proposal submitted for funding of 10 CCCs in Margibi
- Mapping of, and planning for, the 10 CCC sites begins with CHT collaboration

October

- SCI's ECHO project started, Oct 1
- US Navy Lab set up at Cuttington University in Bong, reduces test results from 2 days or more to under 4 hours.
- CCC scale-down from 10 to 2 CCCs

- Construction of CCCs begin in Dolo and Worhn
- Recruitment and training of CCC clinical staff in Monrovia and Margibi
- Pleemu village in Gibi District is quarantined by Chief Banyou
- PHC trainings in Kataka with CDC and SCI

November

- State of emergency lifted Nov 13
- Nov 17, Worhn PHC reopens
- CCC in Dolo Town opens Nov 17; first patient Nov 21
- Kakata ETU constructed by SCI and managed by IMC opens Nov 22

December

- Dec 5, CCC in Worhn opens (takes 2 weeks for any patients to come)
- Senator elections take place
- SCI hires a Liberian community mobiliser hired (Dec 8)
- Ever Young Entertainment is hired by SCI to do drama, song and dance routines on Ebola
- A request for 8,400 Ebola education flyers is processed by SCI
- A positive patient is admitted to the Dolo CCCC – a 14-year old girl admitted Dec 30th
- Four cases of Ebola are reported in Margibi and treated at Kakata ETU (Dec 4, 5, 9 and 30)

January

- SCI and MoHSC sign 3-year MoU to strengthen the PHC system in Margibi
- Second quarantine of Dolo Town takes place (404 people over 21 days)
- Ebola messaging changes from emphasizing the fact that "Ebola is real" to focusing on issues of complacency ("Ebola is still here").
- SCI begins supporting the Ebola hotline in Margibi in collaboration with the CHT
- The death of Solomon's wife takes place outside the gates of Worhn CCC

February

- ETU in Kakata tries to cut down staff but MoH refuses.
- Last Ebola case in Margibi discharged from ETU in Kakata.
- Feb 12, a new CCC coordinator is employed.

March

- Schools re-open in Liberia
- CCC management staff further reduced
- Peace and Unity County Culture Troop hired by SCI
- SCI starts building triage and isolation units at the PHCs and has CCC staff do trainings with PHC staff
- New area manager arrives in Margibi with a 1-year contract
- March 15: Death of a 3-month old child at the Worhn CCC
- SCI's Ebola Must Go Massive Awareness Campaign in Worhn (March 28)

April

- SCI's Ebola Must Go Massive Awareness Campaign in Kakata (April 10)
- Decommissioning events at Worhn and Dolo CCC
- CCC evaluation begins

5.9. Appendix I: CCC Community Mobilization Activities

**Provided by SCI Margibi Office Community Mobiliser for activities begun in December 2014*

Table 8: Community Mobilization Activities

Activities	Date	Location(s)
Stakeholder meetings	Dec 8, and then periodically.	In all 4 districts of Margibi
Training of gCHVs to conduct house-to-house awareness (using the gCHV information "fact sheet")	December 9 to March 14	Worhn and Dolo, as well as surrounding communities
Production of "Protect Yourself" Ebola flyers	December 16	To be distributed in multiple locations
Town-hall meetings (various uses but often to encourage volunteers and leaders to go to CCC)	Biweekly since December	Worhn and Dolo
Community messaging, using song, dance and drama by Ever Young Entertainment	December, January, February and March	Ebola awareness messaging in community locations throughout Margibi
CCC Promotion Town Hall meetings	January 8 and 9	Worhn and Dolo
PHC promotion jingle	January and February 2015	Radio
Anti-Ebola victim stigma workshop	Jan 28 and Feb 26	Dolo and Worhn
Production and dissemination of anti-Ebola victim stigma song, drama and jingle for radio	January and Feb 2015	Preformed in communities in and around the CCCs, and played on radio 3 times daily for 2 months
CCC community tour meetings	Feb 2, Feb 28 and April 3	Open house at CCCs
Ebola Must Go Massive Awareness Campaign (Parade, messages, soccer match, songs, t-shirts, dance)	March 28 and April 10	In Worhn and Kakata
Survivors health meetings	April 16, 17 and 20	Worhn and Dolo
Production and dissemination of measles, polio and deworming song, drama and jingle	April 20	Throughout Margibi
Decommissioning meetings	April 25 and 28	Dolo and Worhn

5.10. Appendix J: Messaging material associated with the CCCs

1. Produced Jingles
    - Anti-stigma jingle
    - PHC promotion jingle
    - Ebola awareness jingle
    - Measles and Polio vaccination and deworming jingle

2. Produced Songs
    - “Ebola Must Go”
    - “Don’t Run from Ebola Victim and their Family Member”
    - “Kick Measles out of Margibi”

3. Produced Dramas/Plays
    - “Ebola Must Go”
    - “Stopping Ebola is Everybody’s Business”
    - “Stop Neglecting Ebola Victims”
    - “Kick Measles out of Margibi”

4. Produced Flyers
    - “Protect Yourself”
    - “Are you Sick?”

5. Produced training material
    - gCHV information factsheet

5.11. Appendix K: Ebola Survivors

Ebola had severe impacts on Ebola survivors, their families as well as orphans and widows of those who died from the virus.

> *"For me I lost my mother, my wife and two of my kids. I've been very traumatized. When I left the ETU I had to destroy all my things. I had to burn all of my things. My house is still there but I don't go into it [since it has not been disinfected]. I'm living with my little brother."* – FGD, CCC Attendant

It's unclear how many residents died of Ebola in Margibi county, and how many survived.

> *"They were dying in the village and there's no record of them. We need to do a census to figure out. Lots of children were affected and widows too, and they're not receiving support. We have about 40 survivors [who are now receiving support] but we had 51 deaths reported to the office."* FGD, CCC Attendant

Ebola survivors played an important role in reducing community fears about the CCCs and ETUs and addressing the various "Ebola rumors" circulating in the community. This was especially the case for survivors who had been to the ETUs and returned. During a number of FGDs, community members reported that they became more willing to visit the CCCs after survivors told them about their own experiences at ETUs, which dispelled concerns about being killed or having their blood stolen. For a small number of survivors, the CCCs provided employment since they were hire as attendants, which also served to increase community trust of the facilities.

The lack of coordination in administering survivor benefits attracted community attention. Psychosocial support was provided to survivors by other organizations, like the Carter Centre, in both Dolo Town and Worhn. Some survivors received benefits from multiple organizations while others, with valid ETU certifications, had not received any.

Community leaders in Dolo expressed frustration at the fact that to felt that it was challenging to access these survivors benefits an orphans benefits (like monthly allocations of food and non-food items and $100 and cash). A 'survivor' needed to have an ETU certificate. This effectively excluded a large number of survivors, and their families, who had become sick in their community (where they also recovered) before improved referral systems helped locals go to ETUs in Monrovia helped more people to get to the ETUs in Monrovia. It also was felt that orphans from families where parents who had died early in the outbreak had been excluded from support remained undocumented. Some leaders and survivors Some reported duplication and confusion between different NGOs seeking to provide benefits. In Worhn and other communities, there were reports that powerful officials had taken a number of ETU certificates and survivor IDs from local residents in order to obtain benefits.

> *"[Community member] says that many Ebola survivors are complaining that [a community leader] called his name and [a local leader] took his survivor ID [Ebola ticket], and hence his rice and money for this month… many Ebola survivors are complaining of this in Worhn." Another added that: "I can't say anything to him, he has the power and I don't have any power….I just have to keep quiet."* - FGD, Communities

At the community-level, the context of the Ebola response has contributed to uncertainties about who should receive benefits, accountability mechanisms and types of, and timeframes for, survivor benefits.

5.12. Appendix L. Two Case Studies of Community Member Interactions with the CCCs

Based on Key informant interview. Recounted by Solomon's brother. Language modified for accessibility.

Case 1: Solomon and his Wife

Solomon was a man in a village near Worhn with a reputation for being a drunkard. It was also widely accounted that he loved his wife very much—the two of them were known to drink together. When Solomon's wife showed signs and symptoms of Ebola like vomiting blood, a swollen neck, red eyes and fever, Solomon hid her sickness by carrying her on his back to his farm. Daily, he searched for country medicines and medicines from local drug vendors, and he gave her country medications. He would not take her to the Worhn CCC. His brother soon became suspicious, and Solomon told his brother, "I have done a bad thing. I have hidden the sickness of my wife." Solomon's brother told him that he had to take his wife to the CCC. Solomon was afraid of the ETU, and he said "I was afraid to go to the CCC since they would take her away." Solomon and his brother took Solomon's wife to the clinic in a hammock, and they were immediately referred to the CCC. Solomon's wife died outside the gates. His brother noted, "Solomon should have carried the women sooner to the clinic but he was afraid of Ebola."

After her death, Solomon's brother recounted to our interviewers that the CCC staff had told the local community that Solomon's wife did not die from Ebola. The community didn't believe this assertion. They had observed individuals using PPE in the handling of the body, and they were aware that her body was disposed of in an Ebola burial. Solomon's brother noted, "They were lying to us. I am not sure of the reason. We were not allowed to touch or see the body, but they buried the body not far from here in the village."

Case 2: A Community Leader and his Brother

One local leader had a brother who was very sick. Although his brother didn't believe that he had Ebola, he believed that the CCC could help him. The local leader said,

> *"The CCC was here to rescue us, to help us with our health. That is why I took him there. But we were in the Ebola crisis so I was thinking that I would just have a good conclusion to make sure that it wasn't Ebola. But I didn't really suspect that [Ebola] at the time. Many people were saying that he did have Ebola in the village so I wanted to have him tested to make people accept him; people were trying to isolate him. It was not clear what sickness he had and the sickness was getting much worse. I also began to fear that maybe it was Ebola; he started vomiting very badly."*

The local leader cared for his brother for 1½ days at the CCC. While they were there, the CCC staff provided fluids, food, and testing, and his brother was placed "on bed." The local leader was not provided with any PPE. They were then given referral documents to send the brother to the local primary health clinic, and diagnosed him with a 'sore stomach,' citing a lack of medications for addressing his brother's condition.

At the PHC, services were highly restricted and there was not a lot of activity. His brother was allowed to stay for two days, and then he was sent home, despite remaining very sick. He evaluates his experience at the PHC in comparison to the CCC as follows:

"We are not happy with the clinic. During that time, they were not giving proper medicines, only aspirin and paracetemol. There was no vitamin or medicines for a sore stomach at the clinic; they told me I had to go to Monrovia. So then I started giving him country medicine at home. We spend one month at the village before he died...

At the CCC he could walk but in the village it was much worse. At the CCC they gave him good medicine and food and biscuits. The clinic just told me to carry him to Rennie or to Monrovia. They told me to pay money for an ambulance, but I couldn't do that, because he was too sick and I didn't have any money. I think maybe the clinic people were fearing that he had Ebola. I am not sure. But the CCC people told us it was not Ebola. I called the burial team and the burial team were the ones that buried him. I know where the grave is. He has no children now; they are all grown up."

Lessons Learned:

1. Local attitudes towards the ETUs and CCCs were mixed. Some, like Solomon, were afraid of the ETU's and CCCs, while others, like his brother, advocated strongly to use ETUs and CCCs within their families and communities, and were effective. This latter group was intensely involved in still-unrecognized informal surveillance and advocacy in rural areas.
2. For individuals seeking to bypass CCC care, drug vendor networks played an important role in helping individuals engage in (ineffective) care-giving practices like purchasing country medicine.
3. CCCs and CCC staff were, and may always be, under intense levels of scrutiny. After the CCCs were built, communities were still watching to see how individuals were treated at the CCC gates, how their bodies were handled if they died, and what kinds of infection control measures were being used by CCC stuff. Communities may have studied CCC staff responses closely to assess the legitimacy of the institution. They may also have studied the CCC staff responses closely to infer progress in the course of the epidemic, or to learn about community members' fates. Save the Children needs to be conscious of the ways in which CCC activities were regarded as bell-weathers for the Ebola epidemic as a whole in the local area, and strive for transparency and honesty in all interactions will local communities.

During the Ebola response, local communities rapidly integrated the CCCs into a paradigm of health-seeking behaviors. CCC were reputed to be able to certify that individuals did not have Ebola, and this was seen as a needed service for many with sick family members. The standard of care at the CCCs was also regarded as very high within its constraints, but it was known to be very limited.

Appendix M: Physical Infrastructure Provided

Figure 11: Physical Infrastructure given to patients, Dolo and Worhn