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Rebuilding people-centred maternal health services in post-Ebola Liberia through participatory action research

Theresa Jones^a, Lara Ho^b, Kelvin Koffa Kun^c, Penelope Milsom^d, John Shakpeh^e,
Ruwan Ratnayake^a and Rene Loewenson^f

^aInternational Rescue Committee, New York, NY, USA; ^bInternational Rescue Committee, Washington, DC, USA; ^cInternational Rescue Committee, Monrovia, Liberia; ^dLondon School of Hygiene and Tropical Medicine (Formerly International Rescue Committee), London, UK; ^eRedemption Hospital, Monrovia, Liberia; ^fTraining and Research Support Centre, Harare, Zimbabwe

ABSTRACT

During the March 2014–January 2016 Ebola crisis in Liberia, Redemption Hospital lost 12 staff and became a holding facility for suspected cases, prompting violent hostility from the surrounding New Kru Town community, in the capital city Monrovia. Inpatient services were closed for 6 months, leaving the population without maternity care. In January 2015, Redemption reopened, but utilization was low, especially for deliveries. A key barrier was community trust in health workers which worsened during the epidemic. The New Kru Town council, Redemption Hospital, the International Rescue Committee, and Training and Research Support Centre initiated participatory action research (PAR) in July 2015 to build communication between stakeholder groups, and to identify impacts of the epidemic and shared actions to improve the system. The PAR involved pregnant women, community-based trained traditional midwives (TTMs) and traditional birth attendants (TBAs), and community leaders, as well as health workers. Qualitative data and a pre-post survey of PAR participants and community members assessed changes in relationships and maternal health services. The results indicated that Ebola worsened community-hospital relations and pre-existing weaknesses in services, but also provided an opportunity to address these when rebuilding the system through shared action. Findings suggest that PAR generated evidence and improved communication and community and health worker interaction.

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Introduction

Prior to the onset of the Ebola epidemic, Liberia ranked just 177th out of 214 on the United Nations Development Programme's Human Development Index (UNDP, 2014). Liberia's colonial past has been linked to ongoing tensions between individuals, communities and the government (Benton & Dionne, 2015). Civil conflicts between 1989–1996 and 1999–2003 had long-term effects on the economy and health system, particularly the availability of health facilities and health workers (Challoner & Forget, 2011), with subsequent 'patchy' and 'vertical' foreign aid programmes limiting robust primary healthcare coverage and public health surveillance systems (Benton & Dionne, 2015).

Despite this backdrop, the last two decades saw concerted efforts from Liberia to improve its maternal mortality ratio through training health workers (Dolo, Clack, Gibson, Lewis, & Southall,

CONTACT Theresa Jones  theresa.elizabeth.jones@gmail.com

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2016), implementing maternity waiting homes (Lori, Munro, et al., 2013; Lori, Wadsworth, Munro, & Rominski, 2013) and rolling out a national Basic Package of Health Services (Petit, Sondorp, Mayhew, Roura, & Roberts, 2013). Maternal mortality fell from 1800 per 100,000 live births in 1995 to 640 in 2015 (UN, 2015). The 2013 Liberia Demographic and Health Survey showed 98.7% of women receiving at least one antenatal care (ANC) visit, and 73.3% of women delivering with a skilled provider in a health facility in Montserrado County (LISGIS, 2014). In the capital city of Monrovia (see Figure 1), delivery options included numerous public and private health facilities, one public hospital and two private secondary hospitals. The occurrence of known history's most widespread and persistent Ebola epidemic in March 2014, and its impact on the health system, challenged much of this progress (Luginaah et al., 2016) (Figure 1).

Numerous health facilities across Liberia restricted services or shut down entirely including Redemption Hospital, Monrovia's only free-of-charge public hospital. Prior to Ebola, there were 400–500 staff and only 206 beds at Redemption, serving a city of 1.5 million. Denial of the virus' existence and rumours of it being brought by health workers led to violent clashes between hospital staff and the surrounding New Kru Town, a slum community on the northwest coast of Monrovia, with high Ebola transmission rates. After the first Ebola case entered the hospital and led to the death of 12 staff, Redemption Hospital's inpatient services were closed. This ended the availability of all basic and comprehensive emergency obstetric and neonatal care at Redemption Hospital for a period of approximately 6 months between July and December 2014.

Redemption Hospital became a holding centre for suspected Ebola cases that Monrovia's three overcapacity Ebola Treatment Units could not admit. The hospital management reported that few health workers remained during the hospital's temporary status as a holding centre with many recruited to work in the Ebola Treatment Units. Reasons for this included a greater chance of being paid and a perception of relative staff safety (see Miller (2016) for full accounts). The nine other public and private primary health facilities serving New Kru Town also suspended or shut down their services.

Pregnant women faced significant delays before care was provided, and received insufficient or at times no care at all. This was not unique to Monrovia – in Sinoe County which had relatively few Ebola cases and where facilities remained open, estimates of facility-based deliveries between

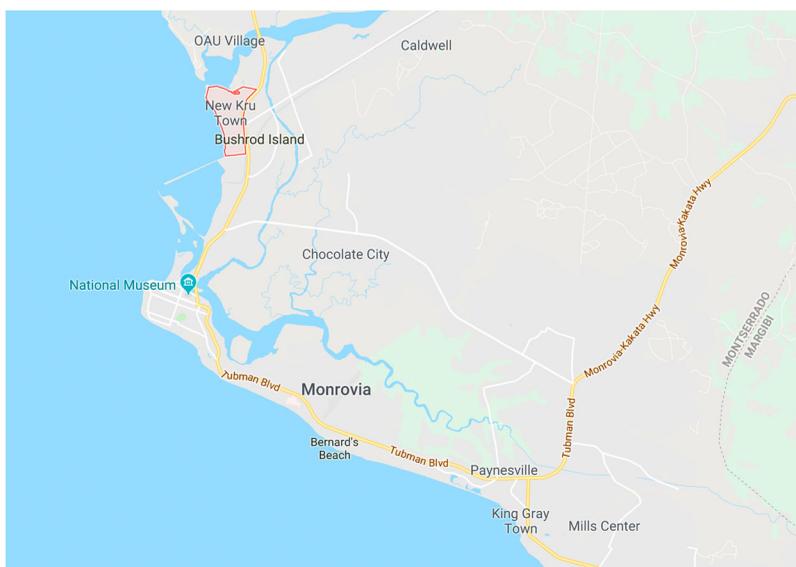


Figure 1. Map of Monrovia and New Kru Town. Source: Google Maps 2017.

March 2011 to June 2014 ('pre-Ebola virus disease (EVD) period') and June 2014 to April 2015 ('EVD period') suggest a drop of 30% (Ly et al., 2016). In Sierra Leone where facilities also remained open, data combined across the districts and reviewed for 10 months during and 12 months prior to the outbreak showed ANC visits dropping by 16% and deliveries dropping by 11% (Jones et al., 2016a). The United Nations Population Fund (2014) predicted that by October 2015, the epidemic could result in 120,000 maternal deaths across Liberia, Sierra Leone and Guinea, either directly from the virus itself or indirectly from a lack of access to general health services.

In the 1990s, a number of Traditional Birth Attendants (TBAs) had received training in safe home delivery from the Liberian Ministry of Health & Social Welfare (MoHSW) and were formally linked to the health system as trained traditional midwives (TTMs). Among the various strategies to address ongoing issues of high maternal mortality in Liberia, the National Reproductive and Sexual Health policy (2010) recommended that skilled attendants accompany *all* births, and TTMs had their roles shifted to birth supporters rather than birth attendants. During Ebola, however, community-based TBAs and TTMs mobilised to fill the gaps in delivery care (S. Saytue, personal communication, July 18, 2015).

As Ebola incidence began to decrease in late 2014, the significant need for essential non-Ebola health services was stark. In response to this, the International Rescue Committee (IRC) partnered with Redemption Hospital in December 2014 to gradually reopen inpatient services. The reopening strategy critically emphasised infection and prevention control (IPC) measures. Screening and triage systems were established and health workers were trained on integrating IPC into their regular practices. New national policies included having a maximum one person per bed and minimum distances between beds, further limiting the number of beds available in the already small hospital. IRC continued to support Redemption Hospital with IPC quality for the next 15 months through ongoing training and supervision, and through providing essential drugs and supplies.

Service use gradually increased over the period of reopening, however, at a slower rate in the antenatal and obstetric departments. Health workers perceived that fear of infection and mistrust of health facility staff were preventing community members from returning to these services (Redemption Hospital Nursing Director, personal communication, January 2015). In 2013, prior to Ebola, Redemption performed an average of 331 normal vaginal deliveries per month. In July 2015, just 136 normal vaginal deliveries were performed. This represented 41% of the pre-Ebola average monthly delivery rate in 2013 (Redemption Hospital Nursing Director, personal communication, January 2015). Obstetric department staff reported more women coming at a late stage of labour, often with already significant complications.

Realising that heightening IPC measures was not sufficient to increase demand for services, the IRC, the local health workers and community representatives identified this post-Ebola context as an important opportunity to explore barriers to access. In doing so, they would strengthen links, relationships and communication between the community and actors within the maternal health system. This work aimed to facilitate relevant stakeholders in New Kru Town, including pregnant women, traditional midwives, hospital staff, community leaders, local government, and programme implementers to:

1. Identify the needs, desired outcomes, and services for maternal health and the factors affecting them;
2. Identify and analyse how the Ebola epidemic affected the needs and services for maternal health, how different actors responded to these impacts, and the priority issues to address to improve services in the future;
3. Identify and implement actions that address these weaknesses/gaps or that strengthen effective and acceptable practice for the priority issues; and
4. Establish a sustainable approach for the collaborative coordination and monitoring of both progress and learning from action.

Methods

Applying a PAR approach

The lack of communication and trust between community members and the formal health system led to participatory action research (PAR) being identified as a potential methodological approach. The experiences, methods, and tools of the Regional Network for Equity in Health in East and Southern Africa (EQUINET) and particularly its learning network on PAR coordinated by Training and Research Support Centre (TARSC) informed the design of this study (Loewenson, Kaim, Chikomo, Mbuyita, & Makemba, 2006; Loewenson, Laurell, Hogstedt, D'Ambruoso, & Shroff, 2014; Mbwili-Muleya et al., 2008).

The methodology aims to establish processes that address power dynamics and build relationships between stakeholder groups and service providers. PAR facilitates those affected by health circumstances to be researchers themselves, to generate and use their own knowledge of the local context to improve access to and quality of maternal health services. PAR (1) draws on and organises the experience of those directly affected by a problem, (2) builds shared analysis on relationships and causes of problems, (3) reflects on and prioritises actions that can be taken to address the causes of problems, (4) takes action and assesses progress in the actions and the effects, and (5) reviews the changes to build shared learning (Loewenson et al., 2014) (see Figure 2).

The time and resource limitation of the project limited the focus of the PAR work to one geographical area. New Kru Town was selected because it immediately surrounds the hospital and relies on its services. Focusing attention and resources on one area allowed for the inclusion of diverse social groups and for the intensity of engagement needed in the PAR process with the limited resources available.

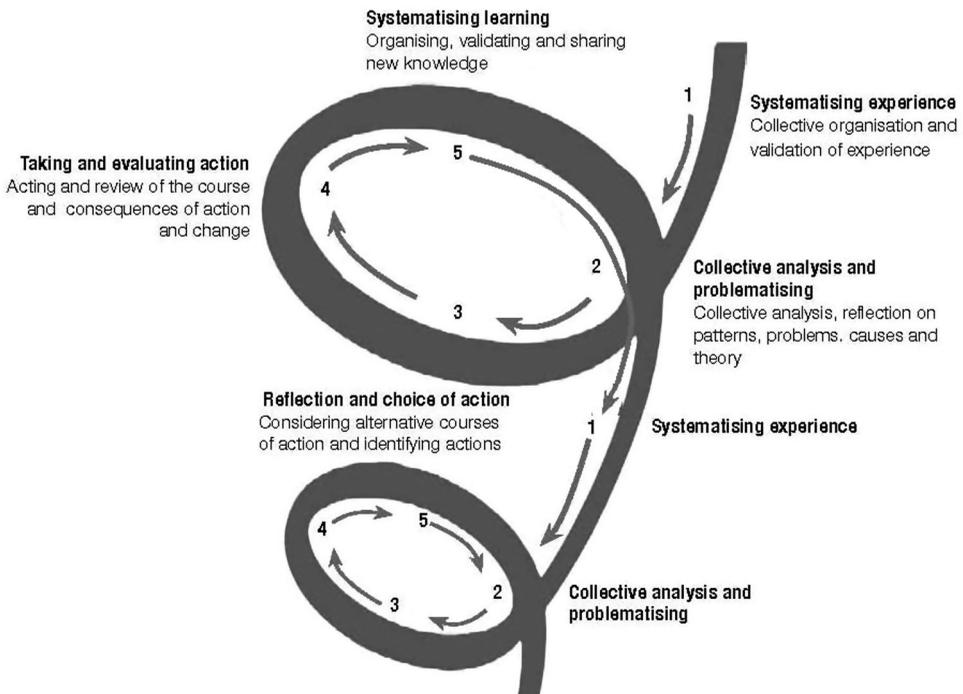


Figure 2. The cyclical and spiral process of PAR. Source: © Loewenson et al. (2014), p. 13, used with permission.

Table 1. Key stakeholder groups engaged in the PAR process.

	Group composition
Group 1	Pregnant women in New Kru town – between the ages of 16 and 45 years
Group 2	Female community leaders, elected male local administrators and traditional leaders, and TTMs and untrained TBAs
Group 3	Redemption Hospital health workers from both the obstetric and ANC services

Through introductory meetings between IRC and representatives and leaders of the community including male leaders, female leaders, and TTMs, the Redemption Hospital management, MoHSW, and with design input on the protocol from TARSC, a protocol was developed that included key stakeholder groups affected by maternal health services or important actors of change in the system as outlined in [Table 1](#).

The protocol described below was reviewed by community leaders and health sector managers, and the IRC Institutional Review board and the University of Liberia Institutional Review Board provided ethical review and approval. As the IRC had a time limit of 6 months to support the process, actors that could continue to support the process and future action were also engaged and oriented to the process.

The PAR process

The initial stage 1 and stage 2 PAR meetings were held between August and September 2015; initial actions were carried out between September and December 2015, and learning from action and new directions for action were carried out from January 2016 onwards.

The aims were addressed in several stages, as outlined in [Table 2](#).

Sixteen facilitators volunteered from the different stakeholder groups. IRC and TARSC co-led a 3-day training workshop to prepare the co-facilitators, full details of which can be found in the full PAR process report (Jones et al., 2016b).

Stage 1 meetings: PAR analysis of the current situation

Each of the three different stakeholder groups had one 2-day stage 1 meeting in New Kru Town. The three groups met separately as homogenous groups to allow for freedom of expression and space to feel comfortable in the PAR process. The meetings involved 17 health workers (10 midwives from the Obstetrics unit, 5 midwives from ANC and 2 hospital managers), 35 community members (15 TBAs and TTMs, 10 community leaders and 10 local administrators), and 35 pregnant women.

The criteria for individual participant selection were agreed in the initial orientation meetings with these wider stakeholder groups. The community leaders, TBAs, and TTMs represented each of the 25 zones of New Kru Town. Pregnant women were purposively recruited through each of these community personnel. An upper limit of thirty-five members was taken, given the

Table 2. Outline of the PAR process.

Stage	Description	Date
Stage 1 meetings	Two-day meetings were held with the three subgroups separately on their current experience of maternal health services, how the Ebola epidemic affected them and the priority issues to address to improve services	Aug 2015
Discussion of stage 1 findings	The findings of the meeting were taken by participants and discussed with their own wider group, whose feedback was brought to a stage 2 meeting	Aug 2015
Stage 2 meetings	A one-day meeting brought all groups together to identify actions to address problems and improve experience of services, to set up a coordination committee and progress markers for the action plan	Sept 2015
Implementation and review of actions	The identified actions were implemented over 3 months and reviewed by the coordination committee against progress markers and in a wider review meeting in December 2015 to support the learning from action	Sept–Dec 2015

Table 3. PAR tools and activities used during the stage 1 meetings.

Tool/Activity	Objective of activity
Picture codes and pile sorting	To build a shared understanding of what maternal health means
Social map	To identify features of the current maternal health situation
Venn diagram	To identify current actors and services involved in the maternal health system
EVD timeline	To discuss impacts of Ebola on the maternal health system, and primary problems and barriers to change
Ranking and scoring/pairwise ranking	To prioritise problems and barriers to change
Market place	To identify current responses to these problems and barriers that can be learnt from or built on

Source: Loewenson et al. (2014) and Loewenson et al. (2006).

participatory nature of the process. This allowed for one pregnant woman to come from each of the 25 zones, with further members added on the advice of the community leaders to reflect variability within some areas and to allow more than one participant from some areas to enable confidence to participate.

Before the stage 1 meetings began, the PAR co-facilitation team discussed the purpose and content of the process verbally with each participant, with special focus on confidentiality, the right to withdraw, and detail on how the information shared would be used. Their interest and willingness to participate was gauged, and their right to decline was emphasised. Participants were given refreshments, lunch, and regular breaks throughout the meetings. They were reimbursed for transportation costs to the location of stage 1 and stage 2 and review meetings.

The stage 1 meeting used a range of PAR tools to enable participation by all, as outlined in Table 3.

All participants were involved at each step. The protocol and techniques used integrated the application of no delegation, with the participants themselves providing the evidence from experience, analysing and collectively validating the findings through consensus. Detail on the tools can be found in Loewenson et al. (2014) and on their use in the stage 1 and stage 2 meetings can be found in Jones et al. (2016b).

The groups discussed outputs and reporting, and how the process might continue beyond initial actions. At the end of the stage 1 meeting, participants agreed how they could convene, discuss and verify these initial findings with wider members of their particular group for validation (e.g. other pregnant women, other TTMs and TBAs, other health workers).

Stage 2 meeting: building a shared action plan

The stage 2 PAR meeting lasted 2 days and brought all groups together in New Kru Town Hall. Participants included 8 health workers, 14 TBAs, TTMs and community leaders, and 14 pregnant women. Each group presented and discussed a summary of their findings and experiences with one another, and the methods used drew the inputs and analysis directly from participants with consensual validation. The combined group used their collective findings to identify common priorities, a shared action plan and a coordination mechanism. This was in the format of a coordination committee, comprised of people from each group with a role to monitor and review the actions and progress markers and to share learning across the groups.

The group size was reduced for the stage 2 PAR meeting to allow for more meaningful engagement of those involved. As it was not possible to bring all participants together in the stage 2 meeting and still have the form of participatory process intended, the smaller size group was discussed at the end of the stage 1 meetings, with the group coming to a consensus as to who would represent them.

All groups took responsibility for areas of actions selected and implemented them over the subsequent 4 months. Actions were reviewed monthly by the identified coordinating committee against the agreed progress markers. The actions, time frames, and progress markers set to monitor progress are discussed in the Results section.

Reviewing the actions and progress

PAR co-facilitators contacted the original PAR meeting participants either face to face or by phone call to invite them to a review meeting in December 2015. Those who were available and willing to attend included 9 health workers, 34 TBAs, TTMs and male and female community leaders, and 15 pregnant women. The meeting included a review of the actions implemented, progress made, and learning from the actions using participatory tools such as progress markers, photos, and group discussions. Again, the reduced number of participants was intentional to allow for maximum discussion and participant contribution. Buzz-groups (small groups who breakaway from the larger group to discuss a specific topic or question) and plenary sessions were used to break the groups into smaller sizes, allowing for free expression and maximum participation. These tools are further explained in an available online methods document that informed the work (Loewenson et al., 2014; Mbwili-Muleya et al., 2008).

Data from each meeting were recorded using a specially designed recording book, completed by hand by the PAR co-facilitation team, with the consent of participants. The recording books included commentary on both the process and content of the workshops. These qualitative data were analysed using a thematic content analysis by TJ and KK and reviewed by RL.

Using quantitative evaluation to assess change

Two cross-sectional surveys were conducted among all PAR participants and a population-based sample of women in New Kru Town to provide a quantitative measure of change to accompany the qualitative data. The 19-question survey included process and output change indicators that included (i) communication between stakeholders regarding maternal health, (ii) perceived quality of relationship between the health system and wider community, (iii) community participation in the health system, (iv) access to safe maternal delivery services, and (v) perceived quality of maternal health services. The survey was deconstructed with the IRC co-facilitator team native to New Kru Town to ensure that the words and phrasing were carefully selected, relevant, and appropriate. Following this, the survey was pilot-tested with six volunteers from New Kru Town community. The survey was administered in Liberian-English by trained Liberian facilitators.

The survey was implemented in July 2015 and again in December 2015 to 78 participants from the stage 1 meetings (9 participants were not available at the time of data collection). Immediately following the review meeting, 80 PAR participants refilled the survey (8 pregnant women and 1 health worker from the stage 1 meetings were not available at the time of data collection).

The same survey was given at baseline in July 2015 and again in March 2016, following the learning from action in the review meeting, to a sample of 150 New Kru Town women aged 15–49 years. For this population-based survey, the sampling frame was derived from the 2012 census. A map was divided into clusters, using proportional to population size sampling to randomly select 30 clusters for first stage sampling. A household was defined as individuals sleeping regularly under the same roof and sharing meals. For the second stage sampling, all households in the cluster were counted and five were selected using systematic random sampling. Women residing in those houses aged 15–49 were invited to participate. If there was more than one eligible woman in the household in the interval, one woman was selected randomly using one or a series of coin tosses. If women declined or no women resided in the house, data collectors went to the next household until five surveys were completed within each of the 30 clusters. If a woman was absent, arrangements were made to revisit the household. The sample size was 150 households with women aged 15–49 years ($z = 1.96$, $p = .5$, $d = 0.10$, design effect = 2, non-response = 5%). A two-sample Wilcoxon Mann–Whitney statistical test was used to compare the medians of the survey answers and the polarisation of responses between rounds.

Findings from the PAR meetings and review meetings were triangulated with the quantitative survey. The findings were presented in a full report (Jones et al., 2016b) co-written by all institutions involved and reviewed by the co-facilitators.

Results

Qualitative evidence from the PAR meetings

Maternal health needs and services before Ebola

All three PAR groups used picture codes to identify key features of maternal health, which included physical health and being free from pain; social determinants including access to good food, clean living environments, personal hygiene and family support; and health service determinants including seeking and accessing treatment when it is needed.

The social mapping exercise identified clean living environments, roads/transport and delivery services as positive features, and nightclubs and other sites of risk of teenage pregnancy as negative features. Community members more commonly identified community-level services as positive (TTMs and TBAs; churches, schools).

The most important maternal health services for good health outcomes in pregnancy, delivery and post-natal care identified by all three groups in the Venn diagrams activity (see [Figure 3](#)) were Redemption Hospital, its midwives and its pharmacy. They were also identified as the least accessible by all. Despite there being nine primary healthcare facilities in New Kru Town, none of the groups mentioned these. Eight of the nine primary care services were private and required payment, whereas Redemption hospital is supposed to be free at point of care.

All three groups identified a woman's mother and their community's TTM and TBA as less important but much more accessible to her. All three groups noted that a woman's husband/boyfriend is less important and less accessible during pregnancy and delivery, but after the birth, he becomes closer and more important, mainly for financial support. In discussion, the community group recognised that during the Ebola outbreak, some husbands/boyfriends were forced to be more 'hands on' during delivery, taking the woman to the TTM or to the hospital when female relatives and friends had become too afraid. Many TTMs reported this to be the first time they had seen so many men accompany a woman during deliveries.

Important barriers to services included lack of transportation, mistrust in health facilities, fear of giving birth in hospital, lack of bed availability at the hospital, and negative perceptions of health workers' attitudes. Cost of care also emerged as a significant barrier. Despite Redemption Hospital supposedly offering free treatment, participants reported staff asking for informal fees because their public sector salaries were unreliable or never paid.



Figure 3. Venn diagrams activity used in the PAR. Source: authors.

Impacts of Ebola

A discussion on a timeline for the Ebola epidemic in Liberia (Figure 4) facilitated identification of impacts of the epidemic on maternal health.

During the timeline activity in which key events during the epidemic were discussed, the majority of the health worker participants broke down into tears. They described the ‘running away time’ when their colleagues died one by one. Each group spoke of catastrophic fear between people, exemplified by one health worker’s comment, ‘nurses are afraid of patients, patients are afraid of nurses’. The pregnant women group described themselves as the most feared social group with stories of stigma in the community, refusal at health facilities and being abandoned in wheelbarrows. The TTMs and TBAs were identified as the first point of care for pregnant and delivering women, carrying out most deliveries and continuing to do so even after the Ebola epidemic.

During and after the Ebola period, some key approaches to maternal health care were affected. Due to fear and subsequent ‘no touch’ policies for health workers without personal protective equipment and/or sufficient training (detailed by Centre for Disease Control, 2015), staff spoke about examinations and monitoring of labour being highly restricted. This made it difficult to provide adequate care because maternal health care personnel were not able to fully examine and monitor to the level they felt was needed. Essential monitoring tools such as partographs and fetoscopes were reported to be barely used, or only in a limited way, because they implied touching the woman in labour. This lack of touch was reported to increase tensions and worsen feelings of mistrust between the health workers and community members.

A bean voting activity allowed identification of priority impacts and the factors affecting these impacts, with the findings outlined in Table 4. A lack of beds or ‘safe places’ to deliver was identified by all three groups as a key impact of Ebola on maternal health. Prior to the epidemic, a national ‘no refusals’ policy at health facilities onset meant that up to three women might share a bed. New ‘one person per bed’ infection prevention and control protocols in the hospital introduced after the onset of the epidemic policy reduced the capacity of the already extremely small labour room to six women at a time. Pregnant women linked this issue to a mismanagement of available space by hospital management; the TTMs and TBAs blamed a lack of organisation between them and the hospital for referrals; and the hospital saw it being caused by the inactivity of other primary healthcare facilities in the area.

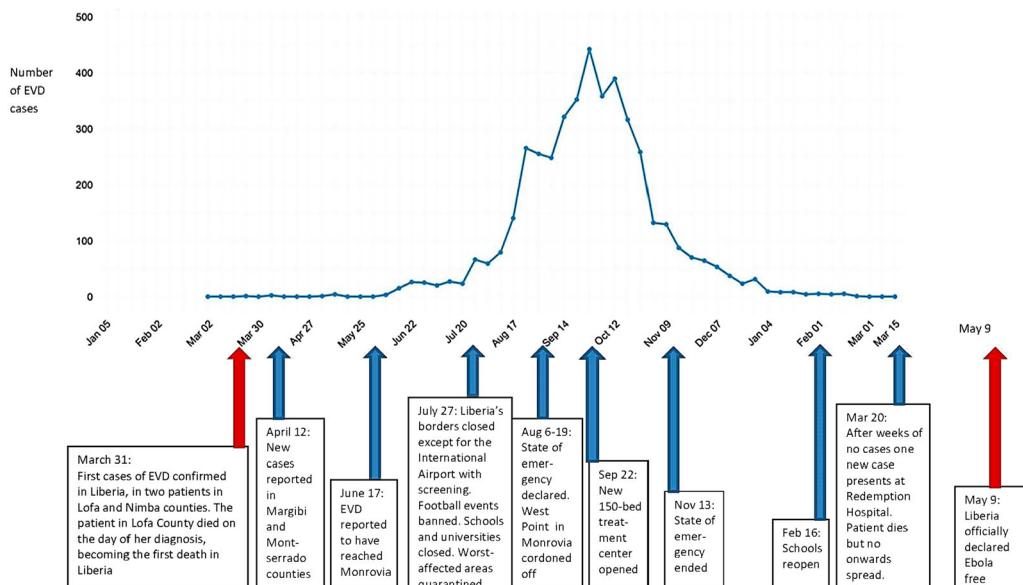


Figure 4. Ebola timeline in Liberia used in the PAR. Source: authors.

Table 4. Main impacts of Ebola having residual effect on maternal health services and the perceived factors leading to them.

Group	Main impacts of Ebola on maternal health	Perceived leading factors for these impacts
Pregnant Women	'Bed business' – Now only one person per bed at hospital limiting bed availability	<ul style="list-style-type: none"> • 'Big men' (hospital management) are not aware of the problem • Mismanagement of the space that is there • Healthcare workers lacking passion for their work • Staff still charging patients informal fees for services
	The approach (interpersonal style) of healthcare staff to patients has worsened	
TTMs, TBAs and Community Leaders	Lack of safe places for women to deliver	<ul style="list-style-type: none"> • TTM and TBA houses too small for the demand • No good organisation between pregnant women, family, TTMs, TBAs, and hospital • TTMs and TBAs have not had enough training • TTMs and TBAs are not established as a formalised body
	TTMs and TBAs do not feel recognised for their work	
Healthcare Workers	Communication and education between the hospital and community has deteriorated	<ul style="list-style-type: none"> • Hospital management do not meet community leadership • Community leaders do not have a role in the hospital • Lack of equipment and trained staff in facilities • No communication between hospital and surrounding facilities
	Hospital services under high pressure without support from surrounding facilities	

The Venn diagrams activity revealed that PAR participants did not identify smaller private or government primary health facilities as services they use even before the outbreak. They stated preferring to use Redemption Hospital, TTMs, or TBAs. Since the outbreak, these primary-level services were reported to be either not functioning or lacking equipment for delivery, and therefore unable to take pressure of the hospital to support maternal healthcare services.

All groups raised the breakdown in communication between health workers, community-level personnel and communities, indicating that the epidemic and its service impacts worsened existing communication gaps and perceptions of negative staff attitudes. The TTMs and TBAs expressed their anger at 'not being recognised' for providing care during Ebola, which they felt was due to their lack of training and informal status. Pregnant woman reported that the charging of informal fees was still creating tension between them and hospital staff. These issues creating ongoing barriers to facility delivery were largely present before and were worsened by the epidemic.

Plans for shared action

Following shared analysis of inter-group similarities and differences, and discussion of different approaches used by stakeholders in the past to address community-level issues, the stage 2 joint meeting identified shared priority areas of action for September–December 2015. This included the creation of action plans to (1) raise awareness of services and improve communication between health workers and communities in New Kru Town through drama performances directed by ANC staff and performed by pregnant women in the Redemption ANC waiting room and in communal spaces in New Kru Town, for both health workers and community members; (2) improve the working relations and collaboration of hospital staff, TTMs, and TBAs through their attendance in regular joint meetings; (3) improve capacities of and protocols for TTMs and TBAs to recognise complications and for timely referrals to services through the training of TTMs and TBAs by hospital and local county health team staff; and (4) ensure that Redemption Hospital works with local registered private and governmental facilities in New Kru Town to facilitate referrals and strengthen their capacity for safe deliveries starting with training and donation of equipment.

Every action crucial to this goal was mapped out and claimed by an individual in the room. Responsibilities were shared across the different groups to capitalise on all resources available.

Table 5. Action plan and progress markers developed in the meeting

Key Areas	Actions	Timing	Progress marker
Improve working together of TTMs, TBAs and Redemption Hospital personnel	Identify TTMs and TBAs	Within 3 months	Active TTMs and TBAs in New Kru Town listed
	Identify certified midwives in Redemption Hospital		Certified midwives at Redemption listed
	Planning agenda for meeting Find a venue for the meeting		Meeting between leadership of both groups. Agreement reached on joint meeting agenda plan, venue found
Training of TBAs and TTMs in New Kru Town	Hold meeting to discuss collaboration	Within 3 months	Meeting between TTMs, TBAs and staff held; Collaboration points agreed including delivery room protocol, referral procedures and mutual respect; TTMs and TBAs accompany hospital deliveries
	Identify the sponsors Speak with County Health Team		Ministry accept the request Sponsor identified
	Identify the trainers Identify the TTMs and TBAs Identify training materials; time and place of training Carry out the training		Trainers made available Active TTMs and TBAs listed Trainers well equipped and ready; time and place of training identified Training held; TTMs and TBAs educated on their role, know how to recognise complications, make timely referrals and collaborate with hospital
Dramas on maternal health to inform health workers and community on services, the importance of good communication and to reduce stigma	Advocate for the TBA and TTM recognition/identity	Longer term	Identification available for TTMs and TBAs
	Decide who is in the drama group; plan the drama	Within 3 months	Pregnant women in the drama group listed; Venue for practice identified
	Practice drama; get materials Drama performance in Redemption outpatients department Inform local leaders Procession through New Kru Town, drama performances across 25 communities		Materials collected and drama prepared Drama performed at Redemption Outpatient area, spectators educated Local leader agreement on performance New Kru Town community members attending informed
Strengthen Facilities in New Kru Town for maternal health	List of facilities from District Health Officer Introduction to the facilities	Within 3 months	Facilities in New Kru Town mapped
	Assess facilities		Redemption and facilities management met Gaps in facility maternal health identified
	Hold meetings with all facilities Training of facilities Set up referral system Provide basic equipment		Meeting held on capacity building, referral Capacity on maternal health increased Facility-hospital referral system in place Facilities have basic maternity equipment
	Establish M and E/reporting system	Longer term	M and E/Reporting systems established

The coordination committee was defined at this point. The actions, time frames, and progress markers set to monitor progress are shown in [Table 5](#).

Resources were collated across the PAR groups including community venues for meetings, time, and expertise for training sessions, and medical materials for donation. The sponsors of different activities that required finance, namely refreshment and transportation costs for the different training sessions, were sourced from the IRC and other locally operating NGOs.

Review of progress on the actions taken

In the 4 months following the initial meetings, the participants implemented these actions. The coordination committee met four times to review the action plans, progress made and how to proceed.

The review meetings revealed that the majority of short-term actions were successfully taken or in progress with the exceptions of a joint meeting between all Redemption midwives, TTMs and TBAs, which was not done due to a lack of time.

Mixed buzz-groups, including pregnant women, TTMs, TBAs, community leaders, and health workers, discussed the changes they perceived to be most important from the process to date. They collaboratively produced written outputs from these discussions, which are cited below and which highlighted a number of themes:

- Improved communication: ‘The hospital and community members are working together now’, notably through the joint actions of planning and performing dramas, and the monthly committee meetings;
- Recognition of and working relations with TTMs and TBAs: ‘The TTMs and TBAs have been recognised at Redemption’, with nurses knowing the TTMs’ and TBAs’ names and speaking more positively with them; ‘The Big Belly and Nurses are also feeling together now’, especially in how they speak with and respect one another; and ‘There is a good working relationship between TTM and TBA themselves as they have now started weekly meetings’, in which the local government representative was also regularly attending;
- Strengthening of primary care services and improved access at all services: ‘Local facilities are being empowered’, through training and equipment donation from the hospital;
- Personal relationships: Which had improved significantly during the process? A pivotal moment was the death of a senior TTM’s husband while at Redemption Hospital. The PAR coordination committee members visited her with their condolences, and she expressed gratitude to the hospital staff for their efforts.

At the same time, some problems were perceived to have not changed, including bed availability and transport: ‘When there are not enough beds, there is no ambulance to take us somewhere else’.

Dialogue on the learning from the actions taken

Overall, the participants reported that the process had:

- Strengthened their joint work across groups at New Kru Town – ‘We have learned to work together’. The actions of holding workshops and coordination meetings improved linkages, particularly in understanding protocol for referring complicated cases from the community to hospital care.
- More power to act on issues – ‘We have learned to do things on our own’, notably the training and donation of equipment from the hospital and to the health facilities.
- Strengthened understanding of different aspects of maternal health, from early care to delivery. Pregnant women reported that ‘Pregnant woman should attend ANC four times during pregnancy’ and ‘The Ministry of Health say we should not deliver our babies at home’, which they better understood through the shared action of the drama performances.
- A shift in perception on the actions the women could take themselves: ‘Pregnant Women themselves can go to hospital’.

Sustaining the process

At the review meeting, the group collaboratively decided on the actions that should continue in 2016, in order to start a second loop of the PAR spiral shown in [Figure 2](#). These actions addressed goals not

yet achieved, were further reinforcing of positive communication and relationship-building between different levels of the system, and pushed for heightened service quality and recognition of the role of TTMs and TBAs. The local government representative agreed to advocate for another community ambulance and to emphasise the issue of bed space in the county Reproductive Health technical working group session. The PAR coordination committee restated their commitment to overseeing the PAR process, and the hospital management placed the monthly PAR coordination committee meeting in their regular meeting calendar. To enable more sustainable organisational participation in the process and these new actions, the IRC identified an international non-governmental organisation (NGO) which had interest and experience with participatory approaches and had longer term activities in the New Kru Town community. The organisation was recommended by the New Kru Town TTMs and TBAs who had previously worked with the NGO. They were engaged through a national maternal health forum, and from March 2016 were orientated through two formal meetings, a comprehensive workshop and through shadowing the activities during a two-month 'hand-over' period.

Changes reported in the follow-up PAR participant and population-based survey

Table 6 shows the median survey responses from baseline to follow-up survey for the non-PAR population-based sample and the PAR health worker group.

Changes were similar between the non-PAR population-based sample and the PAR pregnant women and PAR community groups whose data can be found in this article's online supplementary material (see Table 7, available online).

Between baseline and follow-up, the non-PAR population-based sample reported a significant decrease in agreement that women face problems accessing delivery services (median = 4, IQR = 2–4 to median = 2, IQR = 2–4, $p = .00$). There was a significant increase in the perceived use of health services as opposed to TTMs (median = 4, IQR = 2–4 to median = 3, IQR = 2–4, $p = .01$). There was a significant, negative change between baseline and follow-up in perception that health workers 'speak harshly' in the delivery room (median = 4, IQR = 3–4 to median = 3, IQR = 2–4, $p = .00$) and a positive change in perception that health workers listen to and respect patients (median = 4, IQR = 2–4 to median = 4, IQR = 2–4, $p = .01$). There was a significant positive change in perception that New Kru Town women are actively involved in their maternal health system (median = 3, IQR = 2–4 to median = 4, IQR = 3–4, $p = .00$) and that the community and hospital are working together to make improvements (median = 3, IQR = 2–3 to median = 3, IQR = 2–4, $p = .00$).

Overall, the health worker group data did not show significant changes between baseline and follow-up in terms of access to services (median = 2, IQR = 2–4 to median = 3, IQR = 2–4, $p = .59$), patients needing to pay informal fees for services (median = 2, IQR = 1–3 to median = 2, IQR = 1–2, $p = .40$), and respectful patient–health worker interactions (median = 4, IQR = 3–5 to median = 4, IQR = 4–4, $p = .67$). The more favourable baseline scores indicate that health workers did not initially see these issues as negatively as the other PAR and non-PAR groups. Although the health worker ratings did not change significantly at follow-up, their ratings became more aligned with the community and pregnant women PAR groups.

Health workers did show significant positive change in the perception of communication between the health system and community (median = 2, IQR = 2–4 to median = 4, IQR = 3–4, $p = .01$), working together with the community (median = 2, IQR = 2–3 to median = 4, IQR = 4–4, $p = .00$), and in community participation in the health system (median = 2, IQR = 2–3 to median = 4, IQR = 3–4, $p = .00$). There was a significant negative change in reported difficulties faced at work (median = 4, IQR = 4–5 to median = 4, IQR = 4–4, $p = .03$), in contrast with the pregnant women who showed significantly higher agreement that health workers face difficulties at work (median = 3, IQR = 3–3 to median = 4, IQR = 3–4, $p = .03$).

Table 6. Wilcoxon rank-sum test scores comparing median survey scores from baseline administration to follow-up for the PAR health worker group and non-PAR population-based sample.

No. of respondents Question	Population-based sample			PAR healthcare workers		
	Baseline	Follow-up	<i>p</i> value	Baseline	Follow-up	<i>p</i> value
	150	150		16	12	
	Median (IQR)	Median (IQR)		Median (IQR)	Median (IQR)	
Pregnant women in New Kru Town face problems to find a place to deliver their baby safely	4 (2–4)	2 (2–4)	.00**	2 (2–4)	3 (2–4)	.59
Women in New Kru Town have information about what to do to remain healthy during pregnancy and delivery	4 (4–4)	4 (4–4)	.29	4 (4–5)	4 (4–5)	.74
Community members have information about the services available for maternal health in New Kru Town	4 (3–4)	4 (4–4)	.10	4 (3–5)	4 (4–5)	.98
Women in New Kru Town talk with health workers in Redemption Hospital about their health during pregnancy and delivery	4 (3–4)	4 (4–4)	.00**	4 (3–4)	4 (4–4)	.34
Healthcare workers at Redemption Hospital listen to and respect pregnant women and the New Kru Town community	4 (2–4)	4 (2–4)	.01**	4 (3–5)	4 (4–4)	.67
Women in New Kru Town usually choose to deliver their babies with a traditional midwife in the community than in the hospital	4 (2–4)	3 (2–4)	.01**	4 (2–5)	4 (2–4)	.29
Health workers at Redemption Hospital ask women to pay for Maternal Health treatment	4 (2–4)	2 (2–4)	.00**	2 (1–3)	2 (1–2)	.40
Traditional midwives in the community and health workers at Redemption Hospital communicate with one another	3 (2–3)	3 (2–4)	.08	2 (2–4)	4 (3–4)*	.01**
Health workers at Redemption Hospital face difficulties in their work	3 (3–4)	3 (3–4)	.13	4 (4–5)	4 (4–4)*	.03**
Health workers at ANC services at Redemption Hospital talk to women who use the services harshly	4 (2–4)	3 (2–4)	.23	2 (2–4)	2 (2–3)	.52
Health workers carrying out deliveries at Redemption Hospital talk to women who use the services harshly	4 (3–4)	3 (2–4)*	.00**	2 (2–4)	2 (2–3)	.88
Traditional midwives in the community can refer pregnant woman who have problems during deliveries to Redemption hospital	4 (3–4)	4 (3–4)	.32	4 (4–4)	4 (4–4)	.69
From what you just said, is there good quality care at Redemption Hospital for people when they deliver a baby?	4 (4–4)	4 (3–4)*	.02**	4 (3–5)	4 (4–4)	.80
Health workers providing deliveries at Redemption hospital can often be stressed up at work	4 (3–4)	4 (3–4)	.10	4 (3–5)	4 (4–5)	.39
In New Kru Town health workers and communities are working together to improve maternal health	3 (2–3)	3 (2–4)	.00**	2 (2–3)	4 (4–4)*	.00**
New Kru Town community members actively play a role in improving health care of women during pregnancy and delivery	3 (2–4)	4 (3–4)	.00**	2 (2–3)	4 (3–4)*	.00**
Delivery services in New Kru Town are improving after the height of the Ebola outbreak	4 (3–4)	4 (3–4)	.25	4 (4–5)	4 (4–5)	.94
In New Kru Town women know where to take their complaints about service delivery at Redemption Hospital	3 (2–3)	2 (2–2)	.00**	3 (2–4)	4 (3–4)	.21
At present, pregnant women and new mothers believe if they go to Redemption Hospital they can catch Ebola	2 (1–3)	2 (1–2)	.046	2 (2–3)	2 (2–2)	.543

**Significant change $p < .05$, measured by Wilcoxon rank-sum test.

IQR: Interquartile range: 5: Strongly Agree; 4: Agree; 3: Neutral; 2: Disagree; 1: Strongly Disagree.

Facility indicators

The average number of women attending the Redemption antenatal clinic per month increased from 769 in July 2015 to 1679 in December 2015, with the number of women completing their recommended four visits also increasing over this period. The number of normal vaginal deliveries at Redemption Hospital between July and December 2015 increased since reopening but stayed at 50% below the pre-Ebola average monthly normal vaginal delivery rate (average monthly delivery rate of 331 births per month for 2013 vs. 162 for July–December 2015). The primary health facilities that were engaged in the project reported an increase in the number of deliveries over the PAR period. Although their exact delivery figures are not available, the Redemption Nursing Director reported an increase in monthly referrals from these specific centres between October and December 2015 (19, 21 and 24, respectively) (Redemption Hospital Nursing Director, personal communication, February 15, 2016).

Discussion

Findings on the maternal health system

Links and disconnects between communities, primary care and hospital services

Ebola uncovered pre-existing health system weaknesses in terms of number of qualified health-workers, infrastructure, logistics, surveillance, governance, drug supply systems and management of health systems (Keiny, Evans, Schmets, & Kadandale, 2014). The PAR meetings similarly revealed weaknesses that existed before Ebola and were intensified by it. Community-level personnel including TBAs and TTMs were not formally included in the system. Primary care services, usually a vital link between communities and hospitals, were largely unmentioned. The lack of formal or informal referral networks between these levels of the system further affected access as TTMs and TBAs had difficulties referring complicated cases and Redemption could not refer to other facilities when at capacity. All groups reported in the stage 1 and stage 2 meetings that Ebola worsened and caused lasting damage to these existing communication gaps. The double burden of extra post-Ebola IPC measures, and the lack of locally active primary health facilities, further impeded facility deliveries.

Nonphysical aspects of health and service uptake

The survey showed that ‘good quality care’ for pregnant women in New Kru Town meant *more* than the availability of drugs, and required more of the human and compassionate side of care. These factors were less recognised and underestimated by hospital personnel. The key barriers to receiving facility-based care also went beyond physical distance and road quality. Factors making Redemption hard to access both before and after the Ebola epidemic included perceived negative attitudes and poor interpersonal skills of staff, mistrust, and cost of care (e.g. Lori & Boyle, 2011; Petit et al., 2013; Sipsma et al., 2013). This confirms the findings of global study into why TBAs continue to be used – they are readily available, have better relationships and shared values with clients, and have flexible attitudes towards payment (Owolabi, Glenton, Lewin, & Pakenham-Walsh, 2014).

Further loss of trust and fear of health facilities is recognised as key to the fall in facility deliveries during Ebola (Ly et al., 2016). This was mirrored in New Kru Town where Ebola worsened interpersonal barriers, the main example being the ‘no touch’ policy which added tensions between patients and health workers. This worsened the community’s perception of negative staff attitudes and created an ongoing deterrent for women to seek care at the hospital.

Notably, all groups reported Redemption Hospital to be the best care option in New Kru Town, which suggests a preference for and confidence in a biomedical, public health model and that the health facility is a desired resource. However, this should be interpreted with caution as acceptance of traditional methods, belief and comfort in community and poor understanding, fear and negative rumours about medical interventions were well documented before Ebola

(Lori & Boyle 2011). Regardless, these findings highlight the need to continue building a strong people-centred public health system that emphasises the human and compassionate side of patient care.

Emotional impact of Ebola – ‘running away time’

The psychosocial impact of the outbreak was shared across all three groups. The effect of Ebola on the emotional and social well-being of health workers cannot be understated, and mirrors similar experiences in Sierra Leone (McMahon et al., 2016). The fear and stigma faced by pregnant women, perhaps due to the difficulty distinguishing Ebola symptoms from conditions that naturally arise during pregnancy (Hayden, 2015), drove a bigger gulf between them and the formal health system. The anger felt by TTMs and TBAs at the formal health system for ‘not being recognised’ for providing care during Ebola created an ongoing barrier for referrals from the community to the hospital. Although not an initial objective of the process, the PAR provided a platform for these emotions to be shared, acknowledged and validated.

Men were ‘hands on’

Gender commentary on Ebola links women as the main formal and informal care-takers being more vulnerable during outbreaks (e.g. Harman, 2016; Menéndez, Lucas, Munguambe, & Langer, 2015). Adding another layer to this picture, TTMs and TBAs reported seeing men ‘step up’ to take women for care when female relatives and friends became too afraid. Times of crisis can force social upheaval and therefore transition, especially around entrenched gender roles, for example the First World War providing the first opportunity for women to take over traditional male jobs. This finding of shifting male roles during the Ebola outbreak needs more investigation, but suggests that such cases of social change during crises should be looked for and mindfully built on to encourage positive transitions.

Changes during the PAR process

The review meeting and survey findings suggest that the process helped to (i) improve connection and relationship between actors in the system, (ii) create more shared perceptions of ‘good quality care’, (iii) improve respectful communication style between health workers and service users, and (iv) allow recognition of community resources and community participation in the maternal health system.

The survey and review meeting indicated that through the initial meetings, the coordination committee and the shared actions taken, connections and relationships within the system strengthened, and respondents learned more about their maternal health system.

The process helped to create more shared perceptions of what good healthcare should be, including its physical and nonphysical aspects. Through the initial meetings, the shared actions and the coordination mechanism, qualitative and quantitative data showed health worker perceptions of maternal healthcare becoming more in-line with community members, especially on the importance of good interpersonal style. In the review meeting, the pregnant women acknowledged the importance of medical care in ANC visits, and in the follow-up survey, they better recognised the hard work done by health workers.

The quantitative and qualitative results highlighted more respectful interactions between health workers, service users, and TTMs at the point of referral and care, and during the PAR meetings and coordination mechanism. This included less blame being directed at other stakeholders and a perception that they were uniting *against shared problems* rather than fighting one another.

The PAR process exposed the different experiences of the same epidemic: the increased pressure on overburdened health workers and the under-recognition of community resources, perceived by communities as a rejection of their needs. The process showcased the different contributions to the maternal health system, especially during Ebola, and recognised the grief of the health workers,

the suffering of the pregnant women and the work done by the TBAs and TTMs. The community themselves gained confidence to act in their health system, which appeared to be most powerful for the pregnant women. They reported feeling more agency to go to hospital on their own and their rating of the overall quality of care available fell, possibly due to being informed of what they *should* obtain.

In terms of access, while ANC visits increased and there was a perceived shift towards use of the hospital for deliveries, the monthly average delivery rate was still 50% less than before Ebola. Women still reported problems delivering at a facility, limited bed space, and weakness in primary care services.

A number of the PAR techniques deserve commentary. The timeline exercise was powerful and allowed a secure platform from which participants expressed their personal accounts of the outbreak. The group dynamic allowed a safe space for these issues to be explored. The Venn diagram was a very visual representation of the health system and its gaps. The separate stage 1 meetings allowed groups space to organise their collective experiences and opinions, giving them confidence to present their findings in the larger stage 2 meeting.

Biases and limitations

The process had important limitations. IRC's facilitation of the process may have influenced the discussions, biased project trajectories, or unintentionally marginalised certain stakeholder groups. Working alongside co-facilitators from across the stakeholder groups in process design, data collection, learning, and reporting was incorporated to minimise this. This approach also fostered the sustainability of the PAR process.

It was a strong limitation of this work not to have had a separate stakeholder group of men/fathers, especially as their role in the system was mentioned during the initial meetings. Similarly, experiences of being gatekeepers and influencers to maternal healthcare would have been valuable to collect from male participants through a similar survey methodology.

The power differences that relate between social groups in Liberia may have led to 'less powerful' participants, e.g. pregnant women (see Lori & Boyle, 2011), not expressing their opinions openly, missing important information. The initial separate meetings were designed to allow freedom to express opinion and space for participants to feel comfortable in the process. To address within-group power dynamics, methods were carefully selected to encourage respect for one another's opinions and allow equitable sharing of viewpoints.

The IRC's support to Redemption in ensuring IPC quality and providing drugs and supplies would have undoubtedly influenced these outcomes. It is not possible to know the impact of a PAR process in the absence of this complementary support. Undoubtedly, the PAR efforts needed to run parallel with such focused institutional actions and resources that are beyond the remit of the local community, in order to improve services at the point of care. Higher level support including provision of drugs and supplies and creating adequate space for delivery beds will continue to be vital as this PAR work continues.

Conclusion

In conclusion, over a relatively short period, the PAR methodology uncovered significant issues, allowed community members and health workers to understand each other's experiences and needs, created meaningful links, and strengthened communication between a hospital and its surrounding community. During a time of health system collapse, it recognised rather than condemned the risk-taking and life-saving efforts made at the community level. The findings suggest that PAR methods can be used effectively in low-resource settings, but also in post-crisis contexts, where health systems need to be rebuilt in a way that makes them responsive to current needs and resilient to future crises.

Recommendations

The PAR group used the research process to recommend to the MoHSW to increase options for safe delivery in New Kru Town, either with space and beds at Redemption Hospital or another close site, and to increase the accessibility and quality of their primary healthcare services. The work generated insights that may be useful in other settings to build health systems that are better able to prevent and respond to crises such as Ebola:

1. *Fully appreciate and address the nonphysical – social, cultural, interpersonal and psychological – determinants* that are barriers to healthcare uptake. Kleinman (1980) argued that vast differences in definitions of ‘good quality care’ threatens meaningful engagement in health systems, and called to widen the biomedical model to better include psychological, social, and cultural aspects. Time should be taken to properly understand community perceptions of good maternal health, and their physical, social, and medical needs in order to build a shared vision of how services should look.
2. *Recognise the importance of relationship-building and clinical communication* when defining resilient and responsive health systems. Respectful communication between health workers and service users should be considered as a core competency and meaningfully woven into health worker training and service delivery. Lessons should be learnt from the way trusted community personnel engage their clients and incorporated into health systems planning (e.g. Owolabi et al., 2014).
3. Act upon post-Ebola lessons learnt that called for the *active engagement of communities using effective, evidence-based communication strategies* involving local trusted health personnel (American Anthropological Association, 2014; Ly et al., 2016). Participatory approaches that recognise and actively engage community structures are one way to generate evidence, social change, and more meaningful forms of community and health worker participation that can support more resilient, responsive, and trusted health systems. These approaches require time, commitment, and top-down complimentary support to be of maximum benefit.

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References

- American Anthropological Association. (2014). *Strengthening West African healthcare systems to stop Ebola*. Arlington: American Anthropological Association.
- Benton, A., & Dionne, Y. (2015). International political economy and the 2014 West African Ebola outbreak. *African Studies Review*, 58, 223–236.
- Centre for Disease Control and Prevention. (2015). *Recommendations for managing and preventing cases of malaria in areas with Ebola: Ebola hemorrhagic fever*. Atlanta, GA: CDC. Retrieved from <http://www.cdc.gov/vhf/ebola/outbreaks/malaria-cases.html>

- Challoner, K., & Forget, N. (2011). Effect of civil war on medical education in Liberia. *International Journal of Emergency Medicine*, 4, 6.
- Dolo, O., Clack, A., Gibson, H., Lewis, N., & Southall, D. P. (2016). Training of midwives in advanced obstetrics in Liberia. *Bulletin of the World Health Organization*, 94, 383–387. doi:10.2471/BLT.15.160473
- Harman, S. (2016). Ebola, gender and conspicuously invisible women in global health governance. *Third World Quarterly*, 37, 524–541.
- Hayden, E. C. (2015). Maternal health: Ebola's lasting legacy. *Nature*, 519, 24–26.
- Jones, S. A., Gopialakrishnan, S., Ameh, C. A., White, S., & Van Den Broek, N. S. (2016a). 'Women and babies are dying but not of Ebola': The effect of the Ebola virus epidemic on the availability, uptake and outcomes of maternal and new-born health services in Sierra Leone. *British Medical Journal of Global Health*. Advance online publication. doi:10.1136/bmjgh-2016-000065
- Jones, T., Loewenson, R., Shakpeh, J., Kun, K., & Milsom, P. (2016b). *Addressing barriers to maternal health services post-Ebola in Monrovia, Liberia using participatory action research*. Monrovia: International Rescue Committee, Training and Research Support Centre, Redemption Hospital. Retrieved from <http://www.tarsc.org/publications/documents/Liberia20PAR20Report20January202016.pdf>
- Keiny, M. P., Evans, D., Schmets, G., & Kadandale, S. (2014). Health-system resilience: Reflections on the Ebola crisis in Western Africa. *Bulletin of the World Health Organization*, 92, 850. Retrieved from <http://www.who.int/bulletin/volumes/92/12/14-149278/en/>
- Kleinman, A. (1980). *Patients and healers in the context of culture*. Los Angeles, CA: University of California Press.
- Liberia Institute of Statistics and Geo-Information Services (LISGIS). (2014). *Liberia Demographic and Health Survey 2013*. Monrovia: Ministry of Health and Social, Welfare of Liberia and National AIDS Control Program of Liberia. Retrieved from <https://dhsprogram.com/pubs/pdf/FR291/FR291.pdf>
- Loewenson, R., Kaim, B., Chikomo, F., Mbuyita, S., & Makemba, A. (2006). *Organizing people's power for health: Participatory methods for a people centered health system. PRA toolkit*. Harare: Ideas Studio. Retrieved from www.equinet africa.org/sites/default/files/uploads/documents/EQUINET20PRA20toolkit20for20web.pdf
- Loewenson, R., Laurell, A. C., Hogstedt, C., D'Ambruoso, L., & Shroff, Z. (2014). *Participatory action research in health systems: A methods reader*. Harare: EQUINET. Retrieved from www.equinet africa.org/bibl/docs/PAR20Methods20Reader201420for20web.pdf
- Lori, J. R., & Boyle, J. S. (2011). Cultural childbirth practices, beliefs and traditions in postconflict Liberia. *Health Care for Women International*, 32, 454–473.
- Lori, J. R., Munro, M. L., Rominski, S., Williams, G., Dahn, B. T., Boyd, C. J., ... Gwengale, W. (2013). Maternity waiting homes and traditional midwives in rural Liberia. *International Journal of Gynecology & Obstetrics*, 123(2), 114–118. doi:10.1016/j.ijgo.2013.05.024
- Lori, J. R., Wadsworth, A. C., Munro, M. L., & Rominski, S. (2013). Promoting access: The use of maternity waiting homes to achieve safe motherhood. *Midwifery*, 29(10), 1095–1102. doi:10.1016/j.midw.2013.07.020
- Luginaah, I. N., Kangmenang, J., Fallah, M., Dahn, B., Kateh, F., & Nyenswah, T. (2016). Timing and utilization of antenatal care services in Liberia: Understanding the pre-Ebola epidemic context. *Social Science & Medicine*, 160, 75–86.
- Ly, J., Sathanathan, V., Griffiths, T., Kanjee, Z., Kenny, A., Gordon, N., ... Kraemer J. D. (2016). Facility-based delivery during the Ebola virus disease epidemic in rural Liberia: Analysis from a cross-sectional, population-based household survey. *PLOS Medicine*. Advance online publication. doi:10.1371/journal.pmed.1002096
- Mbwili-Muleya, C., Lungu, M., Kabuba, I., Zulu, I., Lishandu, I., & Loewenson, R. (2008). *Consolidating processes for community – health centre partnership and accountability in Zambia, Lusaka District Health Team and Equity Gauge Zambia. An EQUINET Participatory Research project report*. Harare: EQUINET. Retrieved from www.equinet africa.org/sites/default/files/uploads/documents/PRAequitygauge2008.pdf
- McMahon, S. A., Ho, L. S., Brown, H., Miller, L., Ansumara, R., & Kennedy, C. E. (2016). Healthcare providers on the frontlines: A qualitative investigation of the social and emotional impact of delivering health services during Sierra Leone's Ebola epidemic. *Health Policy and Planning*, 31, 1232–1239.
- Menéndez, C., Lucas, A., Mungambe, K., & Langer, A. (2015). Ebola crisis: The unequal impact on women and children's health. *The Lancet Global Health*, 3(3), e130. doi:10.1016/S2214-109X(15)70009-4.
- Miller, L. (2016). "Whenever light enters darkness, the places becomes bright." *Evaluation of IRC support of the restoration of health services at Redemption Hospital*. Monrovia: International Rescue Committee.
- Ministry of Health & Social Welfare. (2010). *National reproductive & sexual health policy*. Monrovia: Ministry of Health & Social Welfare. Retrieved from www.liberiamohsw.org/Policies%20&%20Plans/National%20Sexual%20&%20Reproductive%20Health%20Policy.pdf
- Owolabi, O. O., Glenton, C., Lewin, S., & Pakenham-Walsh, N. (2014). Stakeholder views on the incorporation of traditional birth attendants into the formal health systems of low-and middle-income countries: A qualitative analysis of the HIFA2015 and CHILD2015 email discussion forums. *BMC Pregnancy and Childbirth*, 14(118), 81. Retrieved from <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-14-118>.
- Petit, D., Sondorp, E., Mayhew, S., Roura, M., & Roberts, B. (2013). Implementing a basic package of health services in post-conflict Liberia: Perceptions of key stakeholders. *Social Science & Medicine*, 78, 42–49.

- Sipsma, H., Callands, T. A., Bradley, E., Harris, B., Johnson, B., & Hansen, N. B. (2013). Healthcare utilisation and empowerment among women in Liberia. *Journal of Epidemiology and Community Health*, 67, 953–959.
- United Nations. (2015). *Trends in maternal mortality: 1990 to 2015. Estimates by WHO, UNICEF, UNFP, World Bank Group and the United Nations Population Division*. Geneva: WHO Press. Retrieved from www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2015/en/
- United Nations Development Program. (2014). Key to HDI countries and Ranks [web page]. Retrieved from <http://hdr.undp.org/sites/default/files/ranking.pdf>
- United Nations Population Fund. (2014). Ebola wiping out gains in safe motherhood. Retrieved from www.unfpa.org/news/ebola-wiping-out-gains-safe-motherhood