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Original Article

How do health workers experience and cope with shocks? Learning from four fragile and conflict-affected health systems in Uganda, Sierra Leone, Zimbabwe and Cambodia

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Abstract

This article is grounded in a research programme which set out to understand how to rebuild health systems post-conflict. Four countries were studied—Uganda, Sierra Leone, Zimbabwe and Cambodia—which were at different distances from conflict and crisis, as well as having unique conflict stories. During the research process, the Ebola epidemic broke out in West Africa. Zimbabwe has continued to face a profound economic crisis. Within our research on health worker incentives, we captured insights from 128 life histories and in-depth interviews with a variety of staff that had remained in service. This article aims to draw together lessons from these contexts which can provide lessons for enhancing staff and therefore health system resilience in future, especially in similarly fragile and conflict-affected contexts. We examine the reported effects, both personal and professional, of the three different types of shock (conflicts, epidemics and prolonged political-economic crises), and how staff coped. We find that the impact of shocks and coping strategies are similar between conflict/post-conflict and epidemic contexts—particularly in relation to physical threats and psychosocial threats—while all three contexts create challenges and staff responses for working conditions and remuneration. Health staff showed considerable inventiveness and resilience, and also benefited from external assistance of various kinds, but there are important gaps which point to ways in which they should be better protected and supported in the future. Health systems are increasingly fragile and conflict-prone, and shocks are often prolonged or repeated. Resilience should not be taken for granted or used as an excuse for abandoning frontline health staff. Strategies should be in place at local, national and international levels to prepare for predictable crises of various sorts, rather than waiting for them to occur and responding belatedly, or relying on personal sacrifices by staff to keep services functioning.

Keywords: Health workers, resilience, conflict, economic shocks, Ebola, coping strategies, Sierra Leone, Zimbabwe, Uganda, Cambodia

Key Messages

- Health staff face a variety of shocks in different contexts, including conflict, disease outbreaks and economic and political crises; these have overlapping effects on staff, including physical (such as threat to life), psychosocial (such as causing fear and stigma); and professional (such as disrupting provision of care).
- Health staff reported using a range of coping strategies in these four contexts, with some similarities but also differences of emphasis across the different types of shocks.
- Staff resilience was supported with some external assistance, but important gaps remain; staff are not adequately supported and protected in these risky situations, which are often chronic or periodic.
- We also need to recognize that resilience is not a good on its own unless it is found in a well performing health system, which includes one which effectively protects and supports its staff.

Introduction

From a systems theory perspective resilience can be understood as the result of a combination of vulnerability and adaptive capacity. Systems that are more vulnerable and have less capacity to adapt to changes are less resilient (Dalziell and McManus 2004). Similarly, from an organizational perspective resilience in an organization depends on its adaptive capacity in which the degree of integration of its different units determines the capacity of the organization to adapt to changes (Brunsdon and Dalziell 2004). However, it is also recognized that decentralization can contribute to greater autonomy in decision making which in turn can strengthen the resilience of complex systems (McKenzie *et al.* 2016).

There is a contested literature around resilience in health systems but a core understanding that it focuses on the ability to absorb shocks and maintain services in the face of them (Kruk *et al.* 2015). It should be noted that resilience, while very popular as a concept, particularly since the Ebola crisis, is an ambiguous term inasmuch as systems can be resilient while offering poor quality or limited services. It can be regarded therefore as necessary but not sufficient as a criterion for assessing well performing health systems (Witter and Pavignani 2016).

Kruk *et al.* (2015) identify five elements characterizing a resilient health system: (1) awareness, (2) diversity, (3) self-regulation, (4) integration and (5) adaptation. Many fragile and conflict-affected states score highly in some of these domains, such as diversity and adaptation. They have often adapted to stresses through innovation and experimentation (Witter and Pavignani 2016). Indeed, if resilience were the only criterion of judgement, they might score more highly than some more stable contexts. However, it is also important to emphasize the need for equitable access to quality health care with financial protection—the UHC goals.[1] In these respects, greater challenges arise.

The health workforce is the motor of any health system in that all activities and programmes have to be adopted or adapted through them. However, understanding how to support a resilient workforce, particularly in contexts which are prone to shocks, is less well elaborated. Yet this question is critical in the current climate where shocks of various kinds (population movements, climate-related, conflict-related and economically driven, to name just a few) are proliferating (Lindborg 2016). Resilience in the health workforce has been explored in relation to coping with stress in high-income settings where the focus is more on the resilience of health workers rather than on overall workforce resilience (Maunder *et al.* 2008; Sull *et al.* 2015).

Sufficiently staffed health services contribute to strengthen the resilience of the health system (Kamal-Yanni 2015; Kruk 2015). Although the focus of health systems has been on increasing the availability of health workers, in the last decades this is often difficult to achieve in low and middle income countries due to fiscal and administrative constraints. Less attention has been devoted to explore the contribution to health systems' resilience of improving the performance of the existing workforce, particularly in challenging environments (e.g. post-conflict). Interventions such as recruiting indigenous health workers who are less likely to abscond in case of insurgencies, extending working shifts or facilitating on-site accommodation for key staff contributed to maintain health service delivery during the Boko Haram insurgencies in Yobe State, Nigeria (Ager *et al.* 2015). Similarly, in Zimbabwe flexibility in enforcing recruitment and deployment policies contributed to maintaining service delivery in remote areas during the peak of the socio-economic crisis in the 2000s (Chirwa *et al.* 2016a).

This article is grounded in a research programme which set out to understand how to rebuild health systems post-conflict. Four countries were studied—Uganda, Sierra Leone, Zimbabwe, and Cambodia—which were at different distances from conflict, as well as each having a unique conflict story. During the research process, the Ebola epidemic broke out in West Africa (2014–15). Zimbabwe has continued to face a profound economic crisis. Although the research was not originally framed around the concept of resilience but focussed on health worker incentives and their evolution and effectiveness post-conflict (Witter *et al.* 2012), we captured insights on how shocks of different kinds affected health staff, and how they coped. This article re-analyses data from the four contexts in order to analyse the impact of different kinds of shocks on health staff (their vulnerabilities)—but also how they coped (their adaptive capacity). The aim is to draw together lessons for enhancing staff and therefore system resilience in future, especially in similarly fragile and conflict-affected contexts.

Methods

A mixed methods study on health worker incentives was designed, using both retrospective and cross-sectional tools (including surveys with health workers, analysis of routine human resource data, document review and qualitative interviews). The objective of the overall research was to understand changing health worker incentives and their policy implications in the post-conflict and post-crisis period (Witter *et al.* 2012). Background on the country contexts is given in Box 1. More details on the policy contexts and policy evolution are provided in (Witter *et al.* 2017).

In this article, we re-analyse data from the life histories and in depth interviews with health workers. Life histories were

Box 1. Background

In northern Uganda, the prolonged and widespread insurgency lasted 20 years (1986–2006) and displaced populations across the region (Rowley *et al.* 2006) while the rest of the country remained largely peaceful. The conflict has profoundly affected the economic and social fabric of the area and had a deeply negative impact for the broader health system. In terms of human resources for health (HRH), the changes were stark as the majority of health workers fled to safer places whereas those who stayed behind were traumatized, struggled to cope with worsened working conditions among other hindrances, and often narrowly survived death (Namakula and Witter 2014b). In 2006, the Lord's Resistance Army was expelled from the region and peace talks began. The ceasefire was followed by efforts to resettle the populations to their home villages. The early post-conflict period also led to the implementation of various recovery activities under the Peace Recovery and Development Plan (PRDP 2007) and aid donations aimed to improve the general health service delivery in the affected parts of the northern region (Namakula and Witter 2014a).

In Sierra Leone, the conflict dated from March 1991 when rebels of the Revolutionary United Front launched an attack from the east of the country near the border with Liberia to overthrow the government. The resulting civil war spanned 11 years, ending in 2002, when new elections were held. During the war time, it is estimated that over 50 000 people were killed and 2 million displaced, which amounted to almost half of the population (Smilie and Minear 2004). The war also devastated the healthcare system. The vast majority of the health infrastructure was destroyed, and health worker attrition rates increased, which compromised efforts to provide equitable access to health care in the aftermath of the conflict (Wurie and Witter 2014). A decade after the war, Sierra Leone still suffers from the effects of the conflict, and the gains made over time to strengthen the health sector were subject to a major setback as a result of the 2014 Ebola outbreak (Wurie *et al.* 2016).

In Cambodia, the conflict dated back to the US carpet bombing during the Vietnam War (starting in 1969) and the imposition of Lon Nol to prevent Cambodian support for Vietnam. Internal political conflicts led to a military coup in March 1970 which brought in Vietnamese and USA involvement. The consequence was a radical insurgency called the Khmer Rouge, which took over power in 1975–78. The Khmer Rouge destroyed all social and economic infrastructures with the aim of turning Cambodia into an agrarian society. In the process, about two million people died from starvation, diseases, execution and institutional destruction (Mysliwiec 1988). The Khmer Rouge was partially overthrown in 1979 by the Vietnamese who formed the People's Republic of Kampuchea (PRK) and helped reconstruct the state institutions based on a socialist ideology. However, civil war continued between the government and the remnants of the Khmer Rouge, until a peace agreement was reached in 1991. The national election in 1993 sponsored by UN was held successfully, but factional fighting broke out again in 1997 (Lanjouw *et al.* 1999) and peace as a realistic description of the situation can only be dated to early 1999 after the death of the Khmer Rouge leader Pol Pot. At that time, a process of political and economic liberalization of the country took place, and international aid was critical to support the country's reconstruction. Although the end of the conflict is now almost two decades back, the challenges for the health system remain stark to this day (So and Witter 2016).

Although Zimbabwe experienced conflict during its war of independence in the 1980s, its more recent history has been characterized by a period of severe economic, social and political crisis between 1997 and 2009. The decade-long socio-economic crisis caused the decline of Zimbabwe's Gross Domestic Product (GDP), leading to constrained capability to finance government services. Between 2000 and 2009, Zimbabwe's real GDP declined by 5.9% annually. Cumulatively, output declined by >40% between 2000 and 2007 (Government of Zimbabwe 2010). The economy experienced high inflation between 2000 and 2008. By mid-2008, hyper-inflation led to the demonetization of the Zimbabwe dollar and the adoption of multiple currencies as official tender in 2009. A marked decline in living standards and increase in poverty occurred during this crisis period.

From 2005, the health system experienced sharp decreases in funding and health spending dropped to a mere 0.3% of the entire national budget. This resulted in the deterioration of health infrastructure, loss of experienced health professionals, drug shortages, increased burden of disease and the attendant high demand for services (Ministry of Health and Child Welfare, Health Services Board 2010). The crisis abated when a coalition government was formed between the two major parties, the Zimbabwe African Union Patriotic Front and the Movement for Democratic Change. This enabled the provision of financial support for various government programmes by the development partners (Government of Zimbabwe 2010). Since 2013, however, the economic crisis has returned, leading to reverses again in government funding to the health sector and a renewed sense of crisis.[4]

deployed to explore health workers' perceptions and experiences of their working environment, how it has evolved and factors which would encourage or discourage them from staying in post in remote areas and being productive. We used this method as it can provide rich information, can document changes over a period of time, and is particularly useful in data-scarce contexts, such as post-conflict or crisis settings. Through their lives and experiences we sought to obtain understanding of the evolution of the health system and the different processes related to the work environment. Their lived experiences provided us with a personal perspective on the effectiveness and intended as well as unintended consequences of human resource policies and their evolution (Witter *et al.* 2017a).

These life histories were conducted with health workers meeting specific criteria (including length of service in the area, to capture experiences of conflict and post-conflict periods,) in selected health

Table 1. Summary of life histories

	Cambodia	Sierra Leone	Uganda	Zimbabwe
Site selection	Six provinces (covering all four ecological regions)—one district from each, including urban, rural and those with more or less external support	Four districts (covering all main regions, including urban and rural/hard to reach and areas of varied socioeconomic status)	Three districts in Acholi sub-region—most conflict-affected area	Two provinces—one well served and one under-served; three districts including urban, mixed and rural
Sectors included	Public sector only	Public sector only	65% public; 35% PNFP (private not-for-profit—largely mission sector)	9 from the government sector; 14 from the municipality; 2 from the Rural District Councils; 6 from the mission sector and 4 from the private sector (but these were public staff working part-time for private facilities)
Health workers interviewed Total: 128	Total: 19 By cadre: 4 doctors; 1 medical assistant; 8 midwives; 6 nurses By gender: 14 f; 5m Age range: 24–53	Total: 23 By cadres: 8 CHWs/CHOs; 5 nurses; 7 midwives 3 medical officers By gender: 12 f/11 m Age range: 36–65 Ebola and health workers study: Total: 25 3 CHWS; 10 nurses/aids; 6 midwives/MCH aids; 5 doctors; I lab technician By gender: 15f/10m: Age range: 29–65	Total: 26 By cadres: 2 clinical officers; 15 nurses; 2 nursing assistants 3 midwives; 2 others By gender: 20 f; 6m Age range: 30–60	Total: 35 By cadres: 2 doctors; 21 midwives; 9 nurses; 3 environmental health practitioners (EHPs) By gender: 32 f; 3 m Age range: 31–65

Source: Namakula et al. 2013; Namakula and Witter 2014b; Wurie and Witter 2014; Chirwa et al. 2016b; Wurie et al. 2016; So et al. 2016.

care facilities in the study areas using an open-ended topic guide. The topic guide covered the following areas:

- How they became health workers
- Their career path since, and what influenced it, including the role of gender
- What motivates/discourages them to work in rural areas and across different sectors
- Challenges they face in their job and how they cope with them
- Conflict related challenges and how they coped
- Their career aspirations
- Their knowledge and perceptions of recent and current incentives.

In addition, in depth interviews with health workers were used to explore the challenges they faced while working during the Ebola Virus Disease (EVD) outbreak in four districts of Sierra Leone, and in particular their coping strategies.

The four countries were selected as they provide a range of perspectives on the post-conflict/post-crisis period: Cambodia, where the conflict had ended over 20 years earlier; Sierra Leone over 10 years earlier; Northern Uganda some 5 years before the project began and Zimbabwe still moving in and out of economic crisis (Box 1). Within the countries, the research team selected a range of districts which represented urban and rural environments, which were well served and underserved, and more or less effected by the conflict, crisis or Ebola epidemic (Table 1). Within the districts, we selected health facilities from different levels within the health system, including health centres and hospitals, and then within these facilities we selected female and male health workers from different cadres. This enabled us to sample a variation of types of experiences within the study population. The research team first approached the district health management team in each district to gain permission to conduct the study in the district, and then approached individual health workers (using the criteria for selection as described earlier) in the facilities to discuss participation in the study.

A total of 103 life histories were conducted (19 in Cambodia, 23 in Sierra Leone, 26 in Uganda and 35 in Zimbabwe) in 2014. The 25 in depth interviews on the EVD epidemic in Sierra Leone were conducted between March and April 2015. We aimed to arrive at the sample size following the principle of saturation whereby interviews should continue until no new data are generated (Ritchie *et al.* 2003). The research teams in each country achieved saturation with regard to key topics. The profile of the participants is shown in Table 1. They represent the mix of staff actually found on the frontline in health centres, which tends to be dominated by mid-level cadres, who are largely female (Witter *et al.* 2017b).

The life histories and in depth interviews were conducted by the local researchers who are part of the ReBUILD programme. They were trained in qualitative interviewing and in particular in the use of life histories prior to data collection. In Sierra Leone, northern Uganda and Zimbabwe, the health workers were comfortable and confident in communicating in English, whereas in Cambodia they were conducted in Khmer. All interviews were face to face, digitally recorded and noted after gaining permission from the participants. The interviews took place in a private place acceptable to the interviewee, such as their office. In the life histories, the health worker drew a timeline of events during their career, e.g. when s/he decided to become a health worker, initial training, first post, and the researcher then asked questions which explored reasons and motivations surrounding these events and decisions. The life histories lasted 2 h, whereas most interviews were shorter at 1 h.

The life histories and interviews were transcribed by the research teams and checked against the recordings. The Khmer interviews were then translated into English by professional translators and checked against the recordings by the research team. Although the translation process may have resulted in some loss of data, the Cambodian research team moved back and forth from the English and Khmer transcripts during the analysis process.

Thematic analysis was conducted, manually in Sierra Leone and supported by software in Zimbabwe and Cambodia (NVIVO), and in northern Uganda (ATLAS Ti). Each country research team carried out the analysis of the country dataset with support from the international team. They jointly developed a coding framework based on themes emerging from the data, the topic guides and study objectives. The research team applied the coding framework to the transcripts. Charts were developed for each theme, and these charts were used to describe the themes. For this article, the research group synthesized the findings across the four settings using the themes of impact of shocks and resilience of health workers.

Ethical approval was gained from each country ethics board and the relevant UK universities. Informed consent was obtained from each health worker before the life history or interview took place.

The health workers interviewed represent 'positive deviants'—those who stayed in service during difficult times for the country (or sub-region, in the case of Uganda)—and cannot therefore be taken to represent the wider health workforce. However, the auto-ethnographic method (Denzin 2014) can provide rich insights into experiences which can productively inform health workforce planning.

Results

We first present themes relating to the impact of conflict on health staff, which is followed by analysis of the Ebola epidemic in Sierra Leone and the economic crisis in Zimbabwe. We then present reported coping strategies across these three different types of shocks—personal coping strategies but also systemic and community support which was reported by staff. In the discussion, we examine the common features and differences, and the wider lessons on supporting health worker resilience which can be drawn.

Effects of conflict

Personal

Abduction. In all contexts being a health worker made staff into targets for abduction to work for rebel forces (Namakula and Witter 2014b).

> *The insurgency started when I was still working in Lacor. I missed being abducted several times. And I call it God's Luck!*
>
> *[…] (Female, Nurse, northern Uganda)*
>
> *[…] I was abducted by rebels in 1993. I was with the rebels up to 1995" (Male, CHO, Sierra Leone)*
>
> *[…] we did not have any fear of Khmer Rouge but gun holders (Vietnamese and, yes, our soldiers) in late 1980s; we didn't know who was who. Gun holders could do almost anything at that time (Female, Midwife, Cambodia)*

Death and injury. In northern Uganda, participants reported traumatic experiences of witnessing the death of colleagues, while those who survived also suffered physical injuries during ambushes at the health facilities or when moving from one district to another.

> *In 1999 after I qualified, I went to Kitgum to do an interview. We were five clinical officers from Pader. On our way back, we were ambushed, one of our colleagues was shot in the chest but he survived narrowly. The rest of us survived as well (Male, Clinical Officer, northern Uganda)*

Health workers not only lost colleagues but also family members.

> *Hearing about people being maimed, people being killed. In fact my mother was also brutally killed by rebels…[.]…the thought alone scares me sometimes (Male, CHO, Sierra Leone)*
>
> *My family had 6 members; and after Khmer Rouge, only 3 members were left. My father was taken for education and never returned. My sister and brother died of malaria (Female, Midwife, Cambodia)*

Insecurity and fear. During the conflicts, health workers reported experiencing fear of death from gunshots by rebels, fear of being abducted and fear of dying from epidemics.

> *Then you could hear gunshots, someone shooting just very near. At times you feel like you are going to be shot at that time, that fear was there (Male, Clinical Officer, northern Uganda)*

The conflicts also had a negative impact on the human resources available as a number of key health workers who were afraid to go to work left the country or their postings to seek refuge elsewhere, leaving health facilities understaffed.

> *After the death of our Principal (at the nursing school) I saw her corpse and after seeing that I decided to run to my village for safety (Female, Nurse, Sierra Leone)*

In the post-conflict period, insecurity often lingers. For example, in Cambodia, staff were posted to areas where Khmer Rouge forces still roamed, making travel and work life, threatening.

> *When I first came here, I was assigned to work at the maternity unit to assist in delivery, to provide ANC services (…) It was difficult for me to travel at night. It was high risk of being arrested by Khmer Rouge. We didn't know who was who, all soldiers. Bad fear really […] working here is very life threatening during the war time (Female, Doctor, Cambodia)*

Professional

Work overload. The flight of many health workers to safer areas and consequent shortage of staff, combined with war casualties and disease outbreaks which also resulted from conflict, meant increased workload and long working hours for staff in all three conflict-affected contexts, as well as having to manage complex case loads.

> *…at that time I was the only expert. Working at that time, I faced lots of trauma. At the time, we had to work 8 hours per day but I worked 24 hours sometimes. It was very tiring. It seemed that there was no working hour at that time (Male, Nurse, Cambodia)*
>
> *You would find many victims of gunshots and you would be there working from the time you arrived in the morning up to 5 pm almost and even if there was a shift coming to relieve you, there was still a lot of work on these patients (Female, Nurse, northern Uganda)*
>
> *Also in the PHU the work load was too much, the staff capacity was very low like we were only, initially we were only 3, myself, the CHO, one SECHN and one MCH aide, so we were subjected to work right round the clock… (Male, CHO, Sierra Leone)*

Challenging working conditions. Insufficient infrastructure, staff accommodation, supplies and equipment due to conflict and inability to move about easily were also reported in all settings.

At the beginning it was terrible. The hospital at Prek Pnov had only one or two beds and there were a lot of patients who got malaria, diarrhoea, and so on. The road was often very bad. It was not really safe, Khmer Rouge pass by very often in the surrounding area, (Female, Midwife, Cambodia)

[…] Some medical equipments were taken by the rebels […] (Male, Clinical Officer, northern Uganda)

Stoppages to pay. Conflict also disrupts payment mechanisms for staff—pay either stops, is severely delayed or is available in places which cannot easily and safely be reached, such as district town banks. Health workers had to improvise and ration food portions to survive.

At the beginning it was very hard, I was paid in rice, but later they converted it into cash (Female, Midwife, Cambodia)

[…] really it was we lived by magic, because even you cannot, you don't know when you will get your salary and what you have at home you don't want it to get finished because there are children around […] So we had to manage the finances, we even had to manage the little we had.[…] People who had the stuff will hide it because they don't want it to get finished and you wanted you are searching all over the place. Even one of our church members lost his life just going out to look for rice and he was shot (Female, Midwife, Sierra Leone)

Effects of the EVD outbreak. Some impacts of the EVD outbreak on health staff in Sierra Leone overlapped with the effects of conflict, although there was much greater emphasis given to issues of stigma and fear of infection by family members, colleagues, and communities, linked to the nature of the epidemic. These posed different challenges and called for different coping strategies.

Personal

Fear of death. Most health workers reported that they were very frightened of contracting Ebola, as they saw many health workers, relatives and community members die. One health worker spoke of caring for a colleague and later realizing that she died from Ebola. Another health worker described how he constantly looked for Ebola symptoms.

October 16th or so we lost our colleague here and I was the person that stayed with that colleague for the rest of the day. When I went home they called me, they text me that she's gone, she's dead. After when she had died, I think three days or four days after, the result was out […] saying she was positive, Ebola positive. I started thinking about myself […] the time that I was taking care of Nurse xxx, did I dress properly, how did I dress. So I was confused, my mind was scattered, I began to think automatically. After 2 days I became sick, the mind was sick, everything about me was sick. I came here I told the in-charge 'please let them collect my sample, I am sick', she says 'no you are ok, you are well', I said 'no my mind is sick, my body is sick, please help me'. She said that we don't have to take the sample for now till after 21 days, let us all observe ourselves. Hmm, so after 21 days they collect my sample, negative (Female, Nurse, Sierra Leone)

Fear of patients. There was a breakdown of trust between the health workers and communities. In addition, many health workers reported that they were also afraid of patients. This was particularly the case at the start of the outbreak, when health workers were ill equipped in terms of knowledge and supplies to protect themselves from infection. A couple of health workers also reported that patients did not always answer truthfully about their symptoms during the triage assessment, and this exacerbated their lack of trust in patients and the community.

They started learning some of the questions that we will ask them at triage when they come, so the patients were lying. There was not truthfulness and that created fear. And also even amongst ourselves the animosity the disease was creating, everybody wanted to leave, some of us wanted to leave but you couldn't just leave your profession and go away (Female, Nurse, Sierra Leone)

Changed family dynamics. Families were worried that the health workers would contract Ebola and either die or transmit it to other relatives. In some instances, female health workers were prohibited from working by their male partners and relatives. Some health workers reported that they were pressurized by their family to discontinue working but they continued to do their job as they felt that it was their duty. Some respondents reported that other health workers did give up work and stayed at home.

I had a few nurses who came and told me 'my husband says I should not work; if I work I will not be able to go to that house again' (Female, Nurse, Sierra Leone)

The outbreak affected how health workers interacted with their families. Some health workers reported that they were reluctant to have close contact and play with their children. One doctor working in an Ebola treatment centre spoke of not visiting his home for many months as he did not want to put them at risk and make them stay in quarantine.

Personally Ebola affected me and my family. Whenever I'm off duty when I get home I make sure I don't go close to my immediate family (Female, Nurse, Sierra Leone)

Community stigma. Health workers were frequently ostracized by their communities—a social isolation which was not only hard to bear but also a poor reward for their continued service. Examples included not being allowed to use the village well for their water, being asked to leave their rented accommodation, and not being allowed to use taxis.

(They were) saying your husband is working there, please don't get [water] from our well, don't come to our pump. So my wife is really stressed by them. I always told her 'please just be calm, we know we are doing the right thing, let us pray' (Male, Nurse, Sierra Leone)

Health workers also reported that wearing their uniforms outside of the health facilities had a negative impact in terms of getting public transportation.

In the vehicles (as in commercial vehicles), they don't want to sit by us. Relationships, people don't want it and so it has been a difficult one but to cope with it we just look on and I think that this Ebola will finish (Female, Nurse, Sierra Leone)

Professional

As with the personal factors, there are a number of shared features of professional impacts between the conflict- and Ebola-affected groups, though we found a much stronger theme of damaged relationships at work and with the community in this context than in conflict settings.

Table 2. Summary of themes on impact of shocks on health workers and their coping strategies

	Physical safety (conflict and epidemics)	Psycho-social (conflict and epidemics)	Working conditions and remuneration (all shocks)
Impact of shock on health workers	Death and injury Infection Fear for self, family and colleagues	Loss of trust in community, in colleagues, in patients Disrupted family lives Stress	Overload Lack of resources for working and living Blockages or loss of pay and remuneration Loss of quality and discipline in the workplace
Coping by health workers	Self-protection	Internal values and resources, including religion, patriotism etc. Personal strategies for distraction, comfort and sedation Peer support, including through social media Family support	Additional earning options Dual practice (mainly in economic crisis) Borrowing money Working longer hours Task shifting and taking on new roles; improvisation to cover material shortages Informal movements of staff Using own resources for patients or passing on costs to patients
External support	Protective materials provided	Managerial support (local and international) Workshops and training Rebuilding relationships with communities	Donor support Expatriate staff support Additional allowances (e.g. risk allowance)
Examples of missing elements	Enforcement of protective laws for health workers during conflict	More proactive communication and support for health staff and communities in all crises	Plans in place for rapid response—e.g. providing back-up drug supplies, more flexible payment systems for staff, greater freedom for local responses, redeployment where needed and service reorganization

Increased stress and overload. Health workers reported experiencing a lot more stress at the workplace since the EVD outbreak. As nurses and doctors were reduced in number and others did not come to work, the remaining staff had to do their work as well as their own, resulting in long working hours, being very busy and increased stress. They also reported that not knowing if someone was infected with Ebola, having to ask questions and not touch the patients was very difficult. This was improved where proper protective equipment was available in the treatment centres.

> *When the first day that Dr xxx went inside for, to take a blood sample from one patient that was one of our first positives. He got stained with a lot of blood because it was a very complicated procedure and he ended up getting infected and he died one week later. So that's when the junior doctors, the house officers er decided to strike, like they were really scared. They didn't feel that they were supported because nobody was supported, nobody knew what to do (Female, Doctor, Sierra Leone)*

Lack of supplies and equipment. Many health workers reported that there was a shortage of supplies such as gloves and personal protective equipment, preventing them from providing care as they did not want to put themselves at risk. This also stopped health workers giving the right treatment—e.g. they were unable to do a caesarean section because they did not have enough personal protective equipment sets for the doctor, assistant and nurse. Some health workers reported that they were unable to give adequate treatment such as enough intravenous fluids or drugs. Others explained that they argued with the storekeepers about providing more supplies and drugs.

> *As for me, in my place, when we don't get these things I normally tell the nurses, I say 'please don't risk your life because you will die. When you become infected, it's 50/50 that you will live or you will die' (Female, Nurse, Sierra Leone)*

Economic difficulties. Health workers reported economic hardships during the outbreak. Some did not go to work and therefore did not receive financial incentives, and relatives did not go to work because movement was restricted.

Worsened relationships with colleagues. Many health workers reported that health workers appeared to be suspicious of each other. Health workers working in the holding and treatment centres explained that staff from the general wards avoided them and did not speak to them as they were frightened that they had Ebola and would transmit the virus to them. A matron explained that since the outbreak, staff were reluctant to attend the routine daily meetings.

> *[. . .] colleagues in the general ward they were really intimidating us. If I walked through this corridor, they will just move and just give a space for me to pass. So really the intimidation was by my colleagues. I was talking to myself that this is Ebola so it is not their fault. It is because of the Ebola so they are all afraid (Male, Nurse, Sierra Leone)*

Effects of economic crisis

The protracted economic crisis in Zimbabwe was experienced differently by health staff. Its main effects were a recruitment freeze, which led to increased workload, and devaluation of pay and allowances. This was accompanied by deteriorated working and living conditions, and more subtle, but still significant, sense of loss of discipline, hierarchy and control in the workforce.

Increased shortages of staff

A freeze in hiring, which was brought in to reduce public wage bills, accompanied by the high rates of emigration of staff and internal movements away from the government sector led to predictable complaints from the remaining staff about workloads and overload.

[. . .] there are challenges of shortage of human resources and other materials. We are short staffed; six nurses short, there is need to increase the number of nurses (Female, Nurse, Zimbabwe)

Devaluation of pay

The devaluation of the Zimbabwean dollar, especially due to the hyperinflationary environment in the mid-2000s, meant that there was a reduction in health worker pay. Health workers reported that the money received was not enough on which to survive. When the US dollar was introduced as official currency in 2009 every health worker in the public sector was given $100 per month, whatever their grade. Some senior and experienced health workers reported getting similar salaries to junior nurses. This has now improved with the introduction of emergency retention schemes after 2009, which are funded externally. However, the crisis for health staff is still associated with deteriorated terms and conditions and insecurity about such allowances.

Resource shortages at work

Health workers reported serious shortages of resources such as drugs, equipment, stationery and other amenities, including erratic electricity supply and poor maintenance, such that health workers found it difficult to offer quality care to their patients. At some health facilities they could not get enough food to give their patients. Health workers were satisfied when their patients recovered following treatment, but during the crisis period they had to turn them away or refer them to other public or private facilities.

There is a shortage of drugs and there are no doctors, it is very difficult to work in these conditions. There is also a shortage of equipment and drugs to use during labour, people endure pain for a long time and at times there will be no driver for the ambulance to transfer the patients to a referral hospital (Female, Midwife, Zimbabwe)

Living conditions

At some health facilities accommodation was a problem to the extent that some health workers had to stay in hostels. There were no funds to alleviate this problem.

Staff accommodation is also a problem - some nurses are staying in boy's hostels and there are no cooking facilities and some buildings have deteriorated but they cannot be renovated because of lack of funds (Female, Nurse, Zimbabwe)

At the peak of the crisis it was difficult to get basic commodities as most grocery shops were empty. People, including health workers, were spending a long time away from their work, waiting in queues to buy basic necessities.

Loss of quality and discipline

More subtle than the effects of material shortages was the sense of eroding professionalism—that standards for selection, training and management were perceived to be slipping, so that the quality of care was deteriorating over time.

There is no transparency in the recruitment of students and workers. You will see a husband, wife and children working at the same place. You cannot control behaviour of people with power, they corrupt the situation and they are difficult to manage and supervise (Female, Midwife, Zimbabwe)

These days we are still training but there is a shortage of resources to do the practical part of the training. We are always telling them that we were supposed to be having certain instruments so you have to improvise and in the end what we are teaching the students is to improvise. Apart from the issue of resources, supervision is also lacking on the students, they are not being well supervised [. . .] This compromises the quality of the nurses we produce (Female, Midwife, Zimbabwe)

Coping strategies

Coping strategies group into measures to provide physical protection, those which provide psycho-social support, and those which relate to practical issues such as working conditions (Table 2). In each case, health workers describe how they managed, using their own resources, and the forms of external support which were received and perceived to be effective. We present these across all three kinds of shocks.

Physical self-protection

Across the conflict-affected and Ebola contexts, health staff described measures which they took to protect themselves from physical harm. For example, during conflict health workers in Uganda slept in the bush, changed sleeping places frequently, and removed their uniforms and changed hair styles in order to be disguised as a patient and thus avoid abduction by rebels (Namakula and Witter 2014b).

During the EVD outbreak, health workers reported having to change their habits to protect themselves—this included having to wear long sleeve clothing and keeping hands folded to minimize bodily contact, avoiding crowded places, avoiding family members after work and educating their households on infection prevention and control measures.

Training and availability of personal protective equipment helped health workers feel more confident to cope with managing the outbreak. Knowledge was shared between all types of health workers, which was seen as supportive. For those working in hard to reach areas, the managers of facilities ensured that any training they acquired was passed on to the rest of the team.

The training and we were given a lot of protective gears so that helped the situation. When you had a lot of protective gear you felt more confident to go in there to your patients (Female, Nurse, Sierra Leone)

Psycho-social coping strategies

Psychosocial support came from the internal resources of the health staff—e.g. by drawing on internalized value systems such as religion and a sense of fatalism and service to country—as well as from community, peer, organizational and international support. These strategies characterized the EVD outbreak and to a lesser extent conflict contexts more than the economic crisis.

With those challenges, but we can still say thanks be to God for His mercy. .But we don't mind, we know that one day our Lord will see us through [. . .] But we hope and pray that they will remember us one day [. . .] I just have to cope. I have nothing else to do. I pray that things will change (Female, Nurse, Sierra Leone)

It's my country, I love my country this is the way I am demonstrating my own patriotism by giving service to my people managing, it's not easy but I've no alternative (Male, Nurse, Sierra Leone)

After Ebola, health workers talked of other methods of coping, including preparing themselves mentally before going to work, avoiding reading the Ebola updates, isolating themselves as they cannot live

with the thought of infecting someone else, living in hope that Ebola would eventually end, and also self-medication to get to sleep.

> *In the health facilities because each time you are coming, you may not be sure of what you are coming to receive. So you just brace yourself up at home - this is what I have signed to do. But I did not sign to come and die, so to yourself you start thinking what am I going to do today when I get to that place? It has been a difficult one but to cope with it we just look on and I think that this Ebola will finish. You know it will go away from the community and then we will come back to our normal lives and that's what we have been looking up to and that's what has given me hope (Female, Nurse, Sierra Leone)*

> *You have some that can't sleep, some people bleed from their nose and their eyes, from all the orifices in their body, some complain of extreme chest pain, some people get agitated. You know it's not good to see. You know most of the time at night, I had to take sedative for me to sleep (Male, Doctor, Sierra Leone)*

Health workers also spoke of the support they received from their peers, especially in the context of the EVD outbreak. Health workers encouraged one another. They prayed and fellowshipped together before starting work. They looked after each other, watched how they were managing patients and reminded each other about infection control.

> *If I make a simple mistake, just a simple one, I will die. So what we have been doing is to constantly keep ourselves, like we our colleagues we talk, we have some free line (as in telephone calls) during the night. If you keep awake at that time you will now tell your colleague: please be careful, keep your children indoors, and what we should do. We will try to remind ourselves, we send text messages around (Female, Nurse, Sierra Leone)*

A social media platform was set up by some frontline health workers during the outbreak to help them cope with the stress of working in the Ebola outbreak, which provided encouragement and support, and helped to reverse stigma, so that health workers went from being pariahs to being seen as heroic.

Other health workers reported that they received support from some senior colleagues and managers. Some health workers explained that they were hesitant in treating patients on their own but become more confident after these patients were seen by a more senior health worker.

> *They are really encouraging me like the matron, deputy matron, the DMO, the secretary, really the hospital staff are really motivating me, praying for me every day, so that even motivate me more. So I mean that makes me to be confident and do my work (Male, Nurse, Sierra Leone)*

Some health workers spoke of their family support, and how their words of encouragement helped them cope with their work, including loss of colleagues.

> *Yes, our friends come, my family, my family called to support us to make sure we take care and then give us words of encouragement, you know, whenever we lost our colleagues (Female, Lab technician, Sierra Leone)*

A few health workers described how trust between the health workers and communities was rebuilt through going into communities and communicating about Ebola and how it can be treated, and encouraging communities to attend for treatment of other illnesses and maternal health care services.

> *They were afraid not even to come in this place [. . .] yeah with time we went out and give health talks, we went in their places we have somebody that is there with megaphone. They went out and announced to them - don't be afraid of the hospital, the hospital as a whole is not a holding, we have the place that we isolate suspect cases and we have another place for treatment and even for deliveries. So when the message was out they started coming again (Female, MCH Aide, Sierra Leone)*

There was also some external psychosocial support given to health workers in workshops later in the Ebola epidemic. Social workers helped them cope with the stigma of being a health worker.

> *We made a lot of workshops about the stigma and the psychological support and everything and how they were feeling and if they felt they were protected by the rest of the hospital (Female, Doctor, Sierra Leone)*

Work-related coping strategies

Health staff presented ways in which they had managed to continue working which related to their own finances but also to workplace practices. These cut across all three kinds of contexts.

Given the disruptions to pay, staff in conflict-affected settings and also economic crisis discussed how they had survived through alternative income-generating strategies, such as going back to farming, mining (in Zimbabwe) and petty trade, such as brewing, poultry projects, sewing and selling food.

> *[. . .] because they wish to move and work on their farm, which was better than working for government with very small pay and high risk of Pol Pot's attacks (Female, Midwife, Cambodia)*

> *I'm doing poultry project here, although it is not allowed to do ithere,I'm just doing it. The project doesn't affect my performance at work (Female, Midwife, Zimbabwe)*

In Zimbabwe, dual practice was common, and some staff also reported having to borrow to survive, but this is much less feasible in conflict and epidemic contexts. In Sierra Leone, private practice was severely reduced by the EVD outbreak.

> *[. . .] I'm a midwife, the women used to come just to ask me questions. I normally have some income from that but now sometimes they cannot climb my steps, they will go away. So that income was stopped there. I cannot give injections at home, so those ones all closed. I now only depend on my salary (Female, Midwife, Sierra Leone)*

Staff in Zimbabwe also reported relocating to rural areas where the cost of living was lower and they were able to grow food, at the height of the economic crisis.

In some cases, like Ebola, where a specific risk allowance was introduced, this helped to compensate for the increased costs of food during the outbreak. However, people still found it difficult to cope and rationed their food.

> *Well there is no way we can have the money, the amount if you are to eat at least 5 cup rice in your family [. . .] you reduce it to four cups because of the prices increasing at that time because vehicles are not running and to travel from here to Freetown it costs hundred thousand Leones (Male, CHO, Sierra Leone)*

The communities have also assisted some health workers by providing food, for instance or assisting in securing accommodation for health workers posted to locations away from their normal place of abode.

The donor community has also been helpful in providing incentives and material support for staff during post-conflict periods and during Ebola. This provides important practical support but also a sense of solidarity, which is appreciated by local staff, who feel supported and also enabled to learn new skills.

One of the positive aspects of crises and shocks was that the need to improvise in order to keep services running gave staff an opportunity to acquire new skills and roles. Task shifting enables health workers to deal with increased workloads and the absence of more senior personnel.

> *[…] we were able to have real practice with the patients. We learn theories, and practice. During that time, they taught skills about the war, to help in the war, but now, they focus more on helping ordinary people (Cambodia)*
>
> *So the response has brought on-board that awareness. So most of our health facilities, most of our health workers, they're now screening, they are now triaging. If I come and I am looking very sick they will pay more attention to me quickly and they have places to put me if I am a suspect (Female, Nurse, Sierra Leone)*

Staff also emphasized the need to work longer hours, to improvise (e.g. using candles where there is no electricity), and in some cases, to use their own resources to provide for patients or to require patients to find items which should be provided for free.

> *The other problem is that of food, there is no food for our inpatients. I usually take vegetables from my garden to give the patients and I use my car to go to the pharmacies to buy drugs for the patients but no one refunds me the money I would have used or for the vegetables I would have provided (Female, Midwife, Zimbabwe)*
>
> *There are shortages of materials like cotton wool and the patient is asked to buy some of the things and most cannot afford (Female, Midwife, Zimbabwe)*

Discussion

This article builds on existing literature on the challenges that health staff face during conflicts and disease outbreaks (McMahon *et al.* 2016), as well as the literature on economic coping strategies (notably dual practice and informal economic activities) in underfunded health systems (Van Leberghe *et al.* 2002). Although most studies focus on specific contexts, this article provides a comparative perspective which places these side by side as differing shocks to the health system, and looks for cross-cutting themes. The impacts and coping strategies illustrate types of vulnerabilities and adaptive capacities in line with the concept of resilience. Resilience is here examined at the personal level, although clearly individual, organizational and institutional levels intersect. In this study we have shown how a resilient health workforce can contribute to the overall resilience of the system, keeping services available even in the absence of the most basic requirements. These individual perspectives feed into the wider debate about the needs of the global health workforce to meet international goals (Campbell *et al.* 2015).

Our findings suggest that the impact of shocks and coping strategies are more shared between conflict/post-conflict and epidemic contexts—particularly in relation to physical threats and psychosocial threats—while all three contexts create challenges and responses for working conditions and remuneration. Although we have grouped the impacts and coping strategies under three broad headings, there are many connections across them. For example, perceptions of falling standards of care provide a practical challenge for staff—how to maintain services in difficult conditions—but also challenge their sense of professional mission. Equally, supportive strategies, which we divide broadly into ones which health workers can trigger themselves and those which are external, can provide both material and psychological assistance, as is the case with supportive interventions from expatriate staff.

The contexts analysed here present a wide range of risks or shocks as conceptualized in previous literature, such as (OECD 2014). These include 'covariate shocks', defined as infrequent events with an impact on almost everyone in the target group, such as violent conflict, volcanic eruptions or currency devaluations. They also include 'idiosyncratic shocks', defined as significant events that specifically affect individuals and families, such as the death of the main breadwinner or the loss of income-generating activity. Seasonal shocks, such as episodic disease outbreaks, like cholera, also occurred during the period under investigation, and these post-crisis settings also face long term threats, such as chronic underfunding and instability, which weaken the potential of the system and deepening the vulnerability of its actors. These stressors affect all levels of the system, though we have focussed here on understanding the individual level.

Some of the positive attributes which are associated with resilience in the wider development literature, such as self-organization and social cohesion are demonstrated in our health worker findings, although the stigmatized context of Ebola presented contrasting themes of isolation as well as pockets of professional cohesion. It is also important to note that not all coping strategies at the individual level are beneficial for the system—dual practice during economic crises is an example of an individual coping strategy which has positive and negative system effects (preserving some services but reducing actual attendance at public facilities). In under-resourced and poorly governed contexts like these, systemic preparedness and redundancy—two attributes also presented as important for resilience (OECD 2014)—tend to be lacking. Absorptive capacity is often low—as demonstrated by the time taken to respond to the Ebola epidemic—and systems struggle to be adaptive, never mind transformative. Although we note the resilience and inventiveness of the staff who worked through wars and crises, it is important to highlight the gaps in their support. Enforcement of protection for health staff during conflicts, when they are often actively targeted, is urgently needed internationally.[2] At national level, particularly in countries which are fragile and crisis-prone, there should also be contingency planning for crises, to include such practical measures as effective communications systems to support staff and communities with real-time advice and reassurance. The social media tools were clearly appreciated in Sierra Leone but came in late in the day. Similarly, plans should include back-up systems to ensure continuity of pay and drugs supply, and giving clear discretion for local management decisions on needed changes to services and staffing.

Although some of these shocks arrived suddenly and were relatively short-lived, it is clear that others—conflict and economic crisis, e.g.—are drawn out and variable. In the case of Cambodia, for example, the civil war lasted around 30 years, and the recovery period had taken another 15 or so. In Zimbabwe, the political and economic crisis has been accelerating since 1999 and, having improved over 2009–13, is now deteriorating again. The need to ensure resilience at system level is therefore longer term.

It is important to note the limitations of our methods, which focused on staff who had stayed in service during the crisis—thus not providing insights into the motivation and mind-set of those who had left. Similarly, by focusing on the experience of staff we omit the community perspective, though our wider tools and programme did add in these wider dimensions.[3]

Conclusions

We use evidence from life histories and in-depth interviews with a range of health staff in four countries to analyse how they experienced and responded to shocks of three kinds: armed conflict, disease epidemics and economic crises. Across the contexts and types

of shocks there are some similarities but also differences in impacts and coping strategies, which we group into physical survival strategies, psychosocial support and practical strategies relating to work and remuneration. There is strong evidence of the resilience of staff and some encouraging external supportive interventions. However, there are also significant gaps in how health staff are supported or protected during crises. Health systems are increasingly fragile and conflict-prone and strategies should be in place at local, national and international level to prepare for predictable crises of various sorts, rather than waiting for them to occur and responding belatedly, or relying on personal sacrifices by staff.

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Conflict of interest statement. None declared.

Notes

1. http://www.who.int/universal_health_coverage/en/
2. http://www.who.int/hac/techguidance/attacks_on_health_care/en/
3. www.rebuildconsortium.com
4. https://www.theguardian.com/world/2016/jul/14/no-cash-no-cure-zimbabwes-hospitals-buckle-amid-economic-crisis

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