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Fragile states and the development of resilient health systems
through the lens of human capital

Susan Anne Jones

A thesis submitted to the University of Huddersfield in partial
fulfilment of the requirements for the degree of Doctor of
Philosophy

March 2020

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Dedication

This PhD is dedicated to my friends and colleagues from the Centre for Maternal and Newborn Health at Liverpool School of Tropical Medicine based in Sierra Leone; Betty Sam, Florence Bull, Steven Bagie Pieh and Mustapha Kemokai and to my husband Siva Namasivayam.

For their friendship and support “*a tell God tenki.*”

List of Contents

Copyright Statement.....	2
Acknowledgements.....	3
Dedication	4
List of Figures	7
List of Tables	7
Abstract.....	8
Chapter 1: Background	9
Positionality Statement.....	12
Chapter 2: Introduction	14
Research question.....	16
Chapter 3: Works included in the thesis.....	17
3.1: Study 1	17
3.1.1: Paper 1	18
3.1.2: Paper 2	19
3.1.3: Paper 3	20
3.2: Study 2	21
3.2.1: Paper 4	21
3.2.2: Paper 5	22
Chapter 4: Literature Review	24
Figure 1: summary of literature included in the thesis.....	26
4.1: Search One	27
4.2: Search two	27
4.3: Search three.....	27
4.4: Search four.....	27
4.5: The Sierra Leone Health System	27
4.6: Resilient Health Systems in low income countries	30
4.7: Human capital within a resilient health system.....	37
4.8: Social capital within a resilient health system	39
4.9: Critiquing the concept of resilient health systems in low-and middle-income countries.....	41
Chapter 5: Discussion.....	45
5.1: Framing of resilience amongst teachers within the MCHA schools	45
5.2: Framing of resilience amongst health care workers.....	49
5.3: Framing of resilience in the relationship between health care workers and the community ..	52
5.4: Evidence of social capital and resilience in the capacities and characteristics of health care workers and in the MCHA schools.....	54

5.5: The role of INGOs in developing a resilient health system.....	58
Chapter 6: Limitations of the included papers	61
6.1: Study one (papers one to three).....	61
6.2: Study two (papers four and five)	62
Chapter 7: Conclusion	63
Chapter 8: Recommendations	69
Chapter 9: Further Research	70
Reference List.....	71

List of Figures

Figure 1: Summary of literature included in the thesis.....25

List of Tables

Table 1: Blanchett et al: The Dimensions of Resilience Governance18

Table 2: Barasa et al: Complex Adaptive Systems Framework18

Table 3: Kruk et al: Framework for Resilient Health System.....19

Abstract

Since the end of the 2014 West Africa Ebola epidemic there has been a call for countries to recognise the role frameworks of resilience can play in health system development, particularly in low resourced settings. This thesis will use the findings from five papers in two related studies to examine and critique frameworks of resilience in relation to the health system in Sierra Leone. Study one addressed the quality of pre-registration education for maternal and child health aides and study two examined the impact of the Ebola epidemic on maternal and newborn care.

Findings from the included papers are utilised to explore how theories of human and social capital may be utilised to examine concepts of resilience in relation to the health system in Sierra Leone. The framing of resilience among health care workers and pre-registration tutors; the current capacities and characteristics of health care workers and their relationship to the human capital requirements of resilience frameworks will also be explored.

Findings from this thesis demonstrate that discussion on human capital for developing resilient systems is largely missing from the resilience agenda. Elements of everyday resilience may be evident amongst health care workers and tutors, but this has not led to system adaption and transformation. In a fragile state such as Sierra Leone there is a danger that focusing on resilience alone will mask the investments that are needed in human capital and the political and social changes needed to improve health care. In the context of Sierra Leone concepts of resilience need to be reframed to acknowledge the cultural context, and recognise the underlying fragility of the state and lack of agency amongst the majority of the health care work force. Investment in human capital should therefore be included as a pre-condition in resilience frameworks which can then be built upon to bring about universal health coverage and system resilience.

Chapter 1: Background

Between 2010 and 2016 Sierra Leone received an annual average amount of US \$587 million in official development assistance (ODA) (OECD 2018). In 2017 the amount of ODA was US \$537 million (equivalent to 14.7% of gross national income (GNI)), of which 40% was spent on health and population programmes. Despite this spending Sierra Leone failed to meet its targets for the Millennium Development Goals (MDGs), including those related to health, and continues to have poor health outcomes (Government of Sierra Leone 2016). Though there were some improvements in key health indicators since the 1970s these were not sustained. For example, the maternal mortality ratio (MMR) decreased from 1800 per 100,000 live births in 2000 to a low of 857 in 2008 but rose again in the years immediately pre and post the 2014-2016 Ebola epidemic (World Health Organisation (WHO) 2016^a). During 2016 there was again a rise in MMR to 1,360, compared with the sub-Saharan African average of 546/ 100,000 (WHO 2016^a), indicating that the health system could not cope with an epidemic and provide fundamental routine health services. Sierra Leone failed to meet any of the criteria for maternal health in Millennium Development Goal 5, missing its target of 450 maternal deaths/100,000 by a considerable way (in 2015 MMR was 1,165/100,000) (Government of Sierra Leone 2016).

Much of ODA spending on health goes towards disease specific programmes (for example malaria, HIV/AIDS, maternal and newborn health), often follows donor rather than country priorities and is aligned with the cost-effectiveness of the programmes (Bendavid, Duong, Sagan, & Raikes 2015). Expenditure is often targeted towards the short-term consumption of resources such as medicines, rather than on long term investment, for example in the number and quality of human resources (Fieno, Dambisya, George, & Benson 2016). This lack of investment in human resources for health has been argued as leading to a global crisis of inadequate numbers and maldistribution of health care workers and is particularly acutely felt in low income countries (McPake, Dayal, & Herbst 2019).

Since the 2014-2016 West Africa Ebola epidemic there has been a global consensus regarding the need to build back better and develop the resilience of health systems globally to withstand future shocks. The epidemic highlighted, amongst other things, the impact of having inadequate human resources for health. Immediately after the epidemic Sierra Leone had 1.9 health care workers per 10,000 head of population, far below the recommended 23 doctors and nurses/midwives per 10,000 head of population (WHO 2016^a). Key to understanding the weaknesses within the Sierra Leone health system is a recognition of the shortfalls within its human resources and the impact that this has on the availability and quality of patient care. As

a consequence of this, post Ebola recovery plans include the need to scale up the number and quality of health care workers (Govindaraj, Herbst, Ajumobi, Rockmore, Idrissi, Workie & Clark, 2018; McPake et al. 2019). Sierra Leone has failed to set any targets for increasing human resources for health but to meet targets as set by Guinea and Liberia (the two other countries mainly affected by the Ebola epidemic) it would need a more than six to nine-fold increase with annual growth rates of between 19.4% and 23.3% (Govindaraj et al. 2018). Such a large increase would need to start with an expansion in training capacity, as well as preventing work force attrition, and require high levels of funding (Govindaraj et al. 2018). It is not clear where such significant levels of funding will come from and as the work force increased the costs of this would take up a larger share of health budgets.

However, increasing the numbers of health care workers alone will not guarantee an effective health service, the capacities and performance of workers also need to be improved. There is less written about the capacities of health care workers in low-and middle-income countries but evidence of the under achievement of the MDGs (Government of Sierra Leone 2016) and health indicators (WHO 2016^a) provide insight into the low quality of patient care in Sierra Leone. The quality of care provided by health care workers in low- and middle-income countries (LMIC) shows challenges in terms of competence and a lack of preparedness to withstand shocks to the health system (Bvumbwe & Mtshali 2018; Murphy et al. 2014). Efforts toward developing a fit-for-purpose health workforce need to include a focus on improving capacities related to health worker performance (Bvumbwe & Mtshali 2018). As part of its overall health strategy the Government of Sierra Leone has attempted to increase the number of health care workers by introducing new middle cadres, for example maternal and child health aides (MCHA) and expanding the number of pre-registration training places. The focus here has been to increase numbers with less attention paid to the quality of teaching and learning in the school.

Increasing the numbers of health care workers may yield improvements over the medium and long term but building capacity of the current workforce may also be needed in the short term. Multiple factors can contribute to sub optimal performance of health care workers including system and individual capacity (for example, availability of supplies and worker knowledge respectively) and their motivation to provide high standards of care. However, this needs to be seen in the challenging system in which health care workers operate in low resourced countries. Short term training programmes have been reported to improve knowledge and skills of health care workers but there is no evidence on how, or if, these programmes improve patient care

and health outcomes (Ameh et al. 2016). Longer term investment in health care workers may be needed to improve their capacities and patient care.

Before implementing a resilience framework, the Sierra Leone government and their international partners could better understand the characteristics of resilience which may, or may not, be evident within the health work force. Without this understanding the assumption that health care workers have the characteristics, knowledge and skills to develop a resilient system may be misplaced. The imposition of resilience frameworks can also be questioned for the assumption that shocks are inevitable, and workers therefore need to learn to absorb these and continue to practice. In the context of a low-income country this assumption could be considered controversial at best and contradictory to the ideals of universal health coverage. There is a danger that in the post Ebola context resilience is seen as the answer to all the problems of the health system when in fact it may mask the more fundamental fragility within that system. Achieving the capacities to cope with a shock such as the Ebola epidemic, as the country eventually did in 2014, does not mean that there has been improvement in the underlying system or an increase in the capacities of those who work in it. The support of international governments and aid agencies undoubtedly helped Sierra Leone to overcome the Ebola epidemic, but it seems to have had limited impact on development of long-term routine health services. Further challenges may also arise if the functions prioritised by the government and global partners to develop a resilient system are not also prioritised by the population and local health care workers. Any disparities between government, workers and community may affect their buy in to the concept of resilience, services changes needed to implement it and uptake of services (Ling et al. 2017). Evidence from Liberia after the Ebola epidemic shows that whereas local leaders prioritized a wide range of services and improving service delivery, external agencies focused on system level issues such as surveillance or coordination to improve resilience (Ling et al. 2017). Focusing on high level system capacities to develop a resilient system may therefore be detrimental to developing resilience and providing the type of health care wanted and needed by a population.

Positionality Statement

As a researcher who had lived and worked in Sierra Leone for five years my experience of the health system raised questions for me around resilience frameworks, their appropriateness to the Sierra Leone context and if the health system could accommodate the major changes needed to develop resilience, meet the Sustainable Development Goals (SDGs) and achieve Universal Health Coverage (UHC) (United Nations 2015^a). Working within a district hospital for a year, and a further four years with schools of nursing, senior ministers in the Ministry of Health and Sanitation (MoHS) and the Chief Nurse of Sierra Leone provided me with an insight into the fragility and routine challenges faced at all levels within the health care system. Further work with the MoHS and international non-governmental organisations during the Ebola epidemic demonstrated how ill prepared the fragile health system and health care workers were to be able to cope with any level of shock to the system.

At both a local and national level prior to and during the Ebola epidemic health care workers involved in the included studies commented on the chronic shortages of resources (both physical and human), poor infrastructure and inability of the system to manage on a day to day basis. This led me to question the discourse around resilience which appeared to be focused on high-level health system changes that need to be introduced without fully recognising the economic, political and human context of the country. In particular, the three most commonly cited frameworks of resilience, discussed later in the thesis, include the capacities of qualified health care workers and their contribution to resilience development, without fully addressing issues of human capital. Poor quality care has been shown to cause a reduction in the likelihood of populations using services and therefore needs to be managed within the context of a comprehensive development framework for health (Kruk et al. 2018).

Evidence from three of the papers in this thesis demonstrated that the process of developing quality health care workers for a resilient system needs to start within pre-registration schools, but that these lack the resources and qualified teachers to deliver effective programmes. If resilience is the answer to the fragile health system in Sierra Leone, then this assumption appeared to me to be predicated on the belief that health care workers have the characteristics and abilities to help develop both individual and system resilience. My experience of working with colleagues in Sierra Leone showed that while the lack of overall resources and funding may be evident, there is less clarity about the workers within it, their capacities and the ways they adapt their practices to the under resourced system. I conjectured that resilience

frameworks may therefore be asking too much of current health care workers, given their training and the system in which they work, and that the projects I had conducted in Sierra Leone could provide more evidence on this.

An initial re reading of the five included works also raised questions around human capital within the health care workforce and how this could be leveraged to better support a resilient health system and achieve universal health coverage. Human capital theory refers to the knowledge, skills and abilities of individuals that, if properly managed, can contribute to an organisation's productivity (Goh, Chenn & Chien 2019). Numerous authors have seen the development of human capital in nursing as a solution to help overcome nurse workforce problems, improve quality of care, reduce nursing shortages and increase the job satisfaction of workers (McGillis-Hall, 2003; Rondeau, Williams, & Wagar, 2009; Evans, Brown, & Baker, 2015). However, when looking at frameworks of resilience the focus appears to be on structural system change with limited discussion of social capital and no discussion around human capital. This appears to be a missed opportunity, post the Ebola epidemic, to examine how health care workers can contribute through development of their human capital to developing a resilient health system.

Chapter 2: Introduction

This thesis will use five papers (see pages 17-23) to critique frameworks of resilience in the context of rebuilding fragile health systems after a humanitarian crisis. In particular it will examine how the 2014-2016 Ebola epidemic in Sierra Leone highlighted the inability of the country's health system to cope with the crisis and was subsequently regarded as a call for countries to recognise the importance of resilience within health systems (WHO 2015). Since the end of the epidemic the general capacities of resilient frameworks (for example disease surveillance, governance, infrastructure) have been described but further work is needed to examine how these can be translated into provision of adequate health services (Kruk, Myers, Varpilah, & Dahn 2015; Barasa, Cloete, & Gilson 2017; Olu 2017). In particular there is a lack of discussion around the activities of health care workers in resilient systems; how and if resilience is manifested in the current workforce and whether fragile health systems, such as that in Sierra Leone, have the human capital to deliver a resilient system.

Metrics to assess the ability of a country to respond to humanitarian crises have been developed, but look at the higher-level capacities of the system, rather than the characteristics of individual health care workers and their ability to respond. For example, the WHO developed its Joint External Evaluation tool (JEE) to measure country capacity to deliver on International Health Regulations during an epidemic (WHO 2016^b). Since its publication the JEE has become an essential tool for countries to measure their ability to manage infectious disease outbreaks and may also be used to help measure resilience (WHO 2016^b). However, the focus of the JEE is on infectious diseases and therefore has limitations in measuring overall system resilience. The JEE does mention the importance of human resources at a strategic level, requiring governments to have a "multisectoral workforce strategy". The contention of this thesis is that achievement of high-level capacities within resilience frameworks (for example legal and policy frameworks, disease surveillance, national and international cross system working) and metrics will not be possible without further understanding of the human capital within the health system and the role and experiences of health care workers in fragile states.

Since the 2014 West Africa Ebola epidemic the assumption within the literature appears to be that resilience offers a way for countries to withstand shocks and to develop the capacities of the health system to better deliver routine health care. Focusing on frameworks of resilience at this higher level may not deliver a better health system but may in fact mask the more fundamental requirements of the system such as workforce development and investment in human capital. Better understanding of the capacities and characteristics of health care workers

who will deliver the resilient system is therefore needed. Global concern about the quality of health care worker performance in low-and middle-income countries (LMIC) and the impact on health outcomes is well documented (Rowe, de Savigny, Lanata, & Victora 2005). Rapid expansion of poorly resourced - training schools may have increased the number of available health care workers, but more evidence is needed on the impact of this training on the overall stock of human capital and consequently the quality of patient care. Low levels of human capital and under performance amongst health care workers may raise questions about their ability to deliver the quality of patient care needed in a resilient health system (Rowe, de Savigny, Lanata, & Victora 2005).

The concept of human capital derives from economic theory developed by Schultz (1981) and Becker (1993), who saw the investments made in employees as beneficial to the company, but also as a risk which may make employees more attractive to another organisation. Increasing the stock of human capital could be considered as a fundamental aspect of health system strengthening, universal health coverage and system resilience, and may help to counter some of the structural issues in a fragile state. As with other organisations health care systems are thought to invest in their workers to increase productivity, to be adaptable to change and improve their reputation with stakeholders (Jones 2004). Through such investment, health care workers themselves may also benefit from further education and training leading to increased salary, promotion and perhaps an improved working environment (Rondeau, Williams & Wagar 2009). This investment in individuals may engender loyalty within workers and increase their commitment to the organisation that has invested in them (Jones 2004). Well-motivated and well-trained health care workers are also an essential component of a countries strategy to deliver on universal health coverage, which is turn is considered a key component of inclusive and sustainable development (Maeda et al 2014). The Sustainable Livelihoods Framework also argues that investments in human capital are needed for societal development at all levels and act as a leverage for other forms of capital (social, political, natural, physical and financial) (UNDP 2017). It could therefore be considered there is a link between the investments made in the human capital of a health system and the capacity of that system to deliver on its goals.

Research question

What are the capacities and characteristics of resilience demonstrated by health care workers in Sierra Leone that may help demonstrate the need for increasing human capital for developing a resilient health system?

The aims of the thesis are:

1. To examine the concepts and frameworks of resilience in relation to building a resilient health system in Sierra Leone.
2. To explore how concepts of resilience are framed amongst health care workers and maternal and child health aide teachers within their workplace setting?
3. To explore the current capacities and characteristics of health care workers in relation to resilience frameworks and through the lens of human capital
4. To explore the challenges to developing resilient health systems in a low-income country.

Chapter 3: Works included in the thesis

The five works included in the thesis are derived from two studies conducted in Sierra Leone from March 2013 to September 2017, while the author was working as a Senior Research Associate at Liverpool School of Tropical Medicine (LSTM). Papers one to three are from a study, funded by UNICEF, conducted in partnership with the Sierra Leone Ministry of Health and Sanitation (MoHS), which aimed to develop the pedagogical knowledge and skills of teachers in pre-registration training schools for Maternal and Child Health Aides (MCHA). Papers four and five were conducted in partnership with the non-governmental organisation VSO, funded by WaterAid, and looked at; paper 4) the provision of maternal and newborn care during the 2014 Ebola Virus Disease epidemic and paper 5) the lived experiences of health care workers during the same epidemic. The combined papers provide a unique insight into the training of key health care workers; their perceptions of working in a fragile health system both before and during a humanitarian crisis; the capacities of health care workers relating to resilience; the stock of human capital within the health system; and evidence of social capital amongst health care workers.

3.1: Study 1

Background to the study

The maternal and child health aide programme in Sierra Leone was introduced in the 1980s to expand the numbers of health care workers providing maternal and newborn health care, particularly in rural areas. Following a revised curriculum in 2012 fifty percent (50%) of students failed their final assessment and were subsequently unable to take up their posts. Consequently, the Ministry of Health and Sanitation raised concerns about the quality of teaching within the programme. LSTM were asked to work with MCHA tutors and programme leads to assess the quality of teaching in the schools, determine reasons for the poor student performance and develop an action plan to improve teaching and learning. The following three papers are derived from this two-year study.

For each of the papers the first author contribution was: conception of the study design and protocol; design of the data collection tools; design of the data analysis; submission of ethics applications to LSTM and the Sierra Leone Ethics and Review Committee; data collection and analysis; first author for the initial, subsequent and final drafts of the paper.

3.1.1: Paper 1

Building capacity for skilled birth attendance: an evaluation of the maternal and child health aides training programme in Sierra Leone.

Study Design

Observation of teaching sessions using a structured observation (Sammons, & Davis 2016) instrument and taking of qualitative notes by the researcher were conducted by three separate research teams consisting of Sierra Leonean and UK researchers. The observation instrument assessed teaching against four elements known to be required for effective teaching and learning; 1) teaching styles, 2) use of visual aids and teaching equipment, 3) teaching environment and 4) student involvement during the lessons. Each of the 14 maternal and child health aide (MCHA) schools were observed at various time points over a period of two weeks. Twenty-eight hours of teaching by twenty-six teachers were observed in twenty-six lessons. Disruption to the school timetable was minimised through event sampling (Sammons, & Davis 2016). Key themes identified were lesson preparedness by tutors, availability and use of visual aids, lesson content, teaching style, student/tutor relationship, student feedback, student participation, assessment, depth of learning, the strength of the teaching technique and teaching environment.

Novel contribution of the paper

Teaching within pre-registration health care programmes has developed in many countries from using didactic teaching styles to a more constructivist approach which puts the student at the centre of teaching (Baeten, Stryven & Docky 2013). The belief behind this change is that students will be better prepared to work in complex health care situations (Fullerton, Thompson & Johnson 2013). However, this change has not been duplicated in many low-and middle-income countries and concerns about the quality of teaching and learning remain (Fullerton et al. 2013)

In low income countries the expansion of pre-service training and introduction of new cadres of staff to fill gaps left by too few nurses and midwives has raised concerns about the quality of training programmes and the negative impact on patient care (Kruk et al. 2018). The introduction and expansion of the Sierra Leone MCHA programme focused on increasing numbers in training rather than the quality of education. Results showed that teachers used either an ‘expert’ or a ‘formal authority’ style of teaching (Grasha 1996). Consequently, the depth of teaching and learning within the schools was limited and the need for a non-didactic, student focused teaching environment was strongly evident. This study demonstrated the

consequences of over expansion of training schools without a well thought out teacher training programme on quality of teaching. Prior to this study none of the MCHA schools' teachers had any formal or informal teacher training. As a consequence of the study peer review was being introduced in a number of schools by the teachers to help them develop their teaching skills. Further work is needed to develop teacher training programmes. Expansion of training numbers therefore needs to include training and development of those delivering programmes and government commitment to infrastructure and resource development.

3.1.2: Paper 2

Strengthening pre-service training for skilled birth attendance: an evaluation of the maternal and child health aide training programme in Sierra Leone

Study Design

A phenomenological approach was used in the study with forty-one key informants from across all 14 of the MCHA schools participating in four focus groups over a two-week period. Focus groups were justified in this study rather than individual interviews as they enabled a wider discussion to take place amongst the group members while still enabling individuals to discuss their lived experience (Bradbury-Jones, Sambrook & Irvine 2009). A higher number of participants from all schools could also be included which would not have been possible with individual interviews due to time constraints. The groups were divided by geographical region to allow discussion of themes common to each area. The focus groups aimed to explore the strengths, weaknesses, opportunities and recommendations for development of teaching and learning within the MCHA programme in Sierra Leone at the national, district and personal level. The study also mapped the learning outcomes within the MCHA programme against national, regional and international standards for skilled birth attendants

Novel contribution of the paper

The study provided a voice for those working in the schools and baseline information on which the schools and research team could develop a programme of support to enhance teaching and learning in each school. This was the first time that this group of key informants had formally come together to discuss the opportunities and challenges they face in delivering the MCHA programme. Informants recognised that there was poor teaching and learning within the schools due to a lack of equipment, inadequate infrastructure, under-developed teaching skills, inconsistency in availability of teachers, lack of autonomy in student selection and inadequate clinical supervision of students. The student assessment process was described as unfair, not

reflecting the course curriculum and not fit for purpose. Though these issues were known to the participants before the study was conducted, they had been unable to provide a coordinated response to the government on the challenges that the schools faced and reasons for their poor performance. Following the focus groups the anonymised results and recommendations of the focus groups were shared with the Ministry of Health and Sanitation and national MCHA coordinating team. Findings from the study were used within the annual MCHA planning meeting to inform developments in academic quality, infrastructure development and peer support.

3.1.3: Paper 3

Student evaluation of the impact of changes in teaching style on their learning: a mixed method longitudinal study.

Study Design

A longitudinal mixed methods approach was used to evaluate the impact of a teacher training programme on teaching methods and student satisfaction with teaching and learning over a two-year period. Structured, non-participant observations of one hundred and forty (140) teachers were made across all fourteen MCHA schools at baseline and three and six months after a tutor training programme. Focus groups were logistically not feasible given the large number of students across fourteen schools. Students were asked to complete a nineteen question, five-point Likert scale, self-administered questionnaire at the same time points as the teaching observations. Five hundred and thirteen (513) students completed the questionnaire. There was a positive correlation between student satisfaction and the increase in student focused teaching methods used.

Novel contribution of the paper

Prior to this study there had been no work on the impact of teaching styles on student satisfaction in nursing schools in low resourced countries. The continued use of didactic teaching identified by other authors in such settings lacked further discussion on how and if students would respond to a change in teaching styles. The assumption seemed to be that the move in high income countries to student focused learning could be replicated in low income areas. However, this student focused style often requires a higher level of resources and it was not clear how this could be replicated in a lower resourced setting, or if students would welcome this. The findings from this paper built on papers one and two and provided a comprehensive picture of teaching and learning in the schools. The study demonstrated to stakeholders the positive impact of training tutors on student satisfaction and performance and

the positive outcome that could be gained in terms of investment in teacher training. At the end of the programme the cohort included in the study had a 90% pass rate compared to the previous cohort which demonstrated a 50% pass rate. The study has implications for the nursing and midwifery training schools across Sierra Leone, and perhaps to the wider education setting in low and middle-income countries, demonstrating the need for investment not just in numbers of students trained but in the quality of teaching and the school environment.

3.2: Study 2

Background to the study

In May 2014 three West African countries, Sierra Leone, Liberia and Guinea were hit by the worst Ebola Virus Disease epidemic ever recorded. During the epidemic routine health services were severely affected due to a loss of health care workers, public mistrust in the health care system and diversion of scarce resources to fight the epidemic. As the epidemic progressed and international support increased the Ministry of Health and Sanitation in Sierra Leone and the international non-government organisation (INGO) VSO asked LSTM to determine the impact of the epidemic on maternal and newborn health. Paper four of the study addresses the impact of Ebola on the availability and uptake of maternal and newborn health services. Paper five addresses the epidemic from the perspective of health care workers providing maternal and newborn care and their experiences of working in this setting prior to and during the epidemic.

3.2.1: Paper 4

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 newborn health services in Sierra Leone.

Study Design

The study conducted retrospective analysis of routinely collected data from each of the thirteen (13) centres providing comprehensive emergency obstetric care (CEmOC) and sixty-five (65) of the sixty-seven (67) facilities providing basic emergency obstetric care (BEmOC) in Sierra Leone. Data were collected from facility registers for the twelve months preceding the Ebola epidemic (May 2013 to May 2014) and ten months during the epidemic (May 2014 to February 2015). The study aimed to assess the ability of health facilities to continue to provide basic and comprehensive emergency obstetric care during the Ebola epidemic and the uptake of these services by women. The changes in service availability and uptake were assessed for impact on rates of maternal mortality and stillbirths. Sierra Leonean LSTM staff used an electronic data collection tool to gather data from each facility either in person or by telephone. Data on

the number of positive Ebola cases per month were obtained from the National Ebola Response Centre. Data were analysed using the statistical package Stata V.12.1 for availability of health care providers; availability of emergency obstetric care; uptake of services and number of maternal deaths and still births.

Novel contribution of the paper

During the 2014 Ebola epidemic the United Nations Population Fund (UNFPA) reported that an expected 800,000 women were due to give birth across the three countries worst affected by Ebola (UNFPA 2014). Of these women, 120,000 would be expected to have some sort of obstetric emergency and the UNFPA raised concerns of a potential increase in the number of maternal and newborn deaths as resources were diverted towards fighting the epidemic (UNFPA 2014). There was a fear at the start of the epidemic that health care workers were leaving their posts due to the risk of catching Ebola and that this would adversely impact availability of patient care and health outcomes. The paper was able to demonstrate that, in principle, the facilities - including staff - were available to provide the same level of services as prior to the epidemic. The increase in maternal and newborn mortality may, therefore, have been due to reduced uptake of services by women who were afraid of catching Ebola if they attended facilities, rather than a lack of service provision. This had a direct impact on the government messages put out to women about the importance of attending for facility-based births and routine care. The study also demonstrated the high impact of a humanitarian disaster on routine health outcomes and the need to continue key routine health services such as maternity care. Across all districts there was an 18% decrease in the number of women attending for antenatal care, a 22% decrease in those seeking post-natal care and an 11% decrease in women having a facility-based delivery. There was a corresponding 34% increase in the maternal mortality ratio and a 24% increase in the still birth rate.

3.2.2: Paper 5

“Even when you are afraid you stay: provision of maternity care during the Ebola virus epidemic: a qualitative study.

Study Design

A hermeneutic, phenomenological approach which enabled a subjective interpretation of results was used to determine the lived experiences of health care workers providing maternity care during the Ebola epidemic. A hermeneutic approach assumes that the researcher cannot be separated from the research allowing them to bring in meaning based around the situation

around the phenomena being studied, in this case the Ebola epidemic. Purposive sampling was used to select 66 key informants from the district health management teams and health care facilities for face to face interviews. Fifty of the key respondents were midwives or nurses which reflects the predominance of these cadres within the Sierra Leone health service. Interviews were conducted by national Sierra Leonean staff from LSTM, audio recorded, translated into English where necessary and analysed using Framework analysis.

Novel contribution of the paper

The boundaries of practice across different cadres of health care workers is often very fluid in low income countries due to the shortage of health care workers; this is especially true for those with a higher-level qualification such as midwives and registered nurses. This fluidity can contribute to the shared experiences of different cadres during a humanitarian crisis such as the Ebola epidemic. The study demonstrated health care workers understanding of the inadequacies of their health system prior to the epidemic and hence its lack of ability to cope with the humanitarian crisis. The study also showed the daily pressures workers faced in delivering care pre and post the epidemic and their coping mechanisms, further informing the discussion around resilience in health care workers, particularly in the poorly researched area of low-income countries. The importance of the community response during the epidemic was also demonstrated and showed the adverse consequences of a lack of public trust in health care workers. These findings are important in the context of building better, resilient health systems post the Ebola epidemic. Health care workers are a key resource in the development of an effective health system, yet in the context of Sierra Leone their voice is often not heard, despite their comprehensive experience of the system. Future preparedness plans and health system development needs to take account of system shocks such as epidemics and poor working conditions on the ability of health care workers to provide adequate care. Health care workers from all levels need to be included in development and implementation plans to ensure these are appropriate and workable.

Chapter 4: Literature Review

A scoping review was conducted to identify the volume of available literature, clarify key terms and concepts, identify the prevailing and emergent views around the aims of the thesis, and to clarify the conceptual boundaries of the thesis (Arksey & O'Malley 2007; Munn et al 2018). A scoping review was thought to be particularly useful for this thesis as it allowed greater flexibility in looking at literature related to a particular country and context, in this case low- and middle-income countries and Sierra Leone. This enabled greater sensitivity around the cultural context in which the five included papers were conducted. Unlike systematic reviews a scoping review does not aim to review all available evidence to produce the definitive answer to a question but to provide an overview of the current literature (Peters et al, 2015). A formal examination of the quality of the available literature is therefore not needed in a scoping review and so allows for the inclusion of a wide range of resources including grey literature. The aims of the review were:

1. To identify current information regarding the Sierra Leone health system since the publication of the five included papers.
2. To identify the main themes and gaps in knowledge within the literature relating to resilient frameworks within health systems in low income countries and Sierra Leone.
3. To explore theories of human and social capital in relation to nursing practice in fragile states and development of a resilient health system
4. To critique the concept of resilience in developing health systems in low-and middle-income countries.

A limited, a priori review of the literature using the databases CINAHL and MEDLINE was conducted to help familiarisation with the literature and identify key words for a more detailed search of the same databases (after Booth, Sutton, & Papaioannou 2016). From this initial review, four distinct review topics were identified and detailed searches were therefore conducted in the following areas:

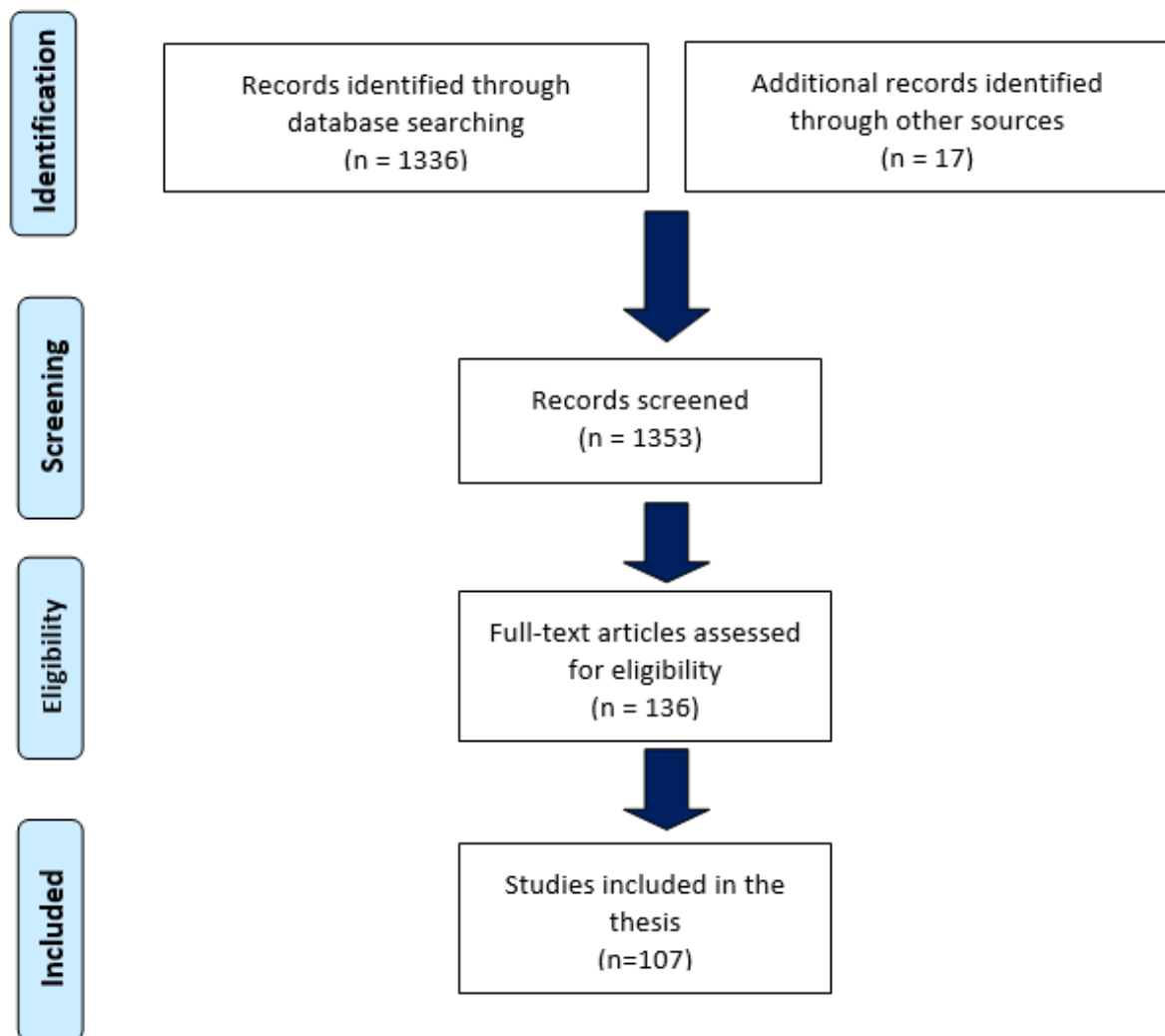
1. Resilient health systems and low and middle and income countries
2. The Sierra Leone health system and Ebola
3. Human capital, resilience and nursing
4. Social capital and nursing

Reference lists of all included studies were searched for additional material. The Boolean operators '*AND*' and '*NOT*' were used to refine the searches. Duplicate articles and those not written in English were removed. The databases CINAHL and MEDLINE were searched from the year 2000 to the point of thesis submission, which encompassed the end of the Sierra Leone civil war. These databases were selected as they provided a comprehensive source of peer reviewed articles relating to global health systems.

The majority of the documents included in the review could be described as not being empirical research papers, were opinion pieces, or grey literature, which perhaps reflects the emerging nature of the subject matter (health system resilience in low and middle income countries) and the lack of empirical research in this area. Of the 107 documents included in the overall thesis four were systematic or scoping reviews, seven were empirical qualitative research and four empirical quantitative research. The type of available literature therefore lent itself to a narrative discussion rather than formal synthesis to identify the available evidence in relation to the aims of the literature review and the overall aims of the study. Details of the inclusion and exclusion criteria used for each of the three searches are given in sections 4.1 to 4.4.

Figure 1 provides detail of the number of articles included in the whole thesis, rather than just the literature review

Figure 1: summary of literature included in the thesis



4.1: Search One

Publications were excluded if they related to resilience in non-health care settings or clinical care, for example drug resilience, resilience in engineering. Publications were also excluded if they did not relate to low income countries. Though the concept of resilience can be applied across high to low income countries, the focus of this study in relation to the five included papers is on health care in a low-income country setting. The results often included papers related to the Ebola epidemic, reflecting the level of international discussion on resilience in the immediate aftermath of the epidemic. Grey literature was searched with reference to the Ebola epidemic, Sierra Leone and resilient health systems including from government, national and international non-government organisations and international agencies such as WHO, the United Nations (UN) and the World Bank.

4.2: Search two

The inclusion criteria focused on those publications specifically written about Sierra Leone as this relates to the five included papers. The aim of the search was to provide further background and an update on the current status of the health system in the country.

4.3: Search three

All frameworks of resilience included in the thesis mention health care workers within a resilient health system. Search three was therefore conducted to explore theories of human capital with reference to nursing and the possible relationship between human capital and resilient organisations.

4.4: Search four

This search was conducted to inform the discussion of the resilience framework described by Kruk et al. (2015) which includes a body of social capital among health care workers as one of the preconditions for resilience. Aspects of social capital are also alluded to in the resilience framework described by Blanchett, Nam, Ramalingham and Pozo-Martin (2017) in their discussion of social brokers and bridge building. Barasa et al (2017) also allude to social capital when they talk of the system software. Papers looking at social capital in health care settings but not related to health care workers were excluded.

4.5: The Sierra Leone Health System

Since the end of the civil war in 2002 Sierra Leone has continued to be described as a fragile state due to a lack of political will and the inability to provide the core functions of a state, such as the reduction of poverty, safe guarding the security of its population, protecting human rights

and development (M'cleod, & Ganson 2018). An estimated 50,000 people were killed during the war, two million (half of the population) were displaced and 20,000 recruited as child soldiers (Bertone, Samai, Edem-Hotaha, & Witter 2014). At the end of the civil war in 2002 sixteen percent (16%) of health care facilities were still functioning, most in the capital Freetown (Gberie 2005).

Evidence from the 1970s and 1980s shows that Sierra Leone suffered from underutilisation of poor-quality health services, especially in rural areas, irregular payment of health care workers and a shortage of most basic drugs (Gberie 2005). Consequently, many people were forced to buy drugs from the open market, use private or voluntary health services and make unofficial payments to health care workers to access what services were available. Through the Bamako Initiative in the 1980s the Ministry of Health and Sanitation bought in a cost recovery programme and user fees (Hardon 1990). These fees and the lack of public trust in health care workers further exacerbated underutilisation of services. By 1995 approximately 91% of spending on health care was private, 95% of which came from out of pocket expenditure, which afforded no protection for the individual against illness or for routine services such as maternity care (Fabricant, Kamara & Mills 1999).

In 2014 despite improvements in some areas, for example, the development of national policies and health information systems, the Sierra Leone health system could be described as continuing to have the characteristics of one in a post conflict state. The characteristics of poor coordination of services, inequitable provision, inadequate management, no referral system, a chronic shortage of resources and poor infrastructure were all evident (Newbrander, Waldman & Shepherd-Banigan 2011). Partly as a result of this fragility the country was ill prepared to cope with the first cases of Ebola that occurred in the Eastern Province of the country. Consequently, the disease was able to spread producing an unprecedented epidemic and highlighting the multiple inadequacies of the health system.

The scale of the 2014-2015 Ebola epidemic across West Africa was unprecedented in the number of confirmed cases, number of deaths and the international response to it. A total of 28,616 cases were confirmed causing 11,310 deaths across the three worst affected countries (Sierra Leone, Guinea and Liberia) (WHO 2016^c). Sierra Leone reported 8704 confirmed cases and 3589 deaths. Health care workers were severely affected with a 74% case fatality rate (296 cases, 221 deaths) compared to the general population fatality rate of 41% (WHO 2016^c). However, these figures may be an underestimation of the true burden given the reluctance of

the population to report cases in the initial phases of the epidemic and poor information and surveillance systems (Elston, Cartwright, Ndumbi, & Wright 2017). The rapid spread of the epidemic was not just due to the virulence of the disease alone but also due to cultural, geographical and political factors. All these factors impacted in varying degrees on the resilience of the health system and its ability to manage the epidemic while continuing to provide routine health services (Flessa & Marx 2016).

There have long been questions about why some countries are better able to develop robust health systems, achieve good health outcomes and withstand shocks compared to others with a similar income. Countries such as Sri Lanka, Costa Rica and the state of Kerala in India have all achieved better health outcomes than other countries at comparable stages of development (Balabanova et al 2013). It might be expected that with economic growth or overseas financial assistance health systems and health outcomes can be improved. Initiatives which appear to have a positive impact on health systems include building the capacity and leadership of skilled health care workers and continuity within development programmes which are responsive to social values and have broad political support. It also appears crucial that windows of opportunity are seized to promote change, for example the national and international response to the Ebola epidemic. However, despite the substantial support and good will from overseas aid and recent economic development Sierra Leone still reports poor health outcomes and low life expectancy (WHO 2018). Since the publication of the WHO's Framework for Action on Health System Strengthening in 2007 there has been general agreement that the essential characteristics of well-functioning health systems include; good governance and a political commitment towards achieving health; an effective bureaucracy and functioning institutions; innovation, particularly related to work force development (including initiatives such as task shifting) and resilience (WHO 2007; Fulton et al. 2011; Balabanova et al. 2013; Olu 2017). At the start of the Ebola epidemic the Sierra Leone health system faced challenges in all these areas and was therefore vulnerable to shocks such as the emergence of a virulent infectious disease.

At the end of the West Africa Ebola epidemic there was much focus on resilience as a way forward with many authors arguing that further work is needed to better understand and implement resilience frameworks. However, the underlying socio-political causes of fragility within Sierra Leone since independence (and more recently the end of the civil war) which prevented the development of good governance and a strong bureaucracy, may also negatively impact on the development of resilience. The causes of fragility include tensions between

political and cultural institutions over power and resources; lack of cohesion between the government and traditional social institutions and poor economic growth and corruption (M'cleod, & Ganson 2018). Within the country political power sits within several loci, not just with the elected government, including local chieftains, elite alliances, secret societies and to some extent religious organisations. Tensions between these groupings related to political power and economic control have meant that many of the structures of the state (judiciary, education, security) remain unresponsive to population needs (M'cleod, & Ganson 2018). Rent seeking behaviour at all levels of government and civil society limit the ability of the country to develop public services and have a negative impact on the social contract between the state and the population. In health care, distribution of external aid coming into Sierra Leone prior to and during the Ebola epidemic has been criticised as being controlled and allocated to reinforce the position of political elites through patronage rather than to benefit the population (Anderson & Beresford 2016). This reliance on external aid is exemplified by the government's flagship health initiative of free health care for pregnant women and children under 5, where 87% per cent of the \$35 million costs were externally funded (Anderson & Beresford 2016). Lack of financial and professional accountability with the health system has provided the opportunity for rent seeking behaviour from those in authority and frontline health care workers further exacerbating weaknesses within the system. It is therefore important to recognise that the development of the technical capacities of a resilient system may also be reliant on the social and political capacities of the state.

4.6: Resilient Health Systems in low income countries

The concept of resilience has been applied to several areas including engineering, ecology, cities and societies to demonstrate how it can help them to better manage and, or, adapt to a variety of stressors (Rockefeller Foundation 2014). In the context of cities four important aspects have been identified as contributing to building resilience: people (their health and well-being); organisation (the economy and society that allow people to live in peace and work together); place (the infrastructures and ecosystems which connect and provide for people and; knowledge (leadership, lessons learnt and strategies for action). Similar ideas are also present in work on the rebuilding of health systems in post conflict states to develop a framework for resilience (Kruk, Freedman, Anglin, & Waldman 2010). In this context the health system includes all the public and private organisations, resources (both financial and human) and institutions which are authorised, or commissioned, to maintain or restore health. Organisations such as the UK Department for International Development (DfID) (2011) and the United

Nations (UNICEF) (2011) have utilised frameworks of resilience in their humanitarian work with reference to using an adaptive capacities approach in humanitarian responses. There is general agreement that resilient health systems are those that can absorb shocks such as epidemics, natural disasters or war and return to normal once the shock has passed (Kieny & Dovlo 2015; Abimbola & Topp 2018). To be classified as being resilient an institution must be able to prepare, adapt and respond to a crisis in an effective way whilst still maintaining routine services (Gao, Barzel & Barabasi 2016; Kruk et al. 2015; Olu 2017; Barasa et al. 2017; Blanchett et al. 2017). Discussion within current literature examines the complexity of health systems and the need to take account of the multiplicity of factors and intrinsic dynamics between workers, the population and system structures which combine to provide resilience. However, these discussions fall short of showing how frameworks of resilience could work within a low-and middle-income countries or a fragile state.

Linking resilience to other key initiatives in global health has been done by a number of authors. In their resilience framework Kruk et al. (2015) linked resilience to health system strengthening, health security and universal health coverage. Health security has been identified as one of the benefits that comes from having a resilient health system. For the individual, health security means the ability to obtain good quality health care (when required) which is safe and accessible, without becoming financially insecure (Heyman et al. 2015). For the collective health security means reducing the vulnerabilities of a society to health threats, including those that may spread across borders such as infectious diseases (Heyman et al. 2015). For a health system to be considered as resilient it needs to continue to provide individual and collective health security in times of crisis. In the aftermath of the West Africa Ebola epidemic the United Nations produced the Sendai Framework for Disaster Risk Reductions (SFDRR) (UN 2015^b) which along with the Sustainable Development Goals (SDGs) (UN 2015^a) are key strategies to help improve resilience and health security globally. The SFDRR emphasises health system resilience as a key factor in disaster risk reduction, a requirement missing from its' predecessor the Hyogo Framework (UNDRR 2005) and includes all aspects of a health system rather than just the infrastructure (Aitsi-Selmi & Murray 2015).

The principle of universal health coverage (UHC) is also seen by some authors as a pre-requisite for a resilient health system. Providing UHC means that a whole population can receive the quality health services that they need with equitable provision and financial protection. UHC can be used to frame a health policy which promotes non-discrimination in

the provision of services and measures progress at a national level rather than for specific groups of patients or programmes (Ooms & Hammonds 2015). As a society moves towards UHC it is anticipated that the vulnerability of individuals and communities are reduced thereby increasing health security. It is therefore argued that UHC can increase the resilience within a health system by tackling a diverse range of health conditions prior to a crisis and encouraging vulnerable people to access services in and out of times of crisis. However, the continued fragmentation of the Sierra Leone health service (Barr, Garrett, Marten & Kadandale 2019), lack of good governance and inadequate numbers of health care workers means that the country is a long way from achieving UHC.

Absorption, adaptation and transformation are concepts used by some authors around which their resilience frameworks are structured (Barasa et al. 2017; Blanchett et al. 2017). There is also agreement amongst authors of resilience frameworks on the importance of community engagement to develop resilience. Other authors see resilience more as a dynamic objective of investment rather than as a framework that can be implemented (Kutzin & Sparkes 2016), which echoes the ideas of everyday resilience required by health care workers in challenging environments as described by Gilson et al. (2017). Resilience frameworks are also thought to help with disaster risk management by helping to build a robust base that can be built on in times of crisis (Olu 2017).

Following the end of the West Africa Ebola epidemic in 2015 there was agreement that the national and global response had been inadequate with neither having the necessary resources or resilience needed to manage the epidemic (Abimbola & Topp 2018). Governments in the affected countries were unable to adapt their systems quickly enough or at the scale required to prevent an epidemic. Conceptual frameworks on resilience in health systems show similarities in several areas but lack detail on how to generate and measure this within a low-income country. There is also some disagreement in the literature if the focus should be on system resilience or the everyday resilience of health care workers. By focusing on the everyday resilience of workers the burden of responsibility is potentially moved from government to those who may be least able to shoulder it.

Though described in different ways the frameworks of resilience by Kruk et al. (2015), Blanchett et al. (2017) and Barasa, Mbau & Gilson (2017) share some common themes. Both Blanchett et al. (2017) (table 1) and Barasa et al. (2017) (table 2) look at the capacities needed within a system for it to develop resilience and share some commonalties such as the need to

recognise and have knowledge of potential shocks. Kruk et al. (2015) (table 3) describe the *preconditions* needed before resilience can be developed which includes, for example, a legal and policy framework. Blanchett et al. (2017) precondition of *legitimacy* and Barasa et al. (2017) description of the *hardware* needed within the health system could be said to relate to policy and legal frameworks and the system being acceptable to the community. Similarly, Kruk et al. (2015) describe inclusive and robust community engagement as a pre-condition for resilience. Common across all three models is the need for an understanding of the assets within the system described as *knowledge* (Blanchett et al. 2017), *awareness* (Kruk et al. 2015) and *cognitive capacity* (Barasa et al. 2017). The values and norms within the system are also seen as important, described by Barasa et al. (2017) as the *software* within the system, included as *legitimacy* by Blanchett et al. (2017) and social capital by Kruk et al. (2015). All three frameworks require resilient health systems to demonstrate integration with other services, to recognise when shocks occur and to be adaptable to these. Barasa et al. (2017) gives a hierarchy of response (from local to national system changes) dependent on the magnitude of the shock to the system.

Table 1: *Blanchett et al. (2017): The Dimensions of resilience governance*

Capacities	Levels of resilience
<p>Knowledge: combine and integrate forms of knowledge including disease surveillance, available resources, system weaknesses, health status of the population, health priorities. Identify risks and threats including non-health threats such as economic or political.</p> <p>Uncertainties: ability to anticipate, cope and plan for shocks. Use of social networks to develop bonds and bridges between workers.</p> <p>Interdependence: engage and handle cross scale dynamics at national and international level. The impact of poor economic and social development on the health system. Idea of social brokers who can coordinate workers and build bridges</p> <p>Legitimacy: socially acceptable institutions and norms, community trust and engagement, community use of services</p>	<p>Absorptive capacity Delivering the same health care despite the system shock</p> <p>Adaptive capacity Health care workers delivering the same care with fewer resources</p> <p>Transformative capacity Health care worker response to a changing environment</p>

Table 2: Barasa et al. (2017): Complex adaptive systems framework

Underpinning Capacities	Strategies for resilience
<p>Cognitive capacity: awareness of shocks or challenges</p> <p>Behavioural capacity: agency to respond to shocks</p> <p>Contextual capacity: available resources</p> <p>Hardware: infrastructure, knowledge and skills, human resources, finance</p> <p>Software: values and norms, power, relationships</p>	<p>Absorptive: of shocks and challenges</p> <p>Creative adaptation: small, local system changes</p> <p>Transformative: large national system changes</p>

Table 3: *Kruk et al. (2015): Framework for resilient health systems*

Preconditions for resilience	Characteristics of Resilient Health Systems
<ol style="list-style-type: none"> 1. Recognition of the global and national impact of health systems and need for a global resilience network. 2. Legal and policy framework to guide response and show accountability 3. Committed and strong workforce with a strong bank of social capital to promote post shock recovery. Social capital includes: <ul style="list-style-type: none"> • Sense of worth, community and responsibility amongst workers. • Inclusive and robust community engagement with the health system 	<p>Awareness Physical, human and information assets, potential health threats. Adequate surveillance and information systems</p> <p>Diverse Covers a wide range of health issues to increase stability and people’s interaction with the system and health seeking behaviour.</p> <p>Self-regulating Identify and target threats, minimise disruption. Use of redundant capacity. Investment is slow and fast variables</p> <p>Integrated With health and other non-health services and national and international organisations</p> <p>Adaptive To improve functionality in adverse conditions. Improve short term functions and contribute to long term resilience.</p>

Of interest to this thesis is how the three authors above view the role of human capital and health care workers within a resilient health system. The inclusion of health care workers in discussions of resilience raises questions around the importance of developing human capital within the system. Whether the role of workers is to respond to a critical incident or absorb everyday shocks, their human capital (that is their skills and capacities) may need to be developed to support the system and provide services. Blanchett et al. (2017) (table 1) see workers as key within the adaptive and transformative capacities of a resilient system; Barasa et al. (2017) (table 2) include human resources as part of the hardware and in the software, with reference to relationships and power. Kruk et al. (2015) (table 3) have a strong and committed workforce as one of their preconditions and emphasise the need for a high level of social capital to instil a sense of worth, community and responsibility amongst health care workers. All three of the frameworks appear to concentrate on the higher-level aspects of resilience and system strengthening. Though the frameworks make mention of health care workers in various ways, there is a lack of detail on the skills and proficiencies they require and the roles they can play in a resilient system. Further understanding of the characteristics that tutors and health care workers displayed prior to and during the Ebola epidemic can help to identify if the requisite level of human capital is available within the Sierra Leone health care system to help develop its resilience.

4.7: Human capital within a resilient health system

Human capital is said to encompass several facets including education and training, experience, autonomy, job satisfaction, organisational trust and career development (McGillis-Hall 2003; Covell & Sidani 2012; Goh 2019). In nursing, construction of human capital starts in pre-registration programmes where students are trained in the skills, capacities and attitudes needed to be a professional nurse. Consolidation and enhancement of these attributes occurs on qualification where a healthy and enabling environment is needed to maintain performance and engender worker commitment (Cordeiro 2017). Without a body of human capital within a healthy working environment there is a danger that workers develop negative feeling towards their employer, lack group integration and loose motivation. Prior to the Ebola epidemic, Wurie, Samai & Witter (2016) reported on the ongoing crisis of health care workers in the country and their unhealthy working environment. Workers complained of a system that was understaffed, overworked, lacked basic resources and had poor working conditions. Non-payment of wages and incentives further demotivated staff, increasing staff attrition and mistrust between health care workers and service users. These findings demonstrate the fragile

context in which workers functioned and the system limitations which may hinder development of human capital.

The underlying socio-political fragility and instability in Sierra Leone since the end of the civil war may also have undermined developments in the health system and the development of human capital within that system (M'cleod & Ganson 2018). The establishment of policies related to human resources for health is often overlooked at the end of conflicts, such as happened in Sierra Leone, yet is an essential component for health system rebuilding (WHO 2005; Bertone et al. 2014). The same may be true after the Ebola epidemic, which has been described as a '*window of opportunity for reform*'; yet that reform appears to rest on developing systems which can recognise and react to threats without addressing the fundamental problems, for example in human resources. The ability of health care workers to play an effective part in developing a resilient health system, if that is to be the focus of reform, requires that human resources and the development of human capital are central to resilience frameworks. It is therefore crucial to understand how resilience is understood or framed within the workforce and the characteristics of workers that may be said to embody human capital and resilience.

Achievement of the sustainable development goals and universal health coverage are heavily dependent on having an effective and appropriately deployed work force (WHO 2016^d). Studies around the barriers to the development of human capital in the health care work force in low-and middle-income countries have raised issues such as work place environment and the response of health care workers (Jayasuriya, Jayasinghe and Wang 2014); financial incentives (Wurrie et al 2016) and supervision and support (Witter et al. 2017). The poor standards for pre-registration training of health care workers and the subsequent poor quality of patient care in low- and middle-income countries also continue to be of global concern (Fullerton et al. 2011). Performance of a worker in this context can be described as the actions of the individual (which they can control) to fulfil the objectives of the organisation while continuing to work within their professional and regulatory boundaries. Three main components of effective job performance can be identified, 1) the ability to complete the task effectively, 2) organisational citizenship behaviour (actions that further the goals of the organisation), and 3) counterproductive work behaviour (actions that harm the organisation or other workers) (Rotundo & Sackett 2002). How an individual performs depends on the task aspect (human capital) and the non-task aspect (social capital) (for example helping colleagues, being efficient and effective and showing respect for others). It is argued that being able to fulfil a task effectively relies not just on the training and experience of the individual but also

on non-task behaviours such as effort, facilitating team performance, peer support, conscientiousness, altruism, cooperation and good will (Jayasuriya et al. 2014). In Sierra Leone where a lack of resources, adequate training and continuing professional development may hinder the amount of human capital within the system, measurement of non-task behaviour (or social capital) may give a better indication of an individual's performance. In the context of this thesis the interpersonal characteristics described above may be as important in the development of a strong and committed workforce rather than skills training/education alone.

Performance of health care workers may also have a secondary effect on health care by disincentivising people to attend facilities if they think the quality of care will be poor (El Arifeen et al. 2004). Many governments and non-governmental organisations attribute poor worker performance to a lack of training and skills and have therefore targeted resources in these areas (Ameh et al. 2016). Though short-term results, that is learning, show improvement, the impact on long term health outcomes is less clear and further work is needed on how and if health care workers implement the training they receive on such courses into effective practice (Ameh et al. 2016). For learning to be effective and the stock of human capital to be increased, both organisational (workforce development, professional self-regulation, formal education) and non-organisational, (informal teaching, peer support, team work) factors need to be considered to allow workers to integrate their learning into everyday practice. This stock of human capital may then help the health system to become more resilient over time (Pereira, Temouri, Patel 2020). The importance of scaling up the amount of human capital within a system can also be seen in the requirements of the Sustainable Development Goals to meet universal health needs (UN 2015^a) and in the agenda around sustainable livelihoods. The potential danger of increasing the volume of care delivered without addressing the quality of individual health care workers' performance is that poor quality health care workers will continue to provide inadequate care. Where a lack of resources hinders worker performance, having a better understanding of the non-task attributes of workers may still enable improvements in health care. The relationship between human and social capital may therefore be important when developing resilient systems.

4.8: Social capital within a resilient health system

The term social capital was first used to describe the social intercourse, good will and fellowship within individuals or families that constitute a social grouping (Hanifan 1916). The social investment that this created was said to make life worthwhile by getting people to work

and socialise together for societal goals. Bourdieu saw social capital as the sum of potential resources available and accessible to certain individuals in elite social groups and networks (Bourdieu 1986). Bourdieu also used the term ‘cultural capital’ to describe the cultural ties and tastes that identified elite groups and that were used to indicate and reinforce their position in society. The ties of family, schooling and social grouping are said to be used as ‘assets’ to build group solidarity and create boundaries with other groups. Barasa et al. (2017) describe similar characteristics in their resilience model which are labelled as the system ‘*software*’.

Coleman advanced the idea of social capital from individuals to encompass groups of people within all social classes, not just elites (Coleman 1988). To Coleman social capital was a variety of entities, defined by their function, residing in individuals. Social capital is therefore valuable because it makes the achievement of some goals possible, which would not be if it were not there. Hence its importance in low resourced health systems that may find themselves facing shocks when there may be a greater need for reliance on the system ‘*software*’. Amongst both the MCHA school tutors and health care workers a bank of social capital could be described as the professional values, ideas and trust held within these groups that helped them to cope with their everyday working conditions. In this context, social capital may help to explain why people cooperated with each other even when it might not be in their own best interest; for example, nurses continuing to provide patient care despite their poor working environment and inadequate resources.

Kruk et al. (2015) seem to allude to non-task aspects of workers performance when they include a stock of social capital as one of the preconditions for resilience in their framework. Similarly, Barasa et al. (2017) recognise the contributions of non-task performance in their “software capacity” which includes elements such as relationships, values, leadership and norms. This raises further questions of how workers may perform effectively in low resourced settings given the complex political economy and government instability that often prevails within a fragile state such as Sierra Leone. To further describe how health care workers do perform in low resourced settings Barasa et al. (2017) coined the term ‘everyday resilience’. This everyday resilience is said to manifest itself in the ability of workers to manage day to day crises, rather than a major humanitarian crisis. In complex health systems resilience is said to come from workers ability to absorb small everyday shocks and go on to adapt and transform services (Barasa et al. 2017). The five papers included in this study provide evidence of this social capital amongst health care workers both before and during the Ebola epidemic in Sierra Leone.

Theories of social capital will be examined briefly to determine if they may be a lens through which non task behaviours may also be evidenced.

4.9: Critiquing the concept of resilient health systems in low-and middle-income countries

Critics of the resilience narrative start by questioning the assumption that crises are an inevitability that need to be prepared for and that responsibility to manage complex or critical situations is shifted unfairly from governments to communities or specific groups (Chandler 2013; Joseph 2013; Nunes 2016; van de Pas, Ashour, Kapilashrami & Fustukian 2017; Kruger 2019). Many health crises occur within weak health systems that lack good governance, are under resourced and where there is a general, systematic element of neglect (van de Pas et al. 2017). The origins of the Ebola epidemic may be seen not as an emerging infectious disease and a one-off event but because of events and choices over time that inevitably perpetuated neglect of the health system within Sierra Leone. Because of this neglect populations may be asked to shoulder some of the responsibility for managing crises and developing resilience without the ability to change the structures that they find themselves in (Evans & Reid 2013). Political criticism of the resilience concept has also been made and focuses on the overruling of democratic processes because of exceptional circumstances, or the use of aid maintaining the status quo of a social injustice, for example inadequate health care (van de Pas et al. 2017).

Central to theories of resilience is a belief in and acceptance of a fundamental vulnerability, whether in the individual or a system (Evans & Reid 2014). Though factors such as reduced exposure preparation and transformation may reduce vulnerabilities, theories of resilience presume that there will always be shocks which therefore require a continued acceptance of risk. In relation to health care workers, there is an expectation that they need to adapt to the risks and the conditions in which they find themselves. Kruk et al. (2015) call for ‘a strong and committed workforce’ and therefore may imply that the moral imperative here is on the individual (rather than the organisation) to develop their human capital to help withstand shocks and bounce back. In a similar vein, Barasa et al. (2017) see the agency of health care workers as a behavioural capacity which underpins resilience in a complex adaptive system. This acceptance of continued risks and shocks could be criticised as being too nihilistic, implying that individuals must adapt but still face a degree of harm, rather than trying to eliminate this (Evans & Reid 2014).

Encouraging sounding words such as ‘*awareness*’ ‘*absorption*’ and ‘*adaptation*’ found in the works of Kruk et al. (2015), Blanchett et al. (2017) and Barasa et al. (2017) give a positivity to the concept of resilience when in fact it may be setting up communities and health care workers to face continual crises. Without the requisite level of human capital amongst workers and a healthy working environment, awareness and adaptation may not be possible. Immediately after the Ebola epidemic, a lack of resilience was given as one reason for the epidemic, when what could have been highlighted was the continued neglect, inadequacy and vulnerability in the health system because of a geo-political system which reinforces Sierra Leone as a fragile state. Blanchett et al (2017) acknowledge in their resilience framework the impact of poor economic and social development in Sierra Leone and its impact on the health system but more clarity is needed on how resilience can overcome this. In their framework Kruk et al. (2015) include a legal and policy framework as a precondition, perhaps acknowledging the impact of poor governance on accountability in the health system. Blanchett et al. (2017) also mention economic and political threats to developing a resilient system and see this as part of the knowledge needed to develop resilience. However, including these with other preconditions/capacities in the resilience frameworks may divert attention away from the underlying fragility of the state and health system. Focusing on resilience and framing the epidemic as a crisis rather than as a product of a neglected system prevents understanding of the fundamental problems that led an outbreak to become an epidemic. This lack of understanding may then lead to a continual cycle of inadequate systems, increased vulnerability, increased risk and inadequate response.

In relation to low-and middle-income countries, the concept of resilience may also be criticised for reinforcing the stereotypes of seeing these countries as places of exceptional tragedy, helplessness and acceptance of a lower quality of life (Evans & Reid 2013). Rather than looking at the global injustices or inequalities that allowed the epidemic to occur the onus of responsibility may be shifted to people to manage what they have, adapt if possible and develop resistance to what may be. In the context of health care workers in Sierra Leone, this could mean accepting the status quo with inadequate training, poor working conditions and personal risks that the current health system perpetuates. The picture around the concepts, value and development of resilience is therefore a complicated one. Whatever framework of resilience is adopted one of the key components of that system should be the health care workforce and the stock of human capital. Without the adequate numbers of well trained and supported workers no system can be truly described as resilient.

Despite the discourse around resilience since the end of the Ebola epidemic there is still no clear discussion in the literature of how to measure or quantify resilience with reference to country specific infrastructures or workforce. Similarly, there is no general agreement on how to measure human capital, but it should perhaps include both current human capital and the ability to develop new knowledge and skills. Numerous measurements of individual resilience are available, for example the Connor-Davidson resilience Scale (CD-RISC) (Connor & Davidson 2003); and the International Collaboration of Workforce Resilience model (ICWR-1) (Rees et al. 2016). However, these instruments concentrate on the individual and their personal characteristics which can influence individual levels of resilience but do not look further to the influence of the system on the individual. If the neo-liberal view of resilience is taken, then it is indeed these individual characteristics of resilience that will be important in developing resilient health systems. However, if critiques of resilience are to be accepted then this reliance on individual resilience may place too heavy a burden on health care workers, especially those working in low-and middle-income countries. There is no available evidence on the use of the above scales within Sierra Leone and little in low income countries making it difficult to determine their validity in these settings.

Measurements of complex adaptive system resilience in areas such as ecology are available and demonstrate that it is the system's intrinsic dynamics that enable it to withstand different perturbations that are important, rather than the perturbation itself (Gao, et al. 2016). This may also be applicable to systems such as health care. If, for example, the Sierra Leone health system had been fully functioning with both the infrastructure, supplies and expertise to withstand the initial cases of Ebola (the perturbation) then an epidemic may have been avoided despite the virulence of the disease. Measuring system resilience in this way may provide better understanding of which characteristics of the system can diminish or enhance resilience. Barasa et al. (2017) refer to the complex adaptive system of health care and the workers role in developing daily resilience, yet if Gao et al. (2016) are correct, then it is not the individual workers (or even workers as a group) but the dynamics of the system itself that enables resilience. There is therefore an interesting juxtaposition between the high-level concepts of resilience described within resilience frameworks, individual resilience and the measurement of resilience within a complex system such as health care.

The following chapter will present a critical discussion of how the five included papers described in chapter three may further inform the debate around developing resilient health systems, with particular reference to human and social capital. In particular, the findings from

the papers will be utilised to explore the potential roles and contributions of health care workers within the resilient frameworks as described by Kruk et al. (2015), Barasa et al. (2017) and Blanchet et al. (2017). The aims of the thesis as described previously will be used to provide a framework for the discussion.

Chapter 5: Discussion

This chapter will use evidence available within the five included papers to address the second, third and fourth aims of the thesis to: explore how concepts of resilience may be framed by health care workers and maternal and child health aide tutors in Sierra Leone; examine the current capacities and characteristics of tutors and health care workers in relation to resilience frameworks, with particular consideration of human capital explore the challenges to developing resilient health systems in a low income country. Though none of the five papers included in this thesis directly measured worker resilience, there is evidence within them which can be used to inform the discussion about health workers awareness of the resilience concept.

5.1: Framing of resilience amongst teachers within the MCHA schools

It is clear in papers one to three that those working in nurse education faced daily challenges in their workplace. The MCHA tutors described and researchers observed that schools only had basic teaching equipment such as chalk boards desks and chairs (paper 1 page 5; paper 2 pages 3 & 5; paper 3 page 5); inconsistencies in funding and irregular payments to tutors and students (paper 2 page 3) and an inadequate supply of the student training manual (paper 2 page 5). The quality of teaching and learning was questioned by tutors and researchers, including the adverse impact of political interference on student selection; poor and inconsistent teaching methods (paper 1 page 4); inappropriate examinations and poor exam invigilation (paper 2 pages 4 & 5).

Tutors acknowledged that they had little agency to make improvements within their schools because of a lack of financial control and inadequate staff training in teaching and learning, raising concerns about investment in human capital in the schools (paper 2 page 3). Power over the schools was held by the district health management team (DMHT) and district councils, who also managed and allocated funding. Stakeholders were also singled out as not fulfilling promises to supply student housing and students' families were described as sometimes being unsupportive. This lack of tutor power was manifested in a lack of teaching resources, continued use of centrally prescribed didactic teaching methods (paper 3), a low opportunity for career development, cancellation of supervision visits by the DHMT (affecting student support) and prioritisation by DHMT tutors of other work over their teaching, seen as disrespectful by tutors (paper 2 page 3). When tutors were given training in teaching and learning methods they responded with enthusiasm and adapted their styles of teaching to be more student centred (paper 3 page 5). This may be some evidence that investment in human

capital, even from external sources, could increase the confidence, motivation and agency of tutors to make changes to their teaching which could be justified with the positive outcomes on student learning (paper 3, table 2)

Against this background tutors displayed elements of everyday resilience in their roles. The MCHA tutors described how the inadequate working conditions came to be viewed as the norm, accepting these even though the conditions may have hindered their ingenuity and creativity (paper 2 page 3). This absorption and adaptation by both tutors and students to the inadequate teaching and learning environment is resonant of Blanchett et al's (2017) dimensions of resilience framework and Barasa et al's (2017) concept of everyday resilience. Blanchet et al. (2017) adapted their framework from concepts of resilience found in environmental studies using ideas of system thinking and complexity theories. This framework views the resilience of a system in relation to its capacity to be able to absorb, adapt and transform. In the context of the MCHA schools the success of Blanchett et al. (2017) framework would depend on the tutors and student's ability to cope with the limitations of their learning environment. Similarly, Barasa et al. (2017) concept of everyday resilience would mean tutors and students accepting the poor conditions in which they find themselves rather than striving for change. By continuing to cope with these limitations both students and tutors are at risk of being unable to develop their human capital not necessarily due to any inherent individual ability, but because of the system that they find themselves in. Understanding how and why tutors and students cope in low resourced environments can help to inform the discussion around resilience. Yet it should not be assumed that because groups do cope with these environments that this is the optimum way for them to work, learn or to help develop resilience. The stock of human capital within a system and worker performance is derived from a combination of individual competence and capacity (initiated in pre-registration training schools), but to be fully effective this performance must occur within an environment that demonstrates structural quality to provide the enabling environment workers (and students) need (Leonard & Maestad 2016). Development of knowledge and skills, or human capital, in health care workers therefore starts within the pre-registration schools. From this base they may go on to consolidate and enhance their learning to become strong and committed workers. It is therefore important to identify any challenges that these schools may face in developing confident and competent graduates.

Building on theories of social capital, Blanchett et al. (2017) used Putnam's concepts of 'bridging' and 'bonding' within their system capacities of uncertainty and interdependence to

explain the links between individuals within a health system and the response to their environment (Putnam 2000). Within the MCHA schools there was evidence of bonding among MCHA tutors who described the teamwork and peer support they have with fellow tutors (paper 2 page 3, table 1). Bonding and was also evident between tutors and students with descriptions of the good relationship that the two groups share (paper 2 page 3). Elements of bridging are seen in the working relationships between the tutors and DHMT. However, the power imbalance between the tutors and DHMT questions the value of this bridging for the MCHA tutors and the schools. The benefits of bridging as described by Putnam (2000), (helping individual advancement through access to new resources), is lacking in the relationship between the DHMT and the schools. Yet, given the responsibility of the DHMT for the MCHA schools it is this very relationship which could be used to improve the schools. It may be that this notion of social capital and bridging to share ideas, resources and expertise to help others get ahead faces unexpected challenges when transferred to low resourced settings such as Sierra Leone. Inadequate relationships between key components of the system could undermine the stock of social capital and the ability of the system to plan for shocks, develop social networks and manage cross scale dynamics mentioned by Blanchett et al (2017).

To some extent bridging can also be seen between the schools and the community that they serve via the district council and local stakeholders and the recruitment of local students (paper 2 page 4). The philosophy behind the schools of embedding them within the community would seem to be an attempt at bridging; to help local students develop the knowledge and skills to serve the community and improve its health outcomes. However, the MCHA tutors reported challenges with the local councils not supporting the schools as expected, mismanagement of student recruitment and a lack of community support to health students.

Blanchett et al. (2017) describe a hierarchy of resilience levels within their framework starting with absorption, moving to adaptation and finally to transformation. In the case of the MCHA schools both tutors and students remain predominantly at the first level (absorption) with some adaptation to the poor working environment but without the positive impact on teaching and learning. Though Blanchett et al. (2017) describe absorption in relation to shocks such as an epidemic rather than the everyday shocks of Barasa et al. (2017), there is a similar expectation that it is the workers response to a shock that will allow adaptation and ultimately transformation of the system. Evidence from papers one and two demonstrate that the MCHA tutors do not have the power, responsibility, agency or support to respond and ultimately to improve training within their facilities.

Kruk et al. (2015) include a strong bank of social capital within a committed workforce as one of their preconditions for resilience (table 3). In their framework Kruk et al. see social capital as helping to provide a sense of worth, community and responsibility amongst workers and helping to develop community engagement. There was evidence of commitment amongst the MCHA tutors to their schools and to the community. However, the same criticisms levelled at Blanchett et al. (2017) notions of bridging and bonding can be levelled at Kruk et al. (2015) for their inclusion of social capital and the burden that this places on workers to develop resilience in a low resourced setting. MCHA school coordinators reported wanting to have more independence and responsibility but being thwarted in this by the DHMT, local council and their national coordinators (paper 2 page 4). The hierarchical structure within the health care system, and amongst health professions, in Sierra Leone may work against workers developing a strong bank of social capital. There is, therefore, a risk that the burden of responsibility that is put on teachers occurs within a system which does not allow them to meet those responsibilities, not through a lack of individual commitment, but because of a lack of opportunity. Resilience and social capital could then become another burden that health care workers and tutors need to shoulder rather than ways to bring individual and system development.

Perhaps more pertinent to the MCHA schools is Barasa et al's (2017) concept of everyday resilience (table 3). In this framework resilience is not just seen as a response to shocks but the capacity of the system and those who work in it to adapt and absorb everyday challenges. Barasa et al. (2017) include the knowledge and skills of health care workers as part of the hardware capacity in their resilience framework. Alongside this hardware is what is described by the same authors as the software of the system, that is the values, power and relationships amongst workers within a system that impact on their functionality. The complex adaptive system as described by Barasa et al. (2017) seems to ask workers to take a pragmatic view of the challenges that they face and absorb these to help develop resilience. In this way the uncertainties within the MCHA school, for example irregular funding and lack of supplies, should be embraced by tutors and students as a challenge which can be managed through small incremental change. In the case of the MCHA schools though it was the tutors and students facing the daily challenges who lacked both the power and effective relationships with key stakeholders for creative adaptation to bring about even small, local system change. This stoical acceptance of their circumstances, or everyday resilience, by workers may help them cope with their daily challenges but increases the risk of individuals developing workplace stress without

any fundamental changes to the system. Further understanding of the processes of responsibility, accountability and agency within this specific groups of workers is needed for creative adaptation and system transformation to be realised.

5.2: Framing of resilience amongst health care workers

The reaction of health care workers and the health system prior to and during the Ebola response can also help further the understanding of resilience amongst health care workers. Paper four provides evidence of the functionality of an important part of the health system (maternal and newborn care) prior to and during the Ebola epidemic. Paper five provides evidence of the health care workers response as individuals and as a team to the epidemic.

Health care workers described the system prior to the epidemic as underfunded, unprepared and under resourced which presented them with a challenging environment in which to work (paper 5 page 3 & 5). The social norm amongst health care workers was to accept these poor conditions while at the same time trying to be creative with the limited resources. Workers described team work as one way that they tried to overcome their daily challenges, along with the sacrifice they had given “*long back*” to their profession (paper 5 page 4). Workers also described their lack of agency to make more substantial changes due to inadequate supplies. Health care workers could be described as displaying characteristics of everyday resilience (or stoicism), absorbing the small daily shocks to the system that were caused by under resourcing and under funding. In this scenario it is the capacities of the workers, the hardware of the system, not the health system itself which may demonstrate resilience (Barasa et al. 2017). The small, local system changes that workers made to provide patient care could be described as creative adaptation (paper 5 page 3) (Barasa et al. 2017). These adaptations by workers appeared to come about not because of the need to develop the system but because of a lack of resources limiting the ability of workers to provide basic patient care. In a low resourced setting this therefore raises questions about the risk of everyday resilience entrenching poor care rather than being a means for adaptation and transformation.

Despite the limitations in their working environment, prior to the Ebola epidemic the health care workers appeared to demonstrate commitment to their role and patients, a pre-condition of Kruk et al’s (2015) resilience framework. This commitment was evident here despite the workers’ apparent lack of belief in the overall system. Understanding why health care workers remained committed to the system in which they work is not clear, it may be that this commitment is not to the health system per se but rather to colleagues and the community they

serve (paper 5 page 3). Though not expressed as such by health care workers, it may be that aspects of social capital such as values, norms and commitment were being shown by the workers. In a system where workers described a lack of leadership the everyday support networks and professional values within them may take on more importance and help to explain why workers remained committed to their roles.

Lack of belief by workers in the system in which they work is important when considering resilience and the necessity for workers to understand and respond to system shocks (Blanchett et al. 2017). In order to have an effective response, workers need to understand the implications of the shock, have the knowledge to assess the risk, be confident that the system can respond effectively and adapt. Though not expressed in the terminology of resilience, workers, were clearly saying that the system they worked in could not cope with the normal day to day requirements placed on it and questioned its ability to provide routine care. This raises concerns regarding the idea of everyday resilience (Barasa et al. 2017) and the possibility of workers absorbing and adapting to the daily shocks that they face. The transformative elements in all the included resilience frameworks require a level of agency amongst health care workers which does not seem to be evident within the five included papers. Without workers agency and capacity, the absorption of daily shocks may occur by default but there will be no creative adaptation which may lead to small local changes.

Paper five (page 4) provides evidence of the inability of the system and workers to understand and manage the epidemic as it unfolded. Despite knowledge of an endemic haemorrhagic disease (Lassa Fever) in the country there was a lack of insight and understanding in the initial stages of the epidemic about the risk and consequences for spread of Ebola (Wilkinson 2017). The reasons for this lack of awareness are often attributed to the lack of any previous cases of Ebola in Sierra Leone yet it could be expected that experience with Lassa fever should have provided some insight into the emerging epidemic. Awareness and recognition of potential shocks is a key capacity in all three of the included resilience frameworks and perhaps this should also include learning from past experiences. It is therefore important to note that workers described the issue of preparedness as being a major problem in Sierra Leone and of being “*never prepared*” (paper 5 page 5). The implication being that workers had little faith in the health surveillance system, its capacity to understand the health threats within the country and to provide adequate care (paper 5 page 4). Most workers reported hearing about the epidemic from non-official sources rather than the Ministry of Health (paper 5 page 5). Initial understanding of Ebola by health care workers came from the community rather than official

sources creating confusion about the nature of the virus and how it was spread (paper 5 page 5). Health care workers were not helped to make the connection between the Ebola Virus and Lassa Fever, or to implement basic infection control procedures, which may have helped to limit the spread in the initial stages of the epidemic (paper 5 page 4). Workers also reported that they had little support from the government and INGO and expressed feelings of isolation from both their families and the community, raising questions about the strength of social capital and social networks between these groups. Information sharing across networks to families and the community was weak at the start of the epidemic compounding mistrust and fuelling fears (paper 5 page 4).

Paper five provide a strong picture of the impact of a shock such as Ebola on health care workers and the health system. Despite the self-reported commitment of health care workers prior to the epidemic, some evidence of social capital and evidence of their everyday resilience, the shock of Ebola and the inability of the system and health care workers to absorb and adapt to the shock is evident. This raises questions about the amount of incremental development needed both for the system and health care workers to be able to develop the capacities and characteristics for a resilient system.

Evidence from paper five (page 5) of the late training in the use of personal protective equipment and infection control that was put in place also demonstrates the slow adaptability of the system. Health care workers used these trainings as an exemplar of the lack of preparedness of the health system along with the lack of information they received about the spread of the virus and the continued risk to themselves and the public. With the majority of health care in Sierra Leone delivered in isolated health posts, this lack of system preparedness and understanding by health workers negatively impacts on key aspects of each of the included resilience frameworks; the identification of threats, (Kruk et al. 2015), knowledge and uncertainties capacities (Blanchett et al. 2017) and the agency of workers (Barasa et al. 2017). There are, therefore, key lessons to be learnt from the response of health care workers to the epidemic on the inherent fragility, lack of faith in the health system and the capacities and training of health care workers which need to be addressed before resilience frameworks can be implemented.

5.3: Framing of resilience in the relationship between health care workers and the community

The effectiveness of the absorptive capacity in a health system is said to also depend on the relationship between health care workers and the community (Kruk et al. 2015). Interaction with the community by health care workers outside of routine health visits (for example for health promotion initiatives) is said to increase public trust and engagement with the health system overall (Kruk et al. 2015). Socially acceptable systems that engender community trust and engagement and use of services are also included in the resilience framework of Blanchett et al. (2017). The success of global initiatives such as the SDGs and Universal health Coverage will also require collaborative and consultative public engagement if they are to be successful (Allotey, Tan, Kirby & Tan 2019). By increasing the quality and availability of care in low income countries through UHC and the SDGs there is an expectation that the community are more likely to use available health services and thereby increase engagement with them in times of crisis. However, there is a potential contradiction here between the aims of UHC and the SDGs and the resilience narrative. UHC and the SDGs ultimately look to improve the availability, quality and uptake of routine services; in contrast to this the narrative around resilience frameworks starts by looking to deliver the same care, despite system shocks. Yet it is quality of care that is said to increase public engagement with services at all levels of the system and so it is this which should be the starting point for health system improvement (Dugani, Veillard, & Evans 2018). Better understanding of the current relationship between health care workers and the community can help to inform the debate about the implementation of UHC, SDGs, quality of care and resilience.

Workers in the health facilities included in paper five (pages 3 & 4) described the poor relationships they had with the community prior to the epidemic which led to mistrust of health care workers. This mistrust was thought to arise due to the poor quality of care and a history of the community having to pay health care workers for services that should be free. Consequently, many people put their trust in local faith healers rather than registered health professionals (paper 5 pages 3 & 4). Papers four (pages 4 & 6) and five (page 3 & 4) provide evidence that despite health care workers remaining in their post during the Ebola epidemic the community were increasingly reluctant to take up services. This reluctance may be due to the lack of public faith in workers combined with a fear of catching Ebola by attending health centres (paper 5 page 3). The system of isolation of suspected cases and removal of patients to holding and treatment centres also exacerbated community mistrust. The challenge for frameworks of resilience here, appears not just to be about the ability of the system to recognise

and respond to shocks but rather the willingness of the community to trust in and access services. In the case of an infectious disease such as Ebola there is an urgent need for health services to engage with the community as early as possible, to disseminate key information and encourage an appropriate response to health messages. Even when critical services such as maternal and newborn care were assessed as being ready, that is health care workers had adapted to the system shock, there was an 18% decrease in women accessing antenatal care; a 22% decrease in women accessing post-natal care and an 11% decrease in women attending for facility-based delivery (paper 4 page 6). The impact of this reduced uptake appears to be a 34% increase in the maternal mortality ratio and a 24% increase in the still birth rate (paper 4 page 6). Without uptake of available services, the system cannot be said to demonstrate resilience. It was not just the ability of the system and health care workers to absorb and adapt to the shock of Ebola that was important but also the ability of the communities as well. However, this absorption and adaptation to the shock by the community had to occur in the context of the pre-existing lack of community trust in health care workers, which was further exacerbated by the epidemic itself. Evidence shows that community trust in the health system is essential for uptake of routine services and developing resilience but once lost it may be difficult to regain (Ozawa, Paina & Qui 2016). Community trust in a health system seems to rely on the interaction of several factors including quality of care, the responsiveness of the health system, equitable treatment, cost and health outcomes (Rockers, Kruk & Laugesen 2012). The fragile health system of Sierra Leone faced challenges in all of these areas prior to the Ebola epidemic which therefore raised issues of community trust (Pierterse & Lodge 2015; Elston et al 2017). The inherent lack of social legitimacy with the health system and health care workers (a pre-requisite for Blanchett et al. 2017) may have reinforced the lack of community trust and engagement as the Ebola epidemic broke with a consequential impact on the resilience of the system

The MCHA schools can also provide some evidence of community engagement with the health system. Students in the school were required to be recruited from within local communities with the aim of using their perceived loyalty to the community to increase their commitment once qualified. This '*bonding*' of the students with their community was thought to help reinforce local identity and maintain the loyalty of graduates to work in poorly resourced and isolated areas on qualification. The ethos behind this local recruitment was for students to identify more fully with their patients once qualified and so share a common purpose of improving health in the community. It is unclear how successful this policy is, since all health

care workers in Sierra Leone are allocated to posts by the MoHS rather than recruited into them. Consequently, workers are sent to wherever the MoHS deems appropriate rather than by personal choice. However, building this sense of community at an early stage in a health care workers career could help to develop the inclusiveness and community engagement required by Kruk et al. (2015).

5.4: Evidence of social capital and resilience in the capacities and characteristics of health care workers and in the MCHA schools

This section relates to the third aim of the thesis and looks to explore the relationship between social capital and resilience among health care workers.

Paper five (page 4) provides evidence of characteristics and capacities demonstrated during the epidemic which could be considered to provide evidence of the values, norms and relationships required for resilience amongst workers (Barasa et al. 2017). Two dimensions of social capital are described within the papers: the first in relation to self-worth, respect and a sense of community amongst workers; the second, described earlier, in health care worker commitment to community involvement. Senior staff demonstrated a clear sense of responsibility and self-worth, describing that they felt obliged to be professional role models, working hard to persuade workers to remain in post despite the risk to themselves and their families. This ability to persuade rather than coerce staff to remain in post may be an indication of community and responsibility amongst health care workers. Other workers saw their role as requiring sacrifices even prior to the epidemic and therefore continued to provide services during the epidemic. Results from paper four (tables 2, 3, 4) show that, despite rumours to the contrary, the majority of staff remained in their posts ready to provide health services. This is perhaps indication of one of the characteristics required to help fulfil the precondition for a resilient network, that is a strong and committed workforce and a bank of social capital (Kruk et al. 2015).

The complex picture of social capital during the Ebola epidemic included senior staff seeing it as their professional duty to be role models, other workers refusing to accept the risk and attend work and yet others putting their faith, not in teamwork and their peers, but in religious beliefs (paper 5 page 5). Respondents in paper five (page 4) reported that once workers moved to the response centres they were reluctant to return to other health facilities and lose the financial incentives available in those centres. Evidence from other studies shows that health care workers response to epidemics in high income and high resourced countries is influenced by the information they receive about risk, fear of catching the disease, trust in their health system and concern for the health of their family (Ives et al. 2009; Koh, Hegney, & Drury 2011).

Similar findings are evident in paper five where Sierra Leonean workers describe a lack of information about the epidemic, poor resources and a lack of trust impacting on their commitment to work. In high income settings the increased availability of protective equipment and other resources may help to explain why health care workers continue to work in risky environments. In Sierra Leone this could be analogous with workers moving to work in the Ebola treatment centres where more equipment, training and support (and therefore possibly less personal risk) was available. The challenge for authors of resilience frameworks is to fully understand this complex picture around worker commitment and acceptance, or not, of risks in their working life. These risks may not be major shocks to the system such as epidemics or natural disasters but the daily risks (both physical and psychological) that workers face by continuing to work in low resourced settings. Without a deeper understanding of the limitations of the workforce and the need for work force development, resilience frameworks may be undermined by their own preconditions and underpinning capacities that rely on human resources for health.

While there is evidence of social capital amongst workers in all five papers there are also questions about the depth of this and how/if it can be strengthened to improve system resilience. In nursing, social capital may be seen as the resources that derive from social relationships within a nursing unit and which can contribute to building strong interpersonal networks at work (Read 2014; Norikoshi, Kobayashi & Tabuchi 2017). Kowalski et al. (2010) and Hsu et al. (2011) saw social capital in nursing as the resources from relationships within a unit that possessed a shared vision or trust. This may help to explain how the work environment can be enhanced through positive working relationships and add value to the work experience. Hofmeyer & Marck (2008) defined social capital in nursing as the bridging or linkage in networks which were characterised by elements such as trust, collective action, mutual understanding, values and cohesions. These characteristics are reflected in Barasa et al. (2017) model of resilience and the '*software*' of an organisation. In Blanchett et al. (2017) model of resilience these are encompassed in the notion of legitimacy and socially acceptable institutions and norms, again highlighting the importance of trust by the community in the system and health care workers.

It should be remembered though that in Sierra Leone the physically and psychologically difficult work situation did not start with the Ebola epidemic but was evident in the lack of infrastructure and inadequate supplies prior to the epidemic. Both MCHA tutors and health

care workers described their inadequate working conditions yet continued to be committed to their roles. In paper five workers acknowledged that despite the risks to themselves, their families and community, and family opposition, many of them continued to attend for work during the epidemic. The shared values of sacrifice, professionalism and of a greater good were all articulated as reasons for the acceptance of personal risk and may provide evidence of a degree of resilience and social capital.

Social capital may therefore be a useful lens through which aspects of resilience can be examined to provide a deeper understanding of the relationships amongst health care workers in Sierra Leone. However, as with theories of resilience, social capital theories can be criticised for emphasising the role of the individual rather than addressing structural issues. In both theories of resilience and social capital responsibility resides within the individual to develop the necessary characteristics to make changes happen, to be able to absorb and withstand continued shocks and continue to provide services. In this situation failure could be seen as the responsibility of the individual, maybe they were just not resilient enough, or there was a lack of trust or responsibility amongst the workers? There is a danger here that the responsibilities for and burden of resilience and social capital could fall disproportionately on the shoulders of those workers with the fewest resources, agency and capacity to manage them. Blanchett et al. (2017) include social brokers to coordinate workers and build bridges within and across health and social systems to increase interdependence and resilience. This resilient capacity resonates with the idea of bridging within social capital but there is a danger that bridging happens only at the strategic level and is controlled by elites rather than health care workers.

Evidence from all five included papers demonstrates that workers in both the MCHA schools and the health care facilities demonstrated positive professional and cultural values that underpinned their work both pre and during the Ebola epidemic. A base for the underpinning human resource capacities and prerequisites of resilience may therefore already be available, but further exploration of the depth and breadth of this is needed. However, social capital may also provide absolution of responsibility for government and policy makers who have designed and manage the failing system that health care workers and tutors find themselves in. Frameworks of resilience therefore need to include not just requirements for everyday resilience, a high level of social capital, or a committed workforce, but measures to address the fundamental issues in training, support and development of health care workers. In an environment like Sierra Leone where there are low levels of financial and human capital, then

social capital may be a force through which workers can find some opportunities for development through their day to day professional relationships.

Quantifying aspects of social capital such as trust, teamwork or culture raises similar problems as with trying to measure and quantify resilience. Without a deeper understanding of the cultural factors which are at play in the Sierra Leone work force, accurate measurement of social capital may be challenging. However, it may be that networks of social relationships rather than social capital itself are more relevant in helping to understand the resilience scenario in relation to the functionality and development of the Sierra Leone health system. The multidisciplinary nature of a health care setting provides many opportunities for the development of networks of social relationships which in turn may allow the development of a professional community amongst workers. However, in the context of Sierra Leone these networks may be limited due to the chronic shortage, maldistribution and isolated working of health care workers and MCHA teachers. Consequently, both health care workers and tutors may find themselves working alone in remote areas, with poor communication systems and a lack of support.

Designated MCHA tutors (those prescribed to work solely in the MCHA schools) developed networks both within the school and with the extended faculty in the DHMT. Tutors attempts to develop this network and be inclusive of others was not always successful. Networks with the extended faculty were weak, evidenced by their reluctance to commit to teaching in the schools and prioritising their work with the DHMT over teaching commitments. This type of workplace social relationship, described by Putnam (2000) as ‘bridging’, could provide opportunities for information sharing and support across disciplines. However, the lack of commitment by the extended faculty may limit opportunities for this.

Development of a professional identity and professional human capital which provides the values, norms and beliefs required for professional practice begins within training schools (Maranon & Pera 2015). This professional identity develops throughout nurses’ careers through interaction with colleagues and can help to maintain professional standards of care. The multi professional nature of health care, particularly in Sierra Leone with the introduction of multiple new cadres of workers, means that interprofessional working relationships need to be developed at an early stage within pre-registration training. In paper two MCHA school stakeholders recognised the limitations of the multi professional relationships the school had and made recommendations in these areas, from regular team updates to orientation for DHMT

tutors and for support from the district council through advocacy. Though the MCHA schools were not directly involved in the Ebola response they play an important role in training 46% of the health care workforce. The observation of and experience in these social networks is an important factor which may shape future social networks with colleagues and professional practice.

The relationship between students and teachers is critical if a good learning environment is to be developed. Students reported a high level of satisfaction overall, particularly in those aspects of learning controlled by tutors, and this rose as more student focused lessons were introduced. As tutors developed and introduced new teaching styles, they were able, perhaps because of the shared values, beliefs and respect of students, to implement the changes with student support. If students had responded negatively to these changes, there would be an expected dip in student attainment and satisfaction. This may suggest that a bank of social capital and social networks were available that allowed the tutors and students to function with limited resources and was enhanced by the training of tutors and the introduction of new equipment.

5.5: The role of INGOs in developing a resilient health system

Though not mentioned in the resilience frameworks included in this thesis, INGOs in Sierra Leone should be considered part of the workforce capacity, and therefore the human capital, of the overall health system due to the volume of services that they provide. INGO influence on the social networks, values, norms, human and social capital of Sierra Leonean health care workers needs further exploration. Prior to and during the epidemic Sierra Leone relied heavily on aid from national and international non-governmental organisations (NGOs; INGOs) to deliver health care (Anderson & Beresford 2016). The dependency of the government on INGOs and external governments for funding and service provision led to many parallel systems, with government focus sometimes being led by the requirements and values of those external providers rather than population needs (Anderson & Beresford 2016). Fears of the INGO community relating to corruption and misappropriation of funding led some of these organisations to bypass government systems and deliver their projects independently of the MoHS. All health care workers interviewed for paper five (page 5) reported having had some sort of working relationship with an INGO, as did tutors in the MCHA schools. During the epidemic some of these relationships continued while others stalled as INGOs left the country and new ones were developed as INGO entered for the Ebola response. There was an appreciation by health care workers of the work that INGOs did but evidence that the social network between INGOs and workers were not strong. Evidence from paper five (page 5)

shows that many workers considered this relationship to have a power imbalance and to be ineffective in making lasting change to the health system. Workers accused INGO of being disorganised and not dependable during the epidemic; of making promises to help but then of not carrying these through; of having their own agenda to fulfil and not responding to the needs of the system; of showing little teamwork with or support for Sierra Leonean health care workers. In its key principles for building resilient health systems the WHO recognises the importance of coordination with development partners and that national governments, rather than INGO, should lead the work on resilience to embed it within a strengthened health system (WHO 2015). However, an INGO will have its own internal dynamics, particularly in relation to workers relationships and professional practice, which may not harmonize with those of national workers. Resilience implies a degree of independence within a system to respond to what are unpredictable events and reliance on INGO may undermine system independence, adaptation and transformation. Blanchett et al. (2017) include international engagement within their interdependence capacity and this should include a role for INGO. However, with over dependence on INGO there is a risk that rather than developing an independent health system the status quo of a failing system prevails (Walton, Davies, Thrandardottir, Keating 2016). Evidence from other countries may provide new ways of looking at the government and INGO relationship.

Studies in Pakistan and Cambodia show that several fundamental changes are needed in the dynamic relationship between INGOs and government for health system strengthening to occur. Reflecting the concerns of Sierra Leonean health care workers mentioned above these include a shift in the power relationship between INGOs and government with greater appreciation by INGO of local expertise (Khan, Meghani, Liverani, Roychowdhury, & Parkhurst 2018). In China after the 2013 earthquake the use of bridging organisations helped to develop and sustain an effective relationship between INGOs and the government, reflecting the notion of social brokers proposed by Blanchett et al. (2017) and bridging within social capital (Putnam 2000; Xu, Xu, Lu & Wang 2018). In Malawi public servants act as development brokers (similar to bridging organisations) between INGO projects to ensure they reflect the needs of the community and do not undermine government initiatives (Pot 2019). These then may be ways for INGO projects in Sierra Leone to become more integrated into the government health system rather than the many parallel systems that prevail.

With the continued role of INGO in helping to rebuild the post Ebola health care system the relationship between workers in both sectors will be important in helping to develop a resilient

health system. In the immediate years post Ebola when the health system is restructuring INGO may be part of the absorptive capacity for the everyday shocks to the inadequate health system. However, this needs to be built on so that they enable creative adaptation and transformation of the system, and ultimately are no longer required. It is difficult to see how a health system that is heavily reliant on INGOs to provide services could be described as resilient, especially when as in the Ebola epidemic many of these agencies chose to leave due to the risk to their own workers.

Chapter 6: Limitations of the included papers

The five papers included in this thesis are derived from two separate studies. The limitations of the papers will therefore be considered individually and as part of the wider studies.

6.1: Study one (papers one to three)

Papers one to three encompass a two-year study related to the maternal and child health aide schools in Sierra Leone. Paper one utilised structured observation of the teaching and learning practices in the schools at that time. The study was limited due to time constraints and the numbers of lessons that could be observed during each visit, therefore no tutors from the wider faculty of the DHMT were observed delivering a session. It would have been useful to observe how a different group of tutors delivered lessons and if these were as didactic as with the MCHA tutors. Both of the research instruments used, and the framework analysis were based on what is known about good teaching and learning environments from well-resourced countries. Though some adaptation was made to the local context of Sierra Leone this could have been developed further. It would have been useful to develop the data collection tool with the MCHA tutors to help increase the cultural specificity of the tool. Similarly, once the initial coding for the framework analysis was completed the researchers could have discussed this with participants to discover codes from their cultural perspective.

Paper two in this study focused solely on the views of the MCHA tutors and coordinators. As acknowledged in the paper the research team should have included other key stakeholders from the DHMT, students, the town council and the community. This would have given a richer and fully rounded view of the issues affecting the schools and might have provided further insight into social networks and resilience. The study also did not explore the issues affecting students within clinical placements, focusing instead on the teaching activities in the school itself, thereby providing limited insight into the quality of teaching and learning in clinical practice.

Paper three aimed to examine the impact of a teacher training programme for MCHA tutors over one year. The study was stopped due to the Ebola epidemic and the closure of the MCHA schools during that time. Therefore, the final teaching observations and student questionnaires could not be completed. For local political reasons all students and schools had to be included in the study. For this reason, a phenomenological approach was used in the study but given its focus on education a phenomenographical approach may have been more suited. This could have provided the schools with a logical hierarchy of phenomena and shown the dimensions of variations across the schools, perhaps being a more useful framework from, which tutors could develop their practice. The use of a questionnaire, though providing a larger number of

participants, limited the depth of understanding of the student views. Focus groups with students could have helped to explore the issues raised in the questionnaires further and provide student focused solutions to improve learning. It could therefore be said that despite the numbers of returned questionnaires, the student voice in the study is not strong enough.

6.2: Study two (papers four and five)

Paper four used data collected routinely by health care workers in the included facilities and was therefore reliant on these workers for the quality of the data collected. Researchers were able to attend some facilities for data collection from these routine records, but this was not always possible due to the Ebola epidemic. The research team were unable to strengthen the data collection or the data before the study took place. The study did not report on if the included facilities had their full complement of staff but only on the change during the Ebola epidemic. The quality of care was not assessed either prior to or during the epidemic. The numbers of Ebola cases are presented by district level as this was the only available data. Data from the facility level may have provided more detailed analysis about service uptake and availability.

Paper five conducted 66 interviews with health care workers which provided a wide breadth of information. For political reasons all districts of the country had to be included, hence the large number of interviews. Having to conduct this number of interviews limited the researcher's ability to explore the themes that emerged from the initial analysis further through focus groups or repeat interviews. Researchers were not able to return to interviewees and discuss the findings with them to ensure accuracy. The study had aimed to include members of the community in the interviews but at the time of the study the mistrust between community and health care workers prevented this.

Chapter 7: Conclusion

In the aftermath of the Ebola epidemic the affected countries and international partners spoke about ‘building back better’ to enable health systems to cope with future shocks. The inability of the health systems in the three worst affected countries to cope with the Ebola epidemic has led multiple authors to focus on the lack of system resilience to explain this lack of coping (Barasa et al. 2018; Govindaraj et al. 2018; Kieny & Dovlo 2015; Kruk et al. 2015). Resilience in health systems can be said to be dependent on several factors including resources, information systems, leadership, governance, preparedness and planning, culture, human capital and social networks. Despite the enthusiasm for health system resilience after the Ebola epidemic there is little evidence within the literature on the current levels of resilience within the affected health systems. This would seem a necessary starting point for any discussion on developing resilient systems in these settings. This thesis used evidence from the included papers to examine the capacities and characteristics of resilience that may or may not be evident within health care workers and further inform the debate.

Further exploration is needed of the role of human capital in low income countries to help develop universal health coverage and resilience. As with many other countries, Sierra Leone suffers from a shortage of appropriately qualified health care workers able to provide high quality patient care (WHO 2016^a). In part, quality of care depends on the working environment, but it also depends on the human capital of health care workers (Aiken et al 2011; Covell & Sidani 2012; Pereira, Temouri, Patel 2020). It is postulated that investment in human capital may increase organisational productivity and reduce staff turnover. Knowledgeable and skilled workers may also be able to develop a stronger voice, greater autonomy and improve relationships with co-workers, helping them to better cope with a crisis (Tan 2014). Leveraging human, rather than social, capital may therefore help to develop the strong, committed workforce required of resilience frameworks.

Development of human capital can be as a direct consequence of investment in pre-registration programmes and continuing professional development but may also need institutional change to recognise the importance of investing in workers. The lack of post graduate courses and continuing professional development (CPD) in Sierra Leone may limit the amount of human capital that can be developed in the health system. The thread of human capital can therefore be seen to start in pre-registration schools and move on to encompass the knowledge and skills of health care workers. Continued investment in human capital is therefore needed to enable

health care workers to appropriately contribute towards the aims of universal health coverage and, consequently, to the development of a resilient health system

However, questions may be asked about the suitability of the resilience concept in low income countries given the current status of their political and health care systems. Without political commitment to the development of human capital, focusing on resilience risks perpetuating failure and maintaining the status quo of an inadequate system rather than bringing about meaningful change. There is a danger here that concepts of resilience are solely relied upon, to bring about system change when this is not what they are for. By definition frameworks are meant to underpin a structure or organisation but in Sierra Leone they may serve to underpin weaknesses within the health system that may themselves be a consequence of the neoliberal policies which may have produced this failing system. The relatively low levels of social and economic development and high levels of inequality in Sierra Leone prior to the epidemic clearly had an impact on the country's ability to respond to and manage the outbreak. Inadequate service provision prior to the epidemic limited its capacity to absorb the shock and respond appropriately, a necessary requirement of a resilient system. The chronic under performance of the health system in Sierra Leone may be a product of the countries wider economic and political landscape which allowed the chronic shortcomings of the health system to prevail. Understanding and acknowledgement of the political and global factors which contributed to the Ebola crisis are by and large missing from the resilience frameworks included in this thesis. Blanchett et al. (2017) refer to the poor economic and social development of the health system but do not set this in a wider political and global context. A lack of resilience alone cannot explain why the affected countries did not cope with the Ebola epidemic nor provide an answer for the systemic and prolonged fragility of the health system.

The rapid country wide spread of Ebola and the high numbers of cases and deaths (particularly amongst health care workers) help to demonstrate the poor absorptive and adaptive capacity of health care workers and the health system. For the system to display the characteristics needed within resilient frameworks political and social commitment is required to develop the skills and capacities of health care workers who can deliver programmes of health system strengthening. It is perhaps with these more fundamental changes in human capital that system wide resilience can be developed with responsibility and accountability for this spread throughout the system.

The current fragile state of Sierra Leone also raises questions about the achievability of the resilience capacities. At a national and international level there is evidence of a lack of interdependence and integration among the Ministry of Health and Sanitation, the community, health care workers and INGO. Without improved networks amongst these groups the required health system strengthening and desired resilience may not be achieved. The presence of multiple INGO in the country over a prolonged period may in fact have allowed the government to continue with the status quo of a failing health system and not invest in human capital, particularly at a post graduate level. The success, or not, of individual INGO projects, measured against their own and donor goals, has not translated into real health gains for the country. The emphasis on resilience building and reliance on INGOs may, therefore, focus too much on the identification and management of infrequent risks rather than on fundamental shortcomings. Despite the many years working together these varied groups seem to lack the social brokers who could work across government, community and non-government organisations to generate trust and provide coordination. With INGO delivering or supporting such a large proportion of health care in Sierra Leone they cannot be left out of the resilience discussion yet are not explicitly included within resilience frameworks.

Given the effort and time required to make the systemic change described above the capacities and characteristics of the current health care workforce may take on a greater importance. There is agreement across key authors in the field of resilience that a committed work force is a key element of a resilient health system (Kruk et al. 2015; Barasa et al. 2017; Barasa et al. 2018; Blanchett et al. 2017). What is not shown in any of the resilience frameworks is an understanding of the professional skills, knowledge, characteristics and capacities of the current health care workforce. Given the challenges to fully meeting the demands of an adequate number of committed workers in a reasonable time frame, efforts could be directed towards understanding the level of human capital and development needs of the current workforce. This thesis offers evidence of the current capacities (including evidence of resilience) amongst health care workers in Sierra Leone and the individual and structural challenges to developing these further.

Blanchett et al. (2017) mention coping as an element of the uncertainty capacity, with workers adapting to deliver the same care with fewer resources. The emphasis here appears to be on physical rather than psychological coping, yet evidence from paper five demonstrates the importance of individual coping strategies as a response to the shock of Ebola. Without this psychological coping health care workers cannot fully adapt to the shock. It is here that

elements of social capital (underpinned by investment in human capital) such as networks, bridging and bonding may come into play and help to provide individual, if not system, resilience. Further evidence and discussions are needed on social capital and if this may also help to build a committed and strong workforce within the cultural context of Sierra Leone. Concepts of everyday resilience would seem to rely particularly on the capacity of health care workers to absorb every day and exceptional shocks within the status quo. Better understanding is needed on how and why health care workers continue to accept risk and manage, or not, within the fragile health system in Sierra Leone. There is danger that that the burden of resilience falls disproportionately on health care workers, maintaining the current status quo, absolving the responsibilities of the government and global partners to provide an enabling work environment for the delivery of quality health care.

All workers from the MCHA schools and the health system acknowledged and understood the frustrations, challenges and limitations of their routine working environment. They demonstrated some elements of everyday resilience in coping with these challenges, despite the potential negative impact on themselves. Though Barasa et al. (2017) would see this everyday resilience as a positive aspect in a resilient system, the negative impact on individual workers cannot be ignored. Continuing to absorb the daily shocks and challenges clearly had an impact on individual workers. While demonstrating the absorptive capacity to cope with routine everyday shocks, MCHA tutors described the lack of opportunity for self-development, to demonstrate ingenuity and a lack of agency to bring about change. Similarly, health care workers demonstrated everyday resilience to cope with routine shocks and then with the Ebola epidemic, at great risk to themselves and their families. Clearly system resilience cannot come at the expense of the individual worker, whether because it causes lack of opportunity or an immediate threat to life. Critics of resilience raise the issue of the potential negative impact on the individual who may shoulder the burden rather than the benefit of resilience (Evans & Reid 2013). The narrative around building resilient health systems post Ebola therefore needs reframing to shift this burden away from the individual.

Developing frameworks which allow individuals to increase their human capital rather than simply to continue to absorb and be adaptive to shocks, will help to reframe the narrative around system strengthening and resilience. A strong and committed workforce begins at the pre-registration level and requires political ambition to develop training programmes relevant to the country's health needs. For example, the introduction of new cadres such as MCHA students in Sierra Leone may show political understanding of maternal and newborn health

needs. However, the underfunding of the schools and lack of professional body input into their development could be an example of doing just enough rather than bringing about substantial improvements in human capital. If health care workers are to be strong and committed then they need to have the agency to share power, develop productive workplace networks, use their ingenuity and further develop a sense of professional worth and responsibility. This development does not start with health care workers per se but rather with their training schools.

Frameworks of resilience therefore need to include a strategy for developing the human capital of health care workers, which reflects both the potential humanitarian and routine health needs of the country and the requirements of the health professions. Understanding the individual worker and their ability to acquire knowledge and skills with reference to human capital rather than social capital may provide greater rewards for individual workers and the overall health system. It is these knowledge and skills which enable the individual to have agency over social structures, increase their own, and the organisations, productivity, or in the case of resilience, to be agents of adaptation and transformation. Reliance on social capital (Kruk et al. 2015) to bring about change within work-based networks may again shift the burden of responsibility onto health care workers and away from the government and global partners. Evidence from the included papers demonstrates some of the challenges workers faced in developing bridges across professions and organisations. Better understanding of the social and cultural structures within the Sierra Leone health system is needed to help determine if a strong bank of social capital, if required, can be developed and help to deliver resilience.

As with other aspects of the health system human capital should be seen within the broader narrative of health system strengthening and not just in relation to developing resilience. Organisational investment in, and strengthening of, human resources for health may, as well as increasing individual human capital, increase the goodwill between workers and the organisation even during times of shock. The caveat to this is that workers (with new knowledge and skills) may instead choose to find greater rewards outside of the organisation. The rational choice aspect of human capital theory sees the individual as someone who aims to maximise their own utility above all else. This may well benefit the organisation, but the final aim is individual rather than organisational gain (Tan 2014). In the context of the Ebola epidemic some health care workers made what could be considered an irrational choice in continuing to work despite increased risks to themselves. Other workers could be perceived as having made the rational choice of continuing to work in the Ebola treatment centres because of the increased financial rewards and readily available protective. Further still, the health care

workers choice to continue to work in a failing system prior to the epidemic could be questioned as irrational. Perhaps it is those other aspects of everyday resilience such as values and relationships which prevail. These aspects are embodied in human capital theory as the innate characteristics of individuals and evidenced in the included papers as health care workers professionalism, commitment, responsibility, role modelling and belief.

Though not explicitly explored in the five included papers, it can be seen from further analysis of those works, that health care workers and MCHA tutors do describe aspects of their work within a resilience narrative. There is description of the values, norms, responsibilities, commitment and community within their respective groups, demonstrated, if not articulated, as everyday resilience. Health care workers and MCHA tutors also demonstrated some of the characteristics and capacities of resilience which may contribute to the development of a resilient system. There was also an understanding amongst workers of the limitations of acquiescing to the resilience narrative that may cause risks to their well-being and stifle their personal development.

Though the discussions around resilience may have helped to focus attention on building back better after the Ebola epidemic there is a danger that this allows the narrative to shift away from overall health system strengthening which should include investment in human capital. The long-term fragility in the country, and in the Sierra Leone health system, means that the efforts needed to overcome these may make frameworks of resilience more attractive as they do not appear to require the fundamental political and social changes required of health system strengthening. As described in SDG 1.5 (which aims to build the resilience of those in vulnerable situations), resilience should be seen within a wider framework of health system development rather than as an independent solution (UN 2015^a). Looking at the capacities and preconditions described in the three frameworks of resilience these are in fact not exclusive to ideas of resilience but instead have been described within discussions for health system strengthening. Issues of political governance, funding, leadership, community involvement and human resource development are all included in resilience framework but have also been described as drivers for system strengthening (Samuels, Amaya, Balabanova 2017; Chee, Pielemeier & Connor 2013). Perhaps it is in the preconditions and capacities of human and social capital, social networks and professional values that concepts of resilience should be framed rather than the drivers mentioned above. Resilience may therefore be seen as an inclusive part of health system strengthening that focuses on strengthening human capital through health care worker development and community involvement.

Chapter 8: Recommendations

1. A reconsideration of resilience frameworks is needed regarding both their suitability and application within the political and social context of fragile states such as Sierra Leone. Part of this reconsideration should include an understanding of how concepts of resilience are framed and measured within a low resourced health system by government, health care workers, the community and global partners. In this system wide context resilience should therefore be viewed as a characteristic of a well-functioning health system rather an end in itself.
2. Frameworks of resilience should be embedded within initiatives for overall health system strengthening (including UHC), which include robust and long-term investment in human capital, rather than be viewed and implemented as external, stand-alone solutions for fragile health systems to withstand shocks. This may help to mitigate against the risk of continuing the status quo of a failing health system, which may withstand system shocks yet continue to provide inadequate routine services.
3. In Sierra Leone a substantial amount of health services are delivered or supported by INGOs. To prevent fragmentation and/or duplication of services INGOs need to be part of the human capital (or underpinning hardware) of the health system. This commitment will require long rather than short term commitment by INGOs to work with national and local government.
4. Workers in the included papers spoke about their lack of professional autonomy and ability to influence change within the health system in clinical areas and in training schools. Professional registration bodies may need to be strengthened and empowered to represent their members at the highest policy level.
5. There needs to be recognition at the highest level that the current workforce is not adequately prepared or supported to deliver the substantial changes needed within the health system. Policies related to investment in human resources for health should be included as a critical requirement for health system strengthening, and for resilience, with developments bought in to better support the current workforce. Both long- and short-term planning will be needed to deliver on a major investment in human resources for health at national and international level.

Given the well documented lack of community trust in health care workers and the health system greater emphasis needs to be put on community engagement for health system strengthening and development of resilience. This may require substantial investment and change to the social contract between government and communities.

Chapter 9: Further Research

1. The five papers included in this study did not explicitly explore resilience amongst health care workers. Further understanding is needed of the culturally specific resilience narrative amongst workers in low resourced areas. This could include how they see their professional roles and responsibilities for delivering routine care compared to times of crisis. Imposition of western narratives of resilience may not be appropriate within the cultural context of Sierra Leone.
2. For health care workers to participate in delivering health system strengthening and resilience greater understanding is needed of the work-based risk factors for developing stress and current stress levels amongst workers in low income countries. The adoption of HSS and resilience frameworks in Sierra Leone without system wide strengthening will place additional burdens on health care workers. Understanding current stress levels can enable policy makers to implement systems of support for workers to mitigate against these risks.
3. Further study is needed on how to measure resilience within the health system and should draw on work which looks at resilience within complex adaptive systems. This will be needed to better understand the impact of resilience on health outcomes compared to other initiatives such as health system strengthening.
4. Theories of human capital and their role in developing human resources for health require further exploration, including pre-registration, to post graduate programmes of study and continuing professional development.
5. The discussion of social capital within resilience frameworks requires further research in relation to its applicability within Sierra Leone. As with theories of resilience, theories of social capital emanate from western centric, high income countries and may not fit within the cultural landscape of the country. Further research is needed on the social networks within the health system, their relationship with communities and how and if these can be built on for health system strengthening.

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