Postpartum Haemorrhage in Humanitarian Crises

Obstacles and facilitators to the adoption of the non-pneumatic anti-shock garment (NASG) into humanitarian settings

Clare V. Lofthouse

Supervision
Ulrika Persson-Fischier & Dr Johannes Leidinger
ACKNOWLEDGEMENTS

The processes and challenges I have been through to reach this final stage of completion have certainly been eventful. I owe a debt of gratitude to the rocks who have supported, encouraged and listened to me over the past six months. I hope you know how appreciative I found each of you for assisting me in different ways, and at different times. It truly made the experience more enjoyable and certainly more profitable in terms of the final product. So to Jonathan Newcombe thank you for your never-ending belief and encouragement in what I’m doing; to Ulrika Persson-Fischier for supporting with continuous and though-provoking supervision and advice; to Dr Lisa Thomas for helping me to find a topic that sparked my interest so deeply and your excellent ability to keep me on-point!; to Dr Johannes Leidinger for inspiring my interest in maternal health, and keeping a medical eye on my research; and finally to my sister Amy Lofthouse who’s expertise and experience as a midwife gave me a safe platform to seek answers to medically-based queries, for a non-medical mind.

Cover Photo 1: Copyright World Health Organization (2014) authorship, taken from photo archives in 2013 from “maternal and child health” available at https://extranet.who.int/photolibrary/index_eng.htm


This thesis is submitted for obtaining the Joint Master’s Degree in International Humanitarian Action. By submitting the thesis, the author certifies that the text is from her own hand, does not include the work of someone else unless clearly indicated, and that the thesis has been produced in accordance with proper academic practices.

Ruhr-Universität Bochum, Germany
Joint European Master in Humanitarian Action
Uppsala Universitet, Sweden
Network on Humanitarian Assistance
### Table of Contents

**Acknowledgements**

**Acronyms**

**Tables, Figures and Charts**

- List of Tables
- List of Figures
- List of Charts

**Introduction**

**Part I. The Methods**

**Research Methods and Processes**

- Aim and Objective
- The Research Questions
- The Link To Humanitarian Action
- The Methodology
- The Theory of Planned Behaviour
  - The Survey
- The Rationale, Limitations And Ethical Dilemmas
  - The Outline

**Part II. The Theory**

**The Diffusion of Innovations Theory**

- Social Change and Diffusion
- Public Health & The Diffusion of Innovations
- The Four Elements
- The Innovation
  - Relative Advantage – ‘would it be an improvement?’
  - Compatibility - ‘does it fit?’
  - Complexity – ‘is it easy to use?’
  - Trialability – ‘can I try it?’
  - Observability – ‘will I see results?’
  - The Re-Invention of Innovation
- Communication Channels
  - Heterophilious and Homophilious
- Time
  - Decision-Making From Innovation to Adoption
  - Innovativeness Of The Intended User
  - Rate Of Adoption
- The Social System
  - Opinion Leaders and Change agents
- Criticisms, Constraints & Consequences
  - The Unintended And Intended Consequences of Innovation
  - Bias and Blame
  - The Inequality of Diffusion

**Social Determinants of Health and Vulnerability**

- The Social Vulnerability Paradigm
- Determinants of Health and Vulnerability
  - Health
  - Women and Gender
# PART III. THE INNOVATION

## THE NON-PNEUMATIC ANTI-SHOCK GARMENT

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trials, Studies and Recommendations</td>
<td>44</td>
</tr>
<tr>
<td>Use in Low-Resource Settings</td>
<td>45</td>
</tr>
<tr>
<td>Adoptability of the NASG</td>
<td>46</td>
</tr>
<tr>
<td>Technology Cluster</td>
<td>46</td>
</tr>
<tr>
<td>Attributes of the NASG</td>
<td>47</td>
</tr>
<tr>
<td>Implementation</td>
<td>49</td>
</tr>
<tr>
<td>Challenges Moving Forward</td>
<td>51</td>
</tr>
</tbody>
</table>

## MATERIALS AND STUDIES AND RECOMMENDATIONS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use in Low-Resource Settings</td>
<td>45</td>
</tr>
<tr>
<td>Adoptability of the NASG</td>
<td>46</td>
</tr>
<tr>
<td>Technology Cluster</td>
<td>46</td>
</tr>
<tr>
<td>Attributes of the NASG</td>
<td>47</td>
</tr>
<tr>
<td>Implementation</td>
<td>49</td>
</tr>
<tr>
<td>Challenges Moving Forward</td>
<td>51</td>
</tr>
</tbody>
</table>

## PART IV. THE CONTEXT

## MATERNAL HEALTHCARE AND HUMANITARIAN CRISIS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum Haemorrhage</td>
<td>54</td>
</tr>
<tr>
<td>Prevention and Treatment</td>
<td>56</td>
</tr>
<tr>
<td>Global Maternal Health And Mortality</td>
<td>57</td>
</tr>
<tr>
<td>Low-Resource Settings</td>
<td>60</td>
</tr>
<tr>
<td>Staffing, commodities and capacity</td>
<td>61</td>
</tr>
<tr>
<td>Delays</td>
<td>64</td>
</tr>
<tr>
<td>Humanitarian Crisis</td>
<td>66</td>
</tr>
<tr>
<td>Vulnerability to Crisis</td>
<td>70</td>
</tr>
<tr>
<td>Sexual and Reproductive Health in Humanitarian Crisis</td>
<td>72</td>
</tr>
</tbody>
</table>

## HEALTH, CULTURE AND BEHAVIOUR

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influence of Culture on Health and Health-Seeking Behaviour</td>
<td>77</td>
</tr>
<tr>
<td>Women, Culture and the Community</td>
<td>79</td>
</tr>
<tr>
<td>Culture in Humanitarian Health Response</td>
<td>80</td>
</tr>
<tr>
<td>Challenges for Humanitarian Organisations and Practitioners</td>
<td>82</td>
</tr>
</tbody>
</table>

## PART V. THE IMPLEMENTATION

## CASE STUDY - NASG IN HUMANITARIAN SETTINGS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kigoma District, Tanzania</td>
<td>87</td>
</tr>
<tr>
<td>Implementation of the Project</td>
<td>88</td>
</tr>
</tbody>
</table>

## SURVEY RESULTS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Respondents</td>
<td>91</td>
</tr>
<tr>
<td>Questions on the NASG</td>
<td>93</td>
</tr>
<tr>
<td>Questions on the MISP</td>
<td>96</td>
</tr>
<tr>
<td>Comments</td>
<td>98</td>
</tr>
</tbody>
</table>

## PART VI. THE CONCLUSION

## CONCLUSION

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommendations</td>
<td>105</td>
</tr>
</tbody>
</table>

## REFERENCES & APPENDICES

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>References</td>
<td>107</td>
</tr>
<tr>
<td>Appendix I The Survey</td>
<td>114</td>
</tr>
<tr>
<td>Appendix II Data from the Survey</td>
<td>118</td>
</tr>
<tr>
<td>Appendix III Extra Data on Q5A and Q5B</td>
<td>121</td>
</tr>
<tr>
<td>Appendix IV The Reproductive Health Kits</td>
<td>122</td>
</tr>
</tbody>
</table>
## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMTSL</td>
<td>Active Management of the Third Sage of Labour</td>
</tr>
<tr>
<td>ASG</td>
<td>Anti-Shock Garment</td>
</tr>
<tr>
<td>BEmOC</td>
<td>Basic Emergency Obstetric Care</td>
</tr>
<tr>
<td>CC-PPH</td>
<td>Continuum of Care Model for Postpartum Haemorrhage</td>
</tr>
<tr>
<td>CEmOC</td>
<td>Comprehensive Emergency Obstetric Care</td>
</tr>
<tr>
<td>CMR</td>
<td>Crude Mortality Rate</td>
</tr>
<tr>
<td>CSDH</td>
<td>Commission on Social Determinants of Health</td>
</tr>
<tr>
<td>EmOC</td>
<td>Emergency Obstetric Care</td>
</tr>
<tr>
<td>FIGO</td>
<td>International Federation of Gynaecology and Obstetrics</td>
</tr>
<tr>
<td>GLOWM</td>
<td>Global Library of Women’s Medicine</td>
</tr>
<tr>
<td>IAFM</td>
<td>Inter-Agency Field Manual for Reproductive Health in Humanitarian Settings</td>
</tr>
<tr>
<td>IAWG</td>
<td>Inter-Agency Working Group on Reproductive Health in Crises</td>
</tr>
<tr>
<td>IAWG-KG</td>
<td>Inter-Agency Working Group on Reproductive Health in Crisis Knowledge Gateway</td>
</tr>
<tr>
<td>ICPD</td>
<td>International Conference on Population and Development, Cairo, Egypt 1994</td>
</tr>
<tr>
<td>ICRC</td>
<td>International Committee of Red Cross and Red Crescent</td>
</tr>
<tr>
<td>IDP</td>
<td>Internally Displaced Person</td>
</tr>
<tr>
<td>IFRC</td>
<td>International Federation of Red Cross and Red Crescent Societies</td>
</tr>
<tr>
<td>INGO</td>
<td>International Non-Governmental Organisation</td>
</tr>
<tr>
<td>IPPF</td>
<td>International Planned Parenthood Federation</td>
</tr>
<tr>
<td>MISP</td>
<td>Minimum Initial Service Package for Reproductive Health in Crises</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>NASG</td>
<td>Non-pneumatic Anti-Shock Garment</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
</tr>
<tr>
<td>PPH</td>
<td>Postpartum Haemorrhage</td>
</tr>
<tr>
<td>RH</td>
<td>Reproductive Health</td>
</tr>
<tr>
<td>SBA</td>
<td>Skilled Birth Attendant</td>
</tr>
<tr>
<td>SRH</td>
<td>Sexual and Reproductive Health</td>
</tr>
<tr>
<td>TBA</td>
<td>Traditional Birth Attendant</td>
</tr>
<tr>
<td>TPB</td>
<td>Theory of Planned Behaviour</td>
</tr>
<tr>
<td>TRCS</td>
<td>Tanzanian Red Cross Society (Member of the IFRC)</td>
</tr>
<tr>
<td>UCSF</td>
<td>University of California, San Francisco</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNFPA</td>
<td>United Nations Population Fund</td>
</tr>
<tr>
<td>UNHCR</td>
<td>United nations High Commissioner for Refugees</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WRC</td>
<td>Women’s Refugee Commission</td>
</tr>
</tbody>
</table>
TABLES, FIGURES AND CHARTS

LIST OF TABLES

TABLE 1 PATHFINDERS CONTINUUM OF CARE MODEL FOR POSTPARTUM HAEMORRHAGE ........................................ 46
TABLE 2 CLINICAL FEATURES OF SHOCK IN PREGNANCY RELATED BLOOD LOSS ........................................ 54
TABLE 3 THE DELAYS FRAMEWORK: AT THE HEALTH FACILITY ................................................................. 64
TABLE 4 THE DELAYS FRAMEWORK: DECISION TO SEEK MEDICAL HELP .................................................. 64
TABLE 5 MISP OBJECTIVES ......................................................................................................................... 75
TABLE 6 COMMONLY CITED DRAWBACKS TO THE SUCCESS OF THE MISP .................................................. 76
TABLE 7 UNDERSTANDING HEALTH BELIEFS AND BEHAVIOURS .......................................................... 80
TABLE 8 SEXUAL AND REPRODUCTIVE HEALTH INTERVENTION APPROACHES ........................................... 83
TABLE 9 OBJECTIVES OF THE NASG PROJECT IN TANZANIA ...................................................................... 87
TABLE 10 TEN STEPS TO INTRODUCE THE NASG IN HUMANITARIAN SETTINGS .................................. 90

LIST OF FIGURES

FIGURE 1 THE THEORY OF PLANNED BEHAVIOUR BY ICEK AZEN ................................................................. 8
FIGURE 2 THE THEORY OF PLANNED BEHAVIOUR SHOWING BELIEFS AND BACKGROUND FACTORS ............. 9
FIGURE 3 A MODEL OF THE DIFFUSION OF INNOVATIONS BY EVERETT ROGERS ......................................... 18
FIGURE 4 VARIABLES AFFECTING THE RATE OF ADOPTION ........................................................................ 27
FIGURE 5 THE ASSOCIATION OF HEALTH AND VULNERABILITY TO CRISIS ............................................... 37
FIGURE 6 A PICTURE OF A WOMAN IN THE NASG ..................................................................................... 42
FIGURE 7 PICTORIAL DEPICTION OF THE NASG ...................................................................................... 43
FIGURE 8 DISASTER IMPACTS 2000-2012 ................................................................................................. 69
FIGURE 9 THE MISP FOR REPRODUCTIVE HEALTH .................................................................................... 74
FIGURE 10 MAP OF PROJECT SITE IN TANZANIA .................................................................................... 87

LIST OF CHARTS

CHART 1 VISUALIZATION OF WHERE RESPONDERS FOUND THE SURVEY ...................................................... 91
CHART 2 YEARS OF EXPERIENCE OF RESPONDERS .................................................................................. 92
CHART 3 SHOWING TRAINING RECEIVED AND WANTED BY RESPONDERS ............................................ 93
CHART 4 QUESTION 4 NASG AND HEALTH INEQUALITIES ........................................................................ 93
CHART 5 QUESTION 5A. THE ADOPTION OF NEW TECHNOLOGY .................................................................. 95
CHART 6 QUESTION 5B. FORESEEABLE CHALLENGES FOR THE ADOPTION OF THE NASG IN HUMANITARIAN SETTINGS ........................................................................................................ 95
CHART 7 QUESTION 9. COMPATIBILTY OF THE NASG AND THE MISP .................................................... 97
CHART 8 QUESTION 10. NASG INCLUSION IN THE MISP ............................................................................ 98

IMPLEMENTING THE NASG IN HUMANITARIAN SETTINGS: ADOPTION OR REJECTION?  VI OF 116


**INTRODUCTION**

In 2013 around 289,000 women died from what was categorised as maternal complications. This figure is likely to be higher as only 40% of the world has an adequately function health reporting system (WHO *et al* 2014, p.1). Severe bleeding causes around 27% of all maternal deaths; this is the single biggest threat to pregnancy and childbirth. Moreover, maternal complications are the second biggest cause of death for women of reproductive age globally. The risks women and girls face through pregnancy and childbirth are the outcome of socio-cultural structures and norms, which increase the inequalities in many societies. The decisions we make, the choices we have, and the actions we carry out are a product of our social system’s structures and norms. Humanitarian crises painfully display the divisiveness and destruction that these structures and norms can have on the members of that system. But, crises also offer an opportunity to either, rebuild structures and norms in a way that reduces inequality and protects the vulnerable, or a regression to more traditional, more patriarchal and more hierarchical structures and norms which will ultimately disadvantage women and girls further in their plight for equality. There is a vicious circle of poverty and mortality that can be triggered by maternal death. In order to prevent these cycles from continuing, creative, simple and appropriate strategies need to be developed for humanitarian response that build on the knowledge systems and capacities of those affected, as well as the experience and expertise of practitioners. Instead of a discussion between development or humanitarian, the conversation should try to find ways for all interventions to be more homophilious with those affected and ensure that they do not worsen the structures protecting the most vulnerable.

Innovation has long since been seen as a process for those who ‘have’, and *not* for those who ‘have not’. Criticisms of increasing inequality through a division based on socio-economic markers have only led to self-fulfilling stereotypes of who is innovative and who is not. This research is trying to shift the focus from one that is divisive to a more inclusionary approach. To address maternal mortality caused by severe bleeding, it is imperative to understand the context in which it is happening. Who is affected? Why? What do they think and believe? What happens to the family, the community? How are the structures and norms of the society affecting it? What solutions have been offered? In answering these questions it is clear how far the impact of maternal mortality can reach. It is the hope of this research, that its can be used to reduce and lessen this impact through better-targeted and tailored responses using appropriate tools – such as the non-pneumatic anti-shock garment, implemented in a mind frame of sustainability and resilience in an environment receptive to innovation. There is a need for fresh ideas and approaches to reduce a burden that does not exist in resource stable parts of the world, and a burden that has come to be seen as a problem of the poor.

The non-pneumatic anti-shock garment is a game changer. It has the potential to inspire interest and access health systems, yet implementation thus far has been limited in humanitarian response. This research will investigate maternal mortality caused by postpartum haemorrhage in humanitarian crises, in an endeavour to improve the discussion on including the NASG into the MISP as an appropriate tool to fight maternal mortality and the inequality that is found at its root.
PART I. THE METHODS

This Part will discuss the methodological decisions I have made in constructing the thesis, as well as detailing the questions that run throughout the research in search of answers. This Part will link the research to the wider subject of humanitarian action and disaster research highlighting how this research is relevant to current humanitarian practice and assist in the formation of future practice to reduce excessive maternal mortality during and after humanitarian crises. Discussion covers the aim and objective, methodology, data collection, creation and development of a survey and the theory behind it.
**AIM AND OBJECTIVE**

This research will address the problem of excessive maternal mortality during humanitarian crises. Several conditions lead to high mortality in humanitarian settings but this research will focus only on postpartum haemorrhage (PPH). PPH is only one of several obstetric complications but it is the single biggest cause of maternal death. As a non-medical person I do not wish to confuse my position with one who knows and understands the intricacies of medical interventions. To that effect, this research will focus on prevention and implementation strategies by humanitarian organisations in addressing PPH in humanitarian contexts and not on the medical techniques of managing a patient suffering PPH or other obstetric complication. A contextual outline of PPH, prevention and treatment is however relevant and can be found in Part IV.

A new technology called the non-pneumatic anti-shock garment (NASG) has been developed by the University of California, San Francisco’s (UCSF) Safe Motherhood Programme as a first-aid device to manage patients suffering from obstetric haemorrhage, which includes PPH. Additionally, a Continuum of Care Model developed by Pathfinder International to address postpartum haemorrhage (CC-PPH) has also been developed to target PPH in low-resource settings using the NASG. To date however, the NASG has mainly been used in tertiary hospital settings as opposed to community or primary health care (PHC). However it has been used once in a primary health service in Zambia and Zimbabwe, and also in stable low- and middle-income countries including Egypt, Nigeria, India, Peru, Pakistan, Mexico and Bangladesh. It has only been used in a humanitarian project in Tanzania. Moreover, it has failed to cross over from the development sphere into humanitarian response. This research therefore, will explore possibility of using the NASG in emergency response to address PPH by asking the following questions:

1. **Is the NASG an appropriate innovation for humanitarian organisations?**
2. **What are the obstacles and facilitators for the NASG in the process to adoption in humanitarian crises?**

The aim and objective of this study is to respond to these questions holistically and ascertain if the NASG has the capability to save lives in humanitarian settings in a practical, cost-effective and efficient way. In order to reach a conclusion, several other building-block questions will be addressed.
THE RESEARCH QUESTIONS

In order to make claims about if the NASG would be an appropriate tool in humanitarian crises, I must first explore several related questions and lines of enquiry to understand the context, history and current status of both the NASG and the environment in which it is to be used – humanitarian crises. These research questions will plague different sections of the study in order to create a fuller picture to find answers and solutions to the overall aim and objective. Through addressing these smaller, yet vital questions a solid structure of knowledge can be built so as to answer and fulfil the aim and objective with conviction.

1. How is the humanitarian community currently addressing maternal mortality during humanitarian crises?
2. Does the NASG reduce the risks of pregnancy and childbirth for women and girls during humanitarian crises?
3. Have humanitarian organisations used the NASG in their emergency response already?
   a. If so, what results and data were collected?
   b. If not, is this because of a lack of knowledge, costing, or other obstacles?

THE LINK TO HUMANITARIAN ACTION

This study intends to explore the impact and burden of maternal mortality caused by postpartum haemorrhage during humanitarian crises, and suggests possible mechanisms to reduce this problem through targeted interventions by humanitarian organisations. It is conducted with the future objective to influence the humanitarian community to seek new ways to reprioritise maternal healthcare during planning, preparedness and initial responses to crises. Moreover, to ensure that the essential services necessary to reduce maternal mortality are adequately established during crises and enjoy continuous attention and adaptation throughout the life of the crisis to reduce unnecessary death or disability of women and girls.

This research will contribute to the field of humanitarian and development studies, disaster research and practical humanitarian response as it seeks to address current and future vulnerable populations. These populations include women and girls caught in humanitarian crises, but it will also benefit the children, families and communities of the women and girls by seeking to protect them from unnecessarily high levels of risk from pregnancy and childbirth complications. It is well known that maternal orphans from poorer backgrounds suffer heightened adverse outcomes than children who grow and develop with a healthy mother. Some of these drawbacks can include poor nutrition and health, less education (as a result of ill health or lack of food for concentration), reduced family protection and worse economic opportunities, all of which limit the chance for children to break free of the bonds of poverty. To strengthen their resilience to this we need to protect the mothers. Therefore, this research will
link together disaster research and global health to reduce such vulnerabilities in the face of humanitarian crises.

**THE METHODOLOGY**

The research explores the possibility and the implications that the non-pneumatic anti-shock garment, could have on emergency response and the target population – women and girls at risk of PPH. Firstly I conducted a desk review of the literature and categorised relevant literature into pre-determined groups of - global maternal mortality with a focus on PPH; the impact of humanitarian crises; maternal healthcare interventions in low-resource settings; health, culture and behaviour. The selection of four broad topics to frame the literature review adequately covered the context of the investigation yet allowed for flexibility with new ideas. In order to search for relevant publications several databases were utilised, the main source was Uppsala Universitet Bibliotek supported by topical Google searches. Other important sources of information for academic and grey literature included the WHO Library, HRP Library Resources, Université de Genève Bibliothèques, PubMed searches, PLOS ONE searches, and publication lists found during research such as the University of California, San Francisco (UCSF) Bixby Centre for Global Reproductive Health. Related logical searching of websites was complemented by additional word- and phrase-specific searches in website search options. A variation of words and phrases such as; ‘humanitarian’ ‘crisis’ ‘disaster’ ‘maternal’ ‘mortality’ ‘reproductive’ ‘RH’ ‘SRH’ ‘global health’ ‘public health’ ‘health’ ‘healthcare’ ‘intervention’ ‘technology’ ‘NASG’ ‘non-pneumatic anti-shock garment’ were combined during searches. Secondly, a search for the theories and perspectives I am using followed a similar logic – ‘Diffusion of Innovation’ ‘Rogers’ diffusion research’, ‘social determinants’, ‘health’, ‘vulnerability’ ‘vulnerability paradigm’, ‘gender perspective’. This also included combining search terms from both searches to see what has already been investigated between these fields. Additionally, relevant journals and books reference lists were also examined for associated research relevant to this thesis topic.

Secondary data has been taken into account from global sources such as the WHO Global Health Observatory Data Repository as well as from WHO-authored research publications. Furthermore, an analysis of journals, books, organisational reports and research as well as grey literature have been studied and examined for both their content and the data used. In this way, relevant secondary data found can be classed as primary research once analysed in a new theoretical perspective. Authors of published papers were contacted for more in depth discussion of their findings.

The entire thesis draws on primary and secondary empirical and qualitative research, demonstrating originality in both statistical and theoretical arguments, in addition to the authors own survey results. Survey respondents opinion will also be analysed as this is seen to
be vital when assessing the landscape for intervention by detecting barriers and potential pitfalls, as well as to discover facilitating factors and advantages.

The thesis includes a survey to examine current attitudes and intentions towards use of the NASG in humanitarian settings. In order to create such a survey, it was constructed using the Theory of Planned Behaviour. An explanation of the theory follows now as the methodology of the survey.

THEORY OF PLANNED BEHAVIOUR

The Theory of Planned Behaviour was first developed by Icek Ajzen in 1985 and has since been revised and improved by the founding author. Simply put, the theory aims to predict a person’s future behaviour based on their intention to perform said behaviour. The Theory sees intention as the closest disposition linked to then actually performing a specific action (Ajzen 2011, p.99) and therefore views intention as the key to predicting and tempering poor behaviour. A variety of studies and Meta analyses have shown a strong correlation between intention and behaviour from a range of disciplines. The Theory has been used extensively in public health to understand poor health decisions such as smoking, eating poorly or partaking in risky behaviour such as drug use. This section will first discuss the framework of the Theory and then go on to relate the Theory to this research.

The foundation of the Theory is its understanding of the differences between traits, attitudes and behaviours. A trait is therefore understood to be a persons’ “dispositional explanations”, for example their personality traits which could include sociability, independence, conscientiousness (Ajzen 2011, p.1). Whereas an attitude is an explanation of human behaviour, such as an attitude towards the church, smoking, or abortion. Thus Ajzen (2011, p.3) describes an attitude as a “disposition to respond favourably or unfavourably to an object, person, institution or event”, attitudes are thus seen in a pro/con or good/bad format. Further, attitudes are seen to be either cognitive responses, affective responses or conative responses, each complete with a variety of expressions and possible data collection points. Comparably, an attitude is evaluative in nature, as it is targeted at a given item, meaning that one can collect data based on attitudes. However, traits are not necessarily evaluative, instead they describe an individuals tendency to behave in a certain way, and/or towards a certain thing, in a certain environment (Ajzen 2011, p.7). The explanation of behaviour will be returned to later in this section as it involves a deeper understanding of the Theory to understand its definition since this is the focus of the Theory.

Ajzen (2011) discusses in detail the impact of control and perceived control over one’s ability to perform a desired behaviour at a designated time and place. He asserts that behaviour is either under the influence of volitional control - which means the individual is able to choose whether to act or not, i.e. it is within their control. Alternatively, the behaviour is under incomplete...
volitional control – which means that the individual is not in control, or only partially in control of performing the action i.e. the behaviour. In cases of volitional control Ajzen (2011, p.99) claims that behaviour is the direct result of attempts made by the individual to successfully carry out the action. Under volitional control the sequence of events follows:

Further the Theory postulates that “barring no unforeseen events, people are expected to do what they intend to do” (Ajzen 2011, p.100). However, in the case of incomplete volitional control, whereby the individual is not in total control of the behaviour, external control factors may include, opportunity or a dependence on others to fulfil the behaviour. Similarly, internal control factors may also be at play, such as emotions, compulsions or an individual’s skills, training and abilities - or lack thereof. All of these factors can inhibit the desired behaviour from taking place. Furthermore, Ajzen (2011, p.107) stresses the importance of differentiating goals from behaviours when discussing control factors. For example, specific behaviours may work towards the attainment of a specific goal, but that goal is often not within the control of the individual, as there are many factors influencing its fulfilment, some of which have already been outlined. Control factors are often most sharply felt when individuals attempt to overcome or change powerful personal behaviours (e.g. smoking) or set their sights on difficult goals (e.g. becoming a Hollywood film star). In this light, all behaviours – big and small, are under a certain degree of uncertainty and incomplete volitional control.

A key moment in the execution of an intended behaviour is time. A general desire to perform a behaviour, such as ‘I want to drink less alcohol’, is often a poor predictor of future behaviour because there is no framework or structure behind the intention (Ajzen 2011, p.102). The more time that passes between the formation of an intention and the behaviour, the less likely it is that the behaviour will materialise, because of the increased chance of unforeseen circumstances and increasing incomplete volitional control impacting the behaviour. Consequently, the intention should instead be, ‘I will only drink 4 glasses of wine per week for the next 3 months’. Ajzen asserts therefore, that time is a proxy for the stability of intentions. Further, he emphasises that the link between the intention and behaviour must be compatible. A disconnect between intention and behaviour has been noted as a drawback to accurately predicting behaviour. Other inconsistencies between intention and behaviour have been highlighted as: ‘saying one thing and doing another’ which questions the validity of the initial intention; the difficulty in performing the behaviour can deter people; a negative intention coupled with a positive behaviour or visa versa may occur due to prejudices; and finally evidence has shown that moderate dispositions are consistent when behaviour is easy to perform however they become inconsistent when the behaviour is difficult (Ajzen 2011, p.104). Therefore it is vitally important
to ensure that, a) intentions match behaviour, b) the control factors are carefully analysed, and c) a time frame is established.

That said, intentions and behaviours do not inform us (the researcher), about the reasoning behind them. In order to understand human behaviour, Ajzen claims that we must first identify the determinants of behavioural intentions. According to the Theory (Ajzen 2011, p.117), there are three basic determinants of intentions and behaviours:

1. **Personal in nature**
   - The individual’s attitude towards the behaviour, positive/negative evaluation of performing the behaviour of interest

2. **Reflect social influence**
   - Social pressure, dealing with perceived normative prescriptions entitled the subjective norm

3. **Deal with issues of control**
   - The sense of self-efficacy or ability to perform the behaviour termed the perceived behavioural control

Therefore, the Theory states that, “generally speaking, people intend to perform a behaviour when they evaluate it positively, when they experience social pressure to perform it, and when they believe that they have the means and opportunity to do so” (Ajzen 2011, p.118). However, the Theory places its weight behind the intentions to perform behaviours and as this entails a variety of considerations depending on the intention and behaviour, it can vary greatly across people, sex, groupings or cultures. Below is a simple graphic of the Theory of Planned Behaviour.

**Figure 1 The Theory of Planned Behaviour by Icek Ajzen (2011, p.118)**

It is important to note that the additional broken line from perceived behavioural control to behaviour reflects the ability of the former to directly influence the latter regardless of intention. Further, as is outlined by this graphic (Figure 1), the attitude towards a behaviour, subjective norm, and perceived behavioural control, collectively create an intention that theoretically leads to the behaviour. Therefore the Theory focuses on the effects of perceived behavioural control, rather than actual control. The simple graphic of the Theory is only one layer of the complexity as the Theory also asserts that the formation of intention is built on, and is the result of, ones
belief system which impacts attitude, the subjective norm, and the perception of control (Ajzen 2011, p.123).

Regarding ones attitude towards an intended behaviour, the Theory claims that beliefs about the consequences of the intended behaviour create the attitude. The Theory terms these behavioural beliefs (Figure 2). Thus, ones attitude is decided upon based on the believed outcomes of the behaviour. Similarly, the subjective norm is the second determinant of intention, and its formation is base on socially-based beliefs called normative beliefs which are influenced both negatively and positively by, for example family, friends, role models (Ajzen 2011, p.124). Finally, the last determinant of intention succumbs to control beliefs, which are about “the presence or absence of factors that facilitate or impede performance of that behaviour” (Ajzen 2011, p.125). Further Ajzen claims that they are often informed based on second-hand information, past experience, or observing others carrying out such behaviour. Moreover, the Theory also claims that the more resources and opportunities individuals believe they have, the more likely it is that they will indeed perform the behaviour. Therefore, there is strength in the perception (whether true or not) that a person can carry out an intended behaviour. Ultimately, this layer of the Theory maintains that once a belief is set within an individual, regardless of truth or fact or scientific validity, it generates a sequence of ‘reasoned’ intentions and behaviours based on that belief. Furthermore, once attitudes, norms and perceptions of control have formed, the path which constructed them is not necessarily revisited every time a future behaviour opportunity presents itself (Ajzen 2011, p.126).

The final stage of the Theory discusses the variability of beliefs based on an individual’s Background Factors. These variables relate to and influence a person’s beliefs, ranging from socio-economic, political, cultural, to personality factors, emotions, attitudes and values. They sustain that differing social environments produce differing beliefs, obstacles and expectations. However, that said, Ajzen (2011, p.134) uses a broken line to highlight that although these
background factors may influence the determinants of intention, “there is no necessary
connection between background factors and beliefs”. The multitudes of background factors that
could, or could not be influencing are too numerous for the Theory to factor in, however it
states that other social theories do complement it. The following sub-section will now turn to
how this Theory has been used in this research.

The Survey

During April 2014 a survey discussing use and knowledge of the NASG within the context of
humanitarian settings following the technique of snowball sampling to respondents working
directly and indirectly in the humanitarian and reproductive health sectors. The survey was
developed with a backbone derived from the Theory of Planned Behaviour (TPB) by Icek Ajzen
that assisted the development of question formation, structure and answer format so as to draw
conclusions over respondent’s intentions and behaviours towards the NASG in humanitarian
settings. I chose to use this Theory over other possibilities because it investigates attitudes and
beliefs for predicting future behaviour.

Initially, I had planned to conduct semi-structured interviews with practitioners, however after
further exploration into the TPB and the guidance it gives on the best methods to use, I opted
for a survey. The rationale for this change was because of self-preservation bias. The Theory
stated that verbal responses to questions are easily distorted or biased by the respondents
conscours over the answers the researcher is looking for. Further, the self-preservation bias can
also disguise the true traits and attitudes of the responder thereby distorting the results. Ajzen
(2011, p.14) suggests either disguising the nature of the investigation, or employing techniques
to limit the control of the responder, such as through a survey. A last point on the TPB refers to
the style of questioning and answering. Two factors were at play in the formation of questions,
1) the time a responder would dedicate to answering the survey, and 2) the theory behind the
structure of questions. These two factors sometimes did not work in a complementary fashion.
For example, the TPB prefers when answers are not only agree or disagree, but rather a
collection of opposing adjectives, such as good/bad, happy/sad, nice/awful on a 7-point scale
so as to improve reliability of answers, as opposed to a single item answer e.g. yes or no (Ajzen
2011, p.8, 15). However, in my survey I wanted to know if they agreed or not to a c
preposition (Question 9 & 10). Therefore several variants of yes/no and agree / disagree
respectively were created in order to compromise to these two factors. Similarly, in Question 5a
and 5b inquiring as to potential challenges, agree and disagree was changed to ‘challenge’ and
‘advantage’ with an additional ‘Unsure’ option. Perhaps, a greater compliance to the TPB
would have been a 7-point scale for these questions however, the overall time and dedication to
the survey by the responder was also a factor that could limit responses.
Following a process of trial and error, the final survey software used was Google Doc’s Forms. The survey comprised of ten questions directly related to the NASG, humanitarian settings and the Minimum Initial Service Package for Reproductive Health (MISP), as well as an optional section of personal details that allowed respondents to remain anonymous, or state the degree of anonymity they desired. The option of anonymity was also to counter self-presentation bias as outlined above. Only two questions were mandatory in the survey - “Would you like to answer the survey anonymously”; and “6. Are you aware of the MISP?” This was because both questions directed the responder to different follow-on questions depending on the answer given. All other questions were not mandatory which allowed the responder to move freely throughout the survey should they wish to revisit any answers already given, or to read the full scope of questions before answering.

The survey was distributed on the 2nd April 2014 via three methods. The first was a direct email to eight people who had been identified as key responders and who had given their permission to be contacted for such an activity. Secondly, it was also posted on the Inter-Agency Reproductive Health Knowledge Gateway discussion board. In effect, this meant that an email from the author (Clare Lofthouse), via the IAWG discussion board was sent to all members of this group. This includes a network of over 1500 individuals as well as UN Agencies, universities and research centres, NGOs and governmental organisation. Clearly this dramatically increased the potential pool of interested and relevant responders. Thirdly, using the networks associated NOHA master, the survey was also distributed using social media site Facebook. A total of three Facebook groups were selected all of which were related to the NOHA master community. These were; ‘NOHA (Past, Present and Future)’; ‘NOHA 2012-2013’; and ‘NOHA Uppsala (All Years)’. In all communications responders were encouraged to disseminate the survey to anyone who they thought to be an appropriate party, this included colleagues, education institutions, and other partners. A copy of the survey and the full responses along with a full transcription of the results is enclosed in Appendix II. Personal details have been removed for anonymity.

THE RATIONALE, LIMITATIONS AND ETHICAL DILEMMAS

The status of global maternal healthcare, especially among low-resource settings is a subject that has been covered by many academics and there is a wealth of literature available. However, few authors have addressed maternal mortality within the context of humanitarian crises – even though it is widely understood that such an event heightens risks for expectant mothers, few have examined in detail the impact of a crisis on pregnancy or childbirth. An exception in this context has been the growth in research, literature and attention on gender- and sexual-based violence during and after crises.
Every humanitarian crisis offers a different context with a variety of challenges and advantage to emergency response. Even though generalisation can be made across crises, it must be noted that obvious exceptions and variations exist. The priority interventions during emergency response tend to focus on basic survival needs such as food, water and shelter. As has been highlighted by research, these must be complemented by health interventions, namely the prevention and management of communicable diseases. As maternal and more generally reproductive health requires a more complex and sustained commitment, these services are often minimal or basic. Over the last fifteen years or so, reproductive health has increasingly been more as an essential component of humanitarian assistance, however implementation still remains a major challenge constrained by inconsistent strategy, limited expertise and low funding. Therefore this research is vastly important for both academic and humanitarian partners, to contribute to a broader discussion on reproductive health interventions and the use of innovation. This research aims to inform a global discussion that has fallen short in both political will and drive.

A limitation to this research will be that no fieldwork from a humanitarian setting will be carried out. This will be a drawback to the creation of real life solutions to the problem of reducing maternal mortality during humanitarian crises. However, it does involve case study from Tanzania that analyses a project on safe motherhood using the NASG as a complementary tool to the MISP. Furthermore, through a survey responded to by a range of humanitarian actors, it will reduce bias in the research which may occur through the examination of case study and organisational approaches. Even though this work will focus on the details of a specific intervention, the analysis will not focus on organisation-specific details, nor is it a critical report on their work. Rather it should be understood as reflecting on current methods used in the humanitarian sector to address maternal healthcare, so as to assess where entry points could be to improve both access to, and diversity of services for women and girls affected by crises.

Ethical dilemmas encountered during this research were related to the anonymity of the responders to the survey on the NASG in humanitarian settings. This dilemma was eliminated by the use of an anonymous option at the start of the survey to protect the responder. Additionally an option to state exactly how the responder would like to be referred by was also included should the person wish to be anonymous in name, but not by geographic location or job role. For example, a person may request to be labelled as ‘WASH expert working in South Sudan’.

**The Outline**

The following chapters will work together to formulate answers to the research questions outlined earlier in this section. Using a specialised theoretical framework to analyse a variety of
resources, and a survey targeting practitioners working in health, and health-related areas of humanitarian action, it will create a clearer picture of the problem of postpartum haemorrhage in humanitarian settings, and the implication of using the non-pneumatic anti-shock garment in such settings. The research has been separated into six parts: Part I: The Methods, Part II: The Theory, Part III: The Innovation, Part IV: The Context, Part V: The Implementation, and finally Part VI: The Conclusion. Within the context, special attention has been drawn to postpartum haemorrhage in low-resource settings, as well as humanitarian crises and vulnerability. Further attention has been given to the impact of culture on health, health seeking behaviours and humanitarian response. The implementation has been split into a case study, and an analysis of the survey results.

I Please see Uppsala Universitet Bibliotek [http://www.ub.uu.se/] for more information

II Google searches were conducted to assist and complement topical search and ensure grey literature was found which may not assert themselves through more academic searches

III This included use of the library at the WHO headquarters in Geneva whilst working as an intern in 2013, as well as access to online resources via [http://www.who.int/publications/en/] All publications are available to access regardless of employment at the WHO


V This includes a multidisciplinary access to all books and journals and also encompasses the Graduate Institute of International and Development Studies, and the Centre for Education and Research in Humanitarian Action, please see: [http://www.unige.ch/biblio/index.html]; [http://graduateinstitute.ch/home/research/library.html]; [http://www.cerahgeneve.ch/accueil.html]

VI Please go to [http://www.ncbi.nlm.nih.gov/pubmed/] for more information

VII Please see [http://www.plosone.org/] for more information on this online peer-reviewed journal

VIII Please go to [https://bixbycenter.ucsf.edu/research/safe_motherhood.html] for more information on this subject

IX For more information on this please refer to [http://apps.who.int/gho/data/?theme=main]

X The Inter-Agency Reproductive Health Knowledge Gateway does require a membership. This can be obtained through registration and later acceptance by the administrators

XI For more information on the IAWG please see p.30 of this research
Part II. The Theory

Part II will outline the theory that has both shaped and inspired the research. A key theme running throughout the research is that of socio-economic and cultural markers as the structures and norms governing our ability to make decisions and take action. This section will explain the evidence base for this theory and how it applies to reducing PPH mortality and morbidity. It will detail the Diffusion of Innovation Theory to shape our understanding of the diffusion of the NASG within the humanitarian community. Finally, the Social Determinants Of Health and the Social Vulnerability Paradigm will frame the context of who is the most vulnerable to PPH and why.
In 1962 Everett Rogers as a result of his own diffusion research throughout the 1940s and 50s, developed the model ‘Diffusion of Innovations’ that would drastically alter diffusion research. Since his seminal work, the Diffusion of Innovations framework has been revised and reworked for five editions, the most recent of which was published in 2003 baring the same title as the original volume. Before the development of the framework diffusion research was segregated into distinct fields of study such as anthropology, health and medicine, agriculture and farming, communication science etc. However, after the Diffusion of Innovations these fields who had previously conducted diffusion studies separate from one another, began to be pulled together by the opening up of the subject in which they found great similarities across their studies (Gluesing 2012, pp.123–4). The Theory therefore created a shared platform for discussion, partnering and synergy building bridges between otherwise insular fields of study. Today the Theory is highly regarded within the social sciences and continues to serve as a multidisciplinary approach to understanding and predicating human behaviour towards innovation. Its digestible and pragmatic approach, simply and clearly repackages empirical findings into an orderly fashion that is easily tailored to suit most environments (Rogers 2003, p.104). First developed in the US it was rapidly transported to Europe, later spreading to Africa, Latin America and Asia during the 1960s. In fact diffusion research started in the 1940s and proliferated throughout the 1950s, and after the creation of Rogers’ Theory, diffusion studies began to spread throughout the world. However it was not until the early 1970s that criticism began to be made, coming mainly from developing nations as the dominant global paradigm of development, which at the time focussed on economic growth, technology transfer and centralised planning, began to shift to more social participation (Rogers 2003, p.105, 130).

According to Schrage (2004), “the diffusion of innovations - not the ‘spread of ideas’ or the ‘clash of civilisations’ or even ‘globalisation’ - is the dynamic driving todays world and tomorrow’s”. He claims that innovation has set a global quality of life and a standard of living, which is now defined by the diffusion of innovations. In its simplest form it, “explains social change, one of the most fundamental of human processes”, and it has become a “natural framework in which to evaluate the impacts of development programmes in agriculture, family planning, public health and nutrition” around the world (Rogers 2003, pp.xviii, xix). Throughout its lifetime, the world has changed dramatically with the introduction of the Internet, the spread of HIV/AIDS, and global terrorism, understandings of how ideas diffuse throughout society remain as important as ever before, but increasingly challenging as new networks of communication continue to multiply. However, the core of the Theory has remained the same, but its application must continue to be re-examined and adapted to fit it’s contexts if it is to remain applicable, because the social change caused by innovation, changes
The Diffusion of Innovation

Both the innovation and the society. This is the challenge Rogers sets for future diffusion research.

As Rogers (2003, p.xx) explains, “the Diffusion of Innovations is essentially a social process in which subjectively perceived information about a new idea is communicated from person to person. The meaning of an innovation is thus gradually worked out through a process of social construction”. The Theory is comprised of ‘Four Elements’, entitled: 1. The Innovation, 2. Communication Channels, 3. Time, and 4. The Social System. Although the Theory is often described as a linear process, these elements interject the overall innovation-decision development differently and at different times, they are used to explain the behaviour of the individual or the organisation moving though the cycle of deciding whether or not to adopt a new innovation. Relatedly, there are ‘Diffusion Networks’ which are ways to influence, persuade and share knowledge about the innovation with the individual or organisation. These are connected to and a product of the Social System, but also closely linked to the Communication Channels. In sum, different parts of the Theory are important at different times, both for individuals deciding on adopting innovation, and the researcher assessing the diffusion of the innovation. This discussion of the Diffusion of Innovations will focus only on those decisions which are optional, and not mandatory or forced. These concepts will be brushed upon, but the focus is on optional adoption.

Social Change and Diffusion

On a daily basis we are continually exposed to new ideas, new processes, new technologies to buy in to and use in our ever-innovative lives. Fortunately, we ignore most innovations as we decide that we do not need them, or they are not suitable for our lives, because of economical constraints or by the choice of a similar competitor. In fact, most innovations that are diffused to us are not appropriate, suitable or necessary (Rogers 2003, p.110). On this issue, Rogers (2003, p.172) states how, “individual[s] tend to expose themselves to ideas that are in accordance with their interests, needs, and existing attitudes”, thus by the same logic, they also consciously (or unconsciously) avoid those of disinterest. This selective exposure increases our chance of being diffused relevant innovations, even still we do not need everything, and everything is not always better than the status quo.

The Diffusion of Innovations focuses on why, we make these choices and why some innovation succeed and others fail, even when there is more science and objective legitimisation behind the ones that failed. Denis et al (2002, p.71) assert how there are many forms of legitimisation outside of science, such as common sense, following reputable institutions, or beliefs and values. Rogers (2003, p.5) defines diffusion as, “the process in which an innovation is communicated through certain channels over time among the members of a social system”. This exchange of information between individuals those seeking information and those imparting innovation knowledge is part of a continuous two-way process based on communication. The sharing of
information is a means to reduce the uncertainty of the individual who is contemplating adoption (Rogers 2003, p.6). This information can come from either objective or subjective sources, and depending on the character of the individual either source will hold different sway in their final decision to adopt, reject or re-invent the innovation in question.

**Public Health & The Diffusion of Innovations**

Public health has been implementing diffusion research since the 1950s, and it has grown in both in size and use. The first partnering was a seminal study on tetracycline diffusion through medical practitioners and authored by Colombia University. This seminal study highlighted the importance of subjective information exchanges as key drivers in diffusion and asserted that the diffusion of innovation was indeed a social process (Rogers 2003, p.64). In confirmation of this, a study on the diffusion patterns of complex health innovation, Denis et al (2002, p.68) found that in the medical context, although science can legitimise the use of innovation is was not the biggest factor in evaluation. Individuals sought subjective endorsements from respected and reputable individuals and organisations.

The main focus of diffusion research in public health has been on family planning, medical commodities, and HIV/AIDS prevention. The majority of innovations that are studied are those whereby the end user is the patient as opposed to the practitioner or health system. Family planning has proved to be a recurrent theme among diffusion studies, especially those conducted in low-resource settings. This in part is due to an earlier model called K.A.P. studies (Knowledge, Attitude, adoption/Practice), but these studies failed to provide quality data collection even though they did highlight important issues such as the demand by individuals to control parity, the demand for government programmes, as well as methodological assertions that family programmes can in fact be evaluated (Rogers 2003, p.69). A recurrent problem with family planning and HIV/AIDS focussed diffusion innovations is that they are prevention strategies. Because of this the result of uptake is prevention and therefore success in that nothing happens. Similarly, prevention innovation is dependent on patient use that is vulnerable to resistance, as “people prefer to adopt magic-bullet technology solutions rather than change their behaviours” (Greenberg 2006, p.209). Especially when the final result is in fact not observable, an individual can feel as though there is no result and this can deter use. This regularly leads to family planning programmes diffusing information and knowledge rather than devices, creating a slow diffusion of contraceptives but better knowledge (Rogers 2003, p.70). Related specifically to this topic, Rogers (2003, p.72) explicitly states how, “contraceptives are a particularly difficult type of innovation to diffuse”. That said Sanson-Fisher (2004, p.555) state how breast cancer screening, which is a preventative innovation was rapidly adopted by practitioners due to the compatibility with their belief of early detection as an inherently good thing.
A common rhetoric from health professionals is that there is a sizable gap between evidence and practice. This is partly due to the amount and speed of medical innovations, but also because even when practitioners are willing to change, the environmental factors of the clinical environment are not conducive to change (Denis et al. 2002, p.60; Grol and Grimshaw 2003, p.1225). Social systems more conducive to adopting innovations are those favourable to creativity and accepting of high levels of uncertainty. They often have flat hierarchical systems and strong leadership committed to effecting change. Whereas, according to Sanson-Fisher (2004, p.556) “the healthcare system has a hierarchical model, with separate organisational structures for each professional group. The system is often bureaucratic, with social norms that hinder rapid change”. Grol and Grimshaw (2003, p.1227) believe that to overcome these system failings, clear adherence to evidence and guidelines would ease innovation. Further, they maintain that no intervention is perfect for all settings; reinvention and modifications must be made in order to increase the likelihood of success.

THE FOUR ELEMENTS

Although there is a suggestion of a logical linear process for the Theory, there are in fact many components that make a simple graphic very difficult to create. However, four main elements comprise the foundation and the basis for our understanding. They are interlinked and connected at different times and in different ways, such as the communication channels and the social system have a great deal of crossover depending on the social system under examination. The graphic above is a visual display of the author’s understanding of the Theory. Each
element is contained within the funnel, yet none are placed so as to suggest a certain relationship or connection between them as these are too numerous and too complex to expand further than this simplistic demonstration of the process of diffusion. Each element bounces among the others yet contained within the funnel, which represents the limits of each study’s peripheral vision. An explanation of each element will now follow.

**THE INNOVATION**

“Innovation isn’t what innovators *do*; it’s what customers, clients, and people *adopt*, and as such it is about the distribution of usable things that ultimately changing behaviour (Schrage 2004). An innovation is not simply a technological device it also encompasses any “idea, practice or object that is *perceived* as new” (Rogers 2003, p.12). The perception of newness has been stressed here as this can vary depending on the individual or social system in question. A person can have knowledge of an innovation, but it can still be new as long as individuals have not yet formed an opinion about it. Thus, “if an idea seems new to the individual, it is an innovation” (*ibid*). It can be a variation in drug regimen for acute diseases, or the latest model of mobile telephone. But it can also be an ideological theory, recycling paper, or an education curriculum. Regardless, most innovations have a ‘hardware’ and ‘software’ component. This refers to the physical tool embodying the innovation, and the “information base” which can be understood differently by different social systems and then adapted to suit the specific needs (Rogers 2003, p.259). This concept is also discussed by Denis et al (2002, p.69) who in a paper explaining diffusion in complex health innovation has seen that each innovation process has a “hard core” and a “soft periphery”. By which Denis et al (2002, p.70) refers to the fixed nature of the innovation and then secondly, the malleability of implementation. Denis et al assert that the greater the uncertainty surrounding implementation techniques, the greater the applicability and adaptability of the innovation to different settings. However, the boundaries of some innovations may seem blurred by other related innovations which can appear confusing when deciphering the impact of one innovation when clearly another or even several other like-minded innovations have been influencing the individual. These technology clusters are a collection of “one or more distinguishable elements of technology that are perceived as being closely interrelated” (Rogers 2003, p.249). An example of *technology cluster* is the recycling of paper, plastic, aluminium and coffee capsules. Technology clusters have not received they attention they deserve in diffusion research because of an oversimplification by researchers. However, the experiences a person has with one part of the cluster will drastically impact their uptake of other parts, or even the entire cluster. Although each component of the cluster diffuses individually within a social system, they are clearly related in the mind of both those pushing uptake and the individual. Ajzen (2011, p.126) would then articulate that this is because an attitude has already formed about the innovation in the mind of the individual, meaning that the innovation-decision process will not occur again for similar innovations. Thus success impacts future related innovation diffusion as well as the current innovation.
As individuals or organisations learn of innovation it creates an uncertainty that can only be clarified by further knowledge and information towards the outcome of use, and the advantages and disadvantages for use. The main questions asked are: What is it? How does it work? Why does it work? What is the consequence of use? What does it do for me specifically? To answer these questions individuals follow a path termed the *innovation-decision process* (Rogers 2003, p.14). This is a process, which although linear in discussion, allows for fluid movement back and forth, shoring up information and knowledge so as to finally form an opinion of the innovation by the individual. A large part of this process involves the innovation itself and the perception of its characteristics. Rogers (2003, p.223) has divided the characteristics of all innovations into five “interrelated empirically” but “conceptually distinct” categories, these are: *relative advantage; compatibility; complexity; trialability, and observability*. It is not one attribute single-handedly that will legitimise and support diffusion, but a collective effort based on the innovations redeeming qualities. Denis *et al* (2002, p.69) acknowledge how science alone, or cost-effectiveness alone is not enough for innovation to succeed in a medical context, it must also make a clinical impact to ensure that practitioners will want to use it. Sanson-Fisher (2004, p.55) notes how analysing the innovation though these attributes is “helpful when adopting specific clinical behaviours and when deciding which components will require additional effort if diffusion is to occur”. Specific attention will be drawn to each characteristic followed by a short discussion on the re-invention of innovation.

**Relative Advantage – ‘would it be an improvement?’**

This is “the degree to which an innovation is perceived as better than the idea it supersedes” (Rogers 2003, p.229). Meaning that the innovation must first be solving, or *perceive* to be solving a problem or fulfilling a need surpassing the current norm. It must be advantageous not simply economically, but it could also feed social prestige, convenience or personal satisfaction. Relatedly, the power that the innovation generates or restrains, for an individual, organisation or system can also be a factor in diffusion (Sanson-Fisher 2004, p.55). It is not necessarily the objective advantages that diffuse innovation, but rather the *perception* by the individual that the innovation is advantageous. This is reiterated by Sanson-Fisher (2004, p.55) who claims that “objective data may be less important that the clinicians perception of whether the innovation will be advantageous”. The greater this perception the more rapid adoption (Rogers 2003, p.15). Depending on the innovation will depend on the specific relative advantage. It has also been noted that increased diffusion based on new technological advances, can lower the purchasing costs by reducing the cost of production. This can in turn encourage more diffusion and speed-up rate of adoption. It is also arguable as to the meaning of an innovation after a dramatic price drop as was seen in technology such as VCR players between the 1980s and 2000s. Therefore an innovation’s characteristics can change radically across periods of time and from owning and using innovation (Rogers 2003, p.230). The social status connected to innovation may also
change over time, especially if more people begin to adopt the same innovation. Social status and prestige can be an important motivator of adopting innovation. This is markedly true in the fashion industry, status cars, or technology brands such as Apple. In such cases, need, justification and objective rationale is overruled by subjective rationale and desire (Rogers 2003, p.232).

The relative advantage of an innovation has been found to be the strongest predictor of an innovation’s rate of adoption, weighing up the expected benefits and costs based on its characteristics and the market forces. It is exactly for these reasons why preventative innovations diffusion so slowly and with great difficulty - because they pose to stop or reduce future events e.g. quitting smoking, uptake of contraception, or fastening seatbelts, but they offer no social prestige, and the effect is a “delayed reward” at an unknown time to the user, creating uncertainty within the user (Rogers 2003, pp.234-5). Moreover, the difficulty in predicating the relative advantage of using a preventive innovation remains complex, as it is based on predicting events which did not happen.

**Compatibility - ‘does it fit?’**

Rogers (2003, p.240) describes compatibility as “the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of potential adopters”. An example of an innovation that is perceived as incompatible with the social system is the introduction of contraceptives in heavily religious communities. When a person sees an innovation as compatible, they are able to give meaning to it and thus accept it much easier. Compatibility, or incompatibility crosses with sociocultural beliefs and values, prior innovations, and need. Importantly however, the greater the compatibility, the less the behavioural change needed for use (Rogers 2003, p.245). This is an interesting point when trying to introduce a technology cluster as the first highly compatible innovation may set the groundwork for later, slightly less compatible innovations which will require more of a behavioural change. This approach can be beneficial to ensure that the more incompatible innovations are not rejected and then act as deterrents for future related innovation. Compatibility and the rate of adoption have a less overt relationship than with relative advantage, but still they are connected (Rogers 2003, p.249). New innovation is always compared to an older or current version, which ultimately is premised on the success of that innovations rate of adoption. The connection between sociocultural beliefs and the associated knowledge systems, to the innovation fronted by a *change agent*, often fails to create common ground on the basis of a demeanour of superiority over such beliefs on the part of the change agents. Innovation must build on the pre-existing systems and use them to explain how and why the innovation is needed and what its capacity is (Rogers 2003, p.255). This is to the benefit of both the individual and the change agency in finding solutions to problems. Presuming local knowledge systems and practices are inferior often leads to the ignorance of such systems, this
is called the ‘empty vessels fallacy’ which is the presumption that no prior knowledge or experience of such an innovation exists in the social system. It is often the reason why the implementation of development innovations fails.

**Complexity – ‘is it easy to use?’**

The complexity of an innovation is “the degree to which an innovation is perceived as relatively difficult to understand and use” (Rogers 2003, p.257). The more complex the skills needed to use, understand and maintain an innovation, the less likely it is to diffuse. Simple, logical, low-maintenance innovations are quick to diffuse because they require little change to the social system and the individual.

**Trialability – ‘can I try it?’**

This is “the degree to which an innovation may be experimented with on a limited basis”. This helps to reduce any outstanding uncertainty by the individual and allows them to give personal meaning to the innovation (Rogers 2003, p.258). It also creates a ‘try by doing’ phase which in some sectors, such as health and medicine, can be a game changer, in which the belief and trust in an innovation is made based on medical practitioners trying it for themselves, while taking on no responsibility to continue use if they are dissatisfied (Sanson-Fisher 2004, p.S56). Trialability also allows for adjustments and re-invention of innovation to fit each setting. This is very effective when large economic costs are ensued by innovation uptake.

**Observability – ‘will I see results?’**

“The degree to which the results of an innovation are visible to others”, and furthermore when the results can draw a clear line back to the innovation, it stimulates discussion with peers, friends, and others within the social networks of the individual (Rogers 2003, p.16). This is how innovation can often clump around certain social systems. In prevention innovation, such as safer sex, there is often a large software component which is the ambiguous idea that something could happen, while the hardware component is about behaviour change i.e. condom use (Rogers 2003, p.259). This balance has meant that preventative innovation have diffused slowly due to the non-result creating no observability.

**The Re-Invention of Innovation**

It now acknowledged in the diffusion field of research, that innovation is not static or unchanging. In fact, innovation can change as quickly as the system in which it diffuses. Re-invention is defined as “the degree to which an innovation is changed or modified by a user in the process of adoption and implementation” (Rogers 2003, p.181). Not all innovation allow for drastic re-invention, as this is dependent on the innovation and its own limitations. The lack of attention in previous years to re-invention, or the contextualisation of innovations is partly due
to the difficulty in studying an innovation that is in a process of change. Many adopters want to customise the innovation to fit their context and needs, and it is this capacity to be re-invented and adapted, Rogers (2003, p.17) claims, that makes diffusion much more rapid and sustained. In fact, many encourage individuals and systems to reinvent innovation as their own, in their own image and for their own context (Schrage 2004). Yet, failure to measure how an innovation was adopted – both the expected and unexpected changes during the implementation stage is one way to measure re-invention. Rogers (2003, p.183) generalises that, re-invention leads to faster adoption and a higher degree of sustainability. Similarly, innovation “may have different meaning for different actors and that this is the key to understanding whether and when adoption will occur” (Denis et al 2002, p.66). The actor will assign meaning to the innovation over time and through use, this dynamic process will change the innovation's meaning, as well as the individual to whom it serves.

**COMMUNICATION CHANNELS**

The second element to the Theory is Communication Channels. Knowledge and information surrounding innovation is diffused through communication, leading Rogers (2003, p.18) to maintain that, “at the essence of the diffusion process is the information exchange through which one individual communicates a new idea to one or several others”. These channels can be through mass media, interactive communication (e.g. via the internet) or inter-personal communication which is much more effective in supplying specific information for those who are already aware of the innovation but desire more detail. All information generated is separated into either objective or subjective information. The former supports the innovation with evidence and science, while the latter has been found to be a more important factor in decision-making for most individuals. This observation has been noted in almost all studies since diffusion research began. It points to a dependence on the behalf of the potential adopter on their social system to support their own evaluation. It also supports that the Diffusion of Innovations is an inherently social process grounded solidly in interpersonal communication (Rogers 2003, p.19). The speed at which a person decides to adopt or not, has been linked to her/his socio-economic markers. It has also been linked to the socio-economic similarity of the person(s) who was influential in diffusing the innovation. These people are often call opinion leaders, change agents and champions. They will be discussed within the context of the social system, but first a short explanation of why it is important who is trying to persuade who to adopt.

**Heterophilious and Homophilious**

The Diffusion Theory is premised on the fact that people are more receptive to those with whom they can relate to, for example from a social, economic, and/or political standpoint. When there are clear similarities between the imparter of information and the recipient of
information, it is called a *homophilious* relationship. This can include anything that builds common ground, such as beliefs, values, education or location. In contrast, the opposing relationship to this situation would be called a *heterophilious* relationship whereby there is no, or little common ground between the two parties. This can also be created when the recipient of information perceives the imparter of information to be ‘from outside’, or external to their social system. These relationships are vital when the innovation requires sizable changes to current behaviours and practices within the wider context of the social system. Such changes can only be instigated from those perceived to be related to the social system. However, this is more often not the case as people who act differently to the majority of a social system are generally not homophilious with the system at large and therefore unable to create changes within in. Similarly, those who have more knowledge of the innovation have exactly that, more knowledge. This difference can sometimes cause a negative divide within the information exchange. Therefore the Diffusion of Innovations demands a certain amount of heterogeneity, however at the same time there is a delicate balance between the exchanges of information about an innovation in a way that ultimately encourages use. To attain this Rogers (2003, p.19) postulates that, “ideally the two parties would be homophilious on all other levels apart from the knowledge on the innovation so as to lessen the divide between them”.

**TIME**

Time has three roles to play in the Diffusion of Innovation and importantly it is included as a variable, which is unusual for most behavioural science theories. Firstly, time is a measure of the *innovation-decision process*. This is the progression from knowledge of an innovation to the final decision to adopt or not by an individual or organisation. Secondly, time is used to measure the level of innovativeness of either an individual or organisation. This means on scale of very early adoption to very late adoption, when does the person or system adopt? This mainly focuses on those who adopt rather than those who reject, however the later stages do discuss those who arrive late to the innovation. Certain characteristics are assigned to people/organisations depending on when they decide to adopt, these are based on socio-economic markers and are divided into 5 categories. On a graph, this is often displayed as a bell curve with the majority of people adopting in the middle of the given time frame. And thirdly, time measures the overall speed at which an innovation diffuses within a social system. This is generally represented as a percentage of people who have adopted within a specific social system and visualised as an S-shaped curve (Rogers 2003, pp.20–23). Due attention will now be given to each measure of time.

*Decision-Making From Innovation to Adoption*

This process involves several stages and again, although represented in a linear format here, it is not necessarily static to these movements and uncertainty and indecisiveness cause people to
move back and forth. The “information-seeking and information-processing” sequence is outlined below (Rogers 2003, p.20). Rogers (2003, p.168) describes the “sequential stages” of the innovation-decision period as, “a series of choices and actions over time through which an individual or a system evaluates a new idea and decides whether or not to incorporate the innovation into on-going practice”. This explanation will focus on the optional choice to adopt an innovation as opposed to a collective or enforced adoption (i.e. from a consensus decision or a system wide dictated change) as it is felt more appropriate the this research and the use of the NASG in humanitarian settings which remains an optional choice. The outcomes of this process could be, adoption (this can be in full or part depending on the innovation), re-invention (adapting the innovation), rejection or discontinuance (following adoption). This innovation-decision period can take months or even years depending on the innovation and the social system in question. When this concerns medical innovation there is a concern that rapid adoption can lead to improper diffusion of training to adequately use and understand the innovation. This could lead to negative outcomes for patients based on pressure for practitioners to utilise the innovation before they are confident (Denis et al 2002, p.70), however this is a problem for system wide adoption procedures rather than individual. In a paper by Poulin et al (2013, p.185), they describe a “Local Technology Decision Support Program” which aims to improve decision-making processes at institutional levels in healthcare systems to encourage improvements associated to innovation. This process “gathers context-free, scientific evidence about the technology, such as Health Technology Assessment reports, and context-sensitive information about local needs and constraints”. This approach could also be seen to counteract the inequality that can be caused by the diffusion of innovation.

**Innovativeness Of The Intended User**

As stated, the innovativeness of the user is broken into five adopter categories, each of which has been assigned a generalised stereotype of that person in terms of their social, economic, and political markers as well as their beliefs and values. In order of innovativeness and speed of adoption, as well as Rogers’ (2003, pp.280-1) approximate percentage of the population in any given social system to fall into each category are: innovators 2.5%, early adopters 13.5%, early majority 34%, late majority 34%, and laggards at 16%. As is clear by the titles and percentages, the majority of people fall into either the early or later majority categories, this is the time when adoption is highest. Of note, is that there is no classification for people who did not adopt, specific attention given to those who adopted in part, or reinvention the innovation to suit their needs.
The Diffusion of Innovation

Innovators are venturesome and tend to be active information seekers who have access to and regularly utilise sources of media with large interpersonal networks that reach far outside their local networks, often including other cliques of innovators. They are able to cope with high levels of uncertainty (partly due to their economic status), and rely heavily on objective analysis of innovations since adoption has not yet spread to create subjective sources (Rogers 2003, p.282, 22). They have an ability to understand and apply complex technical knowledge, and thus are seen as launch pads for innovation. Ajzen (2011, p.125) supports that the greater the perception of control over resources an opportunity a person has, the more likely they will be prone to behave favourably towards innovation. Similarly Sanson-Fisher (2004, p.555) claims how in a study of diffusion in clinical change, the qualities in medical practitioners most likely to try innovations corresponded to the physicians sex, speciality, medical school, years since graduation, location, volume of patients, and also the proportion of elderly patients. More generally Rogers (2003, p.283) asserts this risk-taking behaviour is coupled to a low influence in the social system, but they act as “gatekeeper role in the flow of new ideas into a system”.

Early adopters are often individuals in positions of influence, but not so innovative to distance themselves from those less innovative. It is this category where most opinion leaders are found, and they help to trigger the critical mass through encouraging adoption in others. They also provide the first subjective evaluations to help others innovation-decision process. The Early majority are known to deliberate, while the late majority remains even more sceptical waiting until just after the average member of the system before adopting. The late majority are more influenced by system norms and values, but also are responsive to the social peer pressure to adopt. Finally the laggards are those deemed the most traditional and the last to adopt. They look to the past as a reference for how to proceed into the future, while remaining suspicious of the intentions of change agents and agencies. Rogers (2003, pp.284–5) notes how laggards resistance to innovation is fairly rational since normally they have fewer resources and capacities than do earlier adopters making them more cautious of any uncertainty and risk. It is important to highlight, that as Gluesing (2012, p.128) argues, “innovations does not always mean progress and positive consequences”.

According to Rogers (2003, p.288), and generally speaking, those who are literate, with a greater amount of formal education, higher social status, stronger social mobility, in positions of greater responsibility, and therefore greater financial situation, are more likely to innovate than those in a lesser situation. This is in part due to their ability to absorb losses from risk taking much easier. Similarly, the personality of adopters follows that, those with more empathy, greater rationality and intelligence, feel more positive about change, uncertainty, risk and science, with less focus on fatalistic outcomes and more on aspirations, are more likely to adopt, and adopt sooner (Rogers 2003, pp.289–90). Comparatively, Denis et al (2002, p.65) concluded that in fact the relationship between science and adoption is quite ambiguous, and instead adoption
focuses more on an innovation's characteristics, its interaction with the social system. Finally, Rogers’ (2003, p.291) Theory postulates that the more innovative members of society have more social prestige with large interpersonal networks, greater contact with change agents and exposure to and knowledge of innovations. It is easy to see how divisive this Theory can be when care and attention is not placed on those less likely to innovate, since the depiction of the most innovative vs. the least, is simply the have’s vs. the have not’s.

**Rate Of Adoption**

This measure refers to the speed at which an innovation is adopted by the members of a social system in a given time period and it is often displayed as an S-shaped curve - the steeper the curve, the faster the diffusion within the social system. The perceived attributes of the innovation – compatibility, complexity etc., strongly influence the rate of adoption. Additionally, other variables including the type of innovation-decision, the nature of the context specific communication channels, the nature of the social system, and finally the change agent’s efforts will also impact adoption.

Needless to say, Rogers (2003, p.221-2) asserts that the more people involved in the decision-making process the longer decisions take, and the slower adoption becomes, making innovations being diffused to individuals compared to organisations, simpler as less people are involved.

**The Social System**

A social system is defined as, “a set of interrelated units that are engaged in joint problem solving to accomplish a common goal”, while “the members of units of a social system may be individuals, informed groups, organisations, and/or subsystems” (Rogers 2003, p.23). Within any given social system there will be smaller units distinguishable from each other due to their differences and the common objectives that bind them together. Every social system has built
structures and norms as a way to organise power and information to create stability and regularity in human behaviour. Formal structures order the social system hierarchy and govern the power relations through an understood chain of command; these can include government judicial bodies or security services. Whereas informal social structures manage interpersonal communication, often between homophilious groups which then predict behaviour based on the associated values and norms of the group. There has been little study on the relationship between social structures and diffusion partly because of the difficulty in untangling social systems and finding independent aspects that clearly impacted the diffusion. The structures to which a person is a member is as important as their socio-economic markers in determining their acceptance of new innovations (Rogers 2003, pp.24–5). Relatedly, the norms of a system frame the expectations of its members and the community. They operate on all levels of the system from national, religious, organisational or local and in regards to diffusion they will either facilitate adoption or prevent it.

Rogers (2003, p.26) defines norms as the, “established behaviour patterns for the members of a social system...[norms] define a range of tolerable behaviour and serve as a guide or standard for the behaviour of members of a social system”. Grol and Grimshaw (2003, p.1229) state how in medical diffusion, barriers to innovation are found not only within the clinical practice of medical staff, but also from the “patient, the organisation of care processes, resources, leadership, or the political environment”. Therefore a variety of factors far outside the obvious forces must be accounted for when introducing innovation. Such forces can be problematic when attempting to scale-up innovations that is “not an insulated process unaffected by the outside world...instead it is strongly shaped by external forces” such as poverty, the capacity of health systems, national bureaucratic institutions, the health of population, level of democratic participation, and other contextual global influences (Denis et al 2002, p.60; Simmons and Shiffman 2007, p.24).

**Opinion Leaders and Change agents**

An analysis of the members of a social system shows that some people are more able to be innovative than others. The strength of this innovativeness is measured against their conformity to the social system’s beliefs, norms and practices. Those who hold sizable weight in the community are often not the most innovative since their status demands a certain degree of conformity so as not to alienate those less innovative. Such a person is labelled an opinion leader by the Theory, and they rarely deviate too far from the expected norm. However, they do have the capacity to influence others and often behave with informal leadership (Rogers 2003, p.388). Opinion leaders have reached this status though technical competence, adherence to system norms and behaviours and social accessibility. In comparison to those who they influence they are of a higher social status with greater connectivity to external networks outside the social system that often makes them slightly more innovative. But, they are fickle (Gluesing 2012,
They epitomise the system because they are a product of it, and as such they will only push an innovation to the point at which the social system allows, regardless of potential benefit (Rogers 2003, p.27). Their influential position will be put at risk if they are seen to be too innovative and thus external to the norms and structures of the system. Sanson-Fisher (2004, p.556) note how “if respected and influential clinicians argue for and demonstrate the application of a new procedure or treatment approach, it is likely to have a positive impact upon adoption rates”, especially if she/he is seen to be ‘one of their own’.

By comparison, change agents are external to the social system but as Rogers (2003, p.366) defines, “influences clients innovation-decisions in a direction deemed desirable by a change agency” who has a vested interested in either the success or failure of an innovation. This can mean that overlook or selectively miss out parts of the information on purpose that suggest less favourable outcomes from adoption, but could benefit the diffusion process and the change agency (Gluesing 2012, p.128). This is especially true when there is profit to be made, as change agents’ work for the organisations pushing the innovation. Examples of change agencies are government bodies, for-profit organisations, and pharmaceutical companies. Change agents are normally heterophilious to the social system in terms of education, professional training, and social status, because of this relationship exhorting influence can often be problematic and therefore they regularly employ aides who are from within the system to support them (Rogers 2003, p.27). Change agents must target their approach to suit the needs of the social system, this could mean emphasising cultural sensitivity. Tailoring an approach is even more specific targeting focusing on a homophilious group or individual, to encourage opinion leaders or those of influence to adopt (Rogers 2003, p.368). Teachers, consultants, public health workers or salespeople are examples of change agents, and they possess expertise and advanced knowledge on the innovation. Change agents often come into contact more with those who are more innovative than those who are hesitant (Rogers 2003, p.382, 457). This works negatively towards encouraging those with less experience and knowledge to adopt an innovation that may potentially aide their situation, this is flaw in the theory and continues to plague diffusion by creating greater inequality.

**Criticisms, Constraints & Consequences**

Since the Diffusion of Innovation is concerned with how an innovation has affected human behaviour within a social system, it is expected that there will be consequences to the introduction of any innovation. Rogers (2003, p.106) himself discusses the weaknesses and criticisms of his theory asserting that, “when a scientist follows a theoretical paradigm, a set of intellectual blinders prevents him or her from seeing certain aspects of reality”. Ultimately, “no-one can control or manage this [diffusion] process or know the outcome” once diffusion has begun, which makes pre-empting consequences infinitely difficult (Gluesing 2012, p.127). The following discussion will be around the consequences of innovation diffusion, the built-in pro-
innovation bias of diffusion research, an individual-blame bias as opposed to system-wide failures, and finally the socio-economic impact of innovation in terms of inequality generation.

**The Unintended And Intended Consequences of Innovation**

There has been limited attention given to the consequences of innovation diffusion. Generalisations and predictions of innovation consequences can be far-reaching and discrete making research tricky. Part of the limited attention is because of a pro-innovation bias within diffusion research. Regardless of the success of an innovation there are consequences, which can be desirable or undesirable, direct or indirect, and anticipated or unanticipated. Depending on the standpoint, the same reaction can be seen different ways. Nevertheless, there will almost always be a downside to the introduction, or attempted introduction, of innovation, as fundamentally it was designed to change behaviour and/or attitude of something or someone, somewhere, at some point. For example rejecters or late adopters may be affected by the widening of the socio-economic gap stemming from very early adoption rewards and benefits such as profit (Rogers 2003, p.456, 461). Not only this, but the disparity between high and low socio-economic groups in general can often widen as a result of innovation. Rogers (2003, p.443) maintains that, “every social system has certain qualities that should not be destroyed if the system is to be maintained”, therefore the introduction of new innovation must be careful not burn the bridges which support those most vulnerable as “usually new ideas make the rich richer, and the poor poorer” (Rogers 2003, p.444). Does the innovation advantage a few wealthier members, or is it profitable for everyone, especially those most in need? However, the separation of desirable from undesirable consequences is impossible. Further, for whom is the diffusion desirable?

**Bias and Blame**

There is a presumption that ‘success’ of an innovation is the speed at which it diffuses by all members of the social system without re-invention of any kind. Moreover, there is an understanding that all innovation is inherently ‘good’ and desired by the intended users even if they don’t know it, yet. This was the first major criticism of the Theory from 1971 and has yet to be overcome – a pro-innovation bias. The reason being that most diffusion studies are conducted retrospectively, sometimes years after the release of an innovation. This then creates a bias on the part of the researcher who although “implicit, latent, and largely unintentionally”, look for successful diffusion, as the trail it has left is much easier to study than those less successful and furthermore because they tend to be more dynamic and noteworthy thus increase researchers interest (Rogers 2003, p.111). This leads to innovations that were rejected or reinvented attracting limited coverage and thus our understanding of anti-diffusion is very weak. Moreover as diffusion research is often conducted and funded by research and development departments (R&D) of the organisations financially vested in the innovations success (i.e. change agencies),
there is a high probability of their organisational biases prevented an objective representation of events (Rogers 2003, pp.106–10). Furthermore, if a study is mandated by a change agency to research the diffusion of their products, and they pay the researcher then she/he does not have the ability to select the specific innovation. Because of this bias in the selection process, there is substantially more knowledge about those innovations that diffuse faster, are adopted and not rejected, and their use is not discontinued. Unfortunately, logically, financially, methodologically and intellectually the choice of innovations that are deemed a success attracts more interest whether the selection is independent or not.

In order to overcome this bias, it has been suggested that research into innovation diffusion begins before the diffusion result is already known, i.e. during the process instead of after. Data collection is normally in the form of surveys asking adopters when they chose to adopt, but this retrospective technique is not very accurate, as this process may have begun years ago and therefore open to sizable human error. Moreover, surveys often fail to unearth why these decisions were taken. If research were conducted during the diffusion process, other methodological techniques could be employed such as in-process experiments, field experiments and investigations, case studies or varied data sources (Rogers 2003, p.128). Furthermore, a focus on technology clusters or a comparative study or similar innovations could overcome the pro-innovation bias. Moreover, rejection and re-invention need to be seen a normal and rationale decision, and not reduced to simplistic labelling of an individual as traditional or resistant to change. Ultimately, the end user understands their context better than a researcher and the reduction of innovation to a ‘one size fits all’ is a poor summary for not choosing to adopt (Rogers 2003, pp.114–5). Further, greater knowledge and emphasis should be placed on understanding the context and the motivations of both the potential user and the change agency. For example, little time is dedicated to examining why the change agency decided to diffuse this innovation over another.

The second criticism is the individual-blame bias. Closely linked to the pro-innovation bias it shoulders the blame on to the individual for poor, slow or undesirable diffusion. It is in direct contrast to system-blame, or even organisational-blame. Diffusion researchers have been critiqued for siding with their change agency of employment and mirroring their ideological beliefs and understandings of the social system (Rogers 2003, p.118). The relationship between researcher and change agency may also prevent a truthful depiction of blame. Holding the individual to account for blame, as opposed to the change agency or even system wide failings such as marginalisation, education system failings etc. is much easier. This mentality of ‘if the shoe doesn't fit, your foot is wrong’ often scapegoats the real problems onto the voiceless individual who opted not to adopt. For example, years ago before it was common knowledge, lead paint was a cause of child death, who is to blame in this situation? The individual who bought the paint unaware of the dangers, or the company who manufactured it marketed it and
sold it? Often the blame was placed on the parents whose economic budget led to that paint choice and not the wider system failings preventing this from happening. In reality it is a combination of both factors, but instinctively, the wider system is hard to blame and hard to change (Rogers 2003, p.119). But this rarely materialises as change agents and their agencies escape blame for inappropriate methods and biased information and promotional advice. Blame is placed on those who could not afford, with less education, and those furthest removed from those involved in the diffusion process. A familiar victim of blame within diffusion research are the laggards and the late adopters who are ultimately described as ignorant to change, traditional, or irrational for failure to adopt or adopting late. However, there is a suggestion that since less emphasis is placed on encouraging such people because of this predestined labelling technique, they receive less information and knowledge and thus more unlikely to adopt by virtue of the stereotype (Rogers 2003, p.121).

There needs to be more care placed when assigning blame, this could be achieved by readressing who is the focus of the study – the individual, the system, the organisation? More attention needs to be paid to change agencies intentions, influence and agenda as well as shifting the perspective to contextual factors of influence and ensuring that cause and blame are distinctly separated concepts. Relatedly, researchers need to be aware that blame is more easily placed on individuals rather than the more difficult task of addressing blame within the systems structures and norms. Diffusion research often implies that all variables will ultimately “lead to” innovativeness, and fail to register that for this to happen a variable must precede the innovation, and must relate or co-relate to the innovation with a degree of theoretical basis for impacting innovation and not just because a person is deemed traditional and therefore impervious to change (Rogers 2003, p.128).

**The Inequality of Diffusion**

The Diffusion of Innovation Theory uses socio-economic markers as the basis for its analysis to know who will be innovators and who will be laggards. Moreover, the reduction to socio-economic and belief markers, appears to be a simple division of those who have opportunities and options vs. those who have less so. It claims that these markers define personal traits within individuals that group them into five ‘innovating’ categories. Analysing this methodology of the Theory, but also in light of the social determinants of health and vulnerability, it is clear that this division into those who have, and those have not, only further disadvantages those who in circumstances with less access to resources while those with greater access continue to grow. Yet, only a tiny percentage of studies have focussed on the socio-economic consequences to the Theory and the inequality between those with innovation and those without. Dismally, Rogers (2003, p.130) maintains that “when the issue of equality has been investigated, it has been shown that diffusion of innovations often widens the socio-economic gap”. This observation has been especially sharp in developing countries, however in the growing inequality in many
developed countries such as the USA or the UK, one would expect to find a similar result. The Theory became popular in the Global South during the late 60s and 70s mainly by researchers and scientists who had been educated in the US and Europe returning to their home country to conduct research. Initial results showed the same findings as in the US and Europe, however as global definitions of what constitutes development shifted from economic prosperity, central planning and technology transfer, to a vision of “a widely participatory process of social change in a society intended to bring about both social and material advancement” (ibid), with a focus on vulnerable and marginalised populations, the Diffusion of Innovation was out-dated and seen to further marginalise vulnerable populations.

Key critique came during the late 1970s questioning the applicability of the Theory in regions where the level of development was much less than the regions of origin. The solutions to implementing the Theory in developing countries mainly focussed more on the unanswered why questions which also evaded studies in the Global North. A vocal scholar Juan Bordenave suggested a more robust innovation selection process through the creation of a criteria guide, for example does the innovation promote public health, increase production, maintain low community prices or increase profit for the local elite? Is the innovation appropriate, proven and adequate for the level of development? How could the social structures influence the innovation-decision process that differs from more Western structures? In sum, the focus of critique centred on the context and the different nature of the social systems and communication channels in the Global South (Rogers 2003, p.132). Fajans et al (2006, p.435) assert how persistent problems caused by destructive policies such as structural adjustment, economic downturn, weak processes orchestrated by weak institutions have weakened developing countries health systems and created environments not favourable to innovation. To counter this endemic problem in the field of reproductive health, Fajans et al suggest a strategic approach based on the Diffusion of Innovations to strengthen reproductive health services. However this approach is an “incremental, interdisciplinary and country-owned process that can set in motion much-needed change”, but it is also not very compatible with existing social beliefs and values surrounding sexual and reproductive health, as well as being highly complex. But it is trying to overcome the inequality created by introducing innovation in healthcare.

In general, it was found that in low-resource settings innovation tends to remain within wealthier groups who were seen to be more responsive to innovation and the change agent, while clear disadvantages were seen for less affluent businesses, farms, or individuals. Thus, the innovation was seen to widen the gap in these settings. Denis et al (2002, p.67) believe this is because of the preconception that social systems will act in a rational and self-sustaining way, but this is not the case. Social systems are irrational, unbalanced and vulnerable to power shifts and distribution. Thus the benefit of innovation clings to those holding the reins in terms of values and interests. Schrage (2004) maintains that the most powerful thing in this world is the
power accompanying an innovation that has been diffused to the point whereby it enjoys both global reach and global impact. Further, he claims that the key to unlocking empowerment comes from the ability to access innovation, and not from simply access to ideas, which can only promote awareness. However, Rogers (2003, p.134, 457) claims that with a special focus and attention to socio-economic gaps and the specificities of social structures and norms in low-resource settings, the diffusion of innovation can benefit those of a lower socio-economic status to help lessen the divide. However, it is important to note that the social system itself, will partly determine the level of inequality caused by innovation based on its own structures and norms (Rogers 2003, p.463). Therefore if the system is considerably unequal before introduction of an innovation, then innovation will continue to cause greater disparity within society. Therefore, even if the diffusion of innovation is about choice as Schrage (2004) believes it still remains that not every member of the social system will have the ability or opportunity to choose adoption.

A vital assertion is that innovation is not only moving from the North/ South, developed/developing, centre/periphery, it is moving in both directions, this is often forgotten or ignored in the diffusion literature and remains unexplored by researchers (Gluesing 2012, p.128). If less attention was paid on more innovative groups, and an understanding of innovation flows surpassed narrow ideas of purely Western contexts perhaps such vast inequality could have already be reduced. Nevertheless, a special focus on people in lower socio-economic bands has been proven however, to either reduce or at least not widen the inequality gap through interventions that either disinterest groups who normally benefit from innovation or focussed targeting of communication channels unused by such groups (Rogers 2003, p.467). However, this approach requires an overt desire for such a result by the change agency.

---

1 This is the opinion of Clare Lofthouse and the diagram is a visual display of her personal interpretation of Rogers’ 2003 Diffusion of Innovations Theory
SOCIAL DETERMINANTS OF HEALTH AND VULNERABILITY

This section will briefly outline the perspective used in this research which has shaped its understanding of access to health care, availability of health care, but ultimately the variations in risk and vulnerability to crises of different members of a social system. It will highlight a dominant paradigm focussing on the science and technological advancement, compared to a more recent paradigm that cites socio-economic differences and historical processes at the heart of crises. This research is in line with the latter perspective.

THE SOCIAL VULNERABILITY PARADIGM

In direct opposition to the social vulnerability paradigm is a more mainstream response and understanding of crises. This dominant paradigm places strong emphasis on the scientific nature of disasters, and the science-based human responses and reactions to them. It suggests that hazards are uncontrollable acts of nature that are only slightly modified by modern scientific technology that aims to predict and reduce their impact on the human world. The understanding is that the human world and the natural world are two distinctly separate forces and that natural hazards are not affected by the structures of the built world. Those who are affected by these hazards are seen as random victims of the event. It focuses on a solid understanding of physical processes and neglects the social forces at play. Further this paradigm sees only death, injury and property destruction as consequences and does not assess other impacts that could include damage to the eco-system, social institutions, or political regimes (Fordham et al 2013, pp.8-9). Although this description thus far has centred on natural disasters, it is important to note that it can also be applied to man-made crises.

In opposition to this narrow view of what creates, sustains and impacts crises, the social vulnerability paradigm has evolved in recent years. Its focus is on social vulnerabilities, which it believes are rooted in the unique historical context of every setting. The social vulnerability paradigm states that vulnerability is born not only from the severity of the natural world, but as a direct result of the social structures and power relations within a social system. Fordham et al (2013, p.12) encapsulate this idea as follows: “Social vulnerability thus results from processes of social inequality and historic patterns of social relations that manifest as deeply embedded social structures barriers resistant to change”. Furthermore they claim that it is a failing of society when it does not recognise when some groups are more vulnerable and unable to mitigate the risks of impending crises in certain areas. Social vulnerability does not refer to one specific identity marker, but to a bundling of indicators, which at a specific time, and in a specific place can create greater, or lesser vulnerability to crises, and ones ability to recover. At the heart of social vulnerability is often poverty, marginalisation, and power relations, which according to Fordham et al (2013, p.11, 13) creates huge amounts of “predictable and disproportionate” death during crises. Because of their entrenched roots in the broader societal
The Social Determinants of Health and Vulnerability

The Social Determinants of Health and Vulnerability

During the process of research conducted for this investigation, I encountered several methodologies that attempted to deconstruct the dynamics behind why sub-groups of a given population were more prone to ill health and risk than others. Two concepts kept recurrently creeping into the literature giving weight to the socio-economic components of access and availability to health services by different members of a social system. The concepts, one entitled ‘The Social Determinants of Health’, and the other ‘The Social Vulnerability Paradigm’, were essentially arguing the same point however one focussed on health, and the other on vulnerability, but both attempted to demonstrate that the reasons for the discrepancies within the same population were not based on individual factors, but rather that they were products of a system wide failing. In either framework the same technique was employed giving the same result, for these reasons I have decided to combine the theoretical discussion on health and vulnerability into one compressed framework detailing the stance this research has taken.

Social vulnerability is a dynamic concept, and not simply a mechanism to assign labels to groups within society. The determinants of this vulnerability are a combination of, a) biological factors such as genetics, sex and age; b) environmental factors for example water, sanitation and air pollution; c) individual behaviour; and d) social environmental such as education, culture, gender norms, socio-economic status etc. (Skolnik 2008, p.18). All of these factors will change from person to person, and will play out differently in constrained under the pressure of humanitarian crises as will be detailed later in this work. The structures and norms that govern every society advantage some groups while disadvantaging others, however similar patterns of vulnerability can be seen throughout the world irrespective of time and place.

The main critique of approaches that use social factors to understand divisions, difference and variations within society, is that they – including the vulnerability approach, actually worsen the divide within communities, countries, and ultimately split the world more starkly into have’s and have not’s, while its people are depicted as passive subjects (Bradshaw 2013, p.15). The rhetoric around the division has taken many names of the past decades – first and third world, developed and developing and has now moved, according to Bradshaw (2013) to disease-ridden, poverty-stricken, vulnerable and disaster-prone countries. While Aoláin (2011, p.5) supports the use of the vulnerability approach in humanitarian crises stating: “the inevitability of [the] vulnerability approach demands an alternative to the dominant political and legal theories that are built around a presumed universal human subject supposed to possess the capacity to independently manage its needs and weaknesses”. She is
acknowledging that some vulnerability surpass the control of the individual, as they are a product of the greater social system. Attention will now be drawn to three key determinants of vulnerability of particular relevance to this research—health, women and gender.

**Health**

Health is both a vulnerability in its own right, while simultaneously superimposed on other socio-economic characteristics such as gender, sex or race (Thomas et al. 2013, p.235). Therefore health becomes both a cause and effect of vulnerability. Health cannot be contained within the health sector alone for it impacts on, and is at the mercy of every aspect of life from the economic, social, political to environmental. The link between the social determinants of health, and the social vulnerability paradigm is evident as they focus on the “underlying characteristics, circumstances and situations that contribute to health outcomes” (Thomas et al. 2013, p.242).

The Commission on Social Determinants of Health was set up in 2005 with a three-year mandate to “gather and review evidence on what needs to be done to reduce health inequalities within and between countries” (World Health Organization 2014a). It was comprised of “a global network of policy makers, researchers and civil society organizations brought together by the...WHO to give support in tackling the social causes of poor health and avoidable health inequalities” (ibid). In 2008 the Commission published its final report making three overarching recommendations to close the gap on global health inequalities and inequities: 1. Improve daily living conditions, 2. Tackle the inequitable distribution of power, money, and resources, and 3. Measure and understand the problem and assess the impact of action (CSDH 2008, p.2; World Health Organization 2014a). It has only been within the past decade that such external causes and effects are being examined as direct impacts on poor health. The Commission (CSDH 2008, p.1) states that “premature loss of life arises in large part because of the conditions in which people are born, grow, live, work, and age. In their turn, poor and unequal living conditions are the consequence of poor social policies and programmes, unfair economic arrangements, and bad politics”. These ideals are in direct agreement with those found within the social
The Social Determinants of Health and Vulnerability

Vulnerability paradigm, and to related extent, they create an avenue to overcome the individual-blame and inequality criticisms found in Rogers’ Diffusion of Innovation Theory. The social determinants of health have created a new space in which to redefine what generates and sustains vulnerability.

Vulnerability is not only about looking forward; in equal measure it is inherently a product of the past. Vulnerability is a crosscutting measure of societal structures. Figure 6, taken from Thomas et al (2013, p.245) details the relationship of health and vulnerability within society and in the wake of crisis. The vulnerabilities in daily life continue, and even worsen when placed under the stress of crisis, which seeks to increase vulnerability and widen the inequalities. It demonstrates the complexity of factors at play that create and limit health and vulnerability. Gage (2007, p.1668) highlights these issues by linking together, education, income and access to health services: “communities with a high concentration of poor households and a low concentration of well-educated residents are unlikely to have or attract the resources necessary to develop and sustain high quality health services”, thus perpetuating vulnerabilities and poor access. The link between socio-economic status and health have started to be well documented in the literature, however the full extent of these linkages remain largely unknown due to the difficulty in data collection and the range of factors. The discussion will continue with a focus on women and gender.

**Women and Gender**

Biologically women and men experience the world differently because of this physical difference, which creates biologically different health risks, for example men are at risk from prostate cancer and high cardiovascular disease, while women are faced with the risks of pregnancy and childbirth (second biggest global killer of women of reproductive age), cervical cancer, and drastically higher rates of thyroid and breast cancers (Skolnik 2008, p.18; World Health Organization 2013). However, other individual attributes create their health risks such as age and genetic markers. Some of these associated risks are unavoidable and unchangeable, however associated health risks found within the social, physical and behavioural environment vary across communities. These include (but not exhaustive), social status gender, culture, education, air pollution, water and sanitation access, practices and behaviours, access to healthcare as well as understandings of health. For example, low educational attainment has been closely linked to poor reproductive health autonomy, which directly links to an increased risk of maternal mortality as a result of lesser knowledge of obstetric warning signs (Yamin et al 2013, p.1). This sentiment is reiterated in much of recent literature, linking low socio-economic status to a variety of health conditions and diseases from alcohol consumption to malnutrition. Moreover, Aoláin (2011, p.6) claims that globally most women live in low- or middle-income countries with only 15% of 3.3.billion females living in high-income countries, and 1 in 3 living in low-income countries.
However, many differences in the health needs of men and women stem not from their biological components, but rather from the meaning which is given to them because of this difference, which is decided upon by the society in which they live, often with little choice by the individual (Bradshaw 2013, p.41). Until the 1970s gender was used interchangeably with sex. This has since changed but there is still considerable confusion between the two terms. Even today, governmental forms in the UK still ask the question of sex, as one of gender, offering the answers: male or female to a question on gender suggest a lack of understanding. Gender is something that we as individuals are taught over time, based on societies definitions of what it means to be a man or a woman, with limited options outside these two groups. The difference between nature and nurture can sometimes appear simple, but in the constructs of our identity it moves into a grey area. Does the biological fact that women give birth and breastfeed children mean that they should therefore be the primary career for the whole family because they are ‘naturally” better at it, or because they have been trained since birth in these duties (Bradshaw 2013, p.43)? In many societies being born a female and growing up within the social concepts of what women do and don't do can be detrimental to their health. Yamin et al (2013, p.2) conducted a study on the impact of maternal death on children and their family, and found a vicious intergenerational cycle linking maternal death to limited education, low household wealth, early marriage, younger age of first child, high parity, and so on, trapped whole communities in a perpetual cycle of poverty and maternal mortality. These gender-based disparities for women were found to span their lifetime cross cutting and impacting all socio-economic markers. The key to changing these statistics and vicious chains, is to improve access to reproductive health services, and work towards changing societal norms and beliefs (Hutton 2006, p.20). Maternal mortality has become “a marker of global inequality”, which shows “the widest discrepancy of all public health statistics” (Ronsmans and Graham 2006, p.1189-90).

In the context of humanitarian crises, this means that women and girls are often identified as vulnerable groups in need of greater assistance. In recent years there has been a, “recognition in the gendered dimensions of humanitarian emergencies” (Aoláin 2011, p.1) which has unintentionally created a global image of the vulnerable female victim, and a tendency to homogenise all women into this stereotype. In this same image, men became seen as dominant, powerful, lazy creatures who oppressed the women in their lives (Bradshaw 2013, p.51). Since then relief organisations try to create a balance in their depictions of those in need of assistance, however as most crises happen in low- and middle-income countries, mainly in regions of poverty or highly unstable, often with high inequality and stark gender imbalances, as Aoláin (2011, p.6) maintains; “as disasters place even greater stress on socio-economic capacities, as social nets disintegrate, and as the composition and structure of households fray, women's marginal status in families and communities can further destabilize”. There is a delicate balance between the fact that women and girls are more vulnerable than their male counterparts, while at the same time not victimising them because they are women and girls. Gender attentiveness of
the pre-existing discrimination, marginalisation and exclusion targeted at women in many societies is key to undoing the societal harms and addressing women’s needs. Furthermore, it is imperative that humanitarian response surpasses the basic practical needs of women, as “meeting women’s practical needs can only reinforce their subordinate position, not overcome it” (Bradshaw 2013, p.50). As Tobin-Gurley and Enarson (2013, p.141) and Bradshaw (2013, p.9) assert, gender is never a stand alone vulnerability, but rather part of ‘vulnerability bundling’ of socio-cultural and economic patterns which increase a person's risk to crisis. When coupled with the impact of humanitarian crisis, the vulnerabilities existing within society may revert to more traditional practices and beliefs as part of a coping mechanism.

“The combination of these pre-existing factors with situations of humanitarian emergency underlie the structural vulnerabilities to which women are exposed and that form the normal backdrop to women's lives. In sum, as a result of the complexity of pre-existing social inequities, women and children face singular challenges to their health and well-being in situations of complex humanitarian emergency. The combination of pre-existing biological and socio-cultural factors means those while the health status of populations as a whole deteriorates during complex humanitarian crisis, women and children are especially vulnerable.”

As the above quote from Aolain (2011, p.8) highlights, the magnitude of the problem of vulnerability in humanitarian crisis, but also how necessary it is for humanitarian organisations to be aware of the contextual factors.
The Non-Pneumatic Anti-Shock Garment (NASG) can be used to stabilise women who are showing signs of shock secondary to obstetric complications following a vaginal delivery, or if the foetus is no longer viable. This garment acts as a time delay to overcome the delays when accessing and receiving definitive treatment for all severe bleeding including postpartum haemorrhage, thus providing a greater chance of survival (as detailed in Part IV on Delays). This section will detail the history of the NASG, an overview of the evidence both in support and against use of the NASG in humanitarian settings, as well as an analysis of the NASG in light of the Diffusion of Innovations.
This innovative technology, is used in many countries and has been tested in low-resource settings in Egypt, Nigeria, Pakistan, Zambia, Zimbabwe, Mexico, Tanzania, Peru and India (see the map behind this text: UCSF 2014). The NASG addresses both the delays in reaching health facilities associated with home births, and those occurring once at an emergency obstetric care (EmOC) facility. The NASG is a compression device that has been modified from earlier anti-shock garments (ASG) that were used for a variety of medical interventions since the 1900s whereby compression sought to stabilise patients. The University of California, San Francisco (UCSF Safe Motherhood Program 2013) has developed and worked with the NASG in low-resource settings since 2002 and describes how the garments works: “the NASG applies circumferential pressure to the lower body and uterus which increases circulating blood to the heart, lungs and brain, and decreases the rate of blood flow in the abdomen and pelvis”.

Although several ASGs have at times been medically discredited for their limited impact on life-saving capacity, none were ever discredited for their potential to stabilise cases of pelvic haemorrhaging in obstetrical care. The first compression device was developed by George Crile in 1900 to maintain the blood pressure of patients during surgery (Miller et al 2007, p.1, 2012, p.319). Since then it has undergone many modifications and improvements, but none so simple as the newest ASG designed to specifically address obstetric haemorrhage which, in stark contrast to all other versions, does not use an inflatable system demanding complex management and costly maintenance (Miller et al 2012, p.319). Instead, the NASG resembles the lower half of a full body wetsuit split into six Neoprene and Velcro horizontal compartments that are tightly wrapped around the women starting from section 1 by her ankles and ending at section 6 over her abdomen (see Figure 3 for a visual representation). The three lower sections wrap around each leg, with a section 4 over the pelvis, and section 6 over the abdomen containing a small foam compression ball (section 5). Unlike previous versions, the independent section openings allow for total access to the perennial by opening section 4, while the rest of the suit maintains vital signs (Miller et al 2012, p.321). As Miller et al (2007, p.7) explain the design permits that:
“...Urinary catheters can be placed, genital lacerations can be sutured, speculum or bimanual examinations can be performed, and manual vacuum aspiration or uterine exploration or curettage can be accomplished with the NASG in place. Thus, the source of much obstetrical bleeding can be located and repaired while the garment maintains vital signs.”

Following surgery the garment can be closed over any bandages as it has not been found to increase level of pain at the incision areas, conversely it appears to serve a “splinting function” (Miller et al 2012, p.322). The NASG should be seen as a first-aid device for “reversing hypovolemic shock and decreasing blood loss secondary to obstetric haemorrhage” (Miller et al 2012, p.318). Due to the Neoprene and Velcro materials it is lightweight, easy to use, washable, reusable up to 40 times, simple maintenance and storage, and requires minimal training, thus NASG is highly suitable for low-resource settings. By contrast to earlier ASGs, application training can be given to people of a non-medical background taking approximately one hour, but only medically trained personnel should conduct removal. Once trained application takes just 2 minutes requiring only one person, and a further 10 minutes for patients to regain consciousness from severe shock, and vital signs to begin to recover (ibid, p.321).

Application of the NASG has been proven to drastically reduce blood loss from the vagina and retroperitoneal organs or vessels associated with obstetric haemorrhage (Fathalla et al 2011, p.3; Miller et al 2012, p.319). Furthermore, due to its manufacturing sites in the USA, China and India the cost has been almost halved to around $75 per NASG from $160 in 2007 (Maternova 2014; Miller et al 2007, p.7). This cost can be substantially reduced even further depending on the size of orders (direct email correspondence with Maternova supplier). In fact, Kausar et al (2012, p.314) claim that for their study in 2012 NASGs cost only $55 per suit, which if reused the suggested 40 times is only $1.50 per wear. The authors also assert that in regions like sub-Saharan Africa when health spending on maternal healthcare is only $2 per person affordable solutions are imperative. Comparably, previous inflatable versions of ASGs cost between $600 and $1000 per device (Miller et al 2012, p.319).

Perhaps a similar concept, although today highly disputed for its effectiveness within the medical profession is the Trendelenburg anti-shock position, which was first developed in the
late 1800s by German surgeon Friedrich Trendelenburg. This positioning, which was used to treat shock involved “the patient being placed with their head down and feet and legs elevated. This position was promoted as a way to increase venous return to the heart, increase cardiac output and improve vital organ perfusion” (Johnson and Henderson 2004, p.48). Following widespread use throughout the 1900s via strong advocacy during World War I, this position has become common knowledge among medical practitioners despite concern over its effectiveness and the potential harm. Today, the recommendation is not to use the position unless essential for the insertion or removal of central venous catheters or certain spinal anaesthetic techniques (Guthrie 2010). Yet, it continues to be practiced for shock in many settings as the current research is poor and although it has failed to prove benefit, Johnson and Henderson (2004, p.49) suggest that that in itself it does not necessarily prove absence of benefit.

**TRIALS, STUDIES AND RECOMMENDATIONS**

An analysis of all studies and clinical trials testing the use of the NASG in low-resource settings up to 2012 totalled over 5500 women and found that the garment can be worn for extensive periods of time with no adverse effects. An average wear time of between 18-24hours was recorded, with one woman in Nigeria reportedly in the garment for almost 60hours with no adverse effects (Miller et al 2012, p.321). A more recent study in Zambia and Zimbabwe found that it is not the length of time in the suit that impacts outcomes, but rather earlier application. In this study however, adverse outcomes were noted as increased abdominal pain for the NASG intervention group (Miller et al 2013, p.8). Worryingly, more recent studies have highlighted complacency in the receipt of definitive treatment by healthcare providers for those women wearing the NASG. This is due to stabilised vital signs and regained consciousness compared to control groups. Thus NASG intervention groups have been receiving definitive treatment slower, intravenous fluids later, and a slower receipt of blood transfusions than control groups (Fathalla et al 2011, p.3; Kapungu et al 2012, p.559; Miller et al 2012, p.324, 2013, p.10). Training must therefore, emphasise that the NASG is not definitive treatment but acts purely as a time delay to stabilise patients, and does not treat the cause of the shock (Miller et al 2012, p.324). Nevertheless for women in the NASG intervention, recovery time and overall outcomes were still comparatively better, including decreased blood loss, reduced need for emergency hysterectomy and a reduction in mortality and morbidity outcomes (Kausar et al 2012, p.312; Miller et al 2012, p.321).

Contrastingly Coeytaux and Wells (2012) conducted a review of the NASG in 2012 and found that although the garment was clearly a lifesaving device, its impact on mortality and morbidity remained questionable because the authors attributed the reduction in adverse outcomes not to the use of the NASG, but rather to improved care at the facilities where trials were underway, directly linked to the training on the active management of the third stage of labour (AMTSL) accompanying NASG rollout. Coeytaux and Wells (2012) therefore advocate for health systems
strengthening and not necessarily the use of the NASG questioning the cost effectiveness of the NASG interventions compared to re-training staff. Miller et al (2012, p.321) assert that the NASG is not a replacement for medical techniques, AMTSL or uterotonic agents, rather it is a “damage control” resuscitation measure and should not prevent protocols for the management of postpartum –or other obstetric haemorrhage. However, it remains a contested debate whether it is possible to access, change and improve health systems without a new and interesting device to refocus the problem of postpartum haemorrhage in those regions where it is most needed.

Clearly however the NASG is gaining ground with influential public health figures as in 2011 it was recommended for the prevention and treatment of PPH by the International Federation of Gynaecology and Obstetrics (Lalonde 2012, p.115-6), and it has been presented in the Global Library of Women’s Medicine (Arulkumaran et al 2012) textbooks and guidelines since 2011 through dedicated chapters. Importantly, the WHO guidelines and recommendations for the prevention and treatment of postpartum haemorrhage also endorsed the NASG for use in the treatment protocol for PPH “as a temporizing measure until appropriate care is available” (World Health Organization 2012a, p.6). However, this is a “weak recommendation, low-quality evidence”. Several reasons for the weakness of this endorsement could be related to the fact that the NASG is more appropriate in low-resource settings where health infrastructure and emergency transport is either unavailable or weak. In better-resourced settings there will be a reduced advantage to use (Miller et al 2012, p.320). Moreover, since the WHO publication in 2012 much testing and rollout across many countries and regions has been conducted lending more credibility to the garment through greater data collection and stronger evidence testing against reducing mortality and morbidity.

USE IN LOW-RESOURCE SETTINGS

PathFinder International (2010) developed a continuum of care model for the prevention of postpartum haemorrhage (CC-PPH) for communities in low-resource settings. This model reinforces the use of AMTSL as well as advocating for appropriate techniques at the community level adapted for the specific context. Apart from the addition of the NASG, this model is not new or innovative. These techniques should be standard procedure, however in low-resource settings the lack of skilled staff, resources and training can make these tasks difficult to adhere to. As Kauser et al (2012, p.312) support, “in these busy, understaffed, challenging environments protocols were not always followed”. Pathfinder International has had great success with its CC-PPH model as it incorporates the NASG into a holistic package, or techno cluster of innovation, that addresses many delays in the definitive treatment of PPH that speak to the community and facility level. Yet Coeytaux and Wells (2012, p.3) remain critical of NASG interventions as they believe efforts and resources should prevent PPH and not wait until stabilisation methods are necessary, stating that, “it seems apparent that efforts to prevent
The Non-Pneumatic Anti-Shock Garment (NASG)

Haemorrhage from occurring in the first place holds greater potential for saving lives than using the anti-shock garment”. Instead, Coeytaux and Wells (2012) champion misoprostol distribution in low-resource settings as a low cost simple preventative intervention, while maintaining that unless definitive treatment is available the NASG is useless. However, supporters of the NASG would pose that the two interventions are not mutually exclusive, but rather complementary. As has already been seen in earlier chapters of this research, to fully address the extent of the delays framework and the contextual vulnerabilities associated to it, PPH interventions must be holistic in nature, as the Pathfinder model above details. Kapungu et al (2012, p.559) echo these sentiments, asserting that solutions must bear in mind the “unique social, cultural, economic, geographical, political, and health system factors”. Similarly Prata et al (2013, p.749) also conclude that, “each country must develop its own context-dependent policies and programs, incorporating myriad approaches that combine the most resent recommendations and reflect the experiences of other countries”. Contextual tailoring of PPH interventions is essential to ensure successful adoption premised on medical practitioners, facilities as well as women and their community.

Adoptability of the NASG

Technology Cluster

In accordance with the Diffusion of Innovation theory, the NASG can be seen as part of a wider technology cluster of innovations targeting PPH in low-resource settings. Rogers (2003, p.249) states how “the boundaries around any given innovation are often not clear cut or distinct. In the minds of potential adopters, one innovation may be closely related to another”, for example recycling paper and recycling plastic. Promoting technology clusters can sometimes be more advantageous than supporting each part individually. Innovation related to the NASG includes misoprostol, Uniject oxytocin, reassertion of AMTSL training and techniques, antenatal care checks as well as other interventions which may or may not be new in their lifespan, but when re-bundled and re-contextualised to a new setting, they have the perception of being new, and therefore innovative. Coeytaux and Wells (2012) have criticised the NASG for being a gimmick

Table 1 - Pathfinders CC-PPH Model (Coeytaux and Wells 2012; Geller et al 2013, p.555)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 1. | AMTSL  
Prevention of PPH including administration of uterotonic agent, controlled cord traction, manual removal of placenta… |
| 2. | Blood loss estimation device  
For early detection of haemorrhage |
| 3. | Early treatment for PPH  
Using fluids and uterotonic agent |
| 4. | Community Mobilisation  
To improve transport and communication to referral hospital |
| 5. | NASG  
To stabilise and resuscitate |
| 6. | Comprehensive emergency obstetric care  
To provide definitive treatment including blood transfusion and surgery |

Implementing the NASG in Humanitarian Settings: Adoption or Rejection? 46 of 116
and a tool of political leverage to access otherwise unreachable health systems by external intervening bodies, or change agencies. However, the inclusion of the NASG into PPH cluster interventions has created a perception of ‘newness’ to the entire package. This perception of newness is a key driving force in innovation diffusion (Rogers 2003, p.12). In a study from rural Mexico, Berdichevsky et al (2010, p.446) investigated diffusing the NASG into “functioning health systems”, and found that adoption was “strongly influenced by provider perceptions and context-specific resources”. Furthermore, contrary to interventions in Egypt and Nigeria where adoption had been rapid, implementation in Mexico was slower than expected. Berdichevsky et al (2010, p.445) found that in order for total adoption, the NASG had to be accepted by the women, their families, the community and healthcare providers.

Attributes of the NASG

As has been shown, there are 5 attributes of innovation that increases the likelihood of successful innovation leading to a greater rate of adoption – relative advantage, compatibility, complexity, trialability, and observability. Firstly relative advantage, there is no other stabilising device for women suffering PPH, or other obstetric haemorrhage. There is a clear relative advantage but only when the device is contextualised in low-resource settings such a crises where the need is more pronounced. In more resource secure regions, there is little advantage to use since ambulances, medical care, drugs and equipment are not threatened by constraints on access or availability. Berdichevsky et al (2010, p.452) reiterate this finding, stating how the relationship between the staff who developed ownership over the NASG and championed its use, verses the staff who did not, was premised on their level of exposure to women dying from PPH. Compared to using the NASG to act, stabilise and ultimately save lives. ‘ Owners’ as they are called in the study, but Rogers’ (2003) would label them innovators, were those who came from geographically remote places and thus transport links, supplies and technical skills were all located considerable distance away. The NASG was able to overcome these delays and fill a need. The character of owners and innovators by either author do not necessarily match up 100%, since innovators tend to be highly educated, high social status and cosmopolitan. However, as the theory was developed in the Global North, these categories have taken new meaning in different contexts. Ultimately, the relative advantage of the NASG was strongest when it was associated to ownership that was premised on need.

Even though other PPH innovation have also proven to be effective in addressing PPH in low-resource settings, such as misoprostol, this does not mean that these innovations are in competition with one another since they each possess unique qualities. For example, misoprostol is unable to stabilise a patient who is already showing signs of shock, but it does provide a preventative cause of action directly after vaginal birth. Whereas the NASG is only suitable once the signs of shock have started to show, it is a quasi-preventative innovation and position in the process is much later than the administration of misoprostol. However evidence
has shown that the stabilisation the NASG can afford by postponing the onset of shock secondary to haemorrhage, lasts for around 60 hours of wear, giving sufficient time to reach medical care and receive definitive treatment – a quality misoprostol is unable to perform once signs of PPH have begun. Therefore misoprostol acts preventively and the NASG in a quasi-preventive capacity. Differentiating it from other preventative innovation, the NASG has observable and visible outcome on women suffering from PPH and other obstetric complications. Because of this observability, it does not fall into the trap of preventative innovation that is normally premised on a non-result outcome. Together misoprostol and the NASG could create a safety net for women in crisis settings.

In a paper by Berdichevsky et al (2010, p.449-50) they categorise the medical staff based on their desire to adopt the NASG as; owners, doubters, resisters, and rejecters. Doubters consisted of both nurses and doctors who following training still remained unsure as to the potential of the NASG. This was quickly reversed after witnessing the effects of the NASG on a patient. Interestingly, nurses doubted the NASG because of a fear for the wellbeing of the patient, whereas doctors doubted its mechanisms and insisted on more objective data for confirmation. In this example, observability was a major factor in the decision-innovation process for many practitioners. By contrast, the resisters either remained unmoved after witnessing the effects, or needed to witness it many times before they were convinced. This group was distinguished by their preference to the protocols and procedures already in place and unwilling to change them, especially as they perceived the NASG to diminish the need for their skills, and thus power within the hospital. However, some did reverse their opinion admitting that they are simply “slow to change” (Berdichevsky et al 2010, p.451). The rejecters remained unconvinced by the device, but important to note that most in this category did not witness a patient stabilise by the NASG as these, typically obstetricians were based in large tertiary hospitals and not the community facilities that were the focus of the intervention. This group of doctors had also not been involved in the introduction and training of the NASG and may have felt ignored or undercut by the arrival of the device (Berdichevsky et al, 2010, p.451).

This demonstrates how the medical community can be divided by the NASG, especially based on subjective perceptions. Regardless of the evidence behind the NASG it is still under-adopted. Promisingly, the cost of the NASG has decreased dramatically from almost $200 to $55 or even less. Even though adoption has been relatively slow, production costs and the creation of regional manufacturers has brought the commodity price down, further advantaging adoption. Comparatively however, there has been no cost analysis of an intervention using the NASG verses other PPH interventions. For example, there is markedly less training involved and fewer system changes necessary when implementing misoprostol over the NASG. This could prove to be a barrier. Rogers (2003) notes how in some cases, other components of a technology cluster can inadvertently, or purposefully, prevent the diffusion of related innovation due the
perception of \textit{complexity} involved. A common phrase in diffusion research is that people search for the ‘magic bullet’ innovation, which demands limited behaviour change but maximum benefit (Fajans \textit{et al} 2006, p.435; Greenberg 2006, p.209). The NASG requires special training and encourages system strengthening when implemented. Trainings are fairly quick and simple to understand, moreover the garment itself is very low technology and easy to comprehend. However, the perception by a health system or organisation to dedicate time and resources to conduct system-wide training may act as a barrier. In crisis settings, the NASG is aimed at either national health systems or medical humanitarian organisations, but as Sanson-Fisher (2004, p.S56) asserts, “the healthcare system has a hierarchical model, with separate organisational structures for each professional group. The system is often bureaucratic, with social norms that hinder rapid change”. In support, Poulin \textit{et al} (2013, p.185) state that when attempting to introduce innovation into healthcare systems, “while technology can improve safety and have other benefits, it can also bring new risks and contribute to the increasing cost of care”.

\textit{Implementation}

The ‘hardware’ of the NASG is static and it must be used for its intended purpose as it was designed. However the methods used to implement the NASG are wide-open for manipulation by each context, need and requirement. For example, implementation could focus on improved training and skills of outreach nurse-midwives, or as part of a general update of obstetric practices. “NASG use was influenced by the diverse settings and clinical backgrounds of providers involved. The setting, training, profession, gender, and need for its use” (Berdichevsky \textit{et al} 2010, p.454). This demonstrates how the social system influences the innovation as much as the innovation influences the system. Tailoring and targeting of the NASG is vital to secure successful adoption in areas where need is high. Compatibility is premised on \textit{need} for the innovation, and as Berdichevsky \textit{et al} (2010, p.452) have shown, adoption was greatest where need was highest. In many low-resource settings there is a clear need for interventions addressing PPH as 27\% of all maternal deaths are still caused by severe bleeding (World Health Organization 2014b). This is the single biggest maternal threat to women worldwide as low-resource settings and crises are often coupled with high rates of home births and poor transport, further local beliefs surrounding the birthing process, and perceptions of the local medical facilities and staff can deter women from facility births (Brighton \textit{et al} 2012), not to mention the added security concerns associated to crisis settings.

Berdichevsky \textit{et al} (2010, p.452) found that factors conducive to NASG adoption was a clear need, smaller facilities (fewer people involved in decision-making), lower staff turnover, direct training with a high percentage of staff trained, commitment to the community, and finally environments where power and control were more equal and nurses and nurse-midwives felt ownership over their work decisions and respected by senior staff. Further, staff who were from
the community had a greater incentive to learn new techniques to combat PPH and share their knowledge and experience among the community. By contrast, Berdichevsky et al. (2010, p.453) found conditions creating a negative response to the NASG came from larger facilities who were competing for resources in-house, but also when there was conflicting medical opinion on PPH treatment and prevention by senior practitioners. Hierarchical structures, a belief that new innovation would reduce or shift power and control away from surgical teams and their specialised skills, as well as a perception of distrust towards foreigners (the researchers) all worked against the success of the NASG. Finally, as tertiary hospitals had not been the focus of the research, they had not been included from the start in terms of planning or training. This was seen as a major inhibitor to adoption as the surgeons, doctors and other high profile stakeholders were not incorporated into the study and ultimately they were key decision-makers on innovation adoption. Rogers’ (2003, p.365) has dedicated considerable time to the depiction of change agents in his Theory. Berdichevsky et al. (2010, p.452, 455) found that who introduced the NASG and the bundling of staff into consolidated training deeply affected participants level of adoption. For example, in the more rural communities greatest impact was made if ‘outsiders’ and ‘foreigners’ ran the training as this gave the impression of being specially chosen and important to staff. Whereas, in higher-level facilities staff were much more receptive if the trainer was respected, influential and ‘one of their own’. Further, tailored trainings dividing medial professions (i.e. nurses from doctors) allowed added security for staff to ask questions to fully understand and be involved.

The NASG can fulfil each required attribute to be compatible in humanitarian settings with Rogers’ theory of the Diffusion of Innovation. However, there are forces which may prevent its adoption, such as the social system in which it needs to diffusion – either national health services or medical humanitarian organisations, are both plagued by structures and norms not easily changeable or even open to change. The NASG has proven that it can act as ‘political game changer’ in such situations by “serving as a tool that inspired interest and collaboration from governments, non-profit and private-sector partners and donors” (Coeytaux and Wells 2012). Moreover, awareness about the NASG still remains to be stuck in a small circle of avid supporters and avid opponents, despite support and recommendations by the WHO (2012a) to use the NASG as a tool for PPH treatment. For serious discussion about overcoming barriers of scaling-up and entering the humanitarian sector, awareness of the garment needs to circulate through relevant communication channels. A key concern when diffusing innovation are the consequential ripples caused by changing practices and behaviour within a social system, especially when implementation is in less stable and weakened societies, as is the case during and after humanitarian crises. The widening of inequality is a well cited criticism of the Diffusion of Innovation, yet Rogers (2003, p.467) maintains that with careful analysis of the social, cultural, economic and political context, the most vulnerable groups of society can benefit from innovation diffusion. Re-invention of innovation has gained weight within
diffusion research in recent years and the targeting and tailoring of implementation strategies is believed to encourage sustainability and ownership over innovation.

**CHALLENGES MOVING FORWARD**

By introducing the NASG as a first-aid tool it revitalises the problem of postpartum haemorrhage by repackaging certified evidence-based methods to reduce mortality and morbidity. By their own admission, Coeytaux and Wells (2012, p.5) clearly state that without the NASG as a “political game changer” access to health systems would prove difficult. Until comprehensive emergency obstetric care is available to every woman, everywhere, creative strategies and technologies will be needed in low-resource settings to address gaps in healthcare availability and access. The challenges remain that implementing such a technology in weak, under-resourced health systems is useless unless adequate training and supplies can also be secured. The NASG is not a replacement for other interventions, and it has been shown that PPH demands multifaceted strategies and complementary actions in order to succeed in reducing maternal mortality and morbidity (Geller et al 2013, p.1), partly because of the volumes of women giving birth at home away from skilled birthing attendants. It has been observed by Kausar et al (2012, p.313) that, “only a low percentage” of SBA in a variety of developing countries who attend facility births “can correctly perform bimanual compression or insert an IV”, suggesting a general gap between competency and evidence-based standards. This lack of training, lack of practice and lack of supplies is worrying as an unpractised SBA will not help to lower rates of maternal mortality and morbidity.

Due to these gaps in the health systems in many low- and middle-income countries, it is imperative to support evidence-based innovation addressing PPH; aside from the NASG these could include blood collection drapes, misoprostol and oxytocin Uniject™. Community support and engagement to improve access to EmOC facilities as well as emergency communication systems, early access to uterotonic agents, a reliable aid to overcome the delays associated to home births and poorly resourced EmOC facilities (Kapungu et al 2012, p.560), are key to combating the unnecessary death of thousands of women every year. However, there remain complications, barriers and opposition. Many authors champion the use of SBAs and lay health workers by increasing their numbers and responsibilities and encouraging facility births. But this is only an option if the health system can cope with more patients in terms of resources and staffing. As Prata et al (2013, p.746) realistically note, “these interventions are not a replacement for weak health care infrastructure and limited health care personnel”. However, in humanitarian response the appropriate staffing and support should (ideally) be pre-disposed. Yet, once that team has left and taken supplies and staff with it, what is left for the local population? It is imperative to support and sustain services as best as possible following humanitarian exit strategies, and therefore the sustainability of projects must be planned prior to arriving and must involve and build on national services. As most medical organisations
would rather work in pre-existing hospitals than build new ones or ship field hospitals in, an opportunity arises to strengthen the existing national health system and services through humanitarian response. Therefore, it is essential that humanitarian organisations develop “a disaster relief team with experts in maternal health” in order to support local maternal health services (Nour 2011, p.22). Kapungu et al (2012, p.558) has highlighted that barriers to NASG uptake could be found within the medical profession. Scepticism about the garment’s abilities and uncertainty over the amount of evidence testing undertaken could cause hesitation for use. Moreover individual practitioner perception of PPH and the NASG may create resistance to change practices, implementation methods and behaviour towards PPH management. These challenges could stall adaptability, as senior medical staff will be vital stakeholders. Prata et al (2013, p.746) states that the chain of adaptability for medical innovation is as follows: research and testing; awareness; acceptance; adoption; and finally, clinical practice. By this measure the NASG is in mid-cycle.

In conclusion, the on-going challenges for NASG use in humanitarian settings appear to be; 1, within the medical practitioners – both the international and local staff regarding their willingness to change and adopt new techniques; 2, weakened national health systems; and 3, competition from other low cost interventions addressing postpartum haemorrhage. Some of these challenges will be addressed in Part VI through a case study on NASG use in refugee camps in Tanzania.
PART IV. THE CONTEXT

The first section will explain what postpartum haemorrhage is, how it caused, prevented and treated, and also who is affected by it. Further, it will examine the burden of maternal mortality from a global perspective, and the differences between regions and countries of the world. It will discuss how and why women and girls face adverse risks in some places, but not in others. Pulling together PPH into the context of humanitarian crises, discussion will focus on constitutes a humanitarian crisis, and the risks it creates for reproductive health. Finally, it will delve deeper into the specific niche of sexual and reproductive health (SRH) in humanitarian settings to explore current intervention methods, global and organisational priority setting, together with issues related to access, supply and staffing.

The second section will discuss the influence that culture has on health, and health-seeking behaviour. It will address how health both contributes to vulnerability, while simultaneously being a consequence of other underlying vulnerabilities. Moreover, it will further a discussion around these topics focussing on women, as well as the impact of these factors on humanitarian practice at the organisational and individual practitioner level.
Postpartum haemorrhage or PPH is a severe bleed that usually happens within the first few hours postpartum - after delivery. It can be caused by several factors such as an atonic uterus, retained placental tissue, vaginal injury or trauma. Additionally the bleed may be concealed and often the symptoms are accompanied those of hypovolemic shock (Draycott et al 2010, p.82).

Miller et al (2007, p.3) defines PPH as “vaginal bleeding in excess of 500ml after vaginal delivery and in excess of 1000ml after caesarean delivery”. The average healthy pregnant woman has an elevated amount of blood in her body. The increase of blood, around 6-7 litres compared to around 5 litres, provides a physiological protection from haemorrhage and shock. See Table 2 for more details on the symptoms of shock. However, in low-resource settings where medical care is unavailable or those present at birth are not skilled professionals, a woman can easily loose too much blood and slip into shock and die shortly after if medical care is not sought out fast enough. For those women who reach medical care in time, they can endure lifelong morbidities. According to Miller et al (2007, p.3), “For every maternal mortality, there are 30 maternal morbidities, which compromise women’s lifetime health, productivity, quality of life, family health, and ability to participate in community life.” For example, Prata et al (2013, p.737) states that around 12% of PPH survivors suffer from the consequences of severe anaemia. This added burden heightens strain on mothers, families and the health services to provide or assist in life-long care for these women. Moreover, should these women become pregnant again, their chances of PPH reoccurring are much higher and much more risky.

**Table 2 - Clinical Features of Shock in Pregnancy Related Blood Loss**

Source: Draycott et al 2010, p.81

<table>
<thead>
<tr>
<th>Blood Loss (ml)</th>
<th>Clinical Features</th>
<th>Level of Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 - 1000</td>
<td>Normal blood pressure</td>
<td>Compensated</td>
</tr>
<tr>
<td></td>
<td>Tachycardia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Palpitations, dizziness</td>
<td></td>
</tr>
<tr>
<td>1000 - 1500</td>
<td>Hypotension systolic 90-80 mmHg</td>
<td>Mild</td>
</tr>
<tr>
<td></td>
<td>Tachycardia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tachypnoea (21-30 breaths /minute)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pallor, sweating,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weakness, fainting, thirst</td>
<td></td>
</tr>
<tr>
<td>1500 - 2000</td>
<td>Hypotension 80-60 mmHg</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Rapid, weak pulse &gt; 110 beats/minute</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tachypnoea (&gt; 30 breaths/minute)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pallor, cold clammy skin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poor urine output &lt; 30ml/hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restlessness, anxiety, confusion</td>
<td></td>
</tr>
<tr>
<td>2000 - 3000</td>
<td>Severe Hypotension &lt; 50 mmHg</td>
<td>Severe</td>
</tr>
<tr>
<td></td>
<td>Pallor, cold clammy skin, peripheral cyanosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air hunger</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anuria</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Confusion or unconscious, collapse</td>
<td></td>
</tr>
</tbody>
</table>
As already stated, PPH is the major cause of maternal death accounting for around 25% of global maternal deaths, followed by infection, unsafe abortion and eclampsia (Tsu et al 2004, p.S42; World Health Organization 2012b; Prata et al 2013, p.373). However, this figure may be even higher as maternal deaths are notoriously poorly documented due to health systems failures, human documentation error, a lack of capacity or an oversight either intentional or accidental in nature. What this means is that in some cases there is no mention of a pregnancy in the woman’s death certificate, either by accident, or in an attempt to suppress information that could be seen as sensitive in some contexts. For example, if the death was due to complications of an abortion in a country where this relates to an issue of legality, a woman’s death may not be recorded as maternal so as to avoid future litigation for the family or those involved (WHO et al 2012, p.8). The commonly used definition of a maternal death has already been cited at the start of this section, as have the common causes of such a fatality. However, there has been much discussion over recent decades regarding this narrow definition. The impact of HIV/AIDS on maternal deaths remains a topic in need for greater research; similarly the number of women dying from unsafe abortions due to restrictive national laws remains unknown. In the recent WHO statistics, it has been estimated that the impact of maternal deaths from AIDS is around 7500 deaths in 2013, of which 91% were in sub-Saharan Africa, and proportionally 3.8% of total maternal mortality in this region. Thirteen countries ha 10% or more of maternal deaths related to AIDS (WHO et al 2014, p.2). Some have claimed that “HIV/AIDS has become a leading cause of pregnancy-related death in some hospitals” due to HIV positive women being five times more likely to develop obstetric complications in addition to the HIV aggravating other diseases during pregnancy such as anaemia or tuberculosis (Ronsmans and Graham 2006, p.1194). Pre-existing medical conditions are responsible for 27% of maternal deaths (World Health Organization 2014b). The WHO et al (2012, p.4) define an indirect cause of maternal death as from a “previously existing diseases, or from diseases that developed during pregnancy and that were not due to direct obstetric causes but aggravated by physiological effects of pregnancy”. Examples of indirect causes of maternal death could be suicide and pre-existing disease such as those already named.

The distinct separation of direct and indirect causes of maternal death is important as it highlights areas for intervention so as to tackle high statistics with tailored strategies, this is especially pertinent when background diseases are responsible (28%) for the largest share of maternal deaths of women within reproductive age. This includes HIV, malaria, diabetes and obesity (World Health Organization 2014b). Accidents, murders and suicides are not classed as maternal deaths as they are seen as incidental, however some evidence suggests that this is not necessarily the case as the pregnancy may have in part, impacted the death. For example, domestic violence in India was the 2nd largest cause of death for women who were pregnant. Similarly, 20% of deaths in pregnant unmarried women in Bangladesh were due to suicide,
compared to 5% in pregnant married women. Furthermore, pregnant girls were 3 times more likely to die from violent causes than non-pregnant girls also in Matlab, Bangladesh (Ronsmans and Graham 2006, p.1195). It is worth noting that similar research conducted in the UK did not support the findings from India and Bangladesh, however rather than discredit the studies in South Asia, findings from the UK seek only to firmly cement the importance of cultural factors and localised societal pressures on ones health and understandings of health. In light of the controversies over what does and does not constitute a maternal death, it is no surprise that data collection is prone to underreporting and misreporting, sensitivity screening for reasons ranging from improper or inaccurate examination of cadavers, to politically charged legal issues. Either way, the problems of data collection and the lack of complete data create an unclear global image that may be diverting attention away from an endemic global problem because of poor data. Further, the indirect causes of maternal mortality are only now being seen as serious impediments to the reproductive health of women and girls, such as the indirect causes of poor health that increase due to situations of poverty and lower economic and social status.

**Prevention and Treatment**

To prevent the occurrence of PPH in any woman, medically trained personnel follow a set of procedures which aim to either deter, or control the impact of severe blood loss before hypovolemic shock has chance to set in. The Active Management of the Third Stage of Labour (AMTSL) is a well-practiced technical sequence that “involves a combination of interventions including: cord clamping and cutting, controlled cord tractions, and the use of a uterotonic agent” (Prata et al 2013, p.740). While AMTSL is seen as the ‘gold standard’ by the World Health Organization guidelines and recommendations for the prevention and treatment of PPH, each component of AMTSL has been revisited based on evidence and graded accordingly with greater or lesser stress placed on various techniques and the available resources and skills of practitioners (World Health Organization 2012a). For example, controlled cord traction now has a weak recommendation unless small reduction in blood loss or duration of the third stage of labour is perceived as benedictional (Prata et al 2013, p.739).

Over the last 15 years or so, there has been a great deal of research into the use of uterotonic agents. Uterotonic agents are uterine stimulants that help to induce contractions of the uterus. As such, they have several uses including the management of incomplete abortions and miscarriages, the induction of labour as well as to reduce the risk of postpartum haemorrhage by helping the uterus to contract in the third stage of labour (the time from when the baby is delivered to the delivery of the placenta/ after birth). Thereby, as the placenta is delivered, the uterus can continue to contract back to its original size, it is this action which slows and eventually stops the bleeding from the placental site (McDonald 2009, pp.540–1). The use of the uterotonic oxytocin has long been seen the best option of available drugs, with minimal side effects and quick to act. Oxytocin was first sequenced in 1953 several years prior to the
The description of the AMTSL techniques. However, oxytocin is highly unstable and needs to be stored in a cool environment away from direct light. Additionally, it is administered intravenously, which demands a certain level of skilled practitioner as well as sterile equipment. Alternatively, a newer drug Misoprostol an E1 prostaglandin analogue, originally used to treat gastric ulcers has been found to also act as a uterotonic agent since the early 2000s (Raghavan et al 2012, p.S35). Contrasting its well-established counterpart oxytocin, misoprostol comes in a tablet form and therefore offers dosing options of orally, sublingually, vaginally or rectally (Venture Strategies Innovations 2011). It is highly stable and does not require special storage and is widely available and affordable. As of July 2013 Venture Strategies Innovations (2013) claimed that 23 countries have approved misoprostol for PPH prevention with 21 approving it for treatment. It is associated with several side effects such as shivering, nausea and fever, however these have been found not to harm the mother (Geller et al 2013; Kapungu et al 2012, p. 556; Prata et al 2013, pp.740, 744; Sanghvi et al 2010, p.276; Smith et al 2013). The appeal of misoprostol for use in low-resource settings is clearly evident, and many studies have successfully been conducted on the distribution of misoprostol to expectant mothers by community health workers, lay health workers, midwives and traditional birthing assistants, investigating self-administer by the expectant mothers should they be unable to reach a health facility in time. Moreover, Prata et al (2013, p.747) notes that “an economic assessment of the reduction of PPH in developing countries estimated that the consistent use of a conventional uterotonic in every birth could avert 41million cases of PPH, resulting in an estimated 1.4million lives saved”.

**GLOBAL MATERNAL HEALTH AND MORTALITY**

The comparison of statistical information between countries and regions on maternal health, especially between developed and developing, is not always appropriate however several aspects are worth noting for their value and usefulness. Firstly, that maternal mortality carries a higher risk in the lower economically developed countries where 99% of all maternal deaths occur (WHO et al 2014, p.21). Further, this burden has far reaching consequences such as increasing economic, social and emotional hardship on families and health systems. Secondly, it is generally true that countries with high maternal mortality are also those countries with great gender imbalances. Imbalances that can, for example, limit women and girls reproductive health choices. And thirdly, it is important to highlight the burden of poverty on family life and its impact on decisions of conception (Hutton 2006, p.7). A statistical analysis of the world in terms of maternal health is a necessary, even when accounting for endemic problems of data collection, which are a cause for concern when drawing statistically based conclusions from regional variations in data.

The World Health Organization (WHO) defines maternal death as, “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and
site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes” (World Health Organization 2012b, p.2). However, across the world in each country or region the identification and classification of death as maternal is inconsistent and fraught with unintentional and intentional errors. The most recent global maternal mortality statistics show a decrease of 45% since 1990 in the number of women dying annually from pregnancy-related or childbirth (WHO et al 2014, p.21). However, although commendable, these gains have generally been in those countries where the capacities are higher and the environment is stable with more often than not, a strong government backing and political will pursuing maternal health policies. Statistics from 2010 however, showed that positive change is occurring in many countries, such as a 95% reduction in maternal mortality in Estonia, 81% in Iran, 78% in Nepal and 76% in Viet Nam (WHO et al 2012, p.24), all of which increases the well-being of pregnancy and childbirth for many women and girls now and in the future.

Yet, the statistics clearly articulate that 99% of the 289,000 maternal deaths in 2013, a trend mirrored in previous years, are situated in developing regions where resources and capacities are low. The maternal mortality ratio (MMR) is the number of maternal deaths in a specific time period per 100,000 live births, during the same time period (WHO et al 2012, p.6, 2014, p.1). In 2013 Sierra Leone overtook Chad and Somalia for the highest MMR at 1,100 deaths per 100,000 live births, with India (17%) and Nigeria (14%) together accounting for a third of global maternal mortality (WHO et al 2014, pp.1, 23). The World Health Organization (2012a) estimates that everyday, approximately 800 women and girls die from preventable causes related to pregnancy or childbirth. Furthermore, it claims that sub-Saharan Africa region accounts for 62% of maternal deaths in 2013 an increase of 6% from 2010. Followed by the Southern Asia region with 24% of the burden, this is 5% less than in 2010 (WHO et al 2012, 2014, pp.1, 21). The statistical health differential between developed and developing, as well as within countries regarding maternal mortality and morbidity is probably one of the biggest statements of inequality and inequity in the world (Glasier et al 2006, p.1597). This is clearer stated by the 14-fold difference in MMR between developed and developing regions (WHO et al 2014, p.21).

The WHO Global Health Observatory Data Repository1 at Millennium Development Goal 5 (MDG5) on maternal and reproductive health tracks the maternal mortality statistics per country since 1990 through to the present. Interestingly, it states that during this time global maternal mortality has fallen by around a half, down from around 500,000 per year to around 289,000. There have been huge improvements across coastal African countries, Asia and South America. India has cut MMR from 600 per 100,000 live births in 1990 to 190 in 2013. However, land-locked African nations such as Chad, the Sudan, Central African Republic and Niger still struggle with maternal mortality figures over 500 per 100,000 live births. Unfortunately, the data from Chad shows a rise from 920 in 1990, to 1,200 per 100,000 live births in 2010 (World
HEALTH ORGANIZATION 2014c). A surprising find was that the United States of America’s MMR in 1990 was 12 per 100,000 live births, but in 2010 this had almost doubled to 21 per 100,000 and by 2013 it has reached 28 per 100,000 but the statistics state how it could be as high as 44 which would place the USA on a par with Tajikistan (WHO et al 2014, p.35; World Health Organization 2014c). Suggesting either a change in the reporting system, or a worsening of the healthcare system for some women. In contrast, China underwent a major improvement from 120 to 37 per 100,000 in 2010. Nevertheless, when one compares the countries with increasing or high maternal mortality to the location of world disasters, a correlation is clearly evident (World Health Organization 2014c).

The top ten countries with the highest MMR are all found in sub-Saharan Africa, but this does not necessarily correspond to those countries with the highest amount of deaths. For example, Nigeria is responsible for 14% of all maternal deaths, but its MMR is half that of Sierra Leone at 560 (WHO et al 2014, p.23, 33, 40). The concentration of risk and mortality in sub-Saharan Africa can be attributed to many causes, often shortfalls in the health reporting systems. However, if we examine the recent history of these ten countries it is no surprise that many have been plagued by a combination of armed conflict, civil unrest, natural disasters and/or political instability for decades. It is a well versed fact that during times of crisis, it is often women and girls are disproportionately affected by the disruption to social norms, changes which are felt long after the event itself and can create tension in communities and families trying to rebuild their lives (Nour 2011, p.22; Sami et al 2013, p.1). Contrastingly however, Bradshaw (2013, p.7) asserts that the UN has long since claimed women are more vulnerable and more likely to suffer from the impact of a disaster, yet she states that the evidence surrounding this statement needs re-examining.

The maternal lifetime risk is the chance that a baby girl will die from causes related to pregnancy or childbirth during her lifetime. The highest lifetime risk is found in Chad at 1 in 15, comparably in Belgium the risk is 1 in 45,200 (WHO et al 2012, p.23, 2014, p.31). The majority (80%) of maternal fatalities are due to four factors – severe bleeding (mainly after childbirth), infection, pre-eclampsia and unsafe abortion (WHO 2012b). This essay will focus on severe bleeding which is one of the major obstetric complications that can occur after childbirth. Specifically this research will address postpartum haemorrhage, a problem accounting for around 27% of all maternal deaths – the single biggest cause of mortality even though it is highly preventable and manageable through routine medical interventions (World Health Organization 2014b; Prata et al 2013, p.373). Furthermore, the University of San Francisco’s Safe Motherhood Programme (UCSF 2014) states that a woman dies from this complication every 4 minutes because in low-resource settings, such as those created by humanitarian crises, accessing and providing quality emergency obstetric care (EmOC) adds another layer of complexity to an already endemic problem (Prata et al 2013, p.373). For example, according to
Glasier et al (2006, p.1597) postpartum haemorrhage is responsible for 33.9% of deaths in Africa and 30.8% of deaths in Asia. Fathalla et al (2011) claim that PPH in Egypt is responsible for 33.4% of all maternal deaths, and is the most frequent cause of maternal mortality.

Reinforcing the link between health and economic development, Skolnik (2008, p.5) states that the poor health of a mother often leads to the poor health of her baby and later, the child because of the reduced protection and care able to be given by the mother. This in turn can start a vicious spiral disadvantaging the child to reach his/her full mental and physical potential due to reduced health (Palmer and Zwi 1998, p.239). This can cause a delay in starting school and poor school performance as well as attendance. Therefore, the foundation for economic prosperity of the child is reduced by limited education. Finally this creates a negative impact on society as a whole and the economic development of the country. By contrast, Yamin et al (2013) have conducted the first in a series of research investigating the impact of a maternal death on the life of a child, as well the impact on families and communities. They assert that most maternal deaths occur in poor families, and that “maternal death...is often the end result of compounded discrimination and depravations that woman face across their lives”. Moreover, Yamin et al claim that low educational attainment for women has been liked to reduced reproductive autonomy and consequently reduced family planning utilization, which in turn links to an increased risk of maternal death. And thus, the cycle starting from ill health of a mother continues through generations and within poor communities. Few studies have documented this problem that appears to perpetuate cycle of poverty through early marriage, younger age of first birth of daughters, lower household wealth (Yamin et al 2013, p.2).

LOW-RESOURCE SETTINGS

PPH is scarcely considered a fatal complication in most well equipped and well-staffed settings. In the UK the risk of dying from postpartum haemorrhage is very small at 6.6 women per 1million maternities (Draycott et al 2010, p.78). However, in many regions of the world the risk is very real, in fact differences within a country may also vary greatly depending on an array of socio-economic and contextual factors. But why does such a disparity exist when in higher-income, or well-resourced settings such a fatality is almost obsolete? High rates of maternal mortality and morbidity are attributed to several factors and environments conducive to higher risks not usually found in more resource stable settings. In well-resourced areas pregnant women and girls will visit antenatal care at least four times during pregnancy as recommended by the WHO (World Health Organization 2014d). However in many national guidelines recommended antenatal visits to a trained professional may be even higher, for example in the UK the standard is 12 visits (National Health Service UK, 2014). During antenatal visits risk factors for PPH, general health check-ups for both mum-to-be and baby are addressed as well as other health and non-health related issues which seek to lower any adverse outcomes. That said however, predicting who will or will not develop PPH is incredibly difficult and remains a
THE CONTEXT - MATERNAL HEALTHCARE AND HUMANITARIAN CRISSES

barrier to prevention strategies. Some known risk factors include women who have already suffered complications from previous births, women who previously underwent a caesarean section, women diagnosed with pre-eclampsia during pregnancy or who have previously experienced pre-eclampsia, women with grand multiparity of four or more births, or women aged over 35 years (Draycott et al 2010, p.79). This is a non-exhaustive list and it does not take into account warning signs intrapartum. Moreover, if antenatal checks are missed or disrupted by a disaster, such warning signs may not surface and can put mother and baby at risk during the remainder of the pregnancy and/or at delivery. Additionally, without a skilled professional attending a birth, intrapartum warning signs may again be missed leading to a greater chance of delays and increased risk of mortality and morbidity. These problems are more often found in low- and middle-income countries, but can also be found within pockets of minorities in affluent countries such as the USA where Black women have a four-fold increased risk of maternal complications and death when compared to Hispanic or White women irrelevant of economic status (Saftlas et al 2000; Ronmans and Graham 2006, p.1197).

**Staffing, commodities and capacity**

In reality, PPH is a manageable problem that, when rapid access to high quality skilled practitioners using sterilised equipment in clean, hygienic health facilities with definitive drug and surgical treatments are available, postpartum haemorrhage will rarely cause a fatality. However, in many regions of the world such access and availability is not easily obtainable, if the health infrastructure exists at all. Geller et al (2013, p.1) state that the over representation of PPH fatalities in the global south is because of, “a lack of uterotonics, unreliable transport, electricity and communication networks, and healthcare personnel shortages”. Further underscoring the problem is the fact that high levels of women give birth at home, away from trained healthcare staff and resources. It has been stated that the need for healthcare staff is so great in sub-Saharan Africa that the region only accounts for 1.3% of global skilled healthcare providers yet suffers from 25% of the global burden of disease (Prata et al 2013, p.744). Kapungu et al (2012, p.555) also asserts that “rudimentary health facilities” and home deliveries combined are the sites of 99% of all maternal deaths – the majority of which have been caused by postpartum haemorrhage. According to Shah and Say (2007, p.20) WHO et al (2012, p.28), Glasier et al (2006, p.1597), Prata et al (2013, p.737), and in agreement with many other authors, maternal mortality remains a global burden because around 40-60% of births are not attended by a skilled birth attendant (SBA), and health facilities are often unable to be staffed as need dictates, nor are they supplied with adequate medical commodities. In fact, coverage of skilled practitioners present at births is increasing at less than 0.5% per year, which means that by 2015 “a skilled birth attendant will only reach 1 in 2 women in sub-Saharan Africa and South Asia” (Lawn et al 2010, p.380). Shah and Say (2007, p.24) observe that for the skilled birth attendants to positively impact maternal mortality SBA coverage must reach a minimum of 40% in the
context under examination. Similarly, they argue that for the impact of antenatal care to be noticeable on mortality statistics, again coverage must reach 60% of the population. Additionally the difficulty in predicting cases of PPH, either with or without antenatal checks (even though antenatal visits will help to identify high-risk women), seeks to confound and overwhelm the problem especially in low-resource settings.

It has been stated that maternal mortality impacts the world on unequal terms. Generally speaking, the more industrialised the country the less impact of, and the lower the rates of maternal mortality and morbidity. Why? Between 1935 and 1960 the industrialised countries of the West improved their MMR by: a) professionalising midwifery as a specific medical skill; b) making improvements in healthcare and treatment in general through better hygienic practices; c) a greater scientific awareness of disease contraction; and d) a new importance placed of healthcare systems. Further, developments in surgical techniques and patient aftercare also aided a drastic reduction in postpartum infections and deaths. In many countries, the legalising of abortion appears to have lowered mortality and morbidity (Ronsmans and Graham 2006, p.1192). Advances in science and medicine should be available to every hospital and medical practitioner in every context, however these advances almost 60 years later remain far from universal. Why? Two reasons explain this inequality, firstly, the political nature of sexual and reproductive health and rights. Secondly, a lack of funding, resources and staffing in some areas, that could be linked to the former explanation, or may be hampered due to disruptions in the health system brought on by a destabilising humanitarian crisis. An expanded explanation of these two rationales will follow.

Firstly, sexual and reproductive health does not simply refer to one’s health or a specific disease. By equal measure SRH also includes one’s sexual and reproductive legal rights and thereby introduces SRH into the political arena liable to political scrutiny and regulations. A person’s right to sexual and reproductive rights is less easily translated around the world than, for example the right to water. Failure to provide adequate and holistic SRH services disproportionately affects women and adolescents. Moreover, as many sexual and reproductive health services focus on maternal, neonatal and family planning issues they are often intrinsically linked to the traditional reproductive duties of women. Health, gender and culture will be discussed in depth in Part IV on Health and Culture.

Since the ICPD in Cairo, sexual and reproductive health and rights – which includes maternal healthcare, have tried to remain in the international spotlight, however they have consistently lost support and attention over the decades leading to its neglected unmet promises and ultimately inaction by global leaders. Devastatingly, the link between SRH and poverty reduction has also come into question (Glasier et al 2006, pp.1595, 1604). The grand statements made at the ICPD emphasising “human rights, human development and individual well-being” have remained as inactive statements of good will by interchangeable governments changing
face every 4 years or so (Abrejo et al. 2008). Berer (2012, p.7) claims that the growth of right-wing political and religious dogma, coupled with an anti-science agenda and aggression are halting if not reversing progress for sexual and reproductive health and rights in many parts of the world. Interestingly, Ronsmans and Graham (2006, p.1187) believe that the “persistent emphasis on global differences and strategies has often entailed a neglect of biological, geographical, economic and social differences in maternal mortality within populations”. They have then identified that although global generalisations and strategies may appear to fight for maternal healthcare, it remains a contextual issue that is in need of greater examination to create sustained changes within those societies most at risk. Culture, belief, religion and tradition must all be taken into account when discussing sexual and reproductive health to ensure appropriate methods and activities are encouraged and to determine how and what information to disseminate and advocate for. Similarly, Gayle and Daulaire (2007) note how a single tract goal focusing, for example on one disease has been confused with saving and bettering lives – however such an approach actually undermines investment through a narrow understanding of the problem. There is therefore a greater need to emphasise non-insular interventions. In a review of the lessons learnt from humanitarian interventions since 1994 to 2004, Salama et al (2004, p.1805) reiterate this sentiment with examples from past crises. For example, the 1998 drought and civil war in (then) Southern Sudan demonstrated how interventions must not only provide food to victims of malnutrition and starvation, but that it is essential to be coupled with a health response. The heightened susceptibility of a person to communicable disease when also suffering severe malnutrition was evident from this crisis. Similarly, during severe drought and food insecurity in Ethiopia in 2000, Salama et al (2004, p.1807) assert how the “the response was overly focussed on food-based interventions” which meant large populations congregated around distribution points. Yet, without a complementary health intervention a rapid outbreak of measles spread throughout the population. The authors maintain that inadvertently, the “humanitarian intervention might have contributed to the excessive mortality”.

Secondly, the destabilisation of health care within a country can be due to an internal or external crisis, for example civil unrest, conflict either in-country or in a neighbouring country, an earthquake, flood or other natural hazard. The impact of crises on national health systems will be addressed next in this section through the discussion of a humanitarian crisis. However, a short example of the impact of a crisis on a well functioning healthcare system can be seen in Syria before the recent armed conflict in early 2011, and today in mid-2014. Bashour et al (2005) noted how Syria was “an example of the distortions of privatisation of health care” through “excessive use of ultrasound screening in pregnancy in Syria by private doctors”, who represented 80% of women compared to public doctors (Bashour et al 2005; Berer 2005, p.8). Today the health system (still highly unequal) has reportedly seen in a drastic increase in preferential caesarean sections by women because of a fear of giving birth during a military
operation or being caught out in a precarious situation that could prevent access to medical help, however data on this is difficult to substantiate. Even though rates of caesarean sections in Syria in 2010 were already higher than the recommended 5-15% of all deliveries at 20.6%, projections for the Syrian refugee population now residing in Lebanon are estimated to be around 35% in 2013 (Huster 2013, pp.10, 24, 47). Moreover, the Syrian health system has been deeply affected by the continuing crisis for the following reasons (not exhaustive); 1, because medical staff have fled the violence or have been killed or wounded; 2, because supply chains have been massively disrupted; and 3, because many health facilities have been partially or totally destroyed. Citing a WHO rapid assessment from June 2012, Kherallah et al (2012, p.52) claim that out of 342 primary health facilities and 38 hospitals,

“...It was found that about 43% of PHCs are partially functioning, and 2% of PHCs are non-functioning, 13% PHCs are inaccessible due distance of PHC from patients (50%, mostly in Idleb); lack of safety (34%, mostly in Homs and Hama); difficulties in public transportation (8%, mostly in Tartous) or temporary relocation of patients (2%) while only 50% of hospitals are fully functioning due to lack of staff, equipment and medicine”

This example from Syria before and after the conflict demonstrates the extreme risks people are undertaking to access medical care that may not even be available.

**Delays**

For pregnant women in low-resourced settings, there are two levels of delays that can increase her risk of mortality or morbidity. Firstly, there are delays and barriers prior to arriving at a health facility that prevent her from seeking and accessing the medical care she needs (Ronsmans and Graham 2006, p.1196; Prata et al 2013; Miller et al 2007, p.3; Brighton et al 2012, p.224; Kapungu et al 2012, p.555). The adjoining table outlines the four delays in the framework. Secondly, there is another set of delays and barriers that start once a patient arrive at an EmOC facility.

<table>
<thead>
<tr>
<th>Table 3 The Delays Framework: At the health facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unavailable skilled health care providers</td>
</tr>
<tr>
<td>2. Lack of uterotonic agents and cold storage</td>
</tr>
<tr>
<td>3. Minimal or incorrect proactive of AMTSI</td>
</tr>
<tr>
<td>4. Underestimation of blood loss</td>
</tr>
<tr>
<td>5. Communication and transport infrastructure to the health facilities</td>
</tr>
</tbody>
</table>

In low-resource settings, especially in more rural areas, home births are often more commonplace than in more urbanised settings. Moreover, home births are regularly not attended to by a skilled birthing attendant (SBA). Recognition of the signs and symptoms of PPH may go unnoticed by family members or
unskilled birth attendants. It has been noted by Kapungu (2012, p.557) that family members and unskilled birth attendants only perceive the signs of excessive bleeding – a key warning signal to PPH and other obstetric complications, in around 11% of cases. Delays caused by the underestimation of blood loss can quickly lead to hypovolemic shock, cardiopulmonary arrest and death, most likely caused by postpartum haemorrhage.

The second delay – the decision to seek medical help, is exasperated by the third delay which is the act of reaching a facility equipped with basic (BEmOC), or ideally comprehensive emergency obstetric care (CEmOC) services. A BEmOC facility offers the following services: parenteral antibiotics, parenteral oxytocin, anticonvulsants, perform the manual removal of the placenta, able to perform the removal of retained placenta products, and conduct assisted vaginal deliveries. By contrast, a CEmOC facility can conduct all of the above, as well as perform surgical interventions including caesarean delivery, and blood transfusions. A CEmOC is “typically located in urban areas and not readily available for women in rural communities” (Kapungu et al 2012, p.559), thus requires well-established and good quality communication and transport links between the BEmOC, primary health facilities and rural communities.

The decision to seek out help is often slow especially when such a decision was neither planned for nor customary typical. Brighton et al (2012, p.226) conducted a study investigating women’s perceptions of medicalised obstetric care facilities and their staff, in comparison to traditional methods and traditional birthing assistants in sub-Saharan Africa. According to Brighton et al the perception of the women by her community was found to be very important regarding birthing practices. The general consensus among the study participants was that multiple home births, with no assistance positively correlated to a woman’s elevated social status within their community. Following this understanding, Brighton et al (ibid) also state that in many societies in rural or resource-low settings, it is often female elders or husbands who hold sway over decisions to seek out western medical help, and not in fact the woman in question who “had little autonomy within communities”. In such situations well-established cultural actions are followed which do not necessarily see western medical facilities as a provider of care. Moreover, if women do not believe that a facility delivery will increase their chances for a safe and healthy birth in accordance to their beliefs, then they will not engage in it.

Similarly, in some cultures there are barriers preventing women who wish to seek help because they are not permitted to be without a male escort or without his permission. Should such an event occur where no men are present, her cultural laws may inhibit her desire to find help. In Bangladesh this custom is called purdah and has often been cited a major barrier to seeking out health assistance especially in the aftermath of a disaster (Bradshaw 2013, p.9). Such hierarchical societies built on patriarchy can prevent fast decisions and put the woman or girl’s life at risk. Bradshaw (2013, p.43) provides a very clear understanding of such a society:
“A set of social relations between men which, although hierarchical, establishes an interdependence and solidarity between them which allows them to dominate women. This definition rejects the notion that every man is in a dominant position and every women in an oppressed one”

Rather Bradshaw’s definition emphasises the social structures, which support, construct, and continue these relations rather than the individual. The influence of culture on understandings of health and health seeking behaviours will be detailed in Part IV on Health and Culture.

The third delay is a matter of logistics, and often refers to problems with infrastructure and transport both in terms of cost and availability. In poorly connected, or remote towns and villages it may take hours to reach an EmOC facility, which may already be too late for some women who have lost large quantities of blood. Lam et al (2012, p.4), and supported by claims made by Gage (2007, p.1680), outline a creative example to overcome this delay whereby two to three weeks prior to a woman’s due date, she has the option to stay in a “Casa Materna” which is a house close to the EmOC facility, thereby erasing any delay in accessing the facility. Finally, the forth delay is the pace of receiving definitive treatment once at the EmOC facility. Treatment may not necessarily be instantaneous if the hospital is overburdened by patient load, understaffed staffed, poorly supplied with insufficient capacity for blood transfusions, uterotonic agents and other drugs to counteract shock and treat PPH may not be readily available. All these delays are then further confounded when placed in an unstable crisis.

**Humanitarian Crises**

The definition of a humanitarian crisis used in this research is an event – either a natural or man-made hazard, which supersedes societies ability to cope or manage a response to adequately protect, and prevent further harm to those affected. This definition has been formed throughout the author’s personal on-going educational discussion and research into the subject.

In recent years there has been a growth in the literature in support of the claims that there are now less and less strictly ‘natural’ disasters. This is not to say that there are less natural hazards, but rather that the human element involved in such a disaster is harder to ignore, meaning that natural hazards are exasperated by explicitly man-made characteristics. In other words, population growth and recent global migratory patterns mainly urbanisation, as well as increasing social vulnerability, endemic extreme poverty, environmental degradation and climate change, gaping inequality and inequity, are all helping to create an environment whereby the human tampering behind a natural hazard creates a disaster with the potential to cripple entire economies and redraw societal practices and cultures. Such a crisis also markedly distinguishes between those who suffer and those who do not.

It is important to note that a natural hazard is not necessarily a disaster. A disaster occurs only when the above definition (a situation surpassing a societies capacity to cope) becomes true. For example, when adequately prepared for, a hazard can remain a natural event and not a disaster.
or crisis. Therefore, it is only when a population becomes vulnerable to a hazard that it has the potential to become a crisis with ensuing humanitarian needs. The concept of vulnerability as a prerequisite to a crisis will be returned to later in this section.

Nevertheless, for the purpose of this research natural hazards are defined as earthquakes, floods, droughts, wild fires, tsunamis, hurricanes or tropical storms, and other metrological, oceanic or geographical events with the capacity to ensue harm to populations. Toole and Waldman (1997, p.284) state that natural disasters rarely produce long lasting public health concerns, unless food crops or prolonged and unsanitary displaced camp conditions have ensued. The impact of the 2010 earthquake, lasting around 30 seconds, on the society in terms of public health were, and still are, highly visible ranging from cholera outbreaks to high levels of sexual violence, to malnutrition. This example from Haiti highlights the sometimes-disastrous impact of the natural world on increasingly vulnerable populations and raises questions over the human element involved in the making of the disaster. Furthermore, it is one of many recent natural hazards whose impact was worsened by the collision between nature and a fragile society living in vulnerable conditions.

Contrastingly, a man-made hazard also known as an anthropogenic hazard, are events that inherently contain an element of human failure, intent, negligence or error. Examples of such a hazard would be armed conflict, political instability, terrorism, technological hazards such as industrial or infrastructural events, or the release of hazardous materials such as nuclear radiation contamination or oil spills. In 2009 the United Nations International Strategy for Disaster Reduction (UNISDR) solidified disaster terminology in an attempt to reduce confusion among partners, actors and the media. Therefore, the UNISDR defines a hazard as:

“A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage” (UNISDR 2009, p.17)

And comparatively, UNISDR defines a disaster as:

“A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources” (UNISDR 2009, p.9)

From these definitions one can assert that the fundamental difference between the UNISDR definitions of hazards and disasters, is that a hazard refers to the moment of impact an event has on the human or built world. In other words, its focus is on the moment the natural and human worlds collide with negative impact. Comparatively a disaster refers to the social impact, and the coping mechanisms of that society to manage the hazard’s impact on their community on societal structures.
The complexity of recent disasters has led many to use the term complex humanitarian emergency or CHE which depicts a situation that can neither be understood only as a natural hazard nor as a man-made event, even though it may contain one or both events during the course of the crisis. Often, the combination of political instability, politically motivated discrimination based on religion, ethnicity, gender which seeks to negatively affect either majority or minority groups, can create widespread human rights violations, violence and conflict. Additionally, they can include a plethora of state and non-state actors and incorporate a range of issues from political leadership to natural resources. Relatedly, the impact of conflict or natural hazards can cause such destruction that it leads to the deterioration of health systems, social systems, economic institutions, and ultimately cause more conflict and instability (Toole and Waldman 1997, p.285). Brennan and Nandy (2001, p.147) state that the term CHE first emerged during the 1990’s to refer to specific humanitarian crises “characterized by political instability, armed conflict, large population displacements, food shortages, social disruption and collapse of public health infrastructure”. Additionally, CHEs are associated with large-scale loss of life and sustained vulnerability over long periods of time, accentuated by reduced or no access to vulnerable populations by relief organisations. The authors assert that countries such as Afghanistan, Bosnia, Rwanda, Kosovo and the Democratic Republic of the Congo have suffered extensively from such crises. The health implications of CHEs are elevated from those of other crises, since often the health system has been severely damaged, or mass displacement has created new challenges for providers (Skolnik 2008, p.251). In these contexts, disease and malnutrition are often the main concern as they can lead to high mortality.

Over recent decades the scale and magnitude of humanitarian crises have increased. More and more people are affected every year by disasters, yet markedly less people are being killed by such events (Skolnik 2008, p.250; Nour 2011, p.22). It has been claimed by the International Committee of the Red Cross (ICRC) that globally between 1975 and 1985 around 5 humanitarian crises termed CHE, occurred per year. By the end of the 1990s however, this had risen to around 40 per year affecting 300 million people (ibid, p.251). Conversely, the cost in damages of these events is rising as the following graphic from UNISDR details. The UNISDR does not however include armed conflict, civil unrest or other political violence into its work.

During natural disasters, the health impacts happen in stages, first are trauma victims from the impact of the hazard. Second are other injuries and psychological cases. There is a constant need for disease surveillance and the provision of food, water and shelter. As has already been noted, in such cases disease outbreaks do not often occur, unless unsanitary living conditions of those displaced or if a protracted recovery phase ensues. During CHEs and owing to the often political nature and civil unrest which accompanies these events, the resulting mass displacement is a by-product of the armed targeting of civilians, damage caused to water sources and sanitation systems, and a collapse and overburdening of health infrastructure.
Storms caused the most economic damage - this was also the year of Hurricane Katrina.

Earthquakes caused the most economic damage - this was also the year of the Sichuan earthquake in China.

Drought affected most people - this was also the year of major drought in India and China.

Floods affected most people - this was also the year of major flooding in south and central parts of China.

Earthquakes killed the most people - this was also the year of the Great East Japan Earthquake.

Strengthening the NASP in humanitarian settings: adoption or rejection?

Find out more about UNISDR: http://www.unisdr.org
which was often already weak (Toole and Waldman 1997; Skolnik 2008, p.255). The impact of these crises on mortality and morbidity can be split into two groups - direct and indirect. The former refers to trauma or violence related death, injury, disability, psychological trauma or sexual violence. While the latter refers to mortality and morbidity caused by the social disruption, the collapse of the health system and services creating an increased risk of disease, and malnutrition (Brennan and Nandy 2001, p.150).

Prevention of such devastating situation far exceeds the capacity of humanitarian relief organisations as it necessitates political and economic spheres of influence. As Salama et al (2004, p.1804) assert, “humanitarian interventions provide a response that is limited to the health and other social sectors; such interventions might minimise the consequences of societal disruption, but they cannot undo existing damage”.

**Vulnerability to Crisis**

According to Fordham et al (2013, p.2) big disasters such as the Haiti earthquake in 2010 or the Indian Ocean tsunami in 2004, highlight that some subpopulations are more at risk than others. The reason for these differences can be explained by the socio-economic variances in society, such as income disparity, class, race or ethnicity, gender, age, disability, health discrepancies, educational completion and family or household structures and cultural practices. Each of these variants either adds or reduces a person’s vulnerability to the impact of a crisis. This vulnerability can therefore be termed ‘social vulnerability’ and is described by Fordham et al (2013, p.4) as the “differential social relations among groups in a given society”. Bankoff (cited in Fordham et al 2013, p.5) also states, that “social systems generate unequal exposure to risk by making some people more prone to disasters than others and these inequalities are largely a function of the power relations” within a given society. Therefore, in accordance with this rationale, it is the level of equality, or rather inequality, within a society that defines who is more likely to be affected, and not as the more dominant paradigm suggests, that all people are unable to make good decisions and therefore suffer more during crises (ibid, p.8).

This alternative understanding offered by authors such as Fordham et al and Bradshaw (2013), is in contrast to earlier understandings of disasters and the connections between the natural and built human world. This new paradigm focuses on vulnerability as a measure of changeable risk a person or society has towards an impending or current crisis. It has emerged in opposition to the more dominant science-based paradigm. As discussed by Fordham et al (2013) and Bradshaw (2013), the dominant paradigm understands natural disasters as uncontrollable and unchangeable acts of nature that science and technology attempts to monitor, control and ultimately alter. This understanding places the blame on nature itself as a destructive force, and by doing so eludes all responsibility away from political, social and economic systems or the connections between these human spheres, rather the human influences are seen to be
responding to, and modifying the impact of nature, and in no way responsible for the natural event. In this context nature is seen to be a freak, extraordinary and unusual occurrence. The emphasis in this perspective focuses on the disaster as being an abnormal occurrence.

Both Fordham et al and Bradshaw refer mainly to natural disasters, however much of their discussion on social vulnerability can be related to manmade contexts. Moreover the natural environment is playing an increasingly more important role in rising global vulnerabilities with the impacts of climate change becoming clearer and stronger. Stephenson et al (2013, p.1) maintain, “Global health, population growth, economic development, environmental degradation and climate change are the main challenges we face in the 21st century”. Furthermore, each aspect cited by Stephenson et al is a marker of potential vulnerability outlined by the social vulnerability paradigm. Fordham et al and Bradshaw argue that to discuss an individual’s or even a population, community or societies’ vulnerability, this is a within the current situation or a future projection of vulnerability. However, they assert that the roots of vulnerability are firmly cemented in past marginalisation of the subject(s) through the power relations and structures that intersect all aspects of life. As Fordham et al (2013, p.12) state, “social vulnerability thus results from processes of social inequality and historic patterns of social relations that manifest as deeply embedded social structural barriers resistant to change”. Bradshaw (2013, p.7) supports this claim and asserts that while vulnerability is a product of this, there are many dimensions to vulnerability that incur greater or lesser risk, such as geographic location, prepared national institutions and infrastructure, laws of enforcement for evacuation or protection, technological capacity to provide warnings to communities, capacity and resources to fund a response, adequate policing for safety, government trust and transparency, cultural beliefs and coping strategies. This non-exhaustive list demonstrates how wealthier countries are less prone to crises than poorer and institutionally weaker countries. It also highlights that within a given population there will be sub-populations more at risk than others (ibid).

UNISDR defines vulnerability as “the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard”. As the UNISDR is not involved in conflict-related crises, the definition was targeted more at natural hazards. However, I think it is very clear, that this can apply to any crisis situation, whether that hazard is a flood or an armed group affiliated to a particular ideology. It is important to note, that vulnerability does not come from a disability or age alone, it is a failing in society (both local and international), to recognise that circumstance may prevent a certain group from mitigating the risk, such as race, gender or ethnicity. To be disabled, a woman or Black does not mean you are therefore inherently vulnerable, rather it is a collection of factors which will dictate, at a given time and in a given place that some groups will be hit harder than others, and some will
be more able to recover than others (Fordham et al 2013, p.12). For example, poverty can inhibit decisions over where to live or ability to evacuate.

The socio-economic factors conducive to dictating vulnerability are worsened by global trends such as massive population movements to urban centres. It is estimated that more than half of the world’s population lives in cities, with 1 in 7 people living in an urban slum. Of this urbanisation, 60% of the growth is attributed to natural urban growth, while 40% is due to migration (Stephenson et al 2013, p.4). The impact of humanitarian crises is now creating new challenges and limitations for response in the urban landscape through the additional vulnerabilities found within precariously placed urban slums and illegal settlements.

At the end of 2013 the population of the entire African continent stood at just over 1 billion. In 2011 around 60% of the 1 billion lived in rural settings, with 40% in urban centres. However, it is estimated that by 2050 not only will that ratio have flipped over to reflect a higher percentage of people in urban centres; the continents’ population will have more than doubled to approximately 2.2 billion people. Furthermore, it has been estimated that people living in African cities will increase from just less than half a billion in 2011, to around 1.3 billion by 2050. While conversely, the population in rural areas will only increase by 0.3 billion during the same period (United Nations Department of Economic and Social Affairs 2014; World Population Review 2014).

The societal pressures from urban life and the changes to community life and social structures may have far reaching alterations that seek to further divide the rural – urban population and cause new challenges to reduce social vulnerability. As the world divides into one of extreme poverty and extravagant wealth, the vulnerabilities within society become starker and more precarious. Social vulnerability will be referred back to in conjunction with the social determinants of health framework in Part II The Theory that details the approaches used in this research.

**SEXUAL AND REPRODUCTIVE HEALTH IN HUMANITARIAN CRISIS**

So far this chapter has detailed how globally, maternal mortality takes around a quarter of a million lives annually, 99% of these from low-resource settings, and further that most of these could have been easily prevented through simple interventions and better health infrastructure. It has detailed what a humanitarian crisis is, the health implications of such a situation and it has touched upon social variations in vulnerability to crises. It has discussed the problems in low-resource settings regarding access to healthcare and the delays that can occur for pregnant or postpartum women in need of medical assistance. This final section in this chapter will discuss the specific needs and problems associated to sexual and reproductive health during humanitarian crises.
During and after humanitarian crises the safety of women and girls is frequently worse than the security of their male counterparts. For example women and girls regularly suffer from an increased threat of physical violence and serious reproductive health concerns (Glasier et al 2006, p.1603; The John Hopkins School of Public Health and the IFRC 2008, p.181; Nour 2011, p.25; McGinn 2013, p.176). Nour (2011, p.24) asserts that “after disasters studies have shown that women have more miscarriages, premature deliveries, cases of intrauterine growth restrictions, low birth weight infants, sexual violence, and undesired pregnancies.” This is also supported by Wick and Hassan’s (2012, p.8) account of childbirth during the 22-day Israeli assault on Gaza starting in December 2008. They claim that during the 22 days, 3,700 women went into labour, and based on annual averages this is an increase of around 500 women. Furthermore, using hospital records before the attack as baseline data, during the 22-day attack there was a 33% rise in miscarriages, a 50% increase in neonatal deaths, and a surge in the number of premature births, obstetric complications and caesarean sections. Discussing the impact of the Syrian armed conflict, Sami et al (2013) claim that the provision of reproductive health services can ensure that women and girls’ basic needs are met, which can encouraging them to emerge from the on-going crisis as “essential stakeholders” in the recovery process. This is premised on the belief that asserting SRH and rights will empower women and girls.

In many cases, obstetricians are often not called as first responders to disaster areas (Nour 2011, p.27). Because of this lack of technical expertise, foetal heart monitors are often read incorrectly and skilled trauma surgeons not obstetricians, attempt to perform caesarean sections due to the lack of staff capacity, where as a more experienced personnel might have opted for a different intervention based on greater expertise (Nour 2011, p.26). Additionally, in early onset natural disasters or in armed conflict areas, medical teams use a system of triage - treating as many patients as effectively as possible using the resources available most effectively by categorising patients and taking into account the amount of resources needed vs. chance of survival. Triage can often negatively impact women in labour as risks are not able to be properly assessed and complications can develop unchecked as trauma patients regularly over-rank women in labour (Wick and Hassan 2012, p.11).

In line with the ICPD agenda and probably as a bi-product of the conference, reproductive health during humanitarian crises began to be repackaged as a priority intervention during the 1990s where previously there has been no such focus (Onyango et al 2013, p.1). Reproductive health is especially pertinent during a crisis as it encompasses obstetric emergencies, STI prevention and management including HIV/AIDS, and gender-based violence, which are all significant contributors to excessive mortality and morbidity (Salama et al 2004). As awareness and impact of RH services began to be seen as life-saving interventions, it began to gain support amongst international actors, which led in 1995 to the formation of the Inter-agency Working Group on Reproductive Health in Crisis (IAWG). This working group is comprised of UN
agencies, universities, NGOs, governmental organisations and a network of over 1,500 individual members from over 450 agencies. IAWG aims to promote better access to reproductive health for refugees and internally displaced persons (IDP) in crisis settings. Since 1995, the IAWG has championed two key documents to prioritise reproductive health – the Inter-Agency Field Manual on Reproductive Health in Crises (IAFM); and the Minimum Initial Service Package for Reproductive Health (MISP) (Inter-Agency Working Group for Reproductive Health in Crises 2014). Below are depictions of these tools.

In a humanitarian crisis, out of the total number of those in need of assistance, it has been estimated that approximately 25% of the women of reproductive age (15 to 44 years) will be pregnant, 15% of all deliveries will develop complications, with 5% requiring a caesarean for lifesaving necessity (The International Planned Parenthood Federation 2011, p.6). However, if one takes into account that the majority of global disasters occur in regions where antenatal visits are often low, there could be an increase in potential birthing risks and complications because the signs were not caught early on and managed, such as anaemia or high blood pressure. Additionally the stress of enduring the crises may bring about more complications for the mother and baby (Wick and Hassan 2012) both in the short and long term. The MISP is
comprised of 5 objectives which should be activated in the first phase of a crisis when the crude mortality rate (CMR) is greater than 1 per 10,000 per day (Onyango et al 2013, p.343):

**Table 5 - MISP Objectives**
(Inter-Agency Working Group For Reproductive Health, 2009, p.2)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ensure the health sector identifies a <strong>lead agency</strong> to implement the MISP</td>
</tr>
<tr>
<td>2.</td>
<td>Prevent and assist survivors of <strong>sexual violence</strong></td>
</tr>
<tr>
<td>3.</td>
<td>Reduce the transmission of <strong>HIV</strong></td>
</tr>
<tr>
<td>4.</td>
<td>Prevent excess <strong>maternal and neonatal</strong> mortality and morbidity</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Plan</strong> for comprehensive reproductive health services to integrate into the national primary health care</td>
</tr>
</tbody>
</table>

In addition to this plan of action, 12 reproductive emergency health kits (does not include the NASG) were developed by IAWG and are handled through the UNFPA (Inter-Agency Working Group For Reproductive Health 2011). These kits were organised to complement the 5 objectives of the MISP. However, on closer examination, these 12 emergency health kits focus on a specific priority interventions such as IUDs, safe birthing, or condoms, appear to have been based more on expert opinion than on evidence-based examination. Furthermore, Onyango et al (2013, p.343) claim that there has been no comprehensive evaluation of the MISP to demonstrate its impact on the health of the population, or on how successfully (or not) it is implemented in the field and how. Moreover, although the IAFM is in use on the ground, field-testing has yet to conducted which has been pending since creation in 1997.

Although the MISP is recognised as a SPHERE standard in humanitarian response (The Sphere Project 2011, p.325), awareness among humanitarian responders remains limited, even in the health sector. Several complaints are regularly noted as major drawbacks to the success of the MISP (see table below). However, the IAWG and partners has made efforts to address these persisting issues. For example, the RHRC has created an online e-learning course for MISP awareness and knowledge. The IAWG has also developed a MISP-certified roster for emergency deployment as well as conducting training sessions on the MISP (Onyango et al 2013, p.351).

The MISP is premised on the fact that women will seek out medical assistance during times of crisis, or that in fact humanitarian responders have been granted access to vulnerable areas. In recent times, access has been one of the biggest dilemma’s facing the humanitarian sector. Women who decide not to, or who cannot seek assistance for childbirth could be owing to cultural, religious or traditional practices, the cost of transport or hospital bills, or fear of not reaching the facility safely. Sami et al (2013) assert that in Syria there have been reports of increases in both caesarean sections due to a fear of labour without a skilled attendant, or home births with no skilled attendant due to being trapped by the on-going armed conflict. Nour
(2011, p.24; Bradshaw 2013, p.9) claims that certain cultural norms prevent women in some areas from seeking medical help after a disaster due to fear of interaction with men which is forbidden, however because of the crisis, there is no appropriate man available to assist, thus the context to applying these minimum standards must be carefully examined and adapted.

<table>
<thead>
<tr>
<th>Table 6 Commonly cited drawbacks to the success of the MISP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source: The International Planned Parenthood Federation, 2011</td>
</tr>
<tr>
<td>• Lack of awareness among humanitarian responders</td>
</tr>
<tr>
<td>• Lack of understanding among those who are aware of MISP</td>
</tr>
<tr>
<td>• Unconfirmed evidence-base for the MISP</td>
</tr>
<tr>
<td>• Reproductive health not seen as a humanitarian priority</td>
</tr>
<tr>
<td>• Ad hoc implementation methods</td>
</tr>
<tr>
<td>• Poor MISP focal points and coordination mechanisms</td>
</tr>
<tr>
<td>• The kits ordering system is complicated and time consuming</td>
</tr>
<tr>
<td>• Evaluations of the MISP implementation are unable to be compared due to variations in methodology and scope</td>
</tr>
</tbody>
</table>

\(^1\) For information on WHO data please see: [http://apps.who.int/gho/data/view.main](http://apps.who.int/gho/data/view.main)

\(^2\) See Appendix IV for the full 12 reproductive health kits

\(^3\) Reproductive Health Response in Crises Consortium [http://www.rhrc.org/](http://www.rhrc.org/) This is a collaboration of four operational organisations, two research and training organisations, and one primarily advocacy agency.
Anthropologists first defined the concept of culture in the early 19th century. Since that time understandings of culture have been in continuous flux. Skolnik (2008, p.98) defines culture as, “a set of rules or standards shared by members of a society, which when acted upon by the members, produce behaviour that falls within a range of variation the members consider proper and acceptable”. Simply, this understanding refers to a persons learned and shared behaviours and beliefs that touch on many aspects of life, defining a persons view of food, the traditional practices they are involved in, the decisions a person makes, as well as how those decisions are made. Moreover, culture can also define perceptions and understandings of health, and therefore ill health and how, where and what kind of services to access to improve one’s health.

There are differing medical systems around the world, well-established systems such as the Indian, Chinese, and Western models, or comparatively more localised and traditional systems. The Indian and Chinese systems have been in existence for thousands of years and, like other medical systems are deeply ingrained into societies and intrinsically linked to their respective cultures.

The link between culture and health is evident, yet its importance in establishing values, norms and behaviours needs more discussion. Some cultural practices have remained the same for hundreds of years unchanged and unquestioned. The adaptation of cultural traditions is slow and averse to adjustment as changing practices can be seen as questioning the culture as a whole. However, globalisation has pushed people into new geographic locations, forcing new interactions and connections which have come under greater scrutiny than ever before through better access to information and resources. These new environments are not always as suitable for some cultures than in previous times and places, and some customs may not adapt as well in these new surroundings. These new environments come about because of a specific event or developmental phenomena causing a community to re-establish themselves. For example, nomadic cultures are now challenged by modern-day demarcations of frontiers, boundaries, movement restrictions and regulations, forcing these cultures to change their customs and often become more static (Skolnik 2008, p.98). According to McGinn (2000, p.179), during and after humanitarian crises, the disturbances to cultural norms can be sizable ranging from changes in the family composition, increased dependency on others or organisations and consequently fewer decision-making roles. Moreover these changes, as well as a limited access to basic necessities and reduced options, can either result in, 1, a reassertion of social pressure to maintain the status quo prior to the crisis; 2, cause a regression to even stricter cultural laws; or 3, allow for an opening up of the culture to adaptation and alteration (Jenkins 2013, p.397). Palmer and Zwi (1998, p.242) assert how “during conflict, cultural norms that may not be strictly enforced in peacetime may become a symbol of cultural identity and social cohesion”.
They offer an example of Afghan refugees in Pakistan where the tradition of *purdah* became more strictly enforced in the camps than in the communities prior to the war.

Bradshaw (2013, p.5) claims that culture shapes the disaster response and depending on the location of the disaster different people may be more or less vulnerable, which should in turn influence the response. Further, she claims that a humanitarian response is built on cultural appropriateness, norms and structures that continue to build on the roles and responsibilities found within the indigenous culture. In reality however, Bradshaw’s claims may prove more idealistic than the situation on the ground.

Many cultural practices stem from health beliefs and life cycle events, of particular interest in this research are those practices involving women. Reproductive health, marriage, childbearing and rearing are all controlled by ones values and beliefs, which are understood from within the boundaries of culture. ‘Normal’ is a contested terminology because what is normal, and what is not normal regarding ones health is seen to be different depending on who is being asked. What is a normal disease? What is a normal illness? What is the difference between the two? Skolnik (2008, p.99) asserts that an “illness represents personal, interpersonal, and cultural reactions to disease or discomfort”, by this understanding disease is felt differently across the world based on our cultural understanding of that disease. However, Thomas et al (2013, p.237) claim that while culturally specific definitions of health are important, what is ‘normal’ in any given context, should not be determined based on the prevalence of certain diseases or afflictions. Nevertheless, an understanding of the context, and the underlying prevalence e.g. malnutrition or malaria, is useful for evaluating and understanding health when developing both health and non-health interventions during humanitarian crises.

Furthermore, why someone is suffering an illness is not always believed to be caused by the presence of a disease contracted by, for example drinking unsanitary water or an insect bite, but instead it can be understood to be the consequence of poor behavioural choices or supernatural causes. For example by witchcraft, adultery, greed, lust, soured kin relations or other such punishment for ones actions (Hutton 2006, p.18; Brighton et al 2012, p.225; Skolnik 2008, p.100). These belief systems can work against seeking medical help if the person believes social ramifications will affect their (or their family’s) stance in the community, especially for women and girls who, in almost every culture, are marginalised with less autonomy than men (Ronsmans and Graham 2006; Gayle and Daulaire 2007, p.1297; Brighton et al 2012, p.226; Bradshaw 2013, p.43). In a study of maternal health utilisation in rural Mali, Gage (2007, p.1667), suggests that through social networks and relationships – some of which are obligatory, social capital forms an environment whereby health seeking behaviours and norms are set by elder generations, Gage titles this “intergenerational closure”. A sentiment asserted by other authors who note the influence of elder women on the choices available to younger women and girls regarding their reproductive health needs. This trend limits the opportunities for new thinking.
and changes in health behaviours and mentalities. Therefore, it is not only one's culture and belief system, but also societal structures that act as strong barriers for healthcare utilisation. Moreover, social vulnerabilities within and outside one's culture can act negatively against women's ability to access available medical care.

**Women, Culture and the Community**

In some cases, the perception of why you are ill, or detrimental beliefs about healthcare facilities can prevent people from seeking lifesaving medical care. In a paper on the perceptions of prenatal and obstetric care in Sub-Saharan Africa, Brighton *et al* (2012, p.224) found that “community attitudes regarding cultural beliefs and interactions with healthcare providers were identified as barriers” to reducing maternal mortality and improving medical uptake. Moreover, although there was a good knowledge of complications in the community, the understanding of the complications were cited as either behavioural factors such as disobedience, adultery, disrespectful actions, or associated to evil spirits and sorcery. Since the understandings of ill health are behavioural or spiritual, attempts to improve one's health may also follow this logic and cause further harm to those concerned by not seeking medical assistance.

Some cultural teachings and understandings of health can be detrimental to good health, such as the practice of female genital mutilation, early marriage and young childbearing. Importantly though, the devaluation of female education, food distribution practices based on sex and participation in decision-making can also lower female health outcomes (Palmer and Zwi 1998, p.237; Hutton 2006; Gage 2007; Yamin *et al* 2013). The social stigma surrounding miscarriage, false pregnancy, spontaneous abortions was also found to lead to late presentation at antenatal clinics and discouraged women from regular check-ups (Brighton *et al* 2012, p.226). It is not only health-specific issues that impact health outcomes, a plethora of socio-economic factors have been linked to reduced maternal outcomes (Hutton 2006; Gage 2007; Nour 2011, p.22; Thomas *et al* 2013, p.242; Yamin *et al* 2013). The variety of factors which impact women's health are broad and according to, Palmer and Zwi (1998, p.239), Aoláin (2011, p.8) Hutton (2006, p.19) and Yamin *et al* (2013, p.2), these begin at birth and are magnified if the child is female and worsened still if the child is a maternal orphan which increases a female child's risk to also suffer a similar fate as the mother, thus continuing the vicious cycle. Gage (2007, p.1680) notes that “at the individual level, low maternal education, the low status of women and personal barriers remained important impediments to improved maternal health care seeking.” The author also stresses the narrowness of many maternal interventions that fail to reduce maternal mortality because indirect factors, such as poor road conditions and public transport, lack of childcare, non-engagement of other family members, or incompatibility with community mechanisms of operation were continuously not accounted for in planning. Further, Gage (2006,
claims that this focus on insular and individual factors consistently fails to discover the full extent of community barriers to healthcare utilisation.

Yet, health beliefs and the family decision-making processes contribute to women seeking medical care. Women orientated customs and rules may involve “restrictions on both movement and decision-making, with the hierarchy within households arranged by sex and age” (Palmer and Zwi 1998, p.239). Moreover, Palmer and Zwi claim that even if some women contribute substantial incomes, they may not own the control over the revenue because of male-dominance over finances.

**Culture in Humanitarian Health Response**

In order for interventions to benefit both the intended user, and be a practical use of time and resources by those implementing, “patterns of resort” must be understood to ascertain where and how the intervention will be placed in the community. In particular if home remedies are used; if the community follows traditional medicine; what costs are incurred at the health facility; how are people treated at the facility; are there language or customary barriers with some ethnicities; and if all cultures and customs are respected by staff (Skolnik 2008, p.101)? It is also important to be aware of how the intended users understand illness, moreover how do they think they develop complications, and what they think causes it? How people cope with illness or when and how they seek medical care is crucial to influencing health outcomes. Both direct and indirect factors must be assessed. Examples of direct factors are the cost of treatment or the cost of seeing a trained professional. Whereas indirect costs could be the time taken to reach a facility; the accessibility of facility; transport costs; childcare costs; social impact of using medical facility. In order to create an environment conducive to recognising barriers within a community, Skolnik (2008, p.103, 105) suggests the following methodology to understand the target population’s attitudes and health behaviours:

**Table 7 – Understanding Health Beliefs and Behaviours**
Adapted from Skolnik (2008, p.103, 105)

<table>
<thead>
<tr>
<th>Understanding Health Beliefs</th>
<th>Understanding Health Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the likelihood of X disease / complication etc.?</td>
<td>1. Assess the behaviours within the population</td>
</tr>
<tr>
<td>2. What is the severity of X?</td>
<td>2. Helpful or harmful to health?</td>
</tr>
<tr>
<td>3. What are the benefits of engaging in preventative behaviour?</td>
<td>3. What are the motivations for the behaviour?</td>
</tr>
<tr>
<td>4. What are the barriers to engaging in preventative behaviour?</td>
<td>4. Possible ways to change/adapt harmful behaviours?</td>
</tr>
</tbody>
</table>

Disaster literature has often focussed on what people lack, and their inability to access social capital, rather than, as Bradshaw (2013, p.12) claims, the development literature which has focussed more on what people have, their capacity and how to build on this resilience. In
agreement Jenkins (2013) asserts the need to bridge both these fields together into a single response to ensure sustainability and continuity after the initial response dies down. Jenkins (2013, p. 401) states, “disaster researchers...must integrate the study of disaster with core sociological concerns such as social inequality, social diversity and social change”. Whereas Aoláin (2011, p.3) believes that the biggest challenges for disaster literature are the, “considerable prejudices, revealing an asymmetrical distribution of gender themes, an absence of data on women’s lives and a male bias in identifying the channels from which information is sought”. The methodology laid out by Skolnik (above) creates a platform to bridge this divide, but the wider social context must also remain in the foreground, and researcher bias must be accounted for and either prevented or acknowledged. Health responses working in communities where health behaviours are causing harm to the population need to work together with clear cultural understandings of behaviours in order to change them and improve health outcomes.

It has been argued that a humanitarian crisis can alter cultures and community structures, as Nour (2011, p.25) states, “during emergencies routine behaviours are altered drastically”. These changes cause high levels of stress at a time when there are limited supportive capacities. The disturbances to cultural norms, family composition, economic dependence, limited access to basic necessities, and strong social pressure to maintain the status quo, understandably raise stress levels. However, in many countries attitudes towards women and their role within the community are often based on traditional role associated to marriage and family duties (Palmer and Zwi 1998, p.237). Many authors have noted that during humanitarian crisis women become the target of increased levels of sexual-based violence because as Nour (2011, p.25) explains, “stress and despair create, at best comfort-seeking behaviours when people crave closeness and intimacy, and at worst, violent sexual behaviours”. Similarly, McGinn (2000, p.179) asserts that, “rape and domestic violence are widespread in conflict situations” and that rape and violence in the early phases of a crisis appear to be perpetrated by unknown men, whereas in protracted situations, such crimes appear to be committed by people known to the victim, mainly through domestic violence. These claims are supported by Aoláin (2011, p.11) writing over a decade later who refers to “men’s opportunistic sexual outrages” in the aftermath of a crisis, and then the shift to intimate partner and domestic violence in the medium- to long-term in camps or temporary shelters.

In an interesting perspective, Jenkins (2013, p.404) maintains that “disasters do not create conflict; they amplify previously existing inequality within a community”. Bradshaw (2013, p.4) shares this view claiming that we need to move beyond the disaster and focus on societies perception of the ensuing physical harm and social disruption caused by the crisis. As the impact of a humanitarian crisis on a community is likely to hinder safe motherhood programmes because of “residential mobility and population turnover, family disruption,
population density and resource deprivation” (Gage 2007, p.1668). It is a known fact that women and men are exposed differently to situations affecting health, with differing amounts of power and influence to seek health services. This is true before, during and after crises. For pregnant or postnatal women, the impact of crisis on their health has been poorly documented. McGinn (2000, p.175) for example states, “the general assumption that refugee status worsens the risks and outcomes of pregnancy may not be supported by the available data” because data is often only collected on the condition of the baby, and not if there were maternal complications or other outcomes. Whereas Hutton (2006, pp.14–15) writes that even in any ‘normal’ situation “pregnancy clearly acts as a catalyst to increase the actual and perceived severity of stress”, additionally he notes that, “rapid changes in traditional family structures and practices increase the risk of depression”. Hutton is not directly referring to humanitarian crises, however one can presume that risks are elevated even further than in any ‘normal’ situation.

Challenges for Humanitarian Organisations and Practitioners

The majority of humanitarian crises affect low- and middle-income countries. It is not uncommon for a crisis to happen in a region where the health system was already weak, suffering from limited resources and commodities. As Gage (2007, p.1668) asserts, “communities with a high concentration of poor households and a low concentration of well-educated residents are unlikely to have or attract the resources necessary to develop and sustain high quality health services.” Yet it is regularly in these low-resource settings that humanitarian organisations deliver aid. Ideally, international health organisations work together with local partners and Ministry of Health facilities to ‘sure-up’ pre-existing services since they are already known to local communities, as well as being culturally appropriate and sensitive to the diversities in the area. In ethnically motivated violence this can sometimes prove problematic, however building on existing health infrastructure allows for a greater success of sustainability of programmes and training after the crisis subsides.

A serious impediment to effective humanitarian programs is that prior to the crisis, the social and economic structures of society created deep-rooted power hierarchies, marginalisation and inequalities. Following or during the crisis, these pre-existing constructs are still at play and seek only to further entrench those sub-populations who suffered most as a result of them, women being an almost recurrent grouping (Aoláin 2011, p.8). Nevertheless, Bradshaw (2013, p.9) asserts that women are not a homogenous group and will experience and understand their life cycles differently in different places and at different times. That said, the vulnerability of women have already been outlined in this research and variation will absolutely occur in different contexts, but it unfortunately is safe to assert that women are more likely to be more vulnerability than men.
This remainder of this section will now address two problems in humanitarian response, firstly the response of international health organisations in reference to the importation of culture, bias and approaches; and secondly, the perception of the affected population towards this response. In both instances concepts of masculinity and gender stereotyping will be highlighted. Collumbien and MacDowall (2012, p.139) explain that regarding sexual reproductive health interventions there are four possible methods to frame the approach, each offering variations in the depth of the response through addressing different layers of societal actions.

Table 8 Sexual and Reproductive Health Intervention Approaches
Adapted from: Collumbien and MacDowall 2012, p.139

<table>
<thead>
<tr>
<th>Approach</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural Intervention</td>
<td>“Action(s) that aim to change behaviour by motivating, empowering and/or persuading individuals, or groups of individuals, to adopt the desired behaviour(s)”</td>
</tr>
<tr>
<td>Combination Prevention</td>
<td>“Combines behavioural, biomedical, and structural interventions to address the immediate risks and underlying causes of vulnerability to adverse sexual outcomes”</td>
</tr>
<tr>
<td>Harm Reduction</td>
<td>“An approach that seeks to minimise avoidable harms associated with risky sexual behaviour…contrast[ing] with approaches that seek to eradicate the behaviour”</td>
</tr>
<tr>
<td>Structural Approach</td>
<td>“Action(s) that aim to change the broader context that influence risk behaviour and vulnerability by altering social political, economic and/or environment factors”</td>
</tr>
</tbody>
</table>

Each approach has advantages and disadvantages to use, and perhaps each is more appropriate for different times of an emergency response. Collumbien and MacDowall (2012, p.143, 146) assert that generally, public health favours harm reduction interventions while stressing the importance on context specific guidance. They also maintain that the use of scientific communication and behavioural theories assist the creation of effective strategies as they highlight the importance of knowledge and self-efficacy, health beliefs, as well as perceptions of social norms and influences. An important assertion questions, if the intervention is trying to change the environment, or the perception of the environment? In other words, does the intervention work within the current structures or is it trying to change those structures?

Relatedly, Aolán (2011, p.2; and supported by Bradshaw 2013, p.47), claims that “as experts and policymakers calculate how best national and international communities should respond to such emergencies, women are frequently substantively and procedurally side-lined” from the planning and decision-making processes. A vital assertion is that humanitarian providers intervene in countries and cultures, yet while they plan and develop responses they do so from the stance of their own culture and belief systems. Furthermore, if the providers are indigenous to the country or culture, they may also exert substantial bias and preferences based on their involvement in the community. Either way, the humanitarian providers are likely to have a sizable impact on the methodology of the intervention. According to Palmer and Zwi (1998, p.245), “some relief officials are reluctant to involve women” and citing UNHCR they claim that
“their concerns may reflect the cultural biases of the officials and/or inadequate understanding of both the traditional cultures and the new situations in which refugee women find themselves”. This statement is also reflected by Aoláin (2011, p.8) who maintains that, “intervening internationals might import their own stereotypes of cultural roles and powers for women, thereby compounding local patriarchal exclusion, is an on-going hazard”. All these authors contend therefore that, culture in humanitarian operations is a multidimensional concept in need constant attention to limit biases emitted from both provider and user. As Palmer and Zwi (1998, p.245) conclude, “barriers to the involvement of women are erected by both the providers and beneficiaries of services”. Brighton et al (2013) examines these issues in a paper on perceptions of obstetric care in sub-Saharan Africa, where barriers range from the users preconceptions of how they must behave and dress in health facilities, to the perception of staff as abrasive, uncaring and inattentive. Further, cultural understandings surrounding pregnancy, women and traditional birth attendants also hampered facility use. Thus, all of these examples and assertions continue to bolster the fact that interventions, especially related to reproductive health are always intrinsically linked to culture and remain subject to contextual preconceptions at local, national and international levels.

A final point involves the masculine nature of humanitarian service provision. In her paper on women, vulnerability and humanitarian emergencies, Aoláin (2011, p.15) describes the role of masculinity in both the local men who shape the lives of the local women; and the “internationally-based male elites parachuted in to support, “fix” or shore up a crisis situation. Furthermore, she also describes the relationship between these two groups of men. Aoláin asserts that in many humanitarian contexts, the affected-population are often structurally male-dominated, and together with the “deeply masculine” system of intervention, can sometimes be detrimental to the needs of women because of the limited social and political space in crisis-struck societies. As such, women can be placed between male-dominating culture, and a male-orientated humanitarian response. The knowledge that crises are worsened by the inequalities and imbalances within any society and culture, only places more emphasis on the importance on gender attentiveness throughout humanitarian operations. Aoláin (2011, p.17) argues that disregarding gender by, for example employing only the use of checklists (Bradshaw 2013, p.9) for gender mainstreaming is grossly detrimental to “undoing the exclusion of women and ensuring that women’s needs are not neglected”. Similarly, ignoring the potential role masculinities play in transforming, adapting and reformulating the crisis landscape will also reduce the structural impediments for women to access the services they need. Thus gender incorporates both these aspects as gender is not only about women, but rather the relationships between men and women, how and why they are reproduced, and how to change them.

Lastly, the major pitfalls for all humanitarian organisations and their staff – local and international alike, is to find the balance between the impact of their work on the gender
relations of those affected, while at the same time trying to prevent victimising women and girls by depicting them as helpless or vulnerable. As expressed by Aolán (2011, p.18), “even relief processes that are theoretically aligned with international human rights standards and norms of gender equality may, in practice, give substantial deference to the gender status quo, thereby compounding women's political and economic marginalization”. Previous decades methods of ‘just add women and stir’ should be discarded, and more structural approaches which seek to understand the context that breeds inequality and inequity in the affected-population so as to use the humanitarian operation as an opportunity to raise the status of women and their health long after the relief has subsided. Resilience and sustainability should be given due attention when planning humanitarian health interventions.
PART V. THE IMPLEMENTATION

This case study is based on an unpublished final project report from Pathfinder International (2013) on their activities with the Tanzanian Red Cross Society and Women Refugee Commission in northwest Tanzania between 2009-2011. Other information comes from an advocacy document produced by the WRC on the project in 2012.
In December 2009, Pathfinder International and the Tanzanian Red Cross Society (TRCS), funded by the MacArthur Foundation, and supported by the Women’s Refugee Commission (WRC), initiated a project in the refugee camps of Mtabila and Nyarugusu as well as the surrounding host communities in Kigoma District northwest Tanzania (Krause 2012, p.1; Pathfinder International 2013). Due to a requested increase of the project by the District Medical Officer, the project reached a total of 45 facilities reaching Kigoma, Kibondo and Kasulu, thus spanning the entire district of Kigoma, an increase from the originally planned 18 facilities in Kasulu. The District Medical Officer witnessed the stabilisation of a patient by the NASG and became an outspoken supporter of the device, ordering the inclusion of NASGs in ambulances through the entire district. The partnership between the already named organisations and the Tanzanian Ministry of Health (MOH), implemented a model of ‘Clinical and Community Action to Address Postpartum Haemorrhage’. The goal of the project was to “improve reproductive health among refugees and their host community populations through the expansion and improvement of the Minimum Initial Service Package” (Pathfinder International 2013). In order to improve maternal health outcomes, the Pathfinder CC-PPH model - including the NASG, was modified to suit the context, incorporating training and capacity building. The project addressed gaps in the health systems, and designed activities to encourage sustainability through training and capacity building.

Table 9 Objectives of the NASG project in Tanzania (Pathfinder International, 2013)

| Objective 1. | Assess the capacity of TRCS and one referral site to implement the MISP in one camp and host community in Western Tanzania |
| Objective 2. | Strengthen and sustain the capacity of the TRCS and the referral site to implement the MISP, with the added CC-PPH model component |
| Objective 3. | Facilitate and promote healthy community level SRH behaviours |
| Objective 4. | Support the standard inclusion of the CC-PPH model technologies in the MISP (Pathfinder International 2013) |
building through “four synergistic objectives” framing the project, however these were not all realised due to early assessments of the standard of care in the facilities. However, ultimately the project focussed on the expansion and improvement of the MISP and used the NASG as “a complementary technology” (Pathfinder International 2013). The members of an IAWG sub-working group on technology and innovation for SRH in humanitarian crises collectively decided to investigate the feasibility of associating the NASG to the MISP. The sub-working group was premised on the need for collaboration across the fields of SRH, emergency health response, medical technology and innovation to find creative solutions to the “lack of access to appropriate new and underutilized SRH technologies in crisis settings” (Pathfinder International 2013). Following a meeting in May 2008 it was decided that the NASG and the MISP, along with appropriate training and aids would be tested in a stable humanitarian environment. Nevertheless, the camps were subject to instability from closure and consolidation during the project lifespan. Similarly outbreaks of violence caused greater numbers of refugees to enter the camps, however the numbers did not exceed camp capacity or resources. At the start of the project the NASG had not yet been endorsed by the WHO, this was seen as a hindrance to credibility, and reduced the evidence base of the device.

**Implementation of the Project**

The initial health facilities involved in the project numbered 18 and all were in and around Kasulu, with three managed by the TRCS, eight by the MOH, and one a mission facility. However, once the project had begun it became clear that the project would need to be modified following the activities associated to Objective 1, which was to assess the capacity of the TRCS and the MOH facilities. It was found that none of the facilities met the national standards for safe delivery care. In light of this, the project had to sacrifice Objective 3, which was to promote healthy SRH behaviour in the community, in order to divert resources and time to ensuring the minimum level of care at the health facilities. The focus of the project was amended to cover the gaps found in healthcare including: training in the prevention and treatment of PPH through AMTSL, highlighting the delays framework, accurate blood loss estimation techniques, and the use and maintenance of the NASG. Courses in EmOC were also added to cover the prevention and treatment of eclampsia, and the accurate measurement of blood pressure (Pathfinder 2013). To develop sustainability, “the interventions were designed to integrate project activities into on-going SRH services and refugee/host community health education activities” (Pathfinder International 2013). The improvements in the facilities meant that their reputation increased and with it the number of facility births. The low standards in the facility meant that the project could not endorse facility births as opposed to home births without first updating the quality of care.

Objective 2 successfully implemented activities related to improving the capacity of TRCS and the referral system, incorporating the MISP and PPH model. A total of 225 medical providers
were trained in AMTSL, treatment and prevention of eclampsia and PPH, accurate blood loss techniques, fluid replacement, dosing and administration of uterotonics, appropriate referral system, as well as the NASG. The delays framework was also outlined specifically for the facilities and the delays they suffered from, as well as how to overcome and be aware of them. As a result infrastructure for referral was improved in two facilities, emergency transportation carried NASGs – this included ambulances but also creative community solutions to the lack of transport led to NASGs carried on some tractors (Pathfinder International 2013). Facility equipment, supplies and a referral system with tracking were strengthened to ensure patients arrived at referral facilities with their medical history to assist the teams in larger hospitals. The direct consequence of this activity led to continued high referral of patients to larger facilities for definitive treatment, however it actual reduced the overall cases of PPH in the peripheral regions due to a better adherence to AMTSL.

The supplies included the distribution of 75 NASGs to the facilities. During March 2010 and December 2011 a total of 17 patients developed shock, secondary to PPH, of these cases 15 women (88%) survived. The two fatalities were due to inadequate supplies of blood at the referral facilities, and not related to the NASG. Furthermore, not all patients showing signs of PPH received the NASG as they were managed and controlled by other interventions in the PPH model including the administration of uterotonic agents, uterine massage and IV fluids – all techniques covered in the training. It is believed that the management and awareness of PPH due to the project has increased the quality of care at rural facilities. Unfortunately, not all facilities improved as a result of the project training and the NASG, and this perceived to be related to the emphasis placed by the leadership and management of each facility individually to be involved in the project. Low percentage of staff attending the trainings correlated to a limited improvement in outcomes and standards.

Due to the revision of the project based on the poor standards international health facilities, objective 3 could never be realised. Instead a total of 10,800 educational and health promotional leaflets on safe motherhood, nutrition during pregnancy, newborn care, family planning and birth plan cards were developed for the health centres to be distributed at ANC visits. In the project cycle a total of 1,897 women and their families were reached international his way. This objective would have been key in understanding the dynamics in the community to the issues surrounding birthing and encouragement of behaviour change. The planned activities had included socio-cultural dramas, songs and dances to “reinforce health SRH behaviour” (Pathfinder International 2013). Finally, activities for objective 4 meant that funding was directed towards three advocacy channels, with a) the Tanzanian government and MOH, b) for the NASG to be included in the MISP, and c) for greater awareness of the MISP among the humanitarian community. This advocacy role was conducted by WRC. However, advocacy for the NASG and the PPH model to be included in the MISP appears to have stalled even with the
inclusion of the device into the WHO recommendations. Those involved in the decision-making process at the IAWG appear to be split on the inclusion into the MISP and thus reproductive health kits. However the project maintains that it has demonstrated the need for the PPH model in the MISP in order to address maternal mortality in humanitarian crisis by tackling the single biggest threat more directly and with proven tools to produce results. Pathfinder International also states how the project has noticeably improved the TRCS’s capacity to support and continue implementing the PPH model throughout Tanzania. Furthermore, as a member of the IFRC and other regional humanitarian bodies, its experiences can be shared with the wider humanitarian community to advocate for updating the MISP.

Krause (2012, p.3) has developed a 10-step guide for implementation of the NASG into humanitarian settings, based on the experiences of the NASG in Tanzania. The guide highlights the need to build on the existing structures and norms found within each settings. As well as the importance of identifying people from within the community who are well respected and (ideally) hold weight among decision-making bodies, to champion the use of and continued of the NASG during and after the humanitarian response. Similarly to Rogers’ (2003, p.381) key requisite that for diffusion and sustainability, those who are advocating for the innovation, either change agents or opinion leaders, must be as homophilious with the social system as possible in order to produce the maximum effect. This model can be easily adapted and incorporated into other humanitarian settings. Through greater data collection and evidence gathering of the use of the NASG in humanitarian settings more weight can be put behind such interventions in the future and inspire changes at the institutional levels.

Table 10 Ten Steps to Introduce the NASG in Humanitarian Settings (Krause, 2012, p.12)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Advocate to achieve stakeholder buy-in and the identification of champions</td>
</tr>
<tr>
<td>2</td>
<td>Integrate the NASG into broader interventions to address emergency obstetric care</td>
</tr>
<tr>
<td>3</td>
<td>Assess health workers’ baseline knowledge and current challenges to successful service delivery</td>
</tr>
<tr>
<td>4</td>
<td>Introduce the NASG to referral-level facilities in with equal importance as the community to ensure senior medical staff support the intervention</td>
</tr>
<tr>
<td>5</td>
<td>Conduct community outreach engaging community members to identify information, education and communication needs and to overcome challenges in antenatal care attendance, facility-based deliveries and general acceptance of the garment</td>
</tr>
<tr>
<td>6</td>
<td>Expand use of the NASG to all cadres of health workers in hospitals and community facilities</td>
</tr>
<tr>
<td>7</td>
<td>Establish maintenance and storage protocols for the NASG</td>
</tr>
<tr>
<td>8</td>
<td>Establish a system of NASG return from the referral facility back to the community facility</td>
</tr>
<tr>
<td>9</td>
<td>Provide training and continued supervision of the NASG. The need for training and retraining is even greater in crisis-affected settings where political instability, insecurity and staff burnout cause higher rates of health worker staff turnover</td>
</tr>
<tr>
<td>10</td>
<td>Systematically collect data to identify any particular issues related to the use of the NASG in crisis affected settings that may differ from its use in development settings</td>
</tr>
</tbody>
</table>
The survey was distributed on the 2nd April 2014. It aimed to further this research’s understanding of current use and knowledge of the NASG, specifically within the context of humanitarian settings. It was sent out to people working directly and indirectly in the humanitarian, reproductive and health sectors using snowball sampling. The survey was developed with a backbone inspired from the Theory of Planned Behaviour (TPB) by Icek Ajzen that assisted question formation, structure and answer format so as to draw conclusions over respondent’s intentions and behaviours towards the NASG in humanitarian settings. As no question was mandatory to answer, it meant that not all responders answered all the questions. This could be because of human error, or because of misunderstanding the question, or a third undetermined reason. However, gaps in answering were only observed twice. A copy of the survey and the full data (excluding personal information is attached in Appendix I and II.

The Respondents

In total, the survey received 49 responses. The survey was live for several weeks however, as expected the majority of responses came within the first 24 hours with responses continuing to arrive until the 9th April 2014 (a week after dissemination). The results also showed that overwhelmingly, 23 responders found the survey by a “Direct email from Clare Lofthouse”, however as I only sent eight direct emails, some confusion over the IAWG-KG distribution email must have effected the answering of this question, as the IAWG-KG sends a direct email to all members on behalf of the person posting. Nevertheless, 11 (23%) responders stated that they found the survey via the IAWG distribution, and encouragingly 9 (18%) respondents reported that a friend or colleague had forwarded the survey to them, lending support to the snowball sampling technique employed. A further 6 (12%) people reported to have found the survey though the

<table>
<thead>
<tr>
<th>Anonymous?</th>
<th>Direct email</th>
<th>IAWG distribution</th>
<th>Colleague /friend</th>
<th>Facebook groups</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>15</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Chart 1 Visualization of where responders found the survey

- Direct email from Clare Lofthouse: 45%
- A friend / colleague suggestion of interest: 12%
- IAWG Email Distribution List: 23%
- NOHA Facebook group: 18%
- Other: 2%
Facebook groups, and 1 (2%) responder through their work with the NASG thus selecting the option “Other”.

Of the 49 responses, 63% (31) opted to remain completely anonymous while 24% (12) elected not to be, with a further 12% (6) also choose disclosure however remained anonymous by name. Of the 18 responses opting to disclose all or part of their details, the following medical professions were represented: 8 midwives or nurse-midwives, 2 doctors, 1 epidemiologist/data analysis. The remaining non-medical professions represented included: reproductive health specialists, a ‘programme associate’, ‘health delegate’, ‘program manager’, a student, and a ‘program intern’. This places the ratio of medical to non-medical at 11:7 with 33 unknown professions. Between the groups opting to disclose and not disclosing their details, there was no statistical difference between the manor in which they received the survey and their decision to disclose, suggesting that neither direct email communication, nor second party communication - such as through the IAWG and Facebook groups, affected respondents decision to share their personal details.

From the available 18 disclosed responses, there were 8 responses from across Africa, 5 from Europe, 2 from within the Middle East, and one responder from each of the following South America, Oceania and Asia. One responder noted their location as ‘Global, especially Africa’. Other points of interest regarding location are that two responders were in Geneva, Switzerland, three from South Sudan, and three cities in Nigeria - Sokoto, Katsina and Ibdan. From the available information it is also clear that the survey succeeded in global dissemination. Similarly, the (disclosed) organisations represented a spread across governmental departments, United Nations agencies, small NGOs, large INGOs, research institutes, universities, and medical facilities. Regarding responders experience in the humanitarian sector there was a pleasing spread of results. Interestingly, the ‘More than 15 years’ category and ‘1-3 years’ were the largest groups receiving almost equal responses with 6 and 7 respectively. A further 2 responders had ‘4-8 years’, and 3 were in the ‘9-15 years’ category. Overwhelmingly, 15 out of 18 responders work in the health sector of humanitarian response, while 2 more predominantly in education and 1 in protection.

![Chart 2 Years of experience of responders (based on 18 available responses)](chart.png)
**Survey Results**

**Questions on the NASG**

In the survey the respondents were given a brief description and visual aides about the NASG, its use and medical credibility. They were then asked 5 questions related to the NASG and humanitarian settings. In the first question, 58% (28) of responders claimed that they had indeed heard of the NASG prior to the survey, compared to 42% (20) who had not. An anomaly was discovered here as 1 responder failed to answer the question. However, under further examination this responder had answered the second question that inquired about if they had received training on the NASG as “Yes”, the responder had received training. This therefore supports that this responder did in fact know of the NASG, which therefore altered the results slightly to 59% (29) who knew of the NASG, and 41% (20) who did not. The second question asked, “Have you ever received training on using the NASG?”. To this, only 8 stated “Yes” they had received training, but encouragingly, 55% (27) responded stating “No, but I would like to” receive training. Whereas 29% (14) stated “No, but I don’t want / need to” receive training.

The responders were asked: “Simple, low cost technology has been cited as a key instrument in addressing global health inequalities. Do you agree/disagree that the NASG could be used as a facilitating technology in humanitarian contexts to reduce health inequalities?” They were requested to state where on a scale of 1-7 they stood in reference to the statement. This scale was guided by the Theory of Planned Behaviour, which recommended a scale of 7 when asking people for their sentiment towards an adjective. The use of multiple-item measures as opposed to single-item measure, i.e. a choice of only agree or disagree, helps to increase reliability and accuracy. It also allows for variance in strength towards to specific

**Chart 3 Showing training received and wanted by responders**

**Chart 4 Question 4: Do you agree/disagree that the NASG could be used as a facilitating technology in humanitarian contexts to reduce health inequalities?**
adjective giving greater insight towards the behavioural intention of the person (Ajzen 2011, p.8). This question was measuring agreeability which ranged from strongly disagree through to strongly agree with a middle option of “I don’t know”, should the responder feel unable to answer. The clearly marked scale labelled each option with a gradient of agreement. Five people (10%) opted for the “I don’t know” option, while overwhelmingly 36 people (73%) answered favourably choosing options “agree”, “slightly agree”, or “strongly agree” with 20%(10), 20%(10), and 33%(16) respectively. By contrast 8 people (16%) answered unfavourably with 8%(4), 4%(2) and 4%(2) for “strongly disagree”, “slightly disagree” and “disagree” respectively. A clear majority voted in favour of the NASG as a facilitating technology to reduce health inequalities in humanitarian settings.

The final question in this section was split into two-parts. The first part asked the responders for their perception of challenges towards adoption of new technologies in general, while the second part narrowed the discussion to the specificities of those challenges and advantages related to the adoption of the NASG. The following two diagrams (Figure 15 & 16) detail the number of responders who saw each concerns as one of three options: “a challenge”, “not a challenge”, or “Unsure”. A full summary of the responses in a table format can be found in Appendixes II. The first table (Chart 5) depicts question 5a on the general adaptability of new technology in low-resource settings, not specifically related to the NASG. From the figure, it shows that the majority – around a third of all responses, state that each concerns would all act as a challenge to adoption, with the biggest concerns being “Trust in new technology” (blue), and “Widespread knowledge and awareness of the technology” (purple). The concern that amassed the most “not a challenge” responses was the “Adaptation of new practitioner techniques / skills” with 17 (35%) of the responders. Regarding this concern, there is slight decrease in those who selected “Unsure”, and a slight decrease in the “A challenge for adoption” column, but this last option still amassed 63% (31) of the votes. This could suggest that of all the concerns that act as challenges, there may be the most flexibility in this opinion, which perhaps implies that if well supported by other factors, practitioner skills should not hinder adoption.

The itemised datasheet of responses showed that 19 responders (39%) stated all the concerns would be a challenge, while 12 responders (24%) marked all concerns as “Not a challenge for adoption”, with only 1 responder “Unsure” on all accounts. This “Unsure” responder also chose “I don't know” in the previous question on using the NASG in humanitarian settings to address health inequalities. Moreover, they also answered “No” regarding if they had heard of the NASG prior to the survey. This could imply that this responder felt they lacked the necessary information in order to answer the questions fully. There does not appear to be any patterns between the responder’s perceptions of challenges, and the disclosed information on years of experience of the responder, or their belief that the NASG would be appropriate in humanitarian settings (question 4). Lastly, with almost double the responses in favour of acting as challenges compared to those perceived as “Not a challenge for adoption”, this question reveals the difficultly of introducing a new technology regardless of the setting.
Survey Results

Chart 5 Question 5a. The adoption of new technology in any setting can be challenging. What do you think are potential concerns for new technology becoming commonplace practice?

Chart 6 Question 5b. Related to Q5a, possible foreseeable challenges for the adoption of the NASG in humanitarian settings could be...

Implementing the NASG in Humanitarian Settings: Adoption or Rejection? 95 of 116
Chart 6 illustrates Question 5b, which refers specifically to the adoption of the NASG in humanitarian settings. In this figure there is also a similar division of responses as seen in the previous Chart 5 with most respondents opting for the concerns as challenging rather than advantageous to adoption. However, in these results there are slightly more responders choosing advantages over challenges than in Question 5a. In fact the last concern, “Sustainability of NASG intervention in the post-crisis phase and beyond”, received an almost equal division of 54% a challenge, to 40% an advantage. Even though ultimately more people opted for choosing “a challenge”, this is the greatest number of opinions viewing a concern as advantageous. The data in this figure also shows markedly more “Unsure” responses than in Question 5a. One explanation for this could relate to the specificities of discussing the NASG when 42% of responders stated that they had not heard about this technology before the survey. Compared to Question 5a, the itemised data for Question 5b was much more varied and the use of the “Unsure” option was more frequent.

There were also greater responses in favour of the NASG’s adaptability in humanitarian settings than the more generalised previous Question 5a, where more challenges were seen. For example, 37% of responses stated that both “Knowledge and awareness of the NASG”, and “Training staff to use NASG (time & cost)” were advantages to adoption, while 61% and 55% of the responses thought the opposite. Even though more responders supported the concerns as challenges, the increases in the “Unsure” column is encouragement for facilitating change. The increases of responses in favour of adaptability of the NASG could be due to the lack of specific details in Question 5a making judgement calls more difficult to make, in comparison to the more focussed details in Question 5b.

The full datasheet of responses features the exact selection per respondent regarding the concerns. This gives more detail as to the exact responses and importantly the mind-set of the respondent. A total of 11 respondents (22.4%) voted across the board for all concerns as challenges, while 4 (8.1%) thought all would act as advantages to use. 85.7% of responses (42) included at least 1 challenge in their selection, and, 77% of responses (38) included at least 2 challenges for adoption. The biggest challenge to adoption of the NASG according to the data is the cost per NASG (65%), closely followed by knowledge and awareness of the NASG (61%). These questions on the NASG reveal that although there was over 50% of respondents who were already aware of the NASG technology, the challenges to its adoption in humanitarian settings appear to be sizable. Yet, there was also noticeable support for the technology that encouragingly supports continued exploration into its use in such a setting.

QUESTIONS ON THE MISP

The final section of the survey asked questions on the Minimum Initial Service Package for reproductive health in crises. The first question asked the respondent: “Are you aware of the
Survey Results

MISP?” to which 73% said “yes”, 24% said “no”, and 1 said “unsure”. For those who answered “no” the survey finished with an optional comments box. For those who answered “yes”, they continued on into the MISP section. Therefore the total number of responders for the MISP section was 37 not 49. Unlike during the NASG section where practitioner experience and opinion alone was required to make judgement calls, if the responder had no knowledge of the MISP then they would be unable and inaccurate in answering questions on the MISP.

The second question in this section asked; “Have you completed the online MISP distance training course”, to which 57% (21) said “yes”, 41% (15) said “no”, and 3% (1) said that they had “started but not yet finished”. The third question gaged responders’ involvement in MISP implementation and activities in order to understand their practical experience with the MISP. A total of 43% (16) of responders stated that they had indeed been directly involved with the MISP, while 57% (21) said they had not. The penultimate question inquired about incorporating the NASG into the MISP priority activities through Objective 4 of the MISP, which aims to reduce excessive maternal and neonatal mortality and morbidity.

Responders were asked; “In theory, do you think that the NASG could be introduced into the MISP to help reach Objective 4?” The results showed favouritism towards inclusion of the NASG in the MISP. However noting the difficulty of this task 54% (20) of respondents chose to mark the response “Yes, but with difficulty”, as opposed to 35% (13) who marked, “Yes, easily”; while the final 8% (3) of respondents thought that introducing the NASG would not help MISP objective 4. Further, one responder, a ‘nurse-midwife reproductive health advisor’ with over 15 years experience stated that, “It could be, but I’m not in favour of it”. In summary of this question and the reactions it encountered, although many people believe that the NASG does complement the MISP, there is a looming sentiment that the task of inclusion would be both difficult and face strong opposition from experienced peers.

Lastly, the remaining 37 MISP respondents were asked, “If there was an option to introduce the NASG as a life-saving first-aid devise to the MISP (and therefore the emergency reproductive health kits), which best reflects your standpoint?”. This question differs from the previous one, as instead of asking if the NASG complements the objectives of the MISP, it is asking respondents to take a stance on NASG inclusion should such an opportunity arise now. Thus, it is putting theory aside, and asking directly – if you could decide, what do you want to happen? As Chart 8
departs, the majority of respondents (25/68%) agree to include the NASG into the MISP. Not surprisingly, these 25 responders includes 12 responders also opted for “Yes, easily” in the previous question, and 13 of the respondents who answered “Yes, but with difficulty”. A comparably smaller number of responses stand in opposition with only 8% (3) not agreeing with inclusion. Under closer examination of the 3 responses that disagreed to inclusion, 2 had rejected the compatibility of the MISP and NASG in the previous question, and the third had expressed disdain towards the idea. These responses suggest that these responders are not in support of the NASG as an appropriate technology to support maternal healthcare in humanitarian settings under any circumstance.

There were also 3 responses (8%) stating that they had never contemplated the inclusion of the NASG into the MISP until the survey question, and a further 16% (6) of the responses noted that they did not mind either way. Collectively the groups “I don’t mind either way” and “I have never thought about it before”, amass 9 responses. Of these 9 responses, 7 had stated earlier in the survey that they had never heard of the NASG prior to the survey. By contrast, those respondents voting against NASG inclusion and its compatibility with the MISP were already aware of the NASG prior to the survey. This hints at the suggestion that respondents with the strongest opinions are those with greater knowledge. This proves true for both ends of the spectrum reflecting the avid supporters and those fervently against. Ultimately however, the conclusion remains that from this small pool of voluntary responders, almost 70% are in favour of including, or at least trying to include, the NASG into emergency reproductive health response during crises.

**Comments**

The final option for responders was a comments box at the end of the survey. From a possible 49 entries, 23 people entered text. Of the 23 entries, 7 can be categorised as either encouragement, a mutual appreciation of the subject matter, or contact details for result follow-up. The content of the remaining 16 entries will now be discussed.
The sixteen comments were divided into positive or negative comments by a ratio of 10:6. Of the negative comments some had been constructively critical, however they were critical none the less. Almost all 16 comments continued the discussion over challenges for implementation as had been address in earlier questions (a totally of 11 comments referred to challenges). Of these challenges the responders highlighted the following topics: implementation, other tools to address PPH, evidence base, costing, the MISP and training and capacity. Regarding implementation 2 respondents highlighted that the NASG is not a cure in itself and therefore the presence of definitive treatment is necessary in order to impact mortality and morbidity. Further, that without definitive treatment, the NASG “will do little to save saves” (Anon1). The other responder identified by their location in Geneva, Switzerland referred to the NASG as having “the same applicability as a Band-Aid, will work for a short period of time but doesn’t solve the problem”. However, the NASG has not tried to claim to be a definitive treatment and in fact, its use could well be likened to a Band-Aid, however without that Band-Aid would women be able to reach EmOC facilities, or even once there, would they have enough time to wait to receive definitive treatment without the NASG acting as a “Band-Aid”? In addition to these more critical points, another responder noted how the NASG is part of “broader post-partum haemorrhage technologies” (Anon2). This more optimistic opinion is shared by the 2 respondents highlighted above (Geneva and Anon1), however Anon2 sees the value of the NASG within broader PPH interventions, and that a more holistic approach is necessary as there is no ‘magic-bullet’ intervention to solve the problem of PPH in these settings. Anon2 also highlighted the importance of “training and capacity to use the NASG correctly” (ibid Anon2).

Another issue raised within implementation was the risk of improper cleaning and washing of the NASG that could lead to infection once reapplied to a second patient. However, this hypothetical situation remains exactly hypothetical, if cleaning instructions are followed there is no cause for concern (UCSF Safe Motherhood Program 2014, p.4). The same responder based in Geneva also noted how implementation would not work at a level below that of a regional hospital equipped with surgical facilities and “proper hygiene facilities and practices” as distribution, training and follow-up of new equipment would be a “burden” for staff. In direct contrast to these views however, a responder from Ibdan, Nigeria states, “there is an urgent need to increase the awareness and availability of the NASG especially in rural settings where emergency services are unavailable”. This opinion directly opposes that from Geneva yet it based on the same facts – that more rural settings have less available services and therefore are in need of technologies that can bridge this divide. Moreover, a Health Delegate based in Damascus, Syria working with the IFRC stated that the NASG was “suited for [an] emergency settings”. Furthermore he asserted that the IFRC is supporting Syrian ambulances with NASG distribution and training to increase safe deliveries within the on-going Syrian crisis. This news is very promising for NASG use as it will be the first time the NASG has been rolled out in an
unstable humanitarian setting. A final point regarding implementation is that 2 comments reiterated their support for NASG inclusion in the MISP to as an implementing devise.

Six comments referred to other PPH tools to combat mortality and morbidity. Of these 6 comments, two referenced misoprostol as another intervention. A comment from Douglas Huber at IDEAS inquired about the comparison between the NASG and misoprostol in terms of costing, ease of training and distribution. Further suggested an evidence base of comparison between these two interventions, which are in fact complementary but are often seen in opposition to one another by their supporters. Again Mr Huber raised the question of where to implement the NASG – “in [the] community, primary health facility, district hospital?”, the answer to which is dependent on the context. The other response that mentioned misoprostol was less constructive, claiming misoprostol interventions are of greater cost effectiveness and that misoprostol should already be included in the MISP.

The final remarks within the comments related to requests of follow-up of the results (4), need for greater research and evidence base before widespread implementation (4), while a total of 4 comments questioned the cost effectiveness of an NASG intervention.

In summary, the comments reiterated and expanded on challenges already highlighted in the survey. A fairly recurrent theme was that of how to implement and at what level of the health system. Interestingly only one responder highlighted the importance the working with the Ministry of Health for distribution and training, suggesting their impression was that of a more national and sustainable response. A surprise and encouraging find for adoption were the comments from the IFRC Health Delegate about NASG rollout international Syrian hospitals. The respondents were split on whether the advantages of the NASG actually worked against the garment – such as the ”Band-Aid” approach to postpartum haemorrhage which “only buys the patient time” (Anon1). There appears to have been a misunderstanding that in settings where services are unavailable, time to reach medical assistance, and time waiting for definitive treatment, is an indirect cause of women dying from postpartum haemorrhage, which the NASG outcome.

\[1\] For the full dataset please see Appendix II

\[2\] For the full dataset please see Appendix II
PART VI. THE CONCLUSION
CONCLUSION

At the beginning, I asked two questions, one inquiring as to the barriers and facilitators for adopting the NASG into humanitarian response, and the other asking if the NASG was appropriate for humanitarian crises. In short, this research has shown that yes, the NASG is appropriate for humanitarian settings because it is open to adaptation, reinvention, as well as its attributes of simplicity. The identified obstacles to adoption appear to be related to the methods used for implementation – how is it implemented, and by whom to whom? Additionally, related innovations for PPH in low-resource settings appear to be dividing those in decision-making positions. Further, the perception of cost and the level of involvement necessary for an NASG response, coupled with weak health systems in countries affected by humanitarian crisis are deterring consideration and use. However, on paper the NASG possesses all the attributes of innovation as outlined by Rogers’ (2003) Theory of diffusion – relative advantage, compatibility, complexity, trialability and observability. Berdichevsky et al (2010) found that success and ownership of the NASG came from observable results and need for the NASG. This is felt most starkly in the community however, without equal advocacy targeting senior health officials and practitioners in tertiary hospitals, success will be limited. Those who were resisters or rejecters were found to be surgical staff in positions of power thus very influential in dictating opinion on the innovation. In order not to turn them into opponents, implementation must inspire them to advocate and use the NASG in order to secure its survival in the system. It is this ‘software’ component of the innovation which has been highlighted as the most problematic, but Denis et al (2002, p.70) welcome such a characteristic stating how the greater the uncertainty surrounding implementation techniques, the greater the applicability and adaptability of the innovation to different settings. NASG implementation is as much about not using the NASG as it is about using it. Along with NASG training, the emphasis is placed on proven standards and practices to reduce incidence of PPH and overcome delays.

The obstacles in the way, are merely the failure of successful facilitators, if due attention is paid to the context, discovering who the stakeholders are, and who will be impacted by the device (especially pertinent for power relationship in higher level facilities), many obstacles will be greatly reduced. Nevertheless, there will always be unforeseen consequences to introducing an innovation, and these must be monitored so as to further the learning and implementation of future interventions – the consequences may extend far outside the health system. Similarly, as Pathfinder International (2013) learnt in Tanzania, if the system in place is already below standard, interventions may need to start from a much more basic level in humanitarian settings. However, meeting practical needs alone will not be enough to reduce the vulnerabilities of women and girls in humanitarian settings, activities surrounding PPH such as addressing the delays and the local practices, beliefs and behaviour towards medical care, birthing and pregnancy are the key to sustained health improvements. The NASG serves as a ‘game changer’ to re-emphasise proven practices to manage and control incidence of PPH. It is
CONCLUSION AND RECOMMENDATIONS

low-cost, re-usable, light, quick to apply, simple to use, store and maintain. It is not a cure or a treatment for PPH, but it does not pretend to be. There is a gap in the process of women who suffer PPH receiving the treatment they need and the NASG has been developed to fill that gap. It demands that it is implemented as a package, or in a technology cluster for maximum effect against PPH mortality. The difficult it is now encountering is not if it ‘fits’ into the humanitarian setting, but that it has split medical opinion over the best implementation method to fight PPH in humanitarian crises, rather than being seen as a tool to complement existing strategies and innovations. This was clearly seen in small sample of 50 survey respondents – when able to express their opinion the majority continued discussion over the challenges to implementation.

Furthermore, the MISP remains unaltered since its inception in the 1990s. Neither misoprostol nor the NASG have made gains in being added to the emergency reproductive health kits distributed in crises. This is a barrier, not only to the NASG, but the technology cluster of PPH prevention and treatment as a whole. With limited change at the institutional level, implementation of the NASG will have to come from individual humanitarian agencies or national health systems – with equally numerous bodies involved in decision-making. Encouragingly however, the survey has shown that there may well be movement with the Syrian Arab Red Crescent Society reporting their upcoming plans for NASG rollout across ambulances and in the health system inside Syria. A pivotal moment for the NASGs history in the humanitarian sector and hopefully data will be collected on the procedures used and the success, setbacks and consequences of use recorded to build an evidence base of implementation methods.

This investigation has journeyed through a topic that at its core is a medical issue, but its construction, its continuance and the strategies necessary to counteract it, are intrinsically social and cultural, imbedded in contextual structures and norms. Maternal mortality has been reduced by 45% since 1990, however this is far off the 75% reduction as outline in MDG target 5. Postpartum haemorrhage continues to take over a quarter (27%) of all fatalities and the locations of these deaths are increasingly localised, both between regions, but also within countries and communities. Correlation of maternal mortality to recent humanitarian crises adds to the understanding that a breakdown in societal structures and norms negatively impacts women and girls’ access and availability to reproductive health services. Moreover, humanitarian crises occur more regularly in less economically developed countries where health beliefs and practices are often governed by heavily patriarchal and hierarchical social systems that are detrimental to the health of women and girls through a reduction in their fundamental human rights. At the core of vulnerability is power, or rather powerlessness. The concentration of power is fed and maintained by the structures and norms of society. In communities of poverty expectation would suppose to also find low education, limited economic opportunities and high gender imbalances and inequality. These ails of society are painfully exposed during humanitarian crisis, but with exposure comes opportunity to change
behaviours and attitudes through innovation. Each specific context is unique, and holds the key to its own successful diffusion. Humanitarian response must build on the capacities and capabilities of the affected community – *what do they have?* instead of focussing on what they lack. Building on this resilience will breed sustainability and re-invent humanitarian response in the eye of those affected. However, and of vital importance, is that the response must tend to those structures that will disadvantage the most vulnerable. As Rogers (2003, p.443) maintains, “every social system has certain qualities that should not be destroyed if the system is to be maintained”, therefore the introduction of new innovation must be careful not reinforce the bridges which support those in power, as “usually new ideas make the rich richer, and the poor poorer” (Rogers 2003, p.444). The Diffusion of Innovation is a fascinating tool that highlights where the weaknesses are in the rate of adoption of an innovation and how to overcome them. For the NASG these lie not in the innovation itself, but in the implementation – *where, who and how*. Each setting must re-invent and tailor the implementation to build on the individualised capacities and strengths unique to that context.

The Theory of Planned Behaviour has taught us that that the more resources and opportunities individuals believe they have, the more likely it is that they will indeed perform a desired behaviour. Therefore, there is strength in the perception (whether true or not) that a person can carry out an intended behaviour. This layer of the Theory maintains that once a belief is set within an individual, regardless of truth or fact or scientific validity, it generates a sequence of ‘reasoned’ intentions and behaviours based on that belief (Ajzen 2011, p.126). Consequently, the key to addressing PPH in humanitarian settings, and lessening the vulnerability of women and girls, is premised on their control over their reproductive health. This comes through targeted interventions, of which the NASG may act a tool to inspire change, and use the exposure of humanitarian crisis to improve the health, and future opportunities of women and girls.

Countering the critique of the Diffusion of Innovation, which is focussed on the inequality gap and individual blame, the diffusion of the NASG is targeted at communities at risk of PPH, a problem almost eradicated in countries with quality functioning health systems. UCSF, the research institute who developed and designed the NASG is pushing for positive patient outcomes and not focussed on profit, which drastically shifts the perspective of the Theory. Further, the contexts in which the NASG will be implemented differ drastically from those of its founding, and needless to say the Theory has become a product of its teachings, becoming reinvented to fit the environment in which it is implemented. For example the categories of adopters may not take the shape as those described in the Theory, but they serve as a benchmark for understanding how individuals in each context express themselves about a certain innovation. The applicability of the Diffusion of Innovation is indeed far reaching and its foundation in socio-economic factors and divisions strikes residence across social science research.
CONCLUSION AND RECOMMENDATIONS

Changing structures, norms and behaviour will always pose a challenge and undoubtedly lock heads with those who resist the change. Innovation is about changing behaviour and bringing new thinking to old practices. The perception of control is built from our socio-cultural beliefs and norms that define who and how we make decisions; we are all at the mercy of structures and norms no matter how discreet they may appear. Too many people are involved for institutional change in the way SRH is managed in humanitarian crises. Change will be slow and incremental – if at all. Thus the onus falls to humanitarian organisations to decide whether of not use the NASG in their response. As crises around the world continue to protract and re-occur, ever eroding the gains made in healthcare provision and quality, the key to protecting people from vulnerability will always be in a response that builds on the resilience of those affected, adapting the knowledge systems already in use, and paying attention to contextual factors to create sustainability and despite the crises, give control to those most vulnerable to make their own decisions about their health.

RECOMMENDATIONS

This investigation has journeyed through to its conclusion, however a few key points need to be emphasised moving forward into implementation of the NASG.

1. The greatest rate of adoption with the highest level of sustainability will happen in places where the need is greatest, and therefore the impact is greatest and the results can be directly attributed to the NASG.

2. The dynamics of power relations within all levels of a social system must be carefully analysed, and all stakeholders involved – from the start, to avoid creating resisters or rejecters in senior decision-making positions to implementation. Perception of change and fear of the consequences of innovation and thus changing clinical behaviour can act as a deterrent for those who fear their power and control will be reduced. This uncertainty is reduced through strong innovation-decision processes.

3. NASG intervention and implementation is as much about not using the garment as it is about the garment. The NASG must be coupled with health systems strengthening through training and capacity building. It is not a stand-alone device.

4. The NASG, and all innovations, must build on what there is, and not, what there isn’t. Encouraging re-invention and adaptation of the NASG increases its potential for success by allowing members of the social to give meaning to it and allow a two-way process of behavioural change. This builds resilience to maternal mortality in the future.

5. Every context is unique, and they each possess the key to their own successful diffusion.
REFERENCES & APPENDIXES


Maternova (2014) [ISSUU - Maternova Catalog August 2013](http://issuu.com/maternova.inc/docs/maternova_catalog_issuu_aug_2013) [online], available:


The International Planned Parenthood Federation (2011) *SPRINTing towards Change: Sex and Pregnancy in Emergencies*.


United Nations Department of Economic and Social Affairs (2014) *World Urbanization Prospects, the 2011 Revision* [online], available: http://esa.un.org/unup/Analytical-Figures/Fig_2.htm [accessed 22 Feb 2014].


APPENDIX I THE SURVEY

This is a copy of the survey that was sent out to potential responders in April 2014 using Google Docs Forms.

The non-pneumatic anti-shock garment (NASG) in humanitarian settings

Thank you for taking an interest in filling out this survey on the use of the non-pneumatic anti-shock garment (NASG) in humanitarian settings. I hope it doesn’t take up too much of your time!

My name is Clare Lothhouse, I'm studying a 2-year master in Humanitarian Action at Uppsala University in Sweden. This course is part of the Network on Humanitarian Assistance (NOHA) which is a joint European training programme on humanitarian assistance. The title of my thesis is:

"Addressing postpartum haemorrhage in humanitarian settings: Can the non-pneumatic anti-shock garment be implemented to reduce maternal mortality in humanitarian crises?"

Information gathered in this survey will only be used in my master thesis that will be accessible to the grading panel and myself. The submission deadline and defence will happen between the 30th May and the 3rd June 2014.

The aim of this survey is to investigate current knowledge and the potential use of the NASG within the humanitarian sector. Questions are directed towards answering these queries and all information will remain anonymous unless otherwise explicitly stated so by the responder.

By completing this survey, you will be assisting me in my thesis research. Moreover, this thesis aims to work towards informing a broader discussion on the use of the NASG in humanitarian contexts.

If you are interested in the results of the survey, I will compile all the responses anonymously and send an analysis of the survey to all those who leave a contact email address. I will keep this analysis strictly anonymous regardless of the opt in/out anonymous option for filling in the survey. If you are interested in receiving this email please leave an email address in the comments box at the end of the survey.

You are only required to answer the first question on your anonymous status. After that you can move freely though the survey.

ALL 10 QUESTIONS ARE MULTIPLE CHOICE or CHECKBOXES. It will only take a few minutes to complete!

If you would like to discuss the content or use of the survey please do not hesitate to contact me.
Thank you!
Clare

* Required

Contact me at: lothhouse.clare@gmail.com or +41789670711

UPPSALA UNIVERSITY
1. Would you like to answer the survey anonymously? *  
You can decide if you would like to fill in the form anonymously or if you would like to be referred to by name, by organisation, by job role etc.  
Mark only one oval.  
☐ Yes, I want to be anonymous  
☐ No, I don’t want to be anonymous  
☐ No, but I don’t want to be referred to by name  

2. Where did you find out about the survey?  
Mark only one oval.  
☐ Direct email from Clare Lofthouse  
☐ IAWG discussion forum  
☐ NDHA (Past, present and future) Facebook group  
☐ A friend/colleague suggestion of interest  
☐ Other: ___________________________________  

Optional personal details  
Please fill out any details you are happy to share and select how you would like to be referred to in the thesis.  
You have the option to opt out and remain anonymous at any time. To do so, please email me at lofthouse.clare@gmail.com or call +4178670711 at anytime before the 26th May 2014  

3. Job title  
Please also include your medical background e.g. nurse, midwife, gynaecologist  
__________________________________________________  

4. Organisation currently working with  
__________________________________________________  

5. Your geographic location of work  
City, Country  
__________________________________________________  

6. In the thesis I would like to be referred to by...  
Please tick all that apply e.g. if you only want to be known as ‘a medical officer working in Kenya’, select ‘My job role’ and ‘Geographic location’.  
Mark only one oval.  
☐ My name  
☐ My organisation  
☐ My job role  
☐ My geographic location  
☐ My years of experience  
☐ All or any of the above  
☐ Totally anonymously  
☐ Other: ___________________________________  

7. Email address  
If you are interested I am happy to share the final thesis with you  
__________________________________________________  

8. How long have you been working in the humanitarian sector?  
Mark only one oval.  
☐ 1-3 years  
☐ 4-6 years  
☐ 9-15 years  
☐ More than 15 years  
☐ Prefer not to say  

9. Using the UN Cluster system as a guideline, which cluster do you mainly work in?  
Mark only one oval.  
☐ Health  
☐ Water and Sanitation  
☐ Protection  
☐ Shelter  
☐ Logistics  
☐ Nutrition  
☐ Food Security  
☐ Camp Management and Coordination  
☐ Telecommunications  
☐ Education  
☐ Early Recovery  

The Non-pneumatic Anti-Shock Garment (NASG)  
Below is a picture of a model wearing an NASG with a brief description of its usability underneath. The NASG has been used in Tanzania, Nigeria, Egypt, Zambia, Zimbabwe, India and Pakistan. It is quick and easy applied by anyone following a short training.  

The neoprene and Velcro compression suit allows for easy examination or vaginal procedures as well as the possibility to open the abdominal section for surgery. It can be washed and reused up to 40 times and costs around $75.  

Since 2012 the NASG has been recommended by the WHO for the treatment of postpartum haemorrhage “as a temporizing measure until appropriate care is available” in the WHO recommendations for the prevention and treatment of postpartum haemorrhage.  

NASG pictures below are accredited to http://www.lifetabs.org/ from the University of San Francisco, California
10. Have you heard of the non-pneumatic anti-shock garment (NASG) before?
   Check all that apply:
   □ Yes
   □ No
   □ Maybe

11. Have you ever received training on using the NASG?
    Mark only one oval:
    □ Yes
    □ I am booked on a training
    □ No, but I would like to
    □ No, I don’t want/need to

12. Simple, low cost technology has been cited as a key instrument in addressing global health
    inequalities. Do you agree/disagree that the NASG could be used as a facilitating technology in
    humanitarian contexts to reduce health inequalities?
    1: Strongly disagree 2: slightly disagree 3: disagree 4: I don’t know 5: agree 6: slightly agree 7: Strongly
    agree.
    Mark only one oval.
    □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7
    Strongly disagree □ □ □ □ □ □ □ Strongly agree

13. 5a. The adoption of new technology in any setting can be challenging. What do you think are
    potential concerns for new technology becoming commonplace practice?
    Please select all options that you think apply as either a challenge, a not a challenge, or if you are unsure
    Mark only one oval per row.
    A challenge for adoption □ Not a challenge for adoption □ Unsure □
    - Trust in the new technology
    - Evidence testing of the new technology in specific contexts
    - Adoption of new practitioner techniques / skills
    - Widespread knowledge and awareness of the technology

14. 5b. Related to Q5a, possible foreseeable challenges for the adoption of the NASG in humanitarian
    settings could be
    Please select all options that you think act as either a challenge or advantage to adoption
    Mark only one oval per row.
    I believe this would act as a challenge for adoption □ I believe this would act as an advantage for adoption □ Unsure □
    - Knowledge and awareness of NASG
    - Training staff to use NASG (time & cost)
    - Cost of NASG (around $75 per garment)
    - Sustainability of NASG intervention in the post-crisis phase and beyond

Minimum Initial Service Package for Reproductive Health
<table>
<thead>
<tr>
<th>Timestamp</th>
<th>Anonymity?</th>
<th>What did you find out about the app?</th>
<th>1. Have you ever used an app before?</th>
<th>2. Have you ever made any assumptions about any apps you use or have used before?</th>
<th>3. Do you think there are any potential uses for the app that could be used as a tool?</th>
<th>4. Have you ever used an app in a humanitarian context to reduce a challenge?</th>
<th>5. (Assuming you are not a student, is there any technology you would like to use in your future work in your field or career?)</th>
<th>6. (If you are a student, which technology would you like to use in your future studies?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>NVDA Facebook group</td>
<td>No</td>
<td>No, but I would like to</td>
<td>3</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>NVDA Facebook group</td>
<td>No</td>
<td>No, but I would like to</td>
<td>5</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>NVDA Facebook group</td>
<td>No</td>
<td>No, but I would like to</td>
<td>4</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>A friend / colleague / suggestion of interest</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>Not a challenge for adoption</td>
<td>Not a challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>NVDA Facebook group</td>
<td>No</td>
<td>No, but I would like to</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>No</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>No</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>Yes, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>NVDA Facebook group</td>
<td>No</td>
<td>No, but I would like to</td>
<td>3</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>NVDA Facebook group</td>
<td>No</td>
<td>No, but I would like to</td>
<td>5</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
<td>Not a challenge for adoption</td>
<td>Not a challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>4</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>5</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>5</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/2/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>5</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>5</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>6</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
<td>Not a challenge for adoption</td>
<td>Not a challenge for adoption</td>
<td>Not a challenge for adoption</td>
</tr>
<tr>
<td>4/3/2014</td>
<td>No, but I don't want to be anonymous</td>
<td>Direct email from Clare Lofthouse</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
<td>A challenge for adoption</td>
</tr>
<tr>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
<td>Q</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>1. Have you completed the online MISP course on the NASG?</td>
<td>Are you aware of the NASG?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, no difficulty</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>2. Have you been introduced to the NASG?</td>
<td>Do you think that the NASG could be included into the MISP training course?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>3. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>4. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>5. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>6. What are the advantages for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG in your organisation?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>7. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>8. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>9. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>10. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>11. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>12. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>13. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>14. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>15. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>16. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>17. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>18. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>19. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>20. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>21. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>22. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>23. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>24. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>25. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>26. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>27. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>28. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>29. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>30. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>31. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>32. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>33. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>34. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>35. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>36. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>37. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>38. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>39. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>40. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>41. Challenges for the adoption of the NASG</td>
<td>Challenges for the adoption of the NASG in your organisation</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>42. What are the challenges for the adoption of the NASG?</td>
<td>What are the advantages for the adoption of the NASG?</td>
<td>Yes &amp; easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td>Yes, easily</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>43</td>
<td>I believe this would act as a challenge for adoption</td>
<td>I believe this would act as a challenge for adoption</td>
<td>I believe this would act as a challenge for adoption</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes, easily</td>
<td>I agree with including the NASG</td>
</tr>
<tr>
<td>44</td>
<td>I believe this would act as advantage for adoption</td>
<td>I believe this would act as advantage for adoption</td>
<td>I believe this would act as advantage for adoption</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes, but with difficulty</td>
<td>I agree with including the NASG</td>
</tr>
<tr>
<td>45</td>
<td>I believe this would act as a challenge for adoption</td>
<td>I believe this would act as a challenge for adoption</td>
<td>I believe this would act as a challenge for adoption</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes, but with difficulty</td>
<td>I don’t mind either way</td>
</tr>
<tr>
<td>46</td>
<td>I believe this would act as advantage for adoption</td>
<td>I believe this would act as advantage for adoption</td>
<td>I believe this would act as advantage for adoption</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes, easily</td>
<td>I don’t mind either way</td>
</tr>
<tr>
<td>47</td>
<td>I believe this would act as a challenge for adoption</td>
<td>I believe this would act as a challenge for adoption</td>
<td>I believe this would act as a challenge for adoption</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, easily</td>
<td>I don’t mind either way</td>
</tr>
<tr>
<td>48</td>
<td>I believe this would act as advantage for adoption</td>
<td>I believe this would act as advantage for adoption</td>
<td>I believe this would act as advantage for adoption</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, but with difficulty</td>
<td>I don’t mind either way</td>
</tr>
<tr>
<td>49</td>
<td>I believe this would act as a challenge for adoption</td>
<td>I believe this would act as a challenge for adoption</td>
<td>I believe this would act as a challenge for adoption</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, but with difficulty</td>
<td>I don’t mind either way</td>
</tr>
<tr>
<td>50</td>
<td>I believe this would act as advantage for adoption</td>
<td>I believe this would act as advantage for adoption</td>
<td>I believe this would act as advantage for adoption</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, but with difficulty</td>
<td>I don’t mind either way</td>
</tr>
</tbody>
</table>
This appendix details the responses to Question 5a and 5b of the survey distributed to respondents during April 2014. These tables have been included to add more detail to the statistics discussed in the section ‘Questions on the NASG’ in the chapter on ‘Survey Results’.

**Responses to Question 5a in the NASG survey**

5a. The adoption of new technology in any setting can be challenging. What do you think are potential concerns for new technology becoming commonplace practice?
Please select all options that you think apply as either a challenge, not a challenge, or if you are unsure

<table>
<thead>
<tr>
<th>Concern</th>
<th>A challenge for adoption</th>
<th>Not a challenge for adoption</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust in new technology</td>
<td>35 71%</td>
<td>11 22%</td>
<td>3 6%</td>
</tr>
<tr>
<td>Evidence testing of the new technology in specific contexts</td>
<td>33 67%</td>
<td>13 27%</td>
<td>3 6%</td>
</tr>
<tr>
<td>Adaptation of new practitioner techniques / skills</td>
<td>31 63%</td>
<td>17 35%</td>
<td>1 2%</td>
</tr>
<tr>
<td>Widespread knowledge and awareness of the technology</td>
<td>34 69%</td>
<td>12 24%</td>
<td>3 6%</td>
</tr>
</tbody>
</table>

**Responses to Question 5b in the NASG Survey**

5b. Related to Q5a, possible foreseeable challenges for the adoption of the NASG in humanitarian settings could be...
Please select all options that you think apply as either a challenge, advantage, or if you are unsure

<table>
<thead>
<tr>
<th>Concern</th>
<th>Challenge for adoption</th>
<th>Advantage for adoption</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and awareness of NASG</td>
<td>30 61%</td>
<td>18 37%</td>
<td>1 2%</td>
</tr>
<tr>
<td>Training staff to use NASG (time &amp; cost)</td>
<td>27 55%</td>
<td>18 37%</td>
<td>4 8%</td>
</tr>
<tr>
<td>Cost of NASG (around $75 per garment)</td>
<td>31 65%</td>
<td>12 25%</td>
<td>5 10%</td>
</tr>
<tr>
<td>Sustainability of NASG intervention in the post-crisis phase and beyond</td>
<td>26 54%</td>
<td>19 40%</td>
<td>3 6%</td>
</tr>
</tbody>
</table>
IMPLEMENTING THE NASG IN HUMANITARIAN SETTINGS: ADOPTION OR REJECTION? 122 OF 116

Dec. 2009 © IAWG. Based on Inter-Agency Field Manual on Reproductive Health in Humanitarian Settings.