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An Evaluation of the Efficacy of Communication with Communities on Health Outcomes of a Disaster: the Floods in Taung, North West Province, South Africa, March – April 2006

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An Evaluation of the Efficacy of Communication with Communities on Health Outcomes of a Disaster: the Floods in Taung, North West Province, South Africa, March – April 2006

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Submitted to the Faculty of Health Sciences, University of the Witwatersrand

In partial fulfillment of the requirements for a Masters degree in Public Health (Disaster Management)

Johannesburg, 2008

DECLARATION

I, Jennifer Murray Heslop, declare that this research report, submitted in partial fulfilment of the Degree of Masters in Public Health at the University of the Witwatersrand, Johannesburg, is my own original work; and that it has not been submitted before for any degree or examination at this or any other University.

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University of the Witwatersrand
Health Sciences Faculty
Johannesburg
April 2008

DEDICATION

This research is dedicated to communities that are vulnerable to disasters as a result of poverty and lack of infrastructure as well as those that believe in a community's own inherent strengths and knowledge and recognize there is an opportunity to learn from each other for the greater good. It is also dedicated to my Dad who lived the Rotarian mantra "service above self."

ABSTRACT

The American Defense Institute for Medical Operations (DIMO) states that deaths associated with disasters have increased by 50 percent each decade and as Alexander (2002) notes, although disasters require special organization, coordination and resources, they are not exceptional events. Disasters tend to be repetitive; often re-occurring in the same places and as such, are sufficiently frequent and predictable enough to plan for.

Disasters are occurring more frequently due to industrialization and rapid development, and as the world's population has grown, large numbers of people are "vulnerable"; living in less desirable, less 'safe' areas. "Natural" disasters hit developing countries perhaps harder, where more people are vulnerable, infrastructure is lacking to begin with and resources are already stretched. Many countries including South Africa are challenged by the increasing number of natural disasters and how to protect the most vulnerable who are without basic infrastructure and largely without access to media. Thus effective public health communication and promotion has become of critical importance particularly in high risk communities and is possible since disasters often occur in the same places.

Purpose

Literature exists on the efficacy of using media channels to reach people with critical public health messages during disasters, but no studies have focused specifically on other means of communicating public health messages during disasters in places where media doesn't reach or people can't justify the cost of batteries for their radios. No research has been done to determine if the people affected recall life saving lessons imparted during disasters; why or why not.

Similarly, there is little in the way of documentation detailing the following during past disasters that have occurred both on the African continent and worldwide: who communicated public health messages; what messages were communicated and how messages were imparted. Media – specifically radio and television are used in developed countries to communicate warnings and evacuation messages for example. At best there are reports from the different NGO's that operate in communities affected by a disaster or NGO's that arrived to provide humanitarian assistance. It can be surmised that communication is done by those that take the

initiative using whatever channels exist; this may likely include the affected country's own resources, NGO's and responders. Coordination to prevent duplicating messages or groups operating in the same areas has in the past been lacking. As such, there is a need to look critically at vulnerable places and people, the value of the information imparted during disasters, why messages may or may not be heeded and if communities would apply the information in future without outside assistance.

The study looks at a community that was affected by a specific disaster in South Africa; what proportion of the sample learned life-saving information for the first time during the disaster and whether they would recall these life-saving mechanisms, unaided, in similar future scenarios. Another objective was to determine if gender, age, education or employment status was of any significance against the portion of the study population that learned the information for the first time during the floods. The research leads one to question whether messages are in context with people's realities and what would *prevent* them from applying the principles imparted. Broader questions arose, like, do disasters provide an opportunity for learning where there was no learning yet established; and is there an opportunity for engagement between "outsiders" (those with expertise) and "insiders" (affected community) that is truly beneficial to those in need of the information – beneficial in the sense that the information could be applied in future without outside assistance?

Design/ methodology

The research included two key groups of people: those responsible for the decision making around the communication and public health response to the disaster, and the affected communities. The research design included qualitative key informant interviews accessed through snowballing technique and quantitative face-to-face interviews with 100 community members.

The qualitative study was a descriptive, semi-structure interview outline designed to provide a framework to describe the situation, the health risks, priorities, health promotion messages that were communicated and how they were communicated. Key informants were made up of members of the disaster response team as well as others that played a role during the floods. The interviews were transcribed; reoccurring themes were identified and distilled to get the three most critical public health messages that were communicated during the floods. The recurring themes formed the basis of the quantitative questionnaire.

The quantitative study, a cross sectional descriptive study, relied on one hundred community members living in the broader Qho area during the floods and provided they met the criteria (they lived in the area during the floods and could recall what happened), they were asked for their consent before the interview commenced. The data were captured and analysed using Epi Info 6, frequencies were run to describe the sample, and then cross tabulations were performed, looking for associations between the outcome variables and demographic and media variables; chi square tests were performed to test for significance.

The three most critical public health messages were: water purification, oral re-hydration therapy for diarrhea and warnings not to eat an animal that had died of unknown causes during the floods.

Findings

The findings of the research indicate that across two public health messages more than half of all respondents learned the information that may have saved their lives for the first time during the floods. Forty-eight percent learned how to purify water for the first time during the floods; 54.2 percent learned about oral re-hydration therapy during the floods; and 55.6 percent learned not to eat an animal that has died of unknown causes during the floods.

Determining whether the sample population would apply the same lessons learned, unaided, in future similar circumstances, is harder to prove since it is self-reported. Nearly 100 percent across the three questions said categorically that they would and most could name ways to purify water, stop diarrhea and said that they knew not to eat an animal that has died of unknown causes. One hundred percent of responders said they would know what to do to make dirty water clean and some cited ways they would do this by boiling and/ or the use of ‘Jik’ (brand of bleach; in South Africa, the word ‘Jik’ has become synonymous with ‘bleach’).

Ninety percent of the sample said they would use “the salt and sugar mixture in water” to treat diarrhea and 90 percent knew they should not eat an animal that has died of unknown causes.

It is perhaps of interest to note that significantly more men learned during the flood to use OTR for diarrhea than women. Thus disasters may likely provide an opportunity for men to learn health practices that normally women would be more likely to have learned.

There was also a significant difference between those that learned about ORT during the floods and those that learned before the floods by level of education, with 63 percent of those that learned about ORT before the floods, having completed primary school.

Also of interest was the fact that while only 15 percent of the total sample population has access to television, of the 55.6 percent that learned not to eat an animal that has died of an unknown cause during the floods, 24.5 percent had access to television, and 86 percent of those with access to TV learned about this during the flood.

Practical implications

Disasters provide opportunities to fast-track development and public health goals. However, based on the research, for communication to have the desired response, communities and public health experts should be involved in dialogue with broader stakeholders before, during and after disasters. It is important to include "locals" (experts from the broader community) and community healthcare workers on an on-going basis, in public health promotion and preparedness strategies and to involve men in the community; a group that has largely been absent in communities and not historically involved in family health care.

When a disaster is declared, an injection of resources – human, physical and financial assists significantly in *making* things happen, from providing and / or upgrading infrastructure to getting critical information and resources to affected populations. Just as critical is education – *teaching* people how to respond *and why*, as opposed to just *telling* people. Knowledge is more sustainable than physical resources, although both are often required. People need to truly understand the information in their own contexts, as well as the "why' and "how" if they are going to be able to replicate the lessons unaided in future.

Concurrently, affected people are more open to information and changing behaviours that may now seem foolish or outdated.

Electronic media channels cannot be relied upon as the sole means of communication but need to be incorporated despite low penetration, due to the powerful effect the mediums have in stimulating word-of-mouth transmission of messages, particularly messages that may lead to social discomfort. Alternative means of communication like face-to-face dialogue and use of cell phone messaging, and understanding how communication must be done to ensure effectiveness is imperative - and these guidelines are applicable across cultural, political and socio-economic

boundaries. It is imperative that those providing assistance understand the affected population and their realities as if they were his or her own. This includes local resources like media; literacy levels; beliefs and values; as well as who is trusted by the community.

ACKNOWLEDGMENTS

My job as a photojournalist with a relief and development organisation took me to heart of a community in Mozambique in 2000 during the devastating floods that claimed the lives of men, women, and children. I realized then that being an observer, a documenter, was not enough for me. I came back with a deep interest in improving communication around health in vulnerable communities.

My interest in the subject led me to the pursuit of this degree and en route I met my advisor, Sue Goldstein, one of the legends behind Soul City. I sincerely thank Sue for her invaluable insight and for teaching me the difference between being a researcher as opposed to a journalist.

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TABLE OF CONTENTS

List of Figures 14
List of Tables 15
Definitions 17
Nomenclature 17
Relevant Legislation 18

CHAPTER ONE_Background to The Study 19
A. Introduction 19
B. Background 20
C. Literature review 22
D. Aims and objectives 26

CHAPTER TWO_Materials and Methods 27
A. Overall Study Design 27
B. Qualitative Study 28
1. Study design/ methodology 28
2. Choice of the study design 28
3. Selection of study participants 28
4. Analysis 29
C. Quantitative study 29
1. Study design/ methodology 29
2. Study population 29
3. Sampling 29
4. Data collection 26
5. Measurement 30
5. Analysis 30
D. Pilot Studies 31
E. Ethical considerations 27

CHAPTER THREE_Results 32
A. The Qualitative Study: Results of the Key Informant Interviews 32
1. A description of the study participants 32
2. Priorities of the disaster management team 32
3. How health services were delivered 33
4. Content of the information communicated and mode of communication 33
(1) Water purification messages 33
(2) ORT messages 34
(3) Zoonosis prevention messages 34
5. Other valuable insights 35
B. The Quantitative Study: Results 36
1. A description of study participants 36
2. Access to media 39
3. Knowledge of Health Messages 40
3.1. Water Purification Messages 40
3.2 Oral Re-hydration Therapy (ORT) Messages 43

3.3. Zoonosis prevention messages 47
4. Source of information……..44

CHAPTER FOUR 51
A. Research objectives 51
B. Limitations 52
1. Sample size 52
2. Sampling method 52
C. Translating knowledge into practice 53
D. Discussion 53
1. Recall 53
Water purification 54
ORT 54
Zoonosis prevention and the influence of media 55
B. Efficacy of communication 56
1. Audience 57
2. Source and trust 58
3. Communicated with authority 58
4. Channel 58
5. Message 59
5.1. Clear, simple and repetitive 59
5.2. Believable, or credible 59
5.3. Current, in context and specific 60
5.4. Predictive of the probability of future events 60
5.5. Interactive – allows for and addresses questions 60
5.6. Provide solutions 60
5.7. Personalise 60
6. Relief versus development 61
7. Fast-tracking development 61
8. Relevant questions/ considerations that could not be answered by the research: 62

CHAPTER FIVE Conclusions and recommendations 65
A. Recommendations 65
1. Start health promotion programmes with communities around likely disaster scenarios now 65
1.1 Utilise community healthcare workers 66
1.2. Involve men in health promotion programmes now 67
2. Take advantage of the opportunities to fast-track development 67
3. Consider all elements of successful communication 68
3.1 Channels of communication – particularly relevant in South Africa 68
3.2. Impact and sustainability 68

REFERENCES 70

APPENDIX A: FACULTY ETHICS COMMITTEE ETHICAL CLEARANCE FOR RESEARCH PROJECT 75

APPENDIX B: OUTLINE FOR INTERVIEW WITH KEY INFORMANTS

DEMOGRAPHICS 76

APPENDIX C: TRANSLATED QUESTIONNAIRE FOR COMMUNITY 79

APPENDIX D: MEDIA REPORTING ON THE TAUNG FLOODS 85

APPENDIX E: . Statement from the North West Provincial Government regarding the Taung Floods, 9 April, 2006..... 90

APPENDIX F. SAMPLE OF THE TAUNG SUB-DISTRICT DEPARTMENT OF HEALTH DAILY STATUS REPORTS..... 92

List of Figures

Figure 1: Gender distribution of participants

Figure 2 : Locality: Description of the living area of study participants

Figure 3: Employment status of study participants

Figure 4: Home language of study participants

Figure 5. Proportion of participants that learned to purify water during the flood

Figure 6. Proportion of participants that learned to purify water during the flood by age categories

Figure 7. Proportion of participants who knew what to do to treat diarrhea and when they learned this information

Figure 8. Proportion that Learned to Use ORT During the Floods by Age

Figure 9. Proportion of Study Participants that Learned During the Floods not to eat an Animal that has Died of Unknown Causes During Flood

Figure 10. Proportion of Study Participants that Learned During the Floods not to eat an Animal that has Died of Unknown Causes During Floods by Age

List of Tables

Table 1. Age distribution of quantitative study participants

Table 2. Highest educational level of study participants

Table 3. Access to media: TV

Table 4: Access to media: radio

Table 5: Access to media: newspaper

Table 6. Proportion of participants that learned to purify water during the flood by gender

Table 7. Proportion of participants that learned to purify water during the flood by education

Table 8. Proportion of participants that learned to purify water during the flood by employment

Table 9. Proportion of participants that learned to purify water during the flood by media access: TV

Table 10. Proportion of participants that learned to purify water during the flood by media access: radio

Table 11. Proportion of participants that learned to purify water during the flood by media access: newspaper

Table 12. Proportion of participants that learned to use ORT during the floods by gender

Table 13. Proportion of participants that learned to use ORT during the floods by education

Table 14. Proportion of participants that learned to use ORT during the floods by employment

Table 15. Proportion of participants that learned to use ORT during the floods by media access: TV

Table 16. Proportion that of participants learned to use ORT during the floods by media access: radio

Table 17. Proportion that learned to use ORT during the floods by media access: newspapers

Table 18. Proportion that learned during the floods not to eat an animal that has died of unknown causes during floods by gender

Table 19. Proportion of study participants that learned during the floods not to eat an animal that has died of unknown causes during floods by education

Table 20. Proportion of study participants that learned during the floods not to eat an animal that has died of unknown causes during floods by employment

Table 21. Proportion of study participants that learned during the floods not to eat an animal that has died of unknown causes during floods by media access: radio

Table 22. Proportion of study participants that learned during the floods not to eat an animal that has died of unknown causes during floods by media access: newspapers

Table 23. Proportion of study participants that learned during the floods not to eat an animal that has died of unknown causes during floods by media access: TV

Definitions

Effective communication: communication that elicits the desired response/ action; for the purpose of this research: positive steps to preserve life.

Health communication: the study of methods to inform and influence individual and community decisions that enhance health (Freidmuth 2000).

Social capital: a concept in business, economics, organizational behaviour, political science, public health, sociology and natural resources management that refers to connections within and between social networks as well as connections among individuals. Just as a screwdriver (physical capital) or a college education (human capital) can increase productivity (both individual and collective), so too social contacts affect the productivity of individuals and groups. L.J. Hanifan (1916) describes social capital as: those tangible substances [that] count for most in the daily lives of people: namely good will, fellowship, sympathy, and social intercourse among the individuals and families who make up a social unit....The individual is helpless socially, if left to himself....If he comes into contact with his neighbor, and they with other neighbors, there will be an accumulation of social capital, which may immediately satisfy his social needs and which may bear a social potentiality sufficient to the substantial improvement of living conditions in the whole community. The community as a whole will benefit by the cooperation of all its parts, while the individual will find in his associations the advantages of the help, the sympathy, and the fellowship of his neighbors.

(Wikipedia, accessed 18 September, 2008)

Nomenclature

Zoonosis is any infectious disease that is able to be transmitted (by a vector) from other animals, both wild and domestic, to humans or from humans to animals (the latter is sometimes called reverse zoonosis).

Oral rehydration therapy, (also called **ORT**, **oral rehydration salts** or **solutions (ORS)**, or **oral electrolyte**), is a simple, cheap, and effective treatment for diarrhea-related dehydration, for example due to cholera or rotavirus. It consists of a solution of salts and other substances such as glucose, sucrose, citrates or molasses, which is administered orally. It is used around the world, but is most important in the Third World, where it saves millions of children from diarrhea—still the leading cause of death.

Relevant Legislation

The Disaster Management Act, 2002. Legislated to provide for (1) an integrated co-coordinated disaster management policy that focuses on preventing or reducing the risk of disasters, mitigating the severity of disasters, emergency preparedness, rapid and effective response to disaster and post-disaster recovery; (2) the establishment of national, provisional and municipal disaster management centres; (3) disaster management volunteers; (4) matters incidental thereto.

CHAPTER ONE
Background to the Study

A. Introduction

Preceding a disaster, in the immediate aftermath and even months following, information may mean the difference between life and death. People are likely to lose their homes, personal possessions and livelihoods, access to health care, clean drinking water, and are often unable to prepare food. If the public is entitled to information that affects their health and the health of their families then it is the responsibility of the unaffected to provide this information.

In times of disasters in developing countries the question arises as to what proportion of the affected population learns vital, life saving information for the first time, whether disasters provide the impetus for people to learn, and whether public health messages are contextualized in people's realities. Public health practitioners would need to know if the recipients of messages apply the life saving information and whether they could they apply the same principles unaided if the disaster occurred again.

According to Alexander (2002), information is one of the most vital commodities and potentially one of the mostscarce resources, in disasters. At the Symposium on Health Communication in Fragile States and Humanitarian Emergencies, in Washington, D.C, in 2005, Ron Waldman of Columbia University said "some experts feel that communications, or the absence of good communications, should be considered one of the official causes of death."

Yet natural disasters are not exceptional events. They tend to be repetitive and to concentrate in particular places (Alexander 2002). While they require exceptional coordination and additional resources they are sufficiently frequent and predictable enough to plan for. Thus planning for the likelihood of a disaster, learning from past experience through community's "collective memory" – to draw on lesson learned from previous disasters, is not only possible, but imperative for development.

The right kind of information can save lives, livelihoods and resources provided people apply the information. So how can public health messages be communicated effectively to affected communities to ensure lives are saved?

The disaster that beset Taung and its surrounds in the North West Province of South Africa early in 2006 provides an opportunity to look closely at an under-resourced community in a developing country to understand possible answers to the questions posed above.

In this chapter, the disaster is described and put into context for the purpose of this research. A literature review reveals that while there is no previous research on the reception of messages communicated to communities during disasters through means other than the media, there are relevant findings from other areas that are presented here. This chapter concludes with the aims and objectives of the research.

B. Background

The Greater Taung Local Municipality (GTLM) in the North West province of South Africa received nearly double the average annual rainfall for the area (over 700 mm) in just the first three months of 2006, causing severe flooding.

On 24 March, 2006, continued torrential rain caused the situation to deteriorate to such an extent that the GTLM declared it a municipal disaster. Shortly thereafter it was declared a national disaster. According to the head of the disaster management team, the extent of the flooding was equal to one in 20 year floods.

The GTLM is made up of 106 villages, 3 formal towns and is home to 210,000 people. Eleven rural villages around the town of Taung were badly affected, some cut off from the rest of the country entirely.

Impact on health

According to media reports, six people drowned in the flooding and approximately 1,040 families lost their homes; two children were seriously injured after their house collapsed on them; and the National broadcaster, the SABC reported: “desperate communities in the flood-hit villages have been eating the carcasses of animals, despite a warning from health authorities that they could become severely ill.” (SABC News, **“***Taung still counting their losses***”**, April 04, 2006, 09:30) (Appendix D).

Impact on infrastructure

Based on media reports and local government records, ground water became contaminated due to inadequate sanitation facilities, animal corpses in stagnant water as well as cemeteries not being covered. There was a significant increase in the incidence of water borne diseases like cholera leading to severe diarrhea and vomiting, particularly prevalent in children under five. Two children died of exposure-related illness. Traditional mud houses, numerous bridges, and roads were damaged or washed away. As houses collapsed, household numbers increased with extended family and neighbours moving in to houses that were still standing, in turn causing a significant increase in the incidence of scabies and TB.

There was concern that stagnant water would bring mosquitoes and with them, malaria. While the number of mosquitoes increased, none were malaria-carriers. Healthcare workers reported a significant increase in the number of snakebites.

According to social services, people lost their ID books and were unable to fill or refill scripts for chronic medicines or access their grants. Community members were traumatized due to loss of life around them, loss of homes and property including animals.

Difficulties with statistics

The disaster manager confirmed reports in the media regarding the number of households affected and the cause of injury, however there were differing opinions on the number of people that died as a result of the floods. The research relied on a combination of anecdotal reports as well as the records of the Sub-District Health Department for mortality and morbidity figures. It is important for those unfamiliar with the reality of the rural South African communities to understand this in context. People choose to die at home; under reporting is an issue and the stigma around death and the cause of death in communities, almost exclusively due to HIV/AIDS, makes accessing real figures and accurate causes of mortality and morbidity, complex.

According to the disaster manager, the last recorded floods of this magnitude in the area occurred 18 years ago. However Phenye Vilakazi, the local government MEC, told the SABC that the time that an in-depth study of the area would be required since, “this disaster happens every year when there are rains.” (SABC News ***“North West families evacuated in wake of floods”***, March 27, 2006, 17:30) (Appendix D).

C. Literature review

It is easy to access literature on how the media can be used to communicate critical health messages during disasters (Lowrey, 2007. Prizzia, 2005. Walters, 1989, Wenger, 1985a); how the internet can be used to communicate in public health emergencies (Kittler 2004) and even more literature exists on the necessity of communication for coordination between agencies during emergencies (Auf der Heide 1989. Alexander, 2002. Quarantelli 1985, Wenger 1986). Yet there is a dearth of information on how to ensure successful (effective) communication with communities in emergencies where there are no or few media channels.

Disasters may provide opportunities to "fast-track" health promotion if relevant, on-going health education (a developmental approach) as opposed to vertical interventions that solve problems for short spans of time (a relief approach) are developed. "Fast track" meaning the initiative becomes an immediate priority and starts now, while it may have been on the agenda but no or few steps were taken to begin the initiative.

Oxfam acknowledges that: "Good health promotion combines insider knowledge (what people already know and how they behave) with outsider knowledge (risks of specific diseases according to the conditions people are currently living in.") (Oxfam *Health Promotion Guidelines for Disasters*).

This research has utilized Oxfam's concept of "outsiders" (those with scientific knowledge) and "insiders" (those with local knowledge) in considering the two different groups involved in disasters: those involved it the response to the disaster and doing the communication (in the case of Taung and other communities where media access is not guaranteed) and those receiving the communication.

The American Defense Institute for Medical Operations (DIMO), states that deaths associated with disasters have increased by 50 percent each decade. "Natural" disasters are more frequent due to industrialization and development, and as the world's population has grown, large numbers of people are "vulnerable"; living in less desirable, less 'safe' areas. Thus effective communication in communities has become of critical importance.

If it is true that natural disasters, particularly seasonal ones, form patterns characterized by their repetitiveness (Alexander, 2002), then there is no excuse for loss of life in these times. We need to understand each other, our different cultural beliefs and contexts and how to communicate

across socio-economic barriers now more than ever, since somewhat foreseeable natural disasters are crippling development gains.

But a review of past disasters and responses to disasters begs a few questions. Are governments more likely to provide communities with solutions (purified water, food, tents, and tarpaulins) than to build infrastructure and knowledge before the time? Are responders more likely to provide physical materials than impart knowledge? Are the affected community's vulnerabilities perpetuated? And whose responsibility is it to communicate critical public health messages in times of disaster – the affected country's government or civil society?

As Jay Bernardt, a faculty member in the Department of Behavioural Sciences and Health Education at the Rollins School of Public Health (RSPH) noted: "[In the wake of the anthrax incidents], almost immediately, it became clear that the effectiveness of public health practices and programs was dependent on their use of appropriate communication principles and strategies." (Rollins School of Public Health, Spring 2003).

One particularly relevant guideline for ensuing successful communication (Allender and Spradley, 2004) is applied to the communication of health messages and warnings during the Taung floods for the purpose of this research. It is done so with the understanding that irrespective of who does the communication – a news reader on community radio or a district healthcare worker in person, the principles behind the development and delivery of the message are the same and effective communication transcends culture, political systems and levels of development across countries. Notwithstanding, who delivers the message and how it is delivered is critical to the process and as such, four critical elements of the communication process - audience, message, source and channel are also explored in relation to the research.

Health communication has been defined as the study of methods to inform and influence individual and community decisions that enhance health (Freidmuth, 2000). In order to prevent mortality and morbidity, public health messages need to be communicated *and* people need to take the appropriate action. According to Oxfam *Health Promotion Guidelines for Disasters*, "simply providing people with clean water, toilets, mosquito nets and insecticides does not necessarily ensure that they will use these resources effectively."

The channel or mediums, the means by which the message is sent is equally as important as the message itself (Freimuth, 2000). Understanding what medium (if any) your audience is tuned into is imperative if you are going to reach them. For those not familiar with South Africa, there are more cellular phones than landline telephones in South Africa, approximately 21.5

million (World Wide Worx, 2004) in a population of approximately 47,9 million (Statistics SA, 2007). Approximately 77.4 percent of the population has a television in their household, while 89.7 percent has a radio in their household (AMPS 2006/ 2007).

Using the same definition as detailed earlier for "effective" communication, "must elicit action", information must be: credible; current/ contextual (appropriate for the time and place, ie. current); unambiguous; authoritative; predictive of the probability of future events; it must be interactive – allowing for and addressing questions. It is conclusive, eliminating speculation and "catastrophizing". It must have a sense of urgency, conveying the seriousness without resorting to fear tactics. It must be clear, simple and repetitive. It needs to provide solutions and suggestions. And wherever possible it needs to be personal, using names where possible and addressing real as well as perceived needs.

Using Allender and Spradley's (2004) four key elements of the communication process we are able to put the research findings into context. Below are the four key elements and in chapter 4 these are re-looked against the public health communication done in Taung.

1. Audience

As the WHO Outbreak Communication Guideline states: "It is nearly impossible to design successful messages that bridge the gap between the expert and the public without knowing what the public thinks." It is the job of the communicator to understand the public's beliefs, opinions and knowledge of specific risks. The better the understanding of the audience, the more likely the message is to be developed and delivered in a way that the audience will actually take it up.

2. Source and trust

In order for people to believe the message they must trust the source. What is credible for one segment of a population might not be with another (Freimuth, 2000). The source of the message greatly influences its effectiveness and this refers back to understanding your audience well enough to determine who (and what) would motivate them to take the desired action.

For example, people are more likely to believe information if it comes from experts (Drabek, 1986:75,104) and warning messages if they are communicated with and by official authorities, such as the police, civil defense, fire department, the governor, or the mayor's office (Auf der Heide: 1989).

Marsha Vanderford of the CDC noted from their experience with the Marburg outbreak in Angola in 2005, that the CDC works with organizations to disseminate accurate information and

the messages would be seen as more credible if they were delivered by local agencies than the CDC itself.

Trust takes time. The time this process takes may sound like a luxury one does not have in emergency settings yet Oxfam practices this form of dialogue in the midst of disasters. Some legwork is established before they fact, as they train "health promoters", usually refugees themselves, to teach others about health and hygiene during emergences. The WHO Outbreak Communication Guidelines state that trust can develop during an outbreak, but it is far easier to build trust before it is needed.

3. Channel

If your message is not received – not heard, seen or read, no matter how relevant and well designed, it is worthless. The channel or means by which the message is sent is as important as the message itself. In the case of disasters, utilizing different channels can increase the effectiveness.

4. Message

4.1. Clear, simple, repetitive and believable

The message must be clear and simple, unambiguous and must address the recipient of the message's perception of the risk. Variables around one's perception of their risk, which may help or hinder them taking up the recommended action, include their perceptions of (1) the severity of the health risk, (2) benefits from the recommended action, (3) barriers to action, (4) motivations for action, and (5) confidence in their own ability to take the recommended action. For the message to be effective, it must address at least one of these variables (Freimuth, 2000).

4.2. Current, in context and specific

Messages need to be current and updated as new information about the audience becomes available. The message must always match the intended audience and the desired outcome. It must be highly relevant to the individual and relevant to his or her context in relation to time and place.

Recipients of messages need to know how a threat will personally affect them, beyond just the fact that there is a threat. Information needs to be communicated in a way that is easy for the recipient to understand, like saying that flood waters will crest 5 feet above flood stage may convey less meaning than saying that the waters will cover the community centre stairs (Auf der Heide, 1989).

4.3. Predictive of the probability of future events

Messages need to be predictive of the probability of future events.

4.4. Interactive – allows for and addresses questions

Communication is a two-way process, a dialogue that takes place over time and allows for questions, as even epidemiologist Katzenllenbogen (et al) stated: “Good communication allows both sides to share their concerns, and enables the message to be reshaped to suit the needs, concerns and circumstances of the receiver.” (Katzenellenbogen et al, 1997). Dialogue involves time and trust. It is recommended that communities be engaged on an on-going basis, in a co-orientative or consultative fashion, in which each topic is a discussion and mutually agreeable answers need to be sought out; that what makes sense to community and that which ensures the promotion of good health. This needs to occur before disasters strike as both a development and preparedness strategy.

4.5. Provide solutions

In order for communication to be effective, solutions or suggestions must be provided.

4.6. Personalise

Wherever possible, the recommendation is that people’s names are used so that messages are personalised.

D. Aims and objectives

The objectives of this research are:

1. To uncover what messages relating to preserving life were communicated to the communities around Taung, by whom and how;
2. To determine whether the messages were received and headed (self-reported). and;
3. To determine if gender, age, education or employment status was of any significance against the portion of the study population that learned the information for the first time during the floods.

This study is motivated by the researchers’ desire for more effective engagement to occur between insiders (those with local knowledge) and outsiders (those with scientific knowledge) before, during and after disasters when basic health messages can save lives and further development goals. It is hoped that the findings will assist those working with and in communities to impart knowledge, reasons why and how in context so that communities are better equipped to look after their own well being particularly in times of crisis as much as reasonably possible.

CHAPTER TWO
Materials and Methods

In order to address the question of effectiveness – or success of the communication, it was imperative that the research look at the health priorities determined by the disaster management team; the messages communicated; and the reception of the messages by the community. Thus the research had to incorporate two different groups of people – different in their groupings according to the roles they played; their employment status and education.

In this chapter, the study designs (methodology) and the reasons why these designs were selected are detailed, followed by a description of the ways in which participants were selected, how the data were analysed and ethical considerations.

A. Overall Study Design

To determine what the health priorities were and what was communicated according to those responsible for the response to the disaster, the study utilised "the outsiders" - or "key informants" involved in making decisions concerning the response to the disaster; and / or people providing life saving health messages and resources through a qualitative research design that informed the development of the quantitative questionnaire for community responses.

The first study was a qualitative study, a cross sectional descriptive study that used semi-structured key informant interviews accessed through snowballing technique. The descriptive, semi-structure interview outline designed to provide a framework to describe the situation, the health risks, priorities, health promotion messages that were communicated and how they were communicated. The recurring themes formed the basis of the quantitative study, a cross sectional descriptive study utilizing face-to-face interviews with 100 community members.

Both the qualitative and quantitative studies include questions pertaining to individual respondents' access to media. This question did not differentiate between *ownership* of a television and/ or radio or *ability to access* television and/ or radio broadcasts through a friend or relative during the time of the floods.

Thus, the two study populations were (1) eight of the people involved in the disaster response and; (2) 100 of the members of the communities worst affected by the floods.

B. Qualitative Study

1. Study design/ methodology

In order to understand what happened from a public health context during the floods according to different key role players, qualitative, descriptive, semi-structured interviews were conducted with eight "key informants" purposively selected. Key informants were made up of some of the members of the disaster response team as well as others that played a role during the floods, which is described in more detail below. Approximately half of this group was also "in the field" –communicating directly with community but it is important to note that the group sampled did not make up the *entire* team of people communicating health messages (there were a number of mobile clinic sisters and nurses and health promotion staff from local government doing the same).

The researcher conducted all of the qualitative interviews and each further assisted in developing the community questionnaire.

2. Choice of the study design

The qualitative study was a descriptive, semi-structure interview outline designed to provide a framework to describe the situation, the health risks, priorities, health promotion messages that were communicated and how they were communicated. A snowballing technique was used to increase the researchers' understanding and to develop the questionnaire. As mentioned above, the research also asked questions pertaining to access to media in order to determine what media channels of communication (1) exist in the area and (2) are accessed by whom.

3. Selection of study participants

Key informants were selected based on the roles they played during the disaster. The researcher looked specifically for people directly involved with health and those from other disciplines that were involved with health priorities from different perspectives during the floods,

like for example, social workers. The municipality helped the researcher to identify role players and make contact with them however the decision of whom to interview was the researchers' and was based on the following criteria: they had to have been involved in the response to the floods from a health perspective and be available to be interviewed.

4. Analysis

The interviews were transcribed; reoccurring themes were identified and distilled to get the three most critical health messages that were communicated during the floods. The recurring themes formed the basis of the quantitative questionnaire. This helped ensure relevance of the questions and enabled the refining of questions to include the top priorities of the disaster team in terms of health. The qualitative research greatly assisted in painting a picture of what happened and how people – both those providing assistance and the affected population responded. This is documented in the findings and obviously, informed the recommendations.

C. Quantitative study

1. Study design/ methodology

The quantitative study, a cross sectional descriptive study, relied on one hundred community members living in the broader Qho area during the floods; thus it was a convenience sample.

2. Study population

The study population was comprised of residents of the Qho community over the age of 16 years who lived there during the floods and who could recall what happened during that time.

3. Sampling

One hundred community members living in the broader Qho area during the floods, were selected, and, provided they met the criteria: viz: they lived in the area during the floods and they could recall what happened, they were asked for their consent before the interview commenced. Sampling occurred in two different areas of the Qho community over two Saturdays to ensure

employed community members, including migrant labourers, might also be included in the sample.

4. Data Collection

The researcher employed four multi-lingual research assistants through the local councilors in consultation with the municipality. They were trained by and worked alongside the principle researcher. The training consisted of a one hour morning workshop to explain he objectives, the questions and how to fill in the questionnaire.

Interviews were conducted in the home language of the participant (Setswana) and one-on-one, though not behind closed doors. Community members were informed of the research and of our arrival before the time through the local councilors. Community members gathered at pre-determined central points in the community. Participants were provided with a small token of thanks after the questionnaire was complete, the contents of which were decided on by the research assistants (a small bag of the staple food, mealie meal, and a packet of biscuits).

5. Measurement

The questionnaire covered demographic attributes (age and gender), socio-economic status (education and employment), and questions about knowledge and behavior specifically around: drinking water safety, treating diarrhea and eating animals that have died of unknown causes, as well as questions pertaining to media access. (Appendix C).

6. Analysis

The data were captured into Epi Info 6, and the data cleaned. Firstly frequencies were run to describe the sample, and then cross tabulations were performed, looking for associations between the outcome variables and demographic and media variables, chi square tests were performed to test for significance.

The outcome variables were knowledge and behavior relating to water purification, oral rehydration and prevention of zoonosis.

D. Pilot Studies

Pilot studies were conducted for both the qualitative and quantitative studies to ensure relevance of questions and methodology. Three key informants were interviewed using a semi-structured questionnaire, the interviews were analysed and used to assist in developing the qualitative interview questionnaire. The results of the three questionnaires were integrated into the results.

The pilot informed content of the quantitative research. Approximately 20 community members were interviewed with a pilot questionnaire. The order of questions and the way in which questions were phrased changed slightly after the pilot however the content remained the same. After these interviews were done, the gathering turned into a group discussion which was invaluable to the design of the questionnaire. The 20 interviews were not used in the final study since the order and the way in which the questions were asked needed to be adapted.

E. Ethical considerations

Community members were informed of the study by the local authorities in advance of the research team's arrival. Before the interviews commenced, the research and/or assistants took the time to inform the potential participant of the nature of the research, how it would be used and the fact that we did not require their names and the questionnaires would be kept under lock and key.

The researcher was aware of the possibility of "re-traumatization" and made sure that the community members that assisted with the research were aware of the possibility of this and what to do if a participant showed signs of post-traumatic stress. The researcher had made provisions for counseling if there was a need however there were no such cases.

CHAPTER THREE
Results

A. The Qualitative Study: Results of the Key Informant Interviews

1. A description of the study participants

Of the eight study participants, the majority were males with only 3 females. The average age was 42.5 with one 27-year-old news presenter from the local radio station and one 54-year-old professional nurse working for the Sub-District Department of Health's mobile clinic teams. Of the eight, one was Caucasian while the rest were "African". Seven out of the eight have completed education up to tertiary level. All have access to media (TV, newspapers and radio) and tend to listen to national radio stations more than the local community radio station with the exception of the news presenter from that station.

2. Priorities of the disaster management team

The qualitative study revealed that the primary public health concerns of the emergency staff were mortality and morbidity due to: water borne illnesses as a result of drinking contaminated water; severe, untreated diarrhea; eating of animals that died of unknown causes during the floods; pregnant women going into premature labour; death or injury due to collapsing houses; drownings; possible outbreak of malaria; poor hygiene/ hygienic practices and interruption of ARV's; hypertensives and diabetic treatments.

According to the respondents, the biggest health priorities were:

- Teaching people about rehydration for diarrhea,
- Prevention of:
  (1) Water borne diseases;
  (2) Death, zoonosis or food poisoning due to eating dead animals.

"We were most concerned with the people drinking contaminated ground water and developing severe diarrhea leading to dehydration and eventual death, particularly among children under five," said the Head of the Sub-District Department of Health, Greater Taung Municipality.

3. How health services were delivered

Interviews with people involved in the emergency response revealed that one woman went into pre-mature labour in her home and the baby died shortly after birth. Health workers knew about her but simply couldn't get to her despite desperate efforts that lead to many vehicles concurrently getting stuck. Out of concern that more pregnant women may likely go into premature labour, all pregnant women at or after 8 months into term were airlifted and accommodated in Taung.

Teams of experts from the different departments (different disciplines) were assembled and were flown by helicopter into and out of affected communities according to a daily roster to ensure all the affected communities were seen on a regular basis. Teams were comprised of: a professional nurse and/ or mobile clinic sister/s, and environmental health, health promotion and agricultural and in some cases, traffic officers to support the messages.

The Head of the Sub-District Department of Health, Greater Taung Municipality said she worked closely with other HOD's (Heads of Department) to ensure health service weren't interrupted - like ensuring people got their ARV's, hypertensives and diabetic drugs.

4. Content of the information communicated and mode of communication

It is important to note that there was no plan before of the time of what would be communicated in the event of a flood. The messages were determined by the health personnel involved based on what they were seeing during the aftermath.

(1) Water purification messages

Content: People were told to boil water and dry wood was provided, but in the cases where there was not enough wood, or wood could not be lit, it was recommended that people add one tablespoon of "Jik" (the most commonly used local brand of bleach: sodium hypochlorite) to 20 litres of water and let stand overnight, if they could not boil water. People were provided with 'Jik' while people in another area were told they must boil the water if they could but that 'Jik' had been added to the Sedibeng (municipal water supplier) water tank.

Mode of communication: People were informed face-to-face by the teams that were deployed which were comprised of mobile clinic unit sisters and/ or professional

nurses alongside environmental health and health promotion officers. The communication occurred door-to-door mainly with families and extended "families" inside their homes, one-on-one and in informal gatherings outside when possible. Demonstrations on how to dilute 'Jik' were done for informal gatherings outside. Here, flyers written in Setswana giving the proportions of water to 'Jik' and time period to allow to stand, were given to community members.

"People were open to using 'Jik' because many know this way of cleaning the water," said Environmental Health Practitioner, Sub-District Department of Health, Greater Taung.

(2) ORT messages

Content: Mobile clinic sisters and professional nurses that were deployed communicated how to prevent dehydration caused by diarrhea by using oral rehydration solution, mixing one teaspoon of salt and three teaspoons of sugar to clean water.

Mode of communication: People were told face-to-face in their homes and outside in small gatherings by the mobile clinic sisters. According to the environmental health practitioner, demonstrations were done to illustrate the quantities.

"It was very important that people be told how to use salt and sugar in water to stop the diarrhea," said the Environmental Health Practitioner, Sub-District Department of Health, Greater Taung.

(3) Zoonosis prevention messages

Content: People were told not to eat an animal that died during the floods if they didn't know why it had died. Sisters from the mobile clinic unit alongside environmental health, health promotion officers and officers from the Department of Agriculture explained to people that the carcasses of animals that had died during the floods must be burned. It was unclear whether any further explanation of "why" the animal could be sick and how it could infect someone who ingested the flesh was provided.

Mode of communication: People were told face-to-face in their homes and outside in small gatherings by the teams that were deployed. These were comprised of professional nurses or mobile clinic sisters, environmental health, health promotion and agricultural

officers. The agricultural officer helped communicate the importance of the message and in most cases either burned the carcasses of animals that had died or did this with the community member, said the Environmental Health Practitioner, Sub-District Department of Health, Greater Taung.

"They hang the bodies in their homes to dry to use the meat for biltong. Many were hiding the carcasses so that the agricultural officer couldn't come and burn them."

5. Other valuable insights

The well-intending disaster management team in Taung sprung into action and quickly sourced tarpaulins and tents and secured a large piece of land to set up a camp in the town of Taung for affected community members they planned to airlift to safety. What they found was that people were unwilling to leave their homes, their possessions and their livelihoods, a common phenomenon in disasters (Quarantelli, 1972:67; Quarantelli, 1960:69; Quarantelli, 1965:107; Fritz, 1961:665; Wenger, 1985a:34; Perry, 1985:54). They changed their tactic by taking the experts to the people day in and day out via helicopter for well over a month.

There was no formal preparedness plan so no pre-determined messages existed. Thus, the public health messages communicated were determined by those involved in the response during the flooding and in the immediate aftermath. Messages were adapted to the circumstances – for example, messages about boiling water were not relevant to people who relied on firewood since everything was wet. Therefore, these people – the majority of those interviewed – received Jik or their water source was treated with Jik.

A Programme Manager for Health Promotion from the Taung Sub District said that he advised people to erect toilets and protect their water sources but despite showing people how to construct high platforms and erect pit latrines they did nothing he says because the believe they will be bewitched if they use pit latrines. It was not clear if they were provided with the materials to build the pit latrines.

According to the Environmental Health Practitioner, Sub-District Department of Health, Greater Taung, they discovered many more people than they had on record with TB. She said they advised them that if they had (or have) TB for more than 3 months they must go to the hospital but she said the people prefer to go to private hospitals or die at home if they can't afford private care.

According to the environmental health officer, messages on hygienic practices were also communicated. Specifically, people were told to wash their hands thoroughly after using the toilet.

According to the professional nurse on the mobile clinic team from the Sub-District Department of Health, there were a number of confirmed cases of snakebites and a significant increase in common colds due to exposure. She also said there were many cases of septic scabies and mosquito bites as well as injuries from collapsed houses. She recalled the report of a person with a high fever and swollen surgical scar and mentioned that during the floods they discovered some places that weren't being reached by the mobile clinics at all; places they did not know even existed (ie. they did not know people were living there) before the floods.

B. The Quantitative Study: Results

1. A description of study participants

The sample consisted of 100 respondents.

The age of study participants ranged from 18 to 89 years old. 40 percent of the participants were under 40 years old while almost 60 percent were older than 40 years (Table 1). The majority (62 percent) of the participants were women (Figure 1). All participants came from the same area, a rural village or scattered rural village (Figure 2). The majority of the study participants were not employed (68 percent) with only 6 percent employed and 22 percent pensioners (Figure 3). All of the participants were Africans and 97 percent were Setswana-speaking (Figure 4). The majority of the participants (61 percent) are below the level of education usually associated with literacy. Forty-one percent had no education (Table 2).

Table 1. Age distribution of quantitative study participants

Parametre	Estimate
Mean	45
Standard deviation	17
Range	18 – 89
Age categories	
18 – 24	16%
25 – 40	23%
41 – 60	44%

> 60	17%

Figure 1. Gender distribution of participants

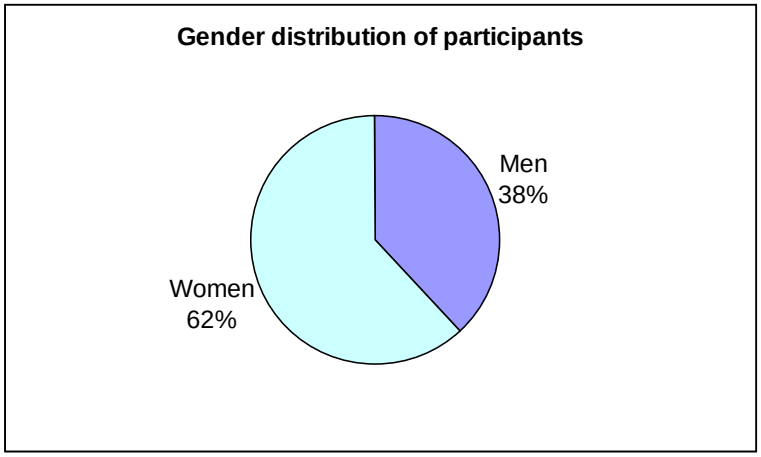


Figure 2. Locality: Description of the living area of study participants

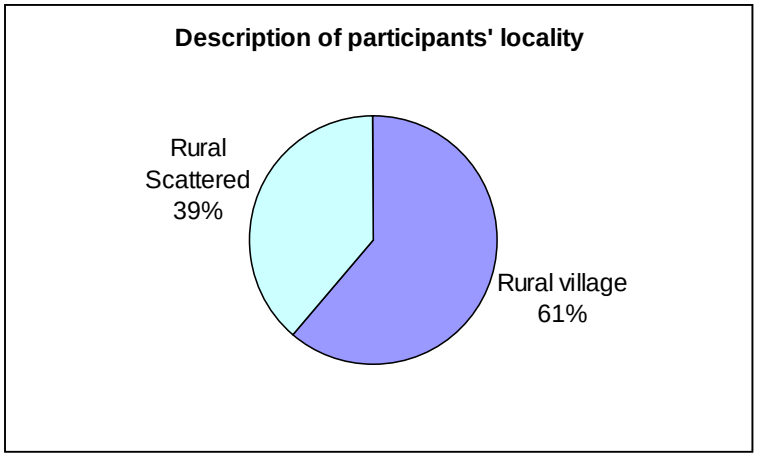
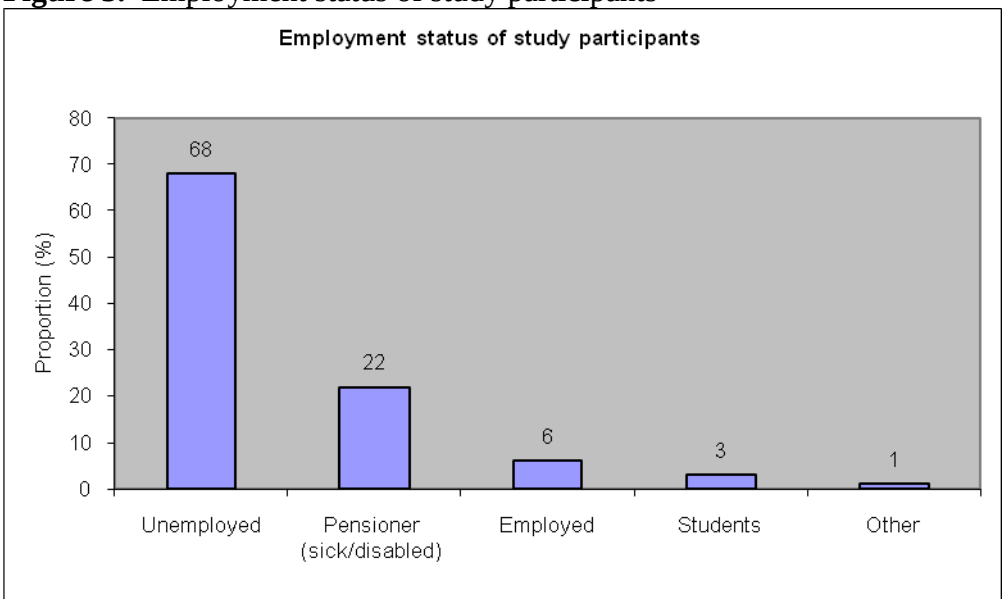


Figure 3. Employment status of study participants



Race: 100 % of the participants were "Africans".

Figure 4. Home language of study participants

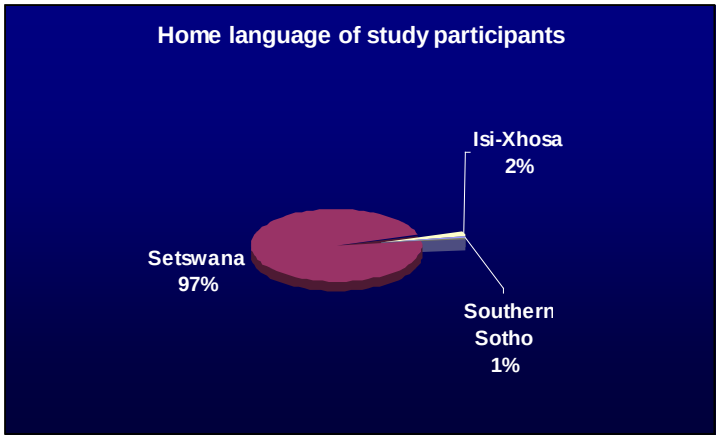


Table 2. Highest educational level of study participants

Highest education achieved	n (%)
None	41%
Some primary	20%
Completed primary	8%
Some secondary	20%
Completed secondary	5%
Tertiary	1%
Other	5%
Total	100 (100)

The majority of participants (61%) are below the level of education usually associated with functional literacy.

2. Access to media

In terms of access to media, access to television was low (15 percent) and moderate for radio and newspapers (59 percent and 64 percent respectively) (Table 3). Access to specific media does not necessarily mean that respondents own a TV or radio. It is common for people in the communities to gather around a single television set (or a few sets) in the community to gain their news or entertainment. The majority of the quantitative study sample did not have access to media (including newspapers, television and radio) yet it emerged that purchasing airtime for cell phones was a higher priority than purchasing batteries for a radio. Although the proportion of participants that had access to radio was moderate (59 percent), twenty-one percent rarely had access (Table 4). Nearly 10 percent of the study population that said they had radios also said they could not use them because they could not afford batteries, but there is a possibility that more people were in this situation since this was not a specific question on the survey. Sixty-four percent of study participants have access to newspapers with the majority saying that someone would read to them (Table 5).

Table 3. Access to TV

Participants' access to TV and frequency of watching TV TV access	n (%)
Yes	15 (15)
Often (2- 7 times a week)	13 (13)
Sometimes (2 – 4 times a months)	1 (1)
Seldom (1 – 12 times a year)	1(1)
Never	85 (85)

Table 4. Access to Radio

Participants access to radio and frequency of listening to radio	
Radio access	n (%)
Yes	59 (59)
Often (2- 7 times a week)	47 (47)
Sometimes (2 – 4 times a months)	9 (9)
Seldom (1 – 12 times a year)	3 (3)
Never	41 (41)

Table 5. Access to Newspapers

Participants' access to newspapers and frequency of reading / having newspapers read to them	
Newspapers access	n (%)
Yes	64 (64)
Often (2- 7 times a week)	22 (22)
Sometimes (2 – 4 times a months)	21 (21)
Seldom (1 – 12 times a year)	21 (21)
Never	36 (36)

3. Knowledge of Health Messages

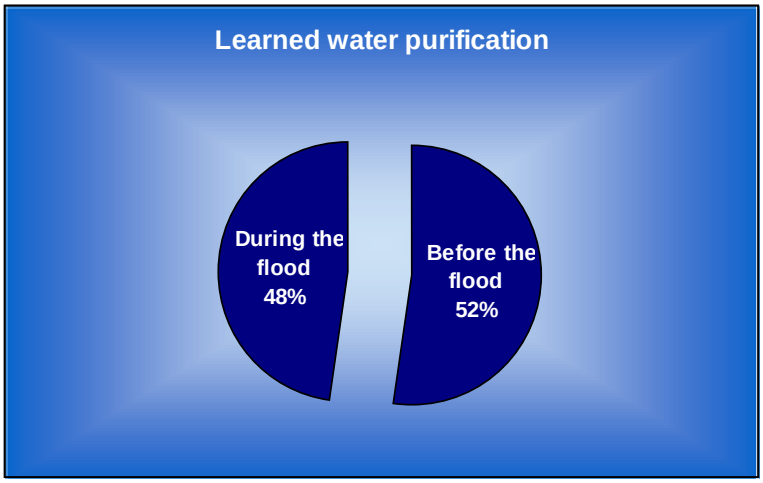
For each research question (detailed by numbers 3.1. Water purification; 3.2. Oral rehydration; 3.3. Zoonosis prevention) results are presented as proportions while a graph and cross tabulations using chi-squared tests are used for any significant relationships between research and explanatory variables. The following explanatory variables were considered – (A) age, education, employment and (B) access to media (TV, radio and newspapers).

3.1. Water Purification Messages

All participants reported knowing how to make dirty water clean by either boiling it or using 'Jik'. 48 percent claimed to have learned how to purify water during the floods (52 percent said they had learned this before the floods) (Figure 5).

Approximately 71 percent cited 'Jik' however the way the question was posed, those who didn't mention it may also know to use 'Jik'. There was not a specific question to determine what percentage learned to use 'Jik' to purify water during the floods.

Figure 5. Proportion of participants that learned to purify water during the flood.



A. By age, gender, education and employment

There was no significant difference in age, gender, education or employment between participants that learned how to purify water during the floods and those that knew this before (Figure 6, Table 6, Table 7, Table 8). Although more 25-40 year olds knew about water purification before the floods and more women (53%) learned to purify water during the flood than men (41%) but the differences were not significant.

Figure 6. Participants that learned to purify water during the flood by age categories

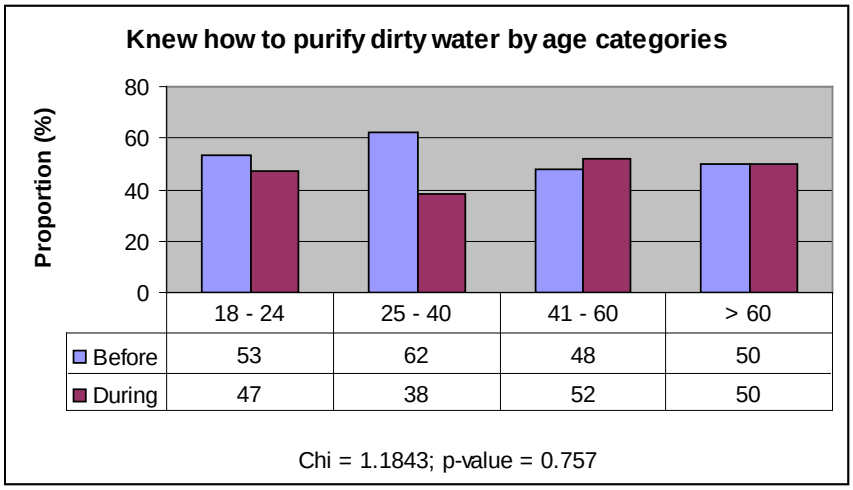


Table 6. Proportion of participants that learned to purify water during the flood by gender

	Learned during the flood	Learned before the flood	Total
Men	15 (41)	22 (59)	37
Women	31 (53)	28 (47)	59
Total	46 (48)	50 (52)	96

Data presented as n (%) Pearson chi2(1) = 1.3125 P-value = 0.252

Table 7. Participants that learned to purify water during the flood by education

	Learned during the flood n (%)	Learned before the flood n (%)	Total
Primary not completed	28 (47)	32 (53)	60
Primary completed	18 (50)	18 (50)	36
Total	46 (48)	50 (52)	96

Data presented as n (%) Pearson chi2(1) = 0.1002 P-value = 0.752

Table 8. Participants that learned to purify water during the flood by employment

	Learned during the flood n (%)	Learned before the flood n (%)	Total
Employed	13 (42)	18 (58)	31
Unemployed	33 (51)	32 (49)	65
Total	46 (48)	50 (52)	96

Data presented as n (%) Pearson chi2(1) = 0.6563 P-value 0.418

B. Media access

There was no significant difference in access to TV (Table 9), radio (Table 10) or newspapers (Table 11) between participants that learned how to purify water during the floods and those that knew this before.

Table 9. Participants that learned to purify water during the flood by TV access

	Learned during the flood n (%)	Learned before the flood n (%)	Total
No access to TV	39 (47)	44 (53)	83
Access to TV	7 (54)	6 (46)	13
Total	46 (48)	50 (52)	96

Data presented as n (%) Pearson chi2 0.2118 P-value = 0.645

Table 10. Participants that learned to purify water during the flood by radio access

	Learned during the flood n (%)	Learned before the flood n (%)	Total
No access to radio	22 (54)	19 (46)	41
Access to radio	24 (44)	31 (56)	55
Total	46 (48)	50 (52)	96

Data presented as n (%) Pearson chi2 0.6454 P-value = 0.331

Table 11. Participants that learned to purify water during the flood by newspaper access

	Learned during the flood n (%)	Learned before the flood n (%)	Total
No access to newspaper	16 (47)	18 (53)	34
Access to newspapers	30 (48)	32 (52)	62
Total	46 (48)	50 (52)	96

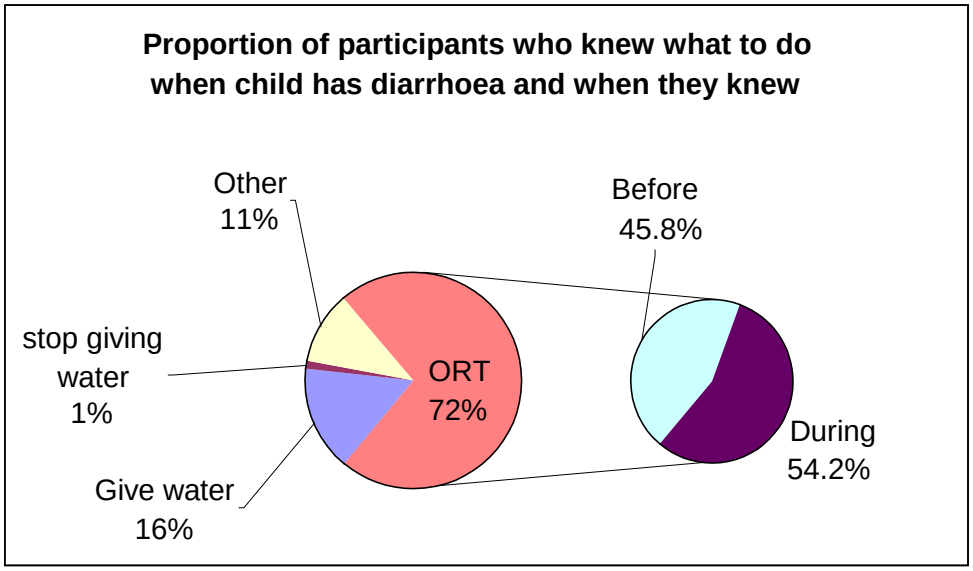
Data presented as n (%) Pearson chi2 0.015 P-value = 0.901

3.2 Oral Re-hydration Therapy (ORT) Messages

Seventy-two percent of participants spoke of a “salt and sugar mixture in water” when asked if they knew what to do when they or a child got diarrhea. One percent said to stop giving water while 16 percent said “give water” and 11 percent said other things including “take the person to the clinic”. Of the 72 percent that knew of ORT, the larger percentage, 39 percent said they learned about ORT during the floods (Figure 7).

In the 41-60 year age group, 61 percent had learned about this during the flood, compared to 39 percent who already knew this (p=0.034).

Figure 7. Participants who knew what to do to treat diarrhea and when they learned this information



A. Proportion that learned to use ORT during the floods by age, gender, education and employment

In the "41-60 age group" 61 percent learned about this during the floods but there was no difference in the other age groups (Figure 8). However the analysis by gender shows that significantly more men (73 percent) learned during the flood to use ORT for diarrhea than women (45 percent) (Table 12).

There is also a significant difference between those that learned about ORT during the floods and those that learned before the floods by level of education (P-value 0.032) (Table 13). It is interesting to note that 63 percent of those that learned about ORT before the floods had completed primary school.

There is no difference by employment status and those that learned ORT during the floods or before the floods (Table 14).

Figure 8. Proportion that learned to use ORT during the floods by age

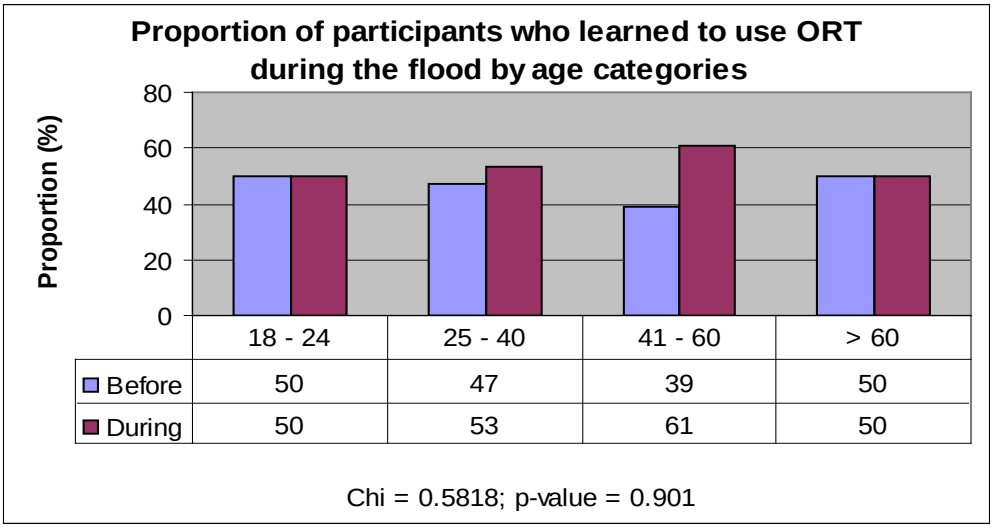


Table 12. Proportion that learned to use ORT during the floods by gender

	Learned during the flood	Learned before the flood	Total
Men	16 (73)	6 (27)	22
Women	19 (45)	23 (55)	42
Total	35 (55)	29 (45)	64

Data presented as n (%) Pearson chi2(1) = 4.4026 **P-value = 0.036**

Table 13. Proportion that learned to use ORT during the floods by education

	Learned during the flood n (%)	Learned before the flood n (%)	Total
Primary not completed	26 (65)	14 (35)	40
Primary completed	9 (38)	15 (63)	24
Total	35 (55)	29 (45)	64

Data presented as n (%) Pearson chi2(1) = 4.5777 P-value = 0.032

Table 14. Proportion that learned to use ORT during the floods by employment

	Learned during the flood n (%)	Learned before the flood n (%)	Total
Employed	12 (60)	8 (40)	20
Unemployed	23 (52)	21 (48)	44
Total	35 (55)	29 (45)	64

Data presented as n (%) Pearson chi2(1) = 0.3313 P-value 0.565

3.2. Media access

There are no significant differences in access to any media and when participants learned about ORT (Table 15, 16, 17).

Table 15. Proportion that learned to use ORT during the floods by TV access

	Learned during the flood n (%)	Learned before the flood n (%)	Total
No access to TV	28 (53)	25 (47)	53
Access to TV	7 (64)	4 (36)	11
Total	35 (55)	29 (45)	64

Data presented as n (%) Pearson chi2 0.4293 P-value = 0.512

Table 16. Proportion that learned to use ORT during the floods by radio access

	Learned during the flood n (%)	Learned before the flood n (%)	Total
No access to radio	17 (59)	12 (41)	29
Access to radio	18 (51)	17 (49)	35
Total	35 (55)	29 (45)	64

Data presented as n (%) Pearson chi2 0.3311 P-value = 0.565

Table 17. Proportion that learned to use ORT during the floods by newspapers access

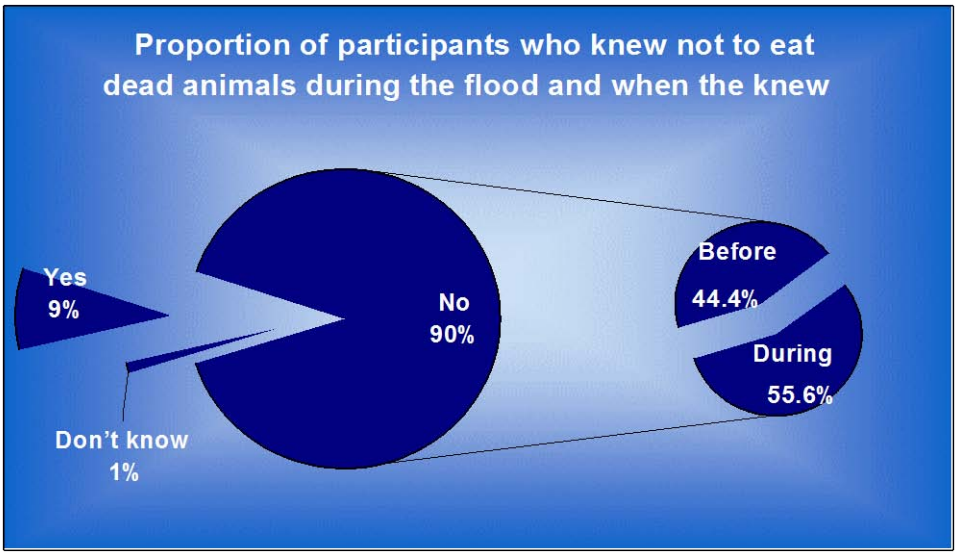
	Learned during the flood n (%)	Learned before the flood n (%)	Total
No access to newspaper	11 (58)	8 (42)	19
Access to newspapers	24 (53)	21 (47)	45
Total	35 (55)	29 (45)	64

Data presented as n (%) Pearson chi2 0.1122 P-value = 0.738

3.3. Zoonosis prevention messages

Of the 90 percent that said it is not ok to eat an animal if you do not know why it has died, 55.6 percent claimed to have learned this during the floods, while 44.4 percent knew this before the floods (Figure 9). Many within this percentage cited their beliefs as the reason why they don't eat animals that have died of unknown causes.

Figure 9. Proportion of study participants that learned during the floods not to eat an animal that has died of unknown causes during floods



A. By age, gender, education and employment

There was a difference in all age groups except the youngest: 60 percent of 24 – 40 year olds and 62 percent of 41 – 60 year olds claimed that they learned this information during the floods while 64 percent of 60 year olds and older, knew this before the floods. (Figure 10) There was no difference between gender, education level nor employment status and those that learned before or during the floods not to eat an animal that has died of unknown causes during the floods (Table 18, 19 & 20).

Table 20 indicates that the proportion of unemployed study participants who learned during the floods not to eat an animal that has died of unknown causes during the floods was 60 percent compared to 40 percent who knew this before although this is not significant statistically.

Figure 10. Participants that learned during the floods not to eat an animal that has died of unknown causes during floods by age

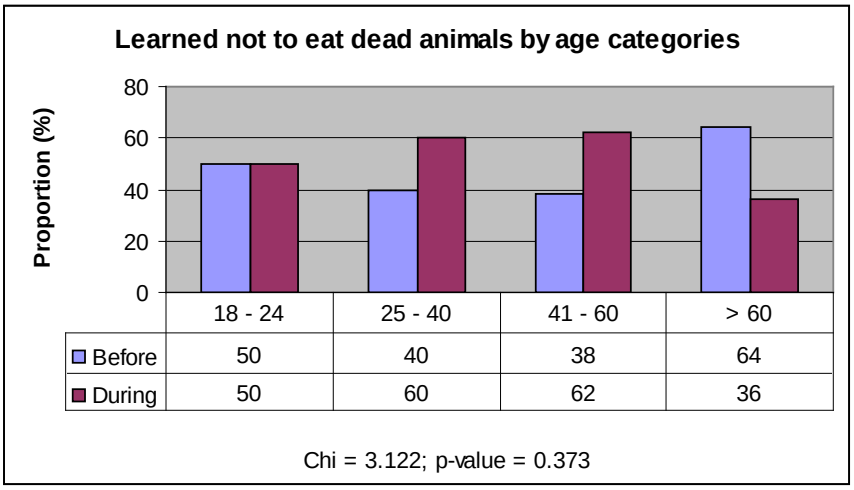


Table 18. Proportion that learned during the floods not to eat an animal that has died of unknown causes during floods by gender

	Learned during the flood	Learned before the flood	Total
Men	12 (35)	22 (65)	34
Women	28 (51)	27 (49)	55
Total	40 (45)	49 (55)	89

Data presented as n (%) Pearson chi2(1) = 2.0704 P-value = 0.150

Table 19. Participants that learned during the floods not to eat an animal that has died of unknown causes during floods by education

	Learned during the flood n (%)	Learned before the flood n (%)	Total
Primary not completed	25 (54)	29 (46)	54
Primary completed	20 (57)	15 (43)	35
Total	49 (55)	40 (45)	89

Data presented as n (%) Pearson chi2(1) = 0.1015 P-value = 0.750

Table 20. Participants that learned during the floods not to eat an animal that has died of unknown causes during floods by employment

	Learned during the flood n (%)	Learned before the flood n (%)	Total
Employed	13 (45)	16 (55)	29
Unemployed	36 (60)	24 (40)	60
Total	49 (55)	40 (45)	89

Data presented as n (%) Pearson chi2(1) = 1.8188 P-value 0.177

B. Access to media

Only 15 percent of the <u>total</u> sample population has access to television, yet of the 55.6 percent of those that learned this information during the floods, 86 percent of those had access to television (Table 23).

There is no difference in access to radio or newspapers and whether people learned not to eat animals that died during the floods of unknown causes before or during the floods (Table 21, Table 22).

Table 21. Participants that learned during the floods not to eat an animal that has died of unknown causes during floods by radio access

	Learned during the flood n (%)	Learned before the flood n (%)	Total
No access to radio	21 (58)	15 (42)	36
Access to radio	28 (53)	25 (47)	53
Total	49 (55)	40 (45)	89

Data presented as n (%) Pearson chi2 0.2624 P-value = 0.608

Table 22. Participants that learned during the floods not to eat an animal that has died of unknown causes during floods by newspapers access

	Learned during the flood n (%)	Learned before the flood n (%)	Total
No access to newspaper	16 (52)	15 (48)	31
Access to newspapers	33 (57)	25 (43)	58
Total	49 (55)	40 (45)	89

Data presented as n (%) Pearson chi2 0.2279 P-value = 0.633

Table 23. Participants that learned during the floods not to eat an animal that has died of unknown causes during floods by TV access

	Learned during the flood n (%)	Learned before the flood n (%)	Total
No access to TV	37 (49)	38 (51)	75
Access to TV	12 (86)	2 (14)	14
Total	49 (55)	40 (45)	89

Data presented as n (%) Pearson chi2 6.3106 P-value = **0.012**

4. Source of information

Nearly 100 percent of participants recalled hearing health-related messages during the floods from community health care workers.

CHAPTER FOUR

This chapter addresses the success and the findings of the study. It begins by determining whether the objectives of the research were met and looks at the limitations of the study. The differences across variables are discussed. The efficacy of the communication done in Taung is measured against the aforementioned Allender & Spradley's four key elements of communication. Some thought is given to the concept of 'relief' (vertical interventions that leave no skills behind) versus 'development' (horizontal interventions that leave skills and resources behind). And lastly, some consideration is given to how the floods in Taung in 2006 may have helped fast-track development – meaning, did the floods put Taung more prominently on the map for immediate investment in infrastructure by government. The chapter concludes with questions the study could not answer.

A. Research objectives

The objectives of the research were to:

- Uncover what messages relating to preserving life were communicated to the communities around Taung, by whom and how;
- Determine what portion of the sample population learned the information for the first time during the floods;
- Determine if gender, age, education or employment status was of any significance against the portion of the study population that learned the information for the first time during the floods;
- Decipher whether messages were received and the information translated into practice by the communities, and;
- Assess whether the lessons could be replicated without assistance in the future.

The study achieved the majority of the objectives, by:

- Uncovering three key public health messages that were communicated during the floods; how the information was imparted and by whom;

- Determining what portion of the study population learned the information for the first time during the floods.

While it seemed conclusive that most of the sample population received the messages and acted accordingly, it is much harder to determine categorically that the sample population would apply the same lessons in future without assistance. Although the research was conducted a year after the flood, it seems from the research that the messages were received and for many it was the first time they were provided this information.

B. Limitations

1. Sample size

A sample size of 100 made the research across a large area manageable but is possibly too small to generalize across the entire community. The research literally halved the sample size by asking "when" the responded learned the respective health-related lesson. In doing so, the sample size was reduced and may be deemed too small to be able to show significant differences between groups.

2. Sampling method

The sampling method (based on who from the community chose to come to the central location to be interviewed and if they met the two criteria) could lessen the validity as we don't know if they are representative of the general population.

The results that come from self reported behaviours are not necessarily conclusive.

Sixty-two percent of the sample was women and there is a possibility that the people that came may have a particular interest in health, thus they may be more knowledgeable. In the pilot study with the community it became apparent that affected community members were hoping to receive compensation from the government for the loss of livestock. They might have come to the research locations on the day in hopes we were from "government."

C. Knowledge and moving towards translating knowledge into practice

It would be ideal to conduct research that looks at what a specific community knows before a disasters strikes and then again after the disaster to determine what they learned from public health messages imparted. Obviously, this design is not really feasible and therefore this research utilized a combination of qualitative and quantitative research methods and self-reporting which may not provide a truly accurate reflection.

Eight-eight percent of participants claimed they do use and will in future use "the salt and sugar mixture" if they or their child gets diarrhea. However it is very difficult to determine whether people would put what they have learned into practice on their own next time. Would community members be able to determine if water was contaminated? Would they know when that occurrence would be most likely? While salt and sugar are generally thought to be commonly-kept household goods, are they if and when the almost non-existent household income is stretched? Is 'Jik'?

Would people know to stock up on these items as the rainy season approaches without external prompts?

The communication process must take into account the time needed to explain in a context that specific community understands, *"the why"* behind the solution; *teaching* not just telling. Do practitioners operate on a "need to know" basis and thus, eliminate information they assume will not be understood or that it would take too much time? If this is the case, by doing so, they limit the person's ability to understanding and thus, think for themselves and take the appropriate action in similar scenarios in the future. Providing limited explanation or information is paramount to a vertical intervention. A development approach that helps the recipient of the message truly understand in terms he or she can relate to would have lasting, meaningful consequences for the future.

D. Discussion

1. Recall

The Taung flood was one of the first disasters to test the Disaster Management Act passed in 2002, so there is other research that is being conducted in Taung, although none from a public health perspective or involving the communities. The key informants described that the core

health promotion messages were communicated repeatedly by members of the disaster response teams both during the worst period of the disaster and for months afterwards. Despite this research being conducted a year after the disaster, most participants recalled the correct information for each outcome: purifying water: 100 percent; oral re-hydration therapy: 90 percent; and zoonosis-prevention messages: 90 percent.

Water purification

Treating water at the household level is recognized as an effective and cost effective intervention against waterborne disease (Sobsey, 2002). Boiling water was the most commonly recommended approach to purifying water, followed by using 'Jik'.

Community members were told to boil water if they could and the municipality supplied dry firewood as well as 'Jik' in case people were unable to light the wood or boil water. In another area where community receive water from the municipal water supplier Sedibeng, 'Jik' (supplied by the local manufacturer as an act of goodwill) was added by the authorities to the water contained in the massive water tanks that supplied the community, thus eliminating the need for such measures as boiling. In this case community was informed that the water had been purified at the tank but they could also, as a precautionary measure, boil the water. Some were unable to do this though, so they carried out their normal activities involving water without having to make additional provisions.

In order to get communities in the habit of thinking about the quality of the water and acting on their concern it is important that where an intervention such as this is done, community members need to be fully informed of the action taken and possibly even be requested to boil the water anyway. Situations like this, in which people do not have the tools to boil water due to flooding and outsiders having to provide dry wood and/ or a purifying agent, in many ways represents the dichotomy that development faces – due to the lack of infrastructure, it seems easier to "provide" resources and neglect the opportunity to teach people about appropriate action. This is further explored below in the section of this chapter entitled "relief versus development".

ORT

The analysis by gender shows that significantly more men (73 percent) learned during the flood to use OTR for diarrhea than women (45 percent). This may likely reflect the traditional role

of women in providing ORT for diarrhea in the family. Thus disasters provide an opportunity for men to learn health practices that normally women would be more likely to have learned. This is of particular significance for cultures in which men traditionally do not exhibit "health seeking behaviours".

There was also a significant difference between those that learned about ORT during the floods and those that learned before the floods by level of education (P-value 0.032) (Table 13). It is interesting to note that 63 percent of those that learned about ORT before the floods, had completed primary school.

Zoonosis prevention and the influence of media

When this subject arose with key informants, three out of the eight said that people in these areas eat animals that have died of unknown causes often and if a donkey was hit by a car, the carcass would only be there for a day before it would be taken away to be used for food. Some community members said outright that eating an animal that died of unknown causes goes against their beliefs. It is not clear from the research whether eating animals that have died of unknown causes is a cultural norm, a result of abject poverty or lack of information.

During the floods, community members were told by members of the response teams from the department of agriculture, health promoters and clinic staff to burn the corpse of any animal that had died of unknown causes during the floods, but in most cases, they had no alternatives in terms of edible meat, and according to community healthcare workers, people felt that it was 'their animal and thus their right to eat it since it had died and could no longer provide milk'. It is important to understand this in context - meat is a luxury in poor communities and very little goes to waste ever.

Almost 100 percent of the community study sample said they know not to eat an animal that has died of unknown causes. While only 15 percent of the total sample population has access to television, of the 55.6 percent that learned not to eat an animal that has died of an unknown cause during the floods, 24.5 percent had access to television, and 86 percent of those with access to TV learned about this during the flood (Table 23). Based on this, it would be worth exploring the power of the media to influence and by word of mouth, reach more people. This may be the case when the subject matter involves an element of fear of public ridicule.

Another example of this: some community members recalled being told that they shouldn't stand in stagnant water or stand in or try to cross flowing water, but interviews with nurses and

other key informants indicated this was not a primary message. A local community radio station Vaaltar's news reporter remembers telling listeners this. This may indicate that despite relatively low access to media, messages communicated via the media may be spread further by the community.

B. Efficacy of communication

It is difficult to measure the efficacy of the communication without looking at what people knew (and did) before the floods and after, and also without real figures pertaining to mortality and morbidity and the causes. It is clear that the communication was effective in increasing knowledge about the issues. It can be deduced that the communication was successful since one hundred percent of responders said they would know what to do to make dirty water clean and some cited ways they would do this by boiling and/ or the use of 'Jik'. 90 percent of the sample said they would use "the salt and sugar mixture in water" to treat diarrhea and 90 percent knew it is dangerous for their health to eat an animal that has died of unknown causes. Many of the respondents had learned this information during the time of the disaster: 48 percent learned how to purify water for the first time during the floods; 54.2 percent learned about oral re-hydration therapy during the floods; and 55.6 percent learned not to eat an animal that has died of unknown causes during the floods.

There were no real differences in knowledge in relation to age, gender, education and employment which may indicate that the communication seemed reasonably good at reaching people across the board. There were a few interesting differences that did emerge though, like 73 percent of the study population that learned about ORT for diarrhea for the first time during the floods were men. And that 63 percent of those that learned about ORT before the floods, had completed primary school. This could mean that during the floods new groups were reached with health messaging i.e. men and less literate people. Also of interest was the fact that while only 15 percent of the total sample population has access to television, of the 55.6 percent that learned not to eat an animal that has died of an unknown cause during the floods, 24.5 percent had access to television, and 86 percent of those with access to TV learned about this during the flood.

To measure the efficacy of the communication that was done in Taung, the four key elements of the communication process detailed in the literature review in Chapter One, namely:

audience, source and trust, channel, and message (Allender and Spradley: 2004) are used to measure the efficacy of the communication done in Taung during the floods.

1. Audience

Effective communication starts with knowing your audience exceptionally well – from cultural beliefs and resources they possess to what would motivate them to do what it is that you are asking them to do, but for their reasons. The people involved in developing the messages in Taung had a good understanding of the community possibly because they came from and/ or live in the broader community. They knew before the time that people were likely to eat the animals that died as a result of the floods. They knew that boiling water or using 'Jik' to purify the water were to some degree, not new concepts and were possibly without many thorns. Those responsible for the logistics and emergency decision making did not know that affected community members would refuse to leave their homes, but this is less about knowing the audience and more of a normal phenomenon in disasters.

Community members, true to social phenomena during disasters, did not want to leave their homes. According to key informants, people had social engagements approaching – mainly funerals they were planning to attend. Funerals have become very important social engagements and opportunities for people to interact socially particularly in communities with little in the way of recreational resources. Disaster responders need to know not only the community but also common human behavior in disasters, like, the phenomenon of people not wanting to leave their homes is not specific to Taung. Another example is that the community thought that pit latrines are bewitched.

Some community members told key informants they were unwilling to leave the land of their ancestors and that they would rather die there. The result was that the only people that were airlifted to the town were women in their second last or last term of pregnancy for fear they would go into premature labour.

It was important that the communication took into account the fact that the majority of the community members are illiterate. Communication was verbal and in their own language. Community health care workers demonstrated how to use "Jik" and written directions were provided in the local language to serve as a reminder for those that could read.

2. Source and trust

In the case of Taung options for the source of the message were limited. Despite this, the fact that teams of multi-disciplinary experts were transported in and out of the area, sequenced according to a roster, and that many people on these teams from all these different areas of expertise were reinforcing and reiterating the same message assisted the community in trusting the source. The messages were also, by design and otherwise, communicated via the media which would have added additional sources to the list.

The people that provided the information in the case of the Taung floods were all broader fellow community members and some may have even been familiar to the community. One interview with a community member referred to "outside" assistance. The woman remembered that one of the mobile clinic staff had told her to mix sugar and salt in water to stop diarrhea when she was told again by one of the professional nurses from the municipality when it flooded. She said that the reminder was important and that having "an outsider" tell her to do it convinced her that it was true.

The fact that the majority of community participants could recall specifically that "community health care workers" were communicating the three primary messages indicates that the source is significant to the recipient of the message.

3. Communicated with authority

Warnings must be communicated with authority if they are going to be effective. In the case of Taung, different people from different areas of expertise communicated the same message. It is likely that between agricultural officers, environmental health officers, health promotion officers, mobile clinic sisters, professional nurses and community healthcare workers the community felt that messages were community with authority. These teams being flown in and out by South African Air Force helicopters may have added to that impression.

4. Channel

In Taung, the best way to ensure that community got the message was to take it to them. The disaster management team originally planned to bring the people to the resources, but since the people wouldn't leave their homes, they instead took the resources to the people. Messages

were communicated face-to-face with community members in the worst affected communities. TV as a medium seems to be very effective though despite a low level of ownership or access.

5. Message

5.1. Clear, simple and repetitive

In the case of Taung, the messages were simple and the severity of the health risk may likely have been addressed by the intense communication most evident to the community by the frequency of the visits to the area by the disaster teams assembled; and the different personnel communicating the same message on a regular basis over the period – about three weeks during the end of the worst flooding and up to a month afterwards. After that mobile clinic teams were in the communities reinforcing those learnings and imparting new information pertaining to the environmental situation then.

Since people were provided with information as well as solutions – like dry firewood, or 'Jik', it is likely that their level of confidence in their own abilities to take the recommended action was high because the barriers to doing so would be limited. Additional research would be required to determine whether communication further addressed community's perception of risk.

The findings of the research indicate that approximately half, or just less than half had heard (learned) the information before the floods. Hearing repeated warnings would increase the likelihood of people taking protective action (Drabek, 1986:61,76; Drabek, 1985b:13; Adams, 1981b:15,53; Auf der Heide: 1989).

Through the methods the sample population mentioned to purify water and treat diarrhea and from the response to the zoonosis questions, it appears that the messages that were provided were consistent.

5.2. Believable, or credible

The message pertaining to the need to purify drinking water may likely have been believable because community members were suffering from diarrhea, a common occurrence in the communities that do not have a safe, secure source of clean drinking water. The salt and sugar mixture to treat diarrhea may be less likely to be believed unless people have experienced it before. The zoonosis-related warnings are harder to "prove" since cause of death may not be defined. Despite this, for more than half or just fewer than half the sample population, the information was not new; they had heard it before. This may have made it more believable. For this group as well as those that learned it for the first time during the floods, the fact that

authorities were communicating the messages may have made them more credible. If the messages were also heard or repeated by community members that heard them on radio or television, this might have added further credibility to the communication.

5.3. Current, in context and specific

Members of the worst affected communities were told to boil water. In some cases people were unable to make fires so the message would be lost if they had not been the recipients of firewood that was distributed. If they were not provided with salt and sugar and did not have both, the message may have been lost and with it, the opportunity to experience the remedy.

5.4. Predictive of the probability of future events

It is not conclusive whether the messages provided in Taung warned community members of what would happen if they did not take the recommended action. Was it stated or was it assumed that people would know that they would get sick from drinking contaminated (dirty) water; and could die from thus, and/ or diarrhea. While it cannot be assumed, since it is a third largest cause of death in children under 5, it may not have needed to be spelled out (Norman et al, 2000). The warning attached to the message around zoonosis leading is less elusive.

5.5. Interactive – allows for and addresses questions

It is not clear if there was an opportunity for community members to ask questions. The fact that there were demonstrations though, in the case of the delivery of the water purification messages, indicates that an exchange is likely to have occurred.

5.6. Provide solutions

In the case of Taung, community members were provided with information as well as ways of purifying water and treating diarrhea. They were provided with emergency food supplies but not fresh meat since refrigeration is not possible.

5.7. Personalise

It is unlikely that the responders used people's names unless they had treated them from the mobile clinic units before. The community members whose scripts were refilled by health care workers involved in the response would have had this type of personalized communication. To determine if the communication really addressed real and perceived needs would require further in-depth research.

Relief versus development

The WHO Outbreak Communication Guidelines stress that communication about personal preventative measures is particularly useful as it empowers public to take some responsibility for their own health, thus resulting in greater public resilience, limiting mortality and morbidity.

The original approach to relief stemmed from the deep-seated misperception that communities are helpless, which according to a presentation by Steve Hansche of the ICRC, has meant that relief is geared towards meeting community's immediate needs, as opposed to long-term development and capacity-building. This would suggest that providing resources to communities is easier than having to engage with them. This is what has historically occurred in disasters. A fundamental shift needs to occur since this vertical approach undermines communities and destroys the opportunity for communities to develop.

The communication process must take into account the time needed to explain in a context that specific community understands, *"the why"* behind the solution. Do practitioners operate on a "need to know" basis and thus, eliminate information they assume will not be understood or that it would take too much time? If this is the case, by doing so, they limit the person's ability to understanding and thus, think for themselves and take the appropriate action in similar scenarios in the future. Providing limited explanation or information is paramount to a vertical intervention. A development approach that helps the recipient of the message truly understand in terms he or she can relate to would have lasting, meaningful consequences for the future.

Fast-tracking development

This study of the 2006 Taung flood disaster illustrated that disasters do fast-track development in a number of ways. A key informant said that the disaster in Taung "put Taung on the map". During the floods places that weren't being reached by the mobile clinics were discovered and are now serviced by additional mobile clinics that were provided by national government.

As legislated under the Disaster Management Act, additional money was allocated to the municipal budget for the response as well as infrastructure repair and development thereafter.

As noted by Clasen et al, in relation to the Indian Ocean tsunami, with widespread public, NGO and donor support, there is an unprecedented opportunity to improve standards of living and public health in the affected communities. In the case of the tsunami disaster, Oxfam dubbed this mission "Reconstruction Plus". The efforts would include ensuing appropriate water and sanitation provision for newly built schools, updating municipal water supplies and sewerage systems during their repair; protecting open water sources; and raising awareness through integrated health promotion campaigns among other plans (Clasen et al, 2006).

In Taung, key informants and community members (unprompted) said conditions had improved since the floods, with roads and houses being built under the government's Reconstruction and Development Programme (RDP), and a focus on areas that were previously neglected.

Public health was fast-tracked, evident in nearly 100 percent of the community understanding zoonosis prevention, how to treat diarrhea and ways of purifying water. The fact that so many men (73 percent of the sample population) learned about ORT for the first time during the floods is an indication of just one way that disasters can further development.

According to the head of the Sub-District Health Department, additional mobile clinic units were started to address areas they did not even existed before the floods and a child protection unit was established under the Department of Social Development. These developments were spurred by among other things, Sub-district health records from the disaster report that one two-month old was referred to hospital with severe malnutrition; other cases of child neglect were reported and a seven-year-old presented with a fever and swelling of an old operation scar.

Further, the disaster illustrated ways that departments can work together for the improvement of public health and brought experts together to share their skills for the greater good, thus promoting development.

Relevant questions/ considerations that could not be answered by the research:

- In order to understand the level of knowledge of basic health care among the affected communities before the floods, it would be useful to determine which areas were serviced by mobile clinics before the floods as well as the services and information they provide. The disaster uncovered areas that mobile clinics weren't reaching. There may likely be a correlation between those that knew the information before and live in

an area that was serviced by a mobile clinic team before the floods and those that learned the information for the first time during the floods and have never been serviced by a mobile clinic.

- Since purifying water with a hypo chloride solution like 'Jik' is a simple, low-cost and possibly even known or accepted practice for ensuring clean safe drinking water, and is possible for communities to do without outside assistance (provided they have 'Jik' in their homes and understand what conditions may result in contaminated drinking water supply,) it would be valuable to know:
  1. The proportion of the sample population that knew about using 'Jik' to purify water before the floods.
     A. And did so without being told to.
     B. And did so after being told to.
     C. Or didn't do so and why.
  2. The proportion of the sample population that learned to use 'Jik' to purify water during the floods.
     A. And did so.
     B. Or didn't do so and why.
- It could prove valuable to look at the proportion of the community that owns cellular phones and how they prioritise the purchase of airtime against things like batteries for radio and staple food stuffs. It would be worth exploring the robustness of the networks in the country to determine if the cellular network could provide a channel to communicate with communities during disasters. This would not replace the need to provide "items" that the community could not survive without though, like dry wood, paraffin, 'Jik' and/ or life-saving drugs/ antibiotics. It would be interesting for future study to look at the role of cellular phones in communication of public health messages – in normal times and exceptional times like disasters.
- On the abovementioned point, understanding the financial prioritization of commonly-kept household ailments like sugar and salt and 'Jik' against other items like food, batteries for radios and cell phone air-time, would help responders understand communities better.
- It might be of use to test people's understanding in more detail, for example, to look at the proportion of people that really understand the "salt and sugar mixture in water"

solution for diarrhea since this is a leading cause of death in children under 5 in the country. Do people know the proportion of salt to sugar?

- Identify areas that are prone to disasters and focus on targeting all stakeholders and the most vulnerable in these areas, with relevant mitigation measures and health promotion programmes developed in partnership with the people on an on-going basis before disasters occur.

CHAPTER FIVE
Conclusions and recommendations

The fact that nearly 100% of responders could name ways to purify water, treat diarrhea and knew about the risks of eating an animal that has died of unknown causes, indicates effective communication. Also, based on Allender & Spradley (2002) guidelines for effective communication used for the purpose of this research, the communication seemed to be effective as messages communicated were recalled easily by community a year later; they were repeated over a period of time by different people and experts; were reinforced by the media and solutions were provided.

This chapter looks at recommendations that naturally emerged from the research.

A. Recommendations

1. Start health promotion programmes with communities around likely disaster scenarios now.

It is recommended that much like what happens at the time of a disaster under the Disaster Management Act – and as was done in Taung – where heads of departments met daily to provide debriefs and coordinate activities, that forums be established for this to occur in non-disaster times to ensure all role players engage around issues relating to health on a regular basis.

While most Western models are developed with first world infrastructure in mind, there are valuable insights that can and must be used to guide planning across cultures and countries irrespective of resources. For example, according to the American organization "Healthy Communities": "The health status of community residents is not the sole responsibility of the public health agency or health service providers."
(http://www.healthypeople.gov/state/toolkit/partners.htm).

While public health agencies may bear responsibility for leading community health improvement efforts, their success hinges on their ability to establish and maintain effective partnerships throughout the state. The public health agency needs to identify and work with all entities that influence community health—from other government agencies to businesses to not-

for-profit organizations to the general citizenry. “Healthy People” initiatives should begin with a commitment to collaboration among diverse constituencies so that everyone feels a sense of ownership in the state plan.”

1.1 Utilise community healthcare workers

Referring to the presentation Steve Hansche of the ICRC made at the Symposium on Health communication in Fragile States and Humanitarian Emergencies, in Washington DC, Hansche summarized that the best work the ICRC does, “leading to the majority of lives saved” has been through community healthcare workers. He went on to say that 99 percent of their (ICRC)’s knowledge comes from their CHWs and their direct contacts.

If communities are being engaged by trained health facilitators or community healthcare workers through appropriate workshops on a regular basis then when disasters occur, communities will be well positioned to ensure their own well being with only outside assistance in the form of physical resources and additional expertise where necessary.

Establish healthcare networks and health communication capacity in communities by involving community or representatives of community in these meetings; creating opportunity for dialogue and understanding of different perspectives and subsequently, over time, developing trust.

While the guidelines for ensuring effective communication can be applied across cultures, no “blueprints” or one-size-fits-all approach should pre-determine the messages. The communication has to be in context and who better to truly understand local contexts than the locals? The recommendation is to use the social capital within the communities as well as community authorities and heads of relevant departments in the broader community to develop the messages and check the messages against the guidelines for effective communication.

Communities’ learnings need to be consolidated after disasters and plans re-looked and possibly re-worked to improve disaster mitigation and response.

Provided community healthcare workers are given all the tools to understand a health issue and solutions, they are best positioned to translate the information health messages into useful, relevant information for community. Involve them and representatives of the community in the decision-making and

message design process. Develop messages with the community before the time based on the most likely scenarios through hazard mapping. And do so collaboratively, locally at regular intervals, adapting messages according to feedback from community.

Build on what people know and their beliefs. As Freimuth notes, reaching culturally diverse groups with vital health messages and trying to convince communities to change behaviours to protect their health may require communication tools that transcend explanatory language.

Explanatory language describes one event followed by another in a linear fashion while figurative language can synthesize and combine, uniting different levels of thought, feeling and behaviour into one picture that gives a complete perspective. Going beyond explanatory language and using figurative language to create health messages has been successfully done by the American Red Cross, the Centres for Disease Control and Prevention and locally, Soul City, to name a few (Freimuth. Potter:1996).

1.2. Involve men in health promotion programmes now

The research showed that in the case of ORT, significantly more men than women learned about ORT for the first time during the floods. This is hardly surprising since women have historically been the primary caregivers within the household and because men tend to exhibit less “health seeking behaviour” than women. The latter may be a product of the assumed role of the woman to provide care though and with the changing dynamics in households because of HIV combined with the increasing number of natural disasters it would make sense to involve men in health promotion programmes before disasters occur.

2. Take advantage of the opportunities to fast-track development

According to WHO, community participation in the communication of specific health messages in the immediate aftermath of a disaster ensures sustainable and incremental improvements in environmental health (WHO *Guidelines for Communication of Outbreaks*).

There is more impetus in times of disaster to change behaviour and to begin programmes that will help mitigate against worst case scenarios in future. The way people did things before the

disaster may now seem foolish or outdated once they understand more. Utilise disasters to further all development goals including health. Begin dialogue between resident experts and communities to build trust before disasters happen. Use this time and the time during disasters to "teach" not just "tell" people what to do, or not do. Teaching involves the how and the why behind the actions. Involve community in the teaching and the communication of messages.

3. Consider all elements of successful communication

Utilise existing models of communication to ensure communication is effective, thus, has the desired response, and test messages before the time in the forums mentioned above and with community. These forms of "drills" are commonly practiced in developed countries and provide opportunities for approaches to be adapted so that they work best when they are really needed.

3.1 Channels of communication – particularly relevant in South Africa

Since disasters often indiscriminately take out communication channels it seems logical that planning for disasters in developed countries would be best undertaken with that scenario in mind. Thus communication strategies must allow for a scenario that excludes modern communication channels and relies like developing countries, on strategies like old fashioned conversation. It is likely that this is what will be needed to save lives.

Traditional media channels it seems should not be left out though, as the research indicated that even a community with little access will amplify the message themselves and the message might be deemed more credible if it is on national television or radio.

Exploring the option of using cellular phone networks would be worthwhile due to the enormous penetration and demographics of cell phone users in South Africa.

3.2. Impact and sustainability

Lastly, in the case of Taung, the effectiveness of the communication may have had something to do with the knowledge the responders had of the affected

community, the way communication was done face-to-face, as well as the community's perception that help came from "outside". It was the first test of the new Disaster Management Act and it seems to have had some success as well as providing some valuable lessons learned that will hopefully form a part of the collective memory of the communities, the responders and those that access the research done around the 2006 Taung floods for future.

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APPENDIX A: FACULTY ETHICS COMMITTEE ETHICAL CLEARANCE FOR RESEARCH PROJECT

APPENDIX B: OUTLINE FOR INTERVIEW WITH KEY INFORMANTS

DEMOGRAPHICS

1a. Sex of respondent/

Male/	1
Female/	2

1b. What is your age in completed years? /

……..YEARS | | |

2. What is your highest educational qualification? /

NONE	01
SOME PRIMARY	02
PRIMARY COMPLETED	03
SOME SECONDARY	04
SECONDARY COMPLETED/	05
TERTIARY/	06
OTHER (SPECIFY)/ …….……..…..	07

3. What language do you speak at home most of the time? /

English	1	
Afrikaans	2	
Zulu/	3	
South Sotho	4	
Setswana	5	
Xhosa	6	
Pedi / North Sotho	7	
Venda	8	
Tsonga	9	
Seswati	10	
Ndebele	11	
Other: …… ……		

4. RACE (***Interviewer do not ask)***

African	1
Coloured	2
Asian	3
White	4

GENERAL MEDIA ACCESS AND EXPOSURE

1. How often do you read newspapers or magazines, or have them read to you?

Every day	1
2-4 times per week	2
Once a week	3
2-3 times a month	4
About once a month	5
Hardly ever	6
Never	7

2. How often do you listen to the radio?

Every day	1
2-4 times per week	2
Once a week	3
2-3 times a month	4
About once a month	5
Hardly ever	6
Never	7

3. Which radio station(s) have you listened to during the past 7 days?

……..			
……..			
……..			

4. How often do you watch television?

Every day	1
2-4 times per week	2
Once a week	3
2-3 times a month	4
About once a month	5
Hardly ever	6
Never	7

5. Which TV station(s) have you watched during the past 7 days? /

…….. | | | |
…….. | | | |
…….. | | | |

PERCEPTIONS

1. What was your role when the area flooded in March/ April this year?

2. How many were affected?

3. What were the heath issues/ risks?

4. What other health effects were suffered by the affected population?

ACTION

1. What was the biggest priority of the disaster management team when the flooding occurred in March/ April this year? (Health priority if another is mentioned)

2. What was done?

3. What was communicated to the affected communities?

4a. How were communities communicated with?

4b. Who's responsibility was it?

5. Have you seen any long-term (after the disaster) effects of the communication?

APPENDIX C: TRANSLATED QUESTIONNAIRE FOR COMMUNITY

QUESTIONNAIRE FOR COMMUNITY

MPHO - INTERVIEWER to ask questions – do not offer answers – tick box that applies
BOTSA POTSO – o se neelane ka dikarabo – tlatsa fa mabokosong a neilweng.

1. Does dirty water carry disease? **A metsi a leswe a na le twatsi?**

Yes / **Ee**	1
No / **Nyaya**	2
Don't know / **Ga ke itse**	3

2. How can you do to make dirty water clean to drink? / **O tshwanela go dira eng gore o phepafatse metsi a leswe gore o kgone go a nwa?**

ASK QUESTION – do not offer answers – tick box that applies / BOTSA POTSO – o se neelane ka dikarabo – tlatsa fa mabokosong a neilweng.

Use 'Jik' / **O ka dirisa 'Jik'**	
Boil it / **O ka a bidisa**	
Other / **Sengwe**	
Don't know / **Ga ke itse**	

3. Did you know how to make dirty water clean before it flooded last year or was this new information? / **A na o ne o itse go phepafatsa metsi a leswe pele go mafula a jara e, kgotsa o ne o simolola go utlwa ka se?**

I knew how to make dirty water clean before / **Ke ne ke itse go phepafatsa metsi peleng**	1
It was new information I learned during the floods / **Ke ne ke simolola go ultwa, mme ke ithutile nakong ya mafula**	2

4. Do you know what to do if you or your child gets diarrhea? / **A na o itse se o tshwanelang go se dira fa wena kgotsa ngwana wa gago a ka tshwara ke letshollo?**

Yes / **Ee**	1
No / **Nyaya**	2
Don't know / **Ga ke itse**	3

5. What should you do if for diarrhea? / **A na o itse se o tshwanelang ke go se dira ka letshollo?**

Give clean water mixed with one spoon full of salt and 2 full of sugar / **Ba naye metsi a phepa a tshetsweng leswana le le nngwe la letswai le a mabedi a sukiri**	

Give water **/ Ba nose metsi**	
Stop giving the child food / **Emisa go ba naya dijo**	
Stop giving the child water / **Emisa go ba naya metsi**	
Other / **Tse dingwe**	

6. Did you know what to do if your baby/ child gets diarrhea before it flooded last year or was this new information? / **A na o ne o itse gore o tshwanela go dira eng ga ngwana a ka tshwara ke letshollo pele go mafula, kgotsa o ne o simolola go utlwa ka se?**

I knew this before / **Ee, ke ne ke ntse ke itse**	1
It was new information I learned during the floods / **Ke ne ke simolola go ultwa, mme ke ithutile nakong ya mafula**	2

7. Is it ok to eat an animal that has died? / **A na go siame go ja seruiwa se se suleng?**

Yes / **Ee**	1
No / **Nyaya**	2
Don't know / **Ga ke itse**	3

8. Did you know this before it flooded last year or did you learn this then? / **A na o ne o itse se pele go mafula**

I knew this before / **Ee, ke ne ke ntse ke itse**	1
I learned this during the floods / **Ke ithutile se nakong ya mafula**	2
Don't remember / **Ga ke sa gopola**	3

9. Did you learn anything from the floods? / **A o ithutile sengwe morago ga mafula?**

Yes / **Ee**	1
No / **Nyaya**	2
Don't know / **Ga ke itse**	3

10. If yes, what? / **Fa go le yalo, o ithutile eng?**

Not to stand in or cross flowing water		1
How to use 'Jik' to clean water		2
To boil water to make it clean		3
Not to eat the animals that died in the water / **Go re ke se je diruiwa tse di suleng mo metsing**		4
Other:	**Tse dingwe**	5

11. Who did you get information from during the floods? / **Ke bo mang ba le fathlollotseng nakong ya mafula?**

Don't offer answers but tick all that apply – and ask if they heard anything on the radio / **BOTSA POTSO – o se neelane ka dikarabo – tlatsa fa mabokosong a neilweng - gape botsa g e ban eng ba utlwile fa seyalemoyeng.**

The radio / **Seyalemoya**		1
Community health care workers **/ Badiredi ba Maphelo**		2
NGO workers / **Badiredi ba mekgathlo e sa duellweng**		3
Local councilors/ tribal authorities / **Makhanselara / Ba kgosing**		4
People from the municipality **/ Batho ba Mmasepala**		5
Don't remember / **Ga ke gopole**		6
The police / **Mapodisi**		7
Other:	**Bangwe**	8

12. IF THEY KNEW ABOUT THE SALT AND SUGAR MIXTURE for diarrhea ask this question: Do you use the mixture when you get diarrhea?

/ **FA E BA NENG BA ITSE KA GA MOTSWAKO WA SUKIRI LE LETSWAI go fedisa letshollo, botsa potso e: "A o ka dirisa motswako ga o tshwara ke letshollo?"**

Yes / **Ee**	1
No / **Nyaya**	2
Don't know / **Ga ke itse**	3

13. IF THEY KNEW TO USE 'Jik' OR TO BOIL WATER TO MAKE IT CLEAN ask this question : If you think water is dirty do you boil it or use 'Jik' before drinking it?
/ FA E BA NENG BA ITSE KA GA 'Jik' KGOTSA GO BEDISA METSE GO A PHEPAFATSA, BOTSA POTSO E: "Fa o lemoga gore metsi a leswe, a o a a bedisa kgotsa gona go dirisa 'Jik' pele o a nwa?

Yes / Ee	1
No / Nyaya	2
Don't know / Ga ke itse	3

DEMOGRAPHICS

1. Type of area/ name of area

Rural village / **Naga Magaeng**	1
Rural on farm / **Polaseng**	2
Rural scattered / **Dilaleng**	3

2a. Sex of respondent/

Male / **Monna**	1

Female / **Mosadi**	2

2b. What is your age in completed years? / **O na le dingwaga tse kae?**

……..YEARS | | |

3. What is your current employment status (which of the following best describes your present work situation)? / **A na o a dira (Fa e le gore o a dira, ke e feng go tse fa tlase tse thlalosang tiro ya gago ka botlalo**

Student/scholar **/ Morutwana**	1
Unemployed/ **Ga o dire**	2
Work in informal sector / **O dira ko polaseng**	3
Pensioner (sick/disabled, etc.) / **Pentshenara (molwetsi / golofetse, jalojalo)**	4
Self-employed - full time / **O na le kgwebo ye e leng ya gago mme o dira ko go yona ka matsatsi othle**	5
Self-employed - part time / **O na le kgwebo ye e leng ya gago fela o dira mo go yona ka matsatsi mangwe**	6
Employed part time (if none of the above) / **O dira ka matsatsi**	7
Employed full time / **O dira ka matsatsi othle**	8
*Other (specify) / **Tse dingwe (thlalosa)*** ……	9

5. What is your highest educational qualification? / **O rutegile go fithla fa kae?**

NONE / **GA KE A RUTEGA**	01
SOME PRIMARY / **KE TSENE KO PRIMARY**	02
PRIMARY COMPLETED / **KE FEDITSE PRIMARY**	03
SOME SECONDARY / **KE TSENE KO SEKONDARY**	04
SECONDARY COMPLETED/ **KE FEDITSE SECONDARY**	05
TERTIARY/ **KE FEDITSE TERTIARY**	06
*OTHER (SPECIFY)***/ DINGWE (TLHALOSA**) …….……..…..	07

6. What language do you speak at home most of the time? / **O bua puo efe ko lapeng?**

English	1
Afrikaans	2
Zulu/	3
South Sotho	4
Setswana	5
Xhosa	6
Pedi / North Sotho	7
Venda	8
Tsonga	9
Seswati	10
Ndebele	11
Other:/ ***Enngwe*** ……	

7. RACE **(*Interviewer do not ask*)** / **O mothlobo mang**

African / **Mothomotsho**	1
Coloured / **Mocoloured**	2
Asian / **MoIndia**	3
White / **Lekgowa**	4

General media access and exposure / phithlelelo e tsepamileng ya media

1. How often do you read newspapers or magazines, or have them read to you? **O buisa, kgotsa go buisetswa kuranta, kgotsa magazine, ga kae?**

Every day / **Ka mehla**	1
2-4 times per week / **Ga bedi go fithla boneng mo bekeng**	2
Once a week / **Ga nngwe ka beke**	3
2-3 times a month / **Ga bedi kgotsa ga raro mo kgweding**	4
About once a month / **Gongwe ga nngwe mo kgweding**	5
Hardly ever / **Ga ke ke ke buisa**	6
Never / **Ga ke buisi**	7

2. How often do you listen to the radio? / **O mamela seyalemoya ga kae?**

Every day / **Ka mehla**	1
2-4 times per week / **Ga bedi go fithla boneng mo bekeng**	2
Once a week / **Ga nngwe ka beke**	3
2-3 times a month / **Ga bedi kgotsa ga raro mo kgweding**	4
About once a month / **Gongwe ga nngwe mo kgweding**	5
Hardly ever / **Ga ke ke ke retsa Seyalemoya**	6
Never / **Ga ke reetse Seyalemoya kgotlelele**	7

3. Which radio station(s) have you listened to during the past 7 days? **Ke setishi kgotsa ditishi tse difeng tsa Radio tse o di reeditseng matsatsing a supa a fitileng?**

Vaaltaar	1		
Motsweding	2		
Other	3		

4. How often do you watch television? **O bogela Television ga kae?**

Every day / **Ka mehla**	1
2-4 times per week / **Ga bedi go fithla boneng mo bekeng**	2
Once a week / **Ga nngwe ka beke**	3
2-3 times a month / **Ga bedi kgotsa ga raro mo kgweding**	4
About once a month / **Gongwe ga nngwe mo kgweding**	5
Hardly ever / **Ga ke ke ke bogela Television**	6
Never / **Ga ke bogele Television kgotlelele**	7

5. Which TV station(s) have you watched during the past 7 days? / **Ke kanale kgotsa dikanale tse dife tsa Television tse o di bogetseng matsatsing a supa a fitileng?**

SABC	1		
eTV	2		
Other	3		

APPENDIX D: MEDIA REPORTING ON THE TAUNG FLOODS

SABC News

R500 million needed to revive Taung



April 08, 2006, 18:15

About R500 million may be required to rebuild the flood ravaged Taung area in the North West province, according to a recommendation made by the provincial legislature, following a visit to the worst hit areas.

Water levels are subsiding, but the misery continues for many residents. Interim relief is being provided until the national government intervenes. The entire Bophirima district, including Taung, has to be rebuilt. The province has called for it to be declared a national disaster area.

Construction on more than 2 000 damaged houses will begin in the next four weeks. A private company has been appointed to set up an assessment report. The provincial legislature will then decide on the distribution of aid.

Aid pours in for Taung's flood-hit communities

April 05, 2006, 22:15

Aid is pouring in for the flood-hit communities of Taung in the North West as donors respond to appeals for food and other commodities. The SABC's Motsweding FM has embarked on a series of outside broadcasts to encourage businesses and individuals to donate whatever they can afford.

Snyman Rankane, the Motsweding FM acting manager, is over the moon with the response so far as "only the food parcels can be close to R100 000 when you just look at them and the clothes that we are receiving, they can be more than R60 000".

Rankane is unable to establish the amount of cash they have accumulated, but cheques that have been received from listeners amount to a whopping R217 000.

Food parcels urgently needed in Taung



April 05, 2006, 10:45

The Taung local municipality in the North West has again appealed for food aid. This comes after a resolution was agreed to yesterday on providing financial aid to the flood ravaged villages.

Some people in flood-hit areas have been eating the carcasses of animals which died in the floods. This despite a warning from health authorities that they could become severely ill. Boitumelo Mahlangu, the Taung mayor, says more food parcels are urgently needed. "We need food parcels that do not require cooking, it's impossible to cook in an environment where its still flooded."

Yesterday, the local government department, a delegation from the North West disaster management committee and the local authorities agreed that priority will be given to, among others, the rebuilding of infrastructure, health, housing and food.

Taung flood victims get R2.5 million donation

April 04, 2006, 17:30

Much needed relief to the Taung flood victims has come in the form of R2.5 million. The money was donated by a private company and was today released by the North West social services department.

However, the real extent of the damage is only becoming clearer as the flood waters have started to subside. Clean drinking water is still a scarce commodity for more than 1 000 families accommodated in make-shift tents. Food is in short supply, and many have ignored warnings not to eat dead animals.

Roads are still inaccessible and people are still cut off from the outside world. Authorities are working around the clock to get more food, clean water and medical assistance to the area.

Discussions under way
Meanwhile, a delegation from the North West government, the Taung Local Municipality and the disaster management team are meeting with Sydney Mufamadi, the local government and provincial affairs minister, in Pretoria.

Mufamadi announced during his visit to the flood hit Taung villages last week that interim and long-term solutions need to be considered in order to deal effectively with the floods in the future.

Floods wreak havoc in North West municipality



At least R230 million will be required to repair and build 220km of roads

April 01, 2006, 19:15

Although Taung remains a focal disaster area as a result of floods, other local authorities, such as the Naledi Municipality in the North West, have suffered heavy damages and losses because of heavy rains experienced in that locality since the beginning of the year.

More than one 1 000mm of rainfall was recorded in the Naledi Local Municipality since the beginning of the year. The walls of the Metcalf Dam, which supplies water to the local farming areas, is under threat of collapse. The local disaster management committee is putting sandbags along its walls, to prevent any possible collapse. But most damage occurred on the local road networks and this is costing the farmers heavy losses.

Leon Bellingan, of the Vryburg Farmers Association says: "People are struggling to get to town because roads are in total chaos at this stage. The milk farmers tell us about their loss of income of about 25%. The potatoe farmers are unable to get their heavy vehicles on the road, to take their produce to the markets."

R230 million needed for relief
According to Tebogo Kebotlhale, the Naledi municipal manager, more than R70 000 worth of claims have been submitted to the municipality by members of the public, whose vehicles have been damaged by the poor roads condition. At least R230 million will be required to repair and build 220km of roads within the local authority, but there is no money to do this.

Kebotlhale says: "We do not have the necessary financial capacity to be able to meet these challenges. We have submitted this to the provincial government, with the view that the government would intervene to help alleviate the situation."

Disaster committee in talks over Taung flooding



Floods continue to wreak havoc in Tang

March 27, 2006, 11:30

The North West disaster management committee is meeting with the Greater Taung municipality today. They plan to discuss emergency assistance to areas affected by the floods in Taung.

Military helicopters are also expected to airlift emergency supplies, including food parcels and tents, particularly to villages that are inaccessible by road.

Mandla Mathebula, a spokesperson, said that since the rain had started about three months ago, six people had drowned and 1040 families had been left homeless.

Many bridges, including some of those that were recently repaired, have been washed away. Several houses, many made of mud, have been destroyed. Teaching has been halted in some villages, because roads and bridges are impassable.

Taung flooding continues, villagers start to panic

March 27, 2006, 06:30

Several families have been left homeless after their homes flooded and collapsed at Qho and Qhonyana village in Taung in the North West due to heavy rain, the North West local government department says. Taung residents are now starting to panic.

Mandla Mathebula, a spokesperson, said that since the rain had started about three months ago, six people had drowned and 1040 families had been left homeless.

Heavy floods have also destroyed bridges, burying them underwater, making it impossible in some villages for children to attend school.

In an effort to assist locals in the area, a helicopter is being used to deliver food, blankets and tents.

The last heavy floods to hit Taung were about 18 years ago. At the beginning of March, when the first floods fell on the area, the North West government promised to promptly supply food and shelter. However, communities say they are still waiting. - additional reporting by Sapa

Continuous rains leave Taung villages vulnerable

March 25, 2006, 12:45

The situation in most villages of Taung in the North West remains critical following continuous torrential rain in the area. Most bridges in the villages are underwater.

The floods, which hit the area for almost three months, have reportedly left some of the villages isolated and inaccessible. The rains last night - measuring about 30mm - caused extensive damage at Qho village where several houses mostly built of mud have collapsed. Several families have since been accommodated in makeshift tents.

More rain is still expected in the area.

Millions needed to rebuild North West town

March 04, 2006, 13:30

About R780 million is needed fix damaged infrastructure following the flooding in Taung in the North West province. Some roads remain inaccessible following the recent heavy rains.

A few days after the floods some villages are still inaccessible by road. "We've managed to restore roads and basic infrastructure in many areas, however more than 400 have been affected by the heavy rain," says Charl du Plessis, a Taung development manager.

Affected residents are receiving food parcels, blankets and some have been provided with tents.

Rain may pose threat to voters in Taung: IEC

February 28, 2006, 06:30

The IEC in the Taung area in the North West has expressed concern that rain could make it difficult for voters to get to polling stations in tomorrow's local election.

The IEC is adamant that voting hours will not be extended but Charl Du Plessis, the electoral officer in Taung, says that if it continues to rain and some areas remain inaccessible by road, the SANDF may be asked to assist with helicopters.

Taung has recorded 400 millimetres of rain since the beginning of the year and at least one voting station district has had to be relocated.

North West villages flooded

February 14, 2006, 12:45

Schooling has been disrupted by flooding in the Taung region of the North West, with over 17 villages affected.

Scores of mud houses in some of the villages have collapsed after heavy rains in the area. Learners are unable to attend classes as rivers are overflowing.

Nicholas Khonkhobe, the Taung mayor, says the disaster management team is discussing ways of helping the affected communities. Nobody can use the road, where the bridge has subsequently collapsed, teachers, scholars and workers are severely affected. The municipality has discussed the matter with the District Management Team to ensure the implementation of develop strategies.

APPENDIX E: Statement from the North West Provincial Government regarding the Taung Floods, 9 April, 2006



North West Provincial Legislature committees conclude visit to Taung flood villages

9 April 2006

Taung - The North West Provincial Legislature's delegation, visiting the Taung area, concluded their oversight visit late Friday, 7 April 2006. Although the delegation had intended to visit 12 villages ,which were identified as the most stricken, the committees eventually visited 16 villages in total. The eight villages visited on Thursday, 6 April, were Matlapaneng, Sedibeng, Choseng, Loselong, Moretele, Khaukwe, Maganeng and Ntswanahatse. The eight villages visited on Friday, 7 April, were Vaaltyn, Qho, Takaneng, Diretsaneng, Mokgareng, Buxton, Thomeng and Lokgabeng.

The delegation travelled over 350 kilometres by gravel road over two days in 4x4 vehicles. The extent of the damage was especially visible by road as they often met impassable bridges and stretches of gravel road.

"We are travelling by 4x4 over these roads. One can only imagine the people isolated in these villages who are trying to get to and from Taung for the bare necessities either by donkey cart or by foot," said a visibly horrified Mahlakeng Mahlakeng, leader of the delegation.

"Desperate. Dismal," honourable Mahlakeng said when asked to briefly describe the situations they encountered over the two days. "We are coming here two weeks after the worst of the floods have passed and the extent of the devastation is still mind boggling."

In many places the vehicles still had to battle fiercely running water while in others long detours had to be taken to avoid the hidden pools of standing water.

"We picked up a few issues when we spoke to the people," continued Mahlakeng, "and our mentioning them is does not mean that the Greater Taung Municipality did not do its part during this disaster. In fact they rose admirable to challenge and for this we commend them. Water is finished in the tanks provided by Sedibeng water and no one has come to refill them so the people are still drinking the contaminated water. In Ntswanahatse we spoke to a young woman surrounded by children who mentioned that children still have diarrhea while in Sedibeng, Khaukwe and Vaaltyn the people are living in tents that are either too small or of shocking quality. Their isolation is so complete that although the water level has gone down the state of the roads is so bad even a donkey cart cannot move."

"The extent of the destruction is enormous. Our report will go into further detail about what we have seen but suffice it to say at this juncture, we are in agreement with the figures mentioned by the MEC of Developmental Local Government and Housing in the briefing we had with him on Thursday, 6 April, in Taung. In actual fact we think that some of the figures mentioned may be conservative. From what we have seen we believe that a figure of R500 million for reconstruction is not too high," held Mahlakeng.

"We intend to motivate for the entire Bophirima region to be declared a national disaster zone as the funds required to rebuild this area will stretch the provincial coffers in a manner we believe the province will not be able to cope. Batho ba Taung we are with you. We have seen your suffering. We will ensure along with our colleagues in government that your situation is remedied as a matter of urgency," concluded Mahlakeng.

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Issued by: North West Provincial Legislature
9 April 2006

APPENDIX F. SAMPLE OF THE TAUNG SUB-DISTRICT DEPARTMENT OF HEALTH DAILY STATUS REPORTS