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Human agency and everyday childhood injury risk: exploring household protective measures for children in Ward 7, Epworth (Harare) and Samora Machel (Cape Town)

A Thesis Submitted to the Faculty of Science
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Master of Philosophy in Environmental and Geographical
Science
(Disaster Risk Science)

By

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DECLARATION

This thesis has been completed in partial fulfilment for the award of a Master of Philosophy Degree in Disaster Risk Science in the Department of Environmental and Geographical Science, University of Cape Town. I declare that this thesis "*Human agency and everyday childhood injury risk: exploring household protective measures for children in Ward 7, Epworth, Harare and Samora Machel, Cape Town*" is my own work and has not been submitted for any degree at any other university. All sources used and quoted have been indicated and acknowledged by complete references.

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22 July 2011

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"For I know the plans I have for you", declares the LORD, "plans to prosper you and not to harm you, plans to give you hope and a future"

(Jeremiah 29:11)

ABSTRACT

Africa is now reportedly the most rapidly urbanising continent, and is projected to surpass Latin America by 2030 (UN, 2009). Approximately one-half of all inhabitants of cities in developing nations live in informal settlements, areas that not only provide livelihood opportunities, but also are fraught with hardship (Pelling & Wisner, 2009). The need for residents of informal settlements to implement proactive risk management and protective interventions is particularly apparent in the case of young children. These constitute an especially vulnerable group that is exposed to multiple dangers and threats in poor, urban areas. Unfortunately, as is the case with other forms of everyday risk, examples of collective, as well as proactive individual actions that reduce child risk; remain poorly researched and documented in African informal settlements (Pelling & Wisner, 2009).

Specifically, this study sought to explore and examine the role of human agency in reducing and managing everyday risks in two African informal settlements through the lens of child injury prevention.

The methodology used for data collection and data analysis comprised both qualitative and quantitative research methods. A total of 100 household questionnaires were administered in the two study sites. In addition, field observations, two focus group discussions in each study site were facilitated and key informants interviews were conducted. Descriptive statistics were used to analyse quantitative data, which was complemented by qualitative data.

The findings in this study suggest that informal settlements can vary substantially and each particular settlement is likely to have its unique characteristics. In this study, the different socio-demographics from the two sites were reflected in the different approaches in prevention strategies later adopted. Also, this research has

highlighted the important role of community mobilisation and vigilance as an active strategy in child injury prevention. Furthermore, a need for preserving traditional practices such as back-carrying was seen as an essential factor in reducing child vulnerability and thereby reducing child injuries. This study further showed that child protection and injury prevention can only be successfully achieved by incorporating both active and passive strategies. This will not be achieved without responsibility being taken at both household and community scales.

Key words: Urban risk; everyday risk; informal settlement; childhood injury prevention; passive and active strategies.

University of Cape Town

GLOSSARY

Term	Definition	Source
Active strategy	Injury prevention strategies which require an individual action.	Saluja et al., 2004 and Morrongiello & Schell, 2010
Everyday risk	Public health hazards, transportation accidents and threats to pedestrians which cumulatively injure and kill more people than large disaster events.	Pelling & Wisner (2009)
Informal settlement	Settlements of the urban poor developed through unauthorized occupation of land.	Pelling & Wisner (2009)
Injury	A bodily lesion at organic level resulting from acute exposure to energy (this energy can be mechanical, thermal, electrical, chemical or radiant) interacting with the body in amounts that exceed the threshold of physiological tolerance.	Van As & Naidoo (2006)
Intentional injury	Premeditated or purposeful act which results in injury to either oneself or others.	Van As & Naidoo (2006)
Passive strategy	Injury prevention strategies which do not require an individual action.	Saluja et al., 2004 and Morrongiello & Schell, 2010
Risk	The combination of probability of an event and its negative consequences.	UNISDR terminology (2009)
Vulnerability	The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.	UNISDR terminology (2009)
Unintentional injury	Injuries which occur as a result of an accident or mistake.	Van As & Naidoo (2006)

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CHAPTER 1

INTRODUCTION

1.1. Introduction

The 21st century has been referred as the “Century of the City”, since almost half of the world’s population is already living in the urban areas, and by the middle of the century, most of the developing nations will be predominantly urban (UN-HABITAT, 2009). Africa is now reportedly the most rapidly urbanising continent, and is projected to surpass Latin America by 2030 (UN, 2009). Approximately one-half of all inhabitants of cities in developing nations live in informal settlements, areas that not only provide livelihood opportunities, but also are fraught with hardship (Pelling & Wisner, 2009). These problems include poverty, lack of services to meet basic needs, unsafe land, ‘hotspots’ of disaster risk and especially urban risk (Pelling & Wisner, 2009). Moreover, the combined effects of persistent poverty and recurrent shocks and stresses often result in residents of underserved informal areas being unable to meet most of their basic day-to-day needs (Davies, 2007).

1.2. Background

Conditions in poor, informal areas are characterised by limited government service provision, including disaster risk reduction programmes. However, it is also recognised that informal settlement residents have diverse livelihood strategies to manage or cope with a wide range of everyday risks that include crime, employment insecurity, urban fire and other environmental hazards, as well as threats to human health and safety (Pelling & Wisner, 2009).

The need for residents of informal settlements to implement proactive risk management and protective interventions is particularly apparent in the case of young children. These constitute an especially vulnerable group that is exposed to multiple dangers and threats in poor, urban areas. Unfortunately, as is the case with other forms of everyday risk, examples of collective, as well as proactive individual

actions that reduce child risk; remain poorly researched and documented in African informal settlements (Pelling & Wisner, 2009).

Therefore, this research sought to address the prevailing gap in knowledge on African informal settlement risk by examining the application of proactive risk management at two levels.

First, with particular focus on individual interventions, the research explored the character and scope of proactive protection measures that caregivers take to avert child injury and serious illness. Attention was also given to the possible determinants that influence the nature and effectiveness of protective engagement at individual scale. Information on factors that influence the degree of proactive protection afforded young children by individual caregivers (the management of idiosyncratic risk) was then applied to the management of everyday risks at settlement scale (covariant risks), particularly those that apply to child health and safety.

Second, the findings also addressed application and practice concerns. Specifically, the research sought to contribute towards identifying effective ways of disseminating information to mothers and caregivers. Specifically, this sought to inform interventions that would enable mothers and caregivers to better protect their children through managing or reducing everyday risks that lead to child injuries or illnesses. In addition, recognizing the central role that human agency plays in reducing everyday urban risks in underserved areas; the findings were intended to strengthen future risk reduction efforts in informal urban settings.

1.3. Rationale

The well-being and safety of children is a recognised global imperative. This priority was formally expressed through The Convention on the Rights of the Child (CRC) in 1989 and subsequently in the Millennium Development Goals (UNICEF, 2010, UNHCHR, 2010 and UNDP, 2010). The Convention on the Rights of the Child (CRC) in 1989, ratified by the majority of governments, states that children all over the world have the right *“to a safe environment and protection from injury and violence”* (UNHCHR, 2010 and WHO, 2008).

It has been widely accepted that the CRC extends far more than any other human rights treaty (Svevo-Cianci and Velazquez, 2010). The CRC requires governments not to discriminate against any children, but rather to ensure that all their rights; (political, social, cultural, economic and survival of all children) are upheld. In addition, is also reaffirms that all children, either as individuals, members of part of a family and even community. Hence, they are entitled to all these rights and should therefore be seen as neither a favour nor a privilege (Svevo-Cianci and Velazquez, 2010).

Despite these global aspirations, child health and other indicators continue to fall short, especially in developing countries. This is reflected in elevated child mortality and morbidity and a failure to complete primary education (WHO, 2003 and UNESCO, 2010).

These gaps in child health outcomes between developed and developing countries are clearly signaled by differences in the rates of child injuries and deaths. For instance, in developed nations, the number of child injuries and injury deaths of children below the age of 15 years has steadily decreased (WHO, 2008). This contrasts markedly with relatively little attention to the issues of child injuries in low and middle income countries - despite, preliminary evidence that suggests child injuries indeed constitute a significant problem (WHO, 2008). Unfortunately, this lack of awareness, combined with numerous other developmental constraints has

discouraged efforts in child protection in developing countries. This is especially the case in underserved informal settlements (WHO, 2008).

As young children are particularly vulnerable in relation to environmental threats in informal settlements, their safety is significantly determined by the degree of proactive protection extended by care-givers (Olden & Guthrie, 2000). Such protective interventions are illustrative of local risk management strategies that avert “everyday” risk generated disasters at household and community scales (Pelling & Wisner, 2009).

By examining the character and degree of proactive child protective measures taken by care-givers in two African informal settlements and their determinants, this study sought to generate insights on factors that enable and discourage local human agency in risk reduction in underserved urban areas.

In this way, the research also sought to close the prevailing conceptual space between the epidemiology of child injuries and study of urban everyday risk. While child injury and illness constitute empirical measures of realized everyday risk, these two domains are currently conceptualized in parallel.

Moreover, insight drawn from the study intends to potentially inform practice that would simultaneously benefit child safety, as well as settlement-level interventions to reduce everyday risks.

1.4. Research Aim

Therefore, this research aimed to explore and examine the role of human agency in reducing and managing everyday risks in two African informal settlements through the lens of child injury prevention.

1.5. Research Objectives

With a particular focus on informal settlements in Ward 7, Epworth, Harare and Samora Machel, Cape Town, this research sought to:

1. Identify and characterise household and environmental threats that are hazardous to children between 0 and 6 years of age and associated vulnerability factors that increase their exposure to these threats.
2. Examine risk perceptions and protective strategies applied by mothers and caregivers to reduce and manage child exposure to recognised threats.
3. Identify the social and institutional determinants that shape mothers' and caregivers' risk perceptions of recognized threats and that enable or discourage risk averse action at the individual level.
4. Selectively integrate elements from the conceptual model for care giver decisions on injury prevention with Pelling's environmental vulnerability model to examine child injuries as an example of everyday, urban risk.
5. Compare the risk perceptions and preventive responses for mothers and caregivers in both sites through the application of the integrated model of child injury risk management.
6. Identify opportunities for strengthened urban risk management and reduction of childhood injuries in informal settlements through the application of an integrated approach.

1.6. Limitations of the study

The study and its findings were constrained by several important factors. First, although accurate information regarding the number of households, demographic and socio-economic characteristics of people living in Ward 7 in Epworth was unavailable. The Epworth Local Board made provisions of recent reports of prior research. This information provided valuable insights about the community which better enriched the primary data.

Moreover, the sample size in both informal settlements was too small to represent the entire population. Therefore, the findings of this study cannot be generalised for all the informal settlements in either Harare or Cape Town. Thus, these findings will only apply to the two specific study sites from this research.

It is also possible that the in-depth interviews conducted may have produced unreliable and inaccurate information. This could have been due to the respondent bias as those interviewed modified their answers, making them more acceptable to the researcher. Such biased responses may have been increased further due to the audio recording of the interviews. This research risk was minimized through triangulation processes in which information on child protection was sought from key informants interviews and other secondary sources.

In addition, the researcher acknowledges the possibility of a loss of valuable information through the translation processes involved. Specifically, this refers to the translation of questions and responses from Shona to English in Ward 7, Epworth and isiXhosa to English in Samora Machel. These translation risks were minimized in Epworth, due to the researcher's first language being Shona, and in Samora Machel, through the assistance of research assistants who were highly fluent in English and isiXhosa.

The sampling method applied in each study site was not entirely systematic. This was because the community leaders who were familiar with the settlements in each of the two sites generated the lists as there was not a formal list available. Therefore, both lists were not systematically generated in a uniform way (not an alphabetic list of street household numbers).

Furthermore, this research experienced a reporting and recording bias in the case of Ward 7 Epworth. This is because it was not possible to compare the risk perceptions against recorded admissions data. Unfortunately a database with comparable detail to the Red Cross Children's Hospital does not exist in Harare. The situation was further exacerbated due to the inaccessibility of community health facilities as well as the Harare Children's Hospital.

1.7. Ethical Considerations

The sensitive character of this study which examined the protective roles of mothers and caregivers necessitated careful attention to field research ethics. Prior to conducting field research, approval for the study was sought from the Ethics in Research Committee in the Faculty of Science. This was followed by the submission of letters requesting permission for the study to the two Ward Councilors in the settlements concerned.

Moreover, the researcher gave particular attention to the voluntary nature of the research in both sites. She accomplished this with the assistance of community leaders who met with the mothers and caregivers prior to the study to explain its scope and nature. During the interview process itself, the researcher was careful not to place pressure on respondents to answer questions that they found uncomfortable. She also gave clear assurances of confidentiality. In advance of each interview, the researcher specifically requested permission to digitally record the interview.

In order to ensure accountability and transparency in the two research sites, the researcher has also confirmed with the Ward Councilors in both sites that she will send a copy of the report back to the communities.

1.8. Organisation of the Thesis

This thesis is organised into six chapters, beginning with an overview of the study, along with its aims and objectives, ethical considerations and limitations. Chapter two provides a literature review, focussing on key themes central to this research as well as the conceptual framework to guide the study. The research context is outlined in chapter three. Chapter four presents the research methodology, including the collection and compilation of data derived from both secondary and primary field research. In chapter five, the research findings are presented as well as their examination through the integration and application of two main conceptual frameworks. Chapter six concludes by discussing findings through the respective lenses of urban everyday risk and child injuries.

1.9. Summary

This chapter introduced the study. It provided an overview of current global trends in urbanisation, including the growth of informal settlements. These are currently home to more than half the world's urban population and are characterised by high levels of everyday risks, including child injuries. The chapter outlined the research aim and objectives. Specifically this profiled the study's focus on investigating the role of human agency in reducing and managing everyday risks in African informal settlements through the lens of child illnesses and injury prevention. The chapter continued by describing several important limitations to the research, including difficulties in accessing accurate secondary information on households in Ward 7 in Epworth, reliability of primary research and the loss of valuable information due to translation. It concluded by outlining the overall organisation of the thesis.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

The growth of informal settlements due to rapid urbanisation, has led to increased concern about everyday urban risks. In informal settlements, everyday risks can also be reflected in child injuries and illness. Therefore, it is important to examine several key cross cutting themes. This literature spans two main domains; urban risk literature primarily derived from the disaster risk studies and the child injuries domain informed by child epidemiology literature. The chapter explores the evolution of disaster risk perspectives and the conceptual frameworks that underpin it. Moreover, vulnerability is examined, with a particular focus on Pellings's model. Also, child injuries are conceptualised in terms of mothers and caregivers' risk perceptions and the subsequent prevention strategies adopted.

2.2. Urbanisation and informal settlements

Evidence suggests that since 2007, more than half the population has been living in cities and towns, a figure expected to increase to 70% by 2050 (WHO, 2010, Un-Habitat, 2010, UNISDR, 2010). This rapid growth has been further compounded by the inability of local authorities to meet housing and basic service delivery needs of people in urban areas, resulting in the development of informal settlements (WHO, 2010 Un-Habitat, 2010, UNISDR, 2010). While one billion people worldwide currently live in informal settlements, this figure is projected to rise to approximately 2 billion by 2030 (Davies, 2007 & Satterthwaite, 2011).

Such challenges are particularly evident in Africa, which has been experiencing rapid urbanisation of about 6% per annum, twice that of Latin America and East Asia (Sanderson, 2000; Matobvu, 2002; Pelling and Wisner, 2009 and UN, 2010). This is due to several reasons including population growth within cities and towns. Pelling and Wisner (2009) also argue that this is attributed to hardships caused by factors such as civil war and economic pressures posed by globalisation. In Africa, this has led to significant expansion

of informal settlements around the urban “cores” established during Africa’s colonial history. Pelling and Wisner (2009) also note that these settlements are highly diverse, sometimes taking the *“shape of formalized and serviced working class neighborhoods”*, while others *“enjoy little and sometimes no centrally provided infrastructure such as paved roads, drainage sewerage, solid waste collection or piped water”* (ibid: 19).

The sheer scale of such settlement patterns in Africa is underlined by the United Nations Environment Programmes’ estimation that in 2007, 72% of Africa’s urban population resided ‘under slum conditions’, compared with 56% in South Asia. The diversity of informal settlement types also creates challenges in precisely defining their attributes. For instance, Huchzermeyer and Karam (2006:3) have defined informal settlements as *“settlements of the urban poor developed through unauthorized occupation of land”*. Pelling and Wisner (2009:19) also explain that such diversity can be interpreted differently, depending on a settlement’s respective physical, legal, demographic or functional perspectives. Based specifically on legal and functional attributes, they propose three kinds of settlements:

- 1) “squatter settlements on public or private land;
- 2) illegal commercial suburban land subdivisions on private or customary land;
- 3) overcrowded, dilapidated buildings in city centres or densely urbanised areas”

This classification is also consistent with the definition proposed by the United Nations Human Settlements Program (UN-Habitat, 2006) which views informal settlements as either being:

- 1) “residential areas where a group of housing units has been constructed on land to which the occupants have no legal claim, or which they occupy illegally, or,
- 2) “unplanned settlements and areas where housing is not in compliance with current planning regulations (unauthorized housing)”

Specifically, Un-Habitat (2006) views a *“slum household”* as one that *“lacks one or more of the following: durable housing, sufficient living area, access to improved water, access to sanitation and or secure tenure”*. Compromised access to these basic services not only

induces hardships, but also increases a wide range of environmentally and behaviourally-induced risks.

2.3. Urban risk and everyday risks

The management and reduction of urban risks poses new challenges for Africa. For instance, urban risks represent a broad continuum, ranging from catastrophic hazards to everyday hazards (Pelling and Wisner, 2009). In addition, globally, disaster risk specialists have in the past focused more on large scale disasters risks, associated with low probability, high magnitude risks such as earthquakes and destructive storms, paying very little attention to everyday risks (Bull-Kamanga et al., 2003, Satterthwaite, 2011). Past risk communication efforts have primarily been devoted to large disaster events such as earthquakes, tsunamis, volcanic eruptions and coastal storms which occur infrequently and yet lead to injuries and deaths of large numbers of people (Bull-Kamanga et al., 2003, Pelling and Wisner, 2009). Unsurprisingly, these large scale disasters receive the greatest media coverage (such as the 2011 Miyagi earthquake in Japan).

Despite public perceptions on spectacular disaster occurrence, there is increasing evidence that recurrent 'everyday' disasters cause the greatest threat. Everyday risks range from public health hazards, transportation accidents and threats to pedestrians, to social violence (Pelling and Wisner, 2009). However, while everyday risks cumulatively injure and kill more people than large events, evidence suggests shortcomings in appropriate mitigation strategies and mechanisms to reduce their effects (Bull-Kamanga et al., 2003). In addition, as social and economic costs of such risks are diffused across the families of those affected, they result in minimal demands on city administrations (Pelling and Wisner, 2009).

In developed countries, it is less likely that infants or children die of infectious diseases and injuries (Bull-Kamanga et al., 2003). In such countries, the death of a child due to diarrhoea is regarded as an unusual and unacceptable event (Bull-Kamanga et al., 2003). However, in a less developing country, particularly urban cities in Africa, there are high infant and child mortality rates attributed to everyday hazards (Bull-Kamanga et al., 2003). It is common

for about two children below the age of 5 years in ten to die of diarrhoea and household accidents (Bull-Kamanga et al., 2003). This juxtaposition of prevailing views on urban risk, which incorporates the extremes of earthquake-triggered catastrophic loss and communicable disease-related child mortality highlights the differences between 'intensive' and 'extensive' urban risk.

According to the UNISDR (2009) intensive risk applies to those risks which are *“associated with the exposure of large concentrations of people and economic activities to intense hazard events, which can lead to potentially catastrophic disaster impacts involving high mortality and asset loss”*

It contrasts with extensive risk, defined as *“mainly being a characteristic of rural areas and urban margins where communities are exposed to, and vulnerable to, recurring localized floods, landslides storms or drought. Extensive risk is often associated with poverty, urbanization and environmental degradation”* UNISDR (2009), which is the primary focus of this research.

While global approaches to disaster risk (such as the Hyogo Framework for Action) acknowledge the role of national and local government in reducing both intensive and extensive risks, some authors place complementary emphasis on community mobilization (UNISDR, 2005). For instance, Satterthwaite (2011) argues that past approaches which promote the role of local government in reducing, eliminating or managing extensive risks have had uneven results. He explains that shortfalls in political will, along with capacity constraints within local authorities can lead to service delivery failures that have significant consequences for urban health and safety. In this context, he argues that community mobilization to manage local risks is better informed, more effective and encourages local government to assume a supportive role, simultaneously decentralizing responsibilities for risk management (Satterthwaite, 2011).

2.4. Environmental hazards: evolving perspectives

2.4.1 Changing perspectives – from engineering to complexity

Increasing recognition on the importance of community engagement in urban risk reduction reflects a growing understanding that ‘disasters’ are significantly driven by human factors (Wisner et al., 2004:11). This is evidenced by major shifts in thinking about disaster causation that have moved from a primary focus on natural and other ‘hazards’ to an emphasis on social vulnerability reduction (Wisner et al., 2004:11).

Smith and Petley (2009) trace this transition in thought, identifying four distinct stages which they attribute to *engineering, behavioural, developmental and complexity* (ibid: 4). The ‘engineering’ approach is associated with the pre-1950 period in which the primary focus was magnitude and frequency of hazards. These physical hazards, which led to destruction and loss of life were viewed ‘as Acts of God’ (ibid: 4). Therefore, the ‘engineering’ paradigm argued that controlling the hazards through engineering interventions could prevent disasters. Such interventions included designing buildings that could withstand hazards like earthquakes and dam construction (ibid: 4). Gilbert White first introduced the emergence of the ‘behavioural’ paradigm between 1950 and 1970. He argued that disasters were highly associated with society. The occurrence of disaster events were viewed as results of decisions made by people about where they chose to settle and develop, for instance, occupying a hazard-prone area (ibid).

There were continued concerns about disasters being a less natural event or product of a hazard, but rather a consequence of socio-economic, political and historical processes. This led to the emergence of a ‘development’ paradigm between 1970 and 1990. Authors such as Wisner et al., (2004) argued that different societies created different conditions in which they faced hazards. As a result, vulnerability became unevenly distributed, in which marginalised people suffered the most. These differences are attributed to the access of both power and resources within society (Wisner et al., 2004:50). Furthermore, they contended that by addressing poverty, vulnerability to hazards could be reduced (Wisner et al., 2004:56). In the 1990s, a more holistic approach known as the ‘complexity’

paradigm emerged. It emphasised a complicated mutual relationship between nature and society. Hence, the focus shifted away from emergency preparedness and response towards mitigation and recovery strategies (Smith & Petley, 2009:9).

2.4.2. Risk and the key role of vulnerability

The central features of this evolution in thought concern the contribution that human vulnerability particularly makes to accumulating risk processes. It also reflects the challenges in managing the numerous and interlinked risk factors that drive loss. For instance, Pelling (2003:47) argues that early approaches have overlooked social, economic and political factors that are important causes of vulnerability and in turn cause the loss of life and well as the destruction of property.

The emergence of the importance of vulnerability profiled a central theme in the disaster risk literature, profiling the internal conditions that increase susceptibility to loss (Pelling, 2003). Similarly, it underlined the disproportionate risks faced by poor and marginalized communities in disaster-prone areas (ibid). The focus on vulnerability, which emerged from the political ecology literature, generated several widely applied frameworks for investigating risks in poor areas (ibid).

The “pressure and release model”, first conceptualized by Blaikie et al. (1994) and further elaborated by Wisner et al. (2004), focused specifically on the progression of vulnerability in at-risk areas. In this conceptualisation, vulnerability could be traced back to ‘root causes’, located in the conditions of limited access to power and limited resources. Vulnerability progresses through two further stages, ‘dynamic pressures’ and ‘unsafe conditions’ resulting in highly unsafe households that bear the brunt of even modest hazard event (Wisner et al, 2004: 52).

Vulnerability as a central concept in understanding urban risks was further elaborated by Pelling (2003:47) who subsequently generated a framework for interrogating urban environmental vulnerability. The model, which is particularly applicable at settlement and

household scale, differentiates vulnerability into three components, 'exposure', 'resistance' and 'resilience' (Figure 1) (ibid: 47).

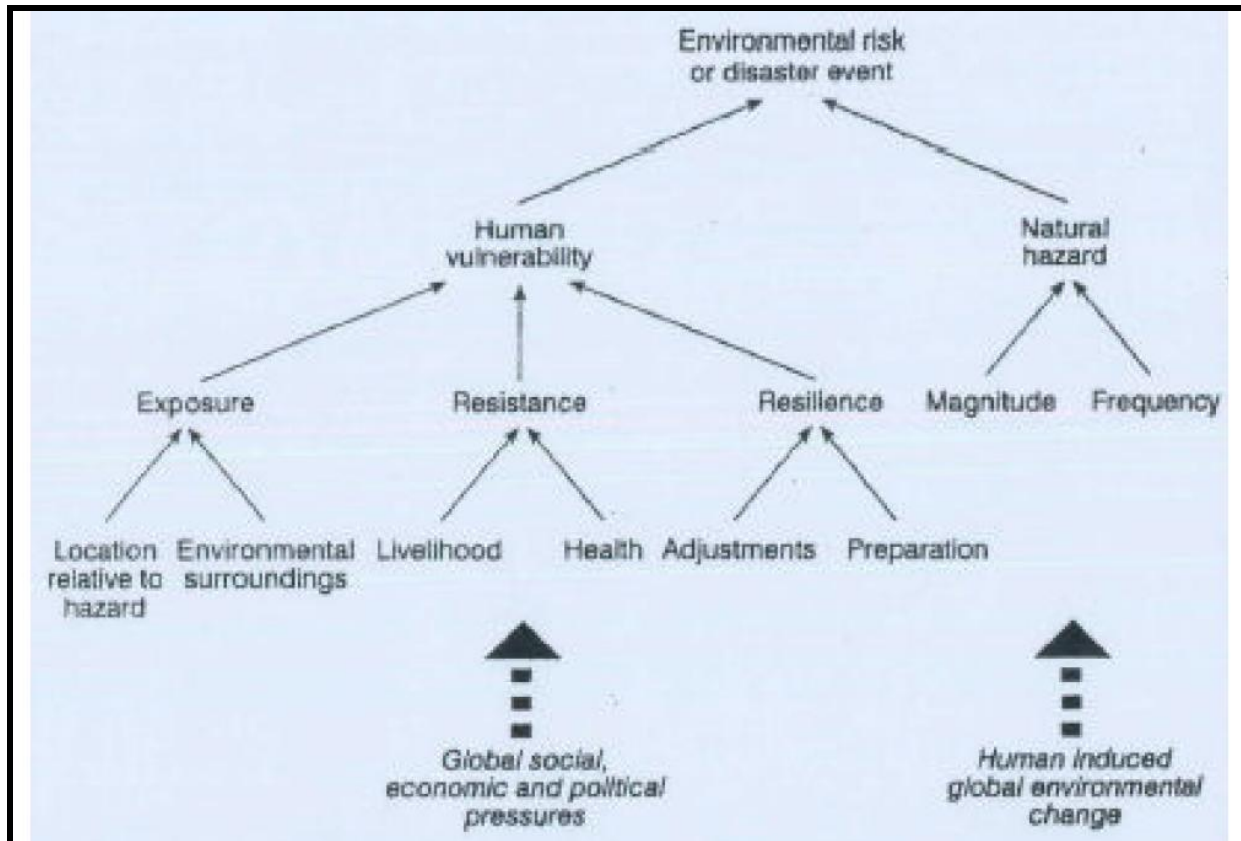


Figure 1: Environmental vulnerability model (Pelling, 2003)

Exposure is described as being the product of the physical location and the characteristics of the surrounding built and natural environment. In other words, it also refers to the population at risk and their relationship to the source of threat. The second element, resistance, refers to the capacity of the individual or population to withstand the impact of the hazard. Resilience means the ability of the individual or group to cope with or even adapt to the stress from the hazard (Pelling, 2003:48).

These three aspects indicate the human capacity to both respond to loss as well as the potential for experiencing loss (Pelling, 2003:48). Thus, a combination of high exposure to the risk, coupled with significantly low levels of resistance and poor resilience, consequently leads to one becoming more vulnerable to hazards (Pelling, 2003:48). Pelling

argues that the individual and or community's access to rights, resources, and assets shape all three components. In addition, these are affected by local and global political socio-economic structures within society (Pelling, 2003:49).

Pelling's model of environmental vulnerability is particularly relevant to our understanding of child injuries in poor urban neighbourhoods. For instance, van As and Naidoo (2006:4) note that *"informal settlements and townships in South Africa have historically been environmentally degraded, with inadequate infrastructure, overcrowding and limited recreational facilities"*. Consistent with Pelling's model, such factors increase vulnerability of children to unintentional injuries.

2.5. Global status of child injuries

It is internationally recognized that children comprise a significant proportion of those at-risk to disasters (UNISDR, 2011). Similarly, they are particularly susceptible to injuries that have long-life consequences (WHO, 2008).

Figure 2 shows the estimated global distribution of unintentional injuries per 100000 for children under the age of 20 years. It illustrates significant differences in the occurrence of unintentional injuries between developing and developed countries. Most of the childhood injuries are concentrated in less economically developed countries such as Africa and Asia. With specific respect to Africa, the report from which this map is derived profiles a high injury rate in Africa of 53 % (WHO, 2008). Those living in chronic poverty are reported as being most vulnerable. Moreover, this report highlights that most of these children live in rural areas or places faced with war and conflict (WHO, 2008).

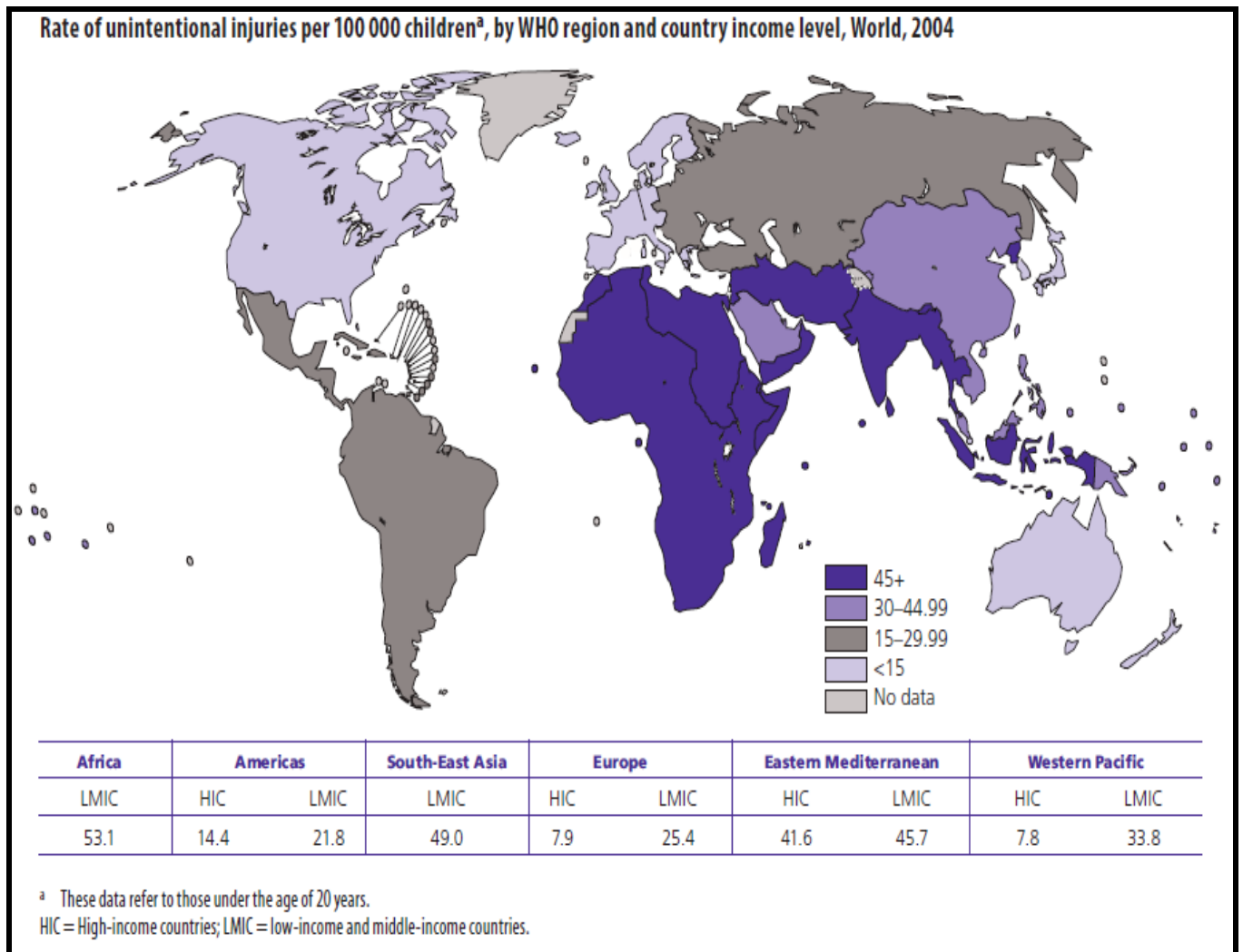


Figure 2: Rate of unintentional child injuries (WHO, 2008)

This data is consistent with that from South Africa, where deaths of children above 4 years is attributed to injury (van As & Naidoo, 2006:4).

2.6. Conceptualizing child injuries and injury prevention

2.6.1. Overview

The management of child injuries is increasingly viewed as a public health concern, differentiated from the fields of emergency medicine and amenable to prevention (van As & Naidoo, 2006:7). Moreover, the public health approach assumes that injuries do not occur randomly. This implies that they can be prevented (van As, & Naidoo, 2006:7).

2.6.2. Key definitions and public health approaches to child injuries

Investigating the domain of child injuries requires an understanding of several key terms. These include; injury, unintentional injury, intentional injury and injury prevention.

Van As and Naidoo (2006:6) define injury as,

“a bodily lesion at organic level resulting from acute exposure to energy (this energy can be mechanical, thermal, electrical, chemical or radiant) interacting with the body in amounts that exceed the threshold of physiological tolerance”

They further differentiate between ‘unintentional’ and ‘intentional’ injuries. The former refers to those types of injuries which occur as a result of an accident or mistake, thus was not initially intended to cause harm (falls, burns road traffic accidents, poisoning). On the other hand, the latter emphasizes a premeditated or purposeful act which results in injury to either oneself or others (van As & Naidoo, 2006). With particular respect to injury prevention, this maybe conceptualized as:

- 1) primary prevention (ways developed to stop the occurrence of an injury event),
- 2) secondary prevention (strategies aimed at reducing the harm following an injury event) and
- 3) tertiary prevention (treatment and rehabilitation of those injured and re-adapting perpetrators to society).

Moreover, ‘universal’ intervention aims to reach everyone in a population, compared with ‘selective’ intervention that aimed at those particularly at risk. ‘Indicated’ intervention targets those who have been victimised (van As & Naidoo, 2006:6).

The application of a public health approach to child injuries also requires an understanding of agent, host/child and environment relations. In the context of child injury studies, the agent is an object that causes direct injury. The interactions of these factors increase injury risk (van As & Naidoo, 2006).

Two explanatory frameworks that have usefully guided child injury prevention strategies are ecological model of childhood injury and the Haddon matrix. The ecological model of childhood injury was initially proposed by Urie Bronfenbrenner in 1979. This framework shows the different networks and institutions affecting the safety of an environment for children. These include family, social, schools and communities. Similarly, the Haddon matrix was first developed in 1970 by William Haddon. It was primarily developed for unintentional injuries, but has been widely used for any injury event. It also allows one to evaluate the importance of the various factors (child and parental, agent, physical and socio-cultural) and in turn intervene (van As & Naidoo, 2006).

2.6.3. Child injury prevention strategies

The extent of risk factors that increase the likelihood of child injuries calls for multifaceted approaches to prevention. These measures can also be classified as 'passive' and 'active' injury prevention strategies.

Passive strategies have been described as those prevention strategies which do not require an individual action. Examples of these injury prevention strategies include speed humps and child-proof packaging (Saluja et al., 2004 and Morrongiello & Schell, 2010). In contrast, active strategies have been described as those which require an individual action in order to prevent child injury, for example child supervision and removal of poisonous containers out of reach of children (Saluja et al., 2004 and Morrongiello & Schell, 2010).

Van As and Naidoo (2006:12) propose four primary strategies for reducing injuries. These are also known as the four 'Es' of injury prevention, they respectively focus on education, environmental modification engineering and enforcement.

2.7. Active injury prevention: the community's role

Both the ecological model for injury prevention and the Haddon matrix underline the key role played by social and community forces in reducing childhood injury occurrence.

The notion of shifting to a community approach in child injury prevention was pioneered and introduced in the United States in 1987 by the National Safe Kids and Safe Kids Worldwide Campaigns and the World Health Organization (WHO) Safe Communities initiative (Spinks et al., 2011). The documented success of 23% decrease in total population injury rate in Sweden in 1989 motivated other countries including Canada and Israel to follow suit. The ideology underpinning the campaign argued that injury prevention could be achieved through,

“integrated, collaborative efforts that are implemented in a supportive social, cultural, and political environment and that community members play the leading role” (Spinks et al., 2011:182)

Such successes from community mobilisation in child injury prevention illustrates the values that community norms make in shaping the way individual families perceive their safety (Daro & Dodge, 2009). These observations are also consistent with research that shows how the quality of a community can support or hamper parenting approaches as well as facilitate or discourage social integration of families who reside there (ibid).

These conclusions are informed by research that investigated the maltreatment of children in two communities (Omaha and Nebraska) that shared similar characteristics, but which generated different child injury rates (ibid). Study results indicated that the community reporting the higher injury rate was characterised by less social integration, less positive neighboring and numerous everyday problems and stress (disorganization) in comparison to the other community (ibid). The community reporting lower child injury rates was characterised by shared values and collective actions to solve problems that benefited all.

Despite increasing awareness of the role of community interventions to reduce child injuries, some authors caution against applying generic ‘one size fits all’ approaches. For instance, Klassen et al. (2000) emphasise that community-based intervention measures should be tailored to meet a specific community’s needs. Moreover, they discourage generic replication of injury prevention measures, arguing that each community has unique needs and characteristics (ibid). In addition, their research also revealed that education (human

capital) is an important element. Most often, an improvement in education is believed to automatically lead to the change in behavior. However, they also argue that other factors such as improved skills, changes in the social norms, supportive environment and reinforcement will promote behavior change (ibid).

2.8. Active injury prevention: caregiver's role, supervision and risk perception

2.8.1. The protective role of supervision

In addition to the role communities play in averting childhood injuries, parents and caregivers are at the forefront of active injury prevention. Child supervision specifically constitutes an important strategy in childhood injury. Inadequate child supervision is often reported as contributing to child injuries (Saluja et al., 2004). In addition, epidemiological data have shown that most child injuries occur in and around the home environment, while children are supposedly being actively supervised (Saluja et al., 2004; van As & Naidoo, 2006).

Supervision behavior has been characterised into three main dimensions, specifically; proximity, attention and continuity. Proximity refers to how close the mother or caregiver is to the child (either within or beyond reach) touching or interaction with the child (WHO, 2008 and Saluja et al., 2004). Attention often refers to watching and listening to the child. The third dimension, continuity, refers to how often the mother or caregiver carries on this behaviour. This can be constant, intermittent or not at all (WHO, 2008; Saluja et al., 2004).

However, supervisory strategies that are adopted to prevent child injuries are also informed by caregiver's perception of risk. These, in turn are rooted in social context and influenced by familial, environmental and personal distinctiveness (Saluja et al., 2004).

2.8.2. Caregiver's risk perceptions

Numerous authors on child injury prevention emphasise that supervision is shaped by perceptions of risk (Saluja et al., 2004 Morrongiello & Schell, 2010). Figure 2 below illustrates that the perception of risk and the subsequent practices of injury prevention

(passive or active) are influenced by the social context in which both the caregiver and child exists in (Saluja et al., 2004).

According to Figure 3, there are three main determinants of risk perception. Firstly, the caregiver's characteristics include aspects such as their knowledge and attitude as well as previous experiences. These characteristics help inform how the caregiver is able to foresee the risk. Secondly, the characteristics of the child play a key role. These include the child's gender, age as well as activity level. The older the child gets, the more active and exploratory they become increasing their vulnerability to injury. Lastly, the environmental characteristics include the presence of the hazard or risk. These three pillars inform the caregiver's protective strategy measures for the child (Saluja et al., 2004).

Essentially, the caregiver's perception of risk and his/her use of environmental protective strategies (either passive or active) influence each other. Saluja et al. (2004) purports that the "more risky" a caregiver perceives a situation to be; the more likely he/she will incorporate protective strategies (Saluja et al., 2004). He further argues that, if protective measures or strategies are in place, the caregiver might view the environment as "safe" and hence the level of supervision might be reduced.

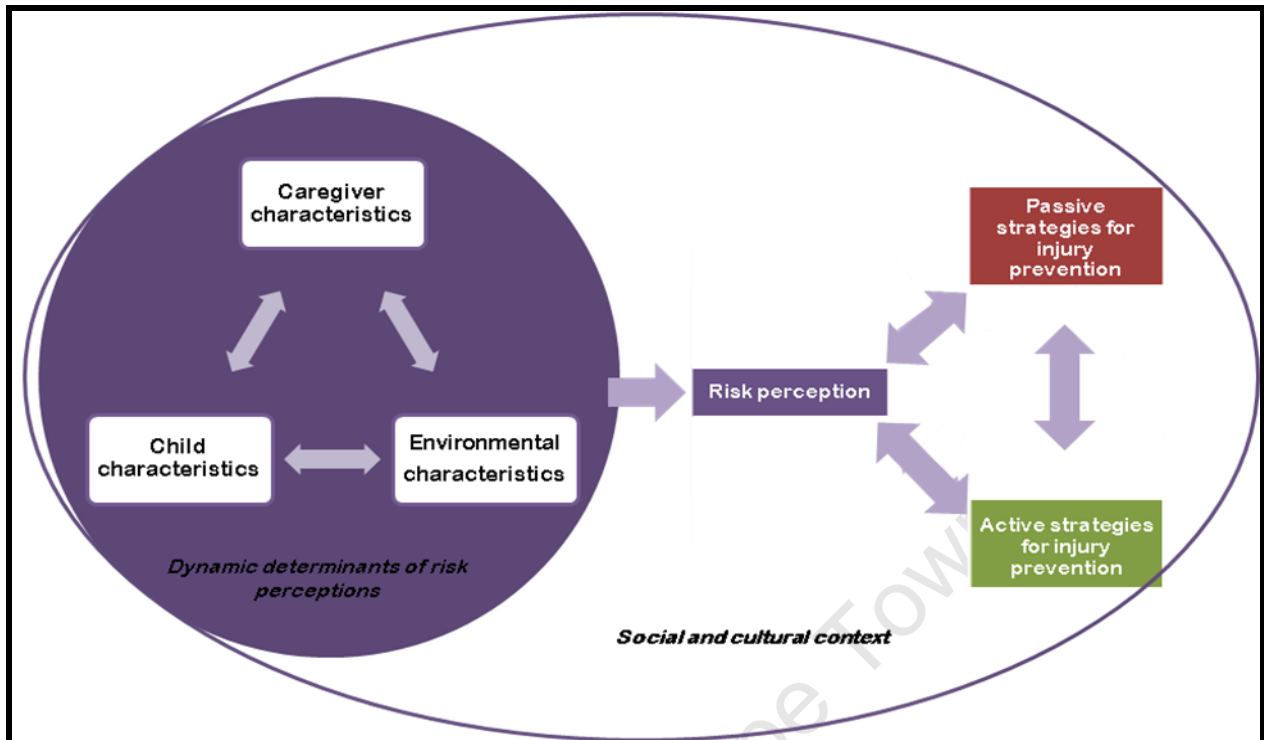


Figure 3: Conceptual framework of caregiver risk perception (Saluja et al., 2004)

2.9. Child injury as risk: converging perspectives and conceptual framework

This focus on child injury provides a valuable lens for examining patterns in extensive risk as well as opportunities for strengthening efforts in injury prevention. It also illustrates useful convergences in approaches from the disaster risk and child injury prevention literature. For instance, both domains have developed similarly, but in parallel from an original focus on reactive interventions to proactive risk avoidance (Wisner et al., 2004, Pelling, 2003, Smith & Petley, 2004). In addition, they both acknowledge that realised risk outcomes (disaster events and child injuries) result from complex interactions involving the environment (built or natural) as well as human factors, in relation to exposure to potentially damaging agent or threats (Pelling, 2003, van As & Naidoo, 2006).

Due to these similarities, the conceptual framework that was used in this study combined relevant elements of both Pelling's environmental vulnerability model (2003) and the caregivers' risk perception (Saluja et al., 2004) to draw benefits and strengths from both approaches. This integrated framework combines a focus on active and passive injury prevention strategies, with urban risk perspectives in terms of exposure and vulnerability.

This approach (Table 1), which seeks to examine the risk factors that increase child vulnerability to injury, differentiates between the exposure and vulnerability characteristics related to the hazardous agent and vulnerability exacerbating factors. It does not focus on perceptions of risk, but rather the reduction of risk. This allows specific risks of child injuries to be interrogated at different geographic scales (for instance, household and settlement levels).

Table 1: Integrated conceptual model for study

Risk categories	Vulnerability conditions	Injury co-risk factors	Injury prevention strategy	
			Active	Passive
Exposure	Location	Accessible kettle cords		
		Accessible stoves		
		Accessible candles and matches		
	Surroundings	Small size of rooms/houses		
		No separate cooking area		
Resistance	Vulnerability of child	High child mobility/no child restraint		
	Protective engagement by mother	Low level of attention by mother		
		Absence of additional adult		

2.10. Summary

Due to specific nature of the study, the chapter explored two main domains of literature, the disaster risk and the child injury. The evolution of perspectives and the conceptual frameworks underpinning disasters and vulnerability was also examined.

The chapter described the different public health approaches to child injury, prevention and protective strategies. Furthermore, the chapter discussed caregiver's perception of risk and how this ultimately influences the resulting protective strategies adopted. These can either be passive or active strategies. The chapter concluded by discussing convergences between the two bodies of literature and the integrated conceptual framework used for the study was presented.

CHAPTER 3

RESEARCH CONTEXT

3.1. Introduction

The study's focus on the everyday risk of child injuries in informal settlements in African cities was undertaken as a comparative study between two sites in two different countries. Therefore, this chapter is structured to provide comparative information at three spatial scales for both sites. It begins by providing an overview of recent urban growth in both Harare and Cape Town that generated the expansion of informal settlements. The chapter continues by describing the larger informal areas in which the two settlements are located. These are Epworth and Philippi, respectively located in Harare and Cape Town. This is followed by more detailed examination of the two specific study sites, Ward 7 (Epworth) and Samora Machel (Philippi). The chapter concludes by comparing the two sites.

3.2. Urbanization and urban risk in Africa – focus on Harare and Cape Town

3.2.1. Changing patterns of risk in Africa – overview

Africa is reported to be the fastest urbanising continent in the world due to the greatest influx of rural dwellers migrating to the-urban areas (Tibaijuka, 2005; UN, 2010). According to the UN-Habitat's "State of African Cities", by 2030, Africa will cease being primarily rural (Tibaijuka, 2005; UN, 2010). It further notes that the current annual growth rate of African urban areas is twice that of Latin America and Asia (UN, 2010). Such trends suggest that by 2050 African urban population will have risen to 60% (UN, 2010).

The context of this research is informed by changing patterns of risk in Africa reflected in the growth of urban centers and the growth of the informal economy. While Harare and Cape Town have distinct urban identities, they are both characterised by significant recent growth in their respective informal populations. As this study specifically focuses on the everyday urban risk of child injury, the recent expansion in informal settlements in both cities affords a valuable comparative opportunity.

Harare (Zimbabwe) and Cape Town (South Africa) illustrate such trends in urban change, accompanied by the expansion of informal settlements.

3.2.2. Harare, Zimbabwe- growing urban informal population

Zimbabwe, formerly known as Rhodesia, is a landlocked country, situated in south-central Africa, with an estimated population of 13 million (www.cia.gov) (Figure 4). Zimbabwe's capital, Harare, is home to approximately 2.3 million people (Brinkhoff, 2010).

Figure 4: Map of Zimbabwe



Source: www.travelnotes.org

Since the 1980s, and especially after attaining independence, Harare's population has grown rapidly. This attributed to multiple factors including ill-advised national development and planning policies. Focused attention to urban development in Zimbabwe evolved in the 1980s post-independence period. This led to skewed investment in basic urban services (safe water, sanitation, housing, education, health care and employment), resulting in escalated rural-urban migration (Sigauke, 2002).

Over a decade (1982-1990), the urban population in major cities in Zimbabwe grew from 23% to 32% (Sigauke, 2002; Tibaijuka, 2005; Chitekwe-Biti, 2009).

This rapid growth in urban population placed increasing demands on urban service delivery. In response, the government attempted to stimulate domestic and foreign investment through economic reforms implemented through Economic Structural Adjustment Programmes (ESAP). Unfortunately, the conditionalities that accompanied ESAP measures required that the government of Zimbabwe to devalue the currency, decontrol prices, remove subsidies, liberalise the labor market and reduce public expenditure (Sigauke, 2002). The unintended consequences of these austerity measures resulted in the closure of many companies, retrenchments and price rises in basic commodities. The unemployed and low income earners were most affected by these policies, leaving little option but to relocate in informal settlements on the urban periphery (Sigauke, 2002).

Additional burdens on the urban poor were unfolded as a result of the severe economic decline faced by the country in the 2000s. This was accompanied by significant shortages of fuel, food and other basic commodities (Roelf, 2009). This economic decline disproportionately borne by poor urban households combined by the growing informal settlements undermined the government's ability to provide services. Therefore in 2005, the government embarked on another ill-advised intervention or cleaning exercise, known as Operation Murambatsvina/Restore Order (Chitekwe-Biti, 2009).

This cleaning exercise had direct as well as indirect impacts. Direct impacts included about 700 000 people being left homeless, and indirect impacts included a further 2 million people whose livelihoods were gravely affected (Chitekwe-Biti, 2009). Those who were left homeless lived in peri-urban settlements, backyards shacks or unauthorised residential extensions and holding camps. Livelihoods of those affected included informally run business either at their homes or in the city centre (Chitekwe-Biti, 2009). Highly contested, the government justified these evictions as a need to clear illegality (operation clean-up, though the literal translation is 'getting rid of filth') and bringing sanity into the cities, so as to better improve the lives of its citizens (Chitekwe-Biti, 2009).

3.2.3. Cape Town, South Africa – rapid growth of informal settlements

Unlike Harare, Cape Town is located at the south-western tip of Africa (Figure 5), with a population of 3 million. However, similar to Harare, in the past two decades Cape Town has also experienced rapid expansion of informal settlements.

Figure 5: Map of South Africa



Source: www.travelnotes.org

Such growth has followed the repeal of the Group Areas Act and Pass Laws Act. Prior to 1994, black South Africans were legally obliged to live in underdeveloped and overcrowded homelands where the land was unproductive and there was no security of land tenure (Western, 1981, Humpries, 1989). However, following 1985 when influx laws were abolished it resulted in rapid increases in the rate of rural-urban migration. The urban sprawl in Cape Town has doubled by 40% over the period 1985-2005. Particularly in informal settlements, the number of inhabitants has increased from 23 000 families in 1993 to an estimated 109 000 families in 2007 (CoCT, 2009).

Eviction of illegal squatters is now impossible without a court order. In 1998, there was the repeal of the Prevention of Illegal Squatting Act of 1951 by the Prevention of Illegal

Evictions from Unlawful Occupation land Act (Section 19 of 1998). It therefore means that forceful eviction of households from an informal settlement without a court order can no longer occur. This new law aims to try and readdress past injustices of those previously disadvantaged poor people who are the main occupants of informal settlements through giving them the opportunity to express their right to occupation (Department of Human Settlement, 2010).

In 2004, the Department of Housing of South Africa put forward a target of housing for all those living in informal settlements by 2014. Notable progress occurred between the periods of 1994 to 2006 when approximately 1.8 million housing units were delivered (Huchzermeyer, 2006). In order to try and eliminate informal dwellings, the government has currently been working on an initiative called Breaking New Ground (BNG). This is a national housing initiative which aims at neither eradicating nor replacing informal dwellings, but rather seeks to improve shack dwellings by 2014. Essentially, the approach seeks to reduce informalisation through the provision of affordable good quality housing (Misselhorn, 2008; Cross, 2006).

3.2.4. Comparative urban risk context: Harare and Cape Town

Harare and Cape Town shared similar characteristics. For instance, both cities experienced rapid growth due to rural-urban migration. However, there are significant differences in terms of policies regarding the development of informal settlement in each site. For instance, in South Africa, there is an explicit commitment to the delivery of rudimentary services. There is also recognition that informal settlements need to be upgraded in-situ. In contrast, in Zimbabwe, these areas were demolished through Operation Murambatsvina.

Section 3.3 and 3.4 respectively introduce the two informal areas in Harare (Epworth) and Cape Town (Philippi) where the study sites are located. Detailed descriptive information on each study site, Ward 7 (Epworth) and Samora Machel (Philippi) concludes each area profile.

3.3. Introducing Epworth and study site- Ward 7

3.3.1. Epworth - location and topography

Epworth is recognised as Zimbabwe's largest and most populous informal settlement (Chirisa, 2011). Located in south-eastern Harare, Epworth is approximately 15 kilometers away from Harare's city centre (Chirisa, 2011, www.sdinet.org). This makes it easily accessible from the Central Business District (CBD) as well as the industrial sites of Msasa and Ruwa, which are potential employment areas (Chirisa, 2011). This area lies between 1 500 – 1 600 metres in altitude, covering an area estimated at 3 600 hectares (Chirisa, 2011).

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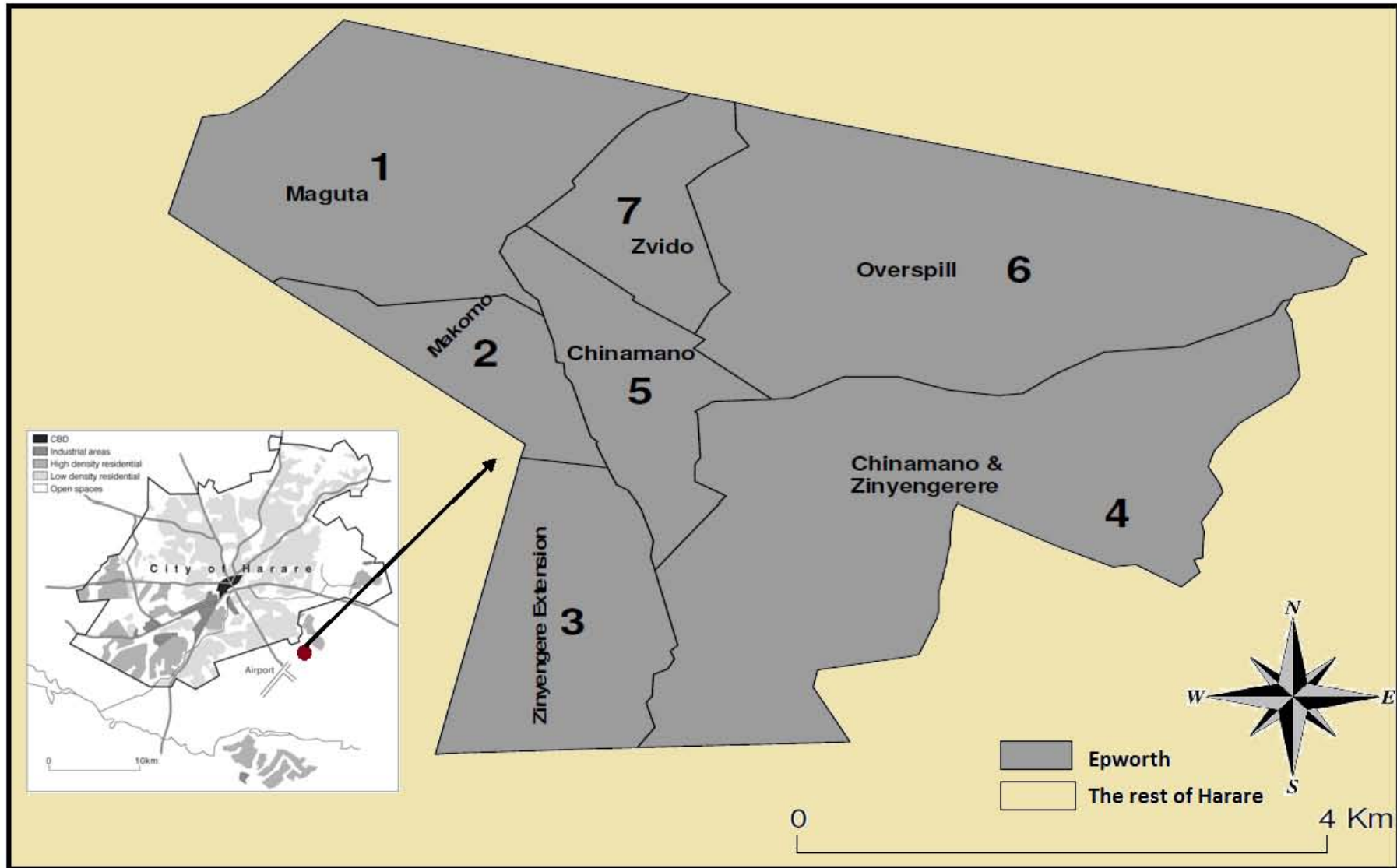


Figure 6: Map of Epworth and the different Wards (Chirisa, 2011 & Zinyama, 1993)

3.3.2. History and socio-demographic profile

Epworth was initially established as a small Christian village set up by Reverend Shimmin of the Methodist Church in 1892, but has since grown to a huge urban residential area (CSO Zimbabwe, 2009; Chirisa, 2011, www.sdinet.org). The Methodist church acquired three farms during the colonial period and developed it as a church mission consisting of two main villages, Chiremba (Maguta-Makomo) and Chizungu (Chinamano-Zinyengere) (Chirisa, 2011, www.sdinet.org).

Even then, Epworth was viewed as an 'African' township (Kay & Smout, 1977). However, residents of the area were primarily involved in agricultural activities until the 1960s and early 1970s. Following the opening up of the land for development, there was an influx of refugees fleeing war from the rural areas. Due to the increasing numbers of people, and the subsequent small plots granted to the newcomers, the area gradually expanded into a residential area, accommodating those people who were working in the centre of Harare. Epworth is one of the few residential areas in Zimbabwe that was permitted by government to develop as an informal settlement and later regularised into a recognised suburb of the city (Zinyama et al., 1993, www.sdinet.org).

Following national independence in 1980, the area expanded rapidly as people moved from the more expensive middle and high density areas in other parts of the city and inhabited this area because both the rent and the rates were comparably cheaper. Ownership of the area was passed onto the local government around 1986 by the Methodist Church who in turn appointed a Local Board (Epworth Local Board) to oversee the development of the area and spearhead its integration with the rest of Harare (Rakodi, 1995, www.sdinet.org).

The population repeatedly grew by over 500% from 20 000 people from 1980 to 123 250 in 2002. It is estimated that the present population is 500 000 people, of whom approximately 80% live in the informal areas of Epworth (CSO Zimbabwe, 2009 and Chenga, 2010, www.sdinet.org). Also, approximately 90% of the population in Epworth is currently unemployed (CSO, 2009). Other residents reportedly earn a livelihood mainly through vending or informal trading and some are even housewives (Murinda &

Kraemer, 2008). The majority of the residents in the Epworth community are Shona speaking (Chirisa, 2011).

3.3.3. Service provision, disaster risk and child health profile

Service provision, in the form of water and electricity in this area still remains rudimentary. As Epworth grew as an informal settlement, it lacked basic services such as water, electricity and even proper road networks. Although local health services are provided by two clinics, residents must travel long distances in order to access these (Epworth Local Board, 2009, www.sdinet.org).

Water sources are either open (unprotected) or protected (self-dug shallow wells) (Murinda & Kraemer, 2008). This is because piped water supply into the area is severely dysfunctional (Brinkhoff, 2010). Untreated water supplies have been associated with cases of diarrhoea (Murinda & Kraemer, 2008). As well as the 2009 cholera outbreak in which Epworth was highly affected (Sebit et al, 2003, Brinkhoff, 2010, Chirisa, 2011, www.irinnews.org). The most common types of toilets in Epworth are pit latrines and Blair toilets (these are ventilated and improved pit latrines) (Brinkhoff, 2010).

Informal settlements are reportedly faced by a variety of health hazards, such as, overcrowding, poverty and criminal activities. Epworth settlement is no such exception, having been labeled as a 'breeding ground for criminals' (Chirisa, 2011). Also, most of Harare's street children are reportedly from Epworth (www.irinnews.org), due to poverty and the loss of parents to HIV/AIDS (www.irinnews.org).

Furthermore, flooding is also noted as a significant problem in Epworth (Brinkhoff, 2010).

3.3.4. Focus on Ward 7

Epworth comprises seven wards, six of which are considered 'formal'. Ward 1 and 4 are predominately occupied by the first settlers of the area, referred to as the 'originals',

though current inhabitants might not necessarily be the original settlers, but are usually the second or third generation who inherited it.

The last ward (Ward 7), which was the focus of this study is still regarded 'informal', although there are plans to regularise it (Figure 6). Ward 7 consists of five areas; Mugabe, Zvidozvevanhu, Tongogara, Jacha and Nyikavanhu (Epworth Local Board, 2009 and Zinyama *et al.*, 1993) and has an estimated population of about 35 000 people (6000 households). The first occupants in Ward 7 report to have settled in the area in 1990 (Epworth Local Board, 2011). This pattern of settlement has been described as haphazard as people settled wherever they desired with no need to seek permission from authorities (Chirisa, 2011).

Similarly to the rest of the Epworth settlement, Ward 7 has limited access to basic services. They use pit latrines without wooden doors and wells (Epworth Local Board, 2011). Houses in Ward 7 Epworth are made from brick and they are usually two rooms, with a separate cooking area.

3.4. Introducing Philippi and study site - Samora Machel

3.4.1. Philippi - location and topography

Philippi is considered as being one of the largest informal settlements in the City of Cape Town (Adlard, 2008; Anderson *et al.*, 2009). It is located on the low-lying area of the Cape Flats and is bordered along Lansdowne Road, Duinefontein Road, Vanguard Road and the R300 at the outskirts of the city (Adlard, 2008).

This area consists of flat and sandy area with an elevation of about 30 meters above sea level (Adelanaand & Jovanovic, 2006). Furthermore, the area is poorly drained and therefore is at high risk of recurrent and frequent rising flooding during the winter period (Holloway & Roomaney, 2008; Ziervogel & Smit, 2009). The waterlogging condition which is experienced within the Cape Flats is attributed to the high water table of this area (Ziervogel & Smit, 2009).

3.4.2. History and socio-demographic profile

Originally, the area known as Philippi today was first inhabited in 1833 by Dutch and German settlers who chose to settle close to a local chapel (Adlard, 2008). Initially, the land was mainly used for grazing until the 1970s when the first informal dwellings emerged in Philippi as a result of occupants from Brown's Farm where relocated (Adlard, 2008).

Since the abolition of the influx control laws in 1985, Philippi experienced a period of rapid expansion (Zweig, 2010). Although the majority of residents in Philippi are isiXhosa speakers who migrated from the Eastern Cape, some migrated from nearby long-existing Cape townships in search for better employment opportunities, administrative services and the improved accessibility to state welfare grants (CoCT, 2005, Zweig, 2010). The population of Philippi almost doubled from 56 659 in 1996 to 110 316 in 2001 resulting in demands on existing public resources, infrastructure and services (University of Stellenbosch, 2005; Zweig, 2010).

Philippi, as other South African informal settlements has experienced numerous social problems argued to be rooted in the apartheid system (Anderson et al., 2009). These include high levels of HIV/AIDS, violent crime, substance abuse, environmental degradation and low education levels (Anderson et al., 2009). Amongst adults, it is reported that 8.6% have no schooling, while 43.3% only have primary education and only 17% have Matric (Anderson et al., 2009). Thus, unemployment levels within this area have since risen from 15.1% in 1996 to 43.1% in 2006 (Anderson et al., 2009). Some earn their livelihood through the basic occupations such as the craft and trade sector (Anderson et al., 2009).

3.4.3. Service provision, disaster risk and child health profile

Service provision in Philippi is rudimentary. Residents have access to stand pipes and toilets which they all share as a community and access to 7 clinics (Zweig, 2010; Anderson et al., 2009). Other basic service shortcomings are electricity and formal housing (Adlard, 2008). For instance, 50% of the residents reportedly lack access to electricity (Anderson et al., 2009).

Moreover, recent urban migration has led to disruptions in the natural drainage patterns, thus increasing storm water run-off (Ziervogel & Smit, 2009). Other hazards that have been identified in the area include crime, fire as well as those related to environmental health (due to blocked drains) (Zweig, 2010).

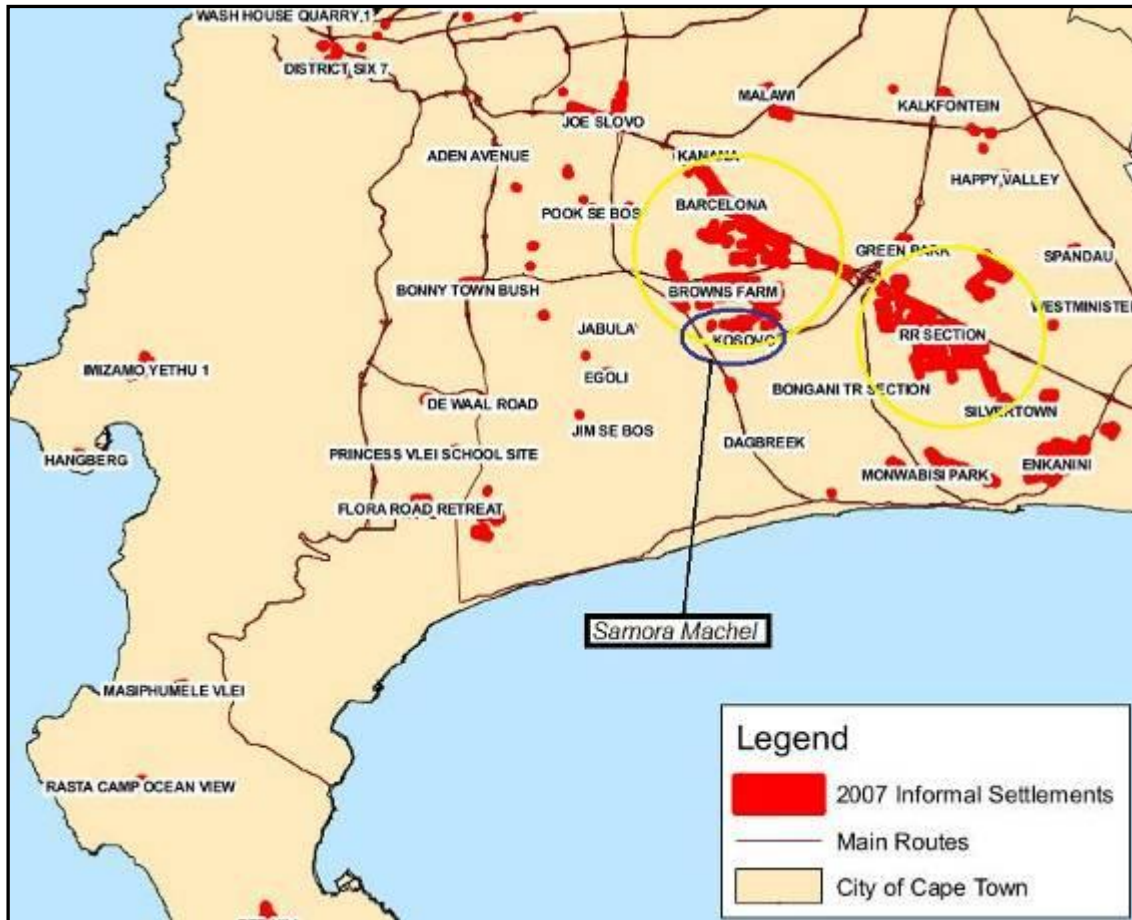
With particular respect to child injury occurrence, Childsafe (2010) reports falls to be the most prevalent injury followed by motor vehicle-related injuries (Figure 8)

3.4.4. Focus on Samora Machel

This study's research site, Samora Machel was first established between 1995 and 1998 (Zweig, 2010). It is bordered in the North by the Mitchell's Plain/Khayelitsha railway line and by Samora Machel Parkway to the east. Vanguard Drive forms the western boarder and the busy major route of the R300 runs along the southern side. Also, Samora Machel is conveniently located close to industrial areas, which also act as opportunities for formal employment. However, informal activities are the main source of livelihoods for most people (DAG, 2008).

The population increased rapidly in the ensuing ten years as shown in Pictures 1 and 2. Samora Machel, which is regarded as the informal area of Philippi, consists of seven areas located within it; Tsunami, New York, New Look, Thembisa, Siyanyazela, Faneza and Zola. The last survey conducted in 1995 reported that there were over 2000 dwellings in Samora Machel (DAG, 2008). This number has since increased as depicted in Figure 7 below. Residents have access to standpipes as well as the bucket system toilets (Anderson et al, 2009). Houses in Samora Machel are built from corrugated iron sheets and flammable materials such as cardboard and plastic.

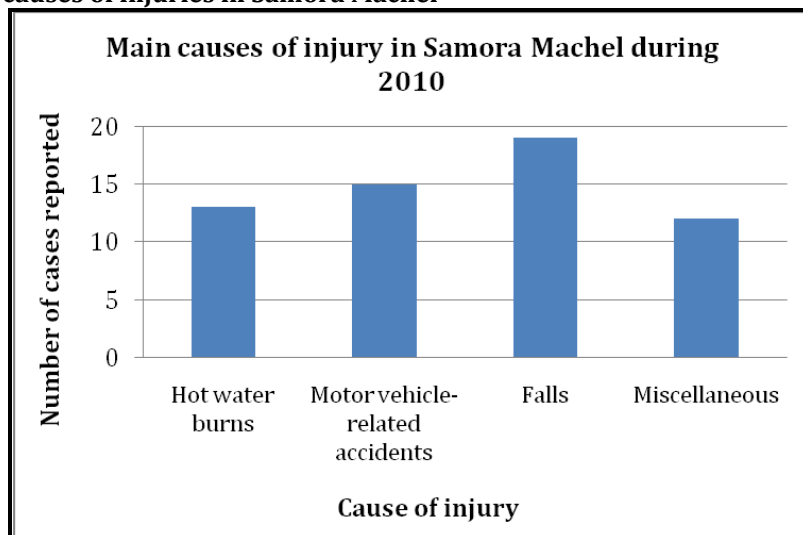
Figure 7: An overview of the layout of informal settlements in Cape Town



Source: Zweig, 2010

Samora Machel shares many of the risks that are reported in South African informal settlements. For instance, during 2010, Red Cross Children’s Hospital noted 59 cases of child injuries from this site. 19 these were due to falls, 15 from motor vehicle-related accidents and 13 from hot water burns (Figure 8).

Figure 8: Major causes of injuries in Samora Machel

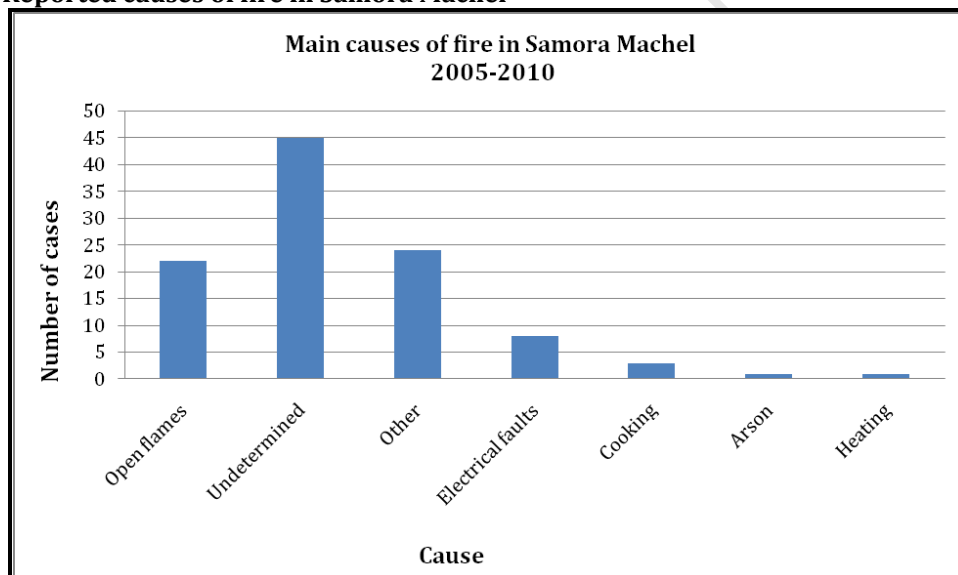


At settlement scale, Samora Machel also faces numerous risks indicated in Table 2 below. This catalogues informal fires and flood events responded to by the City of Cape Town Fire Services and the Disaster Risk Management Centre. This suggests a complex flood and fire risk profile.

Table 2: Flood and fire data for Samora Machel

Year	No. of fires reported	Occurrence of flooding
2005	18	No
2006	23	No
2007	23	Yes
2008	14	Yes
2009	13	Yes
2010	13	No
Total	104	3

Figure 9: Reported causes of fire in Samora Machel





Picture 1: Time series photograph of Samora Machel in 1998 (Zweig, 2010)



Picture 2: Time series photograph of Samora Machel in 2008 (Zweig, 2010)

3.5. Study sites compared

3.5.1. Overview

This overview of Epworth and Philippi illustrates many similar characteristics. Despite being in different locations, they also share the same characteristics. For instance, both settlements are spatially located within the same distance away from the city centre. Also, both settlements originated in the 19th century as mission stations and both have been characterised by recent rapid in-migration. Furthermore, both settlements show a combination of formally and informally planned developments. Also, there are of comparable population size between 200 000 and 400 000 people.

In this context, the selected study sites of Ward 7 and Samora Machel of Epworth and Philippi respectively also share similarities, but also represent important differences such as the level of rudimentary service provision in each study site. Also, there are differences in the housing. There are provided by the city at one site and not at the other. The housing materials and size are also different. The overarching policy environment for informal settlement development is completely juxtaposed. In one area there is an explicit commitment to upgrading and development of informal settlements in-situ, in another there was a recent brutal attempt to completely demolish them. However, the settlement risk profile is also comparable. Both similarities and differences between the sites are summarised in Table 3 below.

3.6. Summary

This chapter sought to provide clear description of the context of the study. It provided an overview of the changing patterns of urban risk in Africa, particularly focusing on the rapid growth of urban informal population in Harare and Cape Town located in Zimbabwe and South Africa respectively. In addition, the laws and policies that shaped the location of the current informal settlements in these cities were described. A particular focus was made on the selected study sites: Ward 7 of Epworth and Samora Machel of Philippi and each of these study sites are described in the table 2.

Table 3: Summary of research study sites

URBAN PROFILE	ZIMBABWE	SOUTH AFRICA
	Total population = 13 million	Total population = 44 million
METRO/CITY SCALE		
<ul style="list-style-type: none"> Name of city Total population % in informal settlements Previous informal settlement policies Current policies 	<p>Harare 2.3 million 10% ESAP 2005 Operation Murambatsvina (demolishing of informal structures)</p>	<p>Cape Town 3 million 33% 1950 Group Acts and Pass Laws Breaking New Ground (upgrading-in-situ)</p>
INFORMAL SETTLEMENT SCALE		
<ul style="list-style-type: none"> Name First settled Racial status Topography Current population Distance from city Health facilities 	<p>Epworth 1892 Africans only Gently undulating ground Over 400 000 people 15km 2 clinics</p>	<p>Philippi 1833 Africans only Low-lying area Over 200 000 18km 7 clinics</p>
STUDY SITE SCALE		
<ul style="list-style-type: none"> Name Current population Service provision Housing types Disaster risks 	<p>Ward 7 6 000 households Protected wells, pit latrines, Blair toilets Two-rooms made from bricks separate and cooking area Flooding, environmental hazards, crime</p>	<p>Samora Machel 2 000 households Standpipes, bucket system toilets One-room made from corrugated iron and flammable materials and no separate cooking area Rising floods, fire, environmental hazards, crime</p>

CHAPTER 4

METHODOLOGY

4.1. Introduction

This chapter describes the study methodology, which integrated both qualitative and quantitative approaches. The chapter begins with an overview of the methods that were used and discussed in the sequence. It continues by describing the secondary data sources consulted, as well as the preparatory work required for the primary field research methods applied in both Ward 7 of Epworth and Samora Machel informal settlements. This is followed by a description of the primary field research in study sites. The chapter concludes by outlining the steps taken in consolidating, analyzing and interpreting qualitative and quantitative data.

4.2. Overview of research methodology

As this study adopted a comparative case-study methodology on caregiver behaviour in two research sites, it involved a range of qualitative and quantitative research methods. The field research components specifically included the administration of household questionnaires, focus group discussions, key informant interviews and field observations in each site. Table 3 below summarizes the steps involved in the process.

Table 4: Different stages in the research process

No.	Stages	Purpose	Methods and procedures used	Data sources
1	Preparatory work: field research and data collection	Selection of research sites and securing permission for access	Consultation with key informants in Ward 7 and Samora Machel	Ward councilors in both sites
		Collection of relevant secondary data	Field work	<ul style="list-style-type: none"> - DiMP - Childsafe (Red Cross Childrens's Hospital) - Harare Children's Hospital.
		Preparation of data collection tools	<ul style="list-style-type: none"> - Household questionnaires: prepared and translated - Guideline of focus group and key informant questions prepared - Observation checklist prepared 	Informed by past studies
		Selection of research assistants and orientation	Selection was made in consultation with a key informant; and orientation was undertaken during pilot survey	Key informants
		Pilot testing of household questionnaire and modification	Interviewed 10 selected households	Residents in both Ward 7 and Samora Machel
		Selection of sample households	Systematic sampling method	Research assistants and councilor
		Selection of focus group participants	Consultation with key informants and councilor	Community members
		2	Primary data collection	Qualitative data collection
Quantitative data collection	Administration of 50 household questionnaires in two sites			Household residents
3	Data consolidation	Consolidation of qualitative data	Summary of notes and field observations	
		Consolidation of quantitative data	Use of MicroSoft Excel and Statistica	
4	Data analysis	Integration of quantitative and qualitative data	An integration of two different conceptual frameworks and research findings	

4.3. Review of secondary data sources

In order to gain insights and better understand the key themes, a review of available secondary data sources was undertaken. Sources are summarized in Table 4 below. These included a review of past Community Risk Assessments and past Disaster Risk theses. The researcher also sourced data on child injuries for both research sites.

Table 5: Secondary data sources and rationale for study

Data source	Type of document	Rationale for study
Disaster and Mitigation for Sustainable Livelihoods Programme (DiMP, Cape Town)	Community Risk Assessments Reports for Samora Machel	Provided detailed account of settlements and their everyday risks.
Epworth Local Board	Past research reports of the community	
Child Safe (Trauma Unit Red Cross Children's Hospital, Cape Town)	Child injury data	Identify and Analyse the causes of injuries in children
Harare Children's Hospital (Harare)	Database for child injury	
Newspapers	Newspaper articles	Gain further insights on disaster risk profiles of research sites
Disaster and Mitigation for Sustainable Livelihoods Programme (DiMP, Cape Town) and University of Cape Town Chancellor Oppenheimer Library	Theses	Provide guidelines for development of questionnaires

Spatial data and time series maps of Samora Machel were provided by Disaster and Mitigation for Sustainable Livelihoods Programme (DiMP). Furthermore, historical information and archival records for both sites was sourced from the University of Cape Town Chancellor Oppenheimer Library to provide insight on the historical development of Ward 7 and Samora Machel.

4.4. Preparation of tools for primary data collection

4.4.1. Overview

The research employed several complementary data collecting instruments. These included a household questionnaire, guidelines for focus group interviews, key informant interviews and field observations. The intent of the questionnaire was to gather data on risk perceptions and protective strategies applied by mothers and caregivers to reduce and manage child exposure to threats.

4.4.2. Household questionnaire

For the purpose of the household survey, a provisional questionnaire was prepared and developed in English. It was informed by survey questions that had been used in other studies and past theses as well as from an 'injury entry data sheet' from Childsafe (Appendix 2). As the study's focus was on caregiver behaviour, the questionnaire involved both closed and open ended questions that addressed the following thematic areas:

- Household demographic profile (age, marital status, number of household members, education, employment status of mother or caregiver)
- House (energy sources, access to water and sanitation,)
- Mother/caregiver profile (knowledge of child protection)
- Child profile and injury history (child injured/ill/admitted, cause of injury, where it occurred, what has improved in the area where it occurred)

The questionnaire was pilot tested in 10 randomly selected households in Samora Machel with the assistance of two research assistants. The questionnaire was then modified and some of the wording was adjusted to suit the specific local context. In addition to this, the final versions were translated into IsiXhosa for Samora Machel and Shona for Ward 7.

4.4.3. Guideline for focus group and key informant interviews

The research methodology also used focus group discussions as a source of qualitative data to complement information from the household survey. This aimed to add depth to the researcher's understanding of the mothers and caregivers' perception of risk in and around the home. In addition to this, the subsequent actions taken by the mothers or caregivers before risk become a realised risk outcome. To avoid overlooking important information, the researcher used checklist.

4.4.4. Field observation guideline

The researcher also developed a field observation checklist. These observations were to be undertaken during a transect walk. A transect walk is defined as a tool used to describe and locate the distribution of different features, resources, land use patterns as well as landscape along a particular transect (www.siteresources.worldbank.org).

4.5. Selection and orientation of research assistants

The household survey component of this study was undertaken with the support of three research assistants in each informal settlement. This was necessitated by a complex field research methodology involving administration of household questionnaires, focus group discussion and field observations.

In consultation with the ward concillor, a respected and knowledgeable community leader who could support the field research process was identified. This then enabled the identification of two additional assistants to support field research in each site. All field research assistants were aged between 28 and 35 years. The field work component was also supported by two women translators in each site. These were identified by DiMP (Samora Machel) and Epworth Local Board (Ward 7). Prior to field work, the researcher carried out a day long orientation with all research assistants and translators. This involved explanation of the rationale behind the

study, methods of data collection, interviewing techniques and clarity of terminologies.

4.6. Selection of research sites and sampling methods

Given the comparative nature of this study, it was necessary to apply uniform criteria both to selection of study sites and study households. This is outlined in the following section.

4.6.1. Rationale for selection of study sites

The rationale underpinning the selection of the two study sites, Ward 7 in Epworth in Harare and Samora Machel in Cape Town was drawn predominantly from their developmental similarities. Both sites were acknowledged to be 'informal' settlements, spatially located within a much larger formal settlement. Furthermore, both sites had comparable population size and socio-economic conditions. Once sites were identified, letters of permission were sent to the ward councillors.

4.6.2. Selection of study households: sampling methods

The study sought to identify 50 households with children between 0-6 years old in each site through the use of a systematic sampling method. This assumes the availability of elements to be selected (in this case, only households in each settlement with children between 0-6 years old). Consequently, every Kth element in the total list was chosen (systematically) for inclusion in a sample of 50 mothers (Babbie & Mouton, 2001).

The baseline list of households meeting these criteria was generated with assistance of community leaders. As they had lived in their respective settlements for many years, they could recall households who met the criteria. The leaders also consulted with the other assistants until a complete list was generated. In order to have a comparable sample size, 50 households were selected systematically from the list.

Table 5 shows the intervals for selecting the households in each site. The households were approached directly by the researcher to participate.

Table 6: Formula for sample selection

	Ward 7, Epworth	Samora Machel
Mothers/caregivers	150	250
Determining Kth household	$150/50$ =3	$250/50$ =5

4.7. Primary Data Collection

4.7.1. Overview of field research process: community entry and positionality

Primary data collection spanned 3 months. The field research for Ward 7 was conducted in 21 days from the 19th of December 2010 to the 11th of January 2011. However, the field research for Samora Machel took 62 days from the 15th of January to the 18th of March 2011. This was a longer process as the need to reschedule meetings with respondents regularly, due to non-attendance.

Moorlag (2008) has argued that the processes which researchers undertake to gain entry into communities can significantly influence the robustness of the subsequent research. This study recognized the importance of careful and respectful access to the two research sites, particularly around the issues that were sensitive. In this case, entry into Samora Machel was facilitated through two mechanisms. Access was enabled by the ward councillors, who introduced the researcher to the community leader. Community entry was also facilitated through the assistance of Childsafe, a non-governmental organisation situated at the Red Cross Children's Memorial Hospital in Cape Town. A similar process was undertaken in Zimbabwe, beginning with the researcher contacting the Epworth Local Board. The Board then introduced the researcher to the ward councillors, who in turn provided a community leader to assist with the field research process.

4.7.2. Researcher's positionality

Part of the research process is the critical reflection of the researcher's positionality and how this was negotiated and effectively managed.

In undertaking qualitative research, human geographers have argued that researchers acknowledge their own positionality through a process known as reflexivity (Rose, 1997; Hopkins, 2007). Examining the researcher's positionality is not only part of the qualitative research process, but is also an important ethical practice (Hopkins, 2007). A researcher's positionality translates into two main ways in which it can be critically reflected upon. First, it examines the way in which the researcher is read and interpreted by the research participants. The second involves the researcher's own experiences and multiple and complex identities (Hopkins, 2007).

The research is also called upon to acknowledge both similarities and differences between the researcher and the participants. In both study sites, one major similarity that existed between the researcher and the research participants was that both parties shared the same gender. This enabled an effective research process. Also upon entry into both communities, the researcher's dress code tried to match with that of women in the two communities. It meant that the researcher wore simple shoes and clothes, with minimal accessories including the absence of a mobile phone. By so doing, the researcher was trying to lessen the label of the 'otherness' being placed upon them.

Although the researcher was neither a mother nor a caregiver, some research participants were the same age as the researcher. These mothers seemed more relaxed as they could identify with the researcher. On the other hand, for some mothers and caregivers, the researcher was young enough to be their child. It therefore meant that the researcher had to humble and assume a 'child-like' role. Furthermore, the fact that the researcher was Zimbabwean meant that she could

easily speak and understand Shona, the dominant language in Ward 7. This was a positive factor, as the participants saw some form of ‘sameness’. However, the researcher’s nationality may have discouraged full participation in Samora Machel as she could neither speak nor understand isiXhosa.

4.7.3. Overview of process: qualitative, quantitative data collection

Field research process sought to gather qualitative information and quantitative data from a variety of sources. This process was further enabled by field observations. It used a range of method summarised in Table 7 below.

Table 7: Different methods used in the field research process

Research objectives	Methods or procedures	Purpose
Identify and characterize household and environmental threats that are hazardous to pre-school children between 0 months to 6 years of age and associated vulnerability factors that increase exposure to these threats	Two focus group in each settlement	This was to get an understanding of how caregivers and mothers perceive risks in and around the home
	Site and household observations	Transect walks, field observations and photographs around the settlement to ascertain hazards and risk conditions of the communities
Examine risk perceptions and protective strategies applied by mothers and caregivers to reduce and manage child exposure to recognized threats, as well as the respective social influences and institutional determinants in shaping risk perception and protective responses.	Household questionnaire survey	This was aimed at addressing these key themes: <i>households’ socio-demographic profiles, child injury data, anticipatory strategies, sources of child protection knowledge</i> (Appendix 2)
	In-depth interviews	These were conducted with local clinics and a community based organization to determine to what extent these institutions play a role in shaping caregiver’s risk perception and subsequent protective responses

4.7.4. Qualitative data collection

Several complementary qualitative data collecting methods were used. These included focus group interviews, key informant interviews and field observations.

Focus group discussions

Krueger and Morgan (1998) describe focus groups as a discussion in which a small number of people, usually about 5 to 12 discuss a specific topic raised by a facilitator, in this case, the researcher. Focus group discussions are also viewed as a method of obtaining detailed information about a particular topic as well as draw out precise issues that might be unknown to the facilitator or researcher. For the purposes of this study, focus group discussions were viewed as important for building an understanding of how mothers and caregivers perceived different risks, in and around the home.

Two focus group discussions of approximately two hours in duration were held with mothers and caregivers in each study site. In Ward 7 Epworth, focus groups comprised twenty five and twenty participants and were held in a community center. In Samora Machel, focus groups consisted of fifteen and eighteen participants, with one taking place in a shebeen, while the other was held in an open area near the community hall. All focus group participants in each study site consisted of mothers and caregivers with children between 0-6 years old.

Key informant interviews

In order to corroborate caregiver perceptives on child injuries and illness with those from official sources, the researcher also conducted 30 minute key informant interviews. These included the ward councillors, head nurses and community leaders at each study site. These also provided information on primary health care services that are accessible or other organisations that offered maternal education.

Transect walk and field observations

A transect walk through each settlement was also undertaken. This provided an opportunity to assess risks and exposure conditions for children within the community. It allowed the researcher to observe and ascertain hazards, risk and exposure conditions, such as access to thoroughfares and accumulation of solid waste. It also allowed photographs and field notes to be taken. Informal discussions with residents were also held.

Picture 3: Focus group discussion Ward 7



Picture 4: Focus group discussion Samora Machel

4.7.5. Quantitative data collection

A total of fifty mothers and caregivers from each informal settlement completed household questionnaires. The purpose of the research was fully explained to those participants who agreed to participate. In Ward 7 Epworth, the administration of each household questionnaire took approximately 15-20 minutes. This contrasted with the amount of time taken in Samora Machel which extended to an hour each. This was due to the limited level of formal education for most mothers and caregivers. It created challenges in explaining questions. In addition, in Samora Machel, it was necessary for the research assistances to complete the questionnaires. This was due to some mothers and caregivers being illiterate. This resulted in a longer process of data collection.

4.8. Data Organisation, Consolidation and Analysis

Data were collected from multiple sources, including survey data, field observations, key informant interviews and focus group discussions. Information was organised and consolidated so as to enable analyses of results.

4.8.1. Consolidation of qualitative data

Field observations, key informant interviews and focus group discussions were transcribed, summarized and coded according to different thematic areas identified through the research objectives. The coding took place immediately upon returning from the field. Information was subsequently applied to quantitative findings in the different sections of the study; either to explain or corroborate the results. Direct quotes were used to give context to those themes that had not been addressed in the questionnaires.

4.8.2. Consolidation and analysis of quantitative data

Having completed the interviews, questionnaires were separated into two different groups, Ward 7 and Samora Machel. Each questionnaire from Ward 7 Epworth was assigned a number code from WE1 to WE50, while those from Samora Machel were coded SM1 to SM50. Data were then consolidated according to each question and captured in a Microsoft Excel spreadsheet before being imported to Statistica for computation. The data were then represented using simple descriptive statistical techniques such as averages, percentages, tables and frequency distribution. In addition to this, comparative tables, pie charts and graphs were generated and used to present and interpret findings.

4.8.3. Analysis of qualitative and quantitative data

The qualitative and quantitative data were analysed through the lens of two conceptual frameworks that underpinned the study. These were the Pelling's urban environmental risk conceptual framework and Caregiver's perception of risk conceptual model. These two frameworks were integrated to allow a better

understanding of findings, as well as enable new insights to be generated between the disaster risk domain and the child injury discipline.

4.9. Summary

This chapter addressed the data collection process and method of data analysis. It outlined the different stages followed, from the preparation of household data collecting tools to the methods used for data analysis. Also, a detailed discussion of the qualitative and quantitative methods used to collect the data was provided, including the preparation of tools. It presented the process applied to determine the sample size and selection of sampled households. The chapter concluded by describing the data consolidation process as well as the methods of data analysis used for the study.

University of Cape Town

CHAPTER 5 FINDINGS AND ANALYSIS

5.1. Introduction

The study's primary focus was to investigate and compare the experience of everyday risks through the lens of child injuries and illness in two informal settlements located in Harare, Zimbabwe and Cape Town South Africa

The chapter begins by describing the socio-demographic profile of study respondents in both Ward 7 within Epworth and Samora Machel of Philippi and their access to basic services. It continues by presenting the environmental characteristics and these include both 'intra-household and environmental threats' and associated vulnerability factors. The chapter then goes on to compare the resultant protective actions, namely 'active or passive strategies' adopted in managing child exposure. Finally, the chapter concludes by analysing the findings through the developed integrated conceptual model.

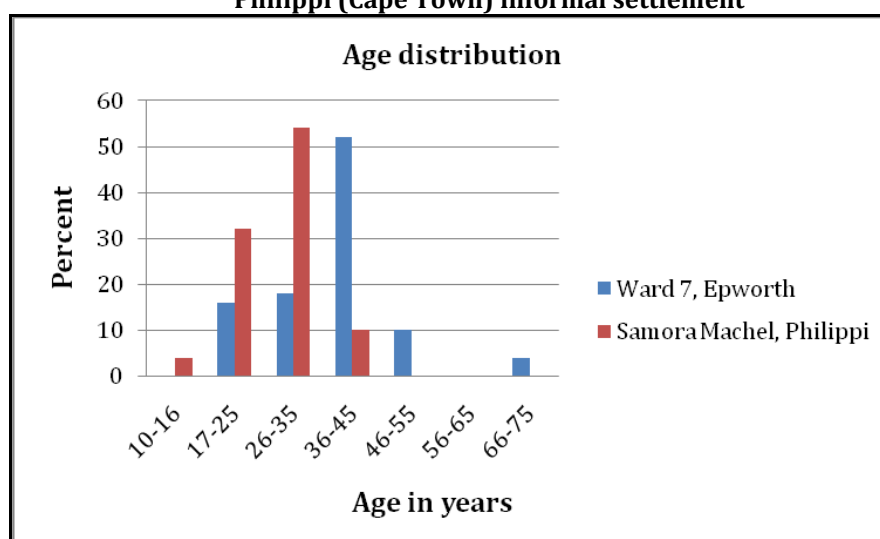
5.2. Respondent socio-demographic profile

This section details the socio-demographic profile of the residents interviewed in both Ward 7 and Samora Machel as these attributes influence both exposure to and protection from local household and neighbourhood hazards. These include age, level of education, access to prenatal information, employment status and marital status. It also includes the duration of residence in the respective sites.

5.2.1. Socio-economic attributes of respondents

Study findings profile strikingly juxtaposed socio-economic characteristics of study respondents in the two sites. For instance, mothers and caregivers in Ward 7, Epworth, were older than those in Samora Machel, with 52 % and 54% respectively aged between 36-45 years and 26-35 years (refer to Figure 10). These differences were underlined by extremes in both sites with the youngest respondent aged 14 in Samora Machel compared to two grandmothers aged 67 and 70 in Ward 7.

Figure 10: Age distribution of respondents in Ward 7, Epworth (Harare) and Samora Machel, Philippi (Cape Town) informal settlement



Given the recognised role of maternal education and literacy levels in enabling access to information about child care and injury prevention, it was essential to explore the respondents' education profiles in each site. Table 8 below indicates significant differences in levels of formal education achieved by respondents in each site. These are most noteworthy with respect to completion of high school with 38% of respondents in Ward 7 having completed O'Levels compared with 4% of respondents in Samora Machel who had completed the equivalent Matriculation (National Senior Certificate). Moreover, as O'Levels in Zimbabwe are examined in English, this signaled relatively high levels of English literacy as well as Shona among the Ward 7 respondents.

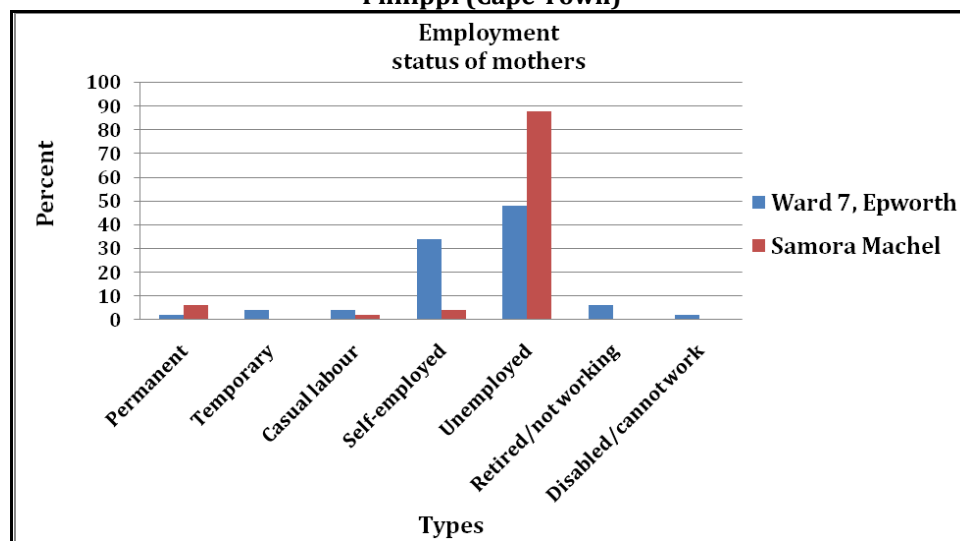
Table 8: Highest level of formal education completed by respondents in Ward 7, Epworth and Samora Machel, Philippi

Highest level of education	Ward 7		Samora Machel	
	No.	%	No.	%
No education	1	2	1	2
Primary	10	20	3	6
Secondary	18	36	44	88
O'Level/Matric	19	38	2	4
A'Level	0	0	0	0
Diploma	2	4	0	0
Degree or above	0	0	0	0
Total	50	100	50	100

Respondent employment and livelihood strategies were also investigated, recognising that while employment confers access to resources and other opportunities, it also determines the need for caregiver support. Figure 11 indicates marked differences in

employment strategies with 88% of mothers in Samora Machel reportedly unemployed at the time of the study compared to 44% in Ward 7. Significantly however, over 30% of Ward 7 mothers reported being self-employed, engaging in various activities such as small-scale vendors, hair dressing, sewing and knitting. Field observations confirmed that many of these activities were home-based while others took place in the nearby market in Epworth. Notably, all Samora Machel respondents who were either single (40%) or partnered (42%) reported receiving child grants (Table 9).

Figure 11: Employment status of respondents in Ward 7 Epworth (Harare) and Samora Machel, Philippi (Cape Town)



Recognising the role played by stable family units, through access to additional income from spouse and resources, the study sought to examine the marital status. Pervasive differences in the marital status of respondents in the two sites were also noted. While 86% of mothers in Ward 7 reported being married, this applied to only 18% in Samora Machel. On the other hand, a significant number of women (40%) in Samora Machel reported being partnered.

Table 9: Marital status: Ward 7, Epworth and Samora Machel, Philippi

Marital status	Ward 7		Samora Machel	
	No.	%	No.	%
Single	1	2	21	42
Married	43	86	9	18
Partnered	0	0	20	40
Divorced	0	0	0	0
Widowed	6	12	0	0
Total	50	100	50	100

As the mother's child health knowledge is also considered important in reducing the risk of child injuries (WHO, 2008), the study investigated whether mothers and caregivers had received relevant child health information. Findings showed that almost all mothers and caregivers in Ward 7, Epworth had received prenatal education (98%), compared with just 50% of those in Samora Machel. All mothers who reported receiving prenatal information acquired it from the local clinics. However, they acknowledged other sources including the media, community based organisations, non-governmental organisations, neighbours and relatives.

Respondents from both sites shared a uniform understanding of the importance of the child 'Road-to-Health' card. In both settlements, 98% of all mothers and caregivers could produce these cards. Moreover, on checking the cards, the researcher found that all children were up to date with their vaccination. The mothers who did not have their cards reported them being stolen. In addition, when asked if they knew about child diarrhea, all mothers and caregivers in both settlements correctly identified Oral Rehydration Solution (sugar and salt solution) and how to prepare it.

5.2.2. Length of stay in informal settlement

Information on the duration of residence within a specific informal settlement provides insight on access to social capital and community support structures. It also indicates the length of time available to respondents to build awareness of frequently occurring natural and other threats situated within the settlement. In this instance, study respondents indicated significantly different durations of stay in their settlements, even though all respondents reported originating from rural areas. For instance, 54% of Ward 7, Epworth respondents arriving prior to 1998, compared to 16% only in Samora Machel.

These results are unsurprising given the history of the two settlements. The history of Epworth indicates that Ward 7 residents first occupied the land in 1990, while those in Samora Machel first settled in around 1996. This also reflects the stability and length of existence of the two settlements.

5.2.4. Access to basic services, resources and potential threats

A recurrent observation on the vulnerability of informal settlement residents relates to their lack of access to basic services such as electricity, safe water supplies, health and education (Tibaijuka, 2005). In this study, household access to basic services was identified as an important indicator or relative exposure to intra-household threats like open flame and toxic substances such as paraffin. Findings indicated marked contrasts in access to energy sources for cooking, lighting and warmth between the two settlements. In Ward 7, Epworth, 100% of respondents used paraffin and wood for cooking and candles for lighting. This contrasted with findings from Samora Machel, where respondents reported access to legal and informal electricity for housing lighting and cooking.

With specific respect to environmental exposures, and particularly water and sanitation-related threats, child exposure also differed in the two sites. For instance, safe potable running water via municipality-provided standpipes was accessible to all respondents in Samora Machel, (20 households per stand pipe). This is contrasted with access to groundwater via covered shallow wells (9 households per well) in Ward 7 Epworth. Similarly, access to and type of toilet varied between the sites. In Ward 7, each household reported access to its own toilet (ventilated pit latrine), while in Samora Machel, clusters of 4 households shared a dry-bucket provided by the municipality.

Furthermore, respondents in Ward 7 Epworth reported not having televisions due to lack of electricity, while almost all respondents in Samora Machel owned television sets.

5.2.4. Summary of socio-demographic attributes and conditions

While both research sites are informal settlements indicative of urbanising Africa, the survey results demonstrate significant differences on virtually all socio-economic attributes as well as respondent access to basic services. For instance, Ward 7 Epworth respondents were older, with uniformly higher levels of education and capacity for spoken and written English. They were also self-employed and were in more stable family units, having lived in Ward 7 Epworth for longer periods of time. This contrasted markedly with the mothers interviewed in Samora Machel who were younger with

significantly lower levels of education who were also unemployed. Respondents from Samora Machel also reported living in the settlement for a much shorter period of time. In terms of fundamental child health knowledge, results were broadly comparable between the respondents from both study sites. This applied to access to the 'Road-to-Health' card, immunisation coverage and knowledge about the treatment ailments like child diarrhoea. However, about twice as many respondents from Ward 7 had received prenatal information compared to those in Samora Machel.

5.3. Identification of perceived intra household, environmental threats and child vulnerability factors

5.3.1. Overview

Public health approaches to child injury prevention and prevailing perspectives on urban risk reduction both acknowledge the importance of characterising the causal chain that leads to injury, illness and loss. Both approaches recognise the contribution of potential causal agents, also known as "sources of risk" (Renn, 2008), "hazard" (Wisner & Blaike, 2004, Pelling, 2003) or "agent" (van As, 2006). Similarly, these fields recognize the contribution of environmental and human vulnerability risk factors that create pathways linking hazardous agents to realized injuries.

The central element of this study of everyday urban risk therefore focused on identifying and characterizing respondent perceptions on household and settlement-specific threats as these related to child injury. Additionally, it sought to investigate the causal pathways identified by respondents that led to injuries or other losses. These findings were compared with field observations and secondary data sources on injury loss data. Tables 3 and table 4 summarise and compare respondent perception on intra-household as well as locality-specific threats on the two sites, signaling little similarity in exposure profiles.

5.3.2. Respondent identification of intra-household and environmental threats to child health and safety

With specific respect to intra-household threats to child health safety, (Table 10), 60% of respondents in Ward 7 Epworth ranked paraffin containers and stoves as the most

endangering threat, followed by candles, matches and sharp objects (16%). This contrasts with 60% of respondents in Samora Machel who ranked sharp objects, like knives and razor blades as the most endangering threat, followed by exposure to kettles and stoves (22%). Respondent perception of intra-household threats indicate some convergence with exposure factors for child burn injuries identified in both sites, along with injuries from sharp objects. The identification of pesticides specifically in respondents in Samora Machel is noteworthy. It reflects awareness of the dangers of locally procured informal pesticides. More significantly however, it implies concern about rodent exposure which is associated with uncollected solid waste.

Table 10: Household and environmental threats identified by respondents in Ward 7, Epworth

Location	Ward 7			
		No	%	Rank
Inside the home	Paraffin containers and stoves (paraffin or saw dust)	30	60	1
	Candles and matches and sharp objects	8	16	2
	Unclosed 25-50 litre water bucket	7	14	3
	Unauthorized access to medicines and pesticides	5	10	4
	Total		50	100
Outside the home	Unlocked wells	20	40	1
	Toilets	12	24	2
	Motor vehicles	10	20	3
	Broken glass and sharp objects	8	16	4
Total		50	100	

Perception of threats outside the home also varied between respondents in both sites (Table 11). 40% and 24% of respondents respectively in Ward 7 Epworth prioritised unlocked wells and toilets as sources of danger for toddlers and preschoolers. This contrasted with 36% and 32% of respondents in Samora Machel who respectively prioritised broken glass/sharp objects and solid waste.

Table 11: Household and environmental threats identified by respondents in Samora Machel

Location	Samora Machel			
		No	%	Rank
Inside the home	Sharp objects (knives, razor blades)	30	60	1
	Kettles and stoves	11	22	2
	Pesticides (rodenticide)	7	14	3
	Cosmetics (deodorants, lotions)	2	4	4
Total		50	100	

Outside the home	Broken glass and sharp objects	18	36	1
	Solid waste	16	32	2
	Speeding motor vehicles	10	20	3
	Grey-water and sewage	6	12	4
Total		50	100	

5.3.3. Perceived child injury pathways: From risk to realized child injury

Table 12 summarizes the causal elements and pathways with particular focus on intra-household threats. It illustrates significant diversity in identified sources of risk. The reported causal chain interestingly foregrounds the hazardous agent and vulnerability of the child. However, the explanatory pathway did not mention mothers' or caregivers' roles in interrupting the chain and their contribution in minimising a realized injury outcome.

Table 12: Perceived intra-household threats, causal chain and potential realized injury outcome

Settlement	Source of risk (Hazardous agent)	Perceived causal chain	Realized injury outcome for children (0-6years)
Ward 7, Epworth	Stoves (paraffin and saw dust)	Can topple over and spill heated pot contents on child. If stove not on elevated surface, child can reach pot handle.	Liquid burn injury
	Paraffin containers	Child can drink paraffin and get sick.	Get "sick" (i.e. poisoning)
	Candles and matches	If candle stand is not elevated, it can be reached by child and topple.	Skin burns (also burn the house) Sharp objects can cut themselves.
	Sharp objects (like knives, razor blades)	If not kept in drawers, child can reach them	Cuts to fingers
	Uncovered 25-50 litre water bucket	Child can crawl into bucket	Child drowning.
	Unauthorised access to medicines and pesticides	If not locked away, child can reach and ingest medicines and pesticides and	Child gets "sick" or even dies.
	Sharp objects (knives, razor blades)	If not kept in drawers, child can reach them	Cuts to fingers

Samora Machel	Kettles and stoves	Child can grab kettle cord and hot water from kettle will burn or pot contents can topple over and spill.	Liquid burn injury
	Pesticides (rodenticides)	If not locked away, child can reach and ingest medicines and pesticides and	Ingesting leads to illness or even death of child.
	Cosmetics (lotion, deodorants)	If not locked away child can reach	Child gets “sick” or even dies.

Similarly to table 12 above, table 13 illustrates the diversity around the environmental threats identified and the perceived pathways leading to a realized injury outcome. This table also fails to profile mothers’ or caregivers’ contribution to the injury pathway.

Table 13: Perceived environmental threats, causal chain and potential realized injury outcome

Settlement	Source of risk (Hazardous agent)	Perceived causal chain	Realized injury outcome for children (0-6years)
Ward 7. Epworth	Unlocked wells	Child can open the unlocked well cover and crawl in and drown.	Child drowning.
	Toilets	Child can fall into the pit latrine	Child injury or even death.
	Motor vehicles	Child can get run over by speeding motor vehicles.	Child injury or even death
	Broken glass and sharp objects	Child can play with these.	Cut feet and fingers
Samora Machel	Broken glass and sharp objects (like tins)	Child can walk on the broken glass.	Cut feet and fingers
	Uncollected solid waste	Child can play on the rubbish dump.	Child gets “sick”.
	Speeding motor vehicles	Child can run into the road.	Child injuries or even death of.
	Grey-water and sewage	Child can play in the dirty water.	Child gets “sick”.

5.3.4. Insights on vulnerability factors increasing risk of child injury and illness

Focus group discussions in both settlements indicated similar, but highly generic and age-dependent vulnerability factors for child injuries in informal settlements (Table 14). These vulnerability factors were further corroborated through key informant interviews with health professionals in confirming the developmental stages of children.

Table 14: Factors influencing child vulnerability to injuries in Ward 7 and Samora Machel

Developmental stage of child	Vulnerability factors
6 months – 1 year	<ul style="list-style-type: none">• Crawling• Stand and sit
2 – 3 years	<ul style="list-style-type: none">• Child is energetic: run-around, jump, and climb• Pick and put anything in the mouth
4 – 6 years	<ul style="list-style-type: none">• More independent and more explorative

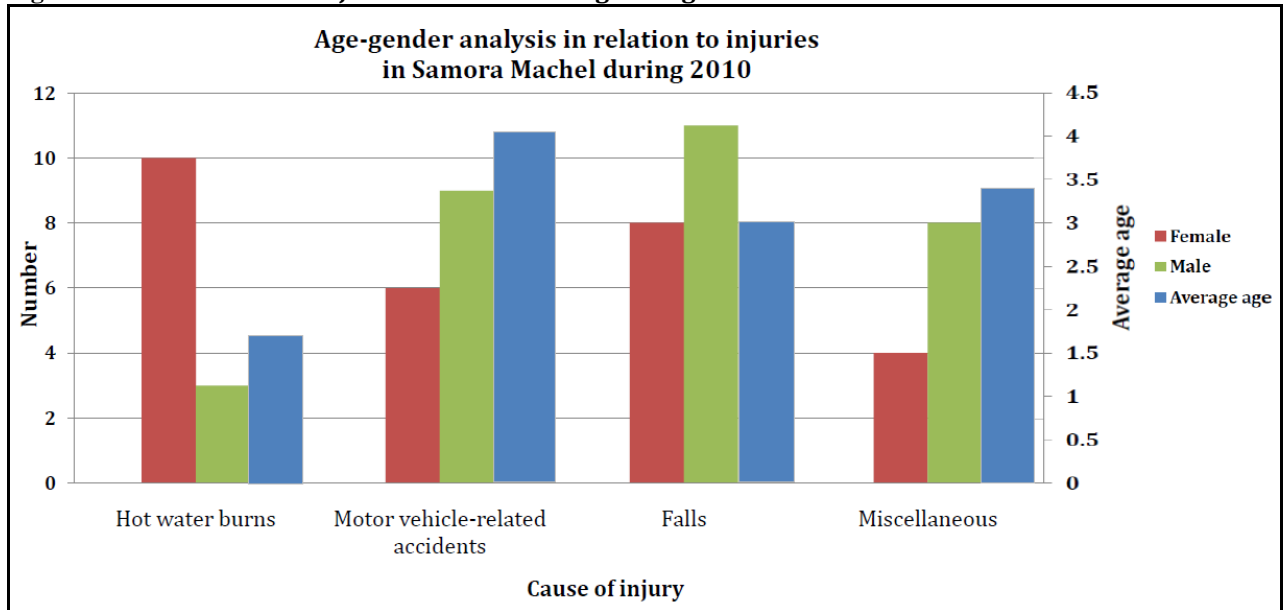
While these child vulnerability factors were identified in both sites, field observations suggested that young children actually did not experience the same level of vulnerability. For instance, the researcher noted differences in levels of child protection through protective restraint during interviews. This was evidenced by Ward 7 mothers carrying children on their backs (up until 2-3 years of age) to interviews. This contrasted significantly with the interview processes in Samora Machel in which mothers arrived at interviews carrying children in their arms and were observed placing them down to play freely (6 months-1 year).

5.3.5. Child injury risks: Insights from secondary data sources

Respondents' perceptions of intra-household and environmental threats related to child injury were also compared with data from secondary sources such as the City of Cape Town, Disaster Risk Management Centre and Red Cross Children's Hospital (Cape Town). Unfortunately, accurate data from Harare Children's Hospital were not available. However, consultation with the Head sister at this hospital indicated no history of admissions from Ward 7, Epworth.

In contrast and particular respect to recorded child injuries that resulted in admission to hospital during 2010, 59 cases from Samora Machel were retrieved from the Red Cross Children's Hospital database. These are reflected in Figure 12 below, indicating that 19 cases were attributed to falls both inside and outside the home. The rest of the cases included 15 admissions that were motor vehicle-related and 13 from hot liquid burns.

Figure 12: Main causes of injuries in relation to age and gender in Samora Machel in 2010



These data also foreground vulnerability factors that are age and gender dependent. For instance, age-gender analysis indicated that boys were more frequently injured in both falls and motor vehicle admissions, while with respect to hot liquid burns the majority was girls. Children aged 3 years were, on average injured from falls, compared with 4 years for motor vehicle-related accidents and 1.6years for hot liquid burns.

While this information in-part converges with perceived child injury risks by respondents, significantly, child injuries attributed to falls were not identified by mothers and caregivers in Samora Machel.

Data from the Disaster Risk Management Centre indicate that fires and floods are the main threats in Samora Machel. However, respondents' perspectives on fire risk converged with that from the Disaster Risk Management Centre, but at different scales. For instance, the Disaster Risk Management Centre dataset indicates that fires are possible threats in Samora Machel. Similarly, respondents in this settlement identified burns from kettles and stoves as source of threat. They also identified the health risks associated with grey water and sewage due to flooding during winter season.

Similarly, Ward 7, Epworth, respondents identified unlocked wells as a potential threat to child safety (drowning). However, they failed to identify the risk of ground water contamination due to the proximity of pit latrines. This shows some inconsistencies

between what is documented about the quality of water in the settlement. Respondents in this settlement failed to identify contaminated water as a source of illness to children.

5.3.5. Summary of perceived intra household, environmental threats and vulnerability factors

Findings from field research indicate marked diversity in the sources of risk in both sites. Although there were uneven exposures to fire threats particularly in one settlement, hot liquid burns constituted a source of injury despite provision of electricity. While in the other settlement, Ward 7, Epworth there was no evidence of electrification, there are high levels of exposure to open flames. However, there were no reports of burns injuries in this settlement.

In the case of Samora Machel, there are convergences between the respondents' perceptions of fire and flood risks at household scale compared to settlement level risks identified by Disaster Risk Management Centre. However, in Ward 7, Epworth, there was an anomalous finding in that residents had a partially correct perception of danger about wells, but failed to identify the risks of contamination of water which have been documented.

5.4. Child injury prevention: active and passive strategies

5.4.1. Overview

Reduction of child injury risk depends significantly on the implementation of both the active and passive injury prevention strategies described in chapter 2. With specific respect to the threats and risks already identified, this section examines active and passive strategies prevention measures taken by mothers or caregivers to reduce child injuries in both sites. The protective role of delegated supervision is also examined in relation to child injury prevention. The section concludes by focusing on the broader social determinants and influences that shape child injury prevention in both study sites.

5.4.2. Child injury prevention: Focus on intra-household threats and risk minimization

Survey findings on injury prevention measures for intra-household threats indicated numerous opportunities for active strategies for injury prevention in both sites.

Table 15 below illustrates encouraging levels of awareness about active child injury prevention strategies for identified intra-household threats in both study sites. Although not explicitly noted by the respondents, the provision of electricity reduces exposure to open flames and access to potable water confers a measure of passive injury prevention in Samora Machel. These services minimise the chance of child accidents due to candles, open flames and uncovered water storage containers.

Table 15: Identified intra-household threats and preventative strategies adopted

Settlement	Source of threat	Preventative strategies	
		Active injury prevention	Passive injury prevention
Ward 7, Epworth	Paraffin containers and stoves(paraffin or saw dust)	Paraffin kept in dark coloured big distinctive containers which are kept out of reach of children on a top shelf Both stoves types placed on elevated surfaces	N/A
	Candles and matches and sharp objects	Objects placed out of reach of children (drawer)	N/A
	Water buckets	Placed a lid on top of bucket	N/A
	Unauthorised access to medicines and pesticides	Medicines and pesticides placed out of reach of children (drawer and cupboards)	N/A
Samora Machel	Sharp objects	Objects placed out of reach of children (drawer)	N/A
	Kettles and stoves	Both stoves and kettles placed on elevated surfaces Kettle cords moved out of reach of children (fastened to the wall)	Passive prevention for other burns due to open flames because of electrification
	Pesticides	Pesticides kept out of reach of children (cupboard or top shelves)	N/A
	Cosmetics	Cosmetics kept in cupboard, out of reach of children (wardrobe)	N/A

5.4.3. Child injury prevention: Focus on environmental threats and risk minimisation

In terms of environmental threats, table 16 below shows marked differences in the level of preventative strategies implemented in both study sites. While respondents in Ward

7, Epworth primarily implemented active strategies for all the environmental threats which they identified, Samora Machel respondents reported greater expectation of passive injury prevention through municipal services.

Table 16: Identified environmental threats and preventative strategies adopted

Settlement	Source of threat	Preventative Strategies	
		Active injury prevention	Passive injury prevention
Ward 7, Epworth	Unlocked wells	Residents fitted locked well covers	N/A
	Exposed ventilated pit latrines	Actively supervise children during toilet use	N/A
	Motor vehicles	Neighbourhood vigilant for child play Motor vehicles not observed in the settlement	N/A
	Broken glass and sharp objects	Daily clean up by residents Children forced to wear shoes	N/A
Samora Machel	Broken glass and sharp objects	Some children observed wearing shoes	Expectation of local government to clean up solid waste
	Solid waste	Residents pile up rubbish Children not observed near solid waste (indicates education /awareness)	Expectation of local government to collect solid waste
	Speeding motor vehicles	Children observed playing unsupervised in the road	Speed-bumps and roundabouts
	Grey-water and sewage	N/A	Expectation of local government to unclog drains

5.4.4. Summary of intra-household and environmental threats and preventative strategies

Field observations, focus group and survey findings show that respondents in both study sites showed high levels of awareness of active strategies for child injury prevention with respect to identified intra-household threats. However, there were marked differences in terms of the identified environmental threats, where Ward 7 respondents only reported using active strategies. There was absence of any passive strategies in Ward 7, Epworth. In addition, there were some anomalous findings related to exposure to open flames. For instance, while exposure to open flames was noted to be

high in Ward 7, Epworth, realised risk outcomes was through highly active prevention strategies. Another anomalous finding was that the record of admissions to Red Cross Children's Hospital foregrounded injuries due to falls which occurred both within and outside the home. However this was not identified as a point of concern by residents. Possibly this could be attributed to there not being a clear source of risk or hazardous agent.

5.5. The protective role of neighbours and community

The uneven distribution and occurrences of child injuries from sources of risk outside the home highlights the important protective role of relatives and neighbours as well as the broader community. As authors such as Saluja *et al.*, 2004 and Morrongiello & Schell, 2010 underline, delegated supervision is a key element of active injury prevention. The study investigated willingness of respondents to deliberately delegate or assign supervision to neighbours or relatives in the absence of the mother.

5.5.1. Protective role of delegated supervision

Figure 14 below shows striking differences with the majority of mothers and caregivers in Ward 7 (90%) routinely delegated child supervision to specifically neighbours and also relatives while going to work. In contrast, delegated supervision (10%) was not identified as a primary prevention strategy by respondents in Samora Machel and was primarily confined to relatives. Although it was not explicitly explained, the fact that in Samora Machel the majority of respondents were young mothers who were unemployed meant that they perceived that they were present all the time even if they were not actually actively supervising their children and thus there was no need for delegation.

In the case of Ward 7, Epworth, the reasons for delegating to neighbours was further explored. It was reported that there was a sense of community identity which existed that consequently led everyone to trust each other. In addition, ¹Mai Rosy emphasised,

¹ This is a pseudonym

“my child is my neighbours’ child, their child is mine, your child is mine.....if any child is misbehaving or needs to be corrected, I have the power to intervene....each of us are mothers, it’s our community, so we look after each other and our community...”

On the other hand, in Samora Machel, respondents did not indicate sense of community responsibility within their settlement through focus group discussions.

5.5.2. Help-seeking behaviours and community as source of protection

A contrast in the engagement of neighbours and friends to carry out child supervision was further illustrated in help-seeking reported by respondents. For instance, in Ward 7, Epworth, 100% of respondents reported that they would “do something” first (consult a neighbour) if their child fell ill. Moreover, they explained that they would only seek clinic assistance if the situation worsened. This help-seeking approach contrasted markedly with that reported in Samora Machel where 100% of the respondents reported going to the clinic first when the child fell in.

Evidence of high levels of community cohesion that confer protective benefit to children was also evidenced by the protection of wells and daily cleaning of the community by respondents in Ward 7, Epworth.

5.6. Analysis

The following analysis section integrates the two main conceptual frameworks previously discussed in the literature, namely Pelling's urban vulnerability risk (2003) and the caregiver's conceptual model introduced by Saluja *et al* (2004). The models presented in this section differentiates through scale, that is, risks within the household (intra-household) and risks located outside the household (environmental). It also integrates the actions of active and passive prevention which are drawn from the child injury literature with the notions of exposure and vulnerability that are drawn from the urban risk literature. This permits specific threats to be understood in relation to their location and the engagement by the mother or caregiver in the broader community.

Table 17: Stoves, kettles: Intra-household threats leading to realised risk (burns)-Generic Model

Risk categories	Vulnerability conditions	Injury co-risk factors	Identified enabling Interventions (active prevention)	Identified enabling Interventions (passive prevention)
Exposure	Location	Accessible kettle cords	Positioning kettles cords out of reach of children	
		Accessible stoves	Elevating stoves	
		Accessible candles and matches	Candle-stand placed on elevated surface. Matches kept in a drawer	Provision of electricity reducing the risk of open flames
	Surroundings	Small size of rooms/houses	Presence of separate rooms in the house	
		No separate cooking area	Presence of a separate cooking area	
Resistance	Vulnerability of child	High child mobility/low level of child restraint	Child carried on mothers' back (strapped/restrained)	
	Protective engagement by mother	Low level of attention by mother	Fewer distractions due to lack of a television set	
		Absence of additional adult	Opportunity of additional supervision of child	

Table 18: Analysis of Ward 7 Epworth and Samora Machel: Intra-household risks and resulting prevention strategies

Risk categories	Vulnerability conditions	Injury co-risk factors	Identified enabling interventions	Type of injury prevention strategy			
				Active prevention		Passive prevention	
				Ward 7	Samora Machel	Ward 7	Samora Machel
Exposure	Location	Accessible kettle cords	Cord kept out of reach of child	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
		Accessible stoves	Elevated stoves	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
		Accessible candles and matches	Candles and matches placed in drawers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	Surroundings	Small size of rooms/houses	Separate rooms	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
		No cooking area	Separate cooking area	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Resistance	Vulnerability of child	High child mobility/low level of child restraint	Child is strapped on mothers' back within the house	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	Protective engagement by mother	Low level of attention by mother	Absence of television sets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
		Absence of additional adult	Extra supervision of child	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Table 17 above represents the generic approach while Table 18 below compares the two study sites. It also demonstrates the relative role of active and passive prevention. This approach is now applied to child injury risk as this relates to intra-household exposures as well as environmental exposures in the two sites. The analysis above shows in the instance of the risk of child burns in the two sites that the role of active prevention is absolutely essential within the home. In Ward 7 Epworth case, there are many more opportunities for active prevention for child burns than in Samora Machel, despite higher exposure to candles and open flames. The provision of electricity in Samora Machel plays a passive prevention role in minimising exposure to open flame. The research from Ward 7 Epworth shows that vigilant active prevention is highly protective.

**Table 19: Broken glass: Environmental threats leading to realised risk (cut fingers and feet)-
Generic Model**

Risk categories	Vulnerability conditions	Injury co-risk factors	Identified enabling Interventions (active prevention)	Identified enabling Interventions (passive prevention)
Exposure	Location	No defined playground	Community defining playground area	Municipality defined playing grounds
	Surroundings	No access to refuse disposal	Community involvement	Regular collection of refuse
		High density of shebeens (poor disposals of beer bottles)	Community clean up	Regulating shebeens /municipality organised street cleaning
Resistance	Vulnerability of child	Low level of child restraint	Child carried on mothers' back (strapped/restrained)	
		Absence of footwear of children	Wearing shoes	
	Protective engagement by mother	No explicit delegated supervision arranged	Delegated supervision	
		Limited individual and collective responsibility	Community pro-activeness	

Table 20: Analysis of Ward 7, Epworth and Samora Machel: Environmental risks and resulting prevention strategies

Risk categories	Vulnerability conditions	Injury co-risk factors	Identified enabling interventions	Type of injury prevention strategy			
				Active prevention		Passive prevention	
				Ward 7	Samora Machel	Ward 7	Samora Machel
Exposure	Location	No defined playground	Community defining playground area	☑	☒		☑
	Surroundings	No access to refuse disposal	Community involvement	☑	☒		☑
		High density of shebeens (poor disposals of beer bottles)	General routine community clean up of bottles and tins	☑	☒		☑
Resistance	Vulnerability of child	Low level of child restraint	Child strapped on mothers' back	☑	☒		
		Absence of footwear of children	Children observed wearing shoes	☑	☑		
	Protective engagement by mother	No explicit delegated supervision arranged	Delegated supervision to neighbours	☑	☒		
		Limited individual and collective responsibility for all children	Pro-active intervention by adults for all children	☑	☒		

Table 19 presents the generic approach as it applies to environmental threats, followed by a comparison of the environmental threats in each study sites. Table 20 clearly demonstrates that Samora Machel is highly depended upon passive strategies from the local authorities, leading to increased passive prevention strategies. However, this research has also shown that these passive prevention strategies do not result in full protection, as evidenced by the injury data from Red Cross which highlighted a higher increase in injuries resulting from environmental threats. On the other hand, this analysis shows significant differences with residents from Ward 7 Epworth who are more active and view it as their responsibility, especially as a community.

5.7. Summary

This chapter has addressed ways of reducing and managing everyday risks in the specific context of child injuries and illnesses in Ward 7 of Epworth and Samora Machel of Philippi settlements. Information used was derived from both primary and secondary data sources.

The results indicated significant differences in the socio-demographic characteristics of respondents in the two study sites. Respondents in both study sites identified different intra-household and environmental threats. With particular respect to intra-household threats, focus group discussions indicated consistent levels of caregiver involvement in terms of active supervision in reducing risk related outcomes of the identified threats in both study sites. With respect to environmental threats, these were different between the study sites, with Ward 7 Epworth respondents primarily employing active strategies, while respondents in Samora Machel mainly relied on passive strategies. The associated vulnerability factors for children were similar in both settlements.

There were marked differences in delegated child supervision between the two sites. Respondents in Ward 7 Epworth primarily delegated to neighbours. Reasons for delegation were due to collective community engagement which consequently led everyone to trust each other. Research findings are interrogated through the integration of two conceptual frameworks to ascertain differences in injury prevention by mothers and caregivers in both study sites.

Chapter 6

Discussion and Conclusion

6.1. Introduction

The final chapter examines the findings on child injuries as an everyday urban risk. It begins by discussing the differences identified in the two settlements, in terms of household and environmental threats as well the anomalous findings pertaining to exposures and child injury outcomes. The chapter continues by examining the differing approaches to injury prevention in relation to prevailing literature on active and passive prevention. It also discusses the identified and important role of social and institutional determinants affecting child injury.

6.2. Household and environmental threats compared

6.2.1. Different settlements – different risks

Study findings underline the diversity of informal settlement settings in Africa. Although Ward 7 (Epworth, Harare) and Samora Machel (Philippi, Cape Town) share similar attributes at settlement-scale, there are marked differences the two sites. These translate into diverging risk profiles at sub-settlement and household scale between. On one hand, both of the ‘umbrella’ areas (Epworth and Philippi) originated in the 19th century and are located at comparable distances from central Harare and the Cape Town Central Business District (CBD). On the other hand, while Philippi (including Samora Machel) has benefited from the delivery of basic services (potable water, electrification, refuse collection and health services), Epworth has had very limited access to these amenities. The settlements are both significantly affected by government policies to informal settlements, which, in this study were almost juxtaposed. This was most starkly illustrated by the introduction of South Africa’s “Breaking New Ground” to human settlements in 2004, which supported the progressive upgrading of informal settlements (Misselhorn, 2008; Cross, 2006). In contrast, the government of Zimbabwe implemented the widely criticised “Operation Murambatsvina/Restore Order” in 2005 that deliberately targeted

informal urban settlements (Chitekwe-Biti, 2009). Both study sites were inevitably affected by implementation of these policies.

6.2.2. Anomalous exposures and child injury outcomes

Although coarse, settlement-scale profiles appear similar, (flooding, crime and environmental health-related risks), sub-settlement and household exposures differed markedly between the two sites. For instance, electricity provision in Samora Machel reduced child exposure to open flame injuries, while open flame lighting and cooking were the norm in Ward 7. Yet, despite the partial protection against burn injuries provided by electrification in Samora Machel, this research still shows a high occurrence of child injuries in this site. This was evidenced by 59 admissions of children aged 0 months-6 years to the Red Cross Children's Hospital in 2010 for injuries that included falls, hot liquid burns and motor vehicle-related accidents.

These results contrast significantly with child injury information from Ward 7, Epworth, including survey data, key informant interviews and feedback from the Harare Children's Hospital. These suggest low to virtually non-existent levels of serious child injury within the settlement, despite exposures to open flame, hot liquids, matches and candles. While the Epworth results may reflect under-reporting due to health sector constraints in Zimbabwe, they indicate remarkably high levels of individual and community agency in child injury prevention – despite shortcomings in public service provision.

6.3. Preventative and protective strategies compared

Encouragingly, research findings indicate high levels of awareness by mothers and caregivers in both sites about intra-household threats (hot liquid and open flames). This is reflected by evidence of active injury prevention by mothers through elevating stoves and candles out of reach of children and securing sharp objects such as knives and razor blades. In the case of Samora Machel, these individual

measures were augmented by passive injury prevention services through reduced intra-household risk through the provision of electricity and access to potable water.

Despite evidence of similar active prevention measures adopted within the home, findings indicate marked differences in child injury prevention strategies adopted outside the home in both sites. For instance, in Ward 7, Epworth, survey data, combined with field observations indicated high levels of active injury prevention. This was evidenced by 90% of respondents explicitly delegating child supervision to their neighbours and relatives. It was also indicated by high levels of community vigilance to monitor children's safety and community mobilisation to cover and lock shallow wells and to keep the settlement free from solid waste. These observations reinforce Saluja's findings on the role of proximity, attention and continuity of mothers in conferring active prevention (Saluja et al., 2004).

Survey results from Samora Machel diverge markedly with respondents reporting minimal confidence in delegating child supervision to neighbours and relatives (10%), along with little evidence of community mobilisation to monitor children's safety or to keep the settlement clean. In this site, passive injury prevention strategies were explicitly viewed as municipal obligations (speed bumps, solid waste removal and settlement clean-up).

These contrasting results in levels of community protection are consistent with other studies which emphasise the protective role of community (Klassen et al, 2000). One further contrast between the two sites that may have differentiated child exposure to household and environmental threats was the practice of carrying children on mothers' or caregivers' backs. This unexpected finding from field observation was evidenced by mothers and caregivers in Ward 7, Epworth, uniformly carrying young children up until 3-4 years old on their backs. It contrasted significantly with observations in Samora Machel where mothers and caregivers carried young children in their arms. During interviews in Samora Machel, mothers were observed placing their children beside them. This allowed

children to crawl, walk or play freely in an endangering environment. In contrast, young children in Ward 7, Epworth were protectively restrained on their mothers' backs. The contrasting practice of baby /child carrying in the two sites could in-part explain the different injury profiles especially as young children in Epworth were less able to reach candles, stoves and other sources of endangerment in the home due to the high level of protective restraint. In Ward 7, the practice extended outside the home, continuing to offer protection to young children, specifically against the presence of wells.

Findings about back-carrying may to a certain extent be explained by the concept of 'rurban' settlements described by Pelling and Wisner (2009:35). They note that some informal settlements in the urban periphery tend to practise both rural and urban lifestyles. In this instance, back-carrying of children in Ward 7, Epworth reflects a rural culture which is still embedded in the community, in which subsistence agriculture is still widely practiced and where extended family units still prevail. This contrasts with Samora Machel where mothers and caregivers have adopted 'modern urban lifestyles' which discard back-carrying of young children. In this instance, the risk is generated by not only exposure to new hazards within the home, but also through implicit withdrawal of traditional practices that would have been protective.

6.4. Social and institutional determinants of child injury

The marked differences in child injury profile can also be attributed to significantly different socio-economic characteristics between the two sites, at both individual (mothers or caregiver/household) and settlement/community scales. At individual scale, mothers and caregivers in Ward 7, Epworth were much older, in stable family structure (married), better educated, bilingual in both spoken and written English and Shona. However, this contrasted with mothers and caregivers in Samora Machel who were comparably much younger, in fragile household structures (single or partnered), poorly educated and with livelihoods highly dependent on child grants. These observations about the protective role of mothers with higher levels of

education are consistent with findings from previous studies. For instance Klassen et al, (2000) argue that an improvement in education is an important element in the change in behaviour by mothers and caregivers in reducing child injuries.

Similar differences were identified at settlement/community scale. There was evidence in Ward 7, Epworth of high levels of social capital and community cohesion. In comparison, survey findings and field observations in Samora Machel indicated a lack of confidence in neighbours, as well as little evidence of community engagement to keep the community clean. This may be attributed to the fact that mothers and caregivers in Ward 7, Epworth had lived in the community for a much longer period of time unlike in Samora Machel where mothers and caregivers had stayed for a shorter period. These findings corroborate with other studies which highlight the importance of the level of community integration/organisation or disintegration/disorganisation in reducing child injuries (Klassen et al, 2000).

6.5. Insights from application of integrated model

The study results also illustrate the value of adopting an integrated approach to urban risk reduction and child injury prevention. For instance, the application of the urban risk and child injury prevention model provides insights into exposure and vulnerability reducing factors at different scales in different settings.

The study findings related to child injury prevention are also consistent with prevailing thought on disaster risk prevention at settlement scale and beyond. They illustrate the shortcomings that accompany over-confidence in passive injury prevention strategies in the absence of active injury prevention strategies. This is consistent with disaster risk domains which speak to over-confidence in structural mitigation measures which are usually undertaken by government to keep the threat away from people (levees, dam walls), as opposed to non-structural mitigation measures that seek to change behaviour and keep people away from the threat (Pelling, 2003). This was shown by the relatively high incidence of serious hot liquid burns in Samora Machel compared with Ward 7, Epworth, despite the

provision of electricity. Passive injury prevention maybe extremely effective in minimising exposures to threats such as open flames in Samora Machel. However, this cannot afford full protection without active injury prevention measures adopted within households and communities.

The findings also provide insights that benefit settlement-scale risk reduction efforts as well as measures to reduce child injuries in unsafe urban environments. For instance, study results illustrate highly divergent patterns of child injury occurrence between two sites, underpinned by juxtaposed levels of human and social capital. As current approaches to risk management for threats such as urban fire and flooding advocate community-based risk reduction, insights from this study caution against generic assumption about community mobilisation capacity. The findings highlight the social diversity in African informal settlements and need for risk reduction approaches that are aligned with local capacities (Satterthwaite, 2011).

6.6. Recommendations for future research

This comparative study on child injuries as an everyday urban risk has identified 3 main areas of potential future research.

1. The study's findings indicate the importance of additional research into the relationship between child injuries and household composition. One particular focus might be to examine the roles played by male partners and/or spouses in enabling or discouraging injury prevention in the home.
2. These research results highlight the contribution that back-carrying of young children plays in providing protection from intra-household and settlement threats.
3. Government resources such as provision of infrastructure and basic service delivery should never be regarded as having the potential to offer the

solution to child protection or injury prevention on their own. Parents and caregivers need to become aware of their own responsibility as agents in achieving full protection of their children and dependents.

6.7. Conclusion

The aim of this study was to explore and examine the role of human agency in reducing and managing everyday risks in two African informal settlements through the lens of child injury prevention. Through the application of the integrated framework of environmental urban risk and child injury prevention strategies developed for this study, the prevention strategies between the two settlements were compared.

The findings of this study suggest that informal settlements can vary substantially and each particular settlement is likely to have its unique characteristics. In this respect, intervention measures should be carefully and appropriately tailored to meet the specific characteristics of each settlement. In this study, both mothers and caregivers from the two sites differed significantly in their socio-demographic profile and this subsequently led to major differences in the levels of prevention strategies adopted.

Also, this research has highlighted the important role of community mobilisation and vigilance as an active strategy in child injury prevention. Furthermore, a need for preserving traditional practices such as back-carrying was seen as an essential factor in reducing child vulnerability and thereby reducing child injuries.

This evidence in this study further supports existing research that child protection and injury prevention can only be successfully achieved by incorporating both active and passive strategies. This will not be achieved without responsibility being taken at both household and community scales.

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12. APPENDICES

APPENDIX 1: The letter for permission

508 Grand Central
227 Main road,
Wynberg,
Cape Town
South Africa
7800
14 June 2010

The Secretary
Epworth Local Board
P.O. Box AP 180
Epworth
Harare
Zimbabwe

RE: PERMISSION TO CONDUCT MY RESEARCH

My name is Chiedza Mavengere. I am currently a student at the University of Cape Town, doing my Masters degree in Disaster Risk Science.

My thesis topic is entitled:

“Human agency and everyday risk: comparing household protective measures for children in Ward 7, Epworth (Harare) and Samora Machel, Philippi (Cape Town)”

For this, I am required to carry out between forty and fifty questionnaire interviews and twenty in-depth interviews. I am kindly requesting your permission to conduct my research in Ward 7 of the Epworth community. These interviews will be conducted in November and December 2010.

Due to ethical reasons, participation of these residents will be entirely voluntary and the information generated will be completely confidential to everyone else and anonymous in the final report of my research project. Each questionnaire interview will take about fifteen minutes and the in-depth interview will take about thirty minutes. All of these will be conducted in venues that are comfortable to the participants. The final report of this research will be made available to the board and the community.

Thank you so much in advance for your assistance.

Kind regards,

Miss Chiedza Mavengere

APPENDIX 2: Household questionnaire

This questionnaire is divided into main four components: household socio-demographic profile, agent (physical environment of house), mother/caregiver profile and child profile and injury history.

Household profile

a. How many people live in the house? _____

b. Age and sex of household members:

Age category (years)							
	0months-6years (please specify)	6-15	16-20	21-30	31-45	46-60	Over 60
Sex							
Number							

c. Marital status

Single	
Married	
Partnered	
Divorced	
Widowed	

d. Employment status of mother/caregiver

Employment type	x	Employment type	x
Permanently		Unemployed	
Temporarily		Retired/not working	
Casual labour		Not working/not seeking	
Self-employed		Disabled/cannot work	
Social grant			

e. Last grade completed by mother/caregiver

Level	x	Level	x
No education		Matriculation	
Primary		Diploma	
Secondary		Degree and above	

f. When did you move to present township?

Year				
	Before 1994	1994-1998	1999-2003	2004- present
When				

g. Where did you previously live? _____

2. Agent/house

a. What sources of energy do you use for the following?

	Legal electricity	Illegal electricity	Paraffin	Wood	Candle
Cooking					
Heating					
Light					
Warmth					
Torch					

b. Do you have the following?

	Yes	No
Toilet		
Running water		

c. How many people/households are you sharing with? _____

d. Where do you keep the following items?

	Cupboard	Drawer	Other
Candles & matches			
5c coins			
Cosmetics (Vaseline, lotion, perfume)			
Paraffin			
Pesticides			
Cleaning agents (jik...)			

3. Mother/caregiver profile

a. Do you have your child's Road-To-Health Card?

	X
Yes	
No	

b. If yes can I see it?

c. If not, what happened to it?

d. If your child were to get sick/ill, what is the first thing that you do?

Where	x
Clinic/Hospital	
Do something yourself	
Neighbour/friends	
Other	

e. If your child was to get diarrhea what would you do?

What	x
Clinic/Hospital	
Sugar-salt solution	
Neighbour/friends	
Other	

f. Have you ever received any information about child care?

	X
Yes	
No	

g. If yes, from where?

Where	x
Clinic/Hospital	
Women's group/union	
Neighbour/friends	
CBO/NGO	
Family member	
TV/Media	

h. If no, would you have found it useful to have known?

	X
Yes	
No	

i. Do you sometimes delegate someone to supervise the child?

	X
Yes	
No	

j. Number of hours per day spent supervising? _____

k. To whom do you usually delegate?

l. Why is this?

m. I make my child keep away from anything that could be dangerous?

	X
Yes	
No	

n. If yes, how?

o. If no, why?

p. Please can you list these dangerous items/things/places?

In the house	Outside the house

q. How do you ensure this?

In the house	Outside the house

4. Child profile & injury history

a. In the last year has any of your child/ren between 0-6years been:

	Yes	No
Ill		
Injured		
Admitted into hospital		

b. Cause of injury/admission:

Transport		Burn		Fall		Miscellaneous		Other	
Pedestrian		Flame		Off bed		Struck by/against		Immersion/drowning	
Passenger-restrained		Fluid		Steps/stairs		Caught between		Suffocation	
Passenger-unrestrained		Heat contact		Attendants' arm		Sharp instrument		Food (FB)	
Passenger-bakkie-minibus		Electrical		Playground equipment		Firearm		Other (FB)	
Cycle		Chemical		Mobiles		Machinery		Unknown	
Motorcycle		Explosion		Other heights		Dog bite			
Other									

c. Where did this occur?

Place	x
Inside own home	
Outside own home	
Inside other home	
Outside other home	
Crèche	
Public space	
Other:	

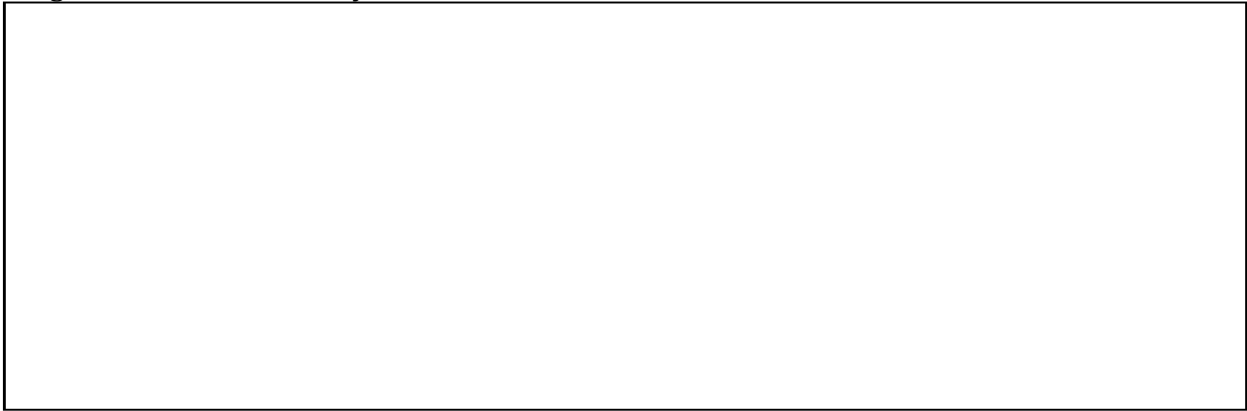
d. Are you comfortable to explain to me what really happened..?

e. Since the injury and or admission have you changed anything in your household to protect the child?

	x
Yes	
No	

f. What have you done differently?

g. Where and how did you learn about this?



**APPENDIX 3: Comparative photographs: Ward 7, Epworth (left)
and Samora Machel (right)**

A) TOILETS



B) WATER SOURCES



C) HOUSING TYPES



D) BACKYARD OF HOUSES



E) PLAYGROUND FOR CHILDREN



F)