



**UNIVERSITY OF
KWAZULU-NATAL**

**INYUVESI
YAKWAZULU-NATALI**

**UNDERSTANDING THE RELATIONSHIP BETWEEN RURAL HEALTHCARE FACILITIES
AND WELLBEING OF PATIENTS:
A PROPOSED HEALING CENTRE IN RURAL KWAZULU-NATAL**

Author:
LEIGHLAN FENNER

A Dissertation submitted in fulfilment of the
Requirements for the degree of Master of Architecture to
The School of Built Environments and Development Studies,
College of Humanities
University of KwaZulu-Natal
Durban, 2015

DECLARATION

I, Leighlan Cohen Fenner, declare that:

1. The research reported in this thesis, except where otherwise indicated, is my original research.
2. This thesis has not been submitted for any degree or examination at any other university.
3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
4. This thesis does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:
 - a. Their words have been re-written but the general information attributed to them has been referenced
 - b. Where their exact words have been used, then their writing has been placed in italics and inside quotation marks, and referenced.
5. This thesis does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the thesis and in the References sections.

Signed

LEIGHLAN COHEN FENNER

DATE

DEDICATION

To my ever so special parents and grandparents: for laying a strong foundation which allowed me to pursue my dreams, and also for encouraging me to never give up despite some challenging times. Their advice, to always believe in myself and be confident helped me achieve my goals.

ACKNOWLEDGEMENTS

I would have never been able to complete my dissertation without the guidance of my supervisor, Mr. Mthembeni Mkhize and my mentor Mr. Rueben Reddy. I would like to express my deepest gratitude to them for their excellent guidance, caring and patience.

Special thanks go out to my parents, Mervin and Clarissa Fenner, and my elder sister, Shalane, for helping in every possible way that they could. They were always supporting me and encouraging me with their best wishes. Special thanks go out to My Grandparents, Fenner's and De Bruins, for paving the way for me to attend university.

I would also like to thank my cousins, Ayrton, Godvick and Jenilee, for motivating me and keeping me moving in the right direction. I would like to thank my friends Siyanda, Ryan, Sibz, Kyle, Pierre, Bevan, Cheron, Jenna-Lee for always being willing to give the best advice, lend a helping hand and for always there cheering me up.

Finally, I would like to thank my classmates, for always being on hand to give advice and assist when the chips were down.

ABSTRACT

The poor condition of public healthcare facilities in rural areas, negatively affects the wellbeing of patients. These facilities are designed to be service efficient as opposed to nurturing patients. Therefore, this dissertation is aimed at understanding existing challenges that affect patient wellbeing. In addition, it will seek to outline strategies of improving patient wellbeing, which will inform the design of a new model of public healthcare facility in rural KwaZulu-Natal.

The study uses a Qualitative methodology, with an exploratory approach. The design of the study includes primary research methods in the form of case studies, observations, photographs, sketches and ten interviews of a purposive sample of past patients and staff. In addition, it includes secondary research methods in the form of library studies and precedent studies. The research was carried out at Appelsbosch Hospital, Ozwathini, KwaZulu-Natal and Umphumulo Hospital, Maphumulo, KwaZulu-Natal. The data was examined through exploratory methods of analysis which was informed by the recurrent issues/themes, research objectives and questions.

In addition, the analysis of data will be done through aspects of the theoretical framework informed by primary theories or concepts, in the context of the topic and the sub-topic. The theories that were used to examine the literature are Genius Loci, Gestalt Theory and Social Construct Theory. These theories address the social and architectural responses within the context of patient wellbeing within public healthcare facilities in rural areas.

The findings show that an environment that improves patients wellbeing are spaces within a physical setting designed to be nurturing. It was also revealed that, aspects of the built and natural environments such as: natural lighting, natural ventilation, open green spaces and healing gardens need to be considered in the design of an environment that improves patient wellbeing. Natural ventilation also reduces the transmission of airborne disease.

The findings show that the natural environment needs to be integrated with the built environment. Views through openings of the therapeutic landscape and open green spaces provide positive distractions for patients. In addition, the findings reveal that design strategies in hospital design are context and climate specific, in order to achieve passive design principles for sustainability.

TABLE OF CONTENTS

DECLARATION	II
DEDICATION	III
ACKNOWLEDGEMENTS	IV
ABSTRACT	V
TABLE OF CONTENTS	VI
LIST OF FIGURES	X
LIST OF TABLES	XIII
LIST OF APPENDICES	XIV

CHAPTER 1: INTRODUCTION

1.0	INTRODUCTION	1
1.1	BACKGROUND INFORMATION	1
1.2	MOTIVATION/JUSTIFICATION FOR THE STUDY	4
1.3	PROBLEM STATEMENT, AIMS AND OBJECTIVES	5
	1.3.1 Research Problem	5
	1.3.2 Defining the Problem	5
	1.3.3 Aims and Objectives	6
	1.3.4 Questions	6
	1.3.5 Problem Statement	7
	1.3.6 Table Summary	8
1.4	SETTING THE SCOPE	9
	1.4.1 Hypothesis	9
	1.4.2 Research scope and limitations	9
	1.4.3 Delineating the Problem	10
	1.4.4 Definition of Key Terms	10
	1.4.5 Stating the Assumptions	10
1.5	CONCLUSION	11

CHAPTER 2: RESEARCH METHODOLOGY

2.0	INTRODUCTION	12
2.1	DESIGN OF STUDY	12
	2.1.1 Qualitative Approach	12
	2.1.2 Exploratory	12
	2.1.3 Sampling Design	13
2.2.	PRIMARY DATA COLLECTION	13
	2.2.1 Case Studies	13
	2.2.2 Observations, Photographs and Sketches	14
	2.2.3 Interviews	14
2.3	SECONDARY DATA COLLECTION	15
	2.3.1 Library Studies	15
	2.3.2 Precedent Studies	15
2.4	METHODS EMPLOYED IN DATA ANALYSIS	16

CHAPTER 3: THEORIES AND CONCEPTS

3.0	INTRODUCTION	17
3.1	THEORIES	17
	3.1.1	Genius Loci -Theory 17
	3.1.2	Social Construction Theory 19
	3.1.3	Gestalt Theory 21
3.2	CONCEPTS	23
	3.2.1	Wellbeing 23
	3.2.2	Consensus Design 24
	3.3.3	Nurturing Environment 24
3.4	CONCLUSION	25

CHAPTER FOUR: LITERATURE REVIEW

4.0	INTRODUCTION	26
4.1	PROBLEMS IN SOUTH AFRICAN HEALTHCARE	26
	4.1.1	Introduction 26
	4.1.2	Rural Public Healthcare Issues 26
	4.1.3	Site Location as an Issue 30
	4.1.4	Dealing with the Problem 31
	4.1.5	Conclusion 33
4.2	WELLBEING	34
	4.2.1	Introduction 34
	4.2.2	Understanding Wellbeing 34
	4.2.3	Factors Affecting Wellbeing 35
	4.2.4	Health and Wellbeing in Architectural Environments 36
	4.2.5	Conclusion 36
4.3	WELLBING IN HEALTHCARE ENVIRONMENTS	37
	4.3.1	Introduction 37
	4.3.2	Well Designed Healthcare Environments 37
	4.3.3	Factors to Consider while Designing Healthcare Environments 38
	4.3.4	Conclusion 38
4.4	BUILT ENVIRONMENT: A TOOL FOR BETTER WELLBEING	39
	4.4.1	Introduction 39
	4.4.2	Healing in Built Environments 39
	4.4.3	Natural Light and Ventilation 40
	4.4.4	Physical Environmental Stimuli 42
	4.4.5	Materials and Wellbeing 43
	4.4.6	Colour and Wellbeing 44
	4.4.7	Conclusion 46
4.5	NATURAL ENVIRONMENT: A TOOL FOR BETTER WELLBEING	47
	4.5.1	Introduction 47
	4.5.2	Healing Properties of Landscaping 47
	4.5.3	Plant Usage and Wellbeing 48
	4.5.4	Principles of Healing Gardens and Therapeutic Landscapes 48
	4.5.5	Conclusion 50
4.6	CONCLUSION	51

CHAPTER FIVE: PRECEDENT STUDIES

5.0	INTRODUCTION	53
5.1	BURATO HOSPITAL, RWANDA.	54
	5.1.1 Introduction	54
	5.1.2 Motivation/Justification.	56
	5.1.3 Site Planning	56
	5.1.4 Materials, Colours and Textures	59
	5.1.5 Gardens and Landscaping	61
	5.1.6 Analysis	61
	5.1.7 Conclusion	62
5.2	PETER & PAULA FASSEAS CANCER CLINIC, USA	63
	5.2.1 Introduction	65
	5.2.2 Motivation/Justification	65
	5.2.3 Site Planning	65
	5.2.4 Materials, Colours and Textures	66
	5.2.5 Gardens and Landscaping	68
	5.2.6 Analysis	68
	5.2.7 Conclusion	69
5.3	BUDDHIST RETREAT CENTRE, IXOPO, SOUTH AFRICA	70
	5.3.1 Introduction	70
	5.3.2 Motivation/Justification	71
	5.3.3 Site Planning	72
	5.3.4 Materials, Colours and Textures	73
	5.3.5 Gardens and Landscaping	74
	5.3.6 Analysis	75
	5.3.7 Conclusion	76
5.4	CONCLUSION	76

CHAPTER SIX: CASE STUDIES

6.0	INTRODUCTION	78
6.1	UMPHUMULO HOSPITAL, KWAZULU-NATAL, SOUTH AFRICA	79
	6.1.1 Introduction	79
	6.1.2 History of Umphumulo Hospital	81
	6.1.3 Motivation/Justification	82
	6.1.4 Site Planning	82
	6.1.5 Materials, Colours and Textures	86
	6.1.6 Gardens and Landscaping	88
	6.1.7 Analysis	89
	6.1.8 Conclusion	90
6.2	APPELSBOSCH HOSPITAL, KWAZULU-NATAL, SOUTH AFRICA	92
	6.2.1 Introduction	92
	6.2.2 History of Appelsbosch Hospital	94
	6.2.3 Motivation/Justification	94
	6.2.4 Site Planning	95
	6.2.5 Materials, Colours and Textures	99
	6.2.6 Gardens and Landscaping	101
	6.2.7 Analysis	102
	6.2.8 Conclusion	103
6.3	CONCLUSION	104

CHAPTER SEVEN: FINDINGS & DATA ANALYSIS

7.0	INTRODUCTION	105
7.1	ANALYSIS AND DISCUSSION	105
7.2	FINDINGS	106
	7.2.1 Rethinking Current Public Healthcare in Rural Areas	107
	7.2.2 Redesigning Healthcare Facilities through Built and Natural Environments	108
	7.2.3 Reintegrating Aspects of Current Public Healthcare	109
7.3	CONCLUSION	111

CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS

8.0	INTRODUCTION	112
8.1	CONCLUSIONS	112
	8.1.1 Theoretical Framework	112
8.2	RECOMMENDATIONS FOR ARCHITECTURAL DESIGN	115
	8.2.1 Impact from the Environment on Patient Wellbeing	116
	8.2.2 Approach in Developing a Typology	117
	8.2.3 Site Selection Criteria	117
	8.2.4 Approach to Accommodation Schedule	118
	8.2.5 Design Parameters	118
	8.2.6 Previous Site Selection	119
	8.2.7 Site Selection	120
8.3	CONCLUSION	120

CHAPTER NINE: BIBLIOGRAPHY

9.0	REFERENCES	121
------------	-------------------	-----

LIST OF FIGURES

Figure 1: Graph showing the increase in expenditure within the private sector, whereas the public sector has remained stagnant (Coovadia et al, 2009).

Figure 2: Image showing relationship between man and his immediate built environment (<http://www10.aecafe.com/>)

Figure 3: Image showing a spatial definition that utilizes the elements of natural lighting, air movement and views manipulation to create a Nurturing Environment (<http://sheilaharrington.org/>)

Figure 4: Shows the Socioeconomic quintiles of South Africa. It shows the rural areas of KZN as one of the most deprived areas in the Country (KZN DoH, 2015).

Figure 5: Shows long queues in order to receive medical care (<http://www.meditech.co.za/news/rotherham-starts-to-implement-meditech/>).

Figure 6: Showing, overcrowded waiting room potentially harbouring airborne diseases (<http://www.health-e.org.za/2014/12/09/numbers-national-health-insurance-mpumalanga/>).

Figure 7: Inappropriate Ventilation Room (Author,2015)

Figure 8: Appropriate Cross Ventilation (Author,2015)

Figure 9: Appropriate Double Banker Ventilation (Author,2015)

Figure 10: Appropriate Roof Ventilating (Author,2015)

Figure 11 & 12: Butaro Hospital naturally ventilated and naturally lit, modified, innovative ward design (Arch Daily, 2011).

Figure 13: Shows the factors that affect wellbeing of Humans in everyday life. (<http://ianluntecology.com/2014/04/06/urban-biodiversity-human-well-beingrban-well-being/>).

Figures 14 & 15: Shows The Incorporation Of Courtyards And Opening Within Design Of Hospital Spaces (Www.Gutenberg.Com).

Figure 16: Flows of naturally ventilated spaces, from North to South, with a central courtyard space (<https://deisqnprimerprecedentanalysis.wordpress.com/>).

Figure 17: Shows textured materials of natural colours, offering a warm, homely environment (<http://www.healthcaredesignmagazine.com/sites/healthcaredesignmagazine.com/files/imagecache/570x360/HolyCrossGermantown98.jpg>).

Figure 18: Shows the use of a splash of green to support balance, harmony and nature (<https://deisqnprimerprecedentanalysis.wordpress.com/>).

Figure 19: Shows warmer, natural colours which support being stable, reliable, organic (<https://deisqnprimerprecedentanalysis.wordpress.com/>).

Figure 20: Garden Spaces And Views To Nature. An experience of beautiful courtyard garden, lingering on a comfortable bench, and even smell the roses or lavender, your senses are heightened, and improves patient wellbeing. (<http://www.sunvalleypropertynews.com/>)

Figure 21: Shows a healing garden within a courtyard with a meditational maze at the top right hand corner (<http://www.spineuniverse.com/practice/fl/celebration/celebration-health>).

Figure 22: Shows a healing garden within a hospital courtyard (<http://communityleague-stmary.org/healing-garden/>).

Figure 23 & 24: Sketch of aspects of creating a positive Healing environment (Author, 2015).

Figure 25 & 26: Sketches showing aspects of creating a positive Healing environment (Author, 2015).

Figure 27 & 28: Sketch & Diagram showing aspects of creating a positive Healing environment (Author, 2015).

Figure 29: Map of Africa, showing the red indicator over Rwanda (Author, 2015).

Figure 30: Map of Rwanda, showing the red indicator over the Burera District (Author, 2015).

Figure 31: Map showing the Burera District, with the red indicator over the town of Butaro (Author, 2015).

Figure 32: Aerial photograph of Butaro Hospital, in the town of Butaro (Author, 2015).

Figure 33: Shows an Ariel photograph overlooking Butaro Hospital from the South (A Daily Dose of Architecture, 2012).

Figure 34: Shows the general, ground floor layout of Butaro Hospital (Arch Daily, 2011).

Figure 35: Shows the general, first floor layout of Butaro Hospital (Arch Daily, 2011).

Figure 36: Also shows the external circulation/corridors and its link to the open green spaces (Arch Daily, 2011).

Figure 37: Shows a section through an inpatient ward, showing how cross ventilation is achieved with the aid of low-speed fans (Arch Daily, 2011).

Figure 38 & 39: Shows the use of the natural & locally sourced volcanic stone as walls, providing texture and contrast to the space (<http://www.domusweb.it/it/notizie/2013/02/22/curry-stone-design-prize-2012-mass.html>).

Figure 40 & 41: Shows the use of colour within one of the inpatient wards, providing contrast (Arch Daily, 2011).

Figure 42: Shows the well maintained gardens and landscaping with views of the natural landscape in the background (<http://www.soshl.com/Butaro-Hospital>).

Figure 43: Shows how the landscaping & gardens are well integrated with the built environment (<http://www.openbuildings.com/buildings/butaro-hospital-profile-40296>).

Figure 44: Map of North America, showing the red indicator on the U.S.A. (Author, 2015).

Figure 45: Map of the United States of America, showing the red indicator on Arizona State (Author, 2015).

Figure 46: Map of Arizona State, showing the red indicator over the city of Tucson (Author, 2015).

Figure 47: Aerial photograph of Peter & Paula Fasseas Cancer Clinic in the city of Tucson (Author, 2015).

Figure 48: Shows the Peter & Paula Fasseas Cancer Clinic, Tucson, Arizona, USA (Healthcare Design Magazine, 2008).

Figure 49: Shows the floor plate with three courtyards cut into it (Healthcare Design Magazine, 2008).

Figure 50: Shows one of the courtyards, with a regional selection of plants (Healthcare Design Magazine, 2008).

Figure 51: Shows the use of natural materials, textures & neutral colours in a waiting area (Healthcare Design Magazine, 2008).

Figure 52: Shows the use of natural materials & colours that compliment the outside landscape (Healthcare Design Magazine, 2008).

Figure 53 & 54: Shows the gardens & landscaping that depicts the surrounding natural desert landscape, designed by Ten Lyck Landscape Architecture (Archtype, 2011).

Figure 55: Map of Africa, showing the red indicator on the country of South Africa (Author, 2015).

Figure 56: Map of South Africa, showing the red indicator on the province of KwaZulu-Natal (Author, 2015).

Figure 57: Map of KwaZulu-Natal, showing the red indicator on the Sisonke District (Author, 2015).

Figure 58: Map of Sisonke District, showing the red indicator on the town of Ixopo(Author, 2015).

Figure 59: The Buddhist Retreat Centre in the town of Ixopo(Author, 2015).

Figure 60: Showing the relaxation rooms of the Buddhist Retreat centre (http://www.bodyandmind.co.za/merchant_nc.php?pid=491&step=4).

Figure 61: Showing the site planning of the Buddhist Retreat Centre in Ixopo (<https://www.flickr.com/photos/stephsalpics/15455175798/>).

Figure 62: Showing the areas and pathways surrounding the site. (<http://www.brcixopo.co.za/environment.html?catpage=1&page=3#category>)

Figures 63 & 64: Showing the natural materials used within the rooms to create relaxation (Breetzke, 2010).

Figure 65 & 66: Showing the gardens and contemplation spaces around the site. (Breetzke, 2010).

Figure 67: Shows the aspects that influence patient wellbeing covered in the literature (Author, 2015)

Figure 68: Map of Africa, showing the red indicator on the country of South Africa (Author, 2015).

Figure 69: Map of South Africa, showing the red indicator on the province of KwaZulu-Natal (Author, 2015).

Figure 70: Map of KwaZulu-Natal, showing the red indicator on the Illembé District (Author, 2015).

Figure 71: Map of Illembé District, showing the red indicator on the rural area of Umphumulo (Author, 2015).

Figure 72: Umphumulo Hospital in the rural area of Umphumulo (Author, 2015).

Figure 73: Shows the main entrance of the Umphumulo Hospital. It is unclear and undefined, no conducive for patient wellbeing (Author, 2015).

Figures 74 & 75: Shows the views of the rolling hills from the site. Relates to the idea of Therapeutic landscapes (Author, 2015).

Figure 76: Showing the site planning of Umphumulo Hospital (Author, 2015).

Figure 77: Sketch showing the Male TB Ward planning (Author, 2015)

Figure 78: Sketch showing the prefabricated general female ward planning (Author, 2015)

Figure 79: Appropriate Cross Ventilation, however not utilised (Author, 2015)

Figure 80: Sketch showing the linear planning of the wards (Author, 2015)

Figures 81 & 82: Shows the measures taken to mitigate the issue of overcrowding (Author, 2015).

Figures 83 & 84: Shows the materials and colours used on the buildings as well as the contrasting colours of the prefabricated general female ward structure (Author, 2015).

Figures 85 & 86: Shows the interior materials and colours used within the buildings as well as the prefabricated general female ward structure, on the right (Author, 2015).

Figures 87 & 88: Shows the leftover grassed open spaces, that are not designed or maintained. There is a lack of plants and trees, which would make these spaces more pleasant (Author, 2015).

Figures 89 & 90: Shows the leftover grassed open spaces, that were fully vegetated, however have been removed to accommodate vehicles and additional prefabricated ward structures (Author, 2015).

Figure 91: Map of Africa, showing the red indicator on the country of South Africa (Author, 2015)

Figure 92: Map of South Africa, showing the red indicator on the province of KwaZulu-Natal (Author, 2015).

Figure 93: Map of KwaZulu-Natal, showing the red indicator on the Umgungundlovu District (Author, 2015).

Figure 94: Map of Umgungundlovu District, showing the red indicator on the rural area of Ozwatini (Author, 2015).

Figure 95: Umphumulo Hospital in the rural area of Ozwatini (Author, 2015).

Figure 96: Shows the pronounced entrance of Appelsbosch Hospital. (Author, 2015).

Figures 97 & 98: Shows the surrounding therapeutic landscapes of the rolling hills of Ozwathini as well as the surrounding community that the hospital serves. (Author, 2015).

Figure 99: Shows the site planning of Appelsbosch Hospital as well as the accommodation schedule, with relationship between the functions of the hospital (Author, 2015).

Figures 100 & 101: Shows the covered walkways, that act as verandas, sub-waiting areas and measures to deal with overcrowding in the main waiting room. They also protect the spaces from the direct north light (Author, 2015).

Figure 102: Sketch showing the general ward planning of Appelsbosch Hospital (Author, 2015)

Figure 103: Sketch showing the alternative ward planning of Appelsbosch Hospital (Author, 2015)

Figure 104: Appropriate Cross Ventilation, which is well utilised within Appelsbosch Hospital (Author, 2015)

Figure 105: Sketch showing the linear planning of the wards (Author, 2015)

Figures 106 & 107: Shows the materials, textures and colours used within Appelsbosch Hospital (Author, 2015).

Figure 108: Shows the interior of Appelsbosch Hospital and the interior materials, textures and colours used. (Author, 2015).

Figures 109 & 110: Shows the well maintained open grassed areas/courtyards in relation to the materials, textures and colours used as well as in relation to the covered walkways (Author, 2015).

Figures 111 & 112: Sketches showing the aspects of site planning and movement through the site (Author, 2015)

Figures 113 & 114: Sketches showing the aspects of natural & cross ventilation within the ward/unit planning (Author, 2015)

Figures 115 & 116: Sketches showing the aspects of visibility and views to nature through openings within the ward/unit planning (Author, 2015)

Figures 117: Map showing the site boundaries of the Amahwaqa Rural Area Site (Author, 2015)

Figures 118: Map showing the site boundaries of the KwaBhidla Rural Area Site (Author, 2015).

Figures 119: Map showing the site boundaries of the Inkangala Rural Area Site (Author, 2015).

Figures 120: Map showing the site boundaries and the town of Highflats that supports the surrounding rural areas (Author, 2015).

LIST OF TABLES

Table 1: *Table summary of research adapted by Author (Author, 2015)*

Table 2: *The variation of colours can have psychological benefits. Author adapted from (Mahnke, 1987).*

LIST OF APPENDICIES

Appendix 1: Semi-structured interview schedule

Appendix 2: Consent Form

Appendix 3: Ethical Clearance Document

CHAPTER 1: INTRODUCTION

1.0 INTRODUCTION

The poor condition of public healthcare facilities does not aid the underprivileged people of South African rural areas and affect patients' wellbeing negatively. This document will explore public healthcare facilities and their relationships with the wellbeing of patients and seek to find solutions. The researcher will be using certain tools (interviews, observations & case studies) in the process of finding contextually specific solutions to aid patients' wellbeing within public healthcare facilities in rural areas. The first chapter will investigate how the topic of poor healthcare facilities influencing its patients' wellbeing can be researched within an architectural discourse.

In this chapter, the researcher will state the background drawing from the many issues in rural, public healthcare and the motivation/justification behind the research. Thereafter the study will articulate the research problem, aims objectives and questions. The research problem will be stated to identify the primary ideas driving the research and the limitations and parameters of the research will be outlined.

1.1 BACKGROUND INFORMATION

Historically many different health providers have provided the health facilities in South Africa. In the 17th and 18th century, during the Dutch colonialism (1652-1800); the Dutch East India Company, colonial governments, provided health and hospital care and Christian missions (internationally funded) (Coovadia *et al*, 2009). In the same period, traditional healers, European trained doctors and missionaries offered a mix of services within the rural and urban areas. However, in the early 19th century, during the British colonialism (1800-1910), indigenous and traditional healers were marginalised and European, medically trained doctors dominated. Thereafter, in the late 19th century, conventional medicine became a specialized practice with qualified nurses and doctors within the towns, and Christian missionaries provided the orthodox medical health care within the rural areas funded by international countries (Coovadia *et al*, 2009).

In the early to mid 19th century, during the period of segregation (1910-1948), the overall doctor to population ratio was one doctor per 3600 population. However, due to racial divides beginning at that time, the ratio was one doctor per 308 white people in contrast to; one doctor per 22000 black people in the peri-urban and rural areas. Therefore, in 1919, the first Union wide Public Health department was established through the Health Act. The Gluckman Commission (1942-1944) attempted to redirect the health system, thus set up several centres, which were the forerunners of community-based primary healthcare (Coovadia *et al*, 2009). Thereafter Gluckman became the Minister of Health in 1945; however, in 1948 the Nationalist Party assumed power before Gluckman's proposals could be applied, and they were all rejected (Coovadia *et al*, 2009).

During the Apartheid years (1948-1994), the state took over the missionary hospitals and health facilities. These were the backbone of the health services in the peri-urban and rural areas. The state then systematically underfunded the health services in the peri-urban and rural areas. Thus the overall doctor to population ratio in the towns strengthened from one doctor per 2427 population in 1946, to one doctor per 1721 population in the early 1970's. However in the peri-urban and rural areas (Bantustans); the doctor to population ratio was still very high, one doctor per 15 000 population (Coovadia *et al*, 2009).

In 1994, the beginning of the Post-apartheid democracy, the African National Congress built on the principles of primary healthcare (Coovadia *et al*, 2009). The concept of primary health care, first recommended by the Gluckman Commission in 1945, was implemented with a system based on community health centres. The health system was driven by the need to address the inequalities of the past and provide essential health care to the less fortunate people within the rural areas. Prior to the newly elected government in 1994, the health system was well resourced compared to other middle-income countries. After 1994, the resourcing of the public health sector has remained dormant due to restricted spending in the public sector, inadequate human resource capacity, and poor leadership, management. However, the spending within the private health sector has improved (Coovadia *et al*, 2009).

The current, governmentally funded, Community Healthcare Centres in rural areas continue to play a vital role within their communities, and however expenditure within the public sector has remained stagnant (*Figure 1*). This indicates a lack of improvements of standards within the public health sector. Public healthcare facility's value in society is something that is continually changing with the new developments and trends of the modern day life. However, wide acknowledgement exists of severe issues in the lack of development, operation, quality and maintenance of public healthcare facilities in rural South Africa (Awake Magazine, 2005). These facilities are rolled out in quantity; however lack the qualities of modern day healing architecture.

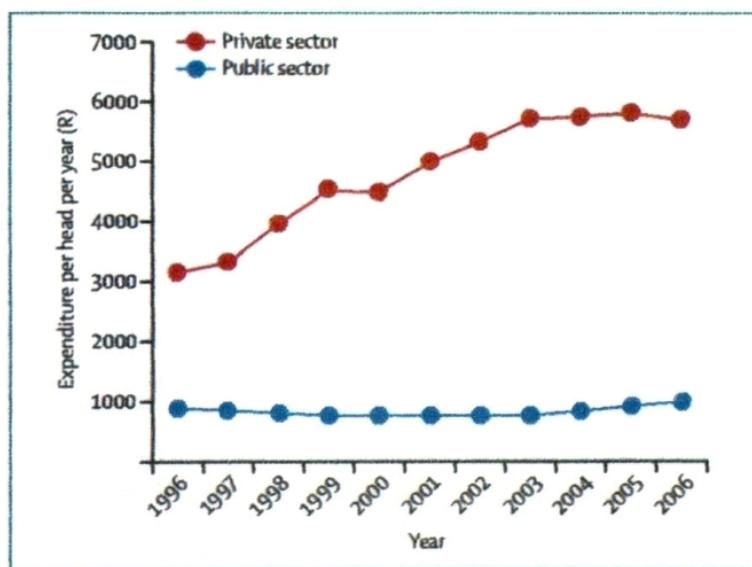


Figure 1, Graph showing the increase in expenditure within the private sector, whereas the public sector has remained stagnant (Coovadia et al, 2009).

Health is shaped by certain factors namely: an individual’s environment, medical care and behaviour. It has been noticeable that rural public healthcare environments, do not contribute positively to the health and wellbeing of humans. In addition, rural public healthcare facilities are stressful to patients and staff due to poor healthcare environments that are also overcrowded and under maintained; which contribute negatively on the users (Justlanded, 2014).Some other environmental factors include: noise levels, lack of windows, to provide views to nature and air quality (Ulrich, 2000).

Public healthcare facilities, in rural South Africa should offer proper healing environments in order to promote wellbeing. Therefore characteristics such as sustainability, social support, privacy,

access to nature and other positive distractions should be considered in order to mitigate the concerns of stressful public healthcare environments in rural South Africa (Ulrich, 1999).

There is a need for a new model of public healthcare architecture within the rural areas of South Africa, which not only aids in the health of its patients, but also improves their wellbeing. Therefore this dissertation is aimed at the formation of a place of healing that can improve wellbeing in a public, rural healthcare facility.

1.2 MOTIVATION/JUSTIFICATION OF STUDY

The state of public healthcare facilities in rural areas has not been redesigned in order to promote wellbeing of patients; however, it has been the case with the public facilities in the urban areas has. Therefore, there is a need for a new model of public healthcare facility in rural areas, in order to improve patient wellbeing and promote health. A new model of public healthcare facility within the specific context of rural areas that will not only deal with the current challenges faced with rural areas, but also deals with the issues of patient wellbeing.

The primary motivation of this dissertation is to research more into physical healthcare environments in rural areas and the effects they have on their patients. This is important as it could assist in the immediate situation in helping public healthcare facilities to promote better healing and wellbeing for all users.

The secondary motivator is to demonstrate how contextually, specific architecture can provide a solution to healthcare as a social and economic issue. In addition, to communicate that the built environments, theoretical analysis and context specific architectural design, can promote healing and aid in the wellbeing of people who occupy the facility. This will contribute to the expansion of knowledge about public healthcare facilities in rural areas.

The motivating factors; points to a need for a new model of architecture that will improve the wellbeing of patients in a public healthcare facility. This will inform the design of a new model of public healthcare facility in rural areas of KwaZulu-Natal.

1.3 PROBLEM STATEMENT, AIMS, OBJECTIVES & QUESTIONS

1.3.1 Research Problem

The state of public healthcare facilities in rural South Africa is very poor. This reflects the country's position as a third world country. The health sector is in need of a complete transformation of the national health care delivery system and all relevant institutions (Yach & Kistnasamy, 2007). Achieving this goal of a complete transformation requires far more than the application of medical technology or even the total efforts of the health sector working alone; but is a multi-disciplinary concept that also requires a healthy environment (African National Congress, 2011). The Department of Health acknowledge that there are severe issues in the quality, operation and maintenance of public healthcare infrastructure; stating that development needs to take place in the sustainability of the environment and in creating healthier healthcare environments for the future (African National Congress, 2011).

1.3.2 Defining the Problem

Current South African public healthcare facilities are overcrowded, understaffed and not designed to enhance healing (News24, 2012). These public healthcare facilities, do not contribute positively to the health and wellbeing of humans.

This research aims to interrogate the relationship between public healthcare environments in rural areas and wellbeing of patients in order to generate context specific architectural principles that promote health and human wellbeing; in the context of rural KwaZulu-Natal. Emphasis will be placed on how a healing environment can be modified through architectural interventions and how these environments can benefit humans.

1.3.3 Aims & Objectives

The aim of this research is to interrogate rural healthcare facilities to reveal existing challenges; in order to generate contextually specific architectural principles, which will inform the design of a new model of public healthcare facility that can promote wellbeing of patients in rural KwaZulu-Natal.

The key objective of this study is:

1. To understand the effect that current public healthcare architecture has on its patients in rural areas.

The secondary objectives of this study are:

2. To generate contextually specific architectural principles, in order to promote patient wellbeing.
3. To contribute towards a new model of public healthcare architecture within the rural context that promotes patient wellbeing.

1.3.4 Questions

The key question of this study is:

1. What kind of factors impact the wellbeing of patients within current rural healthcare architecture?

The secondary questions of this are:

2. How do healthcare environments affect patient wellbeing within a healthcare facility?
3. What is the relationship between the built form and health or wellbeing?
4. What contextually specific architectural principles can be identified in order to promote patient wellbeing?
5. What new type of public healthcare architecture will best promote health and wellbeing of patients within the rural areas of South Africa?

1.3.5 Problem Statement

As has been articulated in the background and motivation, there are many social, physical and economical issues in healthcare environments. Therefore, as articulated by the aim and objectives, this research will interrogate the relationship between public healthcare facilities and patients' wellbeing; in order to find out what factors in current healthcare architecture contribute to the negative effect on patients wellbeing.

As mentioned in the background & motivation there is a need for a new model of public healthcare architecture within the rural areas of South Africa, in order to provide better facilities to the less fortunate. Therefore, this research will look to form a holistic place of healing in the form of a new model of built environment. Moreover, a new model that can be utilised by the Department of Public Works of South Africa to deliver quality health environments those are sustainable and promote wellbeing of patients.

The focus of this study will be on the effects of environments on wellbeing of patients within two public healthcare facilities, namely the uMphumulo Hospital in Maphumulo, Illembe District and the Appelsbosch Hospital in Ozwathini, uMgungundlovu District. Both of these facilities are situated in the rural areas of KwaZulu-Natal. It will focus on the environmental factors that cause stress and affect wellbeing of patients. In addition, the research will focus on the insight of doctors, nurses, admin staff and past patients to collect vital data on the experience within the environment in order to for the researcher to conduct the research ethically.

This research will benefit the underprivileged people in society that require quality healthcare and improved healing environments. For that reason; there is a need for better quality healthcare environments that will least disturb the healing process, relieve stress and pressure of being in a healthcare facility, thus promoting faster recovery of patients. This will also help reduce overcrowding in public healthcare facilities, help reduce operation costs, reduce medication used in the healing process of patients; thus creating a sustainable solution to public healthcare architecture in South Africa.

1.3.6 Table Summary

	PROBLEM	AIM	OBJECTIVE	QUESTION
KEY	The poor condition of public healthcare facilities in rural areas contribute negatively on its patients' wellbeing.	To interrogate rural healthcare facilities to reveal existing challenges that are contextually specific.	To understand the effect that current public healthcare architecture has on its patients in rural areas.	What factors in current public healthcare architecture that do not contribute to the negative impact on the wellbeing of patients in rural areas?
SECONDARY	Rural, public healthcare environments, do not contribute positively to the health and wellbeing of patients.	To link poor public healthcare environments to poor human wellbeing within healthcare facilities.	To identify how poor health care environments affect patients wellbeing in rural areas.	How do poor health environments affect patients wellbeing within a healthcare facility?
	Public healthcare facilities, in rural South Africa do not offer proper architectural healing environments in order to promote patients wellbeing.	To generate contextually specific architectural principles in order to promote patients health and wellbeing.	To generate contextually specific architectural principles in order to promote wellbeing of patients.	What contextually specific architectural principles can be identified in order to promote patients wellbeing?
	There is a need for a new model of public healthcare architecture within rural South Africa, which not only aids in the health of its patients, but also improves their wellbeing.	To inform the design of a new model of public healthcare facility that can promote patients wellbeing in rural KwaZulu-Natal.	To contribute towards a new model of public healthcare architecture within the rural context that promotes patients wellbeing.	What new type of public healthcare architecture will best promote patients health and wellbeing in the rural areas of South Africa?

**Table 1, adapted by Author (Author, 2015)*

1.4 SETTING THE SCOPE

1.4.1 Hypothesis

Patient wellbeing and healing is supported by the combination of a balanced built and natural environment; these fully purposed, architecturally designed spaces promote the wellbeing of patients through a series of psychological systems that benefit patients positively. This understanding will help promote patient healing time and overall wellbeing.

1.4.2 Research Scope & Limitations

This study may have a few limitations in terms of sampling and data collection. The sample will only consist of staff and past patients of the healthcare facilities, as current patients within inpatient wards are persons who have experienced medical problems and may be dependent on medical care. Therefore, this may influence the way they answer questions, resulting in skewed or unreliable information due to their vulnerability.

The participants may find the method of observation, intrusive as private information may be observed. This may cause participants to act or respond differently as they know they are being observed. Thus volunteering to work with the participants will help obtain more in-depth information without the intrusive feeling of the participants.

The method of interviews, participants may not be comfortable in an interview, may not be located in the natural setting of the healthcare facilities and the researcher's presence may bias the participants responses. This may influence the way that they may respond as they may intentionally answer questions in a biased manner, resulting in skewed or unreliable information. For that reason, it is important to create a conversation within a recognisable natural setting to help the interviewee feel comfortable.

1.4.3 Delimitation of the Problem

This dissertation primarily deals with understanding the environmental issues within current public healthcare built environments in rural areas. In addition, it deals with how these environmental stressors may affect patients' health and wellbeing. The overall thought is to research various built, architectural environments that may reduce the patients' stressors within these environments; as a result, aid in promoting health and wellbeing within a well designed healing facility. This research is not going to address the staff-working environment and the staff wellbeing.

1.4.4 Definition of Terms

Public Healthcare Facilities – Healthcare facilities that are designed; funded and maintained by the South African Government.

Patient's Wellbeing – This refers to the holistic health of a patient, the combination of the patients' physical, spiritual and psychological health.

Rural Area – Area located outside of cities and towns (urban areas) with low population density and small settlements.

Contextually Specific Architectural Principles – Architectural principles that are specific to one type of setting, however can be adjusted to better suit different particular site.

New Model of Public Healthcare Facilities – A new, more advanced design of Public healthcare facility that can promote wellbeing through its design.

Contextually Specific – Relating to the surrounding areas, issues and challenges.

Health Promotion – Aiding healthier living and better health outcomes of patients.

Nosocomial– Disease or infection acquired in a hospital environment.

Healing Environment- This describes the physical setting that supports patients wellbeing and the process of which was negatively affected by illness or hospitalisation.

1.4.5 Stating the Assumptions

- The wellbeing of the patients' will be the primary focus
- Built healthcare environments are not contributing to holistically healing their patients', due to their poor design
- Health and wellbeing of patient will be aided through better architectural environments

1.5 CONCLUSION

This chapter articulates the issues within public healthcare facilities. It also articulates the issues within the aspects of architecture and its effect on patients. This chapter also identifies a serious problem within public healthcare facilities of the more underdeveloped rural areas of KwaZulu-Natal. In addition, it states the aims/objectives, research questions and problem statement, before setting out the scope and delimitation of the research. This chapter shows how this topic can be researched as an architectural discourse.

CHAPTER 2: RESEARCH METHODOLOGY

2.0 INTRODUCTION

The following chapter outlines the various methods of research used to conduct this study in order to achieve the aims and objectives outlined in chapter one. This section is divided into four parts namely; the design of the study, primary research methods, secondary research methods and methods of data analysis; thereafter followed by the conclusion. The research methodology was used to investigate and analyse the data collected, answer the research questions and confirm the hypothesis.

2.1 DESIGN OF THE STUDY

A Qualitative research methodology was chosen for this research in order to understand the relationship between the built form and patient wellbeing. This was achieved through exploring perceptions of the healthcare facility's personnel and how the healthcare architecture impacts it. This study was designed to explore the use of primary data in the form of semi-structured interviews from a Purposive sample as well as observation as data collecting tools. This allowed the researcher to compare and evaluate the primary data with the secondary data collected.

2.1.1 Qualitative Approach

As mentioned above, the approach was a qualitative one, as this research was subjective and was seeking to understand the experiences, perceptions and thoughts of the healthcare personnel and past patients within the uMphumulo Hospital in Maphumulo, Illembe District and the Appelsbosch Hospital in Ozwathini rural area, uMgungundlovu District in KwaZulu-Natal. It was required that the researcher immerse himself within the respective facilities and in order to understand the contextual issues of the environments, in order to collect data of personal perception and experience.

2.1.2 Exploratory

Secondly, the method that was applied in this research was exploratory. According to Kothari (2004), an exploratory study majorly emphasizes on discovery and understanding of ideas and insights. The goal of this research was to understand the contextual issues within public healthcare facilities in rural areas; in order to create a better healthcare environment for patients' wellbeing, based on the case studies available. This method aided in gathering information about the existing challenges of wellbeing of patients in rural areas within the uMphumulo Hospital in Maphumulo, Illembe District and the Appelsbosch Hospital in Ozwathini, uMgungundlovu District, as more information was needed to conclude the research.

2.1.3 Sampling Design

A sample of two healthcare personnel (doctor and nurse), two administration personnel and four past patients (total of eight) were selected from uMphumulo Hospital in Maphumulo, Illembe District as well as the Appelsbosch Hospital in Ozwathini rural area, uMgungundlovu District in KwaZulu-Natal. Moreover, this sample represented different races and employment levels. The distinguishing factor was their different experiences within the public healthcare facility. This sampling design was chosen as not to affect current patients' ethically as well as not to affect their wellbeing.

The researcher used Judgmental/Purposive sampling in order to source past patients, doctors, nurses and administration personnel to provide the required information of their experiences aligned with the research objectives and questions. This method was useful in obtaining more contextually specific information and better understanding the user's experiences within these public healthcare facilities.

2.2 PRIMARY DATA COLLECTION

2.2.1 Case Studies

This research was focussed on the two case studies presented. The case study approach provides the best opportunity for contrasting and comparing similarities and differences between each of the two cases adopting varying degrees of contextual issues (Yin, 2003). Case studies were carried out and were critically analysed. These case studies are namely; the uMphumulo Hospital in Maphumulo, Illembe District and the Appelsbosch Hospital in Ozwathini rural area, uMgungundlovu District in KwaZulu-Natal. Each case study was conducted on the identified sites and included personnel Observations and Interviews, the functioning of the facilities, photographs and sketches of possible resources of the intervention. These case studies cover both positive and negative architectural aspects that affect patient wellbeing. Therefore, the case studies provided an in-depth understanding of problems as well as possible solutions in current public healthcare facilities in rural areas. Thus, informing a suitable architectural response that benefits patient health and wellbeing.

2.2.2 Observations, Photographs & Sketches

In order to find out how public healthcare facilities in rural areas influence the wellbeing of its patients, the researcher spent time within the facilities; volunteering as one of the administration personnel, over six day period, in order to share the experience of the users and get first-hand experience of each of the two facilities. The researcher documented the dynamic of the environment through photographs, sketches and recorded his experiences and observations. He also focused on the behaviour of personnel within the facilities. In addition, how the users interact with their surroundings. This enabled the researcher to identify conducive and non-conductive environments that have positive and negative effects on the wellbeing of users.

2.2.3 Interviews

This research calls for a comprehensive understanding of the patients' perceptions. Therefore, through the perspective of the staff (doctors, nurses and administration personnel) and past patients', the researcher conducted eight interviews in total, four interviews per healthcare facility. This data collection method helped garner information about the effects of the environments on patients' within the uMphumulo Hospital and the Appelsbosch Hospital. The interviews were semi-structured and conversational in order to help clarify the researcher's experiences and observations. This method of interviews enabled participants to be comfortable, therefore evoking a conversation, which extracted the desired data. Open-ended questions were used not to be biased.

The primary data collecting methods of observations and interviews proved a balanced set of data between the etic approach of observations and emic approach of interviews.

2.3 SECONDARY DATA COLLECTION

2.3.1 Library Studies

Library studies were used to examine current literature and identify levels to which contextual issues are incorporated into rural healthcare facilities and their importance for the patients' health and well-being. Library studies included various published materials namely books, journal articles, internet pages, academic papers and documents explored and found information on the general understanding and consensus of architectural environments and the human wellbeing. This provided an architectural understanding for both the form and facilities required. Library studies also included design and construction drawings of the relevant plans of the case studies.

2.3.2 Precedent Studies- Specific Library Studies

Precedent studies were used to investigate new ideas and strategies on promoting wellbeing within built environment. These were precedent studies, which had applied new strategies and ideas to healthcare facilities and healing centres locally and internationally. This data gathering method was similar to that of Case Studies, however was conducted only through library research.

2.4 METHOD EMPLOYED IN DATA ANALYSIS

The data analysed throughout the literature was done through exploratory methods of analysis. The Exploratory method suggests that the gathered data needs to be broken up and re-organised. Important facets of the research were identified which correspond or overlap with one another, and these occurrences were made clear to the researcher. The data analysis was informed by the recurrent issues/themes, research objectives and questions. In addition the analysis of data was done through aspects of the theoretical framework informed by primary theories or concepts. Once the primary and secondary data was analysed, they were combined to inform the design process.

CHAPTER 3: CONCEPTS & THEORIES

3.0 INTRODUCTION

This chapter will introduce the three major theories and concepts the dissertation. These theories and concepts are applied to analyse all data collected within the perspective of the dissertation topic of wellbeing in healthcare facilities. These theories and concepts will also be applied in the architectural design phase. The theories and concepts are discussed in more detail below:

3.1 THEORIES

3.1.1 Genius Loci- Theory

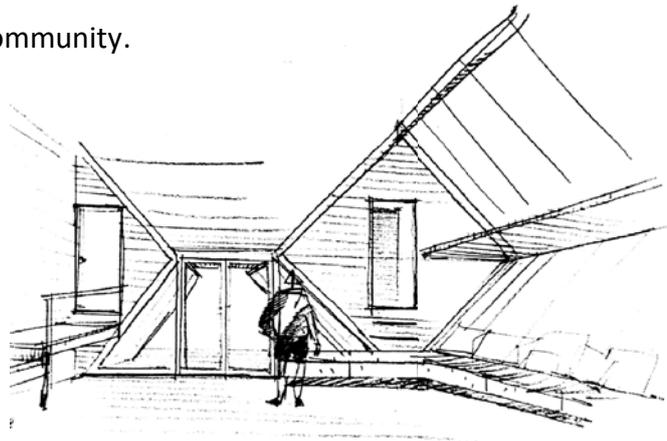
'Genius Loci' originated in the classical Roman religion and was the protective spirit of place. The movement of 'Genius Loci' evolved and developed in the past couple of centuries through the disciplines of art, architecture and particularly in landscape design. Poets such as Alexander Pope (1688-1744) wrote about 'Genius Loci' exploring the ideal classical view, shaped by humans who reflect the term Genius Loci in relation to landscape or place. Pope's verse was the foundation for the principle that landscape designs should always be adapted to the context in which it is situated (Mowl, 2000). In the context of the modern day architectural movement, Genius Loci have an important effect on the atmosphere of a place or 'spirit of place'. Norberg-Schulz (1926-2000), a Norwegian architect, educator and architectural theorist, re-introduced the topic into the modernist movement and explored this field most notably in his book, *'Genius Loci: Towards a Phenomenology of Architecture'*.

The theory of Genius Loci (or 'spirit of place') is a reality that faces an individual on a daily basis within society (Law & Shek, 2014). Genius Loci can be defined as the unique atmosphere or spirit of a place (Silva, 2015). In essence it deals with the spaces where life occurs, which affect the individuals' senses. The individual dwells and feels comfortable when they can identify with the place; therefore, a 'dwelling' is not merely just a 'shelter'. These spaces are places, in the spirit of the word, where life occurs. In the form of architecture, places need to be created with meaning, where individuals will be placed (Norberg-Schulz 1980). In the same approach of genius loci, Yi-fu Tuan (1977) explains that the theory relates to how an individual's psychology, feelings and emotions are evoked in a particular environment. It is something that does not necessarily bring on

words, but rather a 'sense of place'. Relating directly to architecture, it can be brought on through the individual's awareness of the area of a space and form, which is informed by the shape of the building and the surrounding spaces of the environment. These aspects of the built and natural environment will play a vital role in creating architecture that embraces Genius Loci.

Kropf (1996) and Jive'n & Larkham (2003) argue that Norberg-Shulz approach may result in a place with character, but argue that it is the people (individuals and society), through their input and value systems who form a sense of place. Therefore, a socially inclusive approach with other aspects such as social activities would help to move towards a better account of character (Jive'n & Larkham, 2003). Relating to architecture within a rural context, this could be brought on through the involvement of the surrounding community in the operation and maintenance of the facility as well as supportive infrastructure to aid the community.

Figure 2, image showing relationship between man and his immediate built environment (<http://www10.aeccafe.com/>)



The theory of Genius Loci is positive when users of specific environments are able to identify themselves with a specific place. Therefore, would feel comfortable within it, thus promoting their wellbeing. However, a more socially inclusive approach would aid towards an even better environment. Therefore, it is important to create architecture that affects those experiencing it positively, in order for the individual's to feel comfortable, through socially inclusive and thoughtful design. Relating to the topic, this becomes important, in understanding the relationship between healthcare environments and its patients, but also important in the formation of a better solution to healing environments for rural communities. Genius Loci is also a very important theory in selecting a site that offers the feeling and psychology associated with Genius Loci in order to create a new model of responsive public healthcare environment that benefits its patients and the surrounding community.

3.1.2 Social Construction- Theory

Social Construction emerged about thirty years ago. It has a social focus as opposed to focusing on individuals (Andrews, 2012). Social Construction originated in the post-modern era and has very strong ties to sociology. It emerged as an attempt to come to terms with nature and reality. It is an anti-realist, relativist stance (Hammersley, 1992).

Peter Ludwig Berger (born 1929), an Austrian-born American sociologist, and Thomas Luckmann (born 1927), an American-Austrian sociologist, introduced the term Social Construction into the social sciences with their book *“The Social Construction of Reality” (1966)*, which was about sociology of knowledge. Berger and Luckmann were strongly influenced by the earlier works of David Émile Durkheim (1858 –1917), a French sociologist, social psychologist and philosopher and Karl Marx(1818 –1883), a philosopher, economist, sociologist, journalist, and revolutionary socialist. Durkheim and Marx first pioneered the idea of sociology of knowledge at the end of the nineteenth century. They were also strongly influenced by the later works of Alfred Schütz (1899 –1959), an Austrian social scientist, who contributed towards the development of the theory of social phenomenology, and George Herbert Mead (1863–1931), an American philosopher, sociologist and psychologist and one of the founders of social psychology. Berger and Luckmann’s writing therefore synthesis’ the sociologist thinking of Durkheim and Marx with the phenomenological thinking of Schütz and the psychological thinking of Mead to form of Social Construction (Andrews, 2012).

The theory of Social Construction observes the development of constructs as a by-product of social interaction in the understanding of the world. Social constructs are said to be a result of social facts and are developed in co-ordination with other human beings. These constructs are positioned in opposition to natural facts and are rationalised by human beings joint experience by forming a model of the social world and how it functions (Jackson, Penrose, 1993). Thus, various individual’s negative experiences of public healthcare facilities would begin a negative social construct about public healthcare facilities.

Social constructs of knowledge are not produced by nature, therefore have to be preserved and re-affirmed, as they are not in-born or fixed at birth. This is in line with the Nurture argument in the notion of Nature verses Nurture; rather than genetics or in-born traits, constructs of social ideas

and stereotypes such as race, language and nationality; are socially constructed and shaped by their social environment (Jackson, Penrose, 1993). As mentioned in chapter one, the stereotype of public healthcare facilities in the rural areas of South Africa are perceived to be poor. This social construct is to some extent true, with the wide acknowledgement of severe issues in public healthcare facilities in rural South Africa (Awake Magazine, 2005). However, this generalised stereotype can be altered through more positive healthcare environments that support patient wellbeing and positive social interactions within public healthcare facilities.

This theory is important for future designers of public healthcare environments; in order to alter the social construct of the public perceptions through positive healthcare environments. These positive public healthcare environments should support interaction that is more social in order to shape a new more social construct about public healthcare facilities in rural South Africa. Therefore, relating to the topic, ideas of a more community inclusive approach, to a socially interactive healthcare environment that would aid in altering the social construct of the public, as their involvement and interactions would form a positive public healthcare facility that they are proud of and in turn alter their social construct of the public about these healthcare environments. This is also a very important theory in selecting a site that offers a close-knit community that will support and participate in the design, construction, operation and maintenance of the public healthcare facility.

3.1.3 Gestalt- Theory

'Gestalt' is a German word that translates as 'form or shape'. This term refers to the visual input of humans and their perception it. The origins of 'Gestalt' are still a bit unclear. It was said to be first introduced in philosophy in the early 1890's by Christian von Ehrenfels(1859 – 1932), an Austrian philosopher. In the early 20th century Max Wertheimer (1880 – 1943), an Austro-Hungarian-born psychologist, founded Gestalt psychology. Wertheimer's original notion was that humans perceive motion when there is nothing but a rapid series of individual sensory events, such as lights flashing in sequence. This notion has been expanded over the years; with objects being viewed and perceived within an environment as one 'whole form'. In the mid to end of 20th century, David Walter Hamlyn (1924 - 2012), a philosophy professor, utilised these notions and explored them architecturally in his book, *'The psychology of perception; a philosophical examination of Gestalt theory and derivative theories of perception'*.

The psychological based Gestalt theory is vital in linking an individual's feelings and perception through psychology and logic. Hamlyn (1969) explores the capability of individual's senses; and recognizes that the perceptions relate more to the individual's visual recognition of forms and figures rather than lines and curves (Hamlyn 1969). Architecturally, it relates to an individual's interpretation of space, environment and scale of objects. Individuals perceive objects in a specific way; in addition, one's visual perception is a passive process which he/she understands (Hamlyn 1696). Thus, visual perception is an individual and dynamic process; however, it excludes the experience of other senses.

However, Pallasmaa's (2012) idea is that the dominance of vision in art and architecture, suppresses the other tactile senses in one's experience and understanding of the world. The observation being that 'life-enhancing' architecture should address other senses at the same time in order to fuse one's image of self within the experience of the world, though mostly focusing on the peripheral capability of the sense of touch (Pallasmaa, 2012).

"...I learned that our skin is capable of distinguishing a number of colours; we actually see with our skin." (Pallasmaa, 2012)

The individual's capacity to perceive and grasp, environments and atmospheres, unconsciously and peripherally before any observation details are made through touch, is astonishing (Pallasmaa 2012). Therefore, the idea that skin can unconsciously perceive an environment before the eyes can.

The Gestalt theory is more of an urban-based theory. However, the key aspect is evoking positive feelings and perceptions through psychology within an environment. This will allow individuals to interpret space through a sensory experience of the built and natural environments within the rural context. This is also important within the context of human wellbeing environments, as one should consider the peripheral capability of the sense of touch to form a welcoming place for the other senses. This becomes important when relating to the topic of understanding the relationship between specific architecture and its users; as it can alter an individual's feelings and perception of an environment. Gestalt Theory is also a very important theory in selecting a site that offers users a positive sensory experience through the design of this facility, as well as sensory experience through the environment and natural landscape around the facility.

3.2 CONCEPTS

3.2.1 Wellbeing

The concept of human wellbeing is strongly related to health and the environment (Easthope & White, 2006). According to Australian Institute of Health and Welfare (AIHW, 2003), the term 'wellbeing' can be generally described as a state influenced by various cultural, social, emotional and behavioural phenomena and includes other issues such as physical and mental health, spiritual vitality, education and other behaviours (Easthope & White, 2006). However, health focuses on a precise condition whereas wellbeing focuses on the outcomes of the human's health issues, amongst other things (AIHW 2003). Thus health is one aspect of wellbeing.

Wellbeing has hardly ever clearly defined in health and wellbeing discussions; however, psychological literature offers a more detailed discussion on human wellbeing. The individual's perception of wellbeing is said to correspond with their own quality of life, which includes achievements, quality of relationships, values and beliefs (Diener & Eunkook, 2000) (Easthope & White, 2006).

Furthermore, a more holistic perspective investigates other aspects such as individual's spiritual and cultural views, social participation and inclusion in activities and social support of wellbeing (Eckersley et al. 2006) (Law & Shek, 2014). Thus, the individual's vitality is closely related to the social elements of life. Therefore, in order to create a facility that supports human wellbeing one must not only consider the physical health of the individual, but also the mental and spiritual vitality as well as the social support of wellbeing.

The issues and aspects that affect wellbeing are strongly related to the theories of Genius Loci, Gestalt theory and Social Construct theory. These theories use the aspects of the concept of wellbeing such as emotions, psychology and social interaction in order to influence the creation of better spaces and environments, therefore promoting human wellbeing.

The concept of Wellbeing is important as it helps identify the issues that need to be dealt with in order to create a facility that supports healing and human wellbeing. Moreover, healthcare facilities shouldn't only focus on health, as it is only one aspect of wellbeing, therefore the natural

environment can help support the medical process of healing to create a more holistic take on medical care. Relating to the topic, this becomes important, in understanding the how to improve rural healthcare facilities in order to promote patient wellbeing through an enhanced relaxed and calm surrounding. This also becomes important in selecting a site location, as it should offer a relaxing and peaceful natural environment in order to achieve human wellbeing.

3.2.2 Consensus Design

Day (2007) approaches architecture with a concern on wellbeing and the greater environment. Day explains that the social process is vital in the forming of architecture; in the commitment to, and collaboration with individuals, community and society. According to Day (2007) to accomplish consensus design, a technique of evaluation and direct involvement of individuals' (potential users), relating to key issues in relation to the architecture is vitally important (Day, 2007). This approach to design will allow participants to be part of the process in creating a new environment, thus giving the participants a sense of pride in the facility.

Layers define 'Place': physical aspects, the life (individuals) that passes through them and their moods and spirits. Day (2007) views spirit of place as the participation of the individuals within the place, feeding it with actions, emotions, thoughts and values. The underlying motive of 'spirit' in every intervention will enable the individuals who utilize and occupy the space, as well as being directly involved in the creation of their space (Day, 2007). This participation of individuals would generate their spirit into life form within the environment to be enjoyed by others entering the space.

The aspects of consensus design are strongly related to the theories of Genius Loci, and Social Construct theory. These theories use the aspects of the concept of consensus design such as spirit/sense of place, social inclusion and interaction in order to influence the creation of better spaces and environments that relate to its users as well as the society/community. Thus creating an environment that is comfortable and that individuals and society can relate to.

The concept of consensus design is important in the formation of architecture that is connected to the individuals who use it. The idea being that, one is always designing for individuals and society (people who occupy the place), therefore social inclusion or consensus of those potential users will help inform the architecture and would in essence feed a 'place' with 'spirit' and give the users

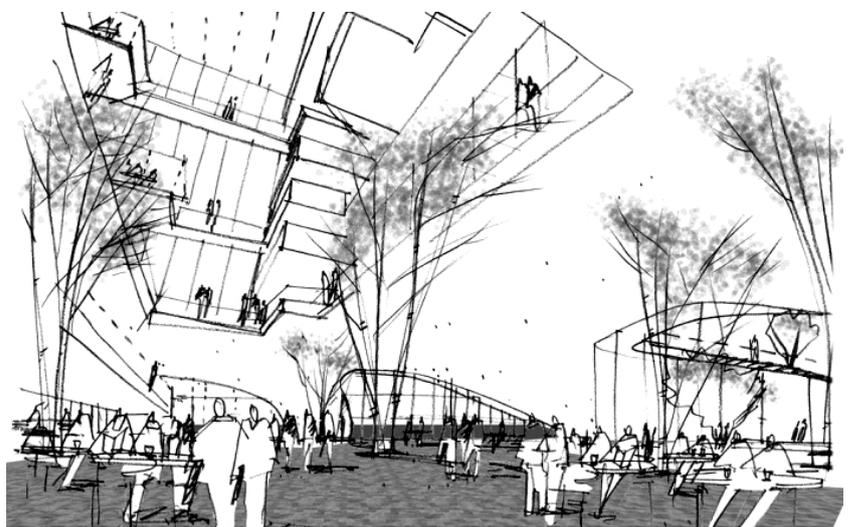
(individuals and community) a sense of pride in the facility. Relating to the topic, this becomes important in the formation of a better solution to healing environments that are filled with input and support (operation and maintenance) of the surrounding community and the individuals who occupy the space. Thus creating a more socially supportive and sustainable facility.

3.2.3 Nurturing Environment

Nurturing Environments are environments that foster successful development and prevent the development of psychological and behavioural problems. According to Biglan et al. (2012), the concept of nurturing environments not only prevents the development of psychological and behavioural problems, but they should also promote the healing of the problems too. Nurturing environments physically minimise biological and psychological toxic events that effect human wellbeing. They also promote positive social behaviour, including self-regulatory behaviours and all of the skills needed to become productive adult members of society, as well as monitor and limit opportunities for problem behaviours (Biglan et al, 2012). These aspects of nurturing environments support the idea of a new model of a more holistic healing environment that would promote human wellbeing.

According to Biglan et al. (2012), Current healthcare environments focus is on the individual's health problems, however if focus is shifted to the prevalence of nurturing environments, there will be progress in reducing physical, emotional and behavioural disorders sub-consciously, thus improving healing and wellbeing (Biglan et al, 2012). A public healthcare movement formed on the foundation of the ideas and notions of nurturing environments and their prevalence will aid in reducing physical, emotional and behavioural illness, thus improving wellbeing.

Figure 3, Image showing a spatial definition that utilizes the elements of natural lighting, air movement and views manipulation to create a Nurturing Environment (<http://sheilaharrington.org/>)



The issues and aspects of nurturing environments are strongly related to the theories of Genius Loci and Gestalt theory. This concept is also strongly related to the concept of wellbeing, as it deals with physical, emotional and behavioural issues that influence wellbeing negatively. These theories and concept use the issues of the concept of nurturing environments in order to influence the creation of better spaces and environments that relate to promoting users wellbeing.

The concept of a nurturing environment is important in the formation of new model of healthcare architecture that not only deals with the medical process of healing, but also the use of environments to heal; thus promoting human wellbeing within environments, built and natural, and aiding in faster and a more holistic healing of users. In addition, it is critical in the process of selecting the appropriate site in order to achieve a positive nurturing environment. This becomes important in the formation of a better solution to public healthcare facilities in rural areas of KwaZulu-Natal.

3.3 CONCLUSION

This chapter explores theories and concepts that relate to the wellbeing of patients in public healthcare facilities in rural areas. Healthcare design in rural areas previously focused on the efficiency of staff and the healthcare facility itself. However, the theories and concepts above show a shift towards a more patient centred and community involved evidence based design in order to create a healing environment that will promote patient wellbeing. A more central focus on environmental design in order to promote wellbeing, will aid in public healthcare facilities that will not only offer improved comfort and wellbeing but also a more sustainable model of architecture for the future. From this research, it is clear that these theories and concepts can be used to improve public healthcare facilities in rural areas, in order to promote the wellbeing of patients.

CHAPTER 4: LITERATURE REVIEW

4.0 INTRODUCTION

The following chapter will introduce the literature reviewed, which will articulate the issues that will structure the research. In this section, the researcher will present conclusions, gaps and trends in the literature in order to articulate the concepts and theories towards the theoretical framework for the architectural design response of the healing centre.

4.1 PROBLEMS IN SOUTH AFRICAN HEALTHCARE

4.1.1 Introduction

As mentioned in chapter one, South Africa's healthcare reflects the country's status and position as a third world country progressing toward a first world status. There are vast differences between private and medical research healthcare facilities, which are advanced and at the forefront of healthcare in the world, and the public healthcare facilities in rural areas which only offer the basic needs (Awake Magazine, 2005). The rural areas/settlements are dispersed and pose unique challenges for the development and service delivery of health care in these areas. The dispersed layout also poses difficulty to the service delivery of social determinants of health; such as water, sanitation, waste removal, electricity, etc (KZN DoH, 2015). The lack of social determinants of health contributes towards the spread of chronic and serious diseases.

4.1.2 Rural Public Healthcare Issues

There are many issues in the context of public healthcare facilities in rural areas of South Africa and particularly in KwaZulu-Natal. Access to, and delivery of healthcare facilities in the rural areas of KwaZulu-Natal are very poor (Gaede & Versteeg, 2011). There are many challenges within rural areas that prevent people from accessing public healthcare facilities. According to the KZN, Department of Health Strategic Plan 2015-2019, poverty is a major factor associated with disease, due to malnutrition. Poverty leads to food insecurity which in turn leads to poor nutrition, which affects the functioning of the immune system leading to susceptibility to disease (including HIV and TB) (KZN DoH, 2015). Additional negative contributing factors are availability and cost of transportation to and from public healthcare facilities (KZN DOH, 2015). There are also many

challenges in healthcare quality within rural areas, ranging from poor infrastructure to inadequate monitoring of patients (Maritz, 2013). These facilities are often under equipped and poorly staffed. According to Maritz (2013), these challenges need to be met with innovative solutions that are cost effective, robust and sustainable (Maritz, 2013). Specific conditions need to be taken into account when planning healthcare infrastructure and health services in rural areas.

However, as reported by Media Club South Africa (2012) there are been about 4 200 public health facilities in South Africa. The number of people per healthcare facility is 13 718, exceeding the guidelines of 10 000 people per healthcare facility (Media Club South Africa, 2012). Since 1994, over 700 clinics have been built or upgraded and about 2 300 clinics supplied with new equipment. In addition, 125 mobile clinics were introduced in order to improve the state of public healthcare in the country (Justlanded, 2014). However, these improvements, new clinics and upgrades haven't addressed the environmental issues within these facilities, as the design and infrastructure of public healthcare in rural areas has always remained rigid, in order to provide a higher quantity of healthcare facilities as opposed to higher quality healthcare facilities.

According to Gaede & Versteeg (2011), the national public healthcare funding allocation of financial resources is not strategically allocated according to the needs of the provinces and focuses on areas with higher population growths. This leads to higher funding within urban areas. Gaede & Versteeg (2011), argue that the better-resourced health infrastructure receive higher levels of funding in order to maintain the high level of care (Gaede & Versteeg, 2011). However, the KwaZulu-Natal Department of Health Strategic Plan 2015-2019 (2015), states that public healthcare facilities in rural areas are in need of infrastructure development to deal with the high levels of infections e.g. Tuberculosis (TB); thus suggesting that funding will be channelled towards rural healthcare infrastructure development.

“Healthcare facilities do not (in general) comply with infection prevention and control specifications and thus being prioritised within a limited funding envelop.” (KZN DoH, 2015)

According to the KwaZulu-Natal Department of Health Strategic Plan 2015-2019 (2015), the province has the largest burden of HIV and TB related infections in South Africa. It also has the highest HIV/TB co-infections rate of 70 % (KZN DOH, 2015). This is due to nosocomial transmission of TB to the vulnerable HIV-infected patients within the poorly ventilated public healthcare facilities. HIV-infected patients can contract the disease through infected TB patients as well as occupational transmission (facility staff) and overcrowding. This is prevalent in the Ugu, Umzinyathi and Zululand rural districts of KwaZulu-Natal (*figure 4*). The combined infection rate in these areas, of HIV/TB is estimated at 70% (KZN DoH, 2015). Thus, the Department needs to reduce TB infections and HIV/TB co-infections by improving ventilation to control and prevent further infections.



Figure 4, Shows the Socioeconomic quintiles of South Africa. It shows the rural areas of KZN as one of the most deprived areas in the Country (KZN DoH, 2015).

As mentioned above issues of natural ventilation and overcrowding are major contributors in the transfer of infections and disease within public healthcare facilities. However, there are also other issues such as, way finding, natural lighting and sustainability, which have a negative effect on the patients (Justlanded, 2014).

Patients and healthcare providers are exposed to contracting airborne diseases within poorly designed healthcare facilities. These airborne diseases are due to healthcare facilities being overcrowded, corridors being used as waiting rooms and insufficient natural ventilation creating constant air changes within the facility; particularly in rural, impoverished settings (*figure 4 & 5*). Some other environmental factors that influence patient's wellbeing negatively include high noise levels, lack of windows, lack of views to nature, institutionalised feel and poor air quality (Ulrich, 2000). These problems have to be mitigated through well researched, quality design strategies'.



Figure 5, Shows long queues in order to receive medical care
(<http://www.meditech.co.za/news/rotherham-starts-to-implement-meditech/>).



Figure 6, Showing, overcrowded waiting room potentially harbouring airborne diseases
(<http://www.health-e.org.za/2014/12/09/numbers-national-health-insurance-mpumalanga/>).

4.1.3 Site Location as an Issue

Primary Health care is the basis of healthcare delivery to persons in rural areas of developing countries; therefore, primary health care must be accessible to the bulk of the population to be successful (Tanser, 2006). Poor access to primary health care can lead to decreased vaccination coverage, difficult pregnancy outcomes and infant mortality as well as affect treatment regimens for chronic diseases (Wilkinson & Tanser, 1999). Therefore, the site locations of primary health care need to be maximised in order to ensure increased population coverage.

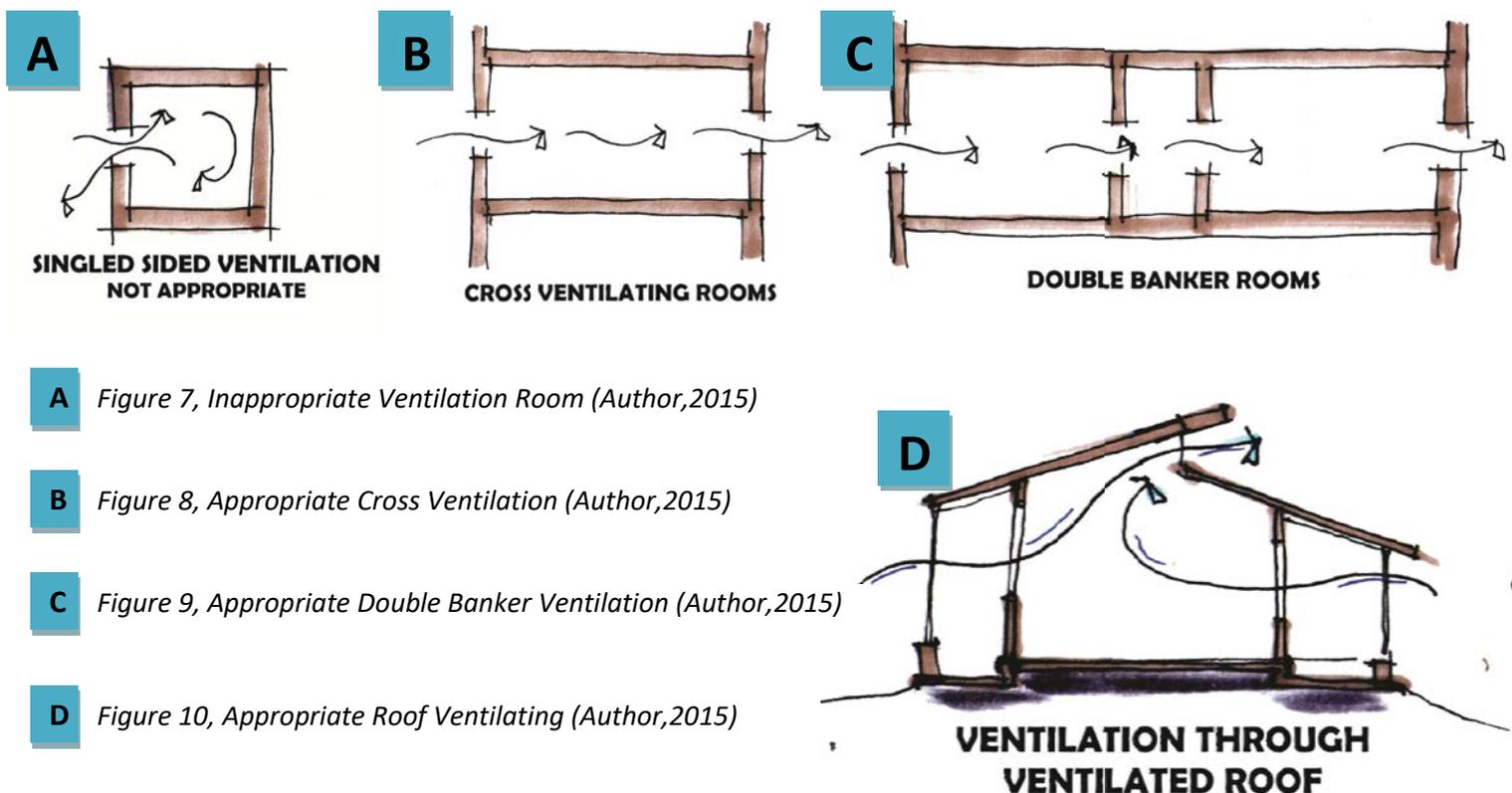
The threshold value that is used to denote “reasonable access” to a District Hospital (typically 30 km or one hour) can be contentious and should be population specific (Green, 2012). According to Tanser (2006), the geographical dispersion of the population makes inequalities in access to healthcare facilities inevitable, especially in areas like rural KwaZulu-Natal, which has no village structure (Tanser, 2006). Poorer populations are more likely to exclusively use the nearest health care facility irrespective of discrepancies in standard of delivery (Smith *et al.* 1999). Thus, the placement of healthcare facilities in rural areas are very important and therefore these facilities should be located where majority of the population can access the services they offer.

According to Tanser (2006), it makes sense placing a new healthcare facility close to other amenities as to make it inexpensive for individuals to travel. Therefore when an individual travels they not only obtain health care but can do shopping, banking and get other government services. This is a viable option as it takes into account the use of public transport by individuals, the better more developed road network, the proportion of population within that central node and offers easier access to the facility for patients and staff, thus making rural healthcare facilities more accessible to the target population.

4.1.4 Dealing with the Problem

As mentioned above by the KwaZulu-Natal Department of Health Strategic Plan 2015-2019 (2015), health facilities in rural areas of KwaZulu-Natal do not comply with infection prevention and control specifications, thus these factors need to be prioritised (KZN DOH, 2015). The Department of Health in KwaZulu-Natal have developed a long-term plan called, the 10-year User Asset Management Plan (U-AMP) in order to deal with service delivery pressures. U-AMP requests, on average, R1.9 billion over the next three years (KZN DOH, 2015). There are two major priorities of U-AMP; priority one is specialised TB healthcare facilities, decentralised MDR-TB units and infection prevention and control.

The department is also trying to improve ventilation in all healthcare facilities, in order to stop the spread of disease within the facilities. This can be achieved through different types cross ventilation through the space (figures 7,8 & 9). One example is changing the ward designs to promote natural ventilation. Priority two is new clinical buildings and infrastructure and upgrading and maintenance of the existing infrastructure, with maintenance of all healthcare facilities being prioritised (KZN DOH, 2015). This plan strives to change healthcare facilities in order to prevent and control infection, however lacks the architecture of a new model of healthcare facility, which is context specific, to improve the healthcare outcomes and wellbeing of patients.



A Figure 7, Inappropriate Ventilation Room (Author,2015)

B Figure 8, Appropriate Cross Ventilation (Author,2015)

C Figure 9, Appropriate Double Banker Ventilation (Author,2015)

D Figure 10, Appropriate Roof Ventilating (Author,2015)

A study conducted by MariskaShioiri-Clark aided in the design of a new model of healthcare architecture in Burera District, Rwanda. Shioiri-Clark specifically focused on healthcare in developing countries and rural areas where she interrogated how the existing public hospital design could be improved to neutralize health risks and promote wellbeing (Architecture for health, 2012).

Well-informed changes included removing corridors in order to prevent the movement of airborne diseases and improved ventilation through larger windows, oversized fans and clerestory windows (figure 11 & 12). Additional emphasis was placed on the hospital's site location and how it connects to that particular place, in order to serve the context and in turn for the context to serve the hospital and its patient's (A daily dose of architecture, 2012).



Figure 11 & 12, Butaro Hospital naturally ventilated and naturally lit, modified, innovative ward design (Arch Daily, 2011).

The product was a hospital design incorporates inventive and cost-effective design modifications that support access to healthcare and preventing the spread of disease, thus improving patient wellbeing. Therefore proving that a new model of healthcare facility can improve patient wellbeing, prevent disease and support access to health (Architecture for health, 2012). This building will be further explored, as a precedent study in the following chapter.

4.1.5 Conclusion

The lack of social determinants of health (water, sanitation and waste removal) in rural areas aid the spread of serious disease, in addition the dispersed nature of the rural settlements of South Africa provide development and service delivery challenges for the Department of Health.

The high rate of disease, coupled with poverty, lack of access to proper healthcare facilities provides many challenges that need to be taken into account in designing proper healthcare infrastructure. The challenges need to be met with innovative solutions that are cost effective and sustainable that is accessible to all.

The current improvements, upgrades and new healthcare facilities have not addressed the specific contextual issues and health issues of the rural areas. The infrastructure in rural areas has remained rigid in order to provide a high quantity of low quality healthcare facilities. This U-AMP plan strives to change healthcare facilities in order to prevent and control infection. Therefore, there is a need for a new model of healthcare facility that meets the challenges of the rural context and prevents and controls infections in order to improve health care outcomes and patient wellbeing.

The Butaro Hospital is an excellent example of a hospital design that is context specific and meets the challenges and needs of the surrounding context and community, it incorporates inventive and cost-effective design modifications, as well as creates a successful new model of healthcare facility within its rural context.

4.2 WELLBEING

4.2.1 Introduction

The following literature will attempt to understand overall human wellbeing. This section has three parts, namely understanding wellbeing, factors that affect wellbeing and creating a balance within architectural environments. This is done to analyse factors that affect human wellbeing.

4.2.2 Understanding Wellbeing

The overall idea of human wellbeing is sturdily related to health and the environment (Easthope & White, 2006). Some architecturally designed, sustainable environments aim to impact positively on human wellbeing. This is due to the decreasing levels of individuals' wellbeing within built environments.

Wellbeing in humans is a very large and complex area of study. The physical, mental and spiritual aspects of individuals determine human wellbeing. The spiritual outlook of an individual can make a considerable impact of the individuals' state of wellbeing and is able to impact on the psychological and physical state of the individual. A more holistic perspective investigates other aspects such as the individual's economic status, spiritual and cultural views, social participation and inclusion in activities and social support of wellbeing (Eckersley et al. 2006) (Law & Shek, 2014).



Figure 13, Shows the factors that affect wellbeing of Humans in everyday life.
(<http://ianluntecology.com/2014/04/06/urban-biodiversity-human-well-beingrban-well-being/>).

Psychological literature offers detailed discussions on human wellbeing. The individual's perception of wellbeing is supposed to correspond with their own quality of life, which includes achievements, quality of relationships, values and beliefs (Diener & Eunkook, 2000). The concept of wellbeing not only explores the issues of the individual's outcomes and emotions from within but also the issues and interaction encountered in the social realm such as one's stresses.

4.2.3 Factors Affecting Wellbeing

Many aspects of life affect human wellbeing. One of the main factors of decreasing human wellbeing is stress. How a person deals with stress can affect heavily on an individual's wellbeing.

According to Mckayet *al* (2004), stress can be defined as a product of imbalance between individual resources and various environmental demands. These are called stressors. These are generated from environmental demands (Mckayet *al*, 2004). Jexet *al* (1992), defines stress as a stimulus of the environment, as a response to environment and as a stimulus-response to the relationships (Jexet *al*, 1992). On the other hand Barley and Knight (1992) see stress as a combination of different factors. According to Barley and Knight (1992), stress is defined as combining a range of negative environmental aspects (air, ventilation, noise pollution), physical sensations (anxiety and depression), the feelings of individuals (social and job demands) and cognitions (Barley and Knight, 1992). These descriptions emphasize that stress is a factor that leads to poor patient wellbeing. Architects should take concerned care in creating environments that do not compound stress, but rather creating environments that relieve stress.

According to *help guide*, five sources cause stress in an individual: financial/job stress, family stress, personal stress, social stress and environmental stress (www.helpguide.org). Seen as this dissertation is dealing with the environment and its effect on patient wellbeing, focus will be shifted to environmental stress. The environment is a powerful source of stress for all individuals. Architects play a vital role in the quality of the environment. Environmental stresses can come from one's home, work or even temporary environments such as healthcare facilities, with these environments all carrying different physical and psychological stresses (Day, 2002). According to Day (1990), architecture can be classified as a 'healing environment' and contain 'healing properties' (Day, 1990). Therefore architects should be creating architectural environments to aid human wellbeing.

4.2.4 Health and Wellbeing in Architectural Environments

It is internationally understood that spaces, places and environments both influence human health and wellbeing consciously and sub-consciously; yet there is still uncertainty about what the relationship is between environments and human health and wellbeing. According to Day (2002), the word 'health' is frequently defined as the exclusion of issues surrounding life-energy, physical performance and the 'state-of-the-soul' dimension (Day, 2002).

"Buildings can support health physically and spiritually, but they can also make us ill." (Day, 2002)

According to Alexander (2002), one's interpretation and experiences of the physical environment affects one's emotions, and the shape of the building or building form affects one's wellbeing and social behaviour. Alexander (2002) believes that with proper influence from the built environments and with a facet of a living structure, environments will aid in promoting one's freedom of spirit. However this can be weakened or even destroyed in the wrong environment lacking a living structure (Alexander, 2002).

The Journal of Alternative and Complementary Medicine (2004), states that positive elements of environmental design can either help or hinder the healing process of individuals. Alternatively, the environment can also produce a great impact on health through the influence of action, behaviours and interactions of the users (Journal of Alternative and complementary medicine, 2004). Built environments should be designed to support a positive level of social connectivity, through social interaction. This creates and builds relationships, which in turn reduce the stress levels allowing individuals to relax and socialise, taking a 'break' from their fast paced lifestyles (Reynolds: 1990).

4.2.5 Conclusion

Human beings are continuously being placed under stress due to numerous aspects of their lives. For example, economic/financial stress, job/career stress, family stress and the stresses of being in built environments all affect human wellbeing. Therefore, it is important to understand the relationship between built environments and human wellbeing in order to minimise the causes of stress; to improve human wellbeing in built environments. There is a need for public healthcare facilities to reduce the stresses of being within the environment, especially in rural areas, in order

to improve the wellbeing of patients to reduce their recovery time. Thus it is vital to reduce stresses within a healing environment.

4.3 WELLBING IN HEALTHCARE ENVIRONMENTS

4.3.1 Introduction

The following literature will explore human wellbeing and quality of life in healthcare environments specifically. This section has two parts, reviewing the benefits of well designed healthcare environments and aspects to consider when designing a healthcare environment. This is done to analyse aspects of healthcare environments that can benefit human wellbeing.

4.3.2 Well Designed Healthcare Environments

According to Codinhoto et al (2009), every day, people experience the pressures of being in healthcare environments. Growing levels of anxiety, depression, stress, agitation and emotional exhaustion can occur if the surroundings are not appropriate. Thus, investigating and understanding the characteristics of healthcare environments can enable us to improve and create environments that enhance the healing process (Codinhoto *et al*, 2009).

According to Hilton (1985) and Rubin et al (1998), poor design is linked to negative health effects (Hilton, 1985) (Rubin *et al*, 1998). The healthcare built environment is crucial to the wellbeing of current and future patients and stakeholders. According to the Department of Health (2000) in London, UK, healthcare built environment must develop a patient-centred strategy and focus on aspects that matter to patients'. However, Calbert et al (2005) states there is little research into patients' perceptions of built hospital environments to draw on.

Previous research done by Beauchemin and Hays (1998) and Pattison and Robertson (1996) began to identify the contribution of patient environments to health and well-being; thus, well designed health-care environments can positively influence health outcomes. Architecture and the Built Environment (CABE) supported the view that well designed healthcare environments produce social and environmental values thus aiding in the wellbeing of individuals (Commission for Architecture and the Built Environment, 2001).

4.3.3 Factors to Consider while Designing Healthcare Environments

Lawson and Phiri's study of architectural health-care environments compared the outcomes of patients referred and treated in new or refurbished hospital wards with that of similarly referred and treated patients in older hospital environments (Lawson and Phiri, 2000). According to Lawson and Phiri (2000), the designs of the internal areas and transitional spaces within health-care facilities should be appraised to ensure that they satisfy the needs of patients and their families (Lawson and Phiri, 2000).

A study conducted by Calbert et al (2005), namely '*Patient-centred improvements in health-care built environments: perspectives and design indicators*', participants from focus groups provided suggestions for improvements in healthcare environments which were characterised into categories of accessibility and mobility; ground and landscape designs; social and public spaces; homeliness; personal space and access to outside. Other factors characterised by an auto photographic study were the quality of the ward design, human interactions, the state and quality of personal space, and facilities for recreation and leisure (Calbert et al, 2005).

4.3.4 Conclusion

There is a lack of patient-centred research in the public healthcare sector, within rural areas, regarding patients' wellbeing within healthcare environments; therefore, there is a need for a patient-centred study in the rural areas of KwaZulu-Natal. However, through this literature it is understood that human wellbeing in healthcare environments and their perception thereof is affected by numerous factors namely: accessibility, interaction spaces, and privacy, dignity and landscape designs. These factors will be compared with the results of this study to create an effective response to the specific context of rural KwaZulu-Natal. Therefore, to create a supportive public healthcare design these factors need to be considered in order to promote healing and improve wellbeing. This goes hand in hand with the social aspects mentioned in the theory of Social Construct and the concept of Wellbeing.

4.4 BUILT ENVIRONMENT

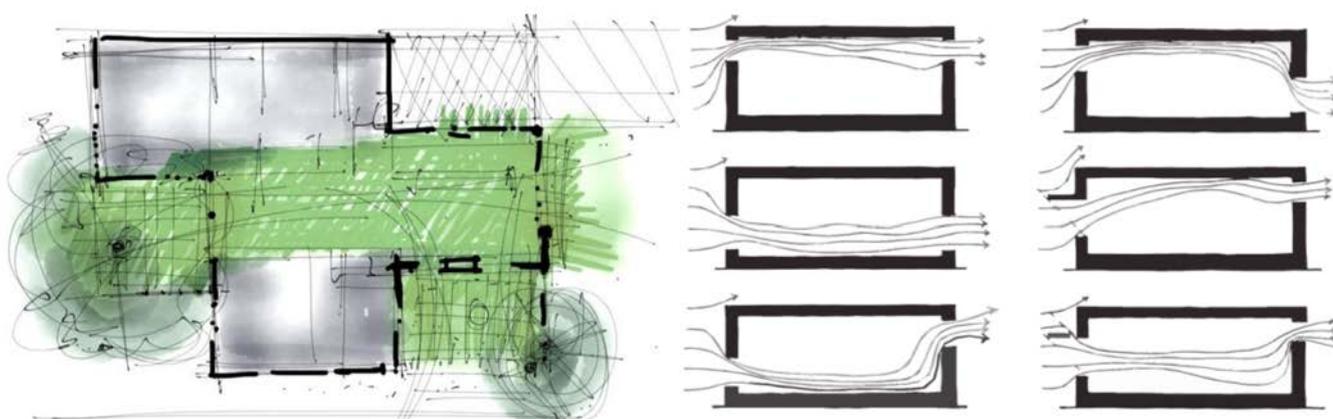
4.4.1 Introduction

The following literature will explore aspects of the built environment that positively impact human wellbeing. This section reviews the benefits of different aspects of the built environment that will improve human wellbeing. This is done to analyse aspects of the built environment that will potentially promote patient wellbeing.

4.4.2 Healing in Built Environments

Day (1990), investigates different aspects of architecture and what constitutes a 'Place of Soul'. According to Day (1990), in order to produce a building that 'heals', one needs to create a harmonious environment which promotes change through organic development sensitive to the site qualities. The building materials also need to be beneficial to the human being (Day, 1990).

According to Pearson (1994), Architects with an anthroposophist focus, state that inhabitants in an organic building will experience a better sense of wellbeing, creativity and individuality through the sub-conscious effects of the environment. Pearson (1990) adds that the environment that the building is situated in, dictates the psychological feeling the building will give off (Pearson, 1994). Therefore, Pearson (1994) says site selection should be well informed in order to select a site with positive qualities, as well as the placement of the building on the site and its orientation, not to impact on the natural qualities but also utilise them for the healing process. Therefore site location and site planning/general layout is very important, it allows for the creation of courtyards and open green spaces (*figure 14 & 15*) that influences patient wellbeing positively.



Figures 14 & 15, Shows The Incorporation Of Courtyards And Different Opening Positions Within Design Of Hospital Spaces (Www.Gutenberg.Com)

According to Aripin (2007) building orientation is the highest priority design decision in creating a healing and sustainable healthcare environment, as it inevitably influences the physical aspects of the design such as; window openings, placement and shading devices (*figure 15*); which in turn directly influences natural light, day lighting and ventilation qualities (Aripin, 2007).

4.4.3 Natural Light and Ventilation

The benefits of natural light, day lighting and ventilation in healthcare facilities reduce lighting, heating, and cooling costs, as well as improved physiological and psychological influences on both patients and staff. Studies have shown that natural light and cross ventilation can reduce mental and physical strain on doctors, nurses and increase patient recovery time. Natural ventilation has proved to reduce nosocomial (Hospital Acquired Infection) rates by cutting spread of air borne diseases like TB (Tang et al, 2006). A study done by Li et al (2007), notes that there is evidence on the link between ventilation in buildings and the spread of infectious diseases such as Measles, Tuberculosis, , Influenza and Chickenpox; especially in rural settings.

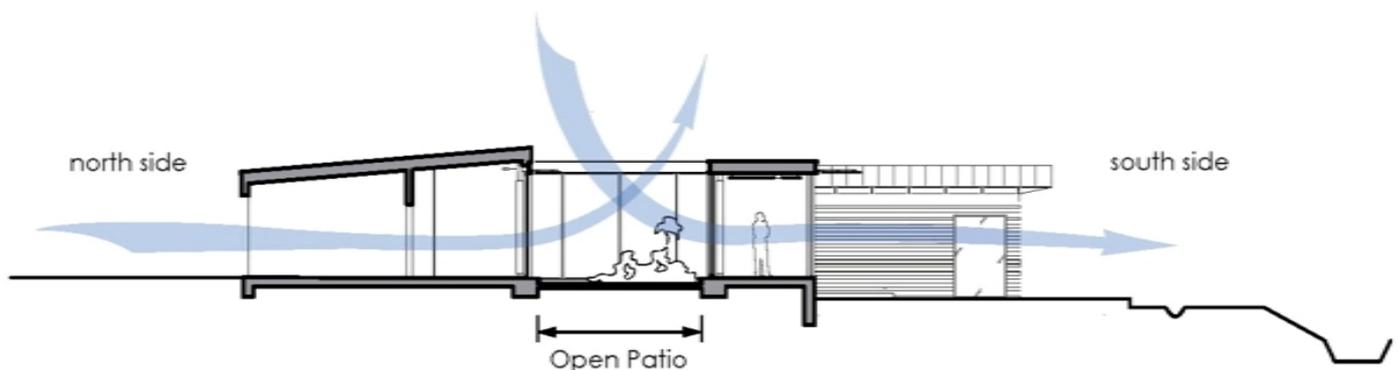


Figure 16, flows of naturally ventilated spaces, from North to South, with a central courtyard space. (<https://deisgnprimerprecedentanalysis.wordpress.com/>).

As mentioned above, natural light is also an important element, in that light affects psychological and physiological aspects of patients. Studies have proven the importance of light(both natural and artificial)in reducing depression, decreasing fatigue, improving wellbeing. Windows within the healthcare environment with access to daylight have been linked with increased satisfaction with the work environment (Boyce, Hunter, &Howlett, 2003; Edwards &Torcellini, 2002).

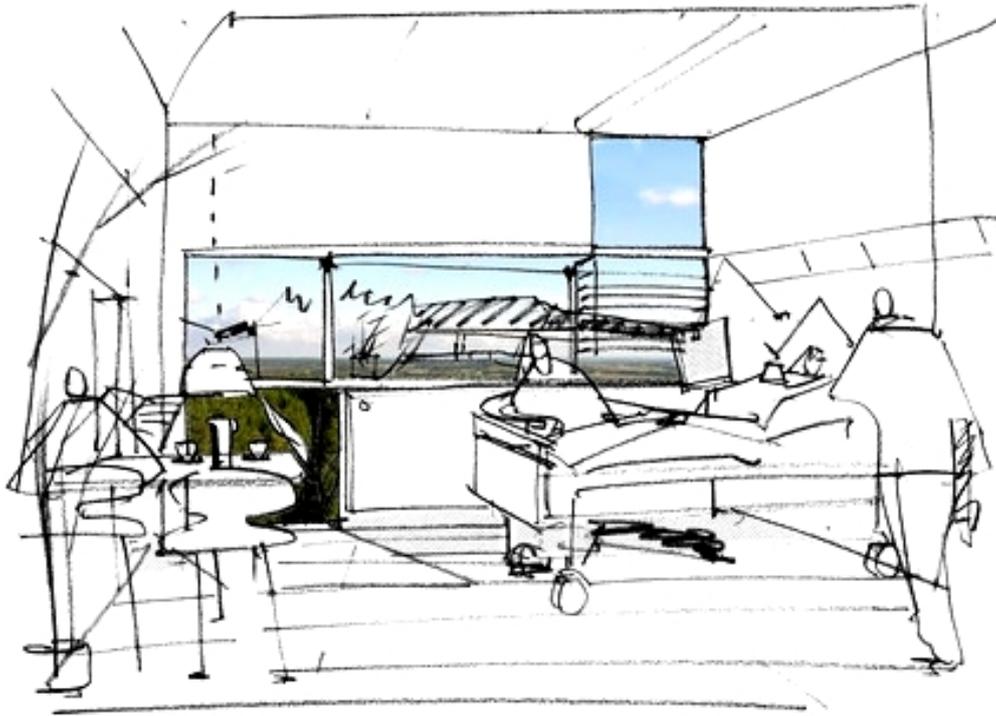


Figure 17, Natural Daylighting strategies within a potential ward. Hospital indoor environments should attempt to create spaces that take into account Natural Ventilation, Natural day-lighting and Open spaces/Views to Nature. These are the elements that can inspire, create and maintain health (<http://hospitalorganizationstudies.org/>).

In addition, Aripin (2007) states natural daylight and ventilation as the most crucial physical aspects in creating a healing environment and argues that they should be regarded as part of a healthy healing environment. Moreover indicates that studies have proven that its effects on the wellbeing of humans, both physically and psychologically, are significant. Campbell et al, (1988) argue that natural light and natural ventilation are the most important environmental inputs in controlling bodily function after food (Campbell et al, 1988).

Greater effort needs to take place to integrate the use of natural ventilation and natural lighting into healthcare facilities in rural areas. A tactical use of artificial lighting and ventilation in combination with natural lighting and ventilation will enrich the environment rather than harming it, thus in turn will accelerate patient recovery, improve wellbeing and contribute to overall energy efficiency.

4.4.4 Physical Environmental Stimuli

Dijkstra *et al.* (2006) argues that there are two ways environmental stimuli can affect an individual; the more direct physiological influence and the more indirect psychological process. It is argued that the physiological effects are unmediated by psychological processes (Taylor *et al.* 1997). As an example, a carpeted floor, within a healthcare facility, may have a direct physiological influence on patients' health, due to it carrying more micro-organisms than a vinyl floor; thus potentially causing more infections. In the psychological process, environmental stimuli may act through the senses and feelings of the individual's. For example, the presence of plants in a healthcare ward may evoke a less stressful, homely feeling; therefore may promote recovery (Dijkstra *et al.* 2006).

Harris *et al.* (2002) argues that physical environmental stimuli are not only the objects or interior design features within a space, but also the space itself. Moreover, it distinguishes the physical environment into three dimensions: interior design features, ambient features and architectural features. (Harris *et al.* 2002). Day (2002) argues the importance of design principles in healthcare facilities, that assist human healing and improves human wellbeing. These characteristics create more gentle space, which allow patients to feel as though they are free to choose a path rather than being directed. Some of these characteristics are listed below:

- Corridors should vary in width, for instance at some areas they should swell to differentiate the stopping places from the routes. In these areas, seating, water features and plants can be placed
- Some doorways should be inset, therefore giving some areas interesting entrances and something special to visually excite the user
- By increasing the connection to the outside and vegetation it increases a person's interest in the paths they are walking along.
- Daylight should be interwoven from various directions, also creating interest in the building
- If there is artificial light used within the building, it should be diffused, varied and softer than normal harsh fluorescent lighting
- Both the interiors and exteriors should be varied in materials. This is especially true for the floors, ceiling heights and the door and window areas.

(Day, 2002)

4.4.5 Materials and Wellbeing

Physical environmental stimuli and space configuration are not the only elements that influence human wellbeing. Building materials play a vital role in this as well. All materials have their own unique qualities that affect a human's perception differently.

Wood or timber is a naturally occurring material sourced from the earth and is associated with life; therefore, it has a warm and comforting feeling. Other materials also give off warmth but in different ways (Breetzke, 2010). For example, bricks are similar in nature but give off warmth through its texture and form. Steel and metal is opposite to wood and bricks and are cold and hard in nature; giving off a feeling of power, related to industrial environments. Plastic and concrete is very similar in that they are not bound by structural characteristics, therefore can be shaped or moulded into any form (Breetzke, 2010). These materials can be compared within a similar setting with different materials. Humans will feel 'happier' in a room finished with unpainted wood or bricks as opposed to a room to steel or concrete finished room. Perceptions from either of the rooms would be unique; therefore, one would have different spatial experiences and resulting emotions.



Figure 17, Shows textured materials of natural colours, offering a warm, homely environment (<http://www.healthcaredesignmagazine.com/sites/healthcaredesignmagazine.com/files/imagecache/570x360/HolyCrossGermantown98.jpg>).

Therefore a building finished in brick or timber as opposed to the same building finished in steel or concrete, would be perceived in a more positive light and feel emotionally warmer, rather than cold and hard (Augustin & Fell, 2015). Therefore, the chosen building materials is important to how the building will be perceived and the effects these materials have within the built environment.

4.4.6 Colour and Wellbeing

Colour and light always occur together and are important in every environment. When designing any human environment, careful consideration must be the psychological and visual aspects. The characteristics of colour and light influence a person's psychological and physiological wellbeing. Research has shown that they affect human organism visually and non-visually (Mahnke, 1987). Visually, it relates to the area of aesthetics, how humans appreciate colour and light. Non-visually, a strong psychological tool can influence energy, mood and vitality.

According to (Augustin & Fell, 2015), colour and light brings out a vibrant energy in humans. This energy affects the bodily functions and influences emotions and state of mind of an individual. Our response to colour and light directly influences both psychological and physiological state negatively or positively (Augustin & Fell, 2015).



Figure 18, Shows the use of a splash of green to support balance, harmony and nature (<https://deisgnprimerprecedentanalysis.wordpress.com/>).



Figure 19, Shows warmer, natural colours which support being stable, reliable, organic (<https://deisgnprimerprecedentanalysis.wordpress.com/>).

Colours within a built environment can lead to under stimulation or overstimulation depending on the combination (Curry & Gaines, 2011). This effect can lead to a dramatic change in medical condition of an individual. Under stimulation can lead to symptoms of restlessness, irritation and difficulty in concentration.

When colour is used unreasonably it can cause over excitation, this which leads to distractions and fatigue (Curry & Gaines, 2011). Thus, the variation of colours can have psychological benefits. The basic colour hues help influence human character. Simple colours, as shown in the table below, have an effect on human wellbeing.

COLOUR	GENERAL EFFECT ON HUMAN WELLBEING
Orange	Stimulates productivity, creativity, optimism, pleasure and enthusiasm.
Blue	Increases calmness, inner peace, relaxation and comfort.
Green	Supports balance, harmony, social interaction and nature.
Purple	Stimulates intuition evokes delicacy and richness.
Red	Increases physical energy, vitality, stamina, stability and passion.
Brown	Supports being stable, reliable, organic, genuine
White	Freshness, hope, light, cleanliness, simplicity, coolness
Yellow	Enlightening, warmth, clarity, optimism, cheerfulness, friendly
Grey	Balance, neutral, calm, stability, strong, character, maturity
Black	Sophistication, power, formality
Pink	Romance, faithfulness, compassion, love, sensitivity

**Table 2, adapted from Mahnke (1987).*

Generally, the traditional healthcare facilities are very dull and lifeless. The dullness does not encourage the inhabitants to benefit within those spaces, thus making it an unpleasant environment to experience (Mahnke, 1987). The charisma of colour inspires humans to experience spaces positively and give positive assessment on building functions. Thus, colour is crucial to human wellbeing as it benefits an individual's experience and promotes wellbeing.

4.4.7 Conclusion

Built environments can have a positive effect on the human healing and wellbeing in healthcare environments. Aspects of natural light and ventilation, in healthcare environments, have a direct relationship to quality of space therefore influencing patient and staff wellbeing significantly. The perception of space, within a healthcare environment, is influenced by a stimulating environment that has an effect on the behaviour and feelings of its inhabitants. Therefore, it is important for the space within a healthcare environment to be dynamic and incorporate gentle spaces in order to provoke positive emotions and behaviour.

Materials also have an influence on human experience, perception and therefore wellbeing, within built environments. Hence, the choice of materials within healthcare environments should be seriously considered in order to create an environment supportive of human healing and wellbeing. In addition, colour and light have the same effect on human experience, perception and therefore wellbeing; affecting humans emotionally and psychologically through sub-conscious interaction in order to improve healing. Thus will play a vital role in the designing a healthcare environment, supportive of healing and wellbeing. Healthcare/Healing environments can only benefit from the use of these all aspects holistically in order to create spaces that promote human healing and improve wellbeing.

4.5 NATURAL ENVIRONMENT

4.5.1 Introduction

The following literature will attempt to explore aspects of the natural environment that positively affect human health, healing and wellbeing. This section reviews the benefits of gardens and landscapes on human healing and wellbeing. This is done to analyse aspects of the natural environment that will potentially promote healing and better wellbeing.

4.5.2 Healing Properties of Landscaping

The significance of the relationship between humans and plant life has not weakened over time, and can be traced back to ancient times. In the bible, humans (Adam and Eve) lived and were created in the Garden of Eden. There is scientific and historic evidence that shows early civilizations gathered and harvested off the fruits of the land and values nature, plants, trees and landscapes. They often domesticated various plants for their medicinal value, food and for protection. It was learnt that it is vital to embrace the relationship to live a prosperous life.

Humans live within the environment, with which they interact every single day, as a result one can notice the association with the natural environment and is necessary for human wellbeing. The natural environment occurs both in rural and urban areas, and includes various green spaces, landscapes, gardens, courtyards and parks of which some are naturally occurring and others intentionally created or man-made. Even though, the forms and functions of gardens and landscapes have evolved over time and across continents, they are still vital to humans (Robbins: 2001).

“Patients and visitors should have opportunities to connect with nature through outside spaces, plants, indoor atriums and views from windows.” (www.icafo.org)



Figure 20, Garden Spaces And Views To Nature. An experience of beautiful courtyard garden, lingering on a comfortable bench, and even smell the roses or lavender, your senses is heightened, and improves patient wellbeing. (<http://www.sunvalleypropertynews.com/>)

4.5.3 Plant Usage and Wellbeing

According to Beal (2004), preceding the 1960s, gardens and landscapes were prevalent in most healthcare facilities. Through globalisation and added economic pressures, the demand for space and undeveloped land increased, as a result it diminished this ancient practice. However, in the United States of America's healthcare recent reform has pushed for the use of more therapeutic gardens in an attempt to promote healing and minimise the time spent in healthcare facilities by patients (Beal, 2004).

According to Larson and Kreitzer (2005), there was an increase in the effect the natural environment had on human healing and wellbeing. around the mid 1980's. The realisation that gardens and landscapes played a vital role in the healing process and wellbeing of humans (Larson and Kreitzer, 2005). Ulrich (1984), study of post-operative, surgery patients showed patients recovered faster and needed less medication when having access to a window with a view of nature (Ulrich, 1984). As a result, healthcare and healing centres understood that there is a need for exposure to the natural environment (Larson and Kreitzer, 2005).

4.5.4 Principles of Healing Gardens and Therapeutic Landscapes

The terms 'healing gardens' and 'therapeutic landscapes' relates to designed landscapes, that promote recovery from sickness and improve wellbeing. According to Larson and Kreitzer (2005), healing in the context of healthcare is designed not necessarily to cure a given illness, but rather improve the individual's overall well-being and encompasses both the individual's spiritual and physical aspects (Larson &Kreitzer: 2005).



Figure 21, Shows a healing garden within a courtyard with a meditative maze at the top right hand corner (<http://www.spineuniverse.com/practice/fl/celebration/celebration-health>).



Figure 22, Shows a healing garden within a hospital courtyard (<http://communityleague-stmary.org/healing-garden/>).

According to Larson & Kreitzer (2005) the main aspect of a healing garden is that it must comfort the soul and renew the spirit (Larson & Kreitzer: 2005). However, therapeutic gardens are illness specific and apply to a particular disease or healing process. Therefore the prescription medication works in harmony with the landscape (Larson & Kreitzer: 2005). These gardens follow design principles consisting of five main ideas:

- Variety of space
- A prevalence of green material
- Encouragement of exercise
- Providing positive directions
- Minimising intrusions and ambiguity

(Cooper-Marcus & Barnes: 1999)

McDowell & Clark-McDowell (1998) think that healing gardens must honour and celebrate the broader human relationship between nature and our spirit. McDowell & Clark-McDowell (1998) have derived six design principles, which should be applied to a 'healing garden'; namely:

- 'A special entrance' should invite and embrace the individual into the garden.
- The element of water should be used for both its spiritual connections, physical and the psychological affects water has on an individual.
- Creative use of colour and light in the garden is essential to increase the emotion of 'comfort' and 'awe' in the individual
- Natural features (such as rocks, wood, screens) become grounding points and have a calming effect.
- Garden features used should attract wildlife and provide a certain level of animal diversity.

(McDowell & Clark-McDowell, 1998).

4.5.5 Conclusion

Gardens and landscapes have a vital role to play within the design of healthcare environments in order to promote the healing and wellbeing of humans. Although most types of healing require a specific landscape; the overall properties of landscapes have a positive psychological effect on general human wellbeing. Therefore, these environments should be carefully planned and situated, in relation to the buildings in order to be experienced and effective.

4.6 CONCLUSION

This chapter articulates the challenges authorities are faced with, within public healthcare in rural areas; as well as within public healthcare architecture and how it affects patients. This chapter also identifies possible solutions within the researched body literature, in order to improve public healthcare facilities within rural areas.

There are many challenges surrounding public healthcare in rural areas. As mentioned above, access to, and delivery of healthcare facilities in the rural areas of KwaZulu-Natal is very poor (Gaede & Versteeg, 2011). However, these challenges can be mitigated through rethinking the location of these public healthcare facilities. As mentioned above, it makes sense placing a new healthcare facility close to other amenities as to make it inexpensive for individuals to travel (Tanser, 2006), thus making rural healthcare facilities in rural areas, more accessible to the population who thrive in these areas. This is vital in making public healthcare facilities more accessible to all. The healing centre will be located in the most accessible location to benefit the vast majority of the population in the area it is situated in.

In addition, site planning/general layout and orientation of these facilities play a major role in the aspects of passive design in the built environment. These aspects effect the incorporation of courtyard spaces, type and size of window openings. Moreover, within the built environment, further challenges surrounding the poor quality of these public healthcare environments such as; overcrowding, lack of natural ventilation and lighting, high noise levels and lack of views to nature etc. All these challenges lead to stress within patients, as mentioned in the previous chapters. An Individual's perception of space has a psychological effect on the individual, therefore the perception of these spaces are vital to its functionality and intention. The spaces within the healing centre will be aimed at promoting healing and wellbeing through aspects of the built and natural environment.

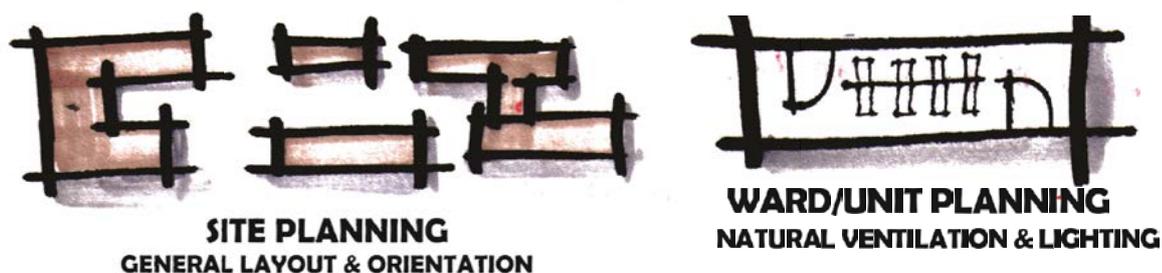
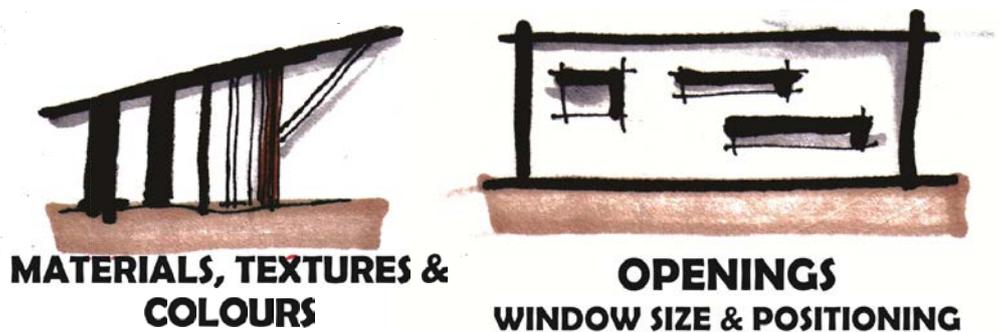


Figure 23 & 24, Sketch of aspects of creating a positive Healing environment (Author, 2015).

Materials and textures have a direct impact on environmental experience, therefore affecting wellbeing of individuals. The incorporation of natural materials within the healing centre will be considered in relation to the function, thus carefully choosing materials and textures that promote wellbeing of patients. This draws on the Genius Loci theory of perception and how materials and textures are interpreted in order to give the patient a suitable perspective to the environment and the function thereof. Colour has been shown to have a direct influence on the psychology of individual's and their wellbeing. The incorporation of colour within the healing centre will address the psychological state of the patient within the space pertaining to the function. This aspect of the environment also draws on the Genius Loci theory of perception and how colours are interpreted in order to give the patient a suitable perspective to the environment and gain a positive perception for their recovery.

Figure 25 & 26, Sketches showing aspects of creating a positive Healing environment (Author, 2015).



In addition, within the built environment gardens and landscapes have had a definitive relationship with humans and has therapeutic benefits that contribute to overall wellbeing. The incorporation of healing gardens and therapeutic landscapes within the healing centre will improve spiritual vitality and psychological state of mind. This aspect of the natural environment also draws on the Genius Loci theory of perception and allows the individual to gain a positive perception for their recovery. These aspects covered within the built and natural environments are done in order to incorporate them into the healing centre. The incorporation of these aspects must be balanced within the built and natural environment for a positive environmental experience, in order to holistically improve patient wellbeing.

Figure 27 & 28, Sketch & Diagram showing aspects of creating a positive Healing environment (Author, 2015).



CHAPTER 5: PRECEDENT STUDIES

5.0 INTRODUCTION

This chapter analyses precedent studies related to the typology of the Healing Centre through the theories, concepts and literature that have been reviewed in earlier chapters. Through the theories and concepts of environmental perception, social construct, nurturing environments and wellbeing, the research has justified a theoretical framework in which the following precedent studies will be analysed, in addition, this will also be conducted with the analysis of the literature reviewed, which has highlighted the significance for improved healing environments for patients within rural areas. The precedent studies will also be analysed in relation to the topic of patient wellbeing and building typology.

The precedent studies will be examined in terms of the general characteristics of each project, thereafter; it will be further examined in terms of how the buildings relate to environmental context as well as how it responds to the patients. The analysis of the environmental context is supported by the ideas within environmental perception theory and the concept of nurturing environments.

The precedent studies will be analysed according to the criteria discussed in the literature review; as it has shown to have the most positive effect on patient wellbeing. The precedent studies will be closely examined according to their architectural aspects and their relationship to improving patient wellbeing. The analysis of these precedent studies is required, in order to provide greater understanding of how potential healthcare facilities can improve patient wellbeing; in addition, to inform the typology of the healing centre through practical and informative design.

5.1 BURATO HOSPITAL, RWANDA

5.1.1 Introduction

Project: Butaro Hospital

Location: Burera District, Rwanda

Architect: MASS Design Group

Size: 6 040 sqm

Project Year: 2011

Funded: Government/Public



Figure 29, Map of Africa, showing the red indicator over Rwanda (Author, 2015).



Figure 30, Map of Rwanda, showing the red indicator over the Burera District (Author, 2015).

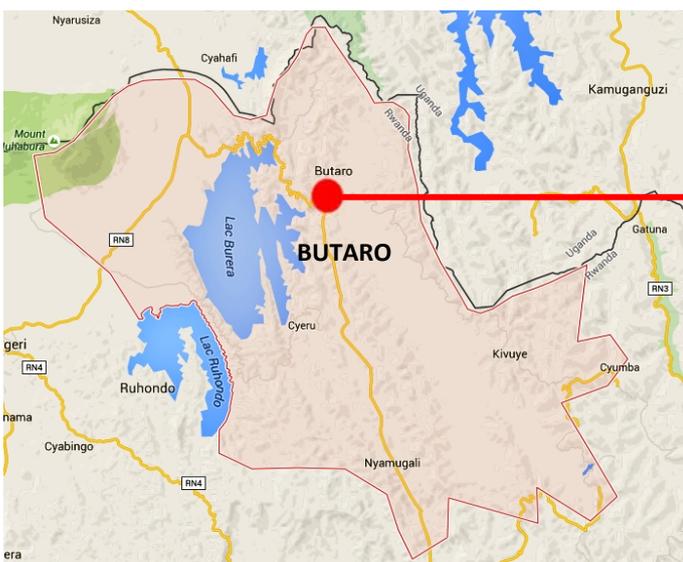


Figure 31, Map showing the Burera District, with the red indicator over the town of Butaro (Author, 2015).



Figure 32, Aerial photograph of Butaro Hospital, in the town of Butaro (Author, 2015).



Figure 33, Shows an Ariel photograph overlooking Butaro Hospital from the South (A Daily Dose of Architecture, 2012).

The Butaro Hospital in the Burera district of Rwanda occupies the hilltop site of a former military base near the Ugandan border (A Daily Dose of Architecture, 2012). The building is separated on site and covers 6 000 square metres. The aims of this project are, not only to show how hospitals serve their contexts via architecture, but also to create a new, more holistic model of public healthcare architecture that strives to lower facility-acquired diseases and infections and influence wellbeing positively (ArchDaily, 2011).

5.1.2 Motivation/Justification

There is still plenty lacking in terms of how healthcare architecture provides to their rural contexts and vice versa. The choice of the precedent is motivated by the Architects' who saw a need for a Multiplicity of a new model of public healthcare architecture in rural areas, however did not disregard the way these facilities were designed before (Line Shape Space, 2015). This idea forces the progression of the healthcare development industry to create well-designed healing environments for people to utilise in order to heal.

In addition, the second motivator was the achieved sensitivity of design to the context, the people as well as the sustainability of the building by the Architects. The Architects' understanding of the environmental and contextual issues that influence the community's health was considered in the design.

5.1.3 Site Planning

The design of the precinct is campus like, therefore the buildings are separated on the site, creating a campus or village like layout; in addition, work with the slope of the site creating a partial perimeter, forming central spaces for pedestrian movement path (A Daily Dose of Architecture, 2012). These buildings are separate wards, which aid in limiting the spread of disease and increasing natural ventilation across the site and are linked by a hospital street. The hospital street makes all facilities convenient and accessible to staff and patients. This constant natural ventilation lowers Hospital-acquired infections and diseases such as TB (Line Shape Space, 2015). Colour-coded signage makes way finding and navigating the courtyards easy for visitors (A Daily Dose of Architecture, 2012). The natural setting provides patients plenty of areas for private visits with families. The buildings' orientations were shifted in order for ward patients to view the beautiful landscape directly outside their windows that offers compassion to influence wellbeing (Line Shape Space, 2015). In addition, the patients in the wards were also shifted from facing other sick people onto facing the landscape in order to offer compassion and privacy that promotes the patients wellbeing (A Daily Dose of Architecture, 2012).



Figure 34, Shows the general, ground floor layout of Butaro Hospital (Arch Daily, 2011)



Figure 35, Shows the general, first floor layout of Butaro Hospital (Arch Daily, 2011).

Due to the problem of overcrowding and interior corridors being used as congested waiting rooms in public healthcare facilities in general; the Butaro Hospital design chose to eliminate the interior corridors to allow for cross ventilation within the building. This led to the ward doors being accessed from external verandas (Architecture for Health, 2012).

In the effort of improving natural ventilation, all air conditioning systems were eliminated in non-surgical settings, to take advantage of the mild climate with the installation of a clerestory. In addition, natural ventilation was aided by the installation of louvered windows and large radius fans to ensure continuous air exchange. A similar idea is used in the design of the ward due to the unique layout, with a high volume, low speed fans that move air from inside to outside the ward through open louvers and windows (Arch Daily, 2011). Thus, this type of layout plan will aid in dealing with the challenges that are experienced with public healthcare facilities in rural areas. However, this will be subject to the choice of site and the shape thereof.

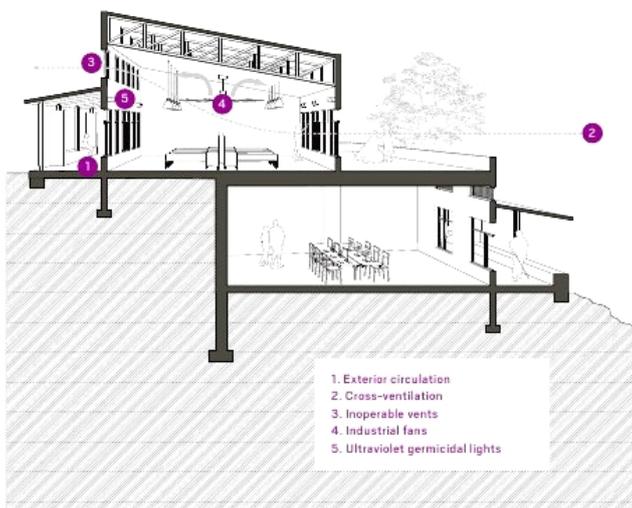


Figure 36, Shows a section through an inpatient ward, showing how cross ventilation is achieved with the aid of low-speed fans (Arch Daily, 2011).



Figure 37, Also shows the external circulation/corridors and its link to the open green spaces (Arch Daily, 2011).

5.1.4 Materials, Colours and Textures

The materials and textures of the Butaro Hospital reflect simplicity. The use of locally sourced natural materials compliments the desired effect of creating a warm and tranquil environment (A Daily Dose of Architecture, 2012). The use of volcanic stone from the Rwandan landscape provided a calming accent colour of deep grey to the neutral coloured exterior plastered walls and contrasting textures on the walls in courtyard areas and other exterior walls (Arch Daily, 2011).

This volcanic material's beautiful natural texture was left exposed to evoke a warm, natural and homely setting within the courtyards but provide natural ventilation through its porous construction technique (*figures 34 & 35*). The use of similar materials and textures to create tranquil environments will be vital within the natural environments between the buildings.



Figure 38 & 39, Shows the use of the natural & locally sourced volcanic stone as walls, providing texture and contrast to the space (<http://www.domusweb.it/it/notizie/2013/02/22/curry-stone-design-prize-2012-mass.html>).

Interior Materials, Colours and Textures

From an internal point of view, it is mostly painted a neutral white colour. The inner plane of the exterior walls are painted a neutral white colour, with a splash of colour being introduced on the dividing 1.5m wall, in the centre of the room, separating the hospital beds. In addition the ceiling is also painted white, giving the space an airy and clean feel(A Daily Dose of Architecture, 2012).

For the floor, the use of a non-permeable, contrasting deep grey, continuous floor finish provided a surface without any joints, which are prone to bacterial growth(Arch Daily, 2011). These aspects of internal construction and finishes make it easy to clean, durable and safe by resisting infection. The use of naturally occurring materials sourced from the Rwandan landscape on the exterior of the building provides a warm, homely and comforting feeling. In addition, the neutral colours and natural materials within the clinic provide patients with a soothing environment, helping to reduce stress within the facility. As mentioned in the previous chapter, materials, textures and colours are vital in improving wellbeing of patients within a healing environment.



Figures 40 & Figure 41, Shows the use of colour within one of the inpatient wards, providing contrast (Arch Daily, 2011).

5.1.5 Natural Environment: Gardens and Landscaping

Due to restrictions in the budget, the landscape was not designed, however the natural courtyards and in between spaces offer a perfect escape from the interior. The natural elements of the gardens, with regional plants throughout, seem to add a natural healing atmosphere to the hospital (Jayes, 2014). These areas provide perfect interaction spaces for patients and their families, as well as providing a strong visual and physical connection to nature which in turn offers patients a sense of calm and tranquillity. As mentioned in the previous chapter this is vital as the natural environment supports the built environment in order to improve patient wellbeing.



Figure 42, Shows the well maintained gardens and landscaping with views of the natural landscape in the background (<http://www.soshl.com/Butaro-Hospital>).



Figure 43, Shows how the landscaping & gardens are well integrated with the built environment (<http://www.openbuildings.com/buildings/butaro-hospital-profile-40296>).

5.1.6 Analysis

The Butaro Hospital, conforms to the concepts and theories mentioned in Chapter Three. Even though the theories of perception and psychology such as Genius Loci and Gestalt are subjective and rely on the feelings of being surrounded by the environment, the images of Butaro Hospital portray a relaxing and airy setting.

This offers a tranquil environment in which the built and natural environment has its own 'sense of place'. This is very important in the process of site selection, locating a site that offers a positive and inspiring natural landscape/environment that can be experienced by the occupants'.

This precedent study is also in line with the concept of nurturing environments. The use of open courtyards and natural landscaping enables one to have a high regard for this healing environment. These areas also aid in the social construct theory, in the empowerment of the community through the construction period and providing areas for social interaction with patients and their families.

5.1.7 Conclusion

The Butaro Hospital is a great example of a well researched, well designed and well constructed healing environment that deals with the contextual and medical challenges of the Rwandan rural area.

In relation to the built environment, the general layout of the hospital supports maximum natural ventilation, natural lighting and integration with the natural environment, thus aiding in improving patient wellbeing. The use of textures, colour and locally sourced natural materials help create a tranquil built environment, which is supported by the views to the open spaces of the natural environment and view of the natural landscape.

In relation to the natural environment, there are no designed healing gardens, however the indigenous plant life and well maintained open spaces provide the relaxation needed. This is also in line with the theories and concepts that provide a guide to creating a healing environment. All these factors have created a balanced healing environment that supports patient healing and wellbeing.

5.2 PETER & PAULA FASSEAS CANCER CLINIC, USA

5.2.1 Introduction

Project: Peter & Paula Fasseas Cancer Clinic

Location: North Tuscon, Arizona, USA

Architect: CO Architects

Size: 7 600sqm

Project Year: 2007

Funded: University Medical Center, Tuscon Arizona



Figure 44, Map of North America, showing the red indicator on the U.S.A. (Author, 2015).



Figure 45, Map of the United States of America, showing the red indicator on Arizona State (Author, 2015).



Figure 46, Map of Arizona State, showing the red indicator over the city of Tucson (Author, 2015).



Figure 47, Aerial photograph of PETER & PAULA FASSEAS CANCER CLINIC in the city of Tucson (Author, 2015).



Figure 48, Shows the Peter & Paula Fasseas Cancer Clinic, Tucson, Arizona, USA (Healthcare Design Magazine, 2008).

The Cancer Clinic in Tucson, Arizona occupies a seventeen acre site, acquired by the University Medical Center in the year 2000. The property was home to an abandoned and derelict two-storey hospital. The architects knew they could produce a better project by incorporating the existing structure with the new construction. The architects aimed to create an environment that integrates architecture and nature as a naturally lit refuge, with plentiful natural lighting, trellised terraces and amazing vistas of the distant mountain ranges in order to affect the patients' wellbeing positively(Healthcare Design Magazine, 2008).

5.2.2 Motivation/Justification

There is plenty lacking in patient-centred, evidenced-based design of public healthcare environments in rural South Africa. This choice of precedent is motivated by the Architects' desire to produce a more informed project with more insight into the patients and staff needs. The architects conducted in-depth interviews with the clients, former and current cancer patients, nurses and physicians. The information learnt had a positive effect on the design and planning of the facility(Healthcare Design Magazine, 2008). The Cancer Centre offers environments and experiences that are supportive and healing.

In addition, the second motivator was the integration of the natural environment with the architecture that was achieved; evoking the power of the desert landscape. The physical and visual access to nature provides an intimate healing facility.

5.2.3 Site Planning

Through the comments and concerns of the patients and staff, it was revealed that many of them wanted to see the desert light and possibly the landscape at all times (Architype, 2011). Therefore, the Cancer Centre design utilises the foundation and steel frame of the abandoned two-storey hospital already existing on site. The existing floor plate was deep, therefore restricting natural lighting. The architects created three courtyards within the existing floor plate in order to bring in natural light and provide garden views to most corridors and patient areas (Architype, 2011).Therefore the clinic was divided into three clinic modules all with their own courtyards, providing natural light to the interior spaces. This also provided the interior spaces with visual and physical access to the Tuscon's, rugged natural landscape that patients and staff could experience daily(Healthcare Design Magazine, 2008).

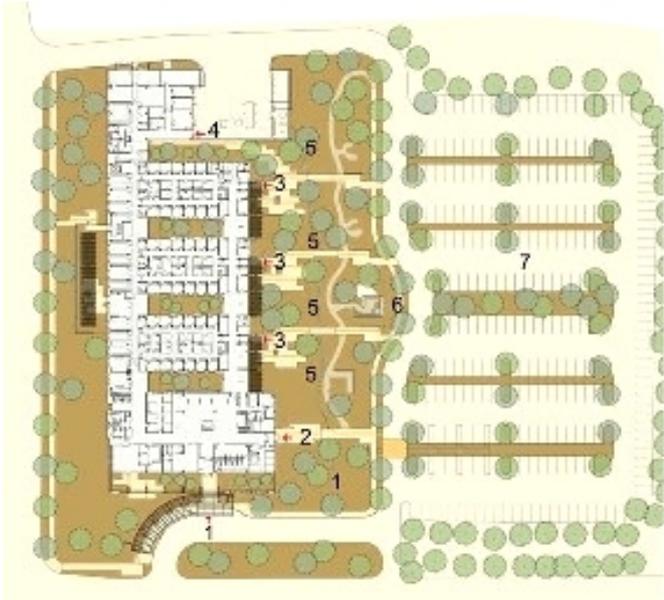


Figure 49, Shows the floor plate with three courtyards cut into it. (Healthcare Design Magazine, 2008).



Figure 50, Shows one of the courtyards, with a regional selection of plants (Healthcare Design Magazine, 2008).

The naturally lit courtyards, supported with access glass door and windows on all sides, provided positive changes; reducing artificial lighting dependability, allowing the planted desert landscape to extend visually deep into the spaces and providing natural ventilation to interior spaces as well (Architype, 2011). The facades around the open courtyard areas are also designed at a more residential scale; these factors aid in providing patients with a more homely experience and better feeling of wellbeing within the facility. This type of general layout is more rigid, and does not support the natural feel of a campus/village like plan discussed in the previous precedent study.

5.2.4 Materials, Colours and Textures

The building design is integrated with the surrounding natural environment; this also applies to the materials, colours and textures chosen. The use of plaster and local Arizona sandstone as a contrasting colour and texture reveals the project's low budget (Architype, 2011). These natural materials connect and blend the building into the rugged, surrounding natural environment seamlessly. These materials are further enhanced by the use of weathered steels trellises and shade canopies. The use of naturally occurring materials sourced in the Arizona region, from the earth is associated with life, therefore has a warm and comforting feeling to the occupants(Healthcare Design Magazine, 2008).

The interior of the clinic also echoes the use of natural materials, with the use of locally sourced cherry wood panelling and stone flooring. The stone was utilised for the flooring to withstand high foot-traffic volumes and also reduce odour absorption within the clinic(Healthcare Design Magazine, 2008). The interior colour palette reflects neutral, lighter earth tones; which also helps reflect soft indirect light within the spaces. These natural colours and materials within the clinic provide patients with a soothing environment, in which they are able to relax (Architype, 2011).



Figure 51, Shows the use of natural materials, textures & neutral colours in a waiting area (Healthcare Design Magazine, 2008).



Figure 52, Shows the use of natural materials & colours that compliment the outside landscape (Healthcare Design Magazine, 2008).

5.2.5 Gardens and Landscaping

The Cancer Centre welcomes nature into the building, therefore inviting it into the healing process. The idea of Ten Lyck Landscape Architecture was to maintain the natural landscape of the desert. There was a natural selection of regional plants which attract the indigenous wildlife of the surrounding area. The science and art of healing is combined to create a technically advanced healing environment that is closely linked to nature (AIA, 2008). The close integration is strengthened by the organisation of examination and treatment rooms with views to the front and rear gardens, as well as the distant mountains. Other rooms such as the waiting rooms, public spaces and corridors offer views to the courtyards, offering restorative views (Architype, 2011).



Figure 53 & 54, Shows the gardens & landscaping that depicts the surrounding natural desert landscape, designed by Ten Lyck Landscape Architecture (Architype, 2011).

5.2.6 Analysis

As mentioned in the previous precedent study; even though the theories of perception and psychology such as Gestalt and Genius Loci are subjective and rely on the feelings of being surrounded by the environment, the images of Peter and Paula Fasseas Cancer Clinic depict a gently embracing and comforting environment. This offers a sense of beauty and calmness within the built and natural environment providing the facility with a unique 'sense of place'. It is vital to select a

site that offers a positive and beautiful natural environment for the occupants to experience and draw power from; in order to heal.

The design of the cancer clinic symbolises a beacon of hope. The use of three open courtyards and natural desert landscaping, helps provide a sense of calm and rugged beauty, which is in line with the concept of nurturing environments. These areas also aid in the theory of social construct, providing areas for relaxing, reflecting, inspiration and social interaction for patients and their families.

5.2.7 Conclusion

The Peter & Paula Fasseas Cancer Clinic is a well researched and designed project. The patient-centred research approach produced a more informed project with more insight into the patients needs. The healing environment deals with the contextual challenges of the desert landscape by integrating the natural environment within the architecture, drawing power from the landscape.

In relation to the built environment, the general layout is rigid, however it has courtyard spaces integrated into the floor plates. Thus, providing sufficient natural ventilation and lighting to the internal spaces. The use of natural colours and textures depict the natural desert landscape; which in turn, provides tranquillity and a soothing effect within the built environment.

In relation to the natural environment; the gardens are made up of a natural selection of regional plants which attract the indigenous wildlife from the surrounding area. In addition, the science and art of healing is combined to create a technically advanced healing garden that promotes patient healing and wellbeing. These factors are in line with the theories, concepts and the body of literature researched. These aspects provide a guide to creating a balanced healing environment that supports patient wellbeing.

5.3 BUDDHIST RETREAT CENTRE, IXOPO, SOUTH AFRICA

5.3.1 Introduction

Project: Buddhist Retreat Centre

Location: Ixopo, KwaZulu-Natal, South Africa

Funded: Private



Figure 55, Map of Africa, showing the red indicator on the country of South Africa (Author, 2015).



Figure 56, Map of South Africa, showing the red indicator on the province of KwaZulu-Natal (Author, 2015).

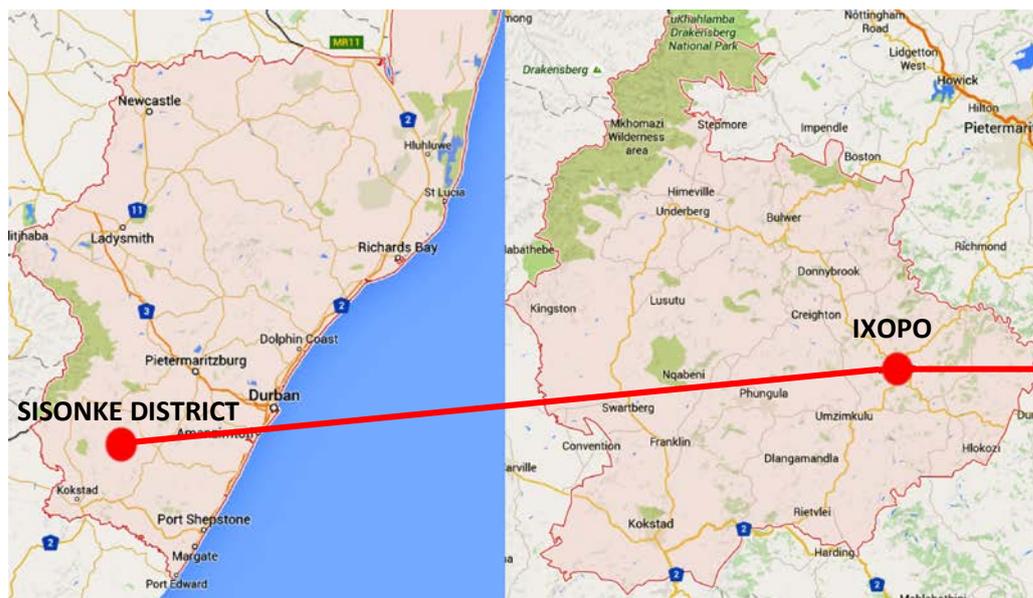


Figure 57, Map of KwaZulu-Natal, showing the red indicator on the Sisonke District (Author, 2015).



Figure 58, Map of Sisonke District, showing the red indicator on the town of Ixopo (Author, 2015).

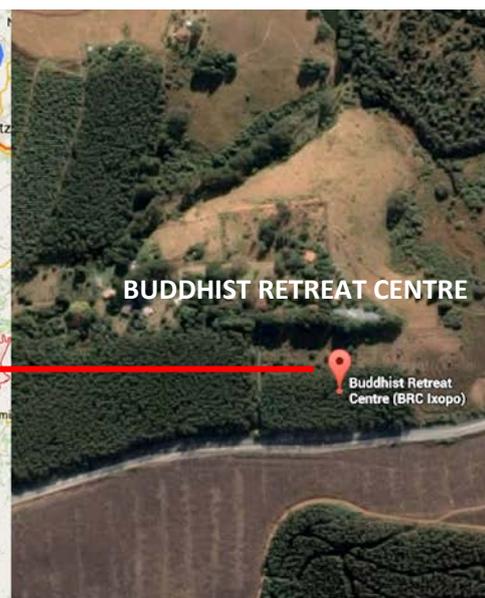


Figure 59, The Buddhist Retreat Centre in the town of Ixopo (Author, 2015).



Figure 60, Showing the relaxation rooms of the Buddhist Retreat centre (http://www.bodyandmind.co.za/merchant_nc.php?pid=491&step=4).

This precedent study is based around the Buddhist Religion, however has significant importance to this dissertation due to its healing and stress relieving facilities. The Buddhist Retreat Centre is located on a ridge in the Umkomaas River Valley in the KwaZulu-Natal province. Nelson Mandela declared it a Natural Heritage Site (The Buddhist Retreat Centre, 2009). The Centre offers splendid views of the surrounding indigenous valley forests and continuous rolling hills. People from all cultures and all religions have come to experience the peace and tranquillity over the past twenty years. The Buddhist Retreat Centre offers gentle and sympathetic environments where one can reflect, relieve stresses and overcome obstacles of their own fast paced life (The Buddhist Retreat Centre, 2009).

5.3.2 Motivation/Justification

Public healthcare facilities are lacking within rural areas; therefore, the idea of integrating them with nature remedial because the surroundings offer stress-relieving aspects to the occupants. This choice of precedent is motivated by the site location and the use of the natural environment to provide a stress relieving and healing facility. The Buddhist Retreat Centre buildings are well integrated into this natural environment, therefore making the natural setting the predominant feature (The Buddhist Retreat Centre, 2009). This provides a continuous link to nature and the natural surroundings.

5.3.3 Site Planning

There are many different buildings at the Buddhist Retreat Centre, which include a shop, lecture theatre, art studio, library, dining room and meditation hall as well as the different types of accommodation. The buildings are laid out in a campus-like configuration and are well integrated with the natural landscape.

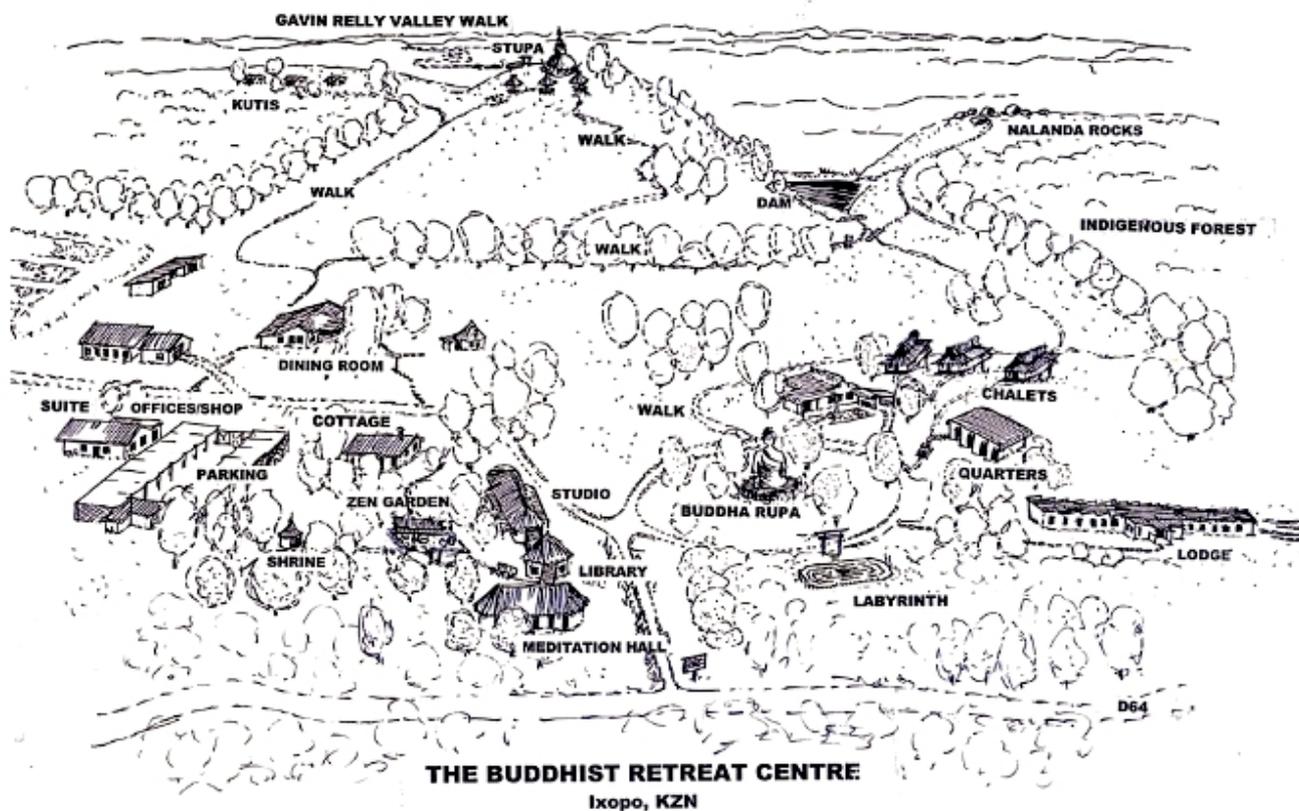


Figure 61, Shows the site planning of the Buddhist Retreat Centre in Ixopo (<https://www.flickr.com/photos/stephsalpics/15455175798/>).



*Figure 62, Showing the areas and pathways surrounding the site.
(<http://www.brcixopo.co.za/environment.html?catpage=1&page=3#category>)*

All the spaces are well ventilated, well lit and offer spectacular views of the surrounding valley areas. The various options of accommodation, ranges from communal to the more elite. There are also shared and single quarters; however, these buildings are slightly distant from the activities on offer within the precinct (Breetzke, 2010). This campus-like layout is lacking continuity and flow between the different activities and facilities; thus the buildings and activities lose cohesion with each other in the forest-like, natural environment.

5.3.4 Materials, Colours and Textures

The Buddhist Retreat Centre offers a series of tranquil healing and reflection spaces. This is achieved architecturally with the use of natural lighting and natural ventilation as well as specific natural materials that help the healing process (The Buddhist Retreat Centre, 2009). Natural materials like wood in its raw form and thatch give off a warm, natural and homely feeling (Breetzke, 2010). These materials are left in their natural state not only to be visually stimulating but also give off a sense of feeling through its textures and tactility. Textures have also been used in the interior and on exterior wall finish, to give off a sense of earthy feeling.

The colour tones echo the same idea of tranquillity, calmness and nature. The use of neutral tones like cream, white, browns and deep oranges, offer a feeling of calmness in order for people to feel at ease within the spaces (Breetzke, 2010). This is important in creating a calming built environment as mentioned in the previous chapter.



Figures 63 & 64, Showing the natural materials used within the rooms to create relaxation (Breetzke, 2010).

5.3.5 Gardens and Landscaping

According to Breetzke (2010), the atmosphere of the surrounding natural landscaping and gardens are emphasised greatly throughout the precinct. The use of natural cobbled paving stones blends with the splendid greenery on offer. The sounds of birds and other animals and the smell of nature evoke a calming and stress relieving effect (Breetzke, 2010). These natural aspects nearly instantly begin the process of self-reflection.

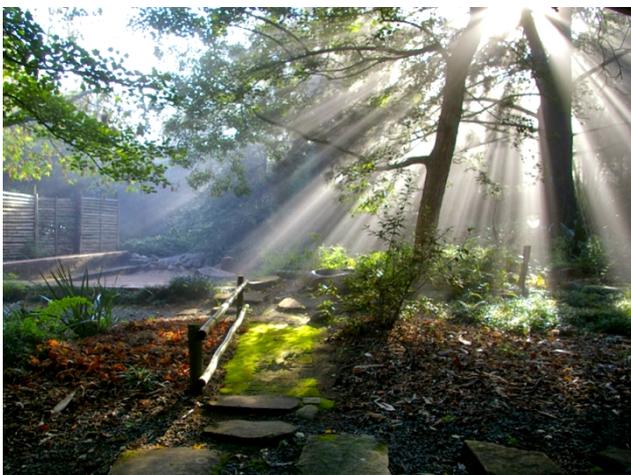


Figure 65 & 66, Showing the gardens and contemplation spaces around the site. (Breetzke, 2010).

Along, through and between the indigenous and naturally landscaped gardens there are many activities or places of reflection and relaxation. There is a landscape designed maze as well as a Zen garden. These activities help calm the mind and encourage self reflection, in addition encouraging deep relaxation and help take one's mind away from the hardships of life (Breetzke, 2010). These long walks on many different paths help psychologically with the healing process through the interaction with nature.

5.3.6 Analysis

Through viewing the images of the Buddhist Retreat Centre, it is portrayed that the Centre offers a strong 'sense of place' or 'Genius Loci'; although theories are subjective and rely on the individuals experience with the environment.

The images of the environment offer a sense of tranquillity and peace, which is echoed by the natural feel that is depicted in the images. The constant link with nature is carried throughout within the accommodation, dining and meditation hall facilities, offers a calmness and beauty to the occupants at all times and creating a unique 'sense of place'. This constant link with nature within the built environment is important in the healing process, and is well represented in these spaces, thus strengthening the theory of 'Genius Loci'.

The constant connection or link with the natural environment and the subtle integration of the built environment is also in line with the concept of nurturing environments. As mentioned in the previous precedent study, these aspects are vital when selecting a site, as the site should offer a positive and beautiful natural environment for the occupants to experience and draw power for healing purposes.

5.3.7 Conclusion

The Buddhist Retreat Centre is well researched and designed to offer the maximum amount of stress relief and healing to its occupants. It has significant importance to this dissertation due to its healing and stress relieving facilities, gardens and reflection spaces. It is also important due to its location within the rural context of KwaZulu-Natal and its continuous connection/integration with the natural environment.

In relation to the built environment, the buildings are laid out in a campus-like configuration and are well integrated into the natural landscape, however are spaced quite a distance from each other, losing a visual link. The spaces are naturally ventilated and lit, offering tranquillity and relaxation. The spaces offer spectacular views of the valley and surrounding areas which is important in creating a healing environment. The use of natural materials in their natural form and natural colours help provide calmness and assist the healing process.

In relation to the natural environment, the gardens are made up of indigenous and naturally landscaped gardens with many activities or places of reflection and relaxation which promotes tranquillity and healing. Although this is a religious retreat and not a medical centre it provides insight into different healing processes and is still in line with the theories and concepts and the researched body of literature that provides a guide to creating a balanced healing environment that supports patient wellbeing.

5.4 CONCLUSION

The Butaro Hospital, the Peter & Paula Fasseas Cancer Clinic and the Buddhist Retreat Centre perform well in their respective purposes and functions of providing healing and wellbeing through the built and natural environments. The inclusive approach, of the patient/occupant and even community, in the research and design processes give opportunity within the social context to change social constructs. This is supported by the concept of social constructs, discussed in chapter three, through the interactions of different social groups, and the understanding of issues between them to achieve inclusivity.

In relation to the built environment, the precedent studies embrace the concept of a nurturing environment, with buildings that are well integrated into the natural environment and explore the visual connections to the natural landscapes. The importance of the site layout/planning helps integrate garden spaces within the facilities. The idea of integrating the natural and built environments is well explored throughout the buildings, in order to benefit the wellbeing of the patient/occupant. However the respect for functions within the building remains. These examples are conscious of the environmental perception of the patient/occupant, therefore aspects of the built environment from natural ventilation, lighting, views, materials and colour have been well-thought through in order to improve wellbeing. These notions and ideas are used in the Gestalt theory and Genius Loci theory of perception, where emotions and feelings are evoked psychologically which is due to how an individual perceives an environment, which is discussed in chapter three.

The research and analysis of these precedent studies will be utilised to further analyse the chosen case studies in the following chapter, in addition, aid in the formation of the new type of public healthcare facility within rural KwaZulu-Natal.

PATIENT WELLBEING
VENTILATION
GARDENS & LANDSCAPES
UNIT PLANNING
LIGHTING
SITE PLANNING

*Figure 67, Shows the aspects that influence patient wellbeing covered in the literature
(Author, 2015)*

CHAPTER 6: CASE STUDIES

6.0 INTRODUCTION

This chapter analyses cases related to the typology of the Healing Centre through the literature and precedent studies that have been reviewed and have highlighted the significance for healing environments for patients in rural areas. Through the theories and concepts of environmental perception, social construct, nurturing environments and wellbeing, the research has justified a theoretical framework in which the following case studies will be analysed, in addition, will also be conducted with the analysis of the precedents studies in mind. The case studies will also be analysed in relation to the topic of patient wellbeing and building typology.

The cases will be examined in terms of the general characteristics of each project, thereafter, further examined in terms of how the buildings relate to environmental context as well as how it responds to the patients. The analysis of the environmental context is supported by the ideas within environmental perception theory and the concept of nurturing environments.

The case studies will be analysed according to the criteria discussed in the literature review and in the precedent studies; as it has shown to have the most positive effect on patient wellbeing. The case studies will be closely examined according to their architectural aspects and their impact on patient wellbeing. The analysis of these cases is required in order to provide greater understanding of current healthcare facilities; in addition, to inform the typology of the healing centre through practical and informative design.

6.1 UMPHUMULO HOSPITAL, ILLEMBE DISTRICT, SOUTH AFRICA

6.1.1 Introduction

Project: Umphumulo Hospital

Location: Maphumulo, KwaZulu-Natal

Funded: Government



Figure 68, Map of Africa, showing the red indicator on the country of South Africa (Author, 2015).



Figure 69, Map of South Africa, showing the red indicator on the province of KwaZulu-Natal (Author, 2015).



Figure 70, Map of KwaZulu-Natal, showing the red indicator on the Illembe District (Author, 2015).

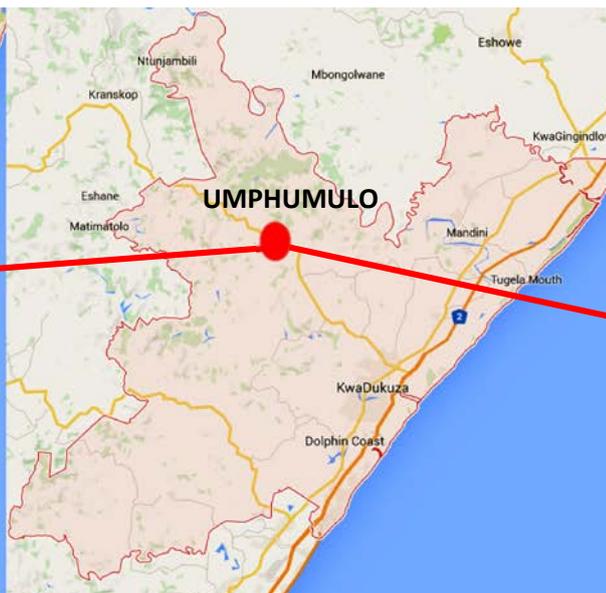


Figure 71, Map of Illembe District, showing the red indicator on the rural area of Umphumulo (Author, 2015).



Figure 72, Umphumulo Hospital in the rural area of Umphumulo (Author, 2015).



Figure 73, Shows the main entrance of the Umphumulo Hospital. It is unclear and undefined, no conducive for patient wellbeing (Author, 2015).

The Umphumulo Hospital is a District hospital situated in the Illembe district. It is perched on small hilltop site between Stanger and Greytown. The 158 bed facility is separated into different buildings on the site. The hospital shares a Sub-district, Maphumulo, with Untunjambili Hospital. The catchment population of the Sub-district is 132 007 in which Umphumulo Hospital accounts for 60% (KwaZulu-Natal Department of Health, 2015).

6.1.2 History of Umphumulo Hospital

The Umphumulo Hospital originally was a training college for teachers. It was built in 1980, by the Norwegian Lutheran Mission Society Glebe of Umphumulo; in the Magisterial District of Maphumulo.

During October 1935, the missionaries then decided to convert the college into a hospital, due to an increase in TB cases in the district. The hospital was a standalone building that was separated into wards with partition walls in order to accommodate maternity patients. In 1942, a hospital kitchen was built in conjunction with two huts that accommodated six and five patients respectively; one for male TB patients and another for female TB patients (KwaZulu-Natal Department of Health, 2015).

There was a chapel built on site by the missionaries where all employees would gather and pray before they started their duties. In addition, the first three missionaries were buried outside the chapel. The hospital buildings became very old and required an upgrade. The government at the time did not want to take over the hospital in its poor state, therefore requested the missionaries to upgrade the hospital.

In 1965, Dr. Gumede joined the hospital and immediately major improvements were made; as he was based on the site of the hospital. People within the community began to have faith in Umphumulo Hospital and citizens came in their masses. In the early 1970, an anonymous Doctor built the currently existing Outpatient Department. He raised funds from overseas countries as well as donating his own money. Shortly after the Hospital was renovated, the local Government took over but shortly handed it over to the state. The Hospital is still very small and in its early stages of development. It will take time and many dedicated staff members in order to take it to greater heights (KwaZulu-Natal Department of Health, 2015).

6.1.3 Motivation/Justification

There is plenty lacking in public healthcare facilities in rural areas; where the natural and built environment do not help improve patients' wellbeing. The choice of case study is motivated by the poor aspects in design of public healthcare facilities in rural areas that are emulated within the Umphumulo Hospital. As well as the lack of understanding of the environmental and contextual issues, that affects the community's health.

In addition, the second motivator was Umphumulo Hospital's potential to become a well-designed healing facility that offers patients' improved wellbeing and recovery through better understanding of the environmental and contextual issues in order to create a therapeutic natural and built environment.

6.1.4 Site Planning

Umphumulo Hospital is perched upon a small hilltop site and it is positioning offers spectacular views of the surrounding natural environment and therapeutic landscape towards the east. However, these aspects are not taken advantage of for the benefit of patients' as the views are only visible as you enter the site.



Figures 74 & 75, Shows the views of the rolling hills from the site. Relates to the idea of Therapeutic landscapes (Author, 2015).

The case study of Umphumulo Hospital gives insight to the functions needed within the typology of the Healing Centre, as well as their relationship to the other surrounding functions (*figure 59*).

The site planning of the hospital buildings are separated, creating a village/campus like layout which also works with the slope and terrain of the site. This form of layout is in-line with the successful layouts discussed in the previous chapter as it forms central spaces between the buildings for gardens and helps deal with the challenges of natural ventilation and light with public healthcare facilities.

However, within the Umphumulo Hospital Precinct the buildings are disjointed and the space between buildings has become leftover space, that is not being utilised to its full potential. In addition, this layout configuration also needs to incorporate covered walkways between departments and wards in order to protect moving staff and patients being transported from the weather elements.

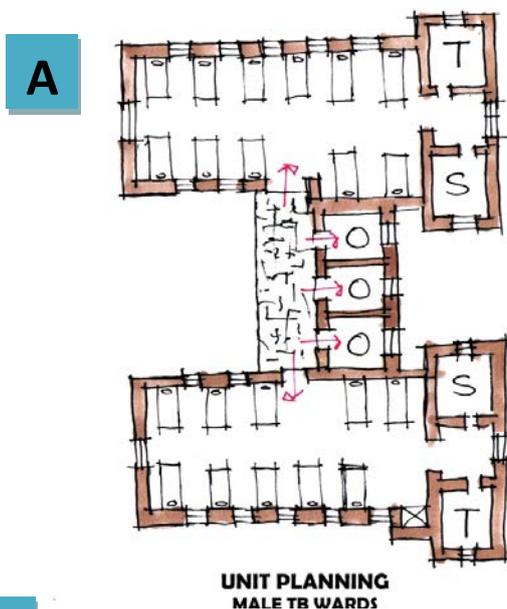


Figure 76, Showing the site planning of Umphumulo Hospital (Author, 2015).

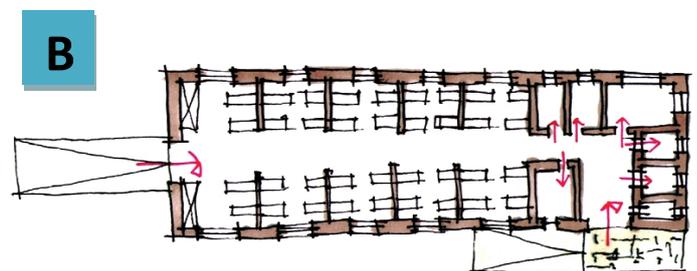
Ward/Unit Planning

The general female, male and split TB wards are separated on site to limit the spread of disease and hospital acquired infections from patient to patient. However, the wards do not make use of the potential principle of natural ventilation that the campus/village like layout provides, on the other hand utilise artificial ventilation in the form of air conditioning. The natural setting provides patients with areas for relaxation, however a lack of vegetation and trees make it unbearable to utilise during hot summer days.

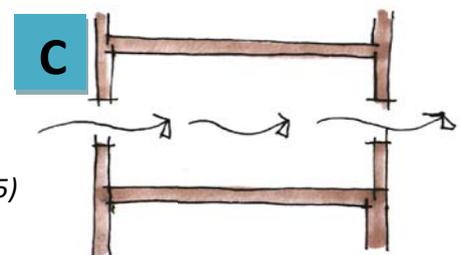
The wards' are orientated to face east-west and are facing the outside areas, however the outside areas do not provide patients with gardens or designed courtyards that can offer compassion to influence wellbeing. The aspects of site planning and the creation of open courtyards is supported by the theories and concepts, literature and precedent studies analysed, in the previous chapters, however those open courtyard spaces must relate to the adjacent buildings. Therefore the use of these aspects does not help promote patient wellbeing and does not fully help inform the typology of the healing centre.



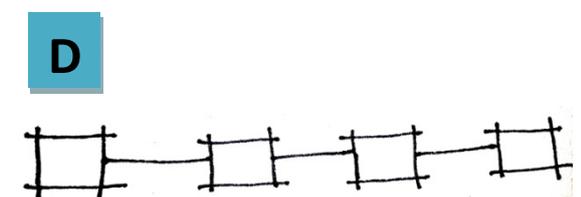
A Figure 77, Sketch showing the Male TB Ward planning (Author,2015)



**UNIT PLANNING
PREFABRICATED GENERAL FEMALE WARD**



C Figure 79, Appropriate Cross Ventilation, however not utilised (Author,2015)



D Figure 80, Sketch showing the linear planning of the wards (Author,2015)

In order to deal with the problem of overcrowding within waiting areas and interior corridors the hospital management erected an outside waiting area in front of the outpatient department that supports the interior waiting area. The outside waiting area is beneficial for limiting hospital acquired diseases due to it being out in the open.

However, there is still a problem of overcrowding within the inpatient wards, particularly the maternity and male TB wards, due to a high influx of patients. Thus, the hospital management have added prefabricated structures to cope with the overcrowding. However, the placement of these buildings do not aid in promoting patient wellbeing as they are placed in somewhat of a random configuration, not in relation to the surrounding environment and surrounding buildings. Therefore this method of dealing with the high influx of patients within public healthcare facilities is unsuccessful, does not help promote patient wellbeing and does not inform the typology of the healing centre.



Figures 81 & 82, Shows the measures taken to mitigate the issue of overcrowding (Author, 2015).

6.1.5 Materials, Colours and Textures

The materials and textures of Umphumulo Hospital reflect the standards of other public healthcare facilities across KwaZulu-Natal. From an external point of view the use of plastered and painted (Paint: a lighter shade of cream) brick walls with a lower band of exposed brick on the older buildings. This has become somewhat monotonous amongst these types of institutions however, does not offer a feeling of tranquillity. Moreover, where there is an absence of a lower band of brick the older buildings are painted (Paint: Salmon colour, with contrasting maroon) in a contrasting colour to create a similar effect. The roof covering is corrugated iron sheeting that has been painted green or maroon, in relation to each of the buildings.



Figures 83 & 84, Shows the materials and colours used on the buildings as well as the contrasting colours of the prefabricated general female ward structure (Author, 2015).

The steel windows are painted white, which adds to the institutionalised feeling of the hospital. The newer prefabricated buildings are raised and do not reflect any of the other buildings on site. Their exterior sheeting is white and a light brown colour (tan); these colours do create warmth and tranquillity as examined in the literature, however the cold, steel materials of the roof and outer skin overpower those feelings. The use of these materials, textures and colours are not supported by the ideas within the theories of perception of environments and concepts of wellbeing and nurturing environment. In addition, the materials used in the construction of Umphumulo Hospital do not support the literature and precedent studies analysed, in the previous chapters, of maximising natural materials. The use of these materials therefore does not help promote patient wellbeing and does not inform the typology of the healing centre.

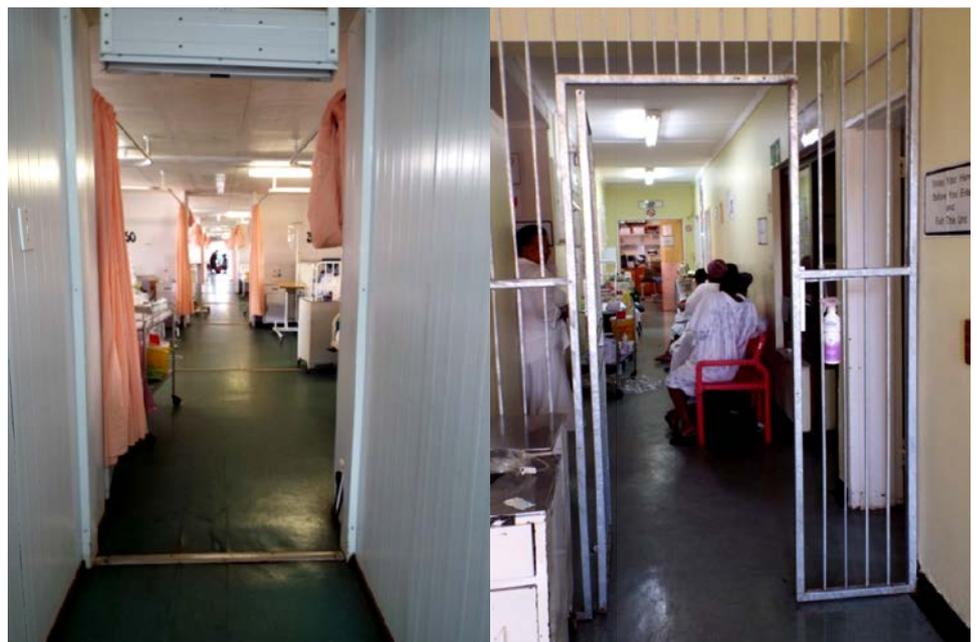
Interior Materials, Textures & Colours

From an internal point of view, most of the inpatient wards and outpatient department areas of the hospital are painted in neutral, colours either a white or a cream colour (Figure). However, in the female and male TB wards the walls are painted in a pale blue colour. All the ceilings are also painted white in colour.

The floors are covered with continuous sheets of vinyl with black vinyl skirting has in order to reduce bacteria between joints, which would could cause further infection. This is consistent with the standards of public healthcare facilities in rural areas in order to maintain the cleanliness of surfaces and help resist infection; however, this becomes monotonous and strengthens the institutionalised feeling that is experienced upon entering the hospital precinct. There is no use of contrasting colours or contrasting, natural materials and textures in the interior, which would provide patients with a warm, homely and comforting feeling.

In addition, this would provide patients with a tranquil environment, helping to reduce stress within the facility and ultimately promote their wellbeing. These aspects do not support the literature and precedent studies analysed, in the previous chapters, of maximising natural materials, contrasting colours and textures. The use of these materials therefore does not help promote patient wellbeing and does not inform the typology of the healing centre.

Figures 85 & 86, Shows the interior materials and colours used within the buildings as well as the prefabricated general female ward structure, on the right (Author, 2015).



6.1.6 Gardens and Landscaping

Due to budget constraints the current public healthcare facilities in the rural areas South Africa, do not offer designed gardens or landscaped areas. However, these facilities do offer open green spaces and courtyards between the buildings; however suffer from lack of maintenance. This is no difference with Umphumulo Hospital, which offers numerous open and courted grassed areas with the potential for healing gardens or landscaped areas.

The grassed areas that exist today are only a portion of what existed in the past; as these spaces were shrunk and trees were removed in order to create vehicular access and parking bays. Patients for relaxation, social interaction space and overflow areas for patients when wards are being cleaned, used these tree-shaded areas; however, patients are forced to wait in the corridors. These open and courted green areas would have provided perfect interaction spaces for patients and their families, as well as providing a strong visual and physical connection to nature which in turn offers patients a sense of calmness and tranquillity. As mentioned in the literature review chapter, this is vital as the natural environment supports the built environment in order to improve patient wellbeing.



Figures 87 & 88, Shows the leftover grassed open spaces, that are not designed or maintained. There is a lack of plants and trees, which would make these spaces more pleasant (Author, 2015).

The aspects of gardens and landscapes within Umphumulo Hospital do not support the theories and concepts, literature and precedent studies analysed, in the previous chapters. The use of these aspects therefore does not help promote patient wellbeing and does not help inform the typology of the healing centre.



Figures 89 & 90, Shows the leftover grassed open spaces, that were fully vegetated, however have been removed to accommodate vehicles and additional prefabricated ward structures (Author, 2015).

6.1.7 Analysis

The Umphumulo Hospital precinct is located on a hilltop site that offers a sense of Genius Loci. It overlooks the surrounding rolling hilly landscape and naturally therapeutic environment. However, as you enter the hospital the feeling of 'sense of place' from the natural surroundings, has been lost. The site planning/layout of the hospital is very dispersed, making it very hard to form defined and intimate grassed areas. Therefore, spaces are just leftover and underutilised. Moreover, the hospital management is focused around creating functional space for vehicles and people at the cost of the open green areas, potential gardens and a relaxing built environment.

Previously utilised gathering and interaction spots, where patients' could sit and relax, have been removed for the incorporation of vehicles. Other gathering spots were repurposed to incorporate prefabricated structures for wards. There is a large amount of vegetation on the precinct boundaries, with additional smaller, but singular plants within the central area of the precinct. In addition, the interior settings of the hospital use cold and institutionalised materials and colours that do not offer any positive perceptions or feelings in line with Genius Loci and Gestalt Theory.

Choice of site is important in creating 'genius loci' or a 'sense of place' this has been achieved by Umphumulo Hospital, but not carried throughout the buildings.

From a nurturing environment and wellbeing, Umphumulo Hospital does not offer patients' an environment that helps relieve the stresses of being within a healthcare facility. This could be achieved through simple interventions such as vegetation to soften the harshness of the building edges, trees to provide informal gathering spaces, the creation of interesting areas where patients feel positive subconsciously and the addition of splashes of colour within the wards to evoke feelings subconsciously. One can assume that these small cost effective innovations and interventions could give a feeling of Genius Loci and ultimately improve patient's wellbeing. The aspects within Umphumulo Hospital do not support the theories and concepts, literature and precedent studies analysed, in the previous chapters therefore does not help inform the typology of the healing centre.

6.1.8 Conclusion

The Umphumulo Hospital does not help promote the wellbeing of its patients and staff. The facility is unable to achieve this as the built and natural environments do not support the medical process of healing.

As mentioned above, the site planning/layout is dispersed, which creates a disjointed layout, that is impossible to link. This causes the natural open green spaces to be undefined and irregular. This does not offer patients, staff and visitors a positive experience of the spaces both built and natural environments. The unit/ward planning of the hospital reflects the same negative experience of which the site planning offers. There is a lack of passive design principles within the ward planning, resulting in the use of artificial ventilation systems being utilised. The openings do not provide sufficient ventilation; however do provide the patients with views to the therapeutic landscapes of the rolling hills in certain areas of the site. In addition, the materials, colours and textures do not seem to be cohesive. The many different colours, to an extent, do reflect the neutral colours mentioned within the literature, however the materials and textures, which either do not contrast the colours or are cold and institutionalised, do not support them. The ideas and notions of Genius Loci, Gestalt Theory and the concept of Nurturing Environments, do not support this.

The Umphumulo Hospital does not perform well for its intended function. There is a lack of understanding of the environmental and social context to promote or improve patients' wellbeing. Aspects of the built and natural environment have to be vastly improved in order to aid patient healing and improve patient wellbeing.

6.2 APPELSBOSCH HOSPITAL, UMGUNGUNDOLOVU DISTRICT, SOUTH AFRICA

6.2.1 Introduction

Project: Appelsbosch Hospital

Location: Ozwathini, KwaZulu-Natal

Funded: Government



Figure 91, Map of Africa, showing the red indicator on the country of South Africa (Author, 2015).

Figure 92, Map of South Africa, showing the red indicator on the province of KwaZulu-Natal (Author, 2015).

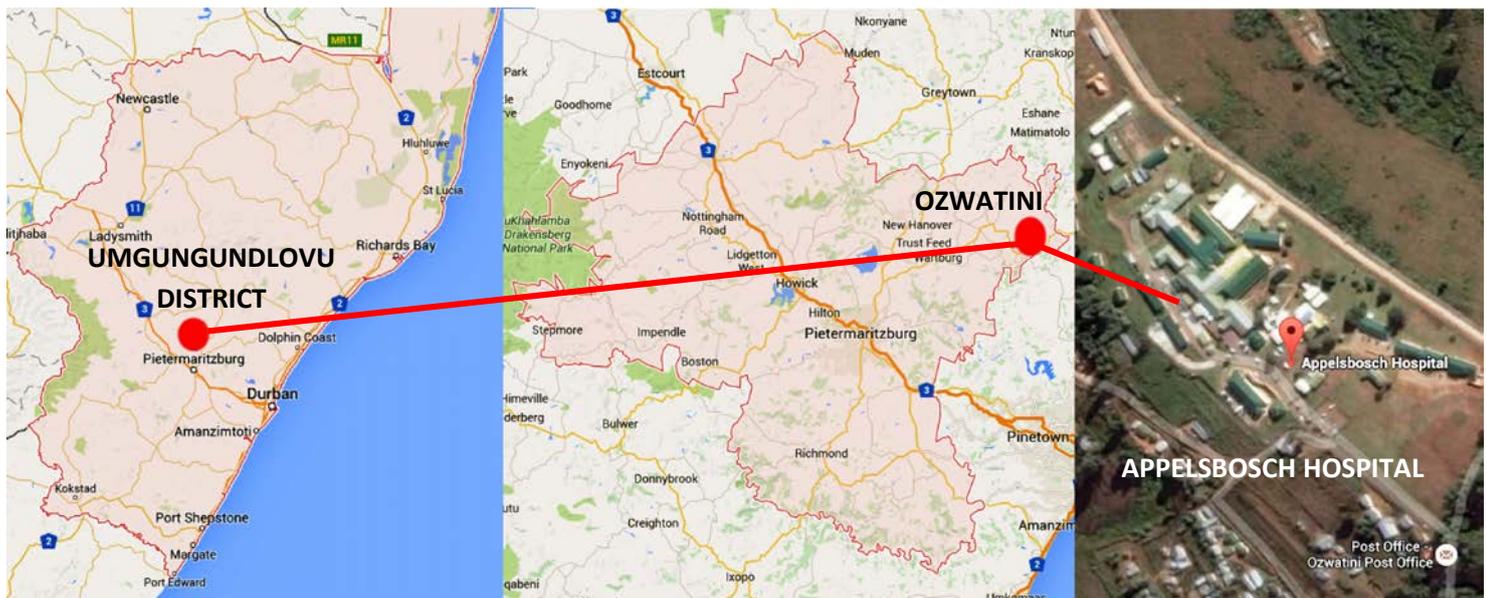


Figure 93, Map of KwaZulu-Natal, showing the red indicator on the Umgungundlovu District (Author, 2015).

Figure 94, Map of Umgungundlovu District, showing the red indicator on the rural area of Ozwathini (Author, 2015).

Figure 95, Umphumulo Hospital in the rural area of Ozwathini (Author, 2015).



Figure 96, Shows the pronounced entrance of Appelsbosch Hospital. (Author, 2015).

The Appelsbosch Hospital is a District hospital situated in the Umgungundlovu district. It is also perched on small hilltop site near the town of Greytown. The hospital is separated into different buildings on the site and overlooks the rolling of Ozwathini rural area.

6.2.2 History of Appelsbosch Hospital

Appelsbosch Hospital was founded in ±1883 by the late Reverend J. Jungquist, after the church of the Swedish Mission sent Missionaries to South Africa. The aim of the church of the Swedish Mission was to bring gospel, light (education) and health (hospital). The first building was built in 1886 and was used for church services and as a classroom. The second building was built in 1923 and was used as a Matron's and Sister's residence. The hospital was then fully established in 1926 with the erection of one main block that was used for all purposes such as; outpatient department, attending to small children and adults, dispensary, etc. Additional wards were erected onto the main block in 1951 in addition with two staff cottages. The Matron's and Sister's residence were also extended in 1951 with an addition of a garage and Store Room. These buildings have since been demolished and are non-existent today.

In 1957 an Engine House was built to keep a Diesel Engine to supply power and in 1958 a Doctors residence was built for a Swedish Doctor who was employed to stay on site at the above building, However, he was overwhelmed with the amount of work and left after a year. Over the course of the 1970's, 1980's and 1990's the hospital developed with numerous additional buildings such as; a store department, a workshop, radiology department, laundry, etc; to what is existing today.

6.2.3 Motivation/Justification

The choice of case study is motivated by some of the poor aspects in the design of public healthcare facilities in rural areas but mostly positive design aspects that are emulated within the Appelsbosch Hospital. The Appelsbosch Hospital can be commended on the operation, management as well as understanding the social context in which it is situated. However, there is still plenty lacking in the understanding of the environmental context, even though the precinct offers a positive feeling of 'sense of place', which could help improve patient wellbeing.

In addition, the second motivator was Appelsbosch Hospital's potential to become a highly regarded and well designed healing facility that promotes patient wellbeing and recovery through both the built and natural therapeutic environments.

6.2.4 Site Planning

Appelsbosch Hospital is also perched upon a small hilltop site, overlooking the surrounding community of Ozwathni, which it serves. It's positioning offers views of the surrounding natural environment to the south west, west and north (figures 75 & 76). However, these views are not fully taken advantage of as they are only visible from portions of the site and only some of the wards.



Figures 97 & 98, Shows the surrounding therapeutic landscapes of the rolling hills of Ozwathini as well as the surrounding community that the hospital serves. (Author, 2015).

The site planning of the hospital buildings are separated, much like the previous case study, creating a village/campus like layout (figure 77). This form is in-line with the successful layouts discussed in the previous chapter as it forms central spaces between the buildings for gardens and helps deal with the challenges of natural ventilation and light within public healthcare facilities.



Figure 99, Shows the site planning of Appelsbosch Hospital as well as the accommodation schedule, with relationship between the functions of the hospital (Author, 2015).

The case study of Appelsbosch Hospital gives insight to the functions needed within the typology of the Healing Centre, as well as their relationship to the other surrounding functions (figure 77).

Although, within Appelsbosch Hospital the open central spaces are not designed, these spaces are cosy, well maintained and offer patients a sense of healing through the natural environment. These open spaces are adjacent to covered walkways, which acts like a veranda for each of the buildings (*figures 78 & 79*). The wide covered walkways protect north-facing buildings from direct harsh light and offers the occupants who are utilising the walkways a pleasant journey to their next destination. In addition, the covered walkways also serve as other functions, as they are utilised as sub-waiting areas that are adjacent to the courtyards for different departments such as the X-ray department and the physiotherapy consultation rooms (*figures 78 & 19*).

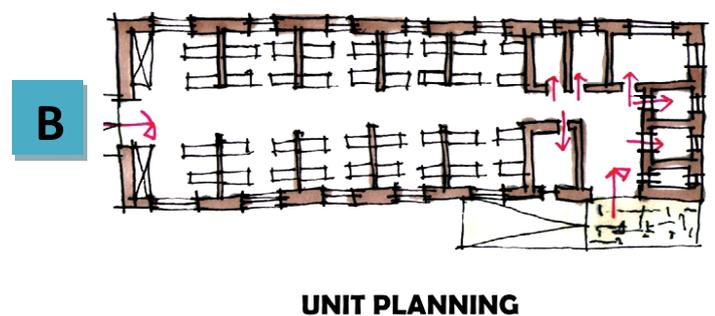
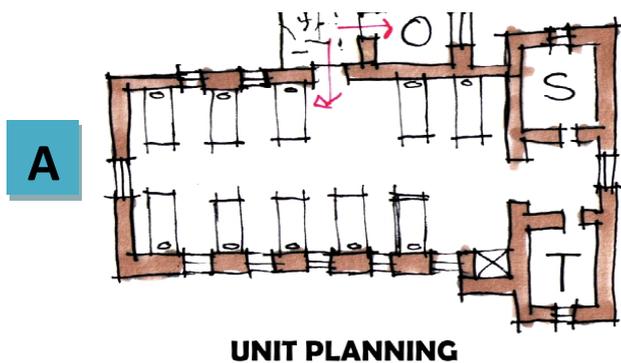


Figures 100 & 101, Shows the covered walkways, that act as verandas, sub-waiting areas and measures to deal with overcrowding in the main waiting room. They also protect the spaces from the direct north light (Author, 2015).

Additionally, the covered walkways act as an overflow for the main waiting area. These covered walkways and cosy, open central courtyard spaces offer not only patients, but other occupants a pleasant undisturbed view to the natural environment at all times, in addition, with the benefits of natural lighting and natural ventilation flooding the spaces. The buildings are better placed in relation to the surrounding environment. Therefore this method of dealing with the high influx of patients within public healthcare facilities is more successful than the previous case study. Moreover, this does help promote patient wellbeing and does help inform the typology of the healing centre.

The Ward/Unit Planning

The general male and female wards are slightly separated on site by two open courtyard spaces, this shortens staff walking distances as the duty room is positioned central to all wards. The covered walkways also offers, staff and patients in transit, protection from the weather during rainy days. The wards make use of the principle of natural ventilation that the village/campus like layout provide, through the passive design principle of cross ventilation, which is also aided by the wards north east orientation. This orientation of the wards welcomes the north easterly cool breeze that provides the best ventilation in the area of KwaZulu-Natal. Although there are air conditioning units, they are somewhat of an oversight as they are underutilised. The aspects of site planning, unit/ ward planning and the creation of open courtyard spaces are supported by the theories and concepts, literature and precedent studies analysed, in the previous chapters. Therefore the use of these aspects does help promote patient wellbeing and does inform the typology of the healing centre.

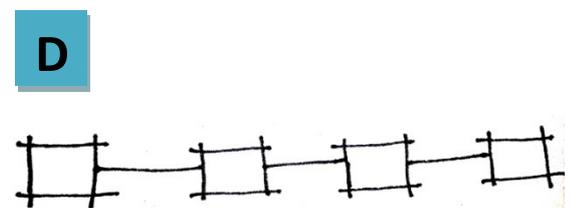
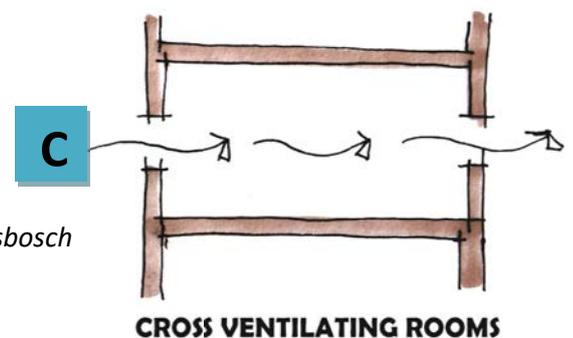


A Figure 102, Sketch showing the general ward planning of Appelsbosch Hospital (Author,2015)

B Figure 103, Sketch showing the alternative ward planning of Appelsbosch Hospital (Author,2015)

C Figure 104, Appropriate Cross Ventilation, which is well utilised within AppelsboschHospital (Author,2015)

D Figure 105, Sketch showing the linear planning of the wards (Author,2015)



6.2.5 Materials, Colours and Textures

The materials and textures of Appelsbosch Hospital reflect the standards of other public healthcare facilities across KwaZulu-Natal. From an external point of view; the use of plastered and painted (Paint: darker shade of cream) brick with a lower band of contrasting exposed brick is standard in public healthcare facilities in rural areas. In addition, on the older buildings where there is an absence of a lower band of brick; the older buildings are painted in a contrasting colour (Paint: brown similar to exposed brick) to create a similar effect. Although this is very similar to the Umphumulo Hospital, analysed in the previous section, it does relate well to the adjacent courtyards due to the use of more natural, earthy colours, that compliments the natural greens in the courtyard. This feeling could be influenced by the fact that Appelsbosch Hospital is well maintained.

The roof covering is also corrugated iron sheeting that has been painted green. The steel windows and reveals are painted brown, the same colour as the contrasting lower band, which removes the institutionalised feeling of the hospital due to its colour, as opposed to the Umphumulo Hospital. The materials used in the construction of Appelsbosch Hospital do support the literature and precedent studies analysed, in the previous chapters. The use of these materials, textures and particularly colours on the exterior of the building, therefore does help promote patient wellbeing, however, can be maximised in order to help promote better healing, faster recovery and promote wellbeing of patients. Therefore, these aspects do inform the typology of the healing centre.



Figures 106 & 107, Shows the materials, textures and colours used within Appelsbosch Hospital (Author, 2015).

From an internal point of view, most of the inpatient wards and outpatient department areas of the hospital are painted in neutral, colours either a white or a cream colour. All the ceilings are lifted to give an airy feeling and are painted white in colour. The floors are power floated and white sealed concrete screed, with minimal joints to prevent bacteria from gathering, which could cause further infection. The covered walkways are tiled in a grey tile in some areas, where other areas have just been finished with screed. This is slightly different from the standards of public healthcare facilities in rural areas, however still maintains the aspects of cleanliness of surfaces in order to help resist infection, in addition offer some 'sense of place' within the hospital. These aspects also reduce the monotonous and institutionalised feeling that is experienced within other public healthcare facilities within rural areas (*figure 86*). There is no use of contrasting colours or contrasting, natural materials and textures in the interior, which would provide patients with a warm, homely and comforting feeling. This would assist in providing patients with a soothing environment, helping to reduce stress within the facility and ultimately promoting their wellbeing. These aspects do support the literature and precedent studies analysed, in the previous chapters. However the maximising of natural materials, contrasting colours and textures would help promote better patient wellbeing and therefore does inform the typology of the healing centre to a certain extent.

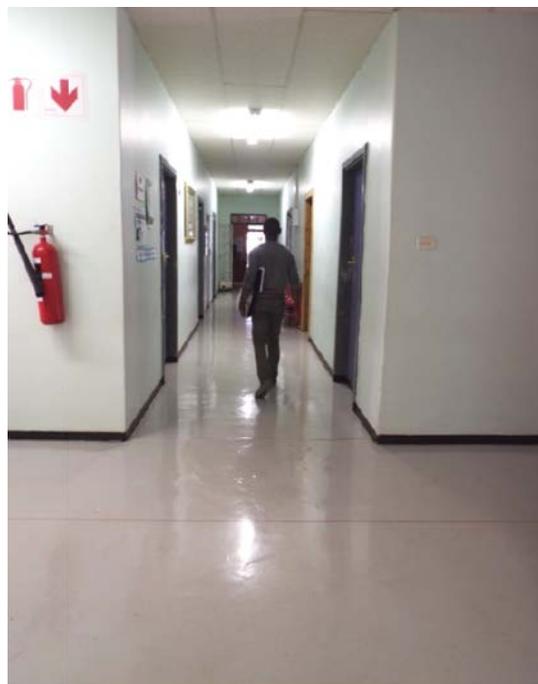


Figure 108, Shows the interior of Appelsbosch Hospital and the interior materials, textures and colours used. (Author, 2015).

6.2.6 Gardens and Landscaping

Similarly to Umphumulo Hospital, due to budget constraints current public healthcare facilities in the rural areas South Africa, do not offer designed gardens or landscaped areas. However, these facilities do offer open green spaces and courtyards between the buildings due to the village/campus like layout. However, compared to Umphumulo Hospital, these open green spaces are well maintained. Appelsbosch Hospital offers numerous open and courted grassed areas with the potential for healing gardens or landscaped areas. These green open spaces could even benefit patients with a tree that offers shade and a couple of benches for relaxation.

These open and courted green areas provide somewhat of a release or breathing space for patients however, with the addition of a shading tree and seating would have provided perfect interaction spaces for patients and their families, as well as providing a stronger visual and physical connection to nature, which in turn offers patients a sense of calm and tranquillity. As mentioned in the literature review chapter, this is vital as the natural environment supports the built environment in order to improve patient wellbeing. The aspects of gardens and landscapes within Appelsbosch Hospital do support the theories and concepts, literature and precedent studies analysed, in the previous chapters in their overall function. The use of these aspects therefore does help promote patient wellbeing and does help inform the typology of the healing centre.



Figures 109 & 110, Shows the well maintained open grassed areas/courtyards in relation to the materials, textures and colours used as well as in relation to the covered walkways (Author, 2015).

6.2.7 Analysis

The Appelsbosh Hospital precinct, similar to the Umphumulo Hospital precinct, is located on a hilltop site that offers a sense of Genius Loci. It overlooks the surrounding rolling hilly landscape and naturally therapeutic environment. As you enter the hospital that feeling of 'sense of place', has been carried through, as one feels comforted and a feeling of homeliness. As in the previous case study, the hospital management is focused around creating functional spaces for people but not at the cost of the open green, courtyard areas. Although, there is not a large amount of vegetation on the precinct boundaries and within the central open courtyard areas of the precinct, the precinct manages to be successful in creating a feeling of a 'sense of place'.

In addition, the interior settings of the hospital also achieves the feelings associated with 'sense of place'; as it does not offer a cold and institutionalised feeling due to the good use of materials and particularly one monotonous colour as in the Umphumulo Hospital. The choice of site is also important in creating 'genius loci' or a 'sense of place' this has been achieved by Appelsbosch Hospital and carried through into the buildings.

From a nurturing environment and wellbeing, Appelsbosch Hospital, offers patients' an environment that helps relieve the stresses of being within a healthcare facility. This could however be improved upon in order to speed up patient recovery through simple interventions such as vegetation to soften the harshness of the building edges, trees to provide informal gathering spaces, the creation of interesting areas where patients feel positive subconsciously and the addition of splashes of colour within the wards to evoke feelings subconsciously. One can assume that these small cost effective innovations and interventions could give a better feeling of Genius Loci and ultimately improve patients' wellbeing. The aspects within Appelsbosch Hospital do support the theories and concepts, literature and precedent studies analysed, in the previous chapters therefore does help inform the typology of the healing centre.

6.2.8 Conclusion

The Appelsbosch Hospital encompasses part of a complete healing environment that promotes wellbeing of patients and staff. The facility is able to achieve this through the immediate surrounding context of the built and natural environments that supports the medical process of healing.

The facility achieves this through a site planning layout that incorporates the natural environment within the building through the form of open and intimate courtyards. This offers patients, staff and visitors a positive experience of the space. However, this is not only achieved through the natural environment, the built environment also accomplishes a positive experience through passive design within the ward/unit planning of the hospital. The openings within the wards provide sufficient cross ventilation, thus making artificial ventilation redundant; in addition provides patients with views to the natural environment adjacent to the wards as well as the therapeutic landscape of the surrounding rolling hills. In addition, the use of materials, colours and textures on the transition spaces (verandas and covered walkways) linked to the courtyards. In addition, the hospital supports the surrounding community fully through efficient and effective systems and management, which upholds the facilities reputation, thus influencing the Social Construct of the surrounding society.

The Appelsbosch Hospital, performs well for its intended function, through the planning of its environmental and social context, which helps promote the wellbeing of patients. However, aspects of these environments can be improved in order to further promote patient wellbeing.

6.3 CONCLUSION

The case studies examined were done so with the intention of gaining a better understanding of the relationship between public healthcare facilities and the wellbeing of patients, through the environmental and social context.

In the exploration of these case study examples, the analysis of the environmental context is very critical to how these facilities perform. The Umphumulo Hospital, tries to improve patient wellbeing through some management systems, however, has not achieved any positive form of improving patient wellbeing through the built and natural environment that is supportive of the medical process. There is potential to create a better healing environment through well researched and contextually specific design but is restricted by government funding. The Appelsbosch Hospital, to a degree, does achieve a positive healing environment that helps improve patient wellbeing through aspects of the built and natural environment. Similarly to Umphumulo Hospital, there is room for improvement, however, is restricted by government funding.

The case studies analysed and examined reveal the type of spaces and functions need with a facility of this nature, however, the environments do not fully reveal or depict the architectural environments required when dealing with patient wellbeing. The built and natural aspects of the social environments dictate how effective the facilities are in addressing the issues and problems within public healthcare environments. This information is important in the understanding of patient wellbeing within rural areas and in the development of a new model of healthcare facility.

CHAPTER 7: FINDINGS & DATA ANALYSIS

7.0 INTRODUCTION

This chapter analyses the fundamental nature of this research through the research questions and research objectives, which were set out at the beginning of the dissertation. The research set out to identify the issues that contributed towards the effect current public healthcare architecture has on its patients in rural areas. The focus of the research was to address current patient health and environments that affect patient wellbeing negatively within a healthcare facility. The researcher's main assumption was that architecture, natural and built environments, could be used to improve patient healing and promote patient wellbeing through psychological, mental and social qualities. The research was essentially aimed at reducing patient stress within public healthcare facilities in rural areas by adopting the notion of a healing environment, which ultimately would improve patient wellbeing.

The results of the collected data will be synthesised through interviews from public healthcare facilities in rural areas of KwaZulu-Natal. The facilities are; Umphumulo Hospital and Appelsbosch Hospital, due to its different standards. The analysis and discussions of the research findings will conclude this chapter. The analytical interpretation draws on the theoretical framework, literature review, precedent studies and case studies that puts together principles and notions that inform an architectural response.

7.1 ANALYSIS AND DISCUSSION

The theoretical framework is formed by the concepts and theories analysed in the previous chapters. The theories of Genius Loci, Gestalt Theory and Social Construct and the concepts of Wellbeing, Nurturing Environments and Consensus Design were all used to analyse the literature, precedent study examples and case study examples, which now also forms part of the theoretical framework.

The theory of Genius Loci illustrates the potential for spaces to feel comfortable and stress-free, through the evoking of senses of the patient. This is supported by the psychological theory of Gestalt, which is vital in linking an individual's feelings and perception through psychology and

logic. In an architectural form relates to an individual's visual recognition of forms and figures through the interpretation of space, environment and scale of objects. Thus giving the individual a platform to experience a space. The theory of Social Construct is to now formulate a new social idea via the notion of socially supportive healthcare architecture, along with forming a new identity for public healthcare architecture in rural areas.

The initial literature has defined the built and natural environments as a plausible intervention for improving patient wellbeing, through psychological, physical and social aspects. The observations examined in the precedent studies and case studies support the aspects mentioned in the literature, and further strengthen those aspects mentioned in the literature. Therefore the analysis of the findings will be based on the collective aspects discussed in the literature, precedent studies and case studies. Thereafter it will serve as a guideline to create a composition of architectural elements, to inform the design of a new model of public healthcare facility that can promote wellbeing in rural KwaZulu-Natal.

7.2 FINDINGS

A semi-structured interview schedule was used to collect data from two public healthcare facilities with the rural areas of KwaZulu-Natal, namely Umphumulo Hospital and Appelsbosch Hospital. These hospitals were chosen due to the environmental and social context within the rural areas of KwaZulu-Natal. Ten interviews were conducted in total, with a sample of staff members and past patients' from each facility being interviewed. All the past patients' were previously involved in aspects of inpatient treatment and had experienced the hospital as a whole. All staff members were involved in the daily running of the hospital and had experiences on most aspects of the facilities. The data collected will be coded into themes and discussed in context of the theoretical framework. This is done in order to process the findings within the context of the literature and in informing an approach towards the architectural response.

7.2.1 Rethinking Current Public Healthcare in Rural Areas

The existing body of literature analysed; highlights the poor state of current public healthcare facilities in rural KwaZulu-Natal. In addition, establishes the need to rethink current public healthcare that can promote patient healing and wellbeing. The current model of public healthcare facilities needs to be rethought in order to successfully improve the standard of healthcare facilities being erected in rural areas. The aim behind this specific line of questioning was directed at assessing the social context in response to the perception of the state of current public healthcare facilities.

Questions conducted with past patients regarding the state of current public healthcare facilities in rural areas garnered contrasting data. Past patients at Umphumulo Hospital expressed concern about many aspects such as; overcrowding, narrow passages, lack of ventilation and privacy. In addition, they expressed greater concern about the lack of air circulation within the wards. A past patient interviewed from Umphumulo Hospital stated, "The ward is very small and overcrowded and there is no privacy. It is hot in the ward and there is no airflow, which makes us irritable." This relates to the issues discussed in the literature. Although, Appelsbosch Hospital Past patients' also expressed concerns about public healthcare facilities in general; the interviewees praised Appelsbosch Hospital for the aspects of natural ventilation, natural lighting, hospitality and the absence of a waiting period. A past patient from Appelsbosch Hospital stated, "I have no complaints, this facility takes care of the entire community's needs efficiently and effectively."

Questions conducted with staff at Umphumulo Hospital, revealed that the issue of overcrowding is due to a high influx of patients from the high number of surrounding feeder clinics. The scale of the hospital cannot deal with the amount of clinics it supports, as its catchment area is 60% of the Illembe District area. It was mentioned that the other issues relate to the lack of funding from the government. An interview conducted with a staff member at Appelsbosch Hospital revealed that the size of the hospital is important in creating an efficient and effective facility, as Appelsbosch Hospital's scale relates to its catchment area.

The findings suggest that there is generally a negative perception and response to the state of current public healthcare in rural areas. This is related to aspects within the theory of Social

Construct in that the public healthcare facilities are labelled as poor and inefficient by the society. The findings also suggest that there is no clear difference in standards between the two healthcare facilities. Social constructs of public healthcare can be explored for the benefit of the efficient and effective healthcare facilities.

7.2.2 Redesigning Healthcare Facilities through the Natural and Built Environment

The existing body of literature established a need for current public healthcare facilities to be redesigned in order to improve patient wellbeing, through the positive healing aspects of the built and natural environments highlighted in the literature. The questions were aimed at assessing the type of aspects that would be feasible in the redesigning of public healthcare facilities in rural areas in order to improve patient wellbeing.

Questions conducted with staff and past patients regarding the improvements of healthcare facilities garnered positive and similar data. Supportive healing introduces aspects of the built and natural environments that reduce stress and enhance physical, social and psychological health. Past patients' from Appelsbosch Hospital were very satisfied with the aspects of the built environment. A former patient from Appelsbosch Hospital stated, "The layout of the wards and size of the passage ways are perfect and the wards also have nice views; it almost feels like you are at home because you are so relaxed." However, past patients from Umphumulo Hospital expressed the need for the built environment to be expanded in order to reduce congestion in passage and pathways within wards, and make proper provisions for wheelchair access. It was also expressed that ventilation and airflow is poor, as mentioned in the previous section. One of the nurses interviewed also expressed this.

Questions conducted with staff and past patients regarding the improvements of healthcare facilities through aspects of the natural environment garnered similar data. Supportive healing can also be achieved through designed/landscaped or just open green spaces. Past patients and staff at Umphumulo Hospital had complained about the reduction of shaded and grassed natural areas within the hospital precinct in order to accommodate vehicles. A past patient, who was previously in the maternity ward at Umphumulo Hospital, was interviewed and mentioned that there is a lack of interaction spaces for mothers to relax in, as the maternity ward is overcrowded. A staff member

interviewed at Umphumulo Hospital expressed concern about this aspect; she mentioned in the past the mothers from the maternity ward used to gather under a shaded tree, open green space adjacent to the maternity ward and socially interact with each other during their done time. She expressed concern, as the management had removed the trees, and tarred the area for vehicular parking. However, within Appelsbosch Hospital, these green areas are located within the layout of the building, which is inaccessible for vehicles. Although these areas are not shaded by trees, the scale of these courtyards and open green space are intimate, well utilised and busy, as sub-waiting areas are directly adjacent to them. Past patients at Appelsbosch Hospital articulated that these areas offer excellent breathing spaces for relaxation within the context of the hospital.

These findings suggest that there is room for many improvements within the built and natural environment of public healthcare facilities in rural areas in general, as demonstrated by Umphumulo Hospital. However, it also suggests that it is achievable, as shown by the Appelsbosch Hospital, which demonstrates the aspects of incorporating natural ventilation, use of colours and materials of the built environment in conjunction with the open grassed areas and therapeutic landscapes of the natural environment to improve patient wellbeing. These aspects of the built and natural environments can be improved drastically for better results, however, it shows they are successful within the context of Appelsbosch Hospital. This is directly related to the aspects of Genius Loci and Gestalt Theory, as well as aspects within the concepts of Wellbeing and the Nurturing Environment.

7.2.3 Reintegrating Aspects of Current Public Healthcare

The existing body of literature established the need for a new model of public healthcare facility that deals with the contextually specific problems and challenges experienced within public healthcare facilities in rural areas. As mentioned above, this can be achieved through the positive healing aspects within the built and natural environments. The questions were aimed at other positive aspects that could be reintegrated into a new model of healthcare facilities. In addition, aspects that the interviewees thought would help influence and improve patient wellbeing, that may exist, of the general healthcare facilities, such as management programs, care of nurses, hospitality etc.

Questions conducted with staff and past patients regarding the further adaption of public healthcare facilities in rural areas, obtained very contrasting responses between the two healthcare facilities. In order for a supportive healing within a facility to occur, that facility should be able to cater for a variety of people. The past patients that were interviewed from Umphumulo Hospital revealed that as much as the environments need to be rethought and improved; care giving of staff is a major issue and also needs to be improved. Another past patient, from the male TB ward, mentioned that they are encouraged, by management, to be outdoors due to their need for Vitamin D through sunlight. However, more outdoor activities or entertainment would aid TB patients in being outside more as well as increase social interaction. An employee, interviewed from Umphumulo Hospital, mentioned that employees are lacking in motivation and "heart" due to the environment in which they are employed to work. The state of the current hospital not only affects the patients wellbeing, but also the staff. It was mentioned that, the improvement of the healthcare environment would also improve staff wellbeing and in turn improve staff motivation. However, past patients from Appelsbosch Hospital praised the good care nurses and doctors were giving in addition praised the good management. The interviewee also mentioned that they are encouraged by employees to spend time within the open grassed spaces in order to relax and relieve stress.

The findings suggest that there are positive aspects within the management and overall running of these facilities that can be re-integrated into a new model of healthcare facility. These aspects are in line with the concept of Wellbeing, which can be improve through different managements systems to the benefit of patients and staff. This is also related to the theory of Social Construct, which can be explored for the benefit of all public healthcare facilities in rural areas.

7.3 CONCLUSIONS

The findings of the primary data collected from semi-structured interviews, observations, photographs and sketches were analysed according to the criteria established and researched in the secondary data collected; thereafter themes were established. The criteria offer an in-depth understanding of architectural aspects that help benefit patient wellbeing, while the themes offer a positive new outlook in order to create a holistic environment for patient wellbeing.

In the primary data collected, it is evident that some public healthcare facilities are lacking in aspects that improve patient wellbeing. However, these facilities have room for improvement and offer patient wellbeing, as is evident from the primary data collected from Appelsbosch Hospital. The themes created were rethinking, redesigning and reintegrating aspects of current public healthcare facilities through the understanding of patient wellbeing in rural areas.

The findings reinforce the ideas and notions discussed within the theories and concepts chapter of creating a socially supportive nurturing environment in order to improve patient wellbeing. In addition, it also supports the literature reviewed and criteria used in the precedent and case studies in that; architectural aspects play a vital role within healthcare environments, in improving patient healing and wellbeing.

These themes and findings are not only in line with the theoretical framework discussed in the theories and concepts chapter and the literature review chapter, but also fill in gaps within the research as to the patients experiences and perceptions within this type of facility.

CHAPTER 8: CONCLUSIONS & RECOMMENDATIONS

8.0 INTRODUCTION

This chapter explains the theoretical framework used to achieve the aim of this research and inform the architectural design response. The theoretical framework is interdisciplinary as it draws on ideas and notions from environmental psychology, architecture and aspects of sociology.

The theoretical framework is explained in relation to the understanding of how patients experience environments, through the theories and concepts, which form the basis for this dissertation, in addition to, the aspects of the built and natural environments, which were examined in the literature review, and defines the relationship between these environments and patient wellbeing.

The introduction chapter, in this dissertation, outlined the issues and problems within current public healthcare facilities in rural areas with the aim of thoroughly understanding the existing challenges, to inform a new design. Thereafter, this dissertation, addressed how the aim of the research were achieved, which is covered in the research methods.

8.1 CONCLUSIONS

8.1.1 Theoretical Framework

The desired aim of this research was to inform the design of a new model of public healthcare facility to improve patient wellbeing. The aim was achieved through the objectives of understanding the effect public healthcare facilities has on it patients and generating contextually specific principles in order to successfully rethink and redesign public healthcare architecture to benefit patients. In addition, successfully reintegrate existing well-planned, quality infrastructure and systems into a new model of healthcare architecture that has been helping patients healing and improving patient wellbeing.

Patient wellbeing in rural areas is affected by many kinds of factors. These factors are not necessarily all architectural, however can be improved through architectural thinking. Factors such as patient access to healthcare facilities are not an architectural factor, but can be resolved through

strategic placement of these facilities. Architectural factors such as orientation, site planning, lack of ventilation and the lack of integration between the built and natural environments cause stress within patients, increasing recovery time. In addition, serious consequences such as overcrowding and airborne diseases, this leads to the transmission of hospital diseases from one patient to another. Therefore, there is a need for a new type of facility that is well designed, with strategically placed buildings that embrace the contextually specific architectural principles such as a well-orientated building, natural ventilated open spaces and an integrated indigenous, natural and built environment improves patient wellbeing. These factors are supported by the ideas and notions discussed in the theories and concepts, and literature review chapters.

The theories and concepts chapter, in this dissertation, is to analyse all data collected within the perspective of the dissertation topic. There are three major theories and three concepts that are inter-related. The theory of Genius Loci illustrates the potential for spaces to feel comfortable and stress-free, through the evoking of senses of the patient. This is supported by the psychological theory of Gestalt, which is vital in linking an individual's feelings and perception through psychology and logic. In an architectural form relates to an individual's visual recognition of forms and figures through the interpretation of space, environment and scale of objects; thus giving the individual a platform to experience a space. The theory of Social Construct is to now formulate a new social idea via the notion of socially supportive healthcare architecture, along with forming a new identity for public healthcare architecture in rural areas.

The initial literature has defined the effect of current public healthcare facilities in rural areas on its patients' and the effects it has on the surrounding communities. The rural areas pose unique challenges for the development of quality and socially sustainable healthcare facilities. The stereotype of people about public healthcare facilities in the rural areas of South Africa is perceived to be poor. These effects oppose the notions of Social Construct theory as it negatively influences the ideas of public healthcare facilities in rural areas. This is in line with the notion that social constructs are positioned in opposition to natural facts and are rationalised by human beings joint experience (Jackson, Penrose, 1993). Thus, various individual's negative experiences of public healthcare facilities would begin a negative social construct about public healthcare facilities.

The issues within public healthcare facilities in rural areas, is mostly related to the contextually specific, environmental influences. This is in line with the literature reviewed on site location, as this is the basis for creating a well functioning, easily accessible, positive healing environment. This relates to the notions analysed in the theory of Genius Loci and the concept of a Nurturing Environment. Whereby an environment must evoke positive feelings and relieve stress and physically minimise biological & psychological events that effect human wellbeing.

As mentioned in the literature, aspects to improve patient wellbeing such as cultural views, social participation and inclusion in activities relates directly to the theory of Social Construct as well as the concept of consensus design which support wellbeing of patients socially. This is in line with the notion that playing a part in society benefits the individual, thus improving their wellbeing. Other aspects such as physical, mental and spiritual health relates to the theories of Genius Loci and Gestalt Theory and how environments affect these aspects. The relationship to the environment, where the processes of medical healing takes place has a direct influence of the patients' wellbeing.

Aspects of both the built environment, (natural ventilation, natural lighting, views to nature, colours and materials) and natural environment (plants, healing gardens and therapeutic environments), play a vital role to play in improving patient wellbeing. This relates to the perception theory of Gestalt Theory and how the interpretation of individual forms and figures within a space or environment allows the patient to derive an appropriate perception for their own healing. Therefore, spaces designed within the architectural response, will be intended at portraying their function as well as creating a calming and stress relieving experience to directly and positively influence patients' wellbeing, which is in line with the theory of Genius Loci, as well as the concepts of Nurturing Environments and Wellbeing.

The literature discussed in regards to the interpretation of colour relates to the theories of environmental perception, which relates to how the aspects and variation in colour effects the individual psychologically. This is similar to the perception and interpretation of materials and textures. The relationship to patient wellbeing also draws on the environmental perception that is to interpret variables in the environment for a more appropriate perception in which a patients experience.

The literature discussed in regards to gardens and landscaping also relates to environmental perception can influence patient wellbeing. This works in conjunction with the built environment. It is the interpretation of variables within the natural environment for a more appropriate perception in which a patients experience.

The observations supported by the interviews, case studies and precedent studies collectively will serve as a guideline to create a composition of architectural elements, to inform the design of a new model of public healthcare facility that can promote wellbeing in rural KwaZulu-Natal.

The findings of the research confirm the hypothesis that a balanced built and natural environment does support patient wellbeing and healing. These fully purposed and architecturally designed spaces do improve patients' wellbeing through a series of psychological systems that benefit patients positively.

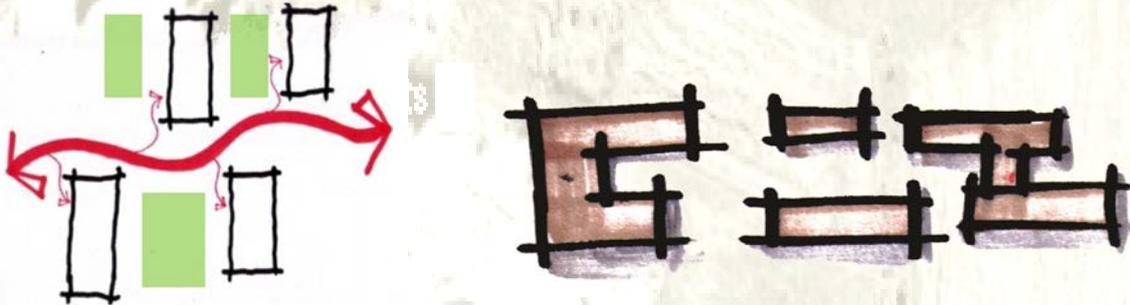
Based on the analysis of the theoretical framework and findings, a suitable architectural response has been derived to address the current issues in public healthcare environments in rural areas. The above assumptions declare that the interviews correspond with the research and theoretical framework.

8.2 RECOMMENDATIONS FOR THE ARCHITECTURAL DESIGN

The purpose of the information examined thus far in the literature review, precedent studies and case studies is to inform an architectural response to deal with the existing challenges of patient wellbeing within public healthcare facilities in rural areas. The following information has been taken from all the data covered within this dissertation. It will be synthesised into recommendations for the architectural design response. These recommendations are as follows:

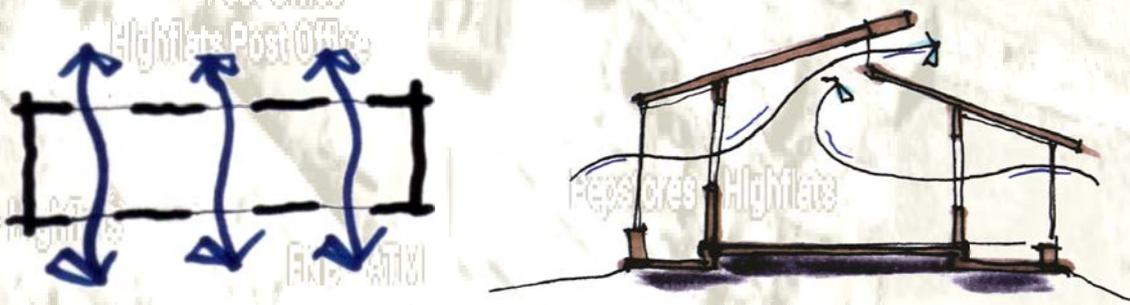
8.2.1 Impact from the Environment on Patient Wellbeing

- Site planning that incorporates courtyards, open grassed areas and healing gardens, supported by the movement through these created green areas.



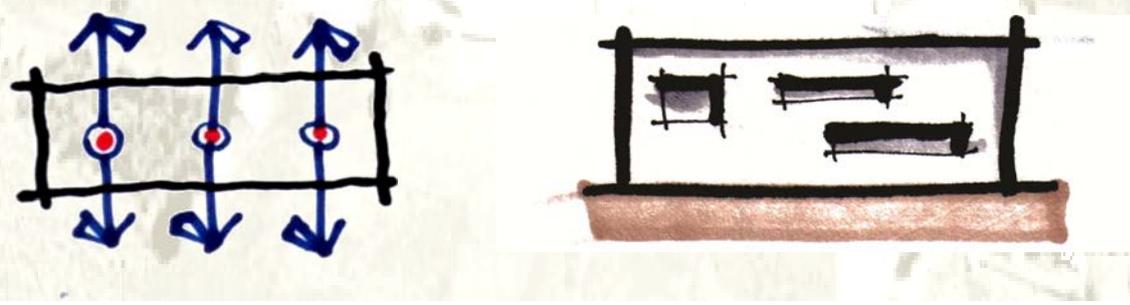
Figures 111 & 112, Sketches showing the aspects of site planning and movement through the site (Author,2015)

- Natural lighting and natural ventilation/cross ventilation are to be considered within the design to improve human wellbeing.



Figures 113 & 114, Sketches showing the aspects of natural & cross ventilation within the ward/unit planning (Author,2015)

- Views, through openings, from the built environment to landscaped gardens and natural features should to be considered throughout the design to promote healthy environments and patient wellbeing



Figures 115 & 116, Sketches showing the aspects of visibility and views to nature through openings within the ward/unit planning (Author,2015)

Impact from the Environment on Patient Wellbeing (continued)

- Functionality and design intent are to be considered throughout the design to promote the spatial quality of the structure for the benefit of the patients.
- Colour variation will be considered throughout the design to promote environmental stimulation or de-stimulation where appropriate.
- Material and textures are to be considered throughout the design and their impact on patient wellbeing.
- Clear spatial function and intent of space can be clearly identified, to aid in way finding.

8.2.2 Approach in Developing a Typology

- The building and typology should promote community support as well as 24 hour emergency functionality.
- The building should provide multipurpose areas for use of staff training functions to further promote community integration.
- The building needs to accommodate a variety of accommodation typologies for inpatient treatment.
- The building should be made able to adapt and change to suit its current context, promoting sustainability and full usage of the building.

8.2.3 Site Selection Criteria

- The site should be located close to the majority of the population can access the services.
- The site should be located close to other amenities (transport interchange, shopping complexes) making it inexpensive and easy for travel.
- The site should be semi-detached from the built environment to create a space for community activities and social interaction.
- The site should support a positive therapeutic setting, with surround natural landscapes.
- The site should evoke all senses through psychology and emotions and provide a positive sensory experience of the natural environment.
- The site should support a closely knit and large community that will support participatory/consensus design, construction and operation
- The site should attract wildlife from the area through indigenous trees and plants.
- The site should not be too far from to a main road to allow for transport and accessibility.
- The site should promote a healing environment absent of noise pollution or other negative environmental influences.

8.2.4 Approach to Accommodation Schedule

The accommodation schedule should consider the following spaces and their pertained functions, within the formulation of a healing centre for the wellbeing of patients in rural KwaZulu-Natal:

- Outpatient Department (X-ray, Pharmacy, 24 Hour Emergency, etc)
- Inpatient Wards (Male and Female TB, Surgical and Medical, Maternity, Physiotherapy, Paediatric)
- Diagnostics and Treatment (ICU, Operating Theatres, Support Services)
- Social interaction spaces (Coffee shop, within outdoor spaces, Forecourt)
- Educational/ Learning spaces (Multipurpose Space, Staff training, Education)
- Healing gardens
- Office/ Administration spaces
- Outdoor/ Landscaped spaces

8.2.5 Design Parameters -

Purpose:

The purpose of the architectural response is to improve the wellbeing of patients within public healthcare facilities in rural areas, through built and natural healing environments.

Why?:

There is a need for quality Healing environments in rural KZN, as the current public healthcare facilities do not aid in improving patient wellbeing.

Who?:

The architectural response is aimed to benefit patients within rural areas that require quality healthcare and improved healing environments.

What?:

The typology is a Healing Centre which is an Integration of a Healthcare facility that offers medical & therapeutic healing environment.

How?:

This will be done through integrating the therapeutic natural & built environment with the process of medical healing.

Client?:

The client for this project will be the KwaZulu-Natal Department of Health

8.2.6 Previous Site Selection



Figures 117, Map showing the site boundaries of the Amahwaqa Rural Area Site (Author,2015)

SITE 1 Amahwaqa Rural Area

(North of Hibberdene)South Coast

- Restrictive community size, Small catchment area
- Far from other amenities
- Far from main road and public transport routes.



Figures 118, Map showing the site boundaries of the KwaBhidla Rural Area Site (Author,2015).

SITE 2 KwaBhidla Rural Area

(South East of Umzimkulu)

- Small Site area
- Restrictive community
- Far from amenities and public transport routes



Figures 119, Map showing the site boundaries of the Inkangala Rural Area Site (Author,2015).

SITE 3 -Inkangala Rural Area, Luthuli

(West of Umgababa) South Coast

- Far from amenities and main public transport routes
- Small site area
- Restrictive community

8.2.7 Site Selection

SITE 4 Highflats, KZN

The site is located East of Ixopo, located on the R612 Main Road, close to the town centre.



Figures 120, Map showing the site boundaries and the town of Highflats that supports the surrounding rural areas (Author,2015).

Reasons for Site Selection

- The town offers larger but closely knit community, with a large, rural catchment area.
- The town is densely populated.
- There is an ease of access from rural areas to the town centre for all.
- Long distance transport routes through the town, therefore provisions for a transport hub for greater access to all.
- The site is close to other amenities, shopping complexes, schools and public service centres
- This site is accessible to feeder clinics.

8.3 CONCLUSIONS

The conclusions and recommendations mentioned, provide guidelines which influence the architectural response of the Healing Centre. These guidelines are informed by the theoretical framework examined in the dissertation.

BIBLIOGRAPHY

- A Daily Dose of Architecture, (2012) *Butaro Hospital* [Online] Available from: www.archidose.blogspot.com/2012/07/butaro-hospital.html [Accessed: 18th March 2015]
- Acharya, L. B., & Cleland, J. (2000). Maternal and child health services in rural Nepal: does access or quality matter more?. *Health Policy and Planning*, 15(2), 223-229.
- African National Congress. (2011). *A National Health Plan for South Africa*. [Online] Available from: <http://www.anc.org.za/show.php?id=257> [Accessed: 18th March 2015]
- Andrews, T. (2012). What is social constructionism? *Grounded theory review*, 11(1), 39-46.
- Architecture for Health: Butaro Hospital and Participatory Design*, (2012)[Online] Available from: www.dddxyz.org/architecture-for-health-butaro-hospital-and-participatory-design/ [Accessed: 16th March 2015]
- Architype. (2011) *Peter and Paula Fasseas Cancer Clinic at University Medical Center*. [Online] Available from: www.architype.org/project/peter-and-paula-fasseas-cancer-clinic-at-university-medical-center/ [Accessed: 21st March 2015]
- Arch Daily, (2011) *Hospital / MASS Design Group* [Online] Available from: www.archdaily.com/165892/butaro-hospital-mass-design-group/ [Accessed: 18th March 2015]
- Augustin, S. & Fell, D. (2015). Wood as a Restorative Material in Healthcare Environments [Online] Available from: <https://fpinnovations.ca/media/publications/Documents/health-report.pdf> [Accessed: 18th November 2015]
- Australian Institute of Health and Welfare (AIHW) 2003, *Australia's young people: Their health and wellbeing 2003*, AIHW Cat. No. PHE 50, Australian Institute of Health and Welfare, Canberra.
- Berger, P. & Luckmann, T. (1991). *The social construction of reality*. London: Penguin Books.
- Body and Mind. (2010) The Buddhist Retreat Centre. [Online] Available from: www.bodyandmind.co.za/merchant_nc.php?pid=491&step=4 [Accessed: 20th July 2015]
- Bourke, L. & Geldens, P. (2007) *What does wellbeing mean? Perspectives of wellbeing among young people & youth workers in rural Victoria*, Youth Studies Australia, vol. 26, n- 1
- Breetzke, L.N.C. (2010) *A Study of the Relationships between Architectural Environments and Human Wellbeing*, unpublished Thesis University of KwaZulu-Natal.
- BRC Ixopo. (2007) Environment. [Online] Available from: www.brcixopo.co.za/environment.html?catpage=1&page=3#category [Accessed: 25th July 2015]

Broek, N. D., White, S. A., Ntonya, C., Ngwale, M., Cullinan, T. R., Molyneux, M. E., & Neilson, J. P. (2003). Reproductive health in rural Malawi: a population-based survey. *BJOG: An International Journal of Obstetrics & Gynaecology*, 110(10), 902-908.

Cocks, M. & Moller, V. (2002) Use of indigenous and indigenised medicines to enhance personal well-being: a South African case study. *Science Direct*. [Online] Volume 54 (3).p.387–397. Available from: www.sciencedirect.com/science/article/pii/S0277953601000375. [Accessed: 21st November 2014]

Community League. Healing Gardens. [Online] Available from: www.communityleague-stmary.org/healing-garden/ [Accessed: 19th March 2015]

Coovadia, H., Jewkes, R., Barron, P., Sanders, D., McIntyre, D. (2009), The health and health system of South Africa: historical roots of current public health challenges. *The Lancet*. [Online] Volume 374 (9). p.817-834. Available from: www.thelancet.com [Accessed: 21st May 2015]

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. SAGE Publications.

Curry, Z. & Gaines. K. (2011), The Inclusive Classroom: The Effects of Color on Learning and Behavior. *Texas Tech University*. [Online] Volume 29(1). p.46-57. Available from: <http://www.natefac.org/Pages/v29no1/v29no1Gaines.pdf> [Accessed: 21st November 2015]

Day, L. (2007), *Healing environments and the limits of empirical evidence*, *American Journal of Critical Care*, 16(1), 86.

Design Boom. (2013) MASS design group: Butaro Hospital, Rwanda. [Online] Available from: <http://www.designboom.com/architecture/mass-design-group-butaro-hospital-rwanda/> [Accessed: 22nd March 2015]

Design Prime Precedent Analysis. Medium Density Multi-Residential Housing. [Online] Available from: www.deisgnprimerprecedentanalysis.wordpress.com/ [Accessed: 19th March 2015]

Diener, E. & Eunkook, M.S. (2000), *Measuring subjective well-being to compare the quality of life of cultures, in Culture and subjective well-being*, MIT Press, Cambridge, Massachusetts, pp.3-12.

Domus. (2013) Curry Stone Design Prize 2012: MASS. [Online] Available from: www.domusweb.it/it/notizie/2013/02/22/curry-stone-design-prize-2012-mass.html [Accessed: 22nd March 2015]

Easthope, G. & White, R. (2006) Health and wellbeing: How do young people see these concepts? *Youth Studies Australia*, v.25, n.1, pp 42-49.

Eckersley, R., Wierenga, A. & Wyn, J. (2006) 'Success and wellbeing: A preview of the Australia 21 report on young people's wellbeing', *Youth Studies Australia*, v.25, n.1, pp.10-18.

Ecology for Australia. (2014) The natural secrets of urban well being. [Online] Available from: www.ianluntecology.com/2014/04/06/urban-biodiversity-human-well-beingrban-well-being/ [Accessed: 21st March 2015]

Flickr. (2014) Map of BRC Complex. [Online] Available from: www.flickr.com/photos/stephsalpics/15455175798/ [Accessed: 25th July 2015]

Frankenberg, E. (1995). The effects of access to health care on infant mortality in Indonesia. *Health Transition Review*, 143-163.

Gaede, B., &Versteeg, M. (2011). The state of the right to health in rural South Africa. *South African Health Review*, 99-106.

Green, C. (2012). *CSIR Guidelines for the provision of social facilities in South African settlements*. CSIR Built Environment.

Hamlyn, D.W. (1969) *The psychology of perception: A philosophical examination of Gestalt Theory and Derivative Theories of perception*. Routledge & Kegan Paul: London.

Hammersley, M. (1992). *What's Wrong with Ethnography?* Routledge, London.

Healthcare Design Magazine. (2008) *Peter and Paula Fasseas Cancer Clinic at University Medical Center North Tuscon, Arizona CO Architects*. [Online] Available from: www.linespacespace.com/mass-design-builds-hospitals-with-hope-in-rwanda/ [Accessed: 21st March 2015]

Healthcare Design Magazine.(2014) Holy Cross Germantown Hospital. [Online] Available from: www.healthcaredesignmagazine.com/sites/healthcaredesignmagazine.com/files/imagecache/570x360/HolyCrossGermantown98.jpg [Accessed: 19th March 2015]

Health-E News. (2014) By the numbers: National Health Insurance in Mpumalanga. [Online] Available from: www.health-e.org.za/2014/12/09/numbers-national-health-insurance-mpumalanga/ [Accessed: 20th March 2015]

Jayes, K. (2014) A Place of Healing. *Earthworks Magazine*. 20 (7). P.70-76.

Jive'n. G. &Larkham, P.J. (2003) Sense of Place, Authenticity and Character: A Commentary, *Journal of Urban Design*, Vol. 8, No. 1, 67–81

Justlanded, (2014) *Public Healthcare: South Africa's health system* [Online] Available from: www.justlanded.com/english/South-Africa/South-Africa-Guide/Health/Public-Healthcare [Accessed: 18th November 2014]

Kropf, K.S. (1996) Urban tissue and the character of towns, *Urban Design International*, 1(3), pp. 247–263.

KwaZulu-Natal Department of Health. (2015) *Strategic Plan 2015-2019*. Pietermaritzburg : KZN Department of Health.

KwaZulu-Natal Department of Health. (2015) History of the Hospital. [Online] Available from: <http://www.kznhealth.gov.za/Umphumulo/history.htm> [Accessed: 20th August 2015]

- KZN Health. (2015) History of the Hospital. [Online] Available from: <http://www.kznhealth.gov.za/appels/history.htm> [Accessed: 20th August 2015]
- Law, M. F., & Shek, D. T. L. (2014). Encyclopedia Of Quality Of Life And Well-being Research.
- Line Shape Space. (2015) *MASS Design Builds with Beauty, Dignity, and Hope in Rwanda and Beyond*. [Online] Available from: www.lineshapespace.com/mass-design-builds-hospitals-with-hope-in-rwanda/ [Accessed: 10th March 2015]
- McCullough, C. S. (2009). *Evidence-based design for healthcare facilities*. Sigma Theta Tau.
- Meditech. (2012) Gauteng's Health Department Allocated R34BN. [Online] Available from: www.meditech.co.za/news/rotherham-starts-to-implement-meditech/ [Accessed: 21st April 2015]
- Murphy, E., Dingwall, R., Greatbatch, & Parker, P. (1998). Qualitative research methods in health technology assessment: a review of the literature. *Health Technology Assessment* 2(16).
- News24. (2012) Health Care and Poverty in Rural KZN. [Online] Available from: www.news24.com/MyNews24/Health-Care-and-Poverty-in-Rural-KZN-20120824 [Accessed: 1st April 2015]
- Norberg-Schulz, C. (1980) *Genius Loci: Towards a Phenomenology of Architecture*. New York: Rizzoli.
- Open Buildings.(2011) Butaro Hospital. [Online] Available from: www.openbuildings.com/buildings/butaro-hospital-profile-40296 [Accessed: 21st March 2015]
- Pallasmaa, J. (2012) *The Eyes of the Skin Architecture and the Senses*, John Wiley and Sons Ltd, United Kingdom.
- Ryan, R. & Deci, E. (2000) *Self-Determination and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being*, *American Psychologist*, 55(1), pp. 68-78.
- Silva, K. D. (2015). The spirit of place of Bhaktapur, Nepal. *International Journal of Heritage Studies*, (ahead-of-print), 1-22.
- Smith, M. J., Solanki, G., & Kimmie, Z. (1999). The second Kaiser Family Foundation survey of health care in South Africa. *Washington: The Hendry J Kaiser Family Foundation*.
- SosHI Studio. (2014) Butaro Hospital Burera District, Rwanda. [Online] Available from: www.sosHI.com/Butaro-Hospital [Accessed: 1st April 2015]
- Spine Universe. (2015) Celebration Health. [Online] Available from: www.spineuniverse.com/practice/fl/celebration/celebration-health [Accessed: 19th March 2015]
- Taking Charge, (2014) *How does nature impact our wellbeing* [Online] Available from: www.takingcharge.csh.umn.edu/enhance-your-wellbeing/environment/nature-and-us/how-does-nature-impact-our-wellbeing. [Accessed: 18th November 2014]

Tanser, F. (2006). Methodology for optimising location of new primary health care facilities in rural communities: a case study in KwaZulu-Natal, South Africa. *Journal of Epidemiology and Community health*, 60(10), 846-850.

Thaddeus, S., & Maine, D. (1994). Too far to walk: maternal mortality in context. *Social science & medicine*, 38(8), 1091-1110.

The American Institute for Architects. (2008) 2008 AIA National Design Award for Healthcare. [Online] Available from: www.aia.org/practicing/groups/kc/AIAS074548?dvid=&recspec=AIAS074548 [Accessed: 21st March 2015]

The Buddhist Retreat Centre, Ixopo, KwaZulu-Natal, South Africa. (2009) [Online] Available from: www.brcixopo.co.za [Accessed: 1st April 2015]

Ulrich, R. S. (2001). Effects of healthcare environmental design on medical outcomes. In *Design and Health: Proceedings of the Second International Conference on Health and Design*. Stockholm, Sweden: Svensk Byggtjans. pp. 49-59.

Verderber, S., & Fine, D. J. (2000). *Healthcare architecture in an era of radical transformation*. Yale university Press.

Wilkinson, D., & Tanser, F. (1999). GIS/GPS to document increased access to community-based treatment for tuberculosis in Africa. *The Lancet*, 354(9176), 394-395.

Yach, D. and Kistnasamy, B. 2007. Health care in a democratic South Africa. *Paper presented at After Apartheid: The Second Decade in South Africa conference*. Macmillan Center. Yale University

Yach, D. & Tollman, SM. (1993) Public Health Initiatives in South Africa in the 1940s and 1950s: Lessons for a Post Apartheid Era. *American Journal of Public Health*. [Online] Volume 83 (7). p.1043-1050. Available from: [Accessed: 21st May 2015]

APPENDECIES

Appendix One- Instruments for Data Collection-Interview Guide (English)



COLLEGE OF HUMANITIES

Interview Guide (English)

I would like to thank you for giving up your time to participate in this research for my dissertation. The topic is entitled, 'Understanding the relationship between public healthcare architecture and its patients' wellbeing: A proposed Healing Centre for rural KwaZulu-Natal'. The aim of this research is to interrogate the relationship between public healthcare facilities and its patients in rural areas to generate contextually specific architectural principles in order to design a place of healing in rural KwaZulu-Natal near the South Coast area, which promotes its users wellbeing. The main objective of this conversation is to understand the current effect public healthcare architecture in rural areas has on its patients.

I would like this interview to be treated as conversation rather than a survey and you should feel free to tell me anything important in relation to the questions. Please feel free to tell me to skip any question you do not prefer to answer, and you may end the interview anytime you like.

If it is acceptable with you, I would like to record this conversation to further analyze at a later stage. This recording will not be shared with anyone and I promise to keep it safe. I might use quotes from what you say in my research. Is it ok if I use your first name to quote this or would you like to choose an alias now?

Can use my first name:

If no, rather use this alias: _____

Interview Questions:

1. Just to get to know you a little bit: can you tell me some things about yourself.
 - 1.1 Tell me about where u from?
 - 1.2 Tell me about your occupation and how you chose it?
 - 1.3 What brought you to this specific healthcare facility?

2. How do you perceive government healthcare facilities in South Africa?
 - 2.1 Please elaborate on why you perceive them in this way?
3. How do you perceive this government healthcare facility?
4. Describe the built environment you currently are in here?
 - 4.1 What are your feelings and experiences of being in this environment?
 - 4.2 What aspects of this environment lead to those experiences and feelings?
5. Will it be beneficial for these environments to be improved to promote wellbeing?

If the answer is yes:

- 5.1 How will it be beneficial to the users?
- 5.2 Please explain how it can aid the patient's experience?

If the answer is no:

- 5.3 Please explain why?

6. Describe your ideal healing environment?
 - 6.1 What aspects will you incorporate in creating a better healing environment?
7. Who could I speak to if I wanted to learn more about this?

I would like to thank you for giving up your time to assist me, and would like to wish you all the best with future endeavors.



COLLEGE OF HUMANITIES

Interview Guide (Zulu)

Ngithanda ukukubonga ngokuchitha isikhathi sakho ungisiza ngalolu cwaningo (Dissertation). Isihloko salolu cwaningo sithi: Ukuqonda ubudlelwane phakathi kwamabhilidi emitholampilo kanye neziguli. Ngicela ukhululeke ukusho lokhu okucabangayo futhi ubuze lapho ungaqondi khona. Ngicela ukhululeke ukungayiphenduli imibuzo ongathandi ukuyiphendula futhi ne interview yethu ungayiphetha noma ingasiphi isikhathi ofisa ngaso.

Ngemvume yakho ngicela ukuqopha inkulumo yethu ukuze ngikwazi ukuyicubungula kabanzi ngesinye isikhathi. Lokhu ngizokugcina kimi futhi akekho omunye ozoyizwa. Ngizosebenza amanye amagama owashoyo kulolucwaningo. Ngabe uyanginika imvume yokusebenzisa igama lakho noma kukhona elinye ongathanda ngilisebenzise na?

Ngingasebenzisa igama lakho:

Noma ngingasebenzisa elinye:.....(alias)

Imibuzo (interview questions)

1. Ukuze ngibe nolwazi oluncane ngawe ngicela ungitshela lokhu okulandeyo ngawe?
 - 1.1 Indawo ophuma kuyo?
 - 1.2 Ngitshela ngomsebenzi wakho nokhuthi kungani wakhetha wona?
 - 1.3 Walethwa yini ukuzosebenza kulendawo osebenza kuyona manje?
2. Uyibona injani imithola mpilo kaHulumeni namabhilidi akhona?
 - 2.1 Ngicela uchaze ukhuthi kungani uyibona kanjalo?
3. Isibhedlela lesi osebenza kusona usibona sinjani?
4. Ngicela uchaze isimo osebenza ngaphansi kwaso?
 - 4.1 Ithini imizwa yakho ngokusebenza lapho osebenza khona?
 - 4.2 Ngabe yini eyenza uzizwe ngale ndlela ozizwa ngayo ngalendawo osebenza kuyo?

5. Ngabe kungasiza ukuthuthukiswa kwalezi zindawo enisebenzela kuzo?
Uma kunjalo
 - 5.1 Chaza ukuthi ingasiza kanjani abantu?
 - 5.2 Chaza ukuthi ingasiza kanjani ekukhuphuleni ulwazi?
Uma kungenjalo
 - 5.3 Chaza imbangela

6. Sichazele ukuthi wena ngokwakho ungafuna umtholaphilo ube indawo enjani?
 - 6.1 Yiziphi izinto ongazifaka kumtholaphilo ukuze kuthuthukiswe umtholaphilo?

7. Ubani omunye engingakhuluma naye uma ngifuna olunye ulwazi ngalolu daba?

Ngithanda ukukubonga ngokuchitha isikhathi sakho ungasiza. Ngikufisela konke okuhle ngekusasa lakho.

DECLARATION OF CONSENT

PROJECT TITLE: Understanding the relationship between rural healthcare facilities and wellbeing of patients: A Proposed Healing Centre in rural KwaZulu-Natal.

RESEARCHER

Full Name: Leighlan Fenner
School: Built Environment and Development Studies
College: Humanities
Campus: Howard College
Proposed Qualification: Master in Architecture
Contact: +27733922105
Email: leighlanfenner@yahoo.com

SUPERVISOR

Full Name of Supervisor: Mthembeni Mkhize
School: Built Environment and Development Studies
College: Humanities
Campus: Howard College
Contact details: +2731 260-1520
Email: mkhizem@ukzn.ac.za

HSSREC RESEARCH OFFICE

Full Name: Premlal Mohun
Office: HSS Research Office
Govan Bheki Building
Westville Campus
Contact: 0312604557
Email: mohunp@ukzn.ac.za

I, Leighlan Fenner (Student no.209529349), am a Master of Architecture student, at the School of Built Environment and Development Studies, at the University of KwaZulu-Natal. You are invited to participate in a research project entitled: Understanding the relationship between rural healthcare facilities and wellbeing of patients: A proposed healing centre in rural KwaZulu-Natal. The aim of the study is to interrogate the relationship between public healthcare facilities and its patient's in rural areas, to generate contextually specific architectural principles in order to design a place of healing.

Through your participation, I hope to understand your perceptions and challenges of patients and staff in order to ease the resultant stresses experienced when trying to heal in public healthcare facilities in rural areas. I guarantee that your responses will not be identified with you personally. Your participation is voluntary and there is no penalty if you do not participate in the study. You have the right to withdraw from this study without any negative consequences. Please sign on the dotted line to show that you have read and understood the contents of this letter. The interview will take approximate 1 hour to complete.

DECLARARTION OF CONSENT

I.....(Full Name) hereby confirm that I have read and understand the contents of this letter and the nature of the research project has been clearly defined prior to participating in this research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

Participants Signature.....

Date.....

Appendix Three- Ethical Clearance Document



31 August 2015

Mr Leighlan Cohen Fenner 209529349
School of Built Environment and Development Studies
Howard College Campus

Dear Mr Fenner

Protocol reference number: HSS/0665/015M

Project title: Understanding the relationship between rural healthcare facilities and wellbeing of patients:
A proposed Healing Centre in rural KwaZulu-Natal

Full Approval – Expedited Application

In response to your application received on 3 June 2015, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)

/pm

Cc Supervisor: Mr Mthembeni Mkhize
Cc Academic Leader Research: Dr Cathy Sutherland
Cc School Administrator: Ms S Naicker

Humanities & Social Sciences Research Ethics Committee

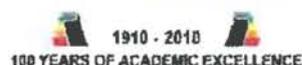
Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8360/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za / snymann@ukzn.ac.za / mohunp@ukzn.ac.za

Website: www.ukzn.ac.za



Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville