

**THE ETHICAL DILEMMAS OF CRITICAL CARE
SPECIALISTS ENCOUNTERED IN THE ADMISSION OF
PATIENTS WITH HIV INFECTION TO INTENSIVE CARE**

SUBMITTED BY:

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Specialists Encountered in the Admission of
Patients with HIV Infection to Intensive Care**

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Nelson R Mandela School of Medicine

University of KwaZulu-Natal Durban, South Africa

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2012

DECLARATION

I, Kantharuben Naidoo declare that:

- (i) The research reported in this dissertation, except where otherwise indicated, is my original work.
- (ii) This dissertation has not been submitted for any degree or examination at any other university.
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Signed:



Date: 12 November 2013

DR K NAIDOO- PHD RELATED ACADEMIC ACTIVITIES

Please accept update on PhD related Academic Activities and Publications related to my PhD study in Print (4) and Conference activities related thereto.

- 2 abstracts accepted for ORAL presentation at **Africa Health Summit**: May 2013
 1. HIV/AIDS and Admission to Intensive Care: A Comparative Review of Brazil, India and South Africa
 2. Predictors of the Outcome of Critically-ill HIV-Infected Patients Reported in the Literature: New and Evolving Challenges to Intensive Care
- 3 abstracts accepted for Poster presentation- **6th SA AIDS CONFERENCE**: June 2013
 1. HIV/AIDS And Admission To Intensive Care- A Comparative Review Of India, Brazil, And South Africa:
 2. Predictors Of The Outcome Of Critically-ill HIV-Infected Patients Reported In The Literature-New And Evolving Challenges To Intensive Care
 3. A Critical Analysis Of ICU/HC Beds In South Africa: 2008-2009
- Speaker and expert panellist at **6th SA AIDS Conference**- “HIV and access to critical care”
- 4 abstracts accepted for POSTER presentation at **World Federation of Societies of Intensive and Critical Care Medicine**- August-2013
 1. "Survey of ethical dilemmas facing critical care specialists in South Africa in admission of patients with HIV infection requiring intensive care", reference 0223
 2. "Audit of ICU/HC beds in South Africa: 2008-2009-Implications for the NHI", reference 0221
 3. "Factors Influencing the Outcome of Critically-ill HIV-Infected Patients reported in the literature- a step closer to a triage tool?",
 4. "The Concept of Medical Futility - Specific issues in the context of HIV/AIDS and intensive care", reference 0224.
- **South African Medical Association** KZN Branch Conference- “The ethics and constitutionality of using HIV status as admission criteria for emergency treatment”.
- Invited speaker for **Dept. of Internal Medicine- Medicine Update 2013- Ethics Talk**:- “The ethics and constitutionality of using HIV status as admission criteria for emergency treatment”.
- Invited speaker to **Pulmonology Society**- KZN Branch- “HIV/AIDS and Ethical issues in ICU admission”

- Invited speaker to **Dept. of Public Health Journal Club Presentation:** - “The ethics and constitutionality of using HIV status as admission criteria for emergency treatment”.
- Invited plenary Chair and Speaker at **17 th International Conference of AIDS and STIs in AFRICA-** 7-11 December 2013. Theme to be announced.

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2. Naidoo K, Govender K. Compulsory HIV testing of alleged sexual offenders –a human rights violation. *South African Journal of Bioethics and the Law* 2011;4(2):95-101
3. Naidoo K, Singh JA, Lalloo UG. HIV/AIDS and admission to intensive care units: A comparison of India, Brazil and South Africa. *S Afr J HIV Med* 2013;14(1):15-16.[<http://dx.doi.org/10.7196/sajhivmed.887>]
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5. Other- Human Rights and Advocacy:
Naidoo K. Rape in South Africa - a call to action, editorial, *SAMJ* 2013; 103(4):210-211. [<http://dx.doi.org/10.7196/SAMJ.6802>]

6. LIST OF THOSE PROVISIONALLY ACCEPTED:

- a. *SAJCC*- Evolving Concepts in Predictors of Survival of Critically-ill HIV-Infected Patients admitted to intensive care: A systematic review and meta-analysis - revisions submitted.
- b. *SAJCC*- HIV/AIDS and challenges to anti-retroviral treatment in intensive care- in revision

7. LIST OF THOSE SUBMITTED:

- a. The ethics and constitutionality of using HIV status as an admission criteria for emergency treatment –*SAJHIVMED*
- b. HIV/AIDS and its impact on Critical Care Medicine- A South African Perspective- *SAJHIVMED*
- c. HIV/AIDS and the Concept of Medical Futility – Good clinical practice or “ triage in cold blood”?- *SAJHIVMED*

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DEDICATION

To GOD for his miracle of my surviving cancer by stem-cell transplant, Prof Peter Jacobs, for his professionalism and dedication in treating me, and my wife and children for their love and support during that difficult period, which has made it possible for the production of this thesis.

This thesis is dedicated to parents, Kista and Devagee Naidoo for their sacrifices in educating me and for their unwavering belief in me as an academic; to my wife Mona, for her love, support and enduring encouragement which has sustained me throughout this study; to my loving daughter Reshania, for her love and help in data capture for the survey; to my baby Nivida, for her understanding and sacrifice in foregoing normal family activities during the period of this study; and to my in-laws, Morgan and Kogie Naidu for their daily support, encouragement and prayer.

ABSTRACT

Introduction

South Africa has one of the fastest growing HIV epidemics in the world with 5.6 million people living with HIV/AIDS. As a consequence of the delayed implementation of the ARV rollout and failure to control the epidemic, the number of people living with HIV/AIDS who seek or need intensive care places a huge burden on precious, expensive and sparse intensive care unit facilities. Critical care specialists are faced with complex challenges when making decisions about the provision of such care.

Aim:

The aim of the study was to develop best practice criteria for admitting HIV-infected patients to intensive care.

Methods:

The study was done utilising:

1. A comprehensive literature review of the legal and ethical framework governing such decisions in South Africa and compared with that in different countries, both developed and developing. Further, legal precedents and clinical best practice that could inform policy and practice in South Africa were applied to the decision making process.
2. An audit of ICU beds in South Africa by first making a comprehensive and contemporary review of critical care facilities in South Africa, to place in context the ethical dilemmas faced by critical care specialists in the admission of HIV/AIDS infected patients to intensive care in a resource limited environment.
3. Critical care practitioners' response to a standardised questionnaire regarding ethical decisions and provision of intensive care to five hypothetical clinical case scenarios.

Results: The study showed that:

- The ICU bed availability in South Africa is limited and the problem is worse in the public sector with widespread variations across the provinces.
- The lack of skilled staff for ICU is insufficient for our needs in the public sector.
- For people living with HIV/AIDS, specific variables influence their survival in intensive care.
- The benefits of anti-retroviral treatment in intensive care are still being debated.
- Clinical prediction tools should be considered as an aid to clinical judgment on decisions about whom to admit to intensive care.
- Rational decision making should include central questions such as ‘ whether the patient too ill or too well for ICU care’ and whether there is a reasonable prospect of ‘reversibility of organ-dysfunction’?
- Non-invasive ventilation using a continuous positive airway pressure (CPAP) ventilation mask is showing promise for patients with *Pneumocystis jirovecii pneumonia* (PJP), especially in a resource-constrained environment. Further studies need to validate this.
- People living with HIV/AIDS are not discriminated against on admissions to ICU and are not subjected to medical futility decisions.

Discussion

The shortage of ICU beds results in critical care specialists being under pressure to deliberate on resource allocation decisions for competing patients. Strong regulatory and ethical frameworks exist to protect the rights of people living with HIV/AIDS and access to intensive care.

The 'Limitation Clause' of the South African Constitution, as canvassed by the courts resulting in the refusal of renal dialysis in the case of Mr. Subramoney, a utilitarian judgment, would not be justiciable for people living with HIV/AIDS and access to intensive care.

The National Health Insurance Plan envisages making more ICU beds available through a public-private sector partnership. There is a compelling need for regionalisation of intensive care services in the country.

Respiratory failure in HIV/AIDS patients remains the commonest indication for intensive care unit admissions, and other diagnosis such as non-PCP pneumonia, sepsis, cardiac, gastrointestinal, and renal diseases, are becoming more common.

The ART era has seen an improvement in ICU to ward survival rates of 70% (similar to that of the general medical population) as well as the three month and long-term survival outcomes post-ICU discharge. ICU prognostic systems should be regarded as an aid to clinical judgment. Daniels 'accountability for reasonableness' provides a moral framework for ethical decision-making and priority setting. In its determined efforts to control the pandemic of HIV/AIDS, some countries, notably Botswana and South Africa are accused of violating international treaties.

Conclusion

South Africa has made many legal provisions to protect the rights of its HIV infected patients. People living with HIV/AIDS are neither discriminated against in admission to intensive care units, nor being subjected to medical futility decisions. With the advent of HAART, people living with HIV/AIDS admitted to ICUs, have similar outcomes to that of the general population. Admission guidelines for ICU as advised by the professional

bodies for use by the general population should be equally applicable to people living with HIV/AIDS, i.e. is the patient too ill or too well to warrant ICU admission, and is there a realistic prospective of 'reversibility of organ dysfunction'?

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ABBREVIATIONS AND ACRONYMS

ABC	Airways, breathing, circulation
ACA	Patient Protection and Affordable Care Act 2010
ACEP	American College of Emergency Care Physicians
AIDS	Acquired immunodeficiency syndrome
AMA	American Medical Association
ART	Anti-retroviral therapy
ARV	Anti-retroviral
ART-CC	The Antiretroviral Therapy Cohort Collaboration
ATS	American Thoracic Society
AU	African Union
APACHE	Acute physiology and chronic health evaluation score
AVPU	Alert, responds to voice, responds to pain, unresponsive
BONELA	Botswana Network on Ethics, Law and Human Rights
CARE Act	Ryan White Comprehensive AIDS Resources Emergency Act
CBA	Cost benefit analysis
CC	Constitutional Court of South Africa
CCS	Critical care specialist
CCSSA	Critical Care Society of South Africa
CCM	Critical care medicine
CEA	Cost effectiveness analysis
CEDAW	Convention on the Elimination of ALL Forms of Discrimination against Women
CEM	Code of Medical Ethics 2010-Brazil
CNS	Central nervous system
CDC	US Center for Disease Control (CDC)
CMS	Centers for Medicare and Medicaid Services
COPICON	Critical Care Society of Southern Africa Conference 2011
COPD	Chronic obstructive pulmonary disease
CPR	Cardio-pulmonary resuscitation
CRC	Convention on the Rights of the Child
CXR	Chest x ray
DALYs	Disability adjusted life years
DNR	Do not resuscitate
EC	Eastern Cape
ED	Emergency department
EMRS	Emergency medical response service
ER	Emergency room

EMTALA	Emergency Medical Treatment and Active Labor Act
FS	Free State
GAVI	Global alliance for vaccines and immunisation
GDP	Gross domestic product
GHI	Global health initiatives
Global Fund	Global fund to fight AIDS, tuberculosis and malaria
GT	Gauteng Province
HAART	Highly active anti-retroviral therapy
HIV	Human immunodeficiency virus
H/C	High care unit
HCT	HIV counseling and testing
HPCSA	Health Professions Council of South Africa
IC	Intensive care
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
ICU	Intensive care unit
IDU	Intravenous drug users
KAP	Knowledge, attitudes, perception
KS	Kaposi sarcoma
KZN	KwaZulu-Natal
LP	Limpopo Province
LRTI	Lower respiratory tract infection
MAP	World Bank Multi-Country AIDS Program
MDR	Multi-drug resistant
MDP	United Nations Millennium Development Project
MDG	Millennium Development Goals
MMED	Masters in Medicine
MODS	Modified organ dysfunction score
MP	Mapumalanga Province
MRSA	<i>Methicillin resistant staphylococcus aureus</i>
MV	Mechanical ventilation
NAP	National STD and AIDS Programme-Brazil
NACA	National AIDS Co-ordinating Agency of Botswana
NC	Northern Cape
NGO	Non-governmental organisation
NHA	National Health Act-South Africa
NHI	National Health Insurance
NSP	The National Strategic Plan for HIV and AIDS, STI and TB

NW	North West Province-SA
PAH	Pulmonary arterial hypertension
PEPFAR	US President's Emergency Plan for AIDS Relief
PREPUDA	Promotion of Equality and Prevention of Unfair Discrimination Act
OHCHR	UNAIDS and Office of the United Nations High Commissioner for Human Rights
PJP	<i>Pneumocystis Jiroveci Pneumonia</i>
PLWHA	People living with HIV/AIDS
PMTCT	Pregnant mother to child transmission
QUALYs	Quality adjusted life years
RNA	Ribonucleic acid
SA	South Africa
SADAC	Southern African Development Co-operation
SAHRC	South African Human Rights Commission
SANAC	South African Nursing Council
SAPS	Simplified acute physiology score
SATS	South African Thoracic Society
SATs	South African triage score
SCCM	Society of Critical Care Medicine in America
SUS	Brazils Unified System-Datasus;Sistema de Monitoramento de Indicadores do Programa Nacional de DST/Aids
TAC	Treatment Action Campaign
TB	Tuberculosis
TADA	Texas Advance Directives Act 1999
TEWS	Trauma early warning score
TRIPS	Trade-Related aspects of Intellectual Property Rights
UDHR	Universal Declaration of Human Rights
UNAIDS	United Nations Programme on HIV/AIDS
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
USD	United Stated of America Dollar
VERIC	The Task Force on Values, Ethics, and Rationing in Critical Care
WC	Western Cape
WHO	World Health Organization
WMA	World Medical Association
XDR	Extreme-drug resistant

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CHAPTER I: INTRODUCTION

1.1 INTRODUCTION

HIV/AIDS is a major challenge facing South Africa (SA) today. It is estimated that globally of the 34 million people living with the human immunodeficiency virus (HIV) in 2010, more than 68% were in sub-Saharan Africa.¹ In 2011, it is estimated that 5.38 million people were living with HIV infection in SA, with 16.6% of the adult population being infected.¹ In 2010-2011 approximately 72% (1.8 million) of deaths due to HIV infection were in sub-Saharan Africa², with at least 11% (194 000) in SA.³

In 2010, the UNAIDS adopted the following motto: ‘Zero new HIV Infections; Zero Discrimination; Zero AIDS-Related Deaths.’⁴ UNAIDS has identified many factors that impact on variable global responses in the control of HIV/AIDS and outlines nine priority intervention areas, one of which includes access to treatment of people living with HIV and AIDS (PLWHA). This is encapsulated in their UNAIDS Outcome Framework 2009–2011, which SA subscribes to and has based its care, treatment and support programs.⁵

1.2 BACKGROUND

Some of the factors that negatively impacted on South Africa’s response to controlling the spread of HIV infection were the ‘dissident views’ that delayed the national roll-out of antiretroviral treatment (ART) in 1999-2002.⁶ Antiretroviral treatment was limited initially to certain research sites. In SA the national roll-out of ART only began in 2004, compared to Brazil (1996), India (2004) and Botswana (2002).⁵(Table 1)

TABLE 1 HIV PREVALENCE AND ART ROLLOUT-COUNTRIES STUDIED

	South Africa	Brazil	India	Botswana	USA
Estimated HIV prevalence 2011 (No. with HIV/AIDS) ⁷	17.3% (5,600,000)	0.3% (490000)	0.3% (2,300,000)	23.4% (300000)	0.7% (1,300,000)
Year of ART rollout ⁵	2004	1996	2004	2002	1995
No. of people initiated on ART 2011 ⁷	1,700,000	215,676	543,000	178,684	426, 590

Despite its late national ART roll-out, SA has done well in terms of the number of people initiated on ART relative to these countries. (Figure 1) According to South Africa’s National Strategic Plan (NSP) 2012-2016.⁸ the country has made significant progress in terms of its NSP 2007-2011 targets,⁹ one of which being access to quality treatment.⁸

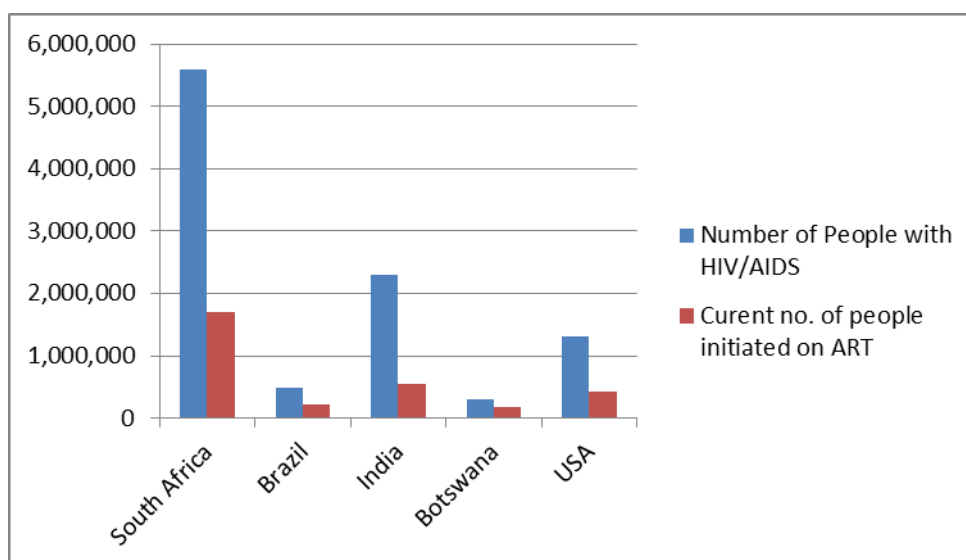


FIGURE 1 NO OF PEOPLE WITH HIV/AIDS AND ART ROLLOUT COUNTRIES

The Henry Kaiser Foundation audit of South Africa’s health system for the period 2004-2010¹⁰ identified several weaknesses in the provision of health services , which included persistently disproportionate allocation of resources between public and private sectors and inequitable spending patterns compared to health needs. The late roll-out of ART has meant that many patients with HIV infection develop severe complications due to opportunistic infections, like *pneumocystis jiroveci* pneumonia (PJP), severe sepsis,

neurological complications and multiple organ failure that would require admission to an ICU.¹¹ Globally, ICU beds are a scarce resource. In a resource constrained environment such as SA with a high burden of disease, this limitation of access to an ICU bed is accentuated and results in individual value-laden decisions by critical care specialists, especially in relation to PLWHA and access to ICU.

To illustrate the comparative lack of ICU facilities, there were 93 955 ICU beds serving a population of 313 million people in the USA in 2005¹², whereas South Africa had 4168 beds serving a population of approximately 49 million people at the same time.¹³ This makes a ratio of 1:4000 intensive care beds to population in the USA and 1:11 000 in South Africa. These numbers in South Africa include private-sector ICU beds. Taking the 2008-2009 data from our study, if private sector beds are excluded the picture is much bleaker giving a ratio of 1:35 000 intensive care beds for 80% (40 million) of the population.¹⁴ As a result, South Africa, as a resource-constrained country and with a high burden of disease, needs to use best available evidence of outcomes for patients with HIV infection and ICU care, with due regard to applicable laws and ethical principles guiding the management of people with HIV infection and the appropriate use of scarce resources.¹⁵

In terms of prevailing law, ethical codes of conduct and scientific evidence, various questions arise, such as:

- Can the medical profession discriminate against a patient on the basis of their HIV status, especially with regard to access to ICU?
- Would a futility judgement for such patients be justified?

Most countries have legislative and professional bodies in place that regulate the medical professions conduct and practices, but these may vary between developed and developing nations as well as among those that are less well resourced. In all countries, their aim is to protect both the health professionals and the patients, in line with the international creed agreed to by virtue of taking the Hippocratic Oath. In all instances, their development is based on the ethical premise of that country, and their contents may therefore vary across the globe.

The World Medical Association (WMA) Ethics Manual,¹⁶ the Code of Ethics for Emergency Physicians by the American College of Emergency Physicians (ACEP) in the USA¹⁷ and the ethical guidelines of the Health Professions Council of South Africa (HPCSA)¹⁸ give ethical guidance to the medical profession. Botswana, Brazil and India also have their Professional councils, which guide the profession on good ethical conduct.

1.3 RESOURCE ALLOCATION AND INTENSIVE CARE

ICUs have become a standard of care “because they house impressive innovations that could reverse physiological dysfunctions and sustain life”.¹⁹ Society holds much regard and praise for the ICU, but this expensive form of technology being accessed by an increasingly older and chronically ill patient have made policy makers re-think the continued financial sustainability of this level of care.²⁰ In true utilitarian fashion, the question asked is ‘who bears burdens and enjoys benefits’?

Triage tools for entry into ICU exist, but these decisions on access to ICU care may be subject to individual value-laden decisions by the attending critical care specialist (CCS).

According to Hadorn (1991), in reference to the Oregon Medicaid Plan,²¹ in the ICU “physicians are driven by the ‘rule to rescue’, the powerful human proclivity to rescue a single identified endangered life, regardless of cost, at the expense of many nameless faces who will be denied health care”. Kohn *et al* (2011)²² in their ‘ICU cost analysis study’ concluded that: “This study suggests that many ICU clinicians feel compelled to provide salvage critical care for identifiable patients with grave prognoses even when doing so measurably contravenes society’s interests.” Levin and Sprung (2008)²³ in their chapter on ‘Critical and Intensive Care Ethics’ mention that globally the definition of a successful ICU outcome has become blurred. They further state that while ICU survival is a measure of outcome, it is no longer considered as a marker for success, as survival to a state of ICU dependence or with marked physical or mental dependence is considered “to be a fate worse than death”. They emphasise quality of life years rather than quantity of years lived. Moreover, according to them, CCSs are faced with difficult, ethically challenging decisions on a daily basis in the ICU concerning the following:

1. Whom to admit to the ICU in the face of limited resources
2. How to manage the patient who has not recovered despite entry into ICU

Such decisions, which may make the difference between life and death for the patient, must be made on scientifically valid guidelines in the form of triage tools. Furthermore, these guidelines must take into account the applicable laws and ethical principles governing such decisions, as well as meet with societal approval.

1.4 PROBLEM STATEMENT

In South Africa, despite its progressive Constitution with regards to health-care reforms, PLWHA are subjected to value-laden decisions by the medical profession, as a

consequence of their illiteracy, and the lack of explicit guidelines regarding PLWHA and access to ICU. Decisions on the effective triage of ICU admissions for PLWHA must take into consideration the clinical case presentation, resources available, and ethics principles.²⁴ Resource-allocation decisions by the CCS must be based on objective guidelines such as a triage tool. However, for PLWHA, there are no existing objective criteria determining who will benefit from ICU admission, and no universally accepted exclusion criteria.²⁵

1.5 RATIONALE FOR STUDY

The study has direct relevance for both South Africa and sub-Saharan Africa in the form of proposed best practice admission criteria for patients with HIV infection and admission to intensive care in a resource-constrained environment. It will also assist in terms of planning at policy level, and in the development of a proposed cost-effective decision-making tree for patients with HIV infection requiring intensive care in a resource-constrained environment, with a high burden of HIV infection. It further proposes that such admission criteria would take cognisance of provisions under law, prevailing ethical codes of conduct and the current best scientific evidence available.

1.6 AIM AND OBJECTIVES

The aim of the study was to develop best practice criteria for admitting HIV-infected patients to intensive care.

The study had the following objectives:

1. To perform an assessment of the HIV epidemic and the health systems of South Africa (an emerging, resource-constrained country with a high burden of disease) with the USA (a first world resource-rich country with a high burden of disease compared to the developed world). This will include a desk-top based 'National Audit of ICU/High-Care beds in SA.
2. To perform an assessment of the regulatory and ethical framework in South Africa (an emerging, resource- constrained country with a high burden of disease) with that of the USA (a first-world resource rich country with a high burden of disease compared to the developed world) concerning patients with HIV infection and access to ICU care.

To perform an assessment of the HIV epidemic and the health systems of Brazil, India and Botswana as comparative emerging economies to South Africa, all with universal health coverage and with a high burden of HIV infection. This would also include an assessment of the regulatory and ethical frameworks, concerning patients with HIV infection and access to ICU care.

3. To perform an attitudes and perceptions survey amongst CCSs in South Africa, who, in the normal scope of their work, are all involved in decisions regarding the provision of intensive care to patients with HIV infection.
5. To perform a systematic analysis of the global literature on HIV/AIDS and Intensive Unit Care to determine the predictors influencing mortality in Intensive care. This systematic analysis would help propose best practice admission criteria guidelines for patients with HIV infection requiring access to intensive care in South Africa from the data obtained.

There is currently no comprehensive relevant information from developing countries on the burden of disease and access to ICU for people with HIV/AIDS on which to base such guidelines.

CHAPTER 2: METHODS

2.1 INTRODUCTION

The aim of this project was to develop best practice criteria for admitting HIV-infected patients to intensive care. The effect of the HIV epidemic in several countries that are defined as resource poor and resource rich were compared to South Africa, a resource constrained country, with a high HIV burden. The United States of America (USA) was selected as the resource rich country that also happens to have a low burden of HIV infection in relation to the comparator countries included in this study. The USA however has a high burden of HIV infection when compared to other developed countries such as the United Kingdom, Australia and New Zealand. Botswana, Brazil and India were selected as the comparator resource poor countries to ensure a more global representation. The demand for intensive care unit (ICU) beds exceeds its supply in diverse global settings. In South Africa, at the epicenter of the HIV epidemic, critical care specialists need to make ethically difficult decisions regarding the triaging of patients with advanced HIV infection to intensive care. None of the current severity criteria such as acute physiology and chronic health evaluation (APACHE) and simplified organ function assessment (SOFA) were designed to triage patients into ICU, presenting a fundamental void in the guidelines to intensive care provision.

The specific objectives described in Chapter one were achieved as follows:

2.2 OBJECTIVE 1: TO PERFORM AN ASSESSMENT OF THE HIV EPIDEMIC AND THE HEALTH SYSTEMS OF SOUTH AFRICA (AN EMERGING, RESOURCE-CONSTRAINED COUNTRY WITH A HIGH BURDEN OF DISEASE) WITH THE USA (A FIRST-WORLD RESOURCE-RICH COUNTRY WITH A HIGH BURDEN OF DISEASE COMPARED TO THE DEVELOPED WORLD).

A ‘National Audit of ICU beds in South Africa (2008-2009)’ was undertaken by desktop analysis. The objective was to determine the national distribution of ICU beds in SA. The last “National audit of critical care resources in South Africa” was done by Bhagwanjee *et al* in 2005.¹³ An updated ICU bed audit was done as this would represent a more realistic picture of current resource constraints in SA.¹⁴ A desk-top audit of all public and private sector ICU units, including intensive care/ high care units (IC/HCU) in South Africa was undertaken for the period 2008-2009. For the purposes of this study, both categories were analysed and referred to as ICU beds, as they reflect the critical care component of the health service in South Africa.

The ICUs analysed included general/medical/coronary/pulmonology, surgical/trauma/burns, neonatal/paediatric, and labour ward/maternity ICUs. Information from the proceedings of the South African Parliamentary Portfolio Committee on Health²⁶ (accessed electronically), personal correspondence with the National Department of Health of SA, Gauteng Department of Health of SA and statistics from the Health Annals – SA,2008²⁷ were obtained. Population statistics were obtained from Stats SA-2012.¹

2.3 OBJECTIVE 2: TO PERFORM AN ASSESSMENT OF THE REGULATORY AND ETHICAL FRAMEWORK IN SOUTH AFRICA (AN

EMERGING, RESOURCE- CONSTRAINED COUNTRY WITH A HIGH BURDEN OF DISEASE) COMPARED TO THE USA (A FIRST-WORLD RESOURCE RICH COUNTRY WITH A HIGH BURDEN OF DISEASE COMPARED TO THE DEVELOPED WORLD) CONCERNING PATIENTS WITH HIV INFECTION AND ACCESS TO ICU CARE.

A descriptive analysis of the two countries, the USA and SA, regarding the HIV epidemic and the health system, in particular the availability of ICU beds was done to enable a comparison between the two countries. Full-length, peer-reviewed journal publications were obtained by searching the electronic databases Pubmed, Medline, Ebscohost and Google Scholar using the Boolean-linked keywords “HIV and AIDS” and “health care” and “intensive care” for the USA. A similar search was performed for SA.

Various national and international regulatory frameworks were studied, with specific emphasis on its application to patients with HIV infection. These included:

- The South African Constitution;
- The American Constitution and the Bill of Rights²⁸;
- African Union (AU) and Southern African Development Co-operation Treaties (SADAC)²⁹;
- Convention on the Elimination of ALL Forms of Discrimination against Women (CEDAW)³⁰
- Convention on the Rights of the Child (CRC)³¹;
- UNAIDS and Office of the United Nations High Commissioner for Human Rights (OHCHR)³²;
- International Covenant on Civil and Political Rights (ICCPR)³³;
- International Covenant on Economic, Social and Cultural Rights (ICESCR)³⁷

- and the Universal Declaration of Human Rights (UDHR)³⁴.

Professional guidelines by the World Medical Association (WMA), the American College of Emergency Care Physicians (ACEP), the American Thoracic Society (ATS), the Society of Critical Care Medicine in America (SCCM) and the Health Professions Council of South Africa (HPCSA) were interrogated in the context of PLWHA and access to ICU.

Full-length, peer-reviewed journal publications were obtained by searching the electronic databases Pubmed, Medline and Ebscohost, using the Boolean-linked keywords: “Law and Ethics and HIV and AIDS” and “Law and Ethics and Intensive Care”. Additional searches were made of Google Scholar using the same search strategies.

2.4 OBJECTIVE 3: TO PERFORM AN ASSESSMENT OF THE HIV EPIDEMIC AND THE HEALTH SYSTEMS OF BRAZIL, INDIA AND BOTSWANA AS COMPARATIVE EMERGING ECONOMIES TO SOUTH AFRICA, ALL WITH UNIVERSAL HEALTH COVERAGE AND WITH A HIGH BURDEN OF HIV INFECTION. THIS INCLUDED AN ASSESSMENT OF THE REGULATORY AND ETHICAL FRAMEWORKS GUIDING CRITICAL CARE SPECIALISTS REGARDING HIV INFECTION AND ADMISSION TO ICU IN THESE COUNTRIES.

Full-length, peer-reviewed journal publications were obtained by searching the electronic databases Pubmed, Medline and Ebscohost, using the Boolean-linked keywords “Law and Ethics and ICU and HIV” in relation to Brazil, India, Botswana and South Africa.

Additional searches were made of Google Scholar using the same search strategies and of

the web pages of the relevant Medical Associations and the Critical Care Societies of the countries studied.

2.5 OBJECTIVE 4: TO PERFORM AN ATTITUDES AND PERCEPTIONS SURVEY AMONGST CRITICAL CARE SPECIALISTS IN SOUTH AFRICA, WHO, IN THE NORMAL SCOPE OF THEIR WORK, ARE ALL INVOLVED IN DECISIONS REGARDING THE PROVISION OF INTENSIVE CARE TO PATIENTS WITH HIV INFECTION.

2.5.1 Attitude and Perception survey

A cross-sectional, descriptive, quantitative and analytical attitudes and perception survey was conducted. A standardized questionnaire was used. The questionnaire was developed by the researcher based on comparative surveys performed in Europe^{35,36,37}, and personal observations. It was subject to a limited pre-test by specialists for content and clarity. In addition, the questionnaire was subject to scrutiny by an acclaimed bioethicist. (Annexure H) No modifications were required.

2.5.2 The Questionnaire

An anonymous self-completed questionnaire consisting of three parts was designed. It included demographic characteristics and professional profile and a survey of CCS perceptions of what influences their decision to admit patients to ICU. Fourteen potential determinants of admission to ICU were investigated using five hypothetical clinical vignettes. The determinants were drawn from the most commonly occurring factors based on personal observations.

2.5.3 The Survey

The survey was administered at the Critical Care Society Annual Congress in 2011 which presented a unique opportunity to conduct the survey as it was hosted in Durban, South Africa, and it is the premier annual event attended by critical care specialists from South Africa.

2.5.4 Inclusion criteria

For the purpose of this study, a critical care specialist is defined as any specialist medical/nurse practitioner who practices in the field of critical care and who is likely to be involved in the admission of patients with HIV infection to intensive care. This included specialists registered with the Critical Care Society of South Africa (CCSSA), South African Thoracic Society (SATS), and specialist Physicians, Surgeons, Paediatricians and residents/fellows registered with the relevant Colleges of Medicine/Emergency Medicine/Surgeons/Paediatricians /Anaesthetists of South Africa. Critical Care Specialists, in both the private and public service in South Africa were sampled.

2.5.5 Study Population

A total of 450 questionnaires were handed out individually on registration to delegates, at the registration desk, meeting the inclusion criteria (from a total of 830 attendees) recorded in the attendance register at COPICON 2011. Delegates were requested to deposit the completed questionnaires in the sealed questionnaire deposit box at the registration desk, which was physically manned by the researcher at all times for the duration of the conference. Boxes that were filled to capacity were retrieved and sealed by the investigator and fresh deposit boxes were provided. Completed questionnaires were kept under lock and key in the researcher's office at Howard College, University of KwaZulu-Natal. This

study was approved by the Biomedical Research Ethics Committee of the University of KwaZulu-Natal (BE 089/010) and permission obtained from the Organizing Committee of the Conference (Annexure H1)

2.5.6 Study tools

The English language questionnaire consisted of three parts (Annexure B), the first being the demographic characteristics of the critical care specialist participating in the questionnaire survey. The second part was a survey of critical care specialist's perceptions regarding ICU admissions. It assessed the perceptions of critical care specialists to 12 questions about various ethical scenarios regarding admission to ICU including, availability of ICU bed, patient quality of life, information given to patient, issues of informed consent and informed refusal, DNR orders, withdrawing and withholding therapy, 'limited care' versus withholding and withdrawing therapy and the need for an ethics committee to assist in ethical decision-making.

The third part investigated the significance of potential determinants of admission to intensive care. For each of the five vignettes, respondents were asked to rate, on a Likert scale, the likelihood of admission to intensive care, with 1= strongly disagree to 5 = strongly agree. Respondents were also asked to rate on a Likert scale 14 potential determinants of admission to intensive care drawn from the literature and from our own experience, with 1= most important and 5= least important. These determinants included prognosis of acute disease; prognosis of underlying disease; patients age; resources; human rights; patient preferences; family wishes; cultural considerations; financial implications for family(e.g. sole breadwinner); socioeconomic status; physician

experience; policy of intensive care unit; threat of litigation and bed used to the prejudice of another patient.

2.5.7 Clinical vignettes

The vignettes describe five hypothetical patients with medical emergencies commonly seen in the emergency room or intensive care unit in SA. Fourteen potential determinants influencing this decision were assessed in all the scenarios using the Likert scale of 1= most important and 5= least important. All five scenarios were designed to rate the admission to intensive care of predominantly patients with HIV infection using a Likert scale of 1=strongly disagree with intensive care admission to 5= strongly agree with intensive care admission. The influence of the HIV positive status of the patient was matched in two scenarios with the HIV negative status of the patient (drug overdose and metastatic carcinoma). Specific variables in the scenarios included the last ICU bed; benefit of urgent initiation of HAART; HIV disclosure; family wishes; withdrawing and withholding of care; HIV positive and possible multi-drug resistant (MDR) and extreme-drug resistant (XDR) TB and non-compliance with medication.

1. **Vignette scenario 1-** “Respiratory failure in clinically advanced AIDS, age-70yrs, poor functional status, and pulmonary hypertension” tested the effect of HIV status, the stage of the disease and age.
2. **Vignette scenario 2-** “Respiratory failure in clinically advanced AIDS, age 24 yrs. Clinically Kaposi’s Sarcoma of the palate tested the effect of HIV status, the stage of the disease and age. It also tested HIV disclosure and influence of family wishes.

3. **Vignette scenario 3-** “Age 75yrs versus 18 yrs ; co-morbidity-AIDS, Respiratory Failure requiring ventilation versus Drug overdose with Respiratory Depression and Seizures requiring ventilation This scenario concerned decisions regarding resource allocation and the ‘last ICU bed’ to an older patient with advanced HIV disease as opposed to a younger patient with drug overdose and not infected with HIV. It was designed to elicit admission to intensive care for the younger patient with drug overdose.
4. **Vignette scenario 4-** tested the determinants to admission of a patient with advanced HIV infection and PTB, having defaulted highly active anti-retroviral treatment (HAART) and TB treatment for many months and presenting in respiratory failure, PJP, CD4 count=1 and suspected of having MDR/XDR-TB. This scenario was designed to elicit a refusal to intensive care.
5. **Vignette scenario 5-** tested the responses regarding priority setting and Issues influencing withholding and withdrawing of care and medical futility in the setting of a single ICU bed. The 2 patients are matched for age, with the one patient, HIV positive, post-acute following a head injury, and ventilator- dependent, on inotropic support, and remaining in a persistent vegetative state for four weeks with sepsis and organ failure requiring dialysis, and the competing patient for the single ICU bed having metastatic carcinoma and dementia, wheel-chair-bound, with acute MVA related head-injury requiring an ICU bed. Three scenarios tested the influence of the ‘last ICU bed’ and two scenarios tested the influence of family wishes

2.5.8 Data management

Data from the paper based questionnaire were entered directly into Microsoft Excel. Data was then imported into Stata version 12.0 (StataCorp, 2011)³⁸ for data cleaning, recoding and analysis.

2.5.8.1 STATISTICAL ANALYSIS

Stata version 12.0 (StataCorp, 2011) was used to analyse the data. All categorical data are presented as frequency counts and percentages. Bivariate analysis was used to test for statistically significant associations between each dependent variable outcome and each of the risk factors. The Likert scale dependent variables were reclassified into dichotomous variables (i.e. strongly agree or agree code as 0, while strongly disagree or disagree coded as 1). Pearson's chi-squared test (or Fisher's exact for small numbers i.e. <5 in a cell) were utilized to test for significant association between the dependent variables and the various determinants and perceptions.

2.5.9 ETHICAL CONSIDERATIONS

Ethical approval was obtained from the Biomedical Research Ethics Committee of the University of KwaZulu-Natal. Permission was sought from the Critical Care Society of South Africa (CCSSA) and the South African Thoracic Society (SATS) (Annexure E and F). This was an anonymous attitude and perception survey, with participant's confidentiality being maintained. Participation was purely voluntary. A 'Yes' tick box on the questionnaire would confirm consent for participation in the questionnaire survey. The format of the questionnaire did not request the names or addresses of the participating Critical Care Specialist. Clinical vignettes using hypothetical patients were used. Issues regarding patient informed consent and confidentiality therefore did not arise.

2.6 OBJECTIVE 5: TO PERFORM A SYSTEMATIC ANALYSIS OF THE INTERNATIONAL LITERATURE ON HIV/AIDS AND INTENSIVE UNIT CARE TO DETERMINE POTENTIAL BEST PRACTICE AND THE PREDICTORS INFLUENCING MORTALITY IN ICU. THIS SYSTEMATIC ANALYSIS WOULD BE USED TO FORMULATE BEST PRACTICE ADMISSION CRITERIA

GUIDELINES FOR PATIENTS WITH HIV INFECTION REQUIRING ACCESS TO INTENSIVE CARE IN SOUTH AFRICA FROM THE DATA GATHERED FROM THE ABOVE FOUR OBJECTIVES. IN OUR STUDY, THE USA IS THE MOST PUBLISHED IN TERMS OF ICU AND CLINICAL OUTCOMES, AND BOTSWANA AND SOUTH AFRICA THE LEAST.THEREFORE TO MEET OBJECTIVE 5 OF OUR STUDY, A GLOBAL SEARCH OF THE LITERATURE WAS PERFORMED.

2.6.1 Methods

We performed a systematic review using the search terms ‘HIV/AIDS’, ‘survival’, and ‘intensive care’ in the MEDLINE, PUBMED and EBSCOHOST database for the periods 1999 to 2012. This search strategy produced 401 prospective articles of which 22 met most study eligibility criteria. However, in two studies access to ART was not available to patients and excluded. Twenty articles met all study criteria and formed the basis of this meta-analysis (Figure 2).

We performed an analyses of the eligible studies from the systematic review to identify which pooled predictors were associated with significant higher mortality risk for PLWHA admitted to ICU.

One of the goals of this project was to propose a set of guidelines for admission to ICU that could be used by all CCSs to make ethically and legally acceptable decisions in South Africa with its high burden of HIV infection and resource constraints. These proposed guidelines could also be applicable to the rest of sub-Saharan Africa.

2.6.2 Eligibility criteria

We limited our study to published data on HIV infected adult's ≥ 18 years of age admitted to ICU, in retrospective cohort studies. These studies had to present both demographic and clinical data with mean and standard deviations. Patients had to have access to highly active antiretroviral therapy (HAART).

2.6.3 Statistical Analysis

This was done using a meta-analysis approach implemented in Stata 12.0 SE ('metan' procedure) to produce pooled measures of effect (in this case odds ratios) for each predictor and corresponding confidence intervals (CI). The pooled estimates were then also used to produce a relative excess probability of mortality (and associated 95% confidence interval) to allow for relative ordering of importance with regards to triage.

Meta-analysis of the available odds ratio (OR) and corresponding confidence interval (CI) for the Forest Plots were performed using PRISMPAD[®] (GraphPad Software, Inc. version 5, California, USA). Two additional analyses were performed to determine the factors associated with survival for PLWHA admitted to ICU and to determine if treatment with HAART in ICU influenced survival.

2.6.4 Ethics

This study was approved by the Bio-Medical Research Ethics Committee of the University of KwaZulu-Natal (Ref: BE 089/010).

Chapter 3 will discuss the HIV epidemic and the health systems of South Africa and the USA in terms of health care and critical care resources and health policy reforms that are

currently being implemented in respect of PLWHA. This chapter will also include a
'National Audit of ICU/HC Beds in South Africa-2008-2009'.¹⁴

CHAPTER 3: AN ASSESSMENT OF THE HIV EPIDEMIC AND THE HEALTH SYSTEMS OF SOUTH AFRICA WITH THE USA

3.1 INTRODUCTION. HIV/AIDS: A GLOBAL PERSPECTIVE

“Critical illness is complex, common, lethal, expensive, perplexing, under-recognised, underfunded (in some countries), and, without proper attention, will overwhelm developed nations ‘budgets and underdeveloped nations’ cemeteries.”³⁹ HIV/AIDS continues to be a worldwide health priority.⁴ Globally in 2010, there were 34 million people living with HIV/AIDS, with an adult prevalence of 0.8%, 2.7 million new infections and 1.8 million people dying of AIDS. It has been projected that globally by 2030, the number of HIV related deaths will be 6.5 million people, assuming universal coverage with ART of 80%.⁴⁰

3.2 HIV/AIDS- AN ASSESSMENT OF THE EPIDEMIC IN THE USA

In the USA for 2011, there was an estimated 1,3 million HIV infections of all ages, with an adult prevalence of 0.7%, and 20 000 deaths due to AIDS.⁷(Table 1) Approximately two thirds of those infected are gay and bisexual men.⁴¹ The increasing prevalence among men who have sex with men in the USA is well-documented.⁴ The USA bears evidence of this in that the number of PLWHA has increased from 2001 to 2011 (1.0 to 1.3 million people).⁷ Deaths due to AIDS from 2001 to 2011 had remained constant at 20 000 people⁷, with regional differences being noted.⁴ The increasing prevalence of PLWHA is due to combined effects of new HIV infections and the benefits of antiretroviral therapy (ART).⁴

The United Nations Millennium Development Project (MDP), was adopted by most world leaders as the Millennium Development Goals (MDG).⁴² This heralded a new global partnership committed to eradicating poverty and meeting the goals of the MDG by 2015.⁴²

The MDG Goal 6 pertains to combatting HIV/AIDS ,where it was noted that, “Sub-Saharan Africa is the epicenter of the crisis, with continuing food insecurity, a rise of extreme poverty, stunningly high child and maternal mortality, and large numbers of people living in slums, and a widespread shortfall for most of the MDG’s”.⁴²

3.3 HIV/AIDS: AN ASSESSMENT OF THE EPIDEMIC IN AFRICA AND SUB-SAHARAN AFRICA

In 2011, Africa had 23 million people of all ages with HIV/AIDS, with an adult prevalence of 4.6% and deaths due to AIDS of 1.2 million people.⁷ Sub-Saharan Africa remains the region with the highest prevalence of HIV/AIDS.¹ In 2010, sub-Saharan Africa accounted for 22.9 million of the global burden of HIV infections, and 1.9 million of new HIV infections among adults, resulting in a prevalence of 5% .¹ In 2010, ART coverage was estimated at 49 % (CD4 eligibility of 250 cells/mm³).¹

3.4 HIV/AIDS - ASSESSMENT OF THE EPIDEMIC ON SOUTH AFRICA

HIV/AIDS is one of the main challenges facing South Africa (SA) today.⁴³ “South Africa has 0.7% of the world’s population, with 17% of the HIV infected people in the world, which equates to a prevalence of twenty three times the world average”.⁴³ The TB infection rate is the amongst the highest in the world.⁴³ In 2011 , with a total population of 49.99 million people,⁴³ the HIV prevalence for adults was 17.3%, with 5.6 million people with HIV/AIDS, and 1.7 million people on ART.⁷ (Table 1) It is estimated that 7% (360 000 people) have full-blown AIDS,⁴³ with the number of AIDS-related deaths increasing from 2001 to 2011(210 000 to 270 000).⁷ This was largely due to progression of the disease as a result of the late initiation of ART.

In SA the median time from HIV infection to death is estimated at 10,5 years for men and 11,5 years for women.⁴⁴ The life expectancy at birth is estimated at 54.9 years for males and 59.1 years for females.⁴⁴ In 2011, it is estimated that approximately 2.6 million people are in need of ART, at a CD4 count of < 250 cells/mm³.⁴⁴ The total number of new HIV infections for 2011 is estimated at 314 000.⁴⁴ The South African Dept. of Health has issued new ARV initiation guidelines for 2013 which would increase the number of people eligible for combination ART significantly. The 2013 guidelines include the initiation of combination ART for patients with a CD⁴ count of 350 cells/mm³ or WHO stage 3 or 4 disease, all patients co-infected with drug sensitive or resistant TB irrespective of CD⁴ count, all pregnant women with CD⁴ < 350 cells/mm³ to lifelong ART, and test all children below the age of 5 years and treat all who test positive with ARVs.⁴⁵

3.5 A COMPARISON OF THE EPIDEMIC-SA AND THE USA

The burden of disease in SA has been complicated by the ‘dissident views’ regarding HIV infection by the then SA government and hence the late roll-out of anti-retroviral drugs to treat people with HIV infection.⁶ Therefore the HIV disease burden in SA is disproportionately high as compared to the USA. Furthermore, ‘The South African Antiretroviral Treatment Guidelines 2013’⁴⁵ would significantly increase the numbers of people eligible for combination ART. South Africa has a four-fold burden of PLWHA as compared to the USA, which gains significance as South Africa’s population is 6% compared to the USA. This equates to an HIV prevalence of 17.3% for SA compared 0.3% for the USA. As a result South Africa, as a resource constrained country in terms of ICU bed availability (1:11000 in SA vs 1:4000 in the USA) and with a high burden of disease(5.6 million vs 1.3 million infected) SA needs to use best available clinical evidence of

outcomes for patients with HIV infection and ICU care, with due respect to applicable laws and ethical principles guiding the management of people with HIV infection and the appropriate use of scarce resources.¹⁵

A summary of USA health spending by major sources of funds in 2010⁴⁶ are as follows: Medicare spending grew 5.0 percent in 2010 to \$524.6 billion, while Medicaid spending grew 7.2% in 2010 to \$401.4 billion. “Medicare is a health insurance program for people aged 65 years or older, people under 65 years with certain disabilities and people with end-stage renal disease”.⁴⁷ Medicaid is the largest source of Federal funding for PLWHA, provided that they meet the criteria of being ‘ low income’ and ‘ categorically eligible’ such as physical or mental disability etc.⁴⁷

In 2009, growth in total spending for private health insurance premiums slowed, from 2.6% in 2009 to to 2.4% in 2010. In 2010, private spending on health care was 1.8%. The slowdown of growth for private health insurance could be attributed to the global economic recession. The economic recession has also impacted on the Global Fund with donor country pledges of \$ 11.7 billion, which is a substantial shortfall from projections for 2011-2013.⁴⁸ In 2010, the federal government financed 29% of total health spending , state and local governments 16%, private businesses 21%, and private households 28%.⁴⁶ It must be noted that these are estimates of health spending by type of sponsor, i.e. government, private business or households. Federal spending on HIV/AIDS in 2006: Medicare- 51% (\$56.3B); Medicaid- 26% (\$6.3B); Ryan White-17%(\$2.1B); Other- 6%(\$7B).⁴⁹

The Ryan White Comprehensive AIDS Resources Emergency Act (CARE) Act (often known simply as the Ryan White Care Act), is a health care program for PLWHA and is the largest federally funded program in the USA for PLWHA.⁵⁰ The Ryan White Care Act funds programs for low-income, uninsured and under-insured PLWHA and their families.⁵⁰ The Act has been re-authorised twice, the latest by President Obama in 2012. Ryan White Programs are the largest provider of services for people living with HIV/AIDS in the United States.⁵⁰

3.5.1 Health care reform: USA

National expenditure on health care does not have a consistent relationship with the overall health of a population. Issues of availability, accessibility and quality of health care have become major debates in the USA.⁵¹ Taking cognisance of approximately 44 million American citizens having no access to basic health care, the Obama Government, under provisions of the Patient Protection and Affordable Care Act 2010(ACA)⁵¹, has committed America to universal health coverage, which already includes expanded Medicaid eligibility, protection for people with pre-existing conditions such as HIV/AIDS etc. The benefit of the ACA is that it “will allow citizens to access health insurance, and increased access to tax credits will greatly enhance access to HIV treatment and care when the changes come into force in 2014”.⁵² This healthcare reform has translated into the National HIV/AIDS Strategy for the United States 2010⁵³ with its vision being:

“The United States will become a place where new HIV infections are rare and when they do occur, every person, regardless of age, gender, race/ethnicity, sexual orientation, gender identity or socio-economic circumstance, will have

unfettered access to high quality, life-extending care, free from stigma and discrimination”.

These reforms will be discussed in greater detail under the chapter on legislative frameworks and HIV/AIDs.

3.5.2 South Africa

In comparison to the USA, South Africa spends 8.3% of its GDP on health care expenditure.⁵⁴ This 8.3% health spend of the GDP translates to a 4.2% private health spend for 16.2% of the population (8.2 million people) with per capita annual health expenditure of R11 150 and who are largely on private medical insurance.⁵⁴ The remaining 4.1% is spent on 84% of the population (42 million people) with per capita annual health expenditure of R2766, and who are largely dependent on an over-burdened public health service.⁵⁴ As Health Minister Aaron Motsoaledi said “This is not an efficient way of financing healthcare”⁵⁴, and hence the governments strong motivation for the implementation of a National Health Insurance (NHI) as a ‘social responsibility, solidarity and equity’ priority, to access the majority of the population to quality health services, and in so doing, to address the imbalances of the past.⁵⁴

SA’s health expenditure exceeds the WHO’s recommendation of countries spending at least 5% of their GDP on health.⁵⁴ In 2012, the health budget allocated is R25.7 billion, of which R9.59 billion was allocated to HIV/AIDS programs,⁵⁵ with an additional R968 million to increase ART coverage to those patients at the CD4 of 350 mm³ threshold.⁵⁶ A further R26.9 billion for HIV/AIDS is allocated along a medium-term expenditure framework 2011-2013 as a conditional grant to increase ART coverage to 2.6 million

PLWHA.⁵⁶ Despite this high expenditure, the health outcomes remain poor when compared to similar middle to low -income countries,⁵⁴ notably Brazil and Botswana (Table 1), which will be discussed in subsequent chapters.

3.5.2.1 HEALTH CARE REFORM-SOUTH AFRICA: THE CHARTER OF THE PUBLIC AND PRIVATE HEALTH OF THE REPUBLIC OF SOUTH AFRICA

This Charter⁵⁷ is the preamble to the National Health Insurance and exercises Governments mandate in terms of section 7(2) of the Constitution of South Africa⁵⁸ i.e. to respect, protect, promote and fulfill the rights in the Bill of Rights. In terms of the Constitution, Government needs to “take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of the rights of access to health care services, including reproductive health care, sufficient food and water, and social security, including appropriate social assistance where people are unable to support themselves and their dependents.” The foundational principles of the Charter are access, equity and quality in health services.⁵⁷ Pilot projects, in preparation for the full implementation of the NHI in 2014-2015, have already begun, with the Finance Minister allocating a special budget of R1 billion for refurbishments of existing hospitals, and additional funding for the construction of new hospitals in the 2012 financial year.^{54 55}

3.5.2.2 NATIONAL HEALTH INSURANCE

It is widely believed that Government’s poor performance regarding its health outcomes, particularly with regard to its HIV/AIDS programmes, could be attributed directly to the inequities in health spend between the private and public health sectors.⁵⁴ To re-iterate, of the 8.3% of the GDP on health, 4.2% is spent in the private sector and 4.1% in the public sector.⁵⁴ The 4.2% spent on health in the private sector covers 16.2% of the population (8.2 million) who are largely on private medical schemes.⁵⁴ The remaining 4.1% is spent on 84% (41.7 million) of the population accessing the over-burdened public health sector.⁵⁴

In South Africa, almost five times as much is spent on each person on medical aid than on an uninsured person using the public sector.¹⁰ The private sector, catering for the insured and fee-for service patients, is well resourced and staffed compared to the public sector. Therefore the move in SA towards a National Health Insurance promises access to equitable, affordable, appropriate and efficient quality health care, including for PLWHA regardless of their socioeconomic or health status.⁵⁴ However good the macro- policy is, practical realities of deteriorating public health facilities, failure to maintain critical equipment to the extent that operating theatres have to be closed down, such as in Addington Hospital, Durban, and the fast attrition of medically qualified staff to the private sector or abroad, poses a challenge to its successful implementation.

3.5.2.3 THE NATIONAL STRATEGIC PLAN FOR HIV AND AIDS, STI AND TB - 2012-2016

The National Strategic Plan for HIV and AIDS, STI and TB (NSP)-2012-2016 is expected to be the guiding document in optimising and monitoring governments response to the HIV/AIDs programs in terms of “ universal testing for HIV and screening for TB; promoting health and wellness; ensuring access to quality treatment, care and support services for those with HIV and/or TB ; to develop programs to focus on wellness, safety and dignity with the primary objective being addressing issues of stigma, unfair discrimination, human rights, and gender inequality; changing social norms and values with the primary objective being to address societal behaviors that are fuelling the twin epidemics of HIV and TB”.⁸

According to Johnson (2012)⁵⁹, in her article on ‘Access to Antiretroviral Treatment in South Africa, 2004-2011’, SA has made substantial progress in the ART rollout

programme in the public sector since its start in 2004 (47 500 people on ART) to 2011 (1.793 million people on ART) and has exceeded the ART targets in its 2007-2011 NSP⁹. This equates to adult ART coverage by mid-2011 to approximately 80%, using the ART initiation criterion at the time of CD4 <200. Using the new adult ART initiation criteria of CD4 < 350, ART coverage drops to 52%.

The new NSP for 2012-2016⁸, proposes more stringent targets than those in the previous NSP⁹: the ART enrollment target in 2016 is expected to be 80% of the new ART need in that year and must also account for 80% of the unmet need from previous years.

Prevention, treatment, care and support programmes must be expanded to reach these targets. The NSP 2012-2016 proposes several measures to strengthen the monitoring and evaluation of SA's ART programme," including the introduction of a single patient identifier in the health sector and a single registry at the primary care level".⁸ It is hoped that these measures will optimise monitoring of ART coverage in future, as well as identifying barriers of access to care, treatment and support for PLWHA. Barriers of access to care, treatment and support would include access to ICU care for PLWHA.

3.6 GLOBAL HEALTH INITIATIVES AND FUNDING

Global health initiatives (GHI) represent the combined effort by many affluent countries to finance the delivery of specific types of health services for priority health problems that exist or arise in many low-income countries, e.g. vaccines, ARVs for HIV/AIDS, TB drugs etc.⁶⁰ South Africa, Botswana, and many other resource-constrained countries in sub-Saharan Africa, and Brazil and India, have been major benefactors of this funding. Some of these GHIs in resource-constrained countries include the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), the Global Alliance for Vaccines and

Immunisation (GAVI), the US President’s Emergency Plan for AIDS Relief (PEPFAR), and the World Bank Multi-Country AIDS Program (MAP).⁶⁰(Table 2)

TABLE 2 GLOBAL HEALTH INITIATIVES (GHI) AND FUNDING FOR THE TREATMENT, CARE AND SUPPORT OF PEOPLE LIVING WITH HIV/AIDS

Funders	Botswana	Brazil	India	South Africa
Global Fund to Fight AIDS, Tuberculosis and Malaria	X	X	X	X
Global Alliance for Vaccines and Immunisation	X	X	X	X
US President’s Emergency Plan for AIDS Relief	X	X	X	X
World Bank Multi-Country AIDS Program	X	X	X	X
Bill and Melinda Gates Foundation	X	-	-	-
MERC Company Foundation	X	-	-	-
US Center for Disease Control (CDC)	X	-	-	-
Harvard School of Public Health	X	-	-	-

The GHI’s have been an integral part of many resource-limited countries AIDS programmes, and in 2007, this amounted to US\$2.16 billion (Global Fund and GAVI) and US\$5.4 billion (PEPFAR). For 2011-2013, the Global Fund is US\$11.7 billion for deserving countries, which represents a shortfall from the projected US\$20 billion,⁴⁸ with a disappointing commitment from China and Russia.⁴⁸ This shortfall threatens to reverse the considerable gains made in the fight against HIV/AIDS in recipient countries such as Brazil, India, Botswana and South Africa.

3.7 IMPACT ON CRITICAL CARE MEDICINE

The American College of Emergency Physicians (ACEP) currently defines a critical illness or injury as “one that acutely impairs one or more vital organ systems such that there is a high probability of imminent or life threatening deterioration in the patient's condition”.⁶¹ “Critical care services are defined as a physician's direct delivery of medical care for a critically ill or critically injured patient. It involves decision making of high complexity to

assess, manipulate, and support vital organ system failure and/or to prevent further life threatening deterioration of the patient's condition".⁶¹

Any organs could be involved and the reasons could be complex and multiple, highlighting the higher degree of skills and competence required of the critical care team comprising the physician and the critical care nurse, amongst others.³⁹ Critical care services are mainly rendered in critical care units, also called intensive care units (ICU) or high care units (HC). The ICU provides life-support and monitoring for patients with severe physiological instability. According to the American College of Critical Care Medicine, the level of care in an ICU is greater than that available in the HC unit or general ward.⁶²

According to Lanken et al (1997), "Intensive care is distinguished from non-intensive care by several major characteristics:

1. Caring for patients with a high severity of illness that acutely or potentially threatens their life, bodily integrity, or other vital functions;
2. The presence of a multidisciplinary health care team to respond to that threat in a well-organised and sustained manner; and;
3. Providing this care in a geographically defined location, the ICU, equipped with expensive hi-tech life monitoring and life-support systems."²⁰

Despite the importance of the intensive care unit , critical care medicine(CCM) is still not commonly defined as a specialty in its own right.³⁹ In the USA, CCM is a subspecialty of Internal Medicine, Obstetrics and Gynaecology, Paediatrics, Surgery, and Anaesthesiology.³⁹ Nurse practitioners could also register as critical care nurses, having the necessary board accredited training. In the USA the American College of Emergency

Care Physicians oversees this accreditation process. In South Africa, the statutory accreditation authorities are the Health Professions Council of South Africa (HPCSA) and South African Nursing Council (SANC). Brill et al(2001), in their ‘ Critical care delivery in the intensive care unit: Defining clinical roles and the best practice model’ support the recommendation for an intensivist (supported by a critical care trained physician available on a 24 hour basis and with no other ‘competing clinical responsibilities’, ICU nurse, respiratory care practitioner and pharmacist as a closed-unit team, to optimize efficiency and improve ICU outcomes.⁶³

Continuous technological refinement of organ-support devices represents the most obvious advance in CCM.^{39 64} However, it is being increasingly noted that the injudicious use of aggressive treatments in the ICU can do more harm than good,^{39 64} e.g. nosocomial infections, severe sepsis, adverse effects of medication, pneumothorax etc. As the population ages, there is an expectation in affluent countries that critical care will be available to all who need it on demand.^{39 64} This paradigm brings with it issues of costs, cost-effectiveness, availability and ethical issues of rationing of scarce resources and decisions regarding medical futility.³⁹ End-of-life issues and communication between colleagues and families is paramount in this regard.³⁹ Good triage protocols need to exist, which must be informed by existing legal frameworks, ethical principles and evidence-based medicine.³⁹ All these afore-mentioned issues relate directly to the critical care treatment of patients infected with HIV/AIDS needing access to this level of care, which is the primary objective of this study.

3.7.1 Critical care resources

In recent years, there have been growing concerns over the inefficiencies of ICU

utilisation⁶⁵, lack of guidelines and protocols, discordant use of ICU beds at the end of life^{66 67}, and the high costs of ICU care^{12 68 69}. In the USA and SA, there is a shortage of CCSs, including critical care nurses.⁷⁰⁻⁷² Edbrooke *et al* (2011) in their European Union study ‘Implications of ICU triage decisions on patient mortality: a cost-effectiveness analysis’⁷³ conducted a retrospective observational cohort study which included 7659 patients referred to ICU to assess triage decisions on patient mortality and cost-effectiveness. Their study showed that “admission to ICU produced a relative reduction in mortality risk, expressed as odds ratio, of 0.70 (0.52 to 0.94) at 28 days”.⁷³ When stratified by the Simplified Acute Physiology Score 11(SAPS) predicted mortality, “the odds ratio was 1.49, 0.7 and 0.55 for <5%, 5% to 40% and >40% predicted mortality respectively.”⁷³ “ Average cost per life saved for all patients was \$103,771 and cost per life-year saved was \$7,065.⁷³ These figures decreased substantially for patients with predicted mortality higher than 40%, \$60,046 and \$4,088, respectively.⁷³ They state that not only does ICU care produce an improvement in survival, but the cost per life saved falls for patients with greater severity of illness as patients with a SAPS II predictive mortality of > 40% were generally not accepted for ICU care in their study cohort.⁷³ They conclude by stating that ICU care is similarly cost-effective to other therapies that are generally regarded as essential, using their ICU triage exclusion criteria of predicted mortality of higher than 40%.”⁷³

According to Wunsch *et al* (2008) in their study ‘Variation in critical care services across North America and Western Europe’⁷⁴ state that there is no ‘gold standard’ for ICU bed availability in their study and that they found a wide variation across countries in terms of numbers of ICU beds and the numbers of admissions. They further mention that the ICU beds per capita was strongly linked to mortality.⁷⁴

TABLE 3 NUMBER OF ICU BEDS PER COUNTRY

Country	Number of ICUs	Number of ICU beds per 100 000 population
Canada	319	13.5
USA	5980	20
Belgium	135	21.9
France	550	9.3
Germany	-	24.6
Netherlands	115	8.4
Sweden	89	8.7
Spain	258	8.2
UK	268	3.5
South Africa	308	8.9
Australia	160	8

Courtesy Adhikari N, Fowler RA, Bhaqwanjee S, Rubenfeld GD. Lancet 2010

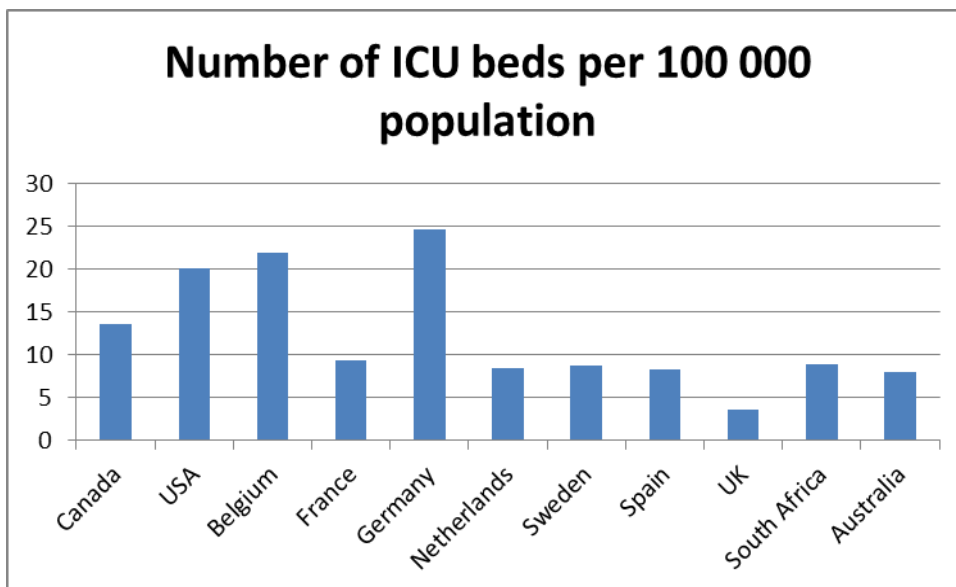


FIGURE 2 GLOBAL NUMBER OF ICU BEDS PER 100 000 POPULATION

3.7.1.1 CRITICAL CARE RESOURCES IN THE USA

The total number of U.S. hospitals with critical care medicine (CCM) beds is 5980, ranking it among the highest ICU bed per capita globally.^{74 75} (Table 3, Figure 2) This equates to 62 800 CCM beds or 9% of all hospital beds.

TABLE 4 ICU BEDS USA -ALASKA, IDAHO, MONTANA, WASHINGTON, WYOMING

STATE	Total	ICU	POP	P/T	P/ICU	Size	Pop density
Alaska	1641	152	626000	381	4118	1	1(51)
Idaho	3614	347	1293000	358	3726	14	16(45)
Montana	3951	318	902000	228	2836	4	6(49)
Washington	7572	784	5894000	778	7517	18	89(26)
Wyoming	2454	327	493000	200	1507	10	5(50)

P/T: population/total bed P/ICU: population/ICU beds
 Internet public library Medicaid database: courtesy J Kahn Annexure E

In Washington DC, with a population of 5.894 million people, there are 7572 hospital beds, with 784 ICU beds.⁷⁶ This equates to a population/total bed ratio of 1:778 and population/ICU bed ratio (P/ICU) of 1:7517, i.e. at any one time, theoretically 7517 potential patients are competing for one ICU bed. In Montana, the P/ICU ratio is 1:2836, Wyoming-1:1507, Idaho-1:3726 and Alaska-1:4118.⁷⁶(Table 4)

The majority (90%) of critical care medicine beds were classified as intensive care, premature/neonatal, and coronary care unit beds. “From 2000 to 2005, critical care medicine costs per day increased by 30.4% (from \$2698 to \$3518).”⁷⁷ Although annual critical care medicine costs increased by 44.2% (from \$56.6 to \$81.7 billion), or 1% of GDP^{12 78}, the proportion of hospital costs and national health expenditures allocated to critical care medicine decreased by 1.6% and 1.8%, respectively.⁷⁷ “In 2005, critical care medicine costs represented 13.4% of hospital costs, 4.1% of national health expenditures, and 0.66% of the GDP.”⁷⁷

Zilderberg *et al* (2008),⁷⁹ in their year 2020 prediction model on cost and bed implications of prolonged acute mechanical ventilation in the USA, demonstrated that

ICU bed utilisation between years 2000 and 2020 will grow from 1.5 to 3.6 million beds, for mechanical ventilation from 2.3 to 5.5 million beds, and from 4.3 to 10.3 million annualised hospital days for the population requiring prolonged acute mechanical ventilation. They also state that the expected annual inflation-adjusted ICU costs may be over \$64 billion and their projections put into perspective the fact that efficiency improvements for ICU care can no longer be viewed as an option, but as a clinical and policy imperative.

3.7.2 Critical care resources in South Africa

3.7.2.1 A CRITICAL ANALYSIS OF ICU/HC BEDS IN SOUTH AFRICA 2008-2009

According to Bhagwanjee et al , in their 2005 ‘National audit of critical care resources in South Africa – unit and bed distribution’ within the public sector, 23% of the hospitals had ICU’s (92/396) compared with 84% in the private sector (216/256).¹³ The data in our study ‘Critical analysis of ICU/HC beds in South Africa: 2008-2009’¹⁴ is presented (Tables 5, 6, 7), indicating the total population per province, the number of public sector ICU beds, the number of private sector beds, the total number of ICU beds as a combination of the private and public sectors, and the bed to population ratio. (Figures 3, 4, 5)

TABLE 5 ICU/HC BEDS IN SOUTH AFRICA: 2008-2009

Province	Population		Public		Private	
	No. (million)	%	No. of beds	% of Total	No. of beds	% of Total
EC	6.648	13.5	90	6.92	162	4.58
FS	2.902	5.9	103	7.92	293	8.2
GT	10.531	21.4	397	33.47	1914	54.17
KZN	10.449	21.2	224	17.24	448	12.68
LP	5.227	10.6	35	2.69	31	0.87
MP	3.606	7.3	40	3.07	101	2.85
NC	1.147	2.3	21	1.61	26	0.73
NW	3.450	7	32	2.46	83	2.34
WC	5.356	10.9	244	18.78	475	13.4
TOTAL	49 320	100%	1186	25%	3533	75%

EC-Eastern Cape; FS-Free State; GT-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo Province; MP-Mpumalanga Province; NC-Northern Cape; NW-North West Province; WC-Western Cape.

In 2008-2009, there were 4 719 ICU/HC beds in the private and public sectors in South Africa, with 75% (3 539) in the former and 25% (1 179) in the latter. The majority of ICU beds in the sectors were located in three provinces, Gauteng (49%, 2 312 beds), KwaZulu-Natal (14%, 660 beds) and the Western Cape (15%, 707 beds), representing 80% of ICU beds (3 775/4 719) and catering for 54% of the country's population. The Eastern Cape had less than 300 beds, the North West province and Mpumalanga Province had less than 150 beds, and the Limpopo and Northern Cape Provinces had 66 and 47 beds respectively.

TABLE 6 PUBLIC AND PRIVATE ICU BEDS AS A PERCENTAGE OF THE TOTAL PER PROVINCE

Province	Public		Private		Beds per Province	
	No. of beds	% of Total Beds	No. of beds	% of Total Beds	Total beds	% Beds
EC	90	1.91	162	3.43	252	5.34
FS	103	2.18	293	6.21	396	8.39
GT	397	8.41	1914	40.56	2311	48.97
KZN	224	4.75	448	9.49	672	14.24
LP	35	0.74	31	0.66	66	1.40
MP	40	0.85	101	2.14	141	2.99
NC	21	0.45	26	0.55	47	1.00
NW	32	0.68	83	1.76	115	2.44
WC	244	5.17	475	10.07	719	15.24
TOTAL	1186	25.13	3533	74.87	4719	100

EC-Eastern Cape; FS-Free State; GT-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo Province; MP-Mpumalanga Province; NC-Northern Cape; NW-North West Province; WC-Western Cape.

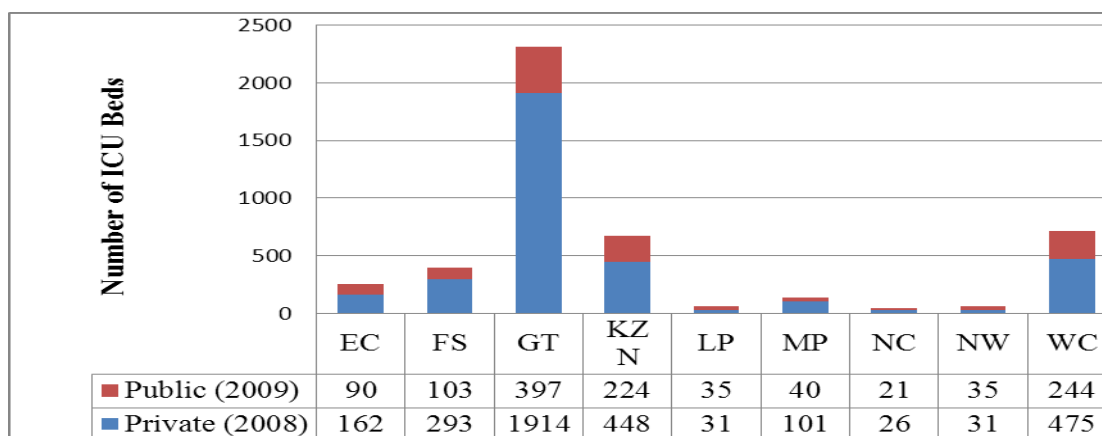


FIGURE 3 TOTAL PRIVATE AND PUBLIC ICU/HC BEDS IN SOUTH AFRICA 2008-2009

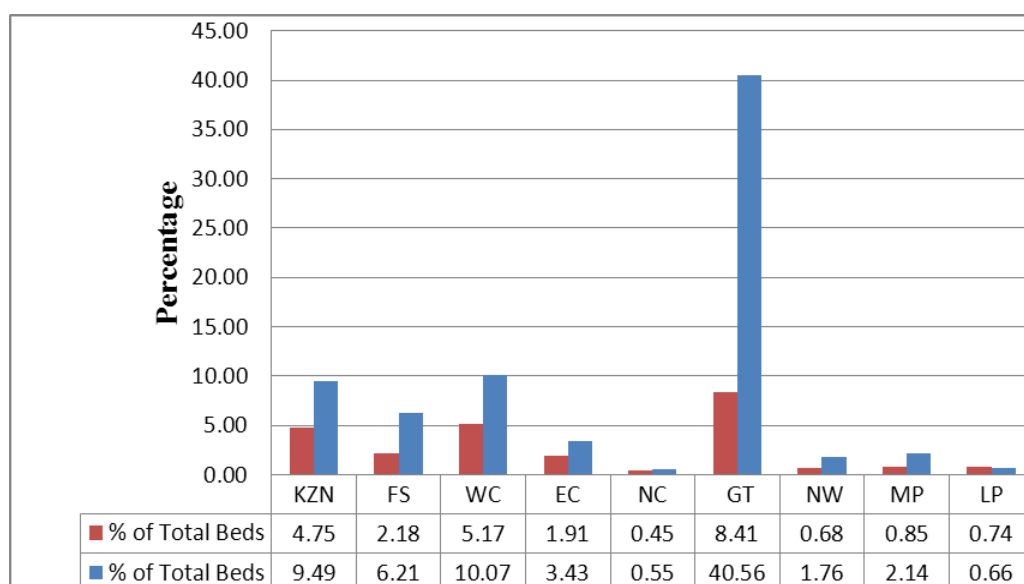


FIGURE 4 PERCENTAGE OF TOTAL PRIVATE AND PUBLIC ICU/HC BEDS IN SOUTH AFRICA - 2008-2009

The population distribution significantly affected the bed: population ratio. The public sector bed: population ratio in the Western Cape was approximately 1:20 000 and in Gauteng, the most populous province at 1:25 000, and the Free State, 1:30 000. KwaZulu-Natal, which comprises 21% of the population and carries the highest burden of HIV/AIDS, has a bed: population ratio of 1:45 000. The ratio for the rest of the provinces ranges from 1:50 000 to 1:150 000. (Table 7, Figure 5)

TABLE 7 PUBLIC SECTOR ICU BED: POPULATION RATIO IN SOUTH AFRICA: 2008-2009

Province	Population No. (million)	Public Sector No. of beds	Public sector ICU bed: population ratio
Eastern Cape	6.648	90	1:75 000
Free State	2,902	103	1:30 000
Gauteng	10.531	397	1:25 000
KwaZulu-Natal	10.449	224	1:45 000
Limpopo	5.227	35	1:150 000
Mpumalanga	3.606	40	1:90 000
Northern Cape	1.147	21	1:55 000
North West	3.450	32	1:110 000
Western Cape	5.356	244	1:20 000
TOTAL	49 320	1186	

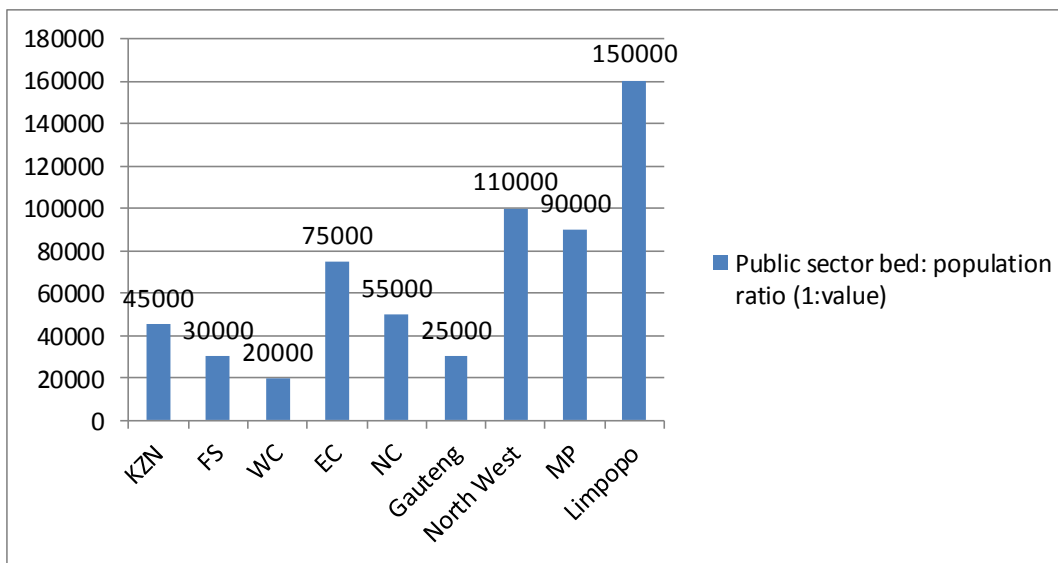


FIGURE 5 PUBLIC SECTOR ICU BED: POPULATION RATIO IN SOUTH AFRICA: 2008-2009

3.7.2.2 DISCUSSION

Within the public sector, 23% of the hospitals have ICU's (92/396) compared with 84% in the private sector (216/256).¹³ It is important to note that with the proposed NHI⁵⁴, the total ICU bed availability would be 4719, which would translate to a bed: population ratio of approximately 1:10 000. As a result of historical inequities, the NHI would not solve the huge discrepancies of access to ICU beds across the provinces. Bhagwanjee *et al*, in their 2005 'National Audit' concluded that in view of huge discrepancies of the availability of ICU beds in the country, there is a compelling need for regionalisation of ICU services in SA.¹³ The data presented in our '2008-2009 national audit' would strongly support their statement.¹⁴

It would appear that in South Africa, the impact of resource-constraints together with the burden of HIV infection and its associated complications imposes a greater burden on already limited resources i.e. the ICU bed, whereas in the USA, it would appear that ad-hoc admissions to ICU as a result of a lack of effective implementation of triage policies

have contributed to unnecessary ICU admissions. Kohn *et al* (2011), in their questionnaire to CCSs, concluded:²² “this study suggests that many ICU clinicians feel compelled to provide salvage critical care for identifiable patients with grave prognoses even when doing so measurably contravenes society’s interests”.

3.7.2.3 HUMAN RESOURCES

In the 2007 ‘National Audit of Critical Care Services’, commissioned by the Critical Care Society of Southern Africa, it was noted that there was a shortage of approximately 291 CCSs in South Africa, which at current rates of production would take 30 years to produce.⁷¹ Notably, provinces such as Limpopo, Mpumalanga, Northern Cape and North West Provinces have no CCSs.⁸⁰ In KZN, overall, 19% of ICU’s are staffed by CCSs.⁸⁰ South Africa has a total of 4719 ICU beds. Approximately 764 000 (14%) of those infected with HIV have AIDS.⁸¹ If 5% of these patients with AIDS require an ICU bed, this would require 38 000 ICU beds, which does not exist, even to the exclusion of all other categories of patients who may require ICU care e.g. trauma, surgical or obstetric emergencies etc. Given these statistics, the proposed National Health Insurance scheme envisioned for South Africa would not make available adequate numbers of ICU beds for treating patients with HIV infection who may require this level of care.

Innovative changes such as the “implementation of fast-track anaesthesia and enhanced post-anaesthesia care unit capabilities,⁸²⁻⁸⁴ the development of sub- intensive, intermediate and step-down units,^{85 86} and the increased use of non-invasive ventilation in regular wards, rather than only in ICU’s,⁸⁷ would decrease the need for ICU beds, which are always in demand and in short supply. These innovative changes would have the desired effect of decreasing the need for CCSs in favour of expansion of hospitalists/generalists in number

and scope of practice.⁸⁸ This would have the effect of decreasing the need for ICU care, and decrease hospital length of stay and costs.¹² The four bedded high-care unit with one ventilator bed at Wentworth District Hospital in KZN, SA, staffed and managed by generalists, is an example of such an innovative change, which takes the pressure off limited ICU resources. Triage tools, based on scientifically validated guidelines and protocols, including the use of admission and discharge criteria are required to enable optimal utilisation of intensive care services. In the context of HIV/AIDS, such triage tools currently do not exist.

3.8 IMPACT OF HIV/AIDS ON THE EMERGENCY ROOM-AN OVERVIEW

3.8.1 Triage in the emergency room

A medical emergency “has been interpreted as a sudden situation or event which is of passing nature in terms of time and not a chronic terminal illness such as kidney disease requiring dialysis”.⁸⁹ The South African Medical Schemes Act⁹⁰ gives the following definition of a medical emergency: “the sudden and, at the time unexpected onset of a health condition that requires immediate medical or surgical treatment, where failure to provide medical or surgical treatment would result in serious impairment to bodily functions or serious dysfunction of a bodily organ or part, or would place the person’s life in serious jeopardy”. Many of these emergencies, apart from resuscitation in the emergency room, would require ongoing life-support in the ICU.

South African government hospitals are poorly resourced, overcrowded, understaffed and underfunded, contributing to the pressure under which emergency departments (EDs) operate.⁹¹ The trauma case load is reported to be among the highest in the world.⁹² In South Africa, the emergency room is inundated with the ‘quadruple burden of diseases’⁹³,

i.e. communicable diseases, non-communicable chronic diseases, trauma-related injuries and HIV/AIDS and TB (listed as a separate category because of its overwhelming burden on workload in the emergency room). Entry into the health care services for a medical emergency begins at the emergency room (ER). Access to emergency health care is protected by law^{28 52 94-97} and by health professional's statutory codes of conduct.^{16 98 99}

¹⁰⁰This is where patients, including PLWHA, are received, assessed, resuscitated and stabilised, and triaged either for discharge, general ward admission or admission into ICU.⁶² This is when triage tools and eligibility criteria for admission into ICU gain significance.^{62 101} Triage tools such as the Western Cape triage score, adopted in 2006 and later revised as the South African Triage Score (SAts) in 2007¹⁰², have been helpful in its design as it was a validated rapid assessment tool, simple, comprehensive, needed minimal training and could be used by nurse practitioners.¹⁰³

3.8.1.1 A BRIEF DESCRIPTION OF THE SOUTH AFRICAN TRIAGE SCORE

On a patient's arrival in the emergency room (ER), according to the generic flowchart for the South African Triage Score (SAts), trained medical or nursing staff take a brief history and record the main complaint and vital signs (pulse rate, blood pressure, temperature), assess their mobility and level of consciousness according to the AVPU scale (A = alert, V = responds to voice, P = responds to pain, U = unresponsive), thereby calculating a Trauma Early Warning Score (TEWS). The TEWS score is then matched to the Sats discriminator list and an appropriate triage score allocated. This score places the patient as red (emergency), orange (treat within 10 minutes), yellow and green codes (non-emergency).

According to Rosedale *et al*, in their 2011 audit of the SAts tool in rural KZN,⁹¹ they found it to be useful in triaging the real emergencies, i.e. the red and orange codes, thus preventing avoidable deaths in the ER. In their study, approximately 48% of the ER

presentations were medical, with a large proportion being chronically ill due to HIV/AIDS.⁹¹ This would reflect the reality of most ER's in South Africa. These chronically ill patients presented in stretchers or wheel-chairs due to weakness or loss of energy.⁹¹ Therefore patients, chronically ill with the inability to walk unassisted or presenting on a wheelchair or stretcher would add one or two points on the score, and could erroneously be triaged as an emergency according to the SATs tool. They make the statement that 'Adding the mobility score to medical patients who were otherwise relatively stable resulted in their over-triage and inappropriate resource allocation'.⁹¹ The medical over-triage in their study was 18% , compared to 4% for surgical over-triage and 1% for trauma over-triage.⁹¹ This 'inappropriate resource allocation' could result in inappropriate admissions to ICU. Their study also reported reluctance by nurse practitioners to use the tool, unless supervised by a senior ER physician.⁹¹

The ER, in addition to being a complex medical environment for health professionals, presents complex legal and ethical challenges as well. It receives patients with life-threatening emergencies, for whom timeous medical intervention would make the difference between life and death. In this context, the patient and their wishes are often unknown, there is minimal time to establish a therapeutic doctor-patient relationship, and often there is ethical conflict regarding issues of informed consent, confidentiality and professional standards of care. Legal documents such as do-not-resuscitate orders (DNR) and living wills may not be known at this time. Furthermore, patients presenting to the ER may have an actual or 'perceived' medical emergency.¹⁰⁴ Through a process of triage,¹⁰¹ the patient is classified as emergency or not, and would be managed accordingly.

It is commonly in the ER that patients do not choose their health professional and there may be no prior doctor –patient relationship of trust, which add to the ethical dilemma in the emergency intervention, e.g. the existence of a valid do-not-resuscitate-order (DNR), living wills, a mandated decision-maker in terms of emergency consent or issues of organ-donor preference. Patients presenting to the ER with an altered mental status creates an ethical dilemma regarding issues of informed consent as it is not known at this stage if the incapacity is temporary, as in head injury, drug and alcohol intoxication or a psychiatric condition, or permanent as in irreversible brain injury or severe dementia.¹⁰⁴

The complexity of the ER is heightened by the presence of concerned and often hysterical family members, members of the emergency medical response service (EMRS) and the presence of law enforcement officers, all of which leads to ethical issues of maintaining patient confidentiality. In this situation, there is often conflict between obligations to patients and responsibilities to society¹⁰⁴ e.g. an inebriated driver from a motor vehicle accident brought in for acute trauma , where the law enforcement officer demands a sample of blood for alcohol and drug testing as their priority and this creates an ethical conflict in terms of the medical emergency at hand i.e. the head injury or ruptured spleen requiring emergency intervention. It is commonly in the ER that triage decisions are made, in consultation with the CCS, regarding admission to ICU. If no beds are available in the resident ICU, then the ER physician has a duty to phone reciprocal hospitals to secure an ICU bed.

3.9 THE 'RULE OF RESCUE'

In the ICU, physicians are driven by the “ rule to rescue, the powerful human proclivity to rescue a single identified endangered life, regardless of cost, at the expense of many nameless faces who will be denied health care.”^{21,22}

“As a result of the severe shortages of ICU beds, especially in the public sector, CCSs had to draw up strict admission/exclusion criteria to their units in order to be able to offer this form of expensive therapy to patients who are most likely to benefit from it. Examples of exclusion criteria include AIDS.”²⁵ Ethico-legally, could a patient with AIDS be denied access to scarce life-saving resources? In the USA, CCSs admit patients on an ad-hoc basis for ‘ salvage therapy’ with the ‘rule of rescue’ ethos as described by Hadorn²¹. In SA, as a result of the overwhelming disease burden and lack of triage criteria for PLWHA and access to ICU, HIV/AIDS has been used as an ‘ exclusion criterion’ to ICU admission.²⁵ Concerning patients with AIDS requiring ICU, the questions that arise are:

1. Could patients with AIDS, in the era of ART, be considered to be in the terminal stages of a chronic incurable illness?
2. If so, would ICU intervention be regarded a waste of hi-tech, expensive and scarce resources in a patient who is in the terminal stage of a chronic incurable illness?
3. Would the Law allow such a decision of medical futility, such as in the *Soobramoney* case¹⁰⁵?

Ethically, in the context of patients with AIDS requiring ICU care, could the CCS deliberate on a medical futility decision based on the principle of utilitarianism i.e. fair allocation of limited resources? Such decisions will require evaluation of at least two instruments:¹⁵

1. The Law and Public Health Policy

2. Ethics

CHAPTER 4: THE LAW, PUBLIC HEALTH POLICY AND ETHICS: SOUTH AFRICA AND THE UNITED STATES OF AMERICA

4.1 INTRODUCTION

Three issues are reviewed:

- i. the international human rights treaties and their influence on the South African and American health systems in the context of people living with HIV/AIDS.
- ii. the regulatory frameworks and policies, as well as the guiding ethical principles that impact on ICU admission in the USA and
- iii. a similar review for South Africa.

South African judge and HIV activist, Edwin Cameron, noted that the role of the law in a public health crisis should be ‘to contain the epidemic and to mitigate its impact’.¹⁰⁶ He states that the law ‘should aim to save the uninfected from infection and to protect the infected from the unjust consequences of public panic’.¹⁰⁶ He also states that the law ‘is to instruct and protect and to guide, rather than condemn.’¹⁰⁶ Various International and National legal instruments address the human rights obligations of the health sector, including health professionals.¹⁰⁷ These instruments give protection to patients accessing the health care system for various health related problems, including PLWHA.

4.2 INTERNATIONAL LEGAL INSTRUMENTS THAT PROTECT THE RIGHTS OF PEOPLE LIVING WITH HIV/AIDS

A number of international legal instruments exist to which many countries have become signatories, thereby binding them to the conditions enshrined in the documents. Six policy documents will be reviewed and their implications for patients with HIV infection and access to ICU will be discussed. (Table 8)

TABLE 8 INTERNATIONAL LEGAL INSTRUMENTS THAT PROTECT THE RIGHTS OF PEOPLE LIVING WITH HIV/AIDS

International Treaties	Botswana	Brazil	India	South Africa	USA
International Covenant on Economic, Social and Cultural Rights (ICESCR)	X	X	X	X Not ratified	X
Universal Declaration of Human Rights	X	X	X	X	X
International Covenant on Civil and Political Rights	X	X	-	X	X
Convention on the Elimination of All Forms of Discrimination against Women and Convention on the Rights of the Child	X	X	-	X	X
United Nation's International Guidelines on HIV/AIDS and Human Rights	-	-	-	X	X
African Union and Southern African Development Co-operation Treaty	X	-	-	X	

X = signatory

A treaty is a written agreement between nation states or sovereigns governed by international law. A treaty is legally binding e.g North Atlantic Treaty Organisation (NATO).¹⁰⁸ A covenant is an agreement, contract, or written promise between countries that constitutes a pledge to do or refrain from doing something e.g. to make war, and is legally binding to ratifying states.¹⁰⁸ A convention is an international agreement, such as the Geneva Convention and may apply before an official treaty. It is legally binding on parties who ratify it. A declaration is the body of law governing legal relations between or among states or nations, and is not legally binding.¹⁰⁸

4.2.1 International Covenant on Economic, Social and Cultural Rights

The International Covenant on Economic, Social and Cultural Rights (ICESCR)¹⁰⁹ is a legally binding agreement ratified by 61 countries, including America, but not ratified by SA. Hence SA is not legally bound by provisions under the covenant. Article 12(1) entitles everyone to “the enjoyment of the highest attainable standard of physical and

mental health.” Article 12(2c) talks about:’ the prevention, treatment and control of epidemic, endemic, occupational and other diseases;’ This would arguably include people with HIV infection. The ICESCR is legally binding for ratifying states. The Siracusa principles¹¹⁰ adopted by the ICESCR spells out five criteria concerning human rights and restrictions to public health based on resource limitations.¹¹¹ The burden of proof still falls on those who want to restrict rights, and concrete scientific and public health evidence is needed, specifically with response to Siracusa Principle 5 which states that “ it cannot be unreasonable or discriminatory in its application”.¹¹¹ This Convention would arguably include people with HIV infection with regard to their being entitled to enjoying the same rights to access ICU care as people not infected.

Although South Africa is a signatory and has not ratified the ICESCR “international human rights treaties, including the right to health, are directly enforceable through domestic courts in the absence of contradictory domestic law or by virtue of their incorporation into domestic statutory law.”¹¹² “Section 27 of South Africa’s Constitution³⁴ addresses the right of access to health care, food, water, and social security. The legislature grouped these rights together and recognised that such rights are linked and all contribute to the overall wellbeing of an individual. All rights in the South African constitution are enforceable and binding to the state.”¹¹²

4.2.2 Universal Declaration of Human Rights

The Universal Declaration of Human Rights³⁴ (UDHR) was ratified by 61 countries, including SA and the USA. Although not “legally binding on signatory states, but arguably morally binding, this declaration signaled a culture of respect for human rights and a commitment to human development” globally.¹¹² It provides for the rights of the individual and gives protection to vulnerable groups, for people not to be discriminated against because of their health status (Articles 1 and 7), and not to be denied access to

treatment (Article 3). Article 12 imposes an ethical and legal responsibility on health professionals to maintain confidentiality regarding their patients' health status, and to prevent further discrimination and stigmatisation on the basis of their health status, including informed consent and counseling. Article 21 enshrines the right to a "standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing and medical care and necessary social services..." Its principles enshrine the right of all persons, including PLWHA, to have access to health care, including ICU care.

4.2.3 International Covenant on Civil and Political Rights

The International Covenant on Civil and Political Rights (ICCPR)³³ was ratified by 61 countries, including SA and the USA. It provides for the protection of many civil and political rights of the individual. Article 2(1) of the ICCPR seeks: "to respect and to ensure...the rights recognized in the present Covenant, without distinction of any kind, such as race, color, sex, language, religion, political or other opinion, national or social origin, property, birth or other status." 'Other status' could include PLWHA and has implications for their rights with respect to accessing ICU care.¹¹³

4.2.4 The Joint United Nations Programme on HIV/ AIDS and Office of the United Nations High Commissioner for Human Rights

The Joint United Nations Programme on HIV/AIDS (UNAIDS)⁵ and Office of the United Nations High Commissioner for Human Rights (OHCHR)¹¹⁴ monitors and ensures "that States have a *core minimum obligation* to ensure the satisfaction of minimum essential levels of each of the rights under the Covenant". These rights to health not only include medical care, but also address the socio-economic determinants of health such as food,

housing, sanitation etc. These rights also extend to vulnerable populations such as women, children, migrants and PLWHA.

The resulting ‘International guidelines on HIV/AIDS and human rights, 2006’³² imposes a duty on states to create a rights-based approach with regard to HIV/AIDS consistent with international human-rights obligations. The guidelines comprise 12 imperatives which include amongst others, community participation in the field of ethics, law and human-rights, thereby giving protection to vulnerable persons, including prisoners; access to health care including access to safe, affordable and effective medication; and the provision of anti-discrimination laws to protect PLWHA, including legal remedies by statutory bodies of the state e.g. ministries of justice or ombudspersons.³² As this relates specifically to PLWHA, it speaks directly to their rights in accessing ICU care. In SA, the significant advocacy role of the Treatment Action Campaign, a non-governmental community driven organization, has resulted in many landmark case precedents in the protection of the rights of PLWHA.

4.2.5 Convention on the Elimination of All Forms of Discrimination against Women and Convention on the Rights of the Child

The Convention on the Elimination of ALL Forms of Discrimination against Women (CEDAW)³⁰ and Convention on the Rights of the Child (CRC)³¹ were both ratified by SA in 1999, while the USA ratified the former but not the latter in 1999.¹⁴⁰ Both these human-rights treaties are legally binding for those countries that have ratified them and gives protection to women and children, as vulnerable populations. In its concluding observations on South Africa’s report on the implementation of CEDAW, adopted in 1999, the CEDAW Committee did not discuss issues around HIV or AIDS.¹¹⁵ The concluding remarks of the CRC to SA’s 2007 HIV/AIDS report was:¹¹⁶ “Particular emphasis should

be placed on changing public attitudes toward HIV/AIDS and identifying strategies to address the continued discrimination experienced by children and adolescents infected with HIV.” Discrimination in this wide context can be interpreted as preventing women and children with HIV/AIDS from being admitted to ICU care.

4.2.6 African Union and Southern African Development Co-operation Treaties

These treaties include the African Charter on Human and Peoples’ Rights (ACHPR); African Charter on the Rights and Welfare of the Child, Protocol to the African Charter on Human and Peoples’ Rights on the Rights of Women in Africa, Treaty of the Southern African Development Community (SADAC), SADAC Protocol on Health, all of which SA is a signatory to.²⁹ However, the benefit of these treaties in the African context is questionable as a result of many signatory countries being in a state of endemic civil war so as to relegate these treaties low priority. SA is bound by these international agreements and section 23.1 of the South African Constitution regulates the signing, ratification and the transformation of treaties into domestic law, “unless it is inconsistent with the Constitution or an Act of Parliament”.⁹⁴ Given their intentions, they provide for the rights of all people to have access to ICU care without any discrimination, including PLWHA.

4.3 THE LAW AND PUBLIC HEALTH POLICY IN THE UNITED STATES OF AMERICA

Four pieces of American legislation speak directly to HIV positive persons rights to access ICU care: the American Constitution and Bill of Rights, the Federal Emergency Medical Treatment and Active Labor Act, the American Health Securities Act 2009 and the Patient Protection and Affordable Care Act of 2010.

4.3.1 The American Constitution and the Bill of Rights

The American Constitution and the Bill of Rights²⁸ AMENDMENT XIV (s1) confers a right to life for citizens of the USA and a right to equal protection under the Bill of Rights. In the early 20th century, the ‘No Duty-to-Treat Principle’ in the case of *Hurley v Eddingfield*¹¹⁷ and later the *Cambell v Mincey*¹¹⁸ court ruling that spared hospitals in Mississippi from any legal duty to admit and treat emergency patients led to social pressure in the USA for health care reform. In the *Matter of Baby K*¹¹⁹, the courts affirmed the duty-to-treat regardless of the patients underlying condition. The most notable advance in social justice in American health care regarding access to emergency care occurred with the passage of the Emergency Medical Treatment and Active Labor Act (*EMTALA*)⁹⁶ and the Patient Protection and Affordable Care Act of 2010.⁵² This has relevance for HIV patients being admitted for any emergency, including ICU admission, irrespective of the patients’ ability to pay.

4.3.2 Federal Emergency Medical Treatment and Active Labor Act

The Emergency Medical Treatment and Active Labor Act (*EMTALA*)¹¹⁸, enacted in 1986, as part of the Consolidated Omnibus Budget Reconciliation Act of 1985, mandates the US Government to provide emergency services to any person accessing the emergency service regardless of the diagnosis (e.g. labor, AIDS).¹⁰⁰ This would clearly include emergency access to ICU for patient’s requiring such level of care, irrespective of their ability to pay. The emergency care worker may not deny services to this category of patient.¹⁰⁰ The *EMTALA* was enacted “in response to concerns that some emergency rooms across the country had denied access to indigent, uninsured patients or inappropriately transferred them to other hospitals, a practice known as ‘patient dumping’”.⁹⁷ *EMTALA* requires hospitals that participate in Medicare to provide a medical screening of any patient who presents to the ER as a medical emergency”.

If the patient presents as a true emergency, validated by triage after screening, the hospital is compelled by law to provide the appropriate care to the patient, including ICU care, “and if such facilities is not available at the institution, it remains the responsibility of the hospital to secure such services from another hospital, having the necessary facilities.” Under *EMTALA*, “it is an offence for a reciprocal hospital not to accept such a patient if it has the facilities to treat”. The source hospital cannot refuse the transfer of a patient from another hospital, if it has the facilities to treat such a patient. The patient’s ability to pay or any delay to treat as a result of payment is an offence under *EMTALA*.¹²⁰ In terms of *EMTALA*, a pregnant women who is having contractions is considered to be in an ‘emergency medical condition’ and the emergency department she presents to, is legally compelled to give her the necessary care.

Any alleged violations under *EMTALA* are investigated by the Dept. of Health and Human Services Centers for Medicare and Medicaid Services (CMS) and referred to the Office of the Inspector General for financial penalty.⁹⁷ Therefore, under provisions of *EMTALA* a patient presenting with a medical emergency has a legal right of access to emergency care including ICU care. This would clearly include PLWHA requiring emergency admission to ICU. *EMTALA* has withstood legal muster as evidenced by case law and precedent as In *St Anthony Hospital v United States Department of Health and Human Services* (Judgement date: 28 August2002)¹²⁰

4.3.2.1 IN ST ANTHONY HOSPITAL V UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES (JUDGEMENT DATE: 28 AUGUST2002)

In this case, the courts upheld the provisions of *EMTALA* by issuing a fine to the hospital for violation of provisions under *EMTALA* by “reverse-dumping” i.e. “refusal to accept an appropriate transfer of a patient or to treat a patient who does not have medical insurance’.

In this case, a patient was involved in a motor vehicle accident and sustained a life-threatening injury to his abdominal aorta, which his attending hospital was not equipped to manage. However, St Anthony's Hospital, a specialised unit equipped to handle such an emergency, refused to accept the patient. On enquiry, the hospital was not busy on that night and none of its theatres were in use.

4.3.2.2 EMTALA AND S 27(3) OF THE CONSTITUTION OF SOUTH AFRICA- THE RIGHT TO EMERGENCY TREATMENT

*EMTALA*⁹⁶ defines an “emergency medical condition as ‘a medical condition manifesting itself with acute symptoms of sufficient severity, such that the absence of immediate attention could reasonably be expected to result in placing the life of the individual, the pregnant woman or her unborn child in serious jeopardy; cause serious impairment to bodily functions; serious dysfunction of any bodily organ or part; and emergency care to a pregnant woman with contractions, where there is not enough time to effect safe transfer to another hospital for safe delivery’”.

In contrast, the SA Constitution⁹⁴ and the National Health Act⁹⁵ do not define ‘emergency medical treatment’ which, unlike *EMTALA*, is explicit in its requirements from health care providers. However, the *Soobramoney* case¹⁰⁵ gave legal definition to the concept of medical emergency and which will be discussed in the subsequent paragraphs. The emergency provisions under *EMTALA*, apply to hospitals that participate in Medicare, and unlike SA’s Constitution, does not impose a legal duty on private health institutions to respond to an emergency for the uninsured or indigent patient. However, the provisions under the American Health Securities Act of 2009⁹⁷ and the Patient Protection and Affordable Care Act of 2010⁵² imposes a legal duty on all health-care practitioners and institutions, to respond to an emergency, irrespective of the ability to pay.

EMTALA recognizes the rights of the unborn child, in its definition of an emergency as regards ‘placing her unborn child in jeopardy’. In SA law, the unborn child does not enjoy rights under provisions of the Constitution, as it is not an autonomous independently functioning organism, but dependent on life-giving sustenance from the mother via the umbilical cord.

4.3.3 American Health Securities Act 2009 (s308 1a)

The American Health Securities Act 2009 (s308 1a)⁹⁷ further entrenches the right to health in the US and states that medical services will be provided to patients ‘without discrimination on the grounds of race....disability or illness’. This clearly would include PLWHA and access to ICU care.

4.3.4 Patient Protection and Affordable Care Act of 2010

The Patient Protection and Affordable Care Act (s1302, p45)⁵² states that ‘Emergency Care is a New Entitlement for All American Citizens’. This would be a new federally funded entitlement program, which grants all U.S. citizens access to emergency services without a direct financial cost to the patient. “At minimum, this codifies access to emergency services as a new entitlement granted to U.S. citizens without a direct financial cost to the patient.”⁵² This clearly would include ICU care for patients with HIV infection. This is in line with the WHO’s vision for universal health coverage.¹²¹ This health-care reform by the Obama Government brings approximately 45 million American citizens into the health care system, which was previously unaffordable, and thus inaccessible to them. This has major implications for PLWHA who now have free access to basic medical care, including treatment, care and support services and free access to ICU care.

Further health-care reforms by the Obama Government, specifically for PLWHA, involved renewing funding for the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act⁵⁰ and the commissioning of a presidential oversight committee on HIV/AIDS.⁵³ This has implications for PLWHA accessing ICU care as emergency care has to be made accessible to everyone.

4.3.5 The law and informed consent-legal precedents

The doctrine of informed consent is enshrined in law and affords protection to patients accessing medical care, including ICU care.

4.3.5.1 THE LAW AND INFORMED CONSENT-LEGAL PRECEDENTS IN THE USA

Most countries require informed consent from the patient for any medical intervention. If the patient lacks capacity to consent, as with patients presenting in coma or inebriated by alcohol or drugs, then proxy consent from a designated family member would be obtained. This is a legal pre-requisite in the USA and SA and espouses the ethical principle of autonomy and respect for the individual. In a medical emergency where consent cannot be obtained, the ‘defense of necessity’ would prevail, including emergency admission to ICU.¹²² In both the USA and SA, legal precedents have been set regarding informed consent, refusal of consent and issues around emergency consent. This has direct relevance to patients admitted to ICU who may refuse such treatment. A do-not-resuscitate (DNR) order or living will may be presented to the CCS, which is a legal instruction to the CCS. In an emergency, the CCS may obtain consent from a mandated surrogate decision-maker for patients who lack capacity to consent. (Table 9)

TABLE 9 THE LAW AND INFORMED CONSENT-LEGAL PRECEDENTS

South Africa	USA
<i>Castell v de Greef (1994)</i> <i>C v Minister of Correctional services(1996)</i>	<i>Schloendorff v. Society of New York Hospitals(1914)</i> <i>Salgo v. Leland Stanford University Board of Trustees(1957)</i> <i>Cobbs v. Grant(1972)</i>

Several landmark decisions in the United States established the legal obligation of clinicians to obtain consent before treating patients. The ‘doctrine of informed consent’ is a legal pre-requisite in the USA, as evidenced by the following case law. In the first case, *Schloendorff v. Society of New York Hospitals*,¹²³ the Court of Appeals of New York in 1914 determined that “Every being of adult years and sound mind has the right to determine what shall be done with his own body.” In the second case, *Salgo v. Leland Stanford University Board of Trustees*,¹²⁴ which was heard in 1957, the Court of Appeals of California stated that clinicians must disclose to a patient ‘all the facts which mutually affect his rights and interests’ in obtaining consent. In the third case, *Cobbs v. Grant*,¹²⁵ the Supreme Court of California in 1972 established that “The scope of the physician’s communication to the patient, then, must be measured by the patient’s need, and that need is whatever information is material to the decision.”

4.4 THE LAW AND PUBLIC HEALTH POLICY IN SOUTH AFRICA

Seven legal frameworks will be addressed with respect to the right of PLWHA accessing ICU care, namely: the South African Constitution and the constitutional right of access to health care services and emergency care⁹⁴, The Promotion of Equality and Prevention of Unfair Discrimination Act, The National Health Act, The Medical Schemes Act, The Law and Informed Consent-Legal Precedents in South Africa, HIV Testing in ICU-the Defense of Necessity and HIV/AIDS -A Human Rights Issue.

4.4.1 The South African Constitution

In terms of the Constitution⁹⁴, the State is prohibited under s9(3) from unfairly discriminating “directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth”. The Constitution specifically makes provision by the State for access to health care services within its available resources (s27). In addition, nobody may be refused emergency treatment (s27). The human rights norms enshrined in the Constitution are justiciable. The Bill of Rights guarantees civil and political as well as economic, social and cultural rights. Numerous provisions in the Bill of Rights impact directly and indirectly on PLWHA, including: s9 on Equality, s10 on Human Dignity, s11 on the right to Life, s12 on Freedom and security of the person, s14 on the right to Privacy, s24 on the right to a healthy and safe environment, s27 on the right to health-care, food, water and social security.⁹⁴ Section 27(1) of the Constitution provides that everyone has the right to have access to health care services, and there is an obligation on the State to take *reasonable* legislative and other measures within its *available* resources to achieve the progressive realisation of each of these rights.¹²⁶ This is the formula that the Constitution uses in respect of the cluster of socio-economic rights that are protected in it.

As the jurisprudence has developed, the key issue is how the courts enforce socio-economic rights within its available resources, such as the right of access to health care, without unconstitutionally trespassing on the policy-making and implementation responsibilities of the executive. The test as far as justiciability of socio-economic rights is concerned, is one of reasonableness.¹²⁶ The advantage of this test is that it requires a clear exposition and justification by government for its policy choices, without being unduly

rigid and prescriptive. However, given that SA is a resource constrained country with limited resources for health care and other services, the issue of admitting PLWHA to ICU must be discussed within the availability of the provision of this limited-resource. The constitutional test for the standard of ‘reasonableness’ has withstood legal muster in the following case law and precedents.

4.4.1.1 GOVERNMENT OF RSA AND OTHERS V GROOTBOOM AND OTHERS(JUDGMENT DATE: 4 OCTOBER 2000)¹²⁷

In this case Irene Grootboom challenged the High Court, and later the Constitutional Court (CC) in terms of section 26, “which gave citizens the right of access to adequate housing, and section 28(1)(c), which gave children the right to shelter”. Irene Grootboom lived in poor conditions in Wallacedene informal settlement. The High Court had found that the children and, through them, their parents were entitled to shelter under section 28(1)(c). Justice Yacoob, noted “that the Constitution had an obligation to help people living in poor conditions in terms of housing, healthcare, food and water, and social security. The Court stressed that human dignity, freedom and equality were denied to those without food, clothing or shelter.” The CC acknowledged that these rights could not be realized immediately, but progressively depending on the available resources of the State. The programme in force in the area at the time “fell short of this obligation and the CC ordered the State to provide relief for those disadvantaged people who had not been catered for.”

The Constitutional Court (CC) in *Grootboom*, indicated that in determining whether governmental action is reasonable in terms of section 26(2) of the Constitution, a court will not enquire into whether different and more favourable measures could have been adopted. The reasonableness enquiry recognises that a wide range of options may be adopted by the

State to meet its objectives.¹²⁶ One of the recurring themes in the judgments of the CC is that if governmental measures are to be deemed reasonable, they must cater for those most in need and whose rights are most in peril.¹²⁸ There must be a demonstration that the most marginalised and vulnerable in the society are being assisted by the government measure. A comprehensive housing policy was therefore held to be unreasonable in *Grootboom*, because no provision was made to alleviate the plight and conditions of those in great need and who were on waiting lists for formal housing. They were simply left to their own devices, with no assistance from the State, and this was untenable. Similarly, in the *Treatment Action Campaign* case,¹²⁹ the court held that the government policy of restricting the use of nevirapine to prevent mother-to-child transmission to certain test sites was unreasonable.

4.4.1.2 MINISTER OF HEALTH AND OTHERS V TREATMENT ACTION CAMPAIGN AND OTHERS (JUDGMENT DATE: 5 JULY 2002)¹³⁰

The Treatment Action Campaign (TAC) and two other parties challenged the Government's policy on the prevention of mother-to-child transmission of HIV by the use of nevirapine. The drug was made available to the South African Government free of charge for two years, but irrespectively, Government restricted its use to a limited number of pilot sites. The Courts ruled in the applicants favour as "the policy seriously affected a significant group of HIV-positive mothers and children who did not have access to the research sites and were effectively denied access to a potentially life-saving medical intervention."

The net effect of the policy was that those who were entirely dependent on the State for health care were being denied access to the drug that could potentially prevent mother-to-child transmission if they attended public hospitals outside the test sites. The drug was being offered free of charge to the State for a certain period, and the court concluded that the reasons for not making the drug available in all State hospitals when its use was sanctioned by the attending physician was unreasonable. Once again, the most marginalised and disempowered in society were worst affected by the policy. The State was ordered to change its policy and bring it into line with the Constitution.

In both *Grootboom* and the *TAC* cases, the court set aside the policies, and taking cognisance of the separation of powers allowed government to reformulate the policies in a manner that complied with its constitutional obligations. Finally, the CC in *Mazibuko*¹³¹ provided further guidance on how to evaluate the reasonableness or otherwise of measures adopted by government. The court declined to grant an order obliging government to provide a minimum of 50 litres of free water per person per day in the Phiri area of

Soweto. Such an order would, in the opinion of the court, have been unduly prescriptive and may have had the effect of hampering government in the proper and systematic realisation of all socio-economic rights. The CC¹³² held that government policies would be unreasonable if they made no provision for those desperately in need, if government adopted a policy with unreasonable limitations and exclusions, and if government did not continually review its policy to ensure that the achievement of rights was being progressively realised. In this case, the court held that the policy of providing 25 litres of free water, together with various other options including installing prepaid water meters, was not unreasonable. A factor that weighed heavily with the court was that indigent persons could apply for a further and additional supply of free water. Importantly, government provided a full and comprehensive explanation for its policy choices.

As a consequence of the jurisprudence on the socio-economic rights, government is required to progressively realise the right of access to health care. In terms of section 4(3) of the National Health Care Act 2003, the State, clinics and community health centers funded by the state must provide free health care services to pregnant and lactating women and children below the age of 6 years, who are not members or beneficiaries of medical aid schemes. Further free primary health care must be provided to all persons, and women access to free termination subject to the Choice on Termination of Pregnancy Act, No 92 of 1996 and free post-exposure prophylaxis to the victims of sexual assault. Beneficiaries of medical insurance schemes and persons receiving occupational health compensation were excluded from these free benefits.

4.4.1.3 THE APPLICATION OF THE LIMITATION CLAUSE - SOOBRAMONEY V MINISTER OF HEALTH (KWAZULU-NATAL) CASE CCT 32/97 (DECIDED ON 27 NOVEMBER 1997)

In South Africa, the constitutionally sound basis for rationing has been canvassed in the case of *Soobramoney*.¹⁰⁵ In a case involving the right to access dialysis treatment, the Constitutional Court held “that the right to emergency medical treatment was restricted to a person who suffers a sudden catastrophe which calls for immediate medical attention. The Court held that the right to emergency treatment could not mean that the treatment of terminal illnesses had to be prioritised over other forms of medical care, such as preventative health care. It also held that the right to emergency medical treatment was independent from the right to life and had to be interpreted in the context of the availability of health services generally.” The court found that Addington Hospital’s dialysis treatment access policy was reasonable and rational, and that the hospital’s denial of treatment to *Soobramoney* was fair. The court’s decision is significant as it endorsed the reasoning that limited resources should be prioritized to the most deserving patients meeting scientifically validated triage/eligibility criteria.

If the right to emergency health care provisions of the Act is challenged, as in *Soobramoney*¹⁰⁵, “the focus no doubt will be on whether the infringement of the rights of the applicant is reasonable and justifiable in accordance with section 36 of the Constitution. Section 36 of the Constitution provides for the limitation of rights in the Bill of Rights, therefore no right is absolute.”

The Siracusa principles¹¹⁰ adopted by the ICESCR spells out five criteria concerning human rights and restrictions to public health based on resource limitations.¹¹¹ The burden of proof still falls on those who want to restrict rights, and concrete scientific and public health evidence is needed, specifically with response to Siracusa Principle 5 which states

that “ it cannot be unreasonable or discriminatory in its application”.¹¹¹ The question, therefore, is whether the purpose the law seeks to achieve, justifies the infringement of the right, for example, not to be denied access to life-preserving renal dialysis, as in *Soobramoney*.¹⁰⁵

In respect of scarce resources, such as access to ICU beds and access to dialysis, policy makers are within the law in equitably prioritising such resources to those patients who will most benefit from it. Therefore, in respect of the limitation clause in the Bill of Rights, as in *Soobramoney*,¹⁰⁵ can a patient with AIDS with multiple co-morbidities, such as severe sepsis and organ failure, be considered to be in the end-stage of a chronic illness, for which there is no cure, and thus be denied ICU care? The answer would be in the affirmative, using the same arguments and precedent decided in the *Soobramoney* case.¹⁰⁵

4.4.2 International Guidelines on HIV/AIDS and Human Rights

In line with provisions under the Constitution, the South African Human Rights Commission (SAHRC) approved the United Nation’s ‘International Guidelines on HIV/AIDS and Human Rights’.¹³³ The SAHRC called on the government to implement them and has been vigilant in protecting the rights of PLWHA, including, inter alia, the lack of provisioning of ART in some government hospitals¹³⁴ and the issue of the South African Blood Transfusion Services banning gay men from donating blood.¹³⁵ The SAHRC is vigilant in protecting the rights of its citizens, including PLWHA, with specific focus on discrimination, access to care, treatment and support, which may be unfairly denied to them.

4.4.3 The Promotion of Equality and Prevention of Unfair Discrimination Act

The Promotion of Equality and Prevention of Unfair Discrimination Act (PEPUDA)¹³⁶ seeks to ‘advance equality in public and private life’ in line with the ideals enshrined in the Constitution. It provides legal redress against ‘unfair discrimination, hate speech and harassment’. It prohibits unfair discrimination on any grounds, including the 16 explicitly listed in the Bill of Rights. PEPUDA further gives protection against unfair discrimination for PLWHA, in its wider interpretation of “other status”.¹³⁶

4.4.4 The National Health Act

The National Health Act (NHA)⁹⁵ s3 (1) tasks the Minister of Health, within the limits of available resources, to equitably prioritise the health services that the state can provide. The “rights of users are dealt with in terms of emergency treatment; participation in decision-making; providing informed consent; consent in respect of incompetent persons and in emergency situations; confidentiality; protection of health records and access to information; and the right to complain”. Section 2(5) of the NHA “specifically mentions the right not to be refused emergency medical treatment”. This is in line with the Constitution (s27.3). Patients with HIV/AIDS, irrespective of the stage of the disease, are protected by Constitution and NHA when decisions need to be made regarding their admission to ICU.

4.4.5 Medical Schemes Act

The Medical Schemes Act of 1998 was enacted to compel medical aids to provide a minimum package of essential services to its membership.⁹⁰ The Act refers to 26 conditions listed under ‘Annexure A-Prescribed Minimum Benefits’ which provide access to emergency medical care including treatment of respiratory failure and chronic renal failure using therapeutic algorithms agreed upon by the Minister of Health.

4.5 THE LAW AND INFORMED CONSENT-LEGAL PRECEDENTS IN SOUTH AFRICA

The legality of informed consent by treating clinicians was established by several landmark decisions in South Africa. Judgment in *Castell v de Greef*¹³⁷ in 1994 (Table 9) introduced the ‘doctrine of informed consent’ into South African medical law. The facts in this case centered around the defendant, a plastic surgeon, who was sued for damages by the plaintiff on account of an unsuccessful subcutaneous mastectomy.¹³⁸ Ackerman J held that the plaintiff was not warned of all the material risks of the operation by the surgeon, which constituted a fundamental requirement of informed consent, as the plaintiff was not aware that gangrene of her breast could be a complication of this type of operation.

In *C v Minister of Correctional services*¹³⁹ in 1996, the Court upheld the patients right to informed consent including knowledge of all material risks of the proposed treatment. In this case, the Minister had ordered HIV testing of all prisoners in his correctional facility, without the patient’s informed consent, without pre- or post-test counseling, and without access to treatment for those who tested HIV positive. Both cases resulted in all patients being required to sign informed consent forms for all hospital procedures, which include PLWHA, who would need to consent to ICU care.

4.5.1 HIV testing in ICU-the defence of necessity

In the USA, approximately 40% of patients admitted to ICU with HIV infection are unaware of their status at the time of their ICU admission.¹⁴⁰⁻¹⁴³ All states in the USA have specific legislation regarding informed consent and HIV testing.¹⁴⁴ For emergency consent and HIV testing, the hospitals ethics committee or legal representative would be consulted.¹⁴⁴ Using surrogate HIV markers, such as HIV RNA (ribonucleic acid) assays or

CD4 counts may be a violation of legal statutes in some states.¹⁴⁴ It should be noted that a low CD4 count, although characteristic of advanced HIV disease, could be due to other non-HIV related causes in critically ill patients.^{145 146} Similarly, with post-exposure HIV testing, some states explicitly permit HIV testing without consent, whilst other states explicitly prohibit HIV testing without consent.¹⁴⁴ In the USA, with the exception of legally-designated decision makers, disclosure of a patient's HIV status to family or friends is prohibited.¹⁴⁷

In patients admitted to ICU who lack consent making capacity due to their medical condition, a definitive diagnosis of HIV/AIDS by using surrogate HIV markers, may lead to earlier diagnosis and treatment of the life-threatening condition. The principle of beneficence and the defense of necessity would prevail.

The WHO guiding document on 'HIV-counseling and testing in health institutions'¹⁴⁸ advise client-initiated HIV counseling and testing (HCT). With regard to 'provider-initiated' HIV testing, the WHO and UNAIDS categorically do not support the mandatory or compulsory testing of individuals on public health grounds.¹⁴⁸ Hence South Africa's 'Compulsory HIV testing of alleged rapists' Act¹⁴⁹ and Botswana's Law^{150 151} regarding 'Harmful HIV-related Behavior Act' and 'Compulsory HIV testing of alleged rapists' Act, would be in direct contravention of the guidelines in the WHO document¹⁴⁸ regarding 'mandatory or compulsory HIV testing'.

For patients who are seriously ill, including patients in ICU, issues of informed consent and confidentiality must be adhered to for patients having such consent-making capacity.¹⁴⁸ For patients lacking consent-making ability, such as coma, the WHO advises proxy consent 'from the patient's next-of-kin, guardian, or other care-giver'. In the absence

of such surrogate decision-maker, the physician should act in the best interests of the patient.¹⁴⁸ In a situation where the HIV status would influence the acute care management of the patient, there is a moral and ethical obligation on the physician to act ‘in the best interests of the patient’.¹⁵² In an emergency, the ‘defense of necessity’ would prevail.¹²²

Would the ‘defense of necessity’ doctrine withstand legal muster with regard to the urgent initiation of ART in ICU, for a patient who lacks consent-making capacity? This ethical dilemma would be further explored in the chapter on the initiation of ART in ICU. The WHO makes mention of ‘ethical partner notification’,¹⁴⁸ but for a patient who lacks consent-making capacity in ICU, such disclosure would create an ethical conflict and ‘awkward interactions’ between the ICU staff and relationships with family members.¹⁴⁷ In the USA, the Centers for Disease Control (CDC) 2009 revised guidelines advocates the policy of routine ‘opt-out screening’ i.e. ‘performing HIV screening after notifying the patient that the test will be performed and that the patient may elect to decline or defer testing. Assent is inferred unless the patient declines testing’.¹⁵³ Since 2010, South Africa has also adopted the routine ‘opt-out screening’ for HIV testing, which is viewed as progressive, as previously HIV testing was only performed at the request of the patient.⁴

In SA, the National Health Act (Ch. 6) further protects the right to informed consent. On the issue of informed consent, patients with HIV infection often present in stupor or coma, and lack capacity to give consent. In an emergency, surrogate decision-making could be employed if a family member of the patient is present.⁹⁵ Often, no family is present. Strauss (1991) advises that:¹²²

“Emergency medical treatment without consent is justified where there is a serious possibility of death or deterioration of the health of the patient. The

treatment must be in the best interests of the patient. The treatment must not be against the will of the patient e.g. any advanced directive. This is justified on the basis of necessity.”

4.6 MEDICAL ETHICS

According to Singh et al, moral agents, in our context, critical care specialists, need to make morally challenging decisions “which is not a precise art but a learned skill”.²⁴ They further state that ethical decision making over “difficult choices” would always be debatable and the decision-maker would have to rely on “various ethical principles and ethical theories devised”²⁴

They further state that in making ethical decisions, three important factors need to be considered.²⁴

1. the choices from which they can deliberate towards an ethically acceptable decision
2. the consequences of these decisions have to be taken into account.
3. the clinical context of the health care dilemma will affect the decision to be made.

4.6.1 Medical ethics at the bed-side-how do critical care specialist’s decide what is ethical?

Medical ethics does not consist simply in following the recommendations of the WMA, HPCSA or American College of Emergency Physicians (ACEP). Their recommendations are usually general and open-ended in nature, and must be individualised by the CCS to the specific situation at hand. There are different approaches to ethical issues i.e. non-rational and rational approaches.¹⁶

4.6.2 Non-rational approaches

There are five non-rational approaches which can be used in deciding whether a patient should be admitted to ICU but they are subjective, and justifying their use would be problematic as opinions between CCSs may vary.

1. Obedience: By just following rules of authority, whether or not one agrees with them.
2. Imitation: Here a subordinate imitates the example of a role model. The common example is junior doctors imitating the behavior of their consultants.
3. Feeling or desire: relies on a subjective feeling of what feels right or wrong.
4. Intuition: is an immediate response of the right way to act in a situation which may be influenced by past experience.
5. Habit: is an efficient method of moral decision-making but there may be good habits (truth-telling) and bad habits (lying).

4.6.3 Rational approaches

The WMA handbook ¹⁶ states that the best way to make ethical decisions is to consider all four rational approaches of consequentialism, deontology, virtue ethics and principlism.

4.6.3.1 CONSEQUENTIAL OR UTILITARIAN ETHICS

In true consequentialist fashion, one has to ask the question 'Do the ends justify the means?' Consequential or utilitarian ethics emphasise the 'greatest good for the greatest number of people'.^{24 154 155} It focuses on what one seeks to accomplish with an action and our 'moral worth' being the relative happiness or pain caused.¹⁵⁶ An action is right if, and only if, it promotes the best consequences, and the best consequences are those in which happiness is maximised. Utilitarianism, the best known consequentialist theory, states that the right action is the one that produces the greatest happiness for the greatest number of people. Hence, utilitarian theory would support the physician in making important

decisions regarding scarce resource allocations, particularly in our context of advanced HIV infection. Consequentialist theory would influence the doctor to use the scarce utility to produce the best outcomes for the greatest number of people. This theory supports the principlism theory of distributive justice i.e. ‘who bears burdens and enjoys benefits’.¹⁵⁷ These ethical theories would support the CCS in making triage or rationing decisions in ICU, a scarce and expensive utility. Utilitarianism has been criticized as “the greater balance of happiness over unhappiness” does not relate to the value of justice or issues of human rights for the individual patient.¹⁵⁶

4.6.3.2 DEONTOLOGICAL ETHICS

Deontology or ‘rule morality’ ethics conforms to a morally acceptable principle that an action is right if, and only if, it is in accord with a moral rule or principle, irrespective of the consequences.¹⁵⁶ It relates to our “rational capacity as human beings to distinguish between right and wrong” and our moral motivation as an “inalienable sense of duty and respect”.¹⁵⁶ It asks the question ‘What is right?’ and ‘What is the right thing to do?’^{24 154}
¹⁵⁵ Immanuel Kant,^{154 155} in his ‘categorical imperatives’ speaks of ‘perfect and imperfect duties’. His perfect duties are ones that have to be met and one is blameworthy if one does not meet them. His ‘imperfect duties’ are praiseworthy and circumstantial.

In our clinical context of a patient with advanced HIV infection, this moral obligation would imply that the physician must always have the intention, duty or obligation to do the right thing, i.e. to ‘treat all patients to the best of your ability’ or ‘stop treating a patient when burdens substantially outweigh benefits’. Deontology is criticized as it remains abstract and difficult to implement practically as consequences are always important in assessing our moral actions.¹⁵⁶ The practical implementation of this theory in terms of

allocation of scarce resources, i.e the single ICU bed for two competing patients, would not factor in triage criteria as it would be morally problematic to make such a value judgement on two lives.

4.6.3.3 VIRTUE ETHICS

Virtue ethics concentrates on the character traits or virtues of the individual that inspire him to do good.^{24 154 155} The theory further states that to do good one has to be good.

Hence the good physician must possess virtues such as compassion, integrity, discernment and trustworthiness. Virtue theory is criticised in that having the good motive and intention to do good does not necessarily mean that a good decision will be reached on every occasion.

4.6.3.4 PRINCIPLISM

Beauchamp and Childress¹⁵⁷ have suggested four basic components of principlism ethics that are particularly relevant to health care ethics: autonomy, beneficence, non-maleficence and justice.

1. **Autonomy.** The principle of autonomy involves respect for the person and the recognition of the patient as an autonomous agent empowered with choices to make decisions. The patient is empowered to make an informed consent or informed refusal of treatment options, but only after demonstrating knowledge, and understanding the implications of such decision.

In the clinical context of a patient with HIV infection requiring resuscitation, clearly a DNR order from the patient would have to be respected. However in practice, such DNR orders are rarely seen, partly due to physicians not sharing such information with their patients and also due to the low literacy levels of patients presenting to public health institutions.¹⁵⁸⁻¹⁶⁰ Do not attempt resuscitation orders(DNAR) may be pronounced by the attending physician if the underlying

medical condition would render resuscitation medically futile, e.g terminal cancer.¹⁶¹ The principle of autonomy also requires the physician to protect those who have diminished autonomy as is the case with a patient with AIDS presenting in delirium or coma. Here the three principles of beneficence, non-maleficence and justice become more important.

2. **Beneficence:** This principle requires the physician to treat the patient in a manner that will benefit the patient and protect them from harm. The Hippocratic Oath requires physicians to benefit patients “according to their best judgment”. In our clinical context of a patient with advanced HIV infection, “best judgment” will include prevention of continued pain and suffering and the provision of palliative care. This would also preclude the administering of medically futile interventions, such as active resuscitation and treatment on mechanical ventilator support in ICU. The American Medical Association (AMA)-Code of Ethics (Opinion 2.037) states: “When further intervention to prolong the life of a patient becomes futile, physicians have an obligation to shift the intent of care toward comfort and closure”.⁹⁸ The Health Professions Council of South Africa (HPCSA) recognises this by stating:¹⁶²

“...life has a natural end and the existence of such techniques of life support...for whom there is little hope for recovery. The quality of life which may follow some treatments might raise questions as to whether it is in the best interests of the patient to start or continue treatment”.

3. **Non-maleficence:** This principle requires the physician not to deliberately harm the patient. In our clinical context, the decision not to actively resuscitate the

patient but rather palliative care balances our obligations to do no harm and maximise possible benefit. There is an overall net benefit to the patient.

4. Justice: The principle of justice in health is about “fairness in health treatment”.¹⁵⁶ This principle encompasses legal justice, as when a patient wishes to litigate against a health practitioner, rights justice, as the right of access to health care, and importantly, in resource constrained environments, the principle of distributive justice. Beauchamp and Childress state that distributive justice is “[f]air, equitable and appropriate distribution in society determined by justified norms that structure the terms of social co-operation”.¹⁵⁷ This is of particular importance in SA, a resource constrained environment with a high burden of disease i.e. HIV/AIDS. Furthermore ethically challenging resource allocation decisions need to be made on a daily basis by CCS on whom to admit to ICU.

Utilitarianism is a justice theory that asks: ‘Who ought to receive benefits and bear burdens?’ Beauchamp and Childress state that this is a question of distributive justice in the sense of ‘fairness in distribution, or ‘what is deserved’.

Libertarianism is another justice theory and is based on the affordability of the patient to pay for services. This theory would support the private health care sector.

Communitarianism is dictated by societal needs. The Texas Advanced Directive Act (TADA) is a good example of this principle as it determines, legally, when further medical treatment may be inappropriate under strictly prescribed conditions, and meets with societal approval.¹⁶³ Egalitarianism is a justice theory which upholds that resources are distributed according to equality and not according to need.

4.7 DISCUSSION

In the light of these rational approaches to decision-making, principlism is probably the most practically effective tool that could be used by CCS as a framework for moral reasoning “ as it draws on the idea of a common morality”.¹⁵⁶ It also emphasizes that when the four principles are in tension each other , “ one must weigh the principles until some equilibrium is found and their relative weights come to rest”, drawing on Rawls’ idea of “ reflective equilibrium”.¹⁵⁶ In the ethical dilemma of access to scarce resources by a patient with poor prognosis i.e. AIDS, and access to ICU, the principles of autonomy, beneficence and non-maleficence, will be in tension with the utilitarian principle of distributive justice. In this instance, one principle must be judged as having priority over the others in terms of priority setting. This is where evidence based medicine is of paramount importance in terms of developing triage criteria for PLWHA and admission to ICU. These criteria must be based on current best scientific practice.

Admitting a patient with AIDS, severe sepsis and multi-organ failure to ICU for life support would not be an optimal use of a scarce and expensive resource, i.e. the ICU bed as current scientific evidence associates these co-morbidities with a high mortality, and may have the added effect of denying another patient with a better prognosis the chance of life. The CCS has to be mindful of the prognosis of the patient and of the resource constraints with regards to access to scarce resources i.e. an ICU bed. This thinking would be influenced by the principle of distributive justice. For PLWHA, there are currently no triage criteria to determine who will benefit from ICU care. Herein lies the ethical dilemmas encountered by CCS on a daily basis on whom to admit to ICU in a resource constrained environment.

Difficult personal decisions still need to be made by the CCS working in HIV endemic regions on the effective triage of ICU admissions of patients with advanced HIV infection based on individual case presentations, availability of resources, and applicable ethical principles.¹⁵ Physicians using HIV infection as an exclusion criterion for admission to ICU is common practice.^{25 164} In the context of patients with HIV infection requiring ICU care, the ethical dilemmas regarding ICU admissions remain:²⁴

- Whom to admit to the ICU in the face of limited resources?
- How to manage the patient who has not recovered despite ICU care?

All these issues are difficult to resolve as there are no existing objective admission criteria for ICU for patients with HIV infection.^{165,104,23} The efficient use of ICU resources is influenced by triage tools, organizational structures (open versus closed units) and cost effective treatment protocols.¹⁶⁶ Utilitarian tools used include Quality Adjusted Life Years(QALYs), Disability Adjusted Life Years (DALYs), Cost Effectiveness Analysis(CEA) and Cost Benefit Analysis (CBA).¹⁶⁷ These approaches still pose the same question: “Do the ends justify the means?”

Patient or surrogate proxy preferences are unlikely to effectively ration ICU care.¹⁶⁸ Danis et al (1988),¹⁶⁹ in their study ‘Patients' and Families' Preferences for Medical Intensive Care” state that 70% of the patients and families were willing to undergo ICU care again even for one month of survival. They further state that 8% of patients were unwilling to undergo ICU care to achieve any prolongation of survival and that their preferences were poorly correlated with functional status, or quality of life and prognosis. Therefore, in their study, patients chose survival over quality of life.¹⁶⁹

4.7.1 Withdrawal of life-support: legal issues

Withdrawal of life support becomes the focus of attention when a patient has an ‘irreversible condition’ and continued ‘life-sustaining treatment’ becomes medically futile.¹⁶³ These legal prescripts will be discussed in detail in the section on medical futility. There is a close connection between health and human dignity. The capacity for enjoyment of the rights to life and human dignity is obviously significantly diminished by poor health.

Regarding the withdrawal of life support, the first and most important case precedent was *In re Quinlan*,¹⁷⁰ Karen Ann Quinlin, a 22 year old woman, had taken a drug overdose which left her in a persistent vegetative state. She was on mechanical ventilation in ICU. The Supreme Court of New Jersey (1976) *In re Quinlan*, was of the opinion:¹⁷⁰

“that, if Ms. Quinlan were to become miraculously lucid and perceptive of her irreversible condition, she would decide against further mechanical ventilation, which it considered her constitutionally-guaranteed right of privacy.”

However, as Ms. Quinlan could not exercise this right on her own, it could be asserted by her father acting as her guardian.” The court was faced with the decisions of weighing Quinlan's right to privacy and the states intent to preserve human life and the medical professions to practice medicine according to their best judgement.¹⁷⁰ Quinlan was in a persistent vegetative state with no chance of recovery and hence could not make this decision. Quinlan's father had applied to the court to be appointed Quinlan's legal guardian and to have the respirator removed. The court agreed and concluded that Quinlan's father should act in ‘in accordance of her best interests’.¹⁷⁰ This landmark decision recognized

the ‘right to die’ and freed the medical profession from criminal prosecutions and civil liability.¹⁷⁰

In the case of *Clarke v Hurst NO23*¹⁷¹, Dr. Fred Clarke was in a persistent vegetative state for four years and ‘there was no prospect of any improvement in his condition and no possibility of recovery’. His wife applied for a court order to appoint her *curatrix* so that she could authorise the withdrawal of his treatment and an order to say that such withdrawal would not constitute murder. The order was granted by the courts for withdrawal of his treatment, including withdrawal of naso-gastric feeding.¹⁷² Thirion J observed in the case of *Clarke v Hurst NO23*:¹⁷¹

“As it was put in 58 US Law Week 4936: ‘Medical advances have altered the physiological conditions of death in ways that may be alarming: highly invasive treatment may perpetuate human existence through a merger of body and machine that some might reasonably regard as an insult to life rather than its continuation.’”

In the language of health care, dignity usually equates to quality of life.¹³⁸ In a situation in which a person no longer has quality of life, his or her dignity is usually significantly impaired. *In re Cruzan*,¹⁷³ *Nancy Cruzan* was in a persistent vegetative state as a result of a motor vehicle accident. She was kept alive by a gastrostomy tube being inserted in her stomach, to give her life-sustaining calories and hydration. Cruzan's parents requested the attending doctors to terminate life support, i.e. gastrostomy feeding, which they were hesitant to do without a court order. The Missouri Supreme Court, acknowledged a patient's right to refuse medical treatment under the ‘Due process clause’, i.e. under the

doctrine of informed consent, but was hesitant to extend this right to family members making this proxy decision for their loved ones, as the court held that it could not guarantee that the family was acting in the best interests of their loved ones.¹⁷³ *In re Cruzan*, court upheld the constitutional right to life.

In the wake of *In re Cruzan*,¹⁷³ the US Congress in 1990 passed the Patient Self-Determination Act¹⁷⁴ to help patients avoid unwanted medical interventions. This took the practical form of do-not-resuscitate orders (DNR) and living wills. The Texas Advance Directives Act 1999 (TADA)¹⁶³ was endorsed by the AMA and was adopted as policy by many hospitals in America. Its intent was to ethically resolve disputes regarding medical futility. TADA will be discussed in depth in the chapter on medical futility.

The Oregon ‘Death with Dignity Act(1997)’ allows terminally ill patients the right to euthanasia by the ‘voluntary self-administration of lethal medications expressly prescribed by a physician for that purpose’.¹⁷⁵

In SA, DNR orders and living wills are regarded as legal instruments.¹⁷²

‘Do not resuscitate’ (DNR) orders, referred to by the HPCSA as ‘Do not attempt resuscitation (DNAR)¹⁶² orders’ may be initiated in three defined situations:

1. by the patient in the form of an advanced directive(e.g. a ‘living will’) or informed refusal for CPR,
2. a clinical judgement by the physician where any attempts at resuscitation would be deemed to be futile as there is no realistic prospect of ‘ reversibility of organ dysfunction’,
3. a decision by the patient and/or his family that the benefits of CPR are outweighed by the burdens and risks involved.

Do not resuscitate orders are a form of passive euthanasia and only applies to the withholding and withdrawing of CPR, and does not affect decisions on palliative and other medical care for the patient.¹⁷⁶ DNR orders allows for the terminal condition to take its natural cause and thus prevent prolonging the patient’s death. A living will is an advance directive made by the patient while mentally competent. This advance directive instructs the treating physician to withhold or withdraw life-sustaining treatment in the event of terminal illness or fatal injury and to allow natural death to take its cause. Due to the low literacy levels in the patient population generally in South Africa, advanced directives such as a ‘ living-will’ is rarely seen by physicians. An advance directive such as a ‘living will’ would remove many of the ethical dilemmas encountered by physicians in the emergency room with regards to patients with advanced terminal illness, including people with advanced HIV disease, and fatal injuries. The withholding and withdrawing of care allows the underlying fatal condition to cause the patient’s death.¹⁷⁶ In the continuum of care for people living with HIV/AIDS, physicians should share knowledge of advance directives (living-will) with patients and their families, when the disease has progressed to advanced stage.

In the clinical context of PLWHA commonly presenting with PJP and respiratory failure, the patients Constitutional right⁹⁴ to life (s11) and the right not to be refused emergency treatment (s27) would compel the CCS to resuscitate the patient. This right is further entrenched in the National Health Act 61 of 2003.⁹⁵

In the USA, the patient has a Constitutional right to life and right to emergency care.²⁸ This right is further entrenched by the American Health Securities Act 2009⁹⁷, Federal *Emtala* Law¹⁰⁰, and the newly enacted Patient Protection and Affordable Care Act of 2010⁵¹. Whether practicing in the USA or SA, the CCS is compelled by law to resuscitate the patient i.e. to render emergency treatment. However, the level of care that the patient subsequently receives will depend on the institutional policies, standard treatment guidelines and availability of resources.

The presence of a DNR or living will would have to be respected in such emergencies.

4.7.2 Legal and ethical right of patients to access an ICU bed

4.7.2.1 LEGAL PRESCRIPTS

The Constitution of America does not contain a ‘limitation clause’. As a result, courts in the USA have been obliged “to find limits to constitutional rights through a narrow interpretation of the rights themselves”.¹³⁸ The Oregon Health Plan was an explicit managed health care plan for the State of Oregon, in an attempt to give universal access to basic health care to its citizens, control costs and to curb expenditure on novel treatments with no proven scientific benefit.¹⁷⁵ The Plan was a consultative process with government, health care providers and civil society input to provide to prioritized list of conditions/treatments that would be funded. The underlying principle was that of rationing

of certain services, in a transparent manner. The Oregon Health Services Commission , comprising Physicians, a nurse, social worker and consumers or purchasers of health care services to develop a list of conditions that were financially viable in terms of its state budget, that would save costs and hence would expand health coverage to more of its people. Part of the cost-containment involved curtailing funding for organ transplant programs.¹⁷⁷ The Oregon Health Plan was shown not to have contained costs and expanding health coverage as envisaged, and is described by some critics as a “ Bold Experiment” that failed.¹⁷⁷

The Patient Protection and Affordable Care Act of 2010,⁵² expected to be fully implemented by 2014, talks of rationed health care in terms of appropriate, cost-effective, quality health care which will be strictly monitored by federal government.⁵² Thus, affluent countries also need to control runaway medical inflation, by legislative means. The ACA contains nine titles that address, amongst others,” the entitlement of quality health for all Americans, the role of public health programs, improving the quality and efficiency of health care and prevention of chronic disease and improving public health”. The right to emergency care, irrespective of affordability is enshrined in the ACA. Section 1302, (page 45) of the ACA states that “Emergency Care Is a New Entitlement for All American Citizens.”⁵²

In South Africa, the legally accepted basis for rationing have been canvassed in the previous discussion of *Soobramoney*¹⁰⁵, in terms of the limitation clause contained in s36 of the Bill of Rights.⁹⁴ In SA, rationing of scarce resources, such as access to ICU and access to dialysis, is justiciable provided its application is reasonable and justifiable, in an open and democratic society ,with due respect to human dignity, equality and freedom and

taking into account , among other provisions, the nature of the right to be restricted and that less restrictive means do not exist to achieve the purpose.⁹⁴

4.7.2.2 ETHICAL PRESCRIPTS

The World Medical Association states that a physician can determine that a treatment is ‘medically futile or non-beneficial because it offers no reasonable hope of recovery or improvement or because the patient is permanently unable to experience any benefit’.¹⁶

The WMA further states that a physician is under no obligation to provide ‘futile or non-beneficial treatment’.¹⁶ The American Medical Association has also deliberated on this issue and has stated that:⁹⁸

‘In a situation where the resources of a health care facility are overwhelmed by epidemic illness.....,the prudent emergency physician must make important triage decisions to benefit the greatest number of potential survivors.’

The American Medical Association (AMA)-Code of Ethics (Opinion 2.037) states: “When further intervention to prolong the life of a patient becomes futile, physicians have an obligation to shift the intent of care toward comfort and closure”.⁹⁸ The Health Professions Council of South Africa (HPCSA) also states that it is permissible to withhold treatment “even if it is not in the best interest of the patient”¹⁶² e.g. in critical care units and chronic dialysis units for end stage kidney failure. The HPCSA contends that ‘ a health care institution has the right to limit life-sustaining interventions without the consent of a patient or surrogate by restricting admission to these units’. The right to life has been characterized as the most fundamental of all human rights.¹³⁸ At the same time, the right to life does not mean life “as mere organic matter...but the right to human life, the right to live as a human being, to be part of a broader community, to share in the experience of humanity”.¹³⁸

4.7.3 Intensive care triage: rationing in the ICU

“However, if a disease exists that can be treated, this does not mean that it should be treated, or that it should be treated with the most effective treatment available. Given the scarcity of resources, the opportunity cost of treating one over another must be considered.”(Mooney, 2003)¹⁷⁸ This statement by Mooney succinctly puts into perspective the importance of triage and rationing policies for ICU in the face of scarce resources. Triage, from the French word “trier”, literally means: “to sort”. It is utilitarian in nature and the aim is to bring “the greatest good to the greatest number of people”¹⁵⁴ – this is achieved through prioritising limited resources to achieve the greatest possible benefit. Patients are sorted with a scientific triage tool in order of urgency - the end result is that the patient with the greatest need is helped first.¹⁰² Triage policies are principled in nature in terms of fair allocation of limited resources. According to the Wallis *et al* , in their ‘Cape Town Triage Score’, “the aim of an efficient triage system is :¹⁰²

1. To expedite the delivery of time-critical treatment for patients with life-threatening conditions,
2. To ensure that all people requiring emergency care are appropriately categorised according to their clinical condition,
3. To improve patient flow
4. To improve patient satisfaction
5. To decrease the patient’s overall length of stay
6. To facilitate streaming of less urgent patients
7. To be user-friendly for all levels of health care professionals.”

In relation to ICU, such a triage process is an ethical and clinical imperative. ICU beds are a scarce resource and its use is a high-cost driver in terms of the health budget, both in the

USA and SA. Critical care services account for more than 1% of GDP in the USA and comprise an increasing proportion of hospital costs, up from 8% in 1980 to 20% currently.^{179 180} It has been estimated that critical care medicine costs had increased 190% between 1985 and 2000.^{181 182} The CCS is at the front-line of such decision-making processes, and is under pressure to contain costs.¹⁸³ Ward *et al*, in their 2008 ‘Perception of cost-constraints, resource limitations, and rationing in United States intensive care units- results of a National survey’ interviewed physician and nurse ICU directors¹⁸⁴ in 447 USA hospitals and concluded that:

“Our study shows that a substantial minority of critical care nurse and physician directors perceive some cost constraints, resource limitation, and rationing of some therapies to occur in ICUs. A larger proportion of respondents perceive rationing to occur “rarely” (defined in this survey as <25% of the time) or ‘never’.”¹⁸⁴

Some of these decisions may have fatal consequences, such as decisions to limit life-support, decisions not to admit a patient to ICU or not to provide a therapy that might be effective.¹⁸⁵ Such decisions must be in accordance with the law, and must be ethical, equitable, free of individual bias, and transparent,¹⁸⁵ and must meet societal approval. Many patients and families believe that they are entitled to the full range of critical care services.¹⁸⁶ As stated, even in the face of poor prognosis, 70% of patients or their families are willing to undergo intensive care to achieve even one month of survival.¹⁸⁷

Many CCSs feel that it is unethical to withhold any treatment from a patient that may benefit the patient.^{188 189} The reality is that no health care system can provide all patients

with all treatments available, especially if marginal benefit is to be gained. To do so would impact on other worthy societal goals such as education or social welfare services etc.¹⁹⁰ Truog *et al* (2006) believes that while public health policy and regulatory structures provide guidelines for rationing of ICU beds, the bed-side clinician still has to use their clinical judgment to make an informed, individual decision based on the specific case presentation.¹⁹⁰ The Task Force on Values, Ethics, and Rationing in Critical Care (VERIC) commissioned by the ATS, has defined rationing as “the allocation of healthcare resources in the face of limited availability, which necessarily means that beneficial interventions are withheld from some individuals.”¹⁹⁰ This is utilitarianism in its true sense: ‘do the ends justify the means?’¹⁵⁴ and relates to the fair allocation of resources.

Truog *et al* divide rationing decisions into three groups, the first being decisions based on external limitations, e.g. non-availability of an ICU bed. Secondly he mentions decisions based on clinical guidelines, e.g. standard treatment guidelines, essential drugs lists, treatment algorithms. Lastly he mentions decisions based on clinical judgment, e.g. personal knowledge and experience regarding outcomes based on multiple chronic co-morbidities and age-based rationing.¹⁹¹ Although rationing by clinical judgment can be ethical, it can be viewed as unethical when issues of subjectivity and bias come into play, which largely remains unrecognised by the individual CCS¹⁹⁰ as it may be a sub-conscious decision, eg. admitting a patient with advanced age or malignancies does not automatically confer a poor prognosis^{192 193} By virtue of CCSs deciding how much time to spend on rounds in the ICU, and allocating more time to the sicker patient needing greater intervention, intrinsic rationing decisions are taken by CCSs every day.¹⁹⁰

With regard to bed-side rationing , Levin *et al* (2006), suggest that this form of rationing involves decisions on ‘diagnostic tests to be performed, therapies to be administered, and decisions about whom to admit and discharge in ICU’.¹⁸⁵ ICU beds are a limited resource and difficult value-laden decisions need to be made on whom to admit and whom not to admit.^{194 195} The dictum of ‘first-come, first-served’ could be used to justify the allocation of the only available ICU bed to equally competing patients who would otherwise have an equal claim to the bed.¹⁹⁰ Triage would justify decisions on fair allocation ‘when resources are diverted to those with the greatest expected benefit’.¹⁹⁰

Other factors identified in influencing triage decisions are bed status, mode of professional communication, time of day or night and seniority of the attending doctor. When beds are limited, fewer and sicker patients are admitted to the ICU^{196 197}; patients discussed by phone are less likely to be admitted to ICU than those examined by the ICU physician¹⁹⁸; at night more patients are refused ICU care (probably because of junior staff on duty)¹⁹⁸; a senior physician's recommendation is more likely to secure an ICU bed than a junior colleague.¹⁹⁸ According to Levin *et al*, these criteria fall into an ‘ethical grey zone’.²³ They further state that improving the triage process with scientifically validated data will improve equity and efficiency in the ‘fair allocation of resources’²³ and would be a move away from “triaging patients in cold blood”¹⁹⁹. The legal provisions governing these decisions have been discussed in the chapters on law and ethics.

4.7.3.1 ENSURING A FAIR PROCESS

Daniels (2004) in his ‘accountability for reasonableness’ for priority setting states that the “central requirements of a fair process are:²⁰⁰

1. **Publicity:** the process must be transparent and involve publicly available rationales for the priorities that are set. This has the added benefit of encouraging good governance.
2. **Relevance:** stakeholders who are affected by the decisions should agree that they rest on reasons, principles and evidence that they view as relevant to making fair decisions about priorities. This has the added benefit of assuring stakeholders that their voice has been heard.
3. **Revisability and appeals:** decisions can be revisited and revised in light of new evidence and arguments. This appeals process provides protection to those who have legitimate reasons for being an exception to adopted policies.
4. **Enforcement or regulation:** a mechanism is in place to ensure that the previous three conditions are met.”

As Cleary *et al* (2011), mention in their paper on ‘Claims on health care: a decision-making framework for equity, with application to treatment for HIV/AIDS in South Africa’,²⁰¹ issues around fair allocation must encompass rational thinking on issues such as ‘ the notion of a claim’ and ‘communitarian claims’²⁰². These theories focus on the fact that an individual is a member of a community or society, and the individual is viewed as having a claim on health care, and society has a reciprocal obligation to provide the care. However, Cleary *et al* mention that claims are not absolute with respect to their being met, and when not all can be met, society needs to allocate resources to those individuals with relatively stronger claims.²⁰¹ Interestingly, strong legal provisions and legal precedents support these theories, as discussed in the chapter on law with regard to the Patient Protection and Affordable Care Act⁵² and ‘The application of the limitation clause in the Bill of Rights-South Africa’,⁹⁴ as canvassed in *Soobramoney*.

4.8 CRITICAL CARE ETHICS AND HIV/AIDS

Critical care ethics concerns the moral issues related to, amongst other things, triage and rationing of beds in ICU, ethical concerns regarding withholding and withdrawing of care in ICU, issues concerning medical futility decisions, HIV testing, informed consent and confidentiality. Critical care ethics also includes decisions regarding ventilator support for patients in respiratory distress e.g. PJP as a result of HIV infection, major surgery performed to an increasingly older and sicker population, and severe poly-trauma related to motor vehicle accidents.²³

4.8.1 The World Medical Association and ethics

The World Medical Association Ethics Manual¹⁶ is the result of a globally representative, comprehensive and consultative process guided and coordinated by the WMA Ethics Unit. It is meant to be a guiding document to practicing physicians, but not be regarded as a policy document. The WMA Declaration of Geneva ethically commits physicians not to “discriminate on their patients on the grounds of age, disease or disability, social standing etc”.¹⁶ This has particular relevance to PLWHA in terms of discrimination and stigmatisation practices by the profession regarding medical care and especially access to emergency care where futility diagnosis on the basis of HIV/AIDS are made.^{25 164}

The Declaration of Geneva requires of the physician that ‘The health of my patient will be my first consideration’. The International Code of Medical Ethics states ‘ A physician shall owe his patients complete loyalty and all the resources of his science’.¹⁶ With resource limitations due to budgetary constraints and other competing priority spend such as education, social welfare etc. allocation of scarce resources have become a major dilemma,

especially in the context of the overwhelming burden of disease such as HIV/AIDS and access to ICU. The WMA has acknowledged this with the following guiding statements: espousing the justice principle by stating¹⁶ ‘It entails a more social approach to the distribution of resources, one that considers the needs of other patients. In circumstances where a choice must be made between potential patients for a particular treatment which is in limited supply, all such patients should be entitled to a fair selection procedure for that treatment. That choice must be made on medical criteria and made without discrimination.’ This statement holds special importance for PLWHA and access to scarce resources, the ICU bed.

Ward et al, in their 2008 survey of resource limitation and rationing in ICU’s in the USA, concluded: ‘for while the commonly held ethical principal of distributive justice dictates we use our limited resources to give the most effective care to the most people, the common interpretation of “beneficence” and the ‘rule of rescue’ often lead our healthcare system to give help to all who ask for it regardless of prognosis.’²⁰³

4.8.2 Professional regulations

The Code of Ethics for Emergency Physicians in the USA¹⁷ and the Health Professions Council of South Africa¹⁸ guidelines on the management of patients with HIV infection or AIDS imposes an ethical duty on a physician not to discriminate against a patient on the basis of their HIV status. Both professional bodies including the WMA further state that a physician is under no obligation to provide ‘futile or non-beneficial treatment’.¹⁶ It is thus evident that the grave decision on medical futility rests with the individual attending CCS. What guides the CCS in such a decision?

The case precedents mentioned established that patients, or their surrogates, have the right to refuse treatment. Outside of these case precedents, CCSs need to be guided by scientific evidence on such decision-making. Some of the potential determinants are thought to be prognosis of the acute disease, prognosis of the underlying disease, patients age, resources, human rights, societal contribution, patient preferences, family wishes, cultural considerations, financial implications for family (e.g. sole breadwinner), socioeconomic status, physician experience, policy of intensive care unit and threat of litigation.³⁵ These potential determinants will be further critically evaluated and analysed in the chapter on the attitudes and perception survey- ‘To investigate the attitudes and perceptions among Critical Care Specialists in South Africa pertaining to the provision of intensive care services to patients with HIV infection’.

4.8.3 The concept of medical futility

In one of the ancient Hippocratic treatises, *The Art*, physicians and patients are admonished: “Whenever a man [sic] suffers from an illness, which is too strong for the means at the disposal of medicine, he surely must not expect that it can be overcome by medicine.” The ancient Greek healers suggested that among the three goals of medicine were cure, relief of suffering, and the refusal to treat those “overmastered by their illness”.²⁰⁴ The text reminded physicians that to attempt a futile treatment was to display an ignorance that is “allied to madness.” These same ancient healers and philosophers went on to note that “dreadful diseases demand dreadful remedies”.²⁰⁵

According to Robert Fine (2000), in his article on ‘Medical Futility and the Texas Advance Directive Act’, he states that “one generation’s futile treatment, becomes the next generation’s bold experiment which may go on to become efficacious therapy”.²⁰⁶ Such is the advance of medical science, that previously common fatal conditions, like scurvy, TB,

and syphilis, are amenable to prevention and treatment. Even for HIV/AIDS, the advent of ART with newer and more potent combination regimens have turned a fatal condition into a chronic manageable condition, like hypertension or diabetes, requiring lifestyle changes and a commitment to life-long treatment. The development of insulin for diabetes and penicillin for sepsis has saved the lives of countless numbers of people, who would otherwise have died. The advent of successful cardio-pulmonary resuscitation in the 1960's,²⁰⁷ organ transplantation and techniques of physiological life support, like dialysis and mechanical ventilation, have given the profession 'mastery' over the functioning of the human body and have challenged and mystified the boundaries of medical futility.²⁰⁶ Some of the science was 'ill-gotten' gains and was unethical, such as the Nazi world war experiments and Tuskegee Syphilis study. The ethics of these experiments are outside the scope of this study.

The *Karen Quinlin*¹⁷⁰, *Nancy Cruzan*¹⁷³ and the *Fred Clarke*¹⁷¹ case precedents have firmly established that patients, or their surrogates, have the right to refuse life-sustaining treatments, by the courts regulating the process of refusal. In the case of *Gilgunn v. Massachusetts General Hospital* (1995)²⁰⁸, the court upheld the physician's request to deny cardiopulmonary resuscitation (CPR) to a patient dying of multiple organ failure. The court's ruling also extended to refusal of the family's request for CPR.

4.8.3.1 ETHICS AND MEDICAL FUTILITY

These and other likewise legal rulings described in the preceding paragraph had resulted in active debates around the concept of medical futility in the medical profession. Some of the definitions and guidelines suggested at the time were 'physiological, qualitative and quantitative futility'.^{209 210} Others argued that the concept of medical futility was too

value-laden and was “fraught with confusion, inconsistency, and controversy”²¹¹ and that the medical profession should not be the sole decision-makers in these decisions, referring to the judiciary’s oversight role in helping with futility decisions. The American Medical Association (AMA) then issued a policy document outlining its policy on medical futility.²¹² The policy recommended a process-based approach, with consultation and deliberation by the ethics committee, and if there was no resolution, an attempt be made to transfer the patient to another institution. If that failed, the council noted that by ethical standards, a futility decision could be made.²¹² AMA did note that “the legal ramifications of this course of action are uncertain.”²¹²

1. The Texas Advance Directives Act

This process was incorporated into the Texas Advance Directives Act in 1999 (TADA).²¹³ TADA recognizes the autonomy of a mentally competent patient to accept or refuse life-prolonging treatment in the context of terminal or irreversible illness. A surrogate could make such decision acting on behalf of an incompetent patient. If there is a request for treatment that the treatment team feels is medically futile, an ethics consultation may be requested. The ethics committee may agree that further treatment is futile, and would advise that if no other facility would accept the patient, then treatment , may be withheld or withdrawn’.

TADA creates a ‘legal safe harbor’ in that the courts are involved in disputes and a ‘moral safe harbor’ as all the relevant parties, attending physicians, members of the ethics committee and concerned family members are involved.²⁰⁶

The Texas Advance Directive Act¹⁶³ gives legal definition to an ‘irreversible condition’ as a ‘condition, injury, or illness that may be treated but is never cured

or eliminated; that leaves a person unable to care for or make decisions for the person's own self ; and that, without life-sustaining treatment provided in accordance with the prevailing standard of medical care, is fatal'.¹⁶³

Here again, TADA has given legal definition as to what constitutes life-sustaining treatment. According to its definition, it means ' treatment that, based on reasonable medical judgement, sustains the life of a patient and without which the patient will die.'¹⁶³ The term includes "artificial life support like mechanical ventilation, kidney dialysis and artificial nutrition and hydration".¹⁶³ The term does not include palliative care such as pain management and comfort care.¹⁶³

2. The American Medical Association and American Thoracic Society

Furthermore, the AMA²¹² and the American Thoracic Society (ATS)²⁰ advise that interventions to limit or withdraw care that physicians consider' futile or inappropriate be made through an extra-judicial conflict-resolution process involving both physicians and patients and their families.' Societal approval was also a pre-requisite.²⁰

In both in the USA and SA, the law and the professional bodies governing the ethical conduct of health care professionals, would support triage and rationing decisions of scarce resources e.g. access to ICU care and dialysis. Futility, by its very nature is a value-laden concept, and needs judicial and ethics committee enquiry, as in TADA. The Codes of Ethical Conduct for the profession by the World Medical Association, American College of Emergency Physicians and the

Health Professions Council of South Africa regarding admissions or medical futility decisions to intensive care services for patients with HIV infection are open-ended and place the responsibility of the decision on the individual physician. Opinion 2.035 on futile care by AMA states that “physicians are not ethically obliged to deliver care that in their best professional judgment will not have a reasonable chance of benefitting their patients’.^{212 214} AMA further advises that such denial of treatment be scientifically and ethically justified, as defined in Opinion 2.03- ‘Allocation of Limited Medical Resources’.²¹⁵

To avoid abuse of this ill-defined concept, the Society of Critical Care Medicine (SCCM),²¹⁶ states that “Treatments should be defined as futile only when they will not accomplish their intended (physiologic) goal. Treatments that are extremely unlikely to be beneficial, are extremely costly, or are of uncertain benefit may be considered inappropriate and hence inadvisable, but should not be labeled futile.” Hence, critical care specialists using the ‘cloak’ of futility to make implicit resource allocation decisions are thus cautioned. Further-more, the AMA²¹² and ATS²⁰ advise that interventions to limit or withdraw care that physicians consider futile or inappropriate be made through a consultative process involving both physicians and patients and their families. Societal approval was also a pre-requisite.²⁰

The guidelines by the American Medical Association (AMA), American College of Emergency Physicians (ACEP), The Society for Critical Care Medicine (SCCM), The American Thoracic Society (ATS) and the Health Professions Council of South Africa (HPCSA) highlight the very essence of this study i.e.

“The Ethical Dilemmas of Critical Care Specialists Encountered in the Admission of Patients with HIV Infection to Intensive Care.”

“Given our limited ICU resources, the introduction of new potentially life-saving technologies, patient demand for them, and the ageing of our population, such challenges will become more commonplace in the future, as will conflicts among ethical principles in the ICU.”¹⁹

CHAPTER 5: BOTSWANA, BRAZIL AND INDIA

5.1 INTRODUCTION

This chapter identifies and evaluates the regulatory and ethical frameworks, as well as current best practices by Critical Care Specialists regarding HIV infection and admission to ICU in Botswana, Brazil and India as comparative emerging economies to South Africa, all with universal health coverage and with a high burden of HIV infection. Resource constraints and other issues relevant to developing countries may require the formulation of guidelines that do not necessarily conform with those of the developed world.

This chapter therefore provides an overview of the HIV burden of Botswana, Brazil and India as well as their relevant laws and guiding ethical codes of conduct. A brief country comparison will be performed between Botswana, Brazil, India and South Africa regarding the impact of HIV/AIDS, their regulatory, ethical and clinical practice regarding HIV/AIDS and admission to intensive care.

5.2 BRIEF OVERVIEW OF BOTSWANA, BRAZIL, INDIA AND SOUTH AFRICA

Botswana, Brazil, India and South Africa are considered to be at similar stages in their economic development, all being previous colonies and as emerging economies, are having to reinvent themselves following their independence. All four countries provide universal health coverage through public health care systems and have dealt with the HIV pandemic with varying levels of success. Resource constraints and other issues relevant to developing countries may require ICU admission guidelines that do not necessarily conform to those of the developed world.

5.3 HIV PREVALENCE

HIV statistics of the four countries indicate their differing resources and levels of political will. (Table 10) Their populations vary considerably in size, and although Botswana has the highest HIV prevalence of 24.8%, it has achieved universal coverage with ART and has the fewest people living with the disease. India has the largest population of over 1 billion people, its estimated HIV prevalence is 0.3% (2.3 million people) while South Africa has the highest number of people with the disease (5.3 million) and the largest ART roll-out programme in the world (1.4 million).¹

5.3.1 Botswana

Botswana's response to HIV/AIDS is considered to be one of Africa's most comprehensive programmes of HIV/AIDS prevention, treatment and care.²¹⁷ In 2012, the total population of Botswana was estimated to be 2 million. The number of PLWHA for 2011 was 300 000, giving a prevalence of 23.4% and 178 684 people on ART, giving an ART coverage of greater than 95%.⁷ (Table 10) PMTCT coverage was greater than 95%. The AIDS mortality co-efficient-per 100 000 inhabitants was 291 or 4200 deaths for 2011, a sharp fall from 18 000 deaths in 2001 due to AIDS.⁷ This could be attributed to Botswana's vigorous treatment and care programs, and the result of its ART programs which began in 2002 which would be discussed in the subsequent sections.

With the introduction of a comprehensive prevention, treatment and care programme, the life expectancy increased from 40 years for the 2000-2005 period, to 53 years in 2011.²¹⁸ This was possibly the result of the expanding access to ART for PLWHA.^{219 220} The ratio of annual AIDS-related deaths decreased by approximately 50%, from 15 500 (2003) to 7400 (2007), while the estimated number of new AIDS orphans fell by 40%.²²¹ The ratio

of ante-natal attendees aged 20-24 years with HIV infection decreased from 38.7% (2001) to 27.9% (2007).²²² The highest number of HIV screening tests in Africa was reported to be in Botswana, with 210 tests per 1000 population.⁵

5.3.2 Brazil

Brazil and SA are similar in that they are nations with ‘great disparities of wealth, a long history of social discrimination based on skin colour, and oppressive gender relationships’, all of which continue to negatively impact on the health of their citizens.²²³ At the beginning of the 1990s, The epidemics in Brazil and South Africa at the beginning of the 1990s were at a similar stage with a prevalence of HIV infection of approximately 1.5 % among adults of reproductive age.²²⁴ However by 1995, the HIV epidemic in South Africa had begun to ‘explode’, with a prevalence already greater than 10%, whereas the infection rate in Brazil at that time had declined by half due to the initiation of ART.²²⁴ In 2011, the HIV prevalence in Brazil is reported to be 0.3%, with 490 000 PLWHA, 215 679 being on combination ART giving an ART coverage of 71% at an entry criterion of CD⁴ count of <350 cells/mm³.⁷ For 2011, the number of AIDS deaths was reported to be 15 000 people.⁷ A large part of Brazil’s success is its effective treatment care and support programs and the initiation of combination ART in 2006.

5.3.3 India

India initiated ART rollout in 2004 and in 2011, a total of 543 000 PLWHA were initiated on ART, representing approximately 39-54% of those needing treatment.^{1 7} In 2033, HIV/AIDS in India is “projected to account for 17% of all deaths and 40% of all infectious diseases deaths”.²²⁵ Their AIDS mortality co-efficient is 14.7 per 100 000. The UNAIDS 2010 report estimated that India has 2.3 million PLWHA, HIV prevalence of 0.3%, ART

coverage of 45.3% (15-49 years), with 425 000 people on ART.²²⁶ The PMTCT coverage is not known. The average life expectancy for males is 65 years and females 67 years, and the AIDS mortality co-efficient-per 100 000 inhabitants is 14.7. According to UNAIDS 2010 report, India accounts for the third largest number of PLWHA, after SA and Nigeria. The data on India masks distinct regional differences across 31 states and 503 districts, in which 72% of the population is rural.²²⁷

In a country with a population of 1 billion people, a 0.1% increase equates to approximately 500 000 people. In 2010, a total of 425 000 PLWHA are on first-line ART and 970 are on second-line drugs as a result of exorbitant costs of second and third line ARTs.²²⁶ Ironically, this was a direct result of India becoming a signatory to the Trade-Related aspects of Intellectual Property Rights (TRIPS) agreement from 2005.²²⁸ This had resulted in these previously locally manufactured 'Indian' ARTs now costing approximately ten times more due to purchasing from Indian-based, but now foreign-owned drug companies.²²⁸ The TRIPS agreement was India's trade-off in trying to comply with anti-piracy laws of western patented products, and its desire to access international markets for its soft-ware industry.²²⁸ However, this was at the expense of its pharmaceutical industry, with its consequent spiralling cost of essential drugs such as second and third line ARTs.²²⁸ AIDS accounted for 3% of all deaths and 9% of all infectious diseases deaths in India.²²⁵ In 2006, according to UNAIDS, approximately 270 000 to 680 000 AIDS deaths occurred in India.²²⁹

Teja *et al*,²³⁰ in their retrospective study of patterns of mortality in HIV infected patients admitted to a tertiary institution, observed that 88.2% of deaths relating to HIV/AIDS occurred in patients who were never tested for HIV. Their study also showed that in the

ART era, a 9.7% increase in AIDS-related deaths occurred as compared to 2.9% in the pre-HAART era. It is postulated that this could be due to the late initiation of ART, treatment failure on first-line regimens, or ART-related toxicities. Devi *et al*, in their 2010 HIV seroprevalence study on patients presenting to the ER, found that 65.2% of the patients did not know their HIV status on presentation and that 35% of the admissions were for opportunistic infections related to HIV/AIDS.²³¹ Both these studies advocate routine provider-initiated opt-out HIV testing as a public health priority, and both emphasise the importance of effective HIV prevention programs, which appears disparate and fragmented.²³² In 2033, it is projected that HIV/AIDS will account for 17% of all deaths in India.^{225 233}

“The health care system in India is also very disparate and fragmented.”²³² “There is an imbalance in resource allocation, inadequate physical access to high-quality health services and human resources for health, high out-of-pocket health expenditures, inflation in health spending, and behavioural factors that affect the demand for appropriate health care.”²³² The administrative responsibilities for health are shared between the central (federal) and state governments.²³⁴ The National AIDS Control Programme is the responsibility of the Central Ministry of Health which lacks a formal public health department for this purpose. This has resulted in India not succeeding in controlling many infectious diseases.²³⁴ In 2009, India had 2 million new cases of TB, many of which were co-infected with HIV/AIDS, the highest for any country in the world.²³⁴

India’s total expenditure on health was estimated to be 3.9% of the gross domestic product (GDP) in 2011²³⁵, of which the public expenditure on health was estimated to be 1.1%.²³⁶ Private expenditures on health have remained high during the previous decade. In 2004-

2005, India had one of the highest proportions of household out-of-pocket health expenditures in the world of 71.1%.²³⁷ Public spending on health increased from 1-3% of GDP,²³⁸ with the Ministry of Health being allocated an increased budget for its National AIDS Control Programme for 2007-2012 of US\$2.5 billion.²³⁸ HIV prevention programmes have been allocated 67% of total funds, with 17% for curative care.²³⁸ The best performing state is Tamil Nadu, with an ART coverage of 40%, which is thought to be due to the commissioning of a dedicated Department of Public Health in the Health Ministry to oversee the National AIDS Control Programme.²³⁴ “In 2008, an estimated 11 289 government hospitals had 494 510 beds, with regional variation ranging from 533 people: bed ratio in a government hospital in Arunachal Pradesh to 5494 in Jharkhand.”²³⁹ However, health disparities continue to grow in India, exacerbated by unequal economic growth, growing commercialisation of health-care (catering for health-tourism), and poor regulation of costs and quality of care.²³⁸

“India is in dire need of a universal health-care system to cater for the large rural communities, estimated at 72% of its population, who have no access to health care, as most government and private hospitals are located in the urban areas.”²³² “Furthermore, the poor quality of health services in the government services are forcing poor people to access expensive private facilities for health care, and in so doing, forcing themselves into a lifetime in debt.”²³²

5.3.3.1 INDIA’S REGULATORY FRAMEWORK

India is not a signatory to the ICCPR, CEDAW, and CRC.²⁴⁰ The Constitution of India does not specifically address the status of international and human rights treaties. “The incorporation into domestic laws of international instruments recognizing the right to health can significantly strengthen the scope and effectiveness of remedial measures. It

enables courts to adjudicate violations of the right to health by direct reference to the International Covenant on Economic, Social and Cultural Rights.”¹¹³ Two specific legal frameworks will be reviewed with respect to patient’s rights in accessing ICU care namely, the Constitution of India and the National Health Bill.

5.3.3.2 CONSTITUTION OF INDIA

Article 21 of the Constitution of India enshrines ‘the right to life’.²⁴¹ As previously discussed, the ‘right to health’ is enshrined in many international human rights instruments, including article 12 of the ICESCR.¹⁰⁹ Specific obligations are set out in General Comment 14, under which countries are bound to respect, protect and fulfil the right to health, and make goods available, accessible and acceptable.¹⁰⁹ Access to affordable drugs has been interpreted as being part of the right to health.²²⁸ “The Constitution of India, Part IV, Article 47, articulates a duty of the State to raise the level of nutrition and the standard of living and to improve public health: The State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties...”¹¹⁴

In 2009, the Government of India drafted a National Health Bill to further legally enshrine the right to health and the right to health care.²³² However, this Bill has not been enacted into law as yet. The Law Commission of India had enacted law, making it a legal duty for private hospitals and practitioners to render emergency care to victims of accidents, medical emergencies and women in labour.²⁴² Whether this commitment to rendering emergency care is legally and ethically enforced in the private hospitals is a point for debate.²⁴³ Article 21 of the Constitution provides for the right to life,²⁴¹ but concepts such as autonomy and death with dignity are not recognised in Indian Law and have not stood legal muster.²⁴⁴ According to Kapadia *et al*, in terms of *The Transplantation of Human*

Organ Act of 1994, brain death is an acceptable diagnosis only in the context of organ donation.²⁴⁴ Outside this exception, the legal validity of making a diagnosis of brain death due to medical conditions, or where the family do not provide consent for organ donation, is questionable.²⁴⁴

In *P Rathnam v Union of India*,²⁴⁵ the court ruled that “attempts to hasten death may be viewed as part of a natural process. A person cannot enjoy the right to life to his detriment, disadvantage or dislike”. However this progressive judgement was overturned two years later in *Gain Kaur v State of Punjab*,²⁴⁶ wherein the judge ruled that “permitting termination of life in the dying or vegetative state is not compatible with Article 21”. As a result, many brain dead patients would be kept ‘alive’ on mechanical ventilation, until cardiac arrest, thus impacting on the availability of a scarce resource i.e. an ICU bed.²⁴⁴ It is interesting to note that only 1.6% of ICU deaths had do- not- resuscitate (DNR) orders.²⁴⁷

5.3.3.3 INDIA’S ETHICAL FRAMEWORK

The conduct of medical and allied health professionals in India is under the statutory authority of the Indian Medical Council,²⁴⁸ very similar in its scope of statutory responsibilities as the HPCSA and the Federal Council of Medicine’s ‘Code of Medical Ethics’ in Brazil. “The Code of Medical Ethics by the Medical Council of India (MCI) was amended in 2002. It is now called Indian Medical Council (professional conduct, etiquette, ethics) Regulation, 2002. It has two important features that have a direct bearing on HIV-infected patients in medical practice. One is consent and the other is confidentiality.”²⁴⁹ In terms of the amended code, no mention is made regarding informed consent before taking a blood test for HIV. Unlike other common-law countries such as

Brazil, SA and the US, where a patient's consent is required for HIV testing,” no such legal principle is recognised in India”. “Accordingly, any challenge to compulsory HIV testing would probably need to rely upon the extension of constitutional rights to privacy.²⁴⁹ The prevailing view of health professionals in India is mandatory HIV testing for patients as it is desirable for the protection of health professionals and other patients.”²⁴⁹

Regarding confidentiality and HIV-infected patients, the amended Code of Ethics of the Medical Council of India states that,

"Confidential information entrusted by patients to a physician should never be revealed unless their revelation is required by the laws of the state. However to protect a healthy person against a communicable disease to which he is about to be exposed the physician should act as he would wish another to act towards one of his own family members in similar circumstances."

Legal remedies to disclosure would be by court order, if there is a serious risk to a reciprocal concerned third party, such as the spouse, and if the condition constitutes a notifiable disease in terms of public health policy.²⁴⁹ In India, HIV/AIDS is a notifiable condition.

The Indian Society of Critical Care Medicine has issued a position statement on limiting life-prolonging interventions and providing palliative care in end-of-life issues.²⁵⁰ With regard to this position statement, there are considerable variations in its application, particularly in the private sector, where the profit motive is the over-riding factor in decision-making.²⁴⁴ Jayaram *et al* state that ‘the common man perceives that miracles regularly happen in ICU and lacks a realistic expectation of critical care outcomes.’²⁵¹

There is, however, no comprehensive legislation in India addressing HIV/AIDS. The draft bill on HIV/AIDS-2006 was approved by the Health Ministry, but not by the Ministry of Law, which stalled its enactment into law in 2007, and has deleted two chapters, one on treatment of HIV/AIDS, and the other on risk reduction. The draft makes provision for PLWHA to access treatment as a right. Furthermore, “the chapter on risk reduction, which sought to grant immunity to various targeted intervention programs by providing condoms to sex workers and homosexuals, and clean syringes for intravenous drug users (IDU) to prevent the spread of the disease, are in conflict with the Indian Law. Under current law, all these are seen as abetting the crimes of prostitution, homosexuality, and drug abuse.” Hence the delay in its implementation.²⁴⁹ A major step towards achieving universal access for key populations was taken in July 2009 with the Delhi High Court decision to read down section 377 of the Indian Penal Code and in effect decriminalise male to male sex behavior.⁴

5.3.3.4 HUMAN RIGHTS IN INDIA

Despite India being the world’s largest democracy and one of the fastest growing economies, successive governments have been slow to fulfil the right to health.¹¹² Article 21 of the Constitution of India enshrines ‘the right to life’.²⁴¹ Chapter IV of the Constitution provides Directive Principles of State Policy that are in the form of instructions/guidelines to government.²⁴¹ They talk about economic and social welfare of the population and how health rights should be fulfilled, but nowhere is there direct reference to the right to health.¹¹² Although these principles are non-justiciable, they are fundamental in the governance of the country, and are the directives for the future governments to incorporate in the decisions and policies to be formulated.²⁴¹ Article 42 of the Directive principles refers to the humane conditions of work and maternity relief. Article 47 further states that the duties of the state includes raising the

level of nutrition and standard of living of its people and improving public health, and to bring about the prohibition of alcohol consumption and drugs injurious to health.

In a case precedent in 1980 regarding deaths due to accumulation of soot in the lungs of young workers in state-run pencil factories, the court ordered the government to implement safety measures.²⁵² A year later, the Indian Supreme court reinforced its intention to link the right to life to the right to health and make it justiciable. It ruled that the right to life includes:

“the right to live with human dignity and all that goes along with it, namely, the bare necessities of life such as adequate nutrition, clothing, and shelter and facilities for reading, writing, and expressing oneself in diverse forms, freely moving about and mixing and co-mingling with fellow human beings. Every act which offends against or impairs human dignity would constitute deprivation pro tanto of this right to live and it would have to be in accordance with reasonable, fair, and just procedure established by law which stands the test of other fundamental rights. The magnitude and components of this right would depend upon the extent of economic deprivation of the country, but must, in any view of the matter, include the bare necessities of life and also the right to carry on such functions and activities as constitute the bare minimum expression of the human self.”²⁵³

In a 1995 case, the court considered the plight of workers in the asbestos industry and ruled that “social security, just and humane conditions of work and leisure to workmen are a part of meaningful right to life”.²⁵⁴ Such judicial precedents have resulted in health-care reforms in terms of access to emergency health care from accidental injuries, medical

emergencies and maternal labour, thus compelling private health care institutions to treat irrespective of the ability to pay.²⁴²

Government hospitals are also obliged to render emergency health care after the judicial ruling in the *Paschim Baga Khet Mansoor Samiti vs State of West Bengal* where the court ruled that the non-availability of beds in government hospitals to treat the medical emergency was a violation of Article 12.²⁵⁵ The court ruled that the right to emergency care was a core component of the right to life. “India’s range of judicial precedents show that although India does not have an explicit and binding right to health in its Constitution, its judiciary is using creative reasoning to force the government to fulfill this right.”¹¹² In the context of PLWHA and ICU care, it would be interesting to see how decisions regarding scarce resource allocations are made as there are as yet no admission and discharge criteria for ICU’s in India.²⁵⁶ Balarajan et al(2011), in their ‘Health care and equity in India’ mention “Physical access is a major barrier to preventive and curative health services for India’s (>70%) rural population”.²³²

5.3.3.5 CRITICAL CARE IN INDIA

In 1993, the Indian Society of Critical Care Medicine was formed, with 2 000 members.²⁵⁶²⁵⁷ Most of the government ICU beds are found in large teaching hospitals and comprise 5-8% of the hospital beds.²⁵⁶ That equates to four beds in a 500 bed teaching hospital. At a best case scenario of 8% ICU beds in the stated 11 289 government hospitals (494 510 beds), this would equate to approximately 40 000 ICU beds for a population of 1 billion people, including 2.27 million PLWHA. Jayaram *et al*, in their ‘ICU in India cost analysis’,²⁵¹ estimated that there are 70 000 ICU beds between the private and public sectors, which cater for 5 million patients annually.²⁵¹ The number of ICU beds available

is disproportionately low, both in private as well as public hospitals, and there is also considerable variations in the allocation and distribution of critical care services.²⁵¹ As a result, obtaining a bed in ICU is often difficult for critically ill patients.

Owing to the shortage of ICU beds, only the ‘most critical of the deserving patients’ are provided ICU care that could contribute to high mortality in ICU as well as in the wards.²⁵⁶ “Overall, there are few critical care units in the country that are well equipped and have the expertise to use modern, sophisticated technology to the patient's advantage.”²⁵⁶ Many PLWHA, particularly those requiring ICU care would find this level of care largely inaccessible or unavailable in the rural areas and largely inaccessible in the government sector in urban areas, and too expensive to access in the private sector. In the absence of comprehensive health care insurance, approximately 80% of patients will access this level of care in the private-for-profit sector, where it is estimated that one episode of hospitalisation is enough to account for 58% of per capita expenditure, pushing 2.2% of the population below the poverty line annually.²⁵¹

TABLE 10 HIV PREVALENCE AND ART ROLLOUT-BOTSWANA, BRAZIL, INDIA, SOUTH AFRICA

	Botswana	Brazil	India	South Africa
Total population (2012)	2 million	199 million	1.2 billion	50 million
Estimated HIV prevalence (2011) (No. with HIV/AIDS) ⁷	23.4% (300 000)	0.3% (490 000)	0.3% (2 300 000)	17.3% (5 600 000)
CD 4 count at ART initiation	350	350	250	250
Year of ART rollout ⁵	2002	1996	2004	2004
No. of people initiated on ART ¹ (2011) and ART coverage(2011) ⁷	178 684 (95%)	215 676 (71%)	543 000 (30-38%)	1 700 000 (66%)
AIDS Mortality co-efficient per 100 000 inhabitants	291	5.8	14.7	816

The differences in their HIV prevalence (2011) are highlighted (Table 10) with Botswana being of particular concern given that it has a population of less than 2 million people.

Table 10 also presents the disparity in HIV prevalence and ART rollout, and gives an indication of the challenges that lie ahead to provide universal ART coverage in the four countries.

5.4 GLOBAL HEALTH INITIATIVES AND HIV/AIDS

In an effort to combat the HIV pandemic, the Global Health Initiatives (GHI) are the efforts of a number of affluent countries and international institutions to finance the delivery of specific types of services for priority health problems in low-income countries, e.g. ART's for HIV/AIDS, TB drugs,⁶⁰ from which South Africa, Botswana, Brazil and India have all benefited.⁷(Table 11) This funding has contributed to the roll-out of services in South Africa in particular,⁶⁰ with over 1.4 million people being initiated on ART by 2011. The GHIs have been an integral part of many resource-limited countries AIDS programmes, and in 2007, this amounted to US\$2.16 billion from the Global Fund to Fight AIDS, Tuberculosis and Malaria and the Global Alliance for Vaccines and Immunisation

(GAVI), and US\$5.4 billion from the US President’s Emergency Plan for AIDS Relief (PEPFAR).

The Bill and Melinda Gates Foundation and MERC Company Foundation also financially support Botswana’s HIV programme with MERC donating expensive third-line ARV’s to Botswana.²⁵⁸ The CDC has also collaborated with the Botswana Government (BOTUSA) to work on HIV/AIDS and TB research programmes. The Harvard School of Public Health is also involved with HIV related health research in Botswana and training the future generation of researchers (KITSO Training Programme) in Botswana as well as increasing and improving research facilities and monitoring programmes.²⁵⁹

According to the 2012 UNAIDS Global Aids Report, the BRICS countries – Brazil, Russia, India, China and South Africa – increased domestic public spending on HIV by more than 120% between 2006 and 2011. These countries currently fund, on average, more than 75% of their domestic AIDS responses and have dealt with the HIV pandemic with varying levels of success.²⁶⁰

TABLE 11 GLOBAL HEALTH INITIATIVES FOR THE PEOPLE LIVING WITH HIV/AIDS

Funders	Botswana	Brazil	India	South Africa
Global Fund to Fight AIDS, Tuberculosis and Malaria	X	X	X	X
Global Alliance for Vaccines and Immunisation	X	X	X	X
US President’s Emergency Plan for AIDS Relief	X	X	X	X
World Bank Multi-Country AIDS Program	X	X	X	X
Bill and Melinda Gates Foundation	X	-	-	-
MERC Company Foundation	X	-	-	-
US Center for Disease Control (CDC)	X	-	-	-
Harvard School of Public Health	X	-	-	-

5.4.1 International treaties in Botswana, Brazil, India and South Africa that give protection to people living with HIV/AIDS, including access to Intensive Care

Botswana, Brazil, India and South Africa are signatories to a number of international treaties that give protection to PLWHA. These international treaties are enshrined in each country’s Constitution and Public Health Acts. (Table 12) While South Africa is a signatory on all six treaties that specifically provide for their protection, and the only one for the United National International Guidelines on HIV/AIDS and Human Rights, India has only signed two of the relevant five treaties.

TABLE 12 INTERNATIONAL TREATIES THAT PROTECT THE RIGHTS OF PEOPLE LIVING WITH HIV/AIDS

International Treaties	Botswana	Brazil	India	South Africa
International Covenant on Economic, Social and Cultural Rights (ICESCR)	X	X	X	X
UNESCO Universal Declaration of Bioethics and Human Rights	X	X	X	X
International Covenant on Civil and Political Rights	X	X	-	X
Convention on the Elimination of All Forms of Discrimination against Women and Convention on the Rights of the Child	X	X	-	X
United Nation’s International Guidelines on HIV/AIDS and Human Rights	-	-	-	X
African Union and Southern African Development Co-operation Treaty	X	-	-	X

Once signed, the contents of these international treaties are provided for in various pieces of legislation, including the Constitution and Public Health Acts. (Table 13)

“The incorporation into domestic laws of international instruments recognizing the right to health can significantly strengthen the scope and effectiveness of remedial measures. It enables courts to adjudicate violations of the right to health by direct reference to the International Covenant on Economic, Social and Cultural Rights.”¹¹³ “SA is bound by these international agreements and section 23.1 of the South African Constitution regulates

the signing, ratification and the transformation of treaties into domestic law, ‘unless it is in inconsistent with the Constitution or an Act of Parliament’.⁹⁴”

Each of the four countries Constitutions does provide for the protection of PLWHA, but only Botswana, Brazil and South Africa have HIV and AIDS strategic plans and programmes. This indicates a potential gap in service delivery in India, and could account for the low number (30-39%) of HIV infected persons initiated on ART.¹

Each of the four country Constitutions ensures a patients right to health care and not to be refused access to emergency healthcare.

TABLE 13 LAWS AND REGULATORY FRAMEWORK RELEVANT TO HIV/AIDS

Country	Laws
Botswana	Constitution, Bill of Rights Public Health Act National AIDS Council (AIDS/Sexually Transmitted Disease (STD) Unit) The National AIDS Co-ordinating Agency
Brazil	Article 196 of the Constitution of Brazil of 1988 Datusus;Sistema de Monitoramento de Indicadores do Programa Nacional de DST/Aids -SUS (Unified Health System) National STD and AIDS Programme Code of Consumer Protection (Law no. 8078, 1990). Article 14 of the Civil Code Resolutions of the Federal Council of Medicine (No. 1.081/82, 1.358/92 and 1.890/09), the National Health Council (no. 196/96) and also the new Code of Medical Ethics 2010
India	Article 21 of the Constitution of India National Health Bill 2009 Draft Bill on HIV/AIDS-2006 Directive Principles of State Policy Ch IV
South Africa	Constitution of South Africa and Bill of Rights-1996 National Health Act 2006 The Promotion of Equality and Prevention of Unfair Discrimination Act Medical Schemes Act 1998 National Health Insurance2011 The National Strategic Plan for HIV and AIDS, STI and TB- (NSP)-2012-2016

Table 14 Case precedents regarding the right to health and access to emergency care

Country	Case Precedents
India	Paschim Baga Khet Mansoor Samiti v State of West Bengal
South Africa	Government of RSA and others v Grootboom and others (Judgment date: 4 October 2000) Minister of Health and others v Treatment Action Campaign and others (Judgment date: 5 July 2002) Soobramoney v Minister of Health (KwaZulu-Natal)116 Case CCT 32/97 (Decided on 27 November 1997)

Legal precedents to this effect exist in India and South Africa, where access to treatment has been tested in a court of law. (Table 14) In *Paschim Baga Khet Mansoor Samiti v State of West Bengal*, the claimant was refused emergency care at eight public health institutions and had to seek help in a private health facility at great personal expense. The Court ruled that the the right to emergency care was a key to the right to life, in terms of article 21 of the Constitution.²⁵⁵ These case precedents have given legal muster to the Constitutional provisions of the right to health care and not to be refused access to emergency healthcare, which equally apply to PLWHA.

5.4.2 HIV/AIDS: A human rights issue

Providing health care to PLWHA has become more than a service delivery issue, and has entered the arena of human rights as a result of some governments' denialist policies and lack of commitment, issues of stigmatisation and discrimination and blatant constitutional violations regarding issues of respect and confidentiality. In the late 1980's, Jonathan Mann directed the Global Program on AIDS at the WHO.²⁶¹ His human rights ethos upheld the provisions under the 'United Nations Commission on Human Rights' and 'Protection of Human Rights in the Context of HIV and AIDS',²⁶² thereby placing human rights as an international imperative, which governments and intergovernmental agencies

were made publicly accountable for through their public-health and human-rights actions.²⁶¹

The UNESCO Universal Declaration on Bioethics and Human Rights²⁶³ emphasises that “progress in science and technology should benefit the well-being of individuals and humanity, by improving access to good quality health care and essential medicines and providing adequate nutrition and water, and that the interests of the individual should have priority over the sole interest of science or society”.²⁶⁴ While this is a noble ideal, particularly on prevention and care programmes for PLWHA regarding its utility value and ensuring access to scarce resources, such as an ICU bed, it creates an ethical and human rights dilemma in terms of allocating scarce resources and priority-setting. Led by civil society, human rights movements have compelled governments to provide treatments for PLWHA. Brazil is an internationally recognised ‘gold-standard’ of civil society compelling its government to prioritise its HIV/AIDS response, their actions forcing the implementation of plans and programmes that resulted in a reversal of their HIV/AIDS pandemic to an estimated HIV prevalence of 0.6%.^{265 266}

India and South Africa are notable for their human rights approaches to health.¹¹² Singh *et al* (2007) in their article ‘Do human rights matter to health?’ state that although Indian law does not have a codified right to health, their courts have consistently enforced human rights in relation to health judgements.¹¹² They further add that although South Africa has an explicit codified right to health, which has resulted in a strong human rights impetus in terms of its Constitution and National Health Act (NHA), this occurs despite its failure to ratify the ICESCR.¹¹²

In South Africa, all rights are enforceable in terms on the Constitution, which has resulted in many new policies, including free primary health care for all senior citizens, free health care for children under the age of 6 years, pregnant women, and people with mental or physical disabilities. It has also resulted in drug policy amendments to reduce the price of essential drugs, provide emergency access to health care services, including private health-care services, a patient’s rights charter, free housing for homeless people and free basic water etc. The *Soobramonry*¹⁰⁵, *Grootboom*¹²⁷ and the *South African Treatment Action Campaign*²⁷ cases highlight the progressive nature of the Constitution of SA with regard to the Constitutional Courts ground-breaking judgements using a rights-based approach.

The South African Treatment Action Campaign (TAC) used the courts to compel the government to provide nevirapine for the Prevention of Mother To Child (PMTCT) programmes, particularly as the drug was made freely available to the government by the manufacturers.¹²⁹ The routine ‘opt-out’ policy already been adopted by the Centres for Disease Control in America¹⁵³, a Brazil²⁶⁷, Botswana²⁶⁸ and South Africa²⁶⁹ has contributed to the successes of the HIV programmes in these countries. (Table 15)

TABLE 15 COUNTRY POLICIES ON HIV TESTING

Country	Clinical Guidelines
Botswana	provider-initiated HIV testing with an ‘opt-out’ option
Brazil	provider-initiated HIV testing with an ‘opt-out’ option
India	Mandatory HIV testing
South Africa	Provider-initiated HIV counselling and testing with an ‘opt-out’ option

While these four countries have laws that ensure that the human rights of PLWHA are respected, in their determined efforts to control the pandemic of HIV/AIDS, some countries are accused of violating international treaties in terms of enacting laws that criminalise certain behavior of PLWHA. (Table 16) These governments have enacted laws

with the contention that the rights of all citizens need to be protected, and that alleged rapists in particular need to be tested to protect the rights of their victims. These contentious laws violate the human rights of an alleged rapist in terms of the ‘presumed innocent’ clause contained in most countries constitutions.¹⁴⁹

TABLE 16 CONTENTIOUS LAWS AND HUMAN RIGHTS

Country	Contentious laws
Botswana	Compulsory HIV testing of alleged rapists’ Act Harmful HIV-related Behavior Act Attorney-General Reference: in Re The State v Marapo
India	Mandatory HIV testing
South Africa	Compulsory HIV testing of alleged rapists’ Act

5.5 PROFESSIONAL ETHICAL GUIDELINES

Botswana, Brazil, India and South Africa subscribe to the World Medical Associations (WMA) Declaration of Geneva’s international creed that provides a framework for the appropriate conduct of the medical profession globally, with each country having a professional association that guides and regulates its professionals on good ethical conduct, particularly with regard to PLWHA.(Table 17) These guidelines protect PLWHA against stigmatisation and discrimination by health professionals, particularly with regard to access to health care, treatment and support programmes. Similarly, the Siracusa principles¹¹⁰ adopted by the ICESCR spells out five criteria concerning human rights and restrictions to public health based on resource limitations.¹¹¹ The burden of proof still falls on those who want to restrict rights, and concrete scientific and public health evidence is needed, specifically with response to Siracusa Principle 5 which states that “ it cannot be unreasonable or discriminatory in its application”.¹¹¹

TABLE 17 PROFESSIONAL NATIONAL GUIDELINES

Country	Guidelines	
	International	Domestic
Botswana	World Medical Association (WMA) Declaration of Geneva Siracusa principles	Botswana Medical Council (Professional Conduct) Regulations Strategic Framework for HIV/AIDS, 2010-2016
Brazil		Federal Council of Medicine Code of Medical Ethics Brazilian Society of Intensive Care, under Resolution No. RDC -7 of 2010
India		Indian Medical Council Regulation, 2002 Indian Society of Critical Care Medicine
South Africa		Health Professions Council of South Africa Critical Care Society of South Africa South African Thoracic Society

The regulatory and ethical frameworks of Botswana, Brazil and India provide a useful indication of the challenges faced by developing nations and how they are accessing PLWHA to appropriate and affordable health care, particularly ICU care. The lessons to be learnt from these three countries will also be reviewed. A more detailed descriptive analysis of each country regarding their regulatory, ethical and clinical practice regarding HIV/AIDS and admission to intensive care will follow.

5.5.1 HIV/AIDS in Botswana

5.5.1.1 BOTSWANA’S REGULATORY FRAMEWORK

Botswana is a signatory to the International Covenant on Civil and Political Rights (ICCPR), Convention on the Elimination of ALL Forms of Discrimination against Women (CEDAW), and Convention on the Rights of the Child (CRC).²⁷⁰ The Constitution of Botswana²⁷¹ does not specifically address the status of international and human rights treaties but international human rights treaties are directly enforceable through domestic courts.²⁷² Three specific legal frameworks will be reviewed with respect to patient’s rights

to accessing health care namely, the Constitution and the Bill of Rights, the Public Health Act and the Strategic framework for HIV/AIDS, 2010-2016.

5.5.1.2 CONSTITUTION, BILL OF RIGHTS AND PUBLIC HEALTH ACT

Chapter II (sections 3 to 19) of the Constitution of Botswana guarantees the promotion and protection of human rights.²⁷¹ The human rights inferences in the Constitution are justiciable.²⁷² Section 15 mentions the right to non-discrimination and prohibits discrimination on the basis of race, tribe, place of origin, political opinions, colour or creed.²⁷¹ Section 15 does not mention health status explicitly.²⁷² The Constitution does not expressly provide for the right to health²⁷¹ but s4 guarantees the right to life. This can be interpreted as measures that the state must take to ‘increase life expectancy’ and ‘elimination of malnutrition and epidemics’, as observed by the Human Rights Committee in relation to Article 6 of the ICCPR.²⁷² The Public Health Act also does not expressly provide for the right of access to health care but makes provision for a host of activities to promote good health.²⁷³

5.5.1.3 STRATEGIC FRAMEWORK FOR HIV/AIDS, 2010-2016

The Botswana Ministry of Health has prioritised the national HIV/AIDS programme by creating a National AIDS Council (AIDS/Sexually Transmitted Disease (STD) Unit) , chaired by the President of Botswana and co-chaired by the Minister of Health.²⁷² The National AIDS Co-ordinating Agency (NACA), created in 1999, is responsible for programme implementation, monitoring and evaluation functions,²⁷² which are monitored by District Multi-Sector AIDS co-ordinators.²⁶⁸ This agency developed the Strategic Framework for HIV/AIDS, 2010-2016, which currently guides Botswana’s response to HIV/AIDS.²⁶⁸

In terms of the Strategic Framework, the four priority areas identified for the period 2010-2016 include: Preventing New Infections, Systems Strengthening, Strategic Information Management, and Scaling Up Treatment, Care and Support.²⁶⁸ The Framework mentions that although health systems need to be improved and strengthened in an increasingly financially constrained environment, innovative collaborations need to be forged with the private health sector in particular.²⁶⁸ Ninety five percent of the population live within an 8 km radius of a public health facility, which is the major provider of health services to 80% of the population.²⁶⁸ The Framework states that several factors affect access and quality of care, such as availability, skills, motivation of health workers and drug procurement etc.²⁶⁸

5.5.2 Botswana's ethical guidelines

The Botswana Medical Council (Professional Conduct) Regulations provides general ethical guidelines for medical doctors and dentists.²⁷⁴ Very much like the Health Professions Council of South Africa, Article 21 deals with issues of informed consent and confidentiality, equally applicable to HIV patients, which must be respected and may be disclosed to third parties under very specific circumstances, a medical colleague involved in the bona-fide care of the patient, a carer of the patient who is chronically ill, so as to protect the carer, and by court order.²⁷² The Botswana Medical Council (Professional Conduct) guidelines contained in Article 21 does not specifically providing guidelines on issues of discrimination for PLWHA, but a wider interpretation of its general ethical guidelines would give protection to PLWHA against discrimination. In terms of the Public Health Act²⁷³, HIV is not notifiable, but new cases need to be reported to the public health specialist in the District Health Team, who in turn notifies the AIDS/STD Unit for planning purposes.²⁷⁵

5.5.3 Human Rights in Botswana

There are no national human rights institutions in Botswana,²⁷² but civil advocacy groups have been vigilant in monitoring human rights issues including HIV/AIDS.²⁷⁶ These include the Botswana Business Coalition against AIDS, the Botswana Network of People Living with AIDS, and the Botswana Network on Ethics, Law and Human Rights (BONELA).²⁶⁸ Section 15 of the Constitution²⁷¹ guarantees protection from discrimination on the grounds of race, tribe, place of origin, political opinions, colour or creed, but does not mention protection from discrimination for PLWHA, people with disabilities etc.

In *Makuto v The State*,²⁷⁷ the Court of Appeal set a precedent “that HIV status could be implicitly understood as being on the list of protected ground from discrimination, despite no specific mention in the Constitution”. In *Attorney-General Reference: in Re The State v Marapo*, the Court of Appeal held that mandatory denial of bail to persons accused of rape was unconstitutional. The court rejected the states argument that the statutory denial of bail was in support of the fight against HIV. However, this judgement is contradictory to later enactments of the Harmful HIV-related Behaviour Act under provisions of s209 of the Penal Code,²⁷⁸ and later the Compulsory HIV Testing of Rape Suspects Acts under provisions of the Penal Code (Amendment) Act 5 of 1998²⁷⁸, where the intention of these acts was the protection of the public against a fatal infection i.e. HIV/AIDS.²⁷⁵

Section 11 of the Public Health Act²⁷³ makes provision for dealing with deliberate attempts to infect others with any communicable disease in public places or streets etc. It is unlikely this Act would involve activities involving HIV transmission, as these are mainly by sexual transmission, which by its very nature is private.²⁷² However, Botswana has punitive laws

regarding Harmful HIV related activities including compulsory HIV testing of alleged rape suspects.²⁷⁵

5.5.4 Critical care in Botswana

No mention is made with regards to access to specialised services, such as ICU's or the availability of critical care skills, if any, in Botswana. The country has three public referral hospitals, and emergency care in hospitals and clinics is provided largely by medical officers and nurses with little or no specific emergency medicine training.²⁷⁹ Over 90% of the doctors are expatriates, mainly from other African countries.²⁷⁹ The University of Botswana opened its first medical school in 2009 and its first graduates of 36 are expected to qualify in 2013. Plans are in place to establish an academic Department of Emergency Medicine with the provision of a four year post-graduate MMED (emergency Med) speciality programme, based on the South African MMED (Emergency Medicine) programme. Botswana is currently awaiting accreditation for its academic programme from the College of Medicine in South Africa.²⁷⁹ The clinical preceptorship programme has resulted in medical professionals with HIV specialist skills being deployed to Botswana, with doctors from the USA and Europe spending 3 month periods, training Botswana health-care professionals.

Recognising the co-existence and co-morbidities of TB, STI, sexual reproductive health (SRH) and HIV/AIDS, the Strategic Framework for HIV/AIDS, 2010-2016 integrates all these services into one programme.²⁶⁸ Approximately 97% of pregnant women have access to the PMTCT programme in Botswana.²⁶⁸ In 2004, the country implemented a routine, but non-compulsory (opt-out) HIV testing policy²⁷², which contributed to the overall success of Botswana's HIV programme, this being in contrast to other countries in Africa. The Constitutions provision for the right to privacy has been respected by the National

Policy on HIV/AIDS with respect to routine testing and issues of human rights, privacy and self-determination for PLWHA.²⁷² There is an opt-out relief, and pre and post-test counselling is routinely given, irrespective of the choice made.

5.6 HIV IN BRAZIL

In 2011 the HIV prevalence in Brazil is 0.3%, with 490 000 PLWHA, 215 676 on ART and with ART coverage of 71% at a CD⁴ of 350 cells/mm³.⁷ PMTCT coverage is 72%, and the average life expectancy at birth is 68 years for males and 76 years for females. The AIDS mortality co-efficient-per 100 000 inhabitants is 5.8. In 1996, Brazil made a pioneering decision to offer free combination ART to all eligible PLWHA.²²⁴ “What Brazil did in the early '90s was to really head this epidemic off at the pass,” said Chris Beyrer, an associate professor of epidemiology at the Johns Hopkins Bloomberg School of Public Health in Baltimore.²⁸⁰

In 2001, Ministers from a number of countries attending a World Trade Organization (WTO) meeting in Doha, Qatar, signed a declaration stating “that the Trade-Related aspects of Intellectual Property Rights (TRIPS) agreement, which provides patent protection for internationally marketed pharmaceuticals, should be respected by member countries in a manner supportive of WTO members' right to protect public health, and in particular, to promote access to medicines for all.” Brazil is not a signatory to the ‘TRIPS’ agreement.

The government’s political will to respond to the HIV/AIDS epidemic was thus effected by bypassing international drug patency agreements (TRIPS) through its issue of a ‘compulsory license’, thus enabling the parallel import of cheaper generic drugs and its

own manufacture of ARTs.^{224 281} The compelling urgency for the Government of Brazil to take such extreme measures was that HIV/AIDS was viewed as a human rights issue.²⁸² A big contributor to the success of Brazil's response to the HIV/AIDS epidemic is not only Government and civil society commitment, but also the strength of its public health system. In their study, Melchior *et al*²⁸³ reported that at least one infectious disease specialist was available in 74% of all outpatient care units, and that 76% of health teams consisted of a social-worker, nurse practitioner, a psychologist and a pharmacist.

5.6.1 Brazil's regulatory frameworks

Brazil's obligations to PLWHA are governed by the UDHR, the ICCPR, and the ICSCR. Brazil is a signatory to both the ICCPR and the ICSCR.²⁸⁴ The Constitution of Brazil of 1988²⁸⁵ does not specifically address the status of international and human rights treaties. "The incorporation into domestic laws of international instruments recognizing the right to health can significantly strengthen the scope and effectiveness of remedial measures. It enables courts to adjudicate violations of the right to health by direct reference to the International Covenant on Economic, Social and Cultural Rights."¹¹³ Two specific legal frameworks will be reviewed with respect to patient's rights to accessing ICU care namely, the Constitution and the National STD and AIDs Programme.

5.6.1.1 ARTICLE 196 OF THE CONSTITUTION OF BRAZIL OF 1988

Under provisions of Article 196 of the Constitution of Brazil of 1988²⁸⁵, Brazil's publicly funded health care system, SUS (Unified Health System) was created, which provided for health care being the "right of all and an obligation of the State".^{266 285 286} The Constitution grants all citizens, in a public-private partnership, the right to free health care from public and private health care providers reimbursed by the government.²⁶⁶ Prior to the SUS,

citizens contributing to social security were able to receive free health care. Hence, prior to 1988, Brazil had a disparate and fragmented health care system similar to SA.

The creation of SUS enables more than 80% (160 million) of the Brazilian population access to free health care with 18.5% of the population paying for private insurance.²²⁴

This public-private mix is similar to SA, with the exception that private-public partnerships in Brazil are a free service, and extend to specialist and ICU care, if necessary.

Brazil has 6384 hospitals, the majority of which are in private facilities (60.1%) designated for government-funded health care.²⁸⁷ However, this publicly funded, privately provided health system continues to intensify its focus on high-cost curative care, driving up hospital costs.²⁸⁷ The Brazilian government is increasingly attempting to bring private health care into the ambit of federal control, in order for it to contain costs and increase accessibility for patients, much like SA's envisioned NHI.⁵⁴

5.6.1.2 NATIONAL STD AND AIDS PROGRAMME

A major contributor to Brazil being hailed as a global success regarding its declining HIV prevalence to 0.3%²⁶⁷ was its aggressive implementation of its National STD and AIDS Programme (NAP) which comprehensively encompassed HIV/AIDS public education programmes, including its VCT programmes, combating stigmatisation and discrimination, and the early commencement of free combination ART in 1996.^{224 288} The NAP has been internationally recognized as a leading example of an integrated rights based approach to the epidemic in the setting of a middle-income country with significant levels of social inequality.

The Brazilian Health System first provided drugs for opportunistic infection treatment in 1988, with zidovudine becoming available in 1991.²⁸⁹ In 1996, the government took an

important step and pioneered passing a law (NAP) effectively giving the State the capacity to provide free ART for eligible PLWHA.²⁸⁷ In the 1990's, "when the annual cost of drugs for AIDS treatment often exceeded US\$10,000 per patient, the World Bank and other development agencies discouraged developing countries from implementing combination ART treatment programs, favouring cost-effective prevention over costly treatment".²⁸¹ Brazil defied the World Bank and decided to provide free universal access to ART for all people living with HIV/AIDS from 1996.²⁸¹

In 2004, SUS spent BRL27 million (US\$15 million) on the treatment of HIV/AIDS on hospital care, including ICU care, equating to an average hospital admission cost of BRL700 (US\$388).²⁹⁰ This resulted in a universal coverage of ART for PLWHA of greater than 80% or 190 000 people.^{224 288} However, in terms of the NAP, Brazil had the foresight to commence ART at a CD4 count of <350 cells/mm³.^{224 288} In 1996, when international studies showed that "three-drug antiretroviral therapy improved survival and quality of life, Brazil's Congress enacted the law providing free triple ART to eligible PLWHA".

Between 1997 and 2005, the government spent a total of BRL3.5 billion (US\$1.5billion) in response to HIV and AIDS, including BRL2 billion (US\$ 891million) for ART. The money for drug treatment had come from internal funds; approximately 11% of the total HIV/AIDS expenditure came from World Bank loans, spent chiefly for prevention programs and to establish a national laboratory network for clinical monitoring of patients and tracking the epidemic.²²⁴ "While implementation of this program required the commitment of significant resources, it is estimated that in 2001, an investment of (BRL520 million)US \$232 million resulted in a total saving of (BRL2.5 billion)US \$1.1 billion."²⁹¹ By the end of 2009, it was estimated that between 460 000 to 810 000

Brazilian people were living with HIV infection.²⁶⁷ The AIDS mortality rate has remained at an average of 11 000 deaths per year. Brazil's commitment to universal access to treatment has meant that, by 2010, nearly all HIV/AIDS patients that required treatment were receiving it.²⁶⁷ This approach has proved to be very cost effective; savings of BRLUS\$2 billion in medical costs were made between 1996 and 2004.²²⁴ Between 1996 and 2005, there was a reduction of almost 40% in mortality specifically relating to AIDS, and the median survival rate of PLWHA increased from 58 months in 1995-1996 to 108 months in 1998-1999 (Ministry of Health, Brazil).²⁶⁷ AIDS-related hospitalisations fell by 80 percent.^{292 293}

According to the Brazilian Health Ministry statistics (Datusus) for 2004, the common HIV-related admissions were TB (11.9%), other bacterial infections (8.8%), PJP (6.8%), 'other' opportunistic infections (8.7%), neurological disease(7.6%) and 'unspecified' HIV disease (25.4%), according to ICD 10 classification.²⁹⁰ It is postulated that unspecified HIV disease could be due to sepsis and organ failure, or possibly related to ART toxicities.

5.6.2 Brazil's ethical framework

In Brazil, the medical profession is regulated by the Federal Council of Medicine which has a Code of Medical Ethics mandatory for all physicians. Issues regarding informed consent and confidentiality are enshrined under the Constitution of 1988 and Code of Consumer Protection (Law no. 8078, 1990).²⁹⁴ These provide protection for patients regarding requirements for informed consent such as capacity and voluntariness, informed refusal of treatment, ages of consent (18yrs for medical and surgical treatment) consent for patients lacking capacity (e.g. as a result of mental illness or drug intoxication), provisions for surrogate decision-making(article 59), consent in emergencies and the right to confidentiality. Article 14 of the Civil Code²⁹⁴ further entrenches the right to informed

consent for medical and surgical procedures, and Article 15 states that nobody can be compelled to undergo life-threatening medical treatment or surgical procedures. The ethical code of informed consent and confidentiality is further enshrined in the Resolutions of the Federal Council of Medicine (No. 1.081/82, 1.358/92 and 1.890/09), the National Health Council (no. 196/96) and also the Code of Medical Ethics.²⁹⁴

The new Code of Medical Ethics (CEM) for 2010 focuses on three themes: information sharing of diagnostic and therapeutic options by doctors to their patients, the respect by physicians of the patients autonomy to accept or refuse treatment, and futility of care decision-making for patients with irreversible and terminal medical conditions, and the provision of palliative care to patients.²⁹⁵ The Brazilian Society of Intensive Care, under Resolution No. RDC -7 of 2010 provides for the minimum requirements for the operation of Intensive Care Units and other measures including organisation, physical infrastructure, human resources, and work processes. The resolution provides for the staffing of ICUs by trained medical and nurse specialists in intensive care, practicing in a multi-disciplinary support environment, with physiotherapist, nutritionist, pharmacist etc.

Article 26 speaks of issues of informed consent, the need for comprehensive medical records, humanising the ICU's by improving communication with patients and their families, and establishing admission and discharge criteria for the ICU in keeping with the 'existing laws and institutional rules'. Failure to comply with the provisions under the resolution will be subject to 'civil liability, administrative and criminal sanctions'.

5.6.2.1 HUMAN RIGHTS AND HIV IN BRAZIL

Following a repressive regime change in 1988, Brazilian citizens began “asserting their rights in the new constitution of 1988, and were demanding that the city, state, and national administrations enter into a dialog with civil society about the future of the country”.^{296 297}

This re-democratisation movement “built political parties, trade unions, and non-governmental organizations (NGOs) throughout the country which demanded a public health system responsive to and controlled by the public, and which defended the right to health as a fundamental human right to be guaranteed by the Constitution”.²⁹⁶

The initial free HIV testing programs and provisioning of ART in Brazil was brought about by court action against the Government by AIDS advocacy groups which in effect operationalised the constitutional right to health.^{298 299} The Brazilian response to HIV/AIDS thus emerged from the bottom up. What seems to distinguish the Brazilian situation from that of many other countries is that the Brazilian government acted in a timely and appropriate manner to implement the court rulings.²⁶⁵ Another strength of the Brazilian Health System is the existence of public health councils with elected community representatives at all levels of the SUS: municipal, state, and federal,²⁶⁵ thus ensuring social control, relevance and representation by civil society on SUS.

“Laws also prohibit HIV-related discrimination in the workplace, in health care and in access to public facilities, and forbids medical personnel from revealing confidential medical information about HIV-positive people.”³⁰⁰ Brazil’s remarkable and world-renowned success in controlling its HIV/AIDS programs is indicated by a HIV prevalence to below 0.3%, universal ART coverage and a free supply of combination ARVs in the public and private sectors (thus removing the profit factor).³⁰¹

With a strong public health system coupled with a government-funded free access to private health-care, PLWHA requiring admission to ICU would have easier access to this level of care in Brazil, where tertiary services are provided by contracted private hospital providers (paid for by SUS) and public teaching hospitals.²⁸⁷ The positive impact of a comprehensive health care program to those living with HIV/AIDS in Brazil is acknowledged by the WHO and other world health authorities. Among developing countries, Brazil is the “only example we have where there's universal access” to antiretroviral drugs, said Jim Yong Kim, former director of the World Health Organization's Department of HIV/AIDS and an associate professor of medicine and medical anthropology at Harvard Medical School in Boston. “I think what they did was to say, ‘We're going to scale up treatment, but we're going to scale up prevention along with it, because it doesn't make sense to do one without the other.’”²²⁴

Studies in Brazil have reported significantly improved survival rates of those living with HIV/AIDS. Hospital admission rates for HIV/AIDS related diagnosis have decreased as a direct result of Brazil's effective NAP policy which implemented early diagnosis and the commencement of ART at a CD4 count of 350 cells/mm³ and which further improved the general health condition of these patients.^{302 303} The Brazilian experience demonstrates the capability of a developing country to treat people with equity, independently of race, gender or economic power.³⁰⁴

5.6.3 Access to intensive care in Brazil

In 1997, the Brazilian Society of Intensive Care (Associação Medicina Intensiva Brasileira-AMIB) performed an audit of Brazilian ICUs,³⁰⁵ and 81.5% of the ICUs(1909) had five to 14 beds. The ICU's are categorised as either adult or paediatric (including

neonatal). The audit showed that 83.1% of the ICU's had up to 60 admissions per month and 71% had occupancy rates greater than 60%.³⁰⁵ The majority of the admissions were due to cardiovascular and respiratory conditions.³⁰⁵ The audit makes no specific mention of admissions due to HIV/AIDS or any reference to admission criteria for ICU. In 2011, there are 2 342 ICU's in Brazil with 25 367 ICU beds.³⁰⁶ Similar to world-wide trends, the demand for ICU beds for eligible patients exceeds supply,^{307 308} with this form of expensive technology needing to be prioritised to those patients with a real likelihood of recovery.^{62 309-311}

The regulatory and ethical frameworks of Botswana, Brazil and India provides a useful indication of the challenges faced by other developing nations and how they are managing to provide their citizens with appropriate and affordable health care, particularly ICU access. South Africa faces many similar challenges, specifically with respect to available resources, and needs to find creative and workable solutions for its high number of HIV/AIDS patients who need ICU care.

5.7 DISCUSSION

Having reviewed the international and national legal and regulatory frameworks for providing HIV care in the four countries, the ethical dilemmas faced by critical care specialist admitting PLWHA to ICU will be explored. The four countries face similar problems regarding resource constraints and the numbers of available intensive care unit beds. (Table 18) Botswana and India are notable in that this high level of care is very limited, inaccessible or unaffordable.

TABLE 18 POPULATION TO ICU BED RATIO

	Botswana	Brazil	India	South Africa
Total population (2012)	2 million	199 million	1.2 billion	49 million
Number of ICU beds	Not known	25367	70 000	4719
Population/ICU bed ratio	-	1: 8000	1:14 000	1: 10 000

While all three countries have legal frameworks in place to provide their citizens with health care, they differ in their provision of ICU care, and for HIV infected people in particular. In Botswana, the field of emergency care is in evolution, with specialised ICU services not currently being available in public health facilities, and specialist care being provided in high care beds by generalists.²⁷⁹ In Brazil, some of the ICU's have no admission criteria, and this decision vested solely on the 'availability, and the knowledge and the experience' of the most experienced ICU specialist at the institution.³¹²

India has few regulatory mechanisms in place to ensure ICU care for critically ill patients in general, and HIV infected persons in particular.

There is a large variation in the availability of hospital beds, which is twice the number between the urban and rural hospitals.²³² Furthermore, there is a growth of private 'fee for service' hospitals predominantly in the urban areas.²³² This must be seen in the context that most patients requiring this level of care are predominantly rural, and estimated at greater than 70% of India's population.²³² The shortage of ICU beds in the large urban areas not only makes it difficult for patients to have access to this level of care, but when they are available, no measures are in place to ensure that patients, including PLWHA, have equal access to this level of care.

5.8 CONCLUSION

The medical associations of India, Brazil and South Africa subscribe to the international guidelines of the World Medical Association's Declaration of Geneva, which provide a framework for the appropriate conduct of the medical profession globally.¹⁶ Each country has a professional association that guides and regulates ethical conduct, particularly with regard to PLWHA. These guidelines protect PLWHA against stigmatisation and discrimination by health professionals, particularly with regard to access to healthcare, treatment and support programmes. Similarly, the Siracusa Principles¹¹¹ spell out five criteria concerning human rights and restrictions to public health based on resource limitations. The burden of proof still falls on those who want to restrict rights, and concrete scientific and public health evidence is needed, specifically with response to Siracusa Principle 5 which states that 'the restriction of the right of access to public health cannot be unreasonable or discriminatory in its application'.¹¹¹

The regulatory and ethical frameworks of Brazil and India provide a useful indication of the varied challenges faced by developing nations regarding PLWHA and their access to ICU care. An important contributor to the success of Brazil's response to the HIV/ AIDS epidemic is its National Health Insurance Scheme, which has strengthened its public health system, including ICU bed availability. In Brazil, health services are provided by private-public partnerships, funded by the government and freely accessible to the patient, and extending to specialist and ICU care.²⁹⁰ It is therefore evident that an HIV-infected patient in Brazil who requires admission to ICU would have easy access to such level of care. The Brazilian Society of Intensive Care³¹³ speaks of issues of informed consent, the need for comprehensive medical records, humanising the ICUs by improving communication with patients and their families, and establishing ICU admission and discharge criteria in

keeping with the ‘existing laws and institutional rules’. As such, failure to comply with the provisions under the resolution will be subject to ‘civil liability, and administrative and criminal sanctions’.

There is no comprehensive legislation in India addressing HIV/AIDS and criteria for ICU admission. The number of ICU beds available is disproportionately low, in the private and public hospitals, and there is also considerable variation in the allocation and distribution of critical care services across the country, given that 70% of the country is rural.^{251 256}

Notwithstanding explicit ICU admission policy at a macro level in South Africa, widespread anecdotal evidence seems to suggest that HIV status may be commonly used as an ICU exclusion criterion. This practice results in arbitrary decision-making and has no prognostic evidentiary basis, rendering such decision-making irrational. Furthermore, it is contrary to SA’s legal and human rights policy frameworks. Given the current state of affairs, policy-makers and clinicians in SA and further afield should devise explicit policy frameworks to govern ICU admissions in the context of HIV status.

CHAPTER 6: ATTITUDE AND PERCEPTION SURVEY

6.1 INTRODUCTION

This chapter presents the methods, results and discussion of the paper-based attitude and perception questionnaire survey conducted among Critical Care Specialists (CCSs) in South Africa.

This anonymous questionnaire pertained to the provision of intensive care services to patients with HIV infection. It is clear that the success of a health care service is dependent on the knowledge, attitudes and perceptions of health care providers. In this study, the attitudes and perceptions of CCSs were established in the context of the prevailing regulatory and ethical guidelines. The influence of CCS personal preferences, patient and family wishes, institutional unit policies and resource allocation, withholding and withdrawing care, were explored in the context of people with HIV infection and access to intensive care.

The chapter is divided into five sections, the first presenting the methodology and sampling strategy, the second demographic and health facility and work experience of the respondents, the third presenting responses to twelve structured ethics questions regarding ICU admissions, the fourth detailing responses to each of the five clinical vignettes involving hypothetical patients, and the fifth section concluding with a discussion of the results.

6.2 MATERIALS AND METHODS

6.2.1 Study design

A cross-sectional, attitudes-and-perception anonymous questionnaire survey of critical care specialists (CCSs) was conducted using convenience sampling. The study was conducted in 2011, when the prevalence of HIV was 17.8% (5.6 million people) and antiretroviral treatment (ART) coverage of 55% (1.3 million people).¹

6.2.2 Sampling strategy

For the purpose of this study, a CCS was defined as any specialist medical/critical care nurse practitioner who practices in the field of critical care and who is likely to be involved in decisions on the admission of patients with HIV infection to intensive care. This definition included specialist members of the Critical Care Society of Southern Africa (CCSSA), South African Thoracic Society (SATS), and other specialists attending a combined national conference of the CCSSA and SATS. A total of 450 questionnaires were handed out individually upon registration to delegates meeting the inclusion criteria (from a total of 830 attendees recorded in the attendance register), with 90 individuals responding with valid and complete questionnaires (i.e. response rate of 20%). The study was approved by the Biomedical Research Ethics Committee of the University of KwaZulu-Natal (BE 089/010).

6.2.3 The questionnaire

An anonymous questionnaire was used. It was subjected to a limited pre-test by specialists for content and clarity and accepted in its original format. The questionnaire was in three parts (ANNEXURE A).

- A. The demographic characteristics of CCS participating in questionnaire was assessed.
- B. The questionnaire of CCS's perceptions regarding ICU admissions to specific questions was also assessed. Twelve questions were formatted to elicit responses to various ethical scenarios regarding admission to ICU including availability of ICU bed, patient quality of life, information given to patient, issues of informed consent and informed refusal, DNR orders, withdrawing and withholding therapy, 'limited care' versus withholding and withdrawing therapy and the need for an ethics committee to assist in ethical decision-making .
- C. We assessed the importance of potential determinants of admission to intensive care. For each of the five vignettes, respondents were asked to rate, on a Likert scale, the likelihood of admission to intensive care, with 1= strongly disagree to 5 = strongly agree. Respondents were also asked to rate on a Likert scale, 14 potential determinants of admission to intensive care drawn from the literature and from our own experience, with 1=most important and 5= least important . These determinants included prognosis of acute disease, prognosis of underlying disease, patients age, resources, human rights, patient preferences, family wishes, cultural considerations, financial implications for family (e.g. sole breadwinner), socioeconomic status, physician experience, policy of intensive care unit, threat of litigation and bed used to the prejudice of another patient. Specific variables in the scenarios included the last ICU bed available, HIV disclosure, family wishes, withdrawing and withholding of therapy, HIV positive and possible MDR/XDR TB, and non-compliance with medication. These variables were drawn from the most commonly occurring factors based on personal observations.

6.2.4 Data management

Data from the questionnaire were entered directly into Microsoft Excel. Data was imported into Stata version 12.0 (StataCorp, 2011) for data cleaning, recoding and analysis.

6.2.5 Statistical analysis

Stata version 12.0 (StataCorp, 2011)³¹⁴ was used to analyse the data. All categorical data are presented as frequency counts and percentages. Bivariate analysis was used to test for statistically significant associations between each dependent variable outcome and each of the risk factors. The Likert scale dependent variables were reclassified into dichotomous variables (i.e. strongly agree or agree code as 0, while strongly disagree or disagree coded as 1). Pearson's chi-squared test (or Fisher's exact for small numbers i.e. <5 in a cell) was utilized to test for significant association between the dependent variables and the various determinants and perceptions. Bivariate unconditional logistic regressions were also used to estimate odds ratios for the above-mentioned associations. A p-value <0.05 was considered as statistically significant.

6.3 RESULTS

6.3.1 Demographic, health facility and professional data

In this questionnaire, the majority of the CCSs were men (49/90, 54.4%) and the majority of the respondents were 40 years or older (58/90, 64%). (Table 19) Most of the CCSs work in the public sector, and approximately half of them work in a tertiary public health institution. (Table 20) The questionnaire thus represents the opinions of a senior cadre of intensive care staff, including critical care nurse specialists, with regard to clinical and

ethical decision-making in ICU, including the decisions to admit the patient to ICU. The results of this survey also reliably reflect decision-making in the public sector intensive care units.

TABLE 19 DEMOGRAPHIC CHARACTERISTICS OF THE 90 CRITICAL CARE SPECIALISTS

1. Gender	No. (%)	3. Province of Practice:	No. (%)
Men	49 (54.4)	KwaZulu-Natal	33 (36.7)
Women	41 (45.6)	Gauteng	27 (30)
Total	90	Western Cape	17 (18.9)
		Eastern Cape	4 (4.4)
		North West	3 (3.3)
		Free State	3 (3.3)
		Limpopo	1 (1.1)
		Northern Cape	1 (1.1)
		Mpumalanga	1 (1.1)
2. Age (years)	No. (%)		
Below 40	32 (35.55)		
40-49	32 (35.55)		
50 or more	26 (28.9)		

TABLE 20 THE HOSPITAL AND ICU CHARACTERISTICS

1. Type of Hospital Facility:	No. (%)	3. No. of Beds in Hospital:	No. (%)
Public Regional	16 (17.8)	Less than 500	37 (41.6)
Public Tertiary	45 (50)	500-749	21 (23.6)
Private Hospital	29 (32.3)	750 or more	31 (34.8)
2. Type of ICU bed:	No. (%)	4. No. of ICU beds:	No. (%)
General	58 (64.4)	Less than 7	37 (15.6)
Surgical	8 (8.9)	7-12	29 (32.2)
Medical	12 (13.3)	13-18	15 (16.7)
Paediatric	10 (11.1)	18 or more	32 (35.6)
Coronary Care	2 (2.2)		

The nature of their specialty is presented in Table 21, with 12(13.3%) being critical care nurses. Fifty percent had 10 years' experience and more, 54(60%) were senior staff, and 51 (57%) spent over 50% of their time on ICU patients.

TABLE 21 PROFESSIONAL CHARACTERISTICS OF CRITICAL CARE SPECIALISTS

1. Primary Speciality:	No. %	3. Role in ICU:	No. %
Anaesthesiology	19 (21.2)	Director	14 (15.6)
Pulmonology	22 (24.4)	Senior staff	54 (60)
Internal medicine/Cardiology	18 (20)	Fellow/resident	13 (14.4)
Surgery	9 (10)	Visiting consultant	5 (5.6)
Paediatrics	10 (11.1)	No formal role	4 (4.4)
Critical Care Nurse	12 (13.3)		
2. Intensive care experience	No. %	4. Proportion of ICU time	No. %
Less than 5 years	27 (30)	Less than 25%	15 (16.7)
5-10 years	18 (20)	25-50%	24 (26.7)
10 years or more	45 (50)	50-75%	15 (16.7)
		More than 75%	36 (40)

6.4 CRITICAL CARE SPECIALISTS PERCEPTIONS REGARDING ICU ADMISSIONS

Sixty three (71.6%) of the respondents cited availability of an ICU bed as influencing the decision to admit. Seventy (84.3%) would admit patients to ICU who may live for several years but whose quality of life was very poor, according to the doctor's opinion's. (Table 22)

Regarding HIV counseling and testing, 59(66.3%) would obtain written consent and 26(29.2%) would obtain oral consent. Eighty six (97.7%) of the respondents would obtain written consent for an elective surgery, 49(56.3%) oral consent for dialysis, 21(24%) written consent for dialysis and 41(46.1%) written consent for a blood transfusion. Eighty four (96.6%) would respect patient autonomy as regards an informed refusal for treatment. Fifty eight (65.9%) would comply with a written DNR order and 21(23.9%) would respect a verbal DNR order by the patient. In patients with no real chance of recovering a

meaningful life, 71(81.6%) of respondents would withhold sophisticated therapy (i.e. not start mechanical ventilation or dialysis etc.) and 63(75.9%) would withdraw sophisticated therapy (i.e. discontinue mechanical ventilation, dialysis etc.).

TABLE 22 CRITICAL CARE SPECIALISTS PERCEPTIONS REGARDING ICU ADMISSIONS

	Criteria	Yes/no	n(%)
1	availability of an ICU bed influencing decision to admit	Yes	63(71)
2	Admit patients to who may live for several years but with very poor quality of life according to the doctors opinion.	Yes	70(84.3)
3	The medical information given to the patient would depend on the type of disease, severity of prognosis, type of patient (personality, perceived wishes, suicidal, depressed etc.)	Yes	30(35.3)
3	would obtain written consent for intubation and ventilation	Yes	12(13.5)
5	Written consent for elective surgery	Yes	86(97.7)
6	written consent for a blood transfusion	Yes	41(46.1)
7	Respect for informed refusal for treatment	Yes	58(65.9)
8	Comply with written DNR order	Yes	58(65.9)
9	withhold sophisticated therapy when no real chance of recovering a meaningful life	Yes	71(81.6)
10	withdraw sophisticated therapy when no real chance of recovering a meaningful life	Yes	63(75.9)
11	decision about terminal care should involve the ICU staff, the patient and family	Yes	58(65.2)
12	ethics consultant/committee can help in decisions regarding ICU admission's	Yes	67(79)
13	continuing medical education programmes should include medical ethics	Yes	82(91.1)

Fifty eight (65.2%) respondents felt that the decision about terminal care should involve the ICU staff (including the critical care nurse) and the patient and family. Sixty seven (79%) of respondents' felt that an ethics consultant/committee can help in decisions regarding ICU admission's where a family insists that 'everything must be done', and where a family insists on 'withholding or withdrawing care'. Eighty two (91.1%) agreed that continuing medical education programmes should include medical ethics.

Thirty (35.3%) respondents would consider as important 'The medical information given to the patient would depend on the type of disease, severity of prognosis, type of patient (personality, perceived wishes, suicidal, depressed etc.)(Table 22)

6.5 DETERMINANTS OF ADMISSION TO INTENSIVE CARE

Five hypothetical scenarios were presented to determine what factors the CCS would use in specific scenarios.

Scenario 1: Respiratory failure in 70 year old clinically advanced AIDS with poor functional status

Scenario 2. Respiratory failure in 24 year old clinically advanced AIDS

Scenario 3. Priority setting - one ICU bed available

Scenario 4. Respiratory Failure, PJP, AIDS-CD⁴ count-1 cells/mm³ defaulted ART and TB treatment for many months

Scenario 5. Resource limitations and priority setting

6.5.1 Scenario 1. Respiratory failure in clinically advanced AIDS-older age and poor functional status.

A 70 year old man (A) presents with acute hypoxemic respiratory failure requiring immediate intubation. The patient has advanced HIV disease complicated by AIDS wasting syndrome, disseminated candidiasis, and pulmonary hypertension, all of which have contributed to his poor functional status at baseline. You are the physician on duty at the ICU and you are requested to admit the patient to ICU for mechanical ventilation.

(Table 23)

TABLE 23 SCENARIO 1, ADMISSION TO ICU - % (N=89 RESPONSES)

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
47.2(n=42)	28.1(n=25)	7.9(n=7)	13.5(n=12)	3.4(n=3)

6.5.1.1 PURPOSE OF SCENARIO 1

This scenario tested the effect of HIV status, the stage of the disease and age so was designed as to elicit a refusal rate close to 100% i.e. withholding of ICU care.

6.5.1.2 RESULTS OF SCENARIO 1

Seventy five percent (n=67) of respondents disagreed with admission to ICU for this patient, 8% (n=7) were uncertain, and 17% (n=15) agreed to ICU admission. (Table 23)

Using the bivariate logistic regression, the most important reasons given for refusal of ICU admission were ‘ prognosis of the underlying disease (OR 7.50, 95% CI: 1.56-36.05, p=0.019), ‘patients age’ (OR =11.00, 95% CI: 1.34-90.27, p< 0.010)and ‘resources’ (OR=5.11,95% CI: 1.37-19.10, p=0.018).(Table 6.6) CCSs did not attach importance to the ‘physician experience’, ‘policy of intensive care unit’, ‘ threat of litigation’ and bed used to the prejudice of another patient’. (Table 24)

Rating to ICU variables were reclassified as follows (1=strongly disagree or disagree and 0 = strongly agree or agree): There was a significant difference in frequency’s (p<0.001, Fishers Exact test) between those who disagreed versus agreed for patient 1 to be admitted when cross tabulated against withholding therapy. Those who disagreed generally (n=42/67 or 62.7%) suggested that “whenever possible withholding therapy is preferable, while among those who agreed to admission, a larger proportion deemed that the patient should be given maximal treatment (n=7/15 or 46.7%) or that the ICU physician should preserve life at all cost (n=6/15 or 40.0%).(Table 24)

TABLE 24 DETERMINANTS OF CRITICAL CARE SPECIALISTS' DISAGREEMENT (1) VERSUS AGREEMENT (0) FOR RESPIRATORY FAILURE IN CLINICALLY ADVANCED AIDS-OLDER AGE AND POOR FUNCTIONAL STATUS (SCENARIO 1) USING BIVARIATE LOGISTIC REGRESSION

Determinant	Disagreed to admission yes/N (%)	Agreed to admission yes/N (%)	Odds ratio (95% CI)	p-value ¹
A. Prognosis of acute disease	57/64 (89.1)	9/12 (75)	2.71 (0.59-12.46)	0.189
B. Prognosis of underlying disease	60/64 (93.8)	8/12 (66.7)	7.50 (1.56-36.05)	0.019
C. Patients age	32/64 (50.0)	1/12 (8.3)	11.00 (1.34-90.27)	0.010
D. Resources	46/64 (71.9)	4/12 (33.3)	5.11 (1.37-19.10)	0.018
E. Human rights	6/64 (9.4)	8/12 (66.7)	0.05 (0.01-0.22)	<0.001
F. Patient preferences	6/64 (9.4)	3/12 (25.0)	0.31 (0.07-1.47)	0.146
G. Family wishes	7/64 (10.9)	3/12 (25.0)	0.37 (0.08-1.69)	0.189
H. Cultural considerations	4/64 (6.3)	0/12 (0.0)	--- ⁱⁱ	0.495
I. Financial implications for family	4/64 (6.3)	1/12 (8.3)	0.73 (0.07-7.20)	0.790
J. Socio-economic status	2/64 (3.1)	0/12 (0.0)	--- ⁱⁱ	0.707
K. Physician experience	19/64 (29.7)	3/12 (25.0)	1.27 (0.31-5.20)	0.743
L. Policy of intensive care unit	25/64 (39.1)	6/12 (50.0)	0.64 (0.19-2.21)	0.533
M. Threat of litigation	5/64 (7.8)	5/12 (41.7)	0.12 (0.03-0.51)	0.007
N. Bed used to the prejudice of another patient	36/64 (56.3)	5/12 (41.7)	1.94 (0.57-6.60)	0.461

i: Fishers exact p-value presented when cell in cross tabulation contains <5 observations

ii: cannot be calculated given a zero containing cell in cross tabulation

This is confirmed by a logistic regression which shows (when using “whenever possible withholding therapy is preferable” as the reference category) that those who disagreed to admission had significantly lower odds of listing the subsequent two categories regarding withholding therapy (namely “maximal treatment should be provided” and “preserve life at all costs”).

Critical care specialists who disagreed to admission were significantly (p=0.019) more likely to select “B. Prognosis of underlying disease” as one of the top 5 most important determinants with regards to their decision (n=60/64 or 93.8%) versus (n=8/12 or 66.7%) among those who agreed to admission. (Table 24) Critical care specialists who disagreed to admission were also significantly more likely to list “C. Patients age” and “D. Resources”

among their top 5 important determinants (n=32/64 versus 1/12, p=0.010 and n=46/64 versus 4/12, p=0.015 respectively).

There was no significant difference in the proportion (n= 37/64 or 57.8% versus 5/12 or 41.7% i.e. slightly higher among disagreeing CCSs) who listed “N. Bed used to the prejudice of another patient” among their top 5 important determinants (p=0.354).

Conversely those who agree to admission were significantly (p<0.001) more likely to list “E. Human rights” among their top 5 important determinants (n=8/12 or 66.7% versus 6/64 or 9.4%) as opposed to those who disagree to admission. CCSs who agree to admission were significantly (p=0.007) more likely to list “M. Threat of litigation” among their top 5 important determinants (n=5/12 or 41.2% versus 5/64 or 7.8%) as opposed to those those who disagree to admission. (Table 24)

There was no significant difference in the proportion (n=3/12 or 25.0% versus 6/64 or 9.4%) who listed “F. Patient preferences” among their top 5 important determinants (p=0.146). There was no significant difference in the proportion (n=3/12 or 25.0% versus 7/64 or 10.9%) who listed “G. Family wishes” among their top 5 important determinants (p=0.189). There was no significant difference in the proportion (n=0/12 or 0% versus 4/64 or 6.3%) who listed “H. Cultural considerations” among their top 5 important determinants. There was no significant difference in the proportion (n=1/12 or 8.3% versus 4/64 or 6.3%) who listed “I. Financial implications for family (e.g. sole breadwinner)” among their top 5 important determinants. Similarly, no significant difference was found for “J. Socio-economic status”. There was no significant difference in the proportion (n=3/12 or 25.0% versus 19/64 or 29.7%) who listed “K. Physician experience” among their top 5 important determinants. Similarly no significant difference was found for “L.

Policy of intensive care unit". The logistic regressions for all the above associations are also presented following the cross tabulation below. For example CCSs who disagreed to admission had a 7.5 higher odds (95% CI for odds ratio: 1.56, 36.05) to select "B. Prognosis of underlying disease" as one of the top 5 most important determinant with regards to their decision as opposed to those who agreed to admission.

With regards to factors influencing their decision to give access to this patient to ICU care, no significant difference in frequency was observed for "according to doctors opinion" or "patients opinion" ($p=0.912$ and $p=0.631$ respectively). (Table 25) However, significantly more CCSs who disagreed to admission indicated that the patient having limited chances of survival ($p=0.007$) influenced their decision compared to those who agreed to admission (OR = 15.0, 95% CI: 2.08, 108.23). This difference was significant ($p=0.014$, Fishers Exact test), with a higher proportion of CCSs who disagreed to admission, when the influencing factor was no hope of survival for more than a few weeks (OR = 9.5, 95% CI: 1.75, 51.78). Cross tabulations showing numbers and Fishers exact p-values follow on from the bivariate logistic regressions.

The majority of CCSs who disagreed to admission of this patient did not think that urgent initiation of HAART would influence their outcome ($n=45/65$ or 69.2%) compared to the 20% ($n=3/15$) who agreed to admission ($p=0.001$, Fishers exact). In other words, CCSs who agreed to admission of this patient were 9 times more likely to think that urgent initiation of HAART would influence the patient outcome compared to those who disagreed (OR=9.0, 95% CI: 2.29-35.4). CCSs also attached importance to 'patients with very limited chances of survival (or poor prognostic index if calculated)' (OR=15, 95% CI:

2.08-108.23, p=0.013) and ‘patients with no hope of survival for more than a few weeks’ (OR=9.52, 95% CI: 1.75-51.77, p= 0.014).(Table 25)

TABLE 25 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE FOR THIS PATIENT?

Determinant	Disagreed to admission yes/N (%)	Agreed to admission yes/N (%)	Odds ratio (95% CI)	p-value ⁱ
Patients who may live for several years but whose quality of life is very poor <u>according to the doctor’s opinion</u>	34/52 (65.4)	7/11 (63.6)	1.08 (0.28-4.18)	0.921
Patients who may live for several years but whose quality of life is very poor <u>according to the patient’s opinion</u>	32/50 (64.0)	5/9 (55.6)	1.42 (0.34-5.98)	0.715
Patients with very limited chances of survival (or poor prognostic index if calculated)	60/62 (96.8)	6/9 (66.7)	15.00 (2.08-108.23)	0.013
Patients with no hope of survival for more than a few weeks	50/53 (94.3)	7/11 (63.6)	9.52 (1.75-51.77)	0.014

i: Fishers exact p-value presented when cell in cross tabulation contains <5 observations

ii: cannot be calculated given a zero containing cell in cross tabulation

6.5.1.3 DISCUSSION OF SCENARIO 1

In this scenario, the majority of CCSs disagreed to ICU admission citing as most important ‘prognosis of the underlying disease’, ‘patient’s age’ and ‘resources’. They also attached importance to ‘patients with limited or no hope of survival’ for this patient. CCSs did not attach importance to ‘physicians experience’, ‘policy of intensive care unit’, ‘threat of litigation’ and ‘bed used to the prejudice of another patient’. Those who disagreed to admit this patient to ICU chose to ‘withhold therapy’ citing ‘whenever possible withholding therapy is preferable’. Those who disagreed to admission were more likely to list ‘patients age’ and ‘resources’ among their top 5 determinants. Between those agreeing or disagreeing with admission no significance was attached to ‘patient preferences’, ‘family wishes’, ‘cultural considerations’, financial implications for family’ socioeconomic status’, ‘physician experience’, or ‘policy of ICU’.

6.5.2 Scenario 2- Respiratory failure in 24 year old clinically advanced AIDS

A 24 year old woman is brought to the A/E by her concerned husband. She is known to your hospital and her hospital records are made available to you. She is HIV positive and awaiting her CD 4 count. She is also awaiting a biopsy of a suspicious lesion on her palate, clinically thought to be Kaposi's sarcoma. She is wasted and now presents with haemoptysis for 2 weeks duration. She is in severe respiratory distress and is restless. Her respiratory rate is 36br /min, HR 108, BP 90/45, T 38, 6 °C and O₂ saturation is 45%. On auscultation, her chest is clear. A blood gas analysis shows the patient to be in Type 1 respiratory failure. A chest X-Ray shows mediastinal widening with hilar lymphadenopathy and left mid-zone consolidation. You are requested to admit the patient to ICU for mechanical ventilation. Her husband wants to know details from you as to what is exactly wrong with his wife regarding her deterioration in health, and pleads with you to do everything to save her life.

TABLE 26 ADMISSION TO ICU % (N=87 RESPONSES)

Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
12.6(n=11)	10.3(n=9)	14.9(n=13)	46.0(n=40)	16.1(n=14)

TABLE 27 DETERMINANTS OF CRITICAL CARE SPECIALISTS DISAGREEMENT (1) VERSUS AGREEMENT (0) FOR RESPIRATORY FAILURE IN 24 YEAR OLD CLINICALLY ADVANCED AIDS USING BIVARIATE LOGISTIC REGRESSION

Determinant	Disagreed to admission yes/N (%)	Agreed to admission yes/N (%)	Odds ratio (95% CI)	p-value ⁱ
A. Prognosis of acute disease	16/19 (84.2)	50/54 (92.6)	0.43 (0.09-2.11)	0.367
B. Prognosis of underlying disease	18/19 (94.7)	45/54 (83.3)	3.6 (0.42-30.51)	0.437
C. Patients age	4/19 (21.1)	44/54 (81.5)	0.06 (0.02-0.22)	<0.001
D. Resources	14/19 (73.7)	23/54 (42.6)	3.77 (1.19-11.98)	0.032
E. Human rights	4/19 (21.1)	14/54 (25.9)	0.76 (0.22-2.69)	0.766
F. Patient preferences	4/19 (21.1)	11/54 (20.4)	1.04 (0.29-3.77)	0.950
G. Family wishes	3/19 (15.8)	15/54 (27.8)	0.49 (0.12-1.92)	0.368
H. Cultural considerations	0/19 (0.0)	0/54 (0.0)	--- ⁱⁱ	---
I. Financial implications for family	1/19 (5.3)	3/54 (5.6)	0.94 (0.09-9.67)	0.962
J. Socio-economic status	1/19 (5.3)	0/54 (0.0)	--- ⁱⁱ	0.260
K. Physician experience	8/19 (42.1)	24/54 (44.4)	0.91 (0.32-2.62)	0.860
L. Policy of intensive care unit	7/19 (36.8)	16/54 (29.6)	1.39 (0.46-4.16)	0.577
M. Threat of litigation	2/19 (10.5)	7/54 (13.0)	0.79 (0.15-4.18)	0.782
N. Bed used to the prejudice of another patient	8/19 (42.1)	11/54 (20.4)	2.84 (0.92-8.77)	0.076

i: Fishers exact p-value presented when cell in cross tabulation contains <5 observations

ii: cannot be calculated given a zero containing cell in cross tabulation

TABLE 28 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE FOR THIS PATIENT?

Determinant	Disagreed to admission yes/N (%)	Agreed to admission yes/N (%)	Odds ratio (95% CI)	p-value ⁱ
Patients who may live for several years but whose quality of life is very poor <u>according to the doctor's opinion</u>	12/19 (63.2)	27/46 (58.7)	1.21 (0.40-3.63)	0.739
Patients who may live for several years but whose quality of life is very poor <u>according to the patient's opinion</u>	7/16 (43.8)	25/39 (64.1)	0.44 (0.13-1.42)	0.231
Patients with very limited chances of survival (or poor prognostic index if calculated)	14/16 (87.5)	31/42 (73.8)	2.48 (0.48-12.72)	0.318
Patients with no hope of survival for more than a few weeks	14/16 (87.5)	28/42 (66.7)	3.5 (0.70-17.59)	0.188

i: Fishers exact p-value presented when cell in cross tabulation contains <5 observations

ii: cannot be calculated given a zero containing cell in cross tabulation

6.5.2.1 PURPOSE OF SCENARIO 2

This scenario tested the effect of HIV status, the stage of the disease and age, so was designed to elicit an acceptance rate close to 100%. It also tested HIV disclosure and influence of family wishes.

6.5.2.2 RESULTS OF SCENARIO 2

Fifty four (62%) of the respondents agreed with ICU admission, with 13(14.9%) uncertain and 20(22.9%) disagreeing with ICU admission. (Table 26) The most important determinants to admission were ‘patients age’ (OR 0.06, 95% CI: 0.02-0.22, $p < 0.001$) and ‘resources’ (OR 3.77 95% CI: 1.19-11.98, $p = 0.032$). CCSs attached least importance to ‘physician experience’, ‘policy of intensive care unit’, ‘threat of litigation’ and bed used to the prejudice of another patient’. (Table 27) Regarding HIV status disclosure to the spouse, 55.5% ($n=50$) would not make disclosure. This decision is informed by ‘knowledge of the law’ 80 % ($n=68$). The majority, 73.9% ($n=65$), would urgently initiate HAART. Those who disagreed to admission were marginally less likely to disclose the wife’s HIV status to the husband (OR=0.33, 95%CI: 0.11-1.05, $p=0.060$) compared to those who agreed to admission. This translates into a proportion who would disclose among those who disagreed of 25% ($n=5/20$) compared to 50.0% ($n=27/54$) among those who agreed to admission.

CCSs who disagreed to admission of this patient were not significantly more likely to say that “Knowledge of law” influenced their decision (OR=1.18, 95%CI: 0.27-5.18, $p=0.828$).

CCSs who disagreed to admission of this patient were not significantly more likely to say that “Ethical code of conduct-HPCSA” influenced their decision (OR=1.38, 95%CI: 0.32-5.91, $p=0.665$). CCSs who disagreed to admission of this patient were not significantly less

likely to say that “Personal duty-based decision” influenced their decision (OR=0.37, 95% CI: 0.07- 1.88, p=0.230).

CCSs who would disclose the wife’s HIV status to the husband were also significantly more likely to consider urgent initiation of HAART beneficial for the patient if admitted to ICU (OR=3.19, 95% CI: 1.04-9.83, p=0.043) compared to those who would not disclose. This corresponds to 86.5% (32/37) versus 67.4% (31/46).

CCSs who would disagree to admit this patient to ICU were significantly less likely to consider urgent initial of HAART beneficial for the patient (OR=0.16, 95% CI: 0.05-0.54, p=0.003) compared to those who would choose to admit. This corresponds to 50.0% (9/18) versus 86.3% (44/51).

CCSs who would disagree to admit this patient to ICU were not significantly less likely to list “A. Prognosis of acute disease” as a potential determinant of admission (OR=0.43, 95% CI: 0.09-2.11, p=0.297) compared to those who would chose to admit. This corresponds to 84.2% (16/19) versus 92.6% (50/54).

CCSs who would disagree to admit this patient to ICU were not significantly more likely to list “B. Prognosis of underlying disease” as a potential determinant of admission (OR=3.6, 95% CI: 0.42-30.5, p=0.240) compared to those who would choose to admit. This corresponds to 94.72% (18/19) versus 83.3% (45/54).

CCSs who would disagree to admit this patient to ICU were significantly less likely to list “C. Patients age” as a potential determinant of admission (OR=0.06, 95% CI: 0.02-0.22,

p<0.001) compared to those who would chose to admit. This corresponds to 21.1% (4/19) versus 81.5% (44/54).

CCSs who would disagree to admit this patient to ICU were significantly more likely to list “D. Resources” as a potential determinant of admission (OR=3.78, 95% CI: 1.19-11.98, p=0.024) compared to those who would choose to admit. This corresponds to 73.7% (14/19) versus 42.6% (23/54). No significant association observed between disagreement/agreement to admit and “E. Human rights” as a determinant.

No significant association was observed between disagreement/agreement to admit and “F. Patient preferences” as a determinant. No significant association observed between disagreement/agreement to admit and “G. Family wishes” as a determinant.

“H. Cultural considerations” was not selected as a determinant in the top 5. No significant association was observed between disagreement/agreement to admit and “I. Financial implications for family (e.g. sole breadwinner)” as a determinant No significant association was observed between disagreement/agreement to admit and “J. Socio-economic status” as a determinant. No significant association was observed between disagreement/agreement to admit and “K. Physician experience” as a determinant. No significant association was observed between disagreement/agreement to admit and “L. Policy of intensive care unit” as a determinant. No significant association observed between disagreement/agreement to admit and “M. Threat of litigation” as a determinant. CCSs who would disagree to admit this patient to ICU were marginally significantly more likely to list “N. Bed used to the prejudice of another patient” as a potential determinant of admission (OR=2.84, 95% CI: 0.92-8.77, p=0.069) compared to those who would chose to admit. This corresponds to 42.1% (8/19) versus 20.4% (11/54).

There was a significant difference in frequency's ($p=0.005$, Fishers Exact test) between those who disagreed versus agreed for this patient to be admitted when cross tabulated against withholding therapy. Those who disagreed generally ($n=11/19$, 57.9%) suggested that "whenever possible withholding therapy is preferable, while among those who agreed to admission, a larger proportion deemed that the patient should be given maximal treatment 69.2% ($n=36/52$). With regards to factors influencing their decision to give access to this patient to ICU care, no significant difference in frequency was observed for any of the categories.(Table 28)

6.5.2.3 DISCUSSION OF SCENARIO 2

The majority of CCSs would agree to ICU admission, with the most important determinants being 'patients' age' and 'resources'. CCSs who chose to admit the patient deemed that maximal treatment should be given. Those who chose not to admit cited 'bed used to the prejudice of another patient' and 'whenever possible withholding therapy is preferable'. They attached least importance to 'physicians experience', 'policy of ICU', 'threat of litigation', and 'bed used to the prejudice of another patient'. The majority would not make HIV disclosure to the spouse citing 'knowledge of the law'. The majority of CCSs would initiate HAART for this patient. CCSs who would disclose HIV status to the spouse were significantly more likely to initiate HAART if admitted to ICU. CCSs who would disagree to admit this patient to ICU were significantly influenced by 'resources' and 'prognosis of the underlying disease' rather than 'patients' age'. CCSs did not attach importance to 'family wishes' or cultural considerations', or 'financial implications', 'policy of ICU' or 'threat of litigation'.

TABLE 29 SCENARIO 1 VERSUS 2 ON DISAGREEMENT TO ADMIT

Scenario 1 versus scenario 2	Proportion (95% CI)
Scenario 1- disagree to admission to ICU respiratory failure in 70 year old clinically advanced AIDS	81.7% (71.6-89.4%)
Scenario 2- disagree to admission to ICU respiratory failure in 24 year old clinically advanced AIDS	27% (17.4-38.8%)

6.5.2.4 DISCUSSION- SCENARIO 1 VERSUS SCENARIO 2

A larger proportion of CCSs disagreed that the patient in Scenario 1 should be admitted to ICU (81.7%, 95% CI: 71.6-89.4%). (Table 29) This is in contrast to their decision for the patient in Scenario 2 where a smaller proportion disagreed that the patient should be admitted (27.0%, 95% CI: 17.4-38.6%). A significant discordancy between their decisions in scenario 1 versus scenario 2 can also be observed ($p < 0.001$, McNemar's exact test). Therefore approximately 73% (not counting uncertain [neutral] responses) of CCSs agreed that the patient in scenario 2 should be admitted compared to only approximately 18% for scenario 1.

6.5.3 Scenario 3. Priority setting - one ICU bed available

A 75 year old patient (a) presents to the A/E Department at the regional hospital in type 1 respiratory failure. He is wasted and has oral candidiasis. Chest examination is clinically clear, with the C-X-ray showing ground glass shadowing consistent with PJP. The patient requires ventilation. His CD4 count is 1 and has defaulted his HAART for many months. At the same time, you are also presented with an 18 year old patient (b) with drug overdose

(suicide attempt) and in severe respiratory depression with uncontrollable seizures requiring ICU care for ventilation, you have only 1 ventilator bed available. The CCS had to decide on fair allocation of resources between **Patient A- 75 yrs.** AIDS, PJP, Resp. Failure, CD4-1, defaulted HAART for many months, and **Patient B-18 yrs.** Drug o/d, severe respiratory depression, uncontrollable seizures (Table 30)

TABLE 30 ADMISSION TO ICU FOR PATIENT A VERSUS PATIENT B

ADMISSION TO ICU?	<i>n=85responses</i> (%)
Patient A	8(9.4)
Patient B	77(90.6)

6.5.3.1 PURPOSE OF SCENARIO 3

This scenario concerned decisions regarding resource allocation and the ‘last ICU bed’ to an older patient with advanced HIV disease as opposed to a younger patient with drug overdose and not infected with HIV. It was designed to elicit a 100% acceptance rate to intensive care for the younger patient with drug overdose. The scenarios were so designed as to elicit a refusal rate close to 100% for patient A and an acceptance rate of close to 100% for patient B.

6.5.3.2 RESULTS OF SCENARIO 3

A larger proportion of respondents thought that patient B should be admitted to ICU (90.6%, 95% CI: 82.3-95.8%) over patient A. In this dichotomous scenario, 79(87.7 %) of CCSs prioritised Patient B for ICU admission over Patient A 9(10%). (Table 31) If patient A was already on ventilation in ICU, respondents would not withdraw ICU care in favour of patient B, as ‘The ICU Physician should preserve life at all costs. Sixty nine (76.6 %) would rather move Patient B to a high-care unit. (Table 31) However, in response to the question on ‘What factors listed below would influence your decision to withdraw further ICU care to Patient A’, respondents rated as important ‘patients with a limited chance of

survival (or poor prognostic index if calculated) 69(88.5 %) and ‘patients with no hope of survival for more than a few weeks’ 69(88.2 %).(Table 31)

Thirty one (36 %) considered age as important. (Fig 6.3) With regard to Patient A, 78(86.6 %) of respondents rated ‘withholding/withdrawing of ICU care’ because of a ‘limited chance of survival’. (Table 32)

TABLE 31 PRIORITY SETTING - ONE ICU BED AVAILABLE

Scenario 3 Patient A – 75 years, HIV, PJP Priority setting – one ICU bed available	<i>n</i> agree(%)
Withholding/withdrawing ventilator care to patient A – limited chance of survival	78/90(86.6)
Admit to ICU	9/90(10%)
Patient B – 24 years, drug overdose, respiratory depression and seizures	
Admit to ICU	79/90(87.7)
No ICU beds; maintain ICU care for patient A, admit patient B to high-care unit	69/90(76.6)

TABLE 32 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE FOR THE PATIENT B ?

Factors	YES N (%)	NO N (%)
Patients who may live for several years but whose quality of life is very poor <u>according to the doctor's opinion</u>	36(50)	36(50)
Patients who may live for several years but whose quality of life is very poor <u>according to the patient's opinion</u>	37(53.6)	32(46.4)
Patients with very limited chances of survival (or poor prognostic index if calculated)	67(88.5)	9(11.5)
Patients with no hope of survival for more than a few weeks	67(88.2)	9(11.8)

The most important determinants to ICU care in this scenario are ‘prognosis of acute disease’ 51(58.6 %) and prognosis of underlying disease 40(40.6 %). (Fig 6) The least important determinants for ICU admission were ‘bed used to the prejudice of another patient’ 20(23.8 %) and ‘resources’ 22 (25.3%). (Fig 6) Fifty six (83.6%) would not perform an HIV test, citing the principle of non-maleficence. They considered the patient to be high suicide risk and would defer the test in favour of counseling. Half (n=53, 68.8%) would perform the HIV testing post-sexual assault, citing the principle of beneficence.

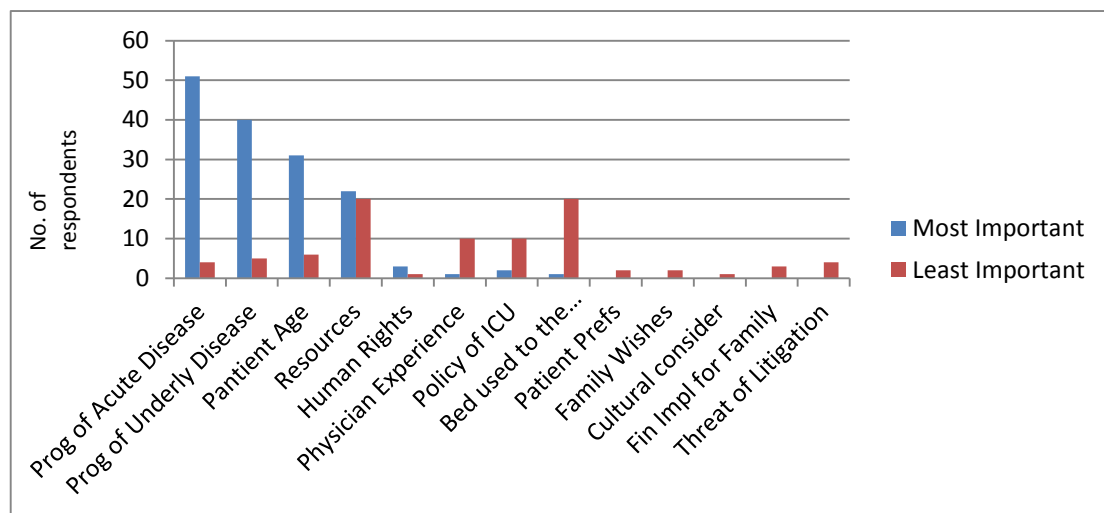


FIGURE 6 DETERMINANTS OF ADMISSION TO INTENSIVE CARE-PRIORITY SETTING - ONE ICU BED AVAILABLE

With regards to factors influencing their decision to give access to the patient B relative to Patient A to ICU care, no significant difference in frequency was observed for all categories (from “Doctors option” to “no hope of survival...”). With regards to withdrawing patient A from ventilation, no significant difference (p=0.725, Fishers exact test) could be identified between those who selected patient A for admission versus patient B for admission (question 3.1). Amongst those who selected patient A or patient B (question 3.1), the most frequently selected category was “Neither can be accepted. The ICU physician should preserve life at all costs. Rather move patient B to a high-care unit”.

No statistical significance was observed when cross tabulating question 3.1 against question 3.5 (factors influencing decision to withdraw further ICU care to patient A).

In response to the request by patient B for an HIV test 46/87 or 47.1% opted not to perform the test. The confidence interval for the proportion however overlaps with 50% so majority cannot be inferred.

6.5.3.3 DISCUSSION OF SCENARIO 3

In this dichotomous scenario, the majority of CCSs would admit Patient B (90.6%). In response to refusal of admission for Patient A, the majority of CCSs rated ‘withholding /withdrawing of care because of a ‘limited chance of survival’. However, if patient A was already in ICU on ventilation, they would maintain patient A in ICU citing ‘The ICU physician should preserve life at all costs’. CCSs would rather move Patient B to a high-care unit in that case.

In response to what factors would influence their decision to withdraw further ICU care for Patient A, they state ‘limited chance of survival’ and ‘patients with no hope of survival for more than a few weeks. There is therefore a discrepancy between CCSs decision to refuse Patient B admission to ICU on the basis of ‘withholding /withdrawing of care because of a ‘limited chance of survival’. But if Patient A was already in ICU, CCSs would refuse Patient B admission stating that “Neither can be accepted. The ICU physician should preserve life at all costs. Rather move patient B to a high-care unit”.

CCSs would also attach importance to prognosis of the acute disease and underlying disease which makes their decision above incongruent. The decision to defer the HIV testing for the patient (47.1%) is questionable as the urgent initiation of HAART would

benefit the patient and protect her against a potentially incurable disease, especially since the patient is in the protective environment of the hospital.

6.5.4 Scenario 4 - Respiratory failure, PJP, AIDS-CD4 count-1- defaulted ART and TB treatment for many months, suspected of MDR/XDR TB

A 55 year old patient (a) presents to the A/E at the regional hospital in Type 1 respiratory failure. He is wasted and has oral candidiasis. Chest examination is clinically clear. C-X-ray shows ground-glass shadowing consistent with PJP. The patient requires ventilation. His CD4 count is 1 and he has defaulted his HAART for many months.

6.5.4.1 PURPOSE OF SCENARIO 4

This scenario was designed to elicit a 100% refusal to intensive care in view of the advanced disease, possible MDR/XDR TB, poor commitment to treatment and threat of infection to ICU staff and other patients.

6.5.4.2 RESULTS OF SCENARIO 4

The majority of respondents disagreed that the patient (50/66) should be admitted to ICU (75.8%, 95% CI: 63.6-85.5%), which is also significantly different to 50% - suggesting majority. (Table 33)

TABLE 33 ADMISSION TO ICU - % (N=84 RESPONSES)

STRONGLY DISAGREE	DISAGREE	UNCERTAIN	AGREE	STRONGLY AGREE
42.9(n=36)	16.7(n=14)	21.4(n=18)	19(n=10)	7.1(n=6)

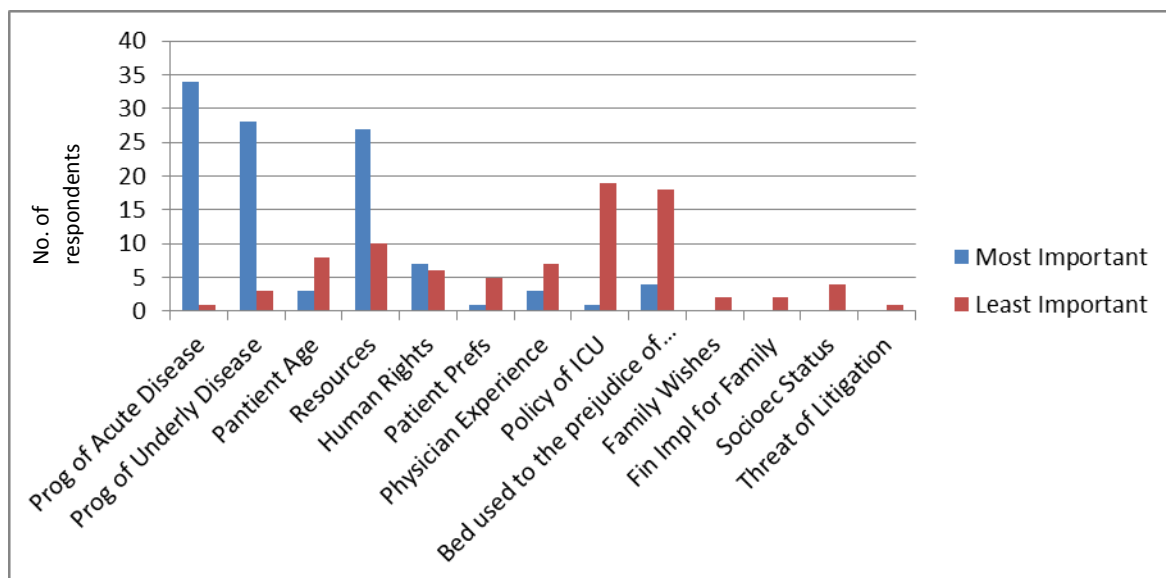


FIGURE 7 DETERMINANTS OF ADMISSION TO INTENSIVE CARE- RESPIRATORY FAILURE, PJP, AIDS-CD4 COUNT-1

CCSs who would disagree to admit this patient to ICU were significantly more likely to list “D. Resources” as a potential determinant of admission (OR=6.83, 95% CI: 1.86-25.12, p=0.004) compared to those who would choose to admit. This corresponds to 83.7% (41/49) versus 42.9% (6/14).(Table 34)

TABLE 34 DETERMINANTS OF CCSS DISAGREEMENT (1) VERSUS AGREEMENT (0) FOR RESPIRATORY FAILURE, PJP, AIDS-CD4 COUNT-1- DEFAULTED ART AND TB TREATMENT FOR MANY MONTHS, SUSPECTED MDR/XDR TB (SCENARIO 4) USING BIVARIATE LOGISTIC REGRESSION.

Determinant	Disagreed to admission yes/N (%)	Agreed to admission yes/N (%)	Odds ratio (95% CI)	p-value ⁱ
A. Prognosis of acute disease	46/49 (93.9)	12/14 (85.7)	2.56 (0.38-17.06)	0.307
B. Prognosis of underlying disease	46/48 (95.8)	12/14 (85.7)	3.83 (0.49-30.09)	0.217
C. Patients age	16/49 (32.7)	6/14 (42.9)	0.65 (0.19-2.18)	0.534
D. Resources	41/49 (83.7)	6/14 (42.9)	6.83 (1.86-25.11)	0.004
E. Human rights	8/49 (42.9)	6/14 (42.9)	0.26 (0.07-0.96)	0.043
F. Patient preferences	4/49 (8.2)	1/14 (7.1)	1.16 (0.12-11.26)	0.901
G. Family wishes	1/49 (2.0)	1/14 (7.1)	0.27 (0.02-4.63)	0.398
H. Cultural considerations	0/49 (0.0)	0/14 (0.0)	--- ⁱⁱ	---
I. Financial implications for family	1/49 (2.0)	3/14 (21.4)	0.08 (0.01-0.81)	0.032
J. Socio-economic status	1/49 (2.0)	1/14 (7.1)	0.27 (0.02-4.63)	0.398
K. Physician experience	22/49 (44.9)	4/14 (28.6)	2.04 (0.56-7.39)	0.362
L. Policy of intensive care unit	21/49 (42.86)	6/14 (42.9)	1.00 (0.30-3.32)	0.617
M. Threat of litigation	1/49 (2.0)	3/14 (21.4)	0.08 (0.01-0.81)	0.032
N. Bed used to the prejudice of another patient	35/49 (71.4)	3/14 (21.4)	9.2 (2.22-37.89)	0.001

i: Fishers exact p-value presented when cell in cross tabulation contains <5 observations

ii: cannot be calculated given a zero containing cell in cross tabulation

There were significant differences in the justification of their decision in question 4.2 ‘You would justify to admit as follows’ against their choice in question 4.1 ‘Please rate your admission to ICU’ when comparing those who disagreed to those who agreed (p<0.001). Among those CCSs who disagreed to admitting this patient, the majority (n=38/50 or 76%) justified their choice with “patient should not be admitted to ICU as he has several co-morbid conditions”. Among those CCSs who agreed to admitting this patient, the majority (n=8/14 or 57.1%) justified their choice with “the ICU physician should preserve life at all costs”. The logistic regression using the first justification choice as the reference group further demonstrates the odds differences in terms of justification choice i.e. lower odds of disagreeing CCSs being in category 2 (“preserve life at all costs”) and conversely higher odds of disagreeing CCSs being in category 3 (“patient should not be admitted to ICU as he has several co-morbid conditions...”).

TABLE 35 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE FOR THIS PATIENT?

Determinant	Disagreed to admission yes/N (%)	Agreed to admission yes/N (%)	Odds ratio (95% CI)	p-value ⁱ
Patients who may live for several years but whose quality of life is very poor <u>according to the doctor’s opinion</u>	21/40 (52.5)	7/9 (77.8)	0.32 (0.06-1.71)	0.267
Patients who may live for several years but whose quality of life is very poor <u>according to the patient’s opinion</u>	15/37 (40.5)	3/7 (42.9)	0.91 (0.18-4.66)	0.909
Patients with very limited chances of survival (or poor prognostic index if calculated)	38/42 (90.5)	11/11 (100.0)	--- ⁱⁱ	0.569
Patients with no hope of survival for more than a few weeks	32/40 (80.0)	8/9 (88.9)	0.50 (0.05-4.60)	0.540

i: Fishers exact p-value presented when cell in cross tabulation contains <5 observations

ii: cannot be calculated given a zero containing cell in cross tabulation

Regarding admission to ICU, respondents also rated as important ‘several co-morbid conditions, shown poor commitment to treatment and his MDR/XDR TB poses a health risk to the ICU team and patients and public in general.’ (Table 35) Most CCSs said ‘He should be referred to an isolation facility for palliative care’ 62.9 % (n=56). Neither those disagreeing or agreeing to the admission of this patient selected “H. Cultural considerations” as one of the top 5 important determinants. CCSs who would disagree to admit this patient to ICU were significantly less likely to list “I. Financial implications for the family (e.g. sole breadwinner)” as a potential determinant of admission (OR=0.08, 95% CI: 0.01-0.81, p=0.032) compared to those who would choose to admit. This corresponds to 2.0% (1/49) versus 21.4% (3/14).

CCSs who would disagree to admit this patient to ICU were significantly less likely to list “M. Threat of litigation” as a potential determinant of admission (OR=0.08, 95% CI: 0.01-0.81, p=0.032) compared to those who would choose to admit. This corresponds to 2.0% (1/49) versus 21.4% (3/14). CCSs who would disagree to admit this patient to ICU were significantly more likely to list “N. Bed used to the prejudice of another patient” as a potential determinant of admission (OR=9.17, 95% CI: 2.22-37.89, p=0.002) compared to those who would chose to admit. (Table 34) This corresponds to 71.4% (35/49) versus 21.4% (3/14).

6.5.4.3 DISCUSSION OF SCENARIO 4

The majority of CCSs would not admit this patient to ICU citing ‘resources’ as important and justified their choice by stating ‘several co-morbid conditions, poor commitment to treatment and his MDR/XDR TB poses a health risk to the ICU team and patients and public’. They also attached importance to ‘bed used to the prejudice of another patient’.

They contend that he should be referred to an isolation facility for palliative care. Those choosing not to admit him were significantly less likely to be influenced by ‘financial implications for the family (e.g. sole breadwinner) or ‘threat of litigation. Those that chose to admit the patient stated that the CCS should ‘preserve life at all costs’

6.5.5 Scenario 5- Resource limitations and priority setting

A 40 year–old male patient (patient a) is admitted to the ICU following a motor vehicle accident in which he suffered severe head and abdominal injuries. He is known to be HIV positive with his CD4 count pending. After four weeks in the ICU, the patient’s neurological condition has stabilized with minimal function (the patient does not communicate but withdraws all four limbs to painful stimuli). Following numerous bouts of sepsis, the patient is developing renal failure. He is anuric, hyperkalaemic, and acidotic. He is also ventilator dependant and on high doses of inotropes. The patient’s family states that in their culture, life continues until the heart stops beating. The family requests that all resuscitative efforts be continued, including dialysis. In parallel, a second patient (patient b) with similar injuries, but with metastatic prostate cancer, is admitted to the A/E and requires an ICU bed. In addition to his acute head injury, he is wheel-chair bound as a result of dementia. No ICU beds are currently available.²³ Scenario 5 consisted of:

Patient A - 40 years old, had trauma injury, HIV +ve, persistent vegetative state, organ failure and inotropic support and ventilator dependent.

Patient B – 40 years old, metastatic carcinoma, wheel-chair-bound, dementia and acute head injury

6.5.5.1 PURPOSE OF THE SCENARIO 5

This scenario tested the responses regarding priority setting and issues influencing emergency care, withholding and withdrawing of care and medical futility in the setting of a single ICU bed. The two patients are matched for age, with the one patient, HIV positive, post-acute following a head injury, and ventilator- dependent, on inotropic support, and remaining in a persistent vegetative state for four weeks with sepsis and organ failure requiring dialysis, and the competing patient for the single ICU bed having metastatic carcinoma and dementia, wheel-chair-bound, and acute head-injury.

This scenario tested the influence of the ‘last ICU bed’ in the context of a medical emergency, the influence of co-morbidities in admission decisions and the influence of family and cultural wishes.

6.5.5.2 RESULTS OF SCENARIO 5

Only 14 (n=18.4%) of the CCSs would have admitted patient B. The 95% confidence interval for selecting patient B was 10.5-29.0%, suggesting significant minority.

TABLE 36 RESOURCE LIMITATIONS AND PRIORITY SETTING

Determinant	Admit patient A yes/N (%)	Admit patient B yes/N (%)	Odds ratio (95% CI)	p-value ⁱ
A. Prognosis of acute disease	14/14 (100.0)	43/59 (72.9)	--- ⁱⁱ	0.030
B. Prognosis of underlying disease	13/14 (92.9)	49/59 (83.1)	2.65 (0.31-22.65)	0.679
C. Patients age	3/14 (21.4)	25/59 (42.4)	0.37 (0.09-1.47)	0.223
D. Resources	12/14 (85.7)	35/49 (59.3)	4.11 (0.84-20.06)	0.118
E. Human rights	7/14 (50.0)	20/59 (33.9)	1.95 (0.60-6.33)	0.357
F. Patient preferences	1/14 (7.1)	2/59 (3.4)	2.19 (0.18-26.05)	0.477
G. Family wishes	5/14 (35.7)	24/59 (40.7)	0.81 (0.24-2.72)	0.733
H. Cultural considerations	0/14 (0.0)	13/59 (22.0)	--- ⁱⁱ	0.061
I. Financial implications for family	1/14 (7.1)	6/59 (10.2)	0.68 (0.08-6.15)	0.731
J. Socio-economic status	1/14 (7.1)	3/59 (5.1)	1.44 (0.14-14.94)	0.762
K. Physician experience	5/14 (35.7)	20/59 (33.9)	1.08 (0.32-3.67)	0.898
L. Policy of intensive care unit	2/14 (14.3)	20/59 (33.9)	0.33 (0.07-1.60)	0.204
M. Threat of litigation	1/14 (7.1)	11/59 (18.6)	0.34 (0.04-2.84)	0.440
N. Bed used to the prejudice of another patient	4/14 (28.6)	21/59 (35.6)	0.72 (0.20-2.59)	0.759

i: Fishers exact p-value presented when cell in cross tabulation contains <5 observations

ii: cannot be calculated given a zero containing cell in cross tabulation

TABLE 37 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE FOR PATIENT A AND B?

Determinant	Admit patient A yes/N (%)	Admit patient B yes/N (%)	p-value ⁱ
Patients who may live for several years but whose quality of life is very poor <u>according to the doctor's opinion</u>	41/51 (80.4)	13/14 (92.9)	0.432
Patients who may live for several years but whose quality of life is very poor <u>according to the patient's opinion</u>	16/41 (39.0)	9/12 (75.0)	0.047
Patients with very limited chances of survival (or poor prognostic index if calculated)	42/51 (82.4)	10/12 (83.3)	0.684
Patients with no hope of survival for more than a few weeks	36/44 (81.8)	10/12 (83.3)	0.637

i: Fishers exact p-value presented when cell in cross tabulation contains <5 observations

ii: cannot be calculated given a zero containing cell in cross tabulation

Those who selected patient B for admission were significantly more likely to list “A. Prognosis of acute disease” among the top 5 most important determinants influencing their decision ($p=0.030$). (Table 36) Those who selected patient B for admission were marginally significantly more likely to list “D. Resources” among the top 5 most important determinants influencing their decision. (OR = 4.11, 95% CI: 0.84-20.06, $p=0.080$). (Table 36) CCSs who selected patient B for admission were significantly less likely to access patient A to dialysis for “Positive HIV status” (0% versus 34%, $p=0.025$, Fishers Exact test).

CCS would prioritise patient A for the continued use of the ICU bed 81.3 % ($n=61$) over patient B 18.7 % ($n=14$). (Table 36) Respondents rated as most important the prognosis of underlying disease 39.8 % ($n=33$) and ‘prognosis of acute disease’ 36.1% ($n=30$) as important. The least important determinant was ‘bed used to the prejudice of another patient’ 14.5% ($n=11$). In response to the withdrawal of care for patient A, in preference for patient B, respondents rated ‘principle of first come-first served’ (32.9% ($n=28$)) and ‘withholding therapy is preferable as continued therapy is medically futile’ (30.6% ($n=26$)).

CCSs would admit patient B and not patient A for ICU admission when asked ‘Patients who may live for several years but whose quality of life is very poor according to the patient’s opinion’ (75 % (9/12) ($p=0.047$). (Table 37)

6.5.5.3 DISCUSSION OF SCENARIO 5

The majority of CCSs would prioritise Patient A for the continued use of the ICU bed, stating prognosis of acute disease’ and ‘ prognosis of underlying disease’ as most important, and least important ‘ bed used to the prejudice of another patient’. This decision by CCSs would be incongruent as patient A is in a persistent vegetative state with multiple

organ failure making his prognosis poor. Further treatment should be withdrawn, including ICU care. Patient B, irrespective of his co-morbidities, has an acute head injury requiring ICU care. This would be regarded as a medical emergency. However, a minority of CCSs would admit this patient to ICU, stating ‘prognosis of the acute disease’ as an important determinant that would influence their decision. CCSs that chose to admit Patient B to ICU stated ‘resources’ among the top 5 most important determinants influencing their decision. CCSs who selected Patient B for admission were less likely to admit patient A for dialysis for ‘Positive HIV status’.

6.6 DISCUSSION OF RESULTS OF QUESTIONNAIRE

Specific factors influence the CCS in decisions to admit patients to intensive care. In keeping with published guidelines, doctors considered the prognosis of the acute disease and of the underlying disease as most important.^{20 195 315 316} Regarding determinants of admission to intensive care for patients with HIV infection, most CCSs rated as important or very important the prognosis of the acute disease and of the underlying disease. These two factors comprise the basic guiding principles of triage, and other studies have shown that they are associated with admission to intensive care.^{20 35 195 315 316} Most respondents rated as probably important or least important ‘resources’ availability, ‘bed used to the prejudice of another patient’, and ‘policy of the intensive care unit’.

6.6.1 Twelve criteria to assess admission to intensive care

Most CCSs cited the availability of an ICU bed as influencing the decision to admit. Surprisingly, a large number would admit to ICU ‘patients who may live for several years but whose quality of life is very poor according to the doctor’s opinion. These problems explain the “relatively liberal attitude” regarding the ICU admission of patients with poor

prognosis.³⁶ Unfair allocation of resources may result, as in denying the acute head injury patient with metastatic carcinoma in preference to the patient with persistent vegetative state and organ failure with sepsis; withdrawing of ICU care for the 75 year old, HIV positive patient, defaulted treatment, PJP, respiratory failure on ventilation , when no ICU beds are available and denying admission of the young patient with drug overdose to ICU, who has a better chance of survival to discharge. Such decisions by the CCS is non-utilitarian, and could be explained by the overwhelming need by the CCS to act in terms of beneficence to the patient, and would be in keeping with the professional guideline of ‘first-come, first served’, a fair allocation decision endorsed by the American Thoracic Society.³¹⁷ (Table 38, 39)

TABLE 38 MOST IMPORTANT DETERMINANTS FOR ALL FIVE SCENARIOS IN INCREASING ORDER OF OCCURRENCE

	Determinant	Most Important
1	Prognosis of Acute Disease	182
2	Prognosis of Underlying Disease	126
3	Patient Age	27
4	Human Rights	25
5	Bed used to the prejudice of another Patient	11
6	Family Wishes	10
7	Physician Experience	10
8	Policy of ICU	8
9	Resources	8
10	Patient Preferences	7
11	Threat of Litigation	2
12	Financial Implications for the Family	1
13	Cultural consider	0
14	Socio-economic Status	0

TABLE39 LEAST IMPORTANT DETERMINANTS FOR ALL FIVE SCENARIOS IN DECREASING ORDER OF OCCURRENCE

	Determinants	Least Important
1	Resources	69
2	Policy of ICU	56
3	Bed used to the prejudice of another Patient	55
4	Physician Experience	40
5	Patient Age	28
6	Family Wishes	28
7	Prognosis of Underlying Disease	24
8	Human Rights	20
9	Prognosis of Acute Disease	17
10	Threat of Litigation	17
11	Patient Preferences	15
12	Financial Implications for the Family	15
13	Cultural consider	9
14	Socio-economic Status	9

Kohn *et al*, in their questionnaire to CCSs, concluded:²² “ This study suggests that many ICU clinicians feel compelled to provide salvage critical care for identifiable patients with grave prognoses even when doing so measurably contravenes society’s interests”. The scenarios presented in their survey involved allocation decisions for the single ICU bed and the two competing patients included a 61 year patient with anoxic brain damage, who had an organ donor card, awaiting harvesting of organs. The competing patient for the single ICU bed was also 61 years old, but with metastatic carcinoma, septic shock and multi-organ failure. The CCSs overwhelmingly showed an obligation to the identifiable living patient i.e. metastatic carcinoma despite his compounded poor prognosis of septic shock and multi-organ failure.²²

The allocation of scarce resources, such as an ICU bed, requires difficult personal decisions by the CCS, especially in HIV endemic regions, on the effective triage of ICU admissions of patients with HIV infection based on individual case presentations, availability of resources, and applicable ethical principles.¹⁵ In an Italian survey by Giannini and Consinno,³⁷ inappropriate admissions were acknowledged by 86% of respondents. The reasons given were clinical doubt (33%); limited decision time (32%) and assessment error (25%). In the context of patients with HIV infection requiring ICU care, the ethical dilemmas regarding ICU admissions remain. Whom to admit to the ICU in the face of limited resources and how to manage the patient who has not recovered despite ICU care?

In the context of HIV/AIDS, the question of survival in ICU is currently the subject of intense debate.⁶⁴ Survival only to complete ventilator dependency, survival only to the high-care ward and survival to home with a poor quality of life as compared to pre-morbid

functioning, raises many ethical questions as to whether this level of intervention was appropriate in the first instance. In our study, younger age preference as a criterion for admission to ICU is evidenced by the inferential statistical analysis of scenarios 1 and 2. A larger proportion of respondents disagreed that the patient in scenario 1 should be admitted to ICU (81.7%, 95% CI: 71.6-89.4%) which is also significantly different to 50% - suggesting majority. This is in contrast to their decision for the patient in scenario 2 where a significant proportion agreed that the patient should be admitted (27.0%, 95% CI: 17.4-38.6%) again significantly different from 50% - suggesting minority. The significant discordancy between their decisions can also be observed ($p < 0.001$, McNemar's exact test). Both patients in scenarios 1 and 2 were matched for disease status (AIDS requiring mechanical ventilation) and CCSs would strongly agree on ICU care for patient B on age criterion and would also urgently initiate HAART in this patient.

In the dichotomous scenario 3, the CCS would strongly agree to admit the young patient with drug overdose (HIV status unknown) in preference to the older patient with AIDS requiring ICU care. The patient's younger age and HIV negative status possibly influenced the CCSs to prioritise her for ICU admission. However if patient A was already admitted to ICU, CCSs would not withdraw ICU care for patient A, but rather move patient B to a high-care unit.

In scenario 5, the CCS chose to keep the HIV positive patient in ICU, despite him having multiple organ failure and brain injury making survival to discharge unrealistic, and denying patient B, with acute trauma injuries, dementia and wheel-chair bound the 'chance at life' as he was a real emergency with head injury and deserving of the only ICU bed (i.e. ICU care should have been withdrawn for patient A.)

It would appear that in this study, CCS were not influenced by the HIV status of the patient, but were influenced by age (scenario 1 and 2), and the principle of ‘first come- first served, provided there is an expected minimal benefit to intensive care’ (scenario 3 and 5) in terms of ‘fair allocation of resources’, a principle advocated by the American Thoracic Society. In scenario 2 the denial of the young patient with overdose, requiring ventilation (patient B), in preference over the 75 year old HIV positive patient with PJP and who has defaulted treatment and occupying the ICU bed (patient A) suggests that respondents do not discriminate on the basis of their HIV status.

Furthermore, in Scenario 5 the patient with HIV/AIDS, persistent vegetative state, sepsis and organ failure and on inotropic support and ventilator dependence for four weeks is further evidence of this subjectivity in decision-making in ICU, as evidenced by Ward *et al* in their study.²⁰³ is at an advanced stage and the ‘reversibility of organ dysfunction’ is unrealistic. According to Levin and Sprung²³, the withdrawing of care means “ the cessation of therapy to prolong life”. This would be applicable to scenario 3, if Patient A was already admitted and Patient B with the overdose needed the only ICU bed available, and to scenario 5, with Patient A in a persistent vegetative state with multi-organ failure. Levin and Sprung²³, also state that the withholding of further care is not to commence therapy that may be required to prolong the patient’s life (Scenario 1 and patient A in Scenario 3, Scenario 4). In these patients the disease is at an advanced stage and the prospect of reversibility of organ dysfunction is poor.

Regarding HIV counseling and testing, elective surgery, and blood transfusion, the majority of CCSs would obtain written consent. A large number would accept oral consent for dialysis. The purpose of informed consent is to involve the patient in the decision-

making process in terms of respecting the autonomy of the patient. However in the intensive care setting the application of this principle has limitations.³⁶

The patient may not wish to know the complete details of their disease or the prognosis. In our questionnaire, more than a third of CCSs would consider the type of disease and severity of the prognosis as well as psycho-social issues of patient (personality, perceived wishes, suicidal, depressed etc.) before disclosure of medical information. The freedom and competency of the critically ill patient who becomes highly dependent on his environment (ICU) has been questioned.³¹⁸ Appelbaum and Grisso also mention, “ to begin with the presumption of competence but in life-threatening circumstances to lower the threshold at which the determination of probable incompetence is made”.³¹⁸ However, the law allows for proxy-consent by a surrogate decision-maker.³¹⁹ In an emergency, where timeous medical intervention is paramount, the ‘defense of necessity’ would prevail,¹²² and the CCS must proceed with the emergency intervention. Ethically the CCS is guided by the life-preserving goal of medicine, unless advanced directives, such as a DNR or living will is presented.

The WHO makes mention of ‘ethical partner notification’,¹⁴⁸ but for a patient who lacks consent-making capacity in ICU, such disclosure would create an ethical conflict and ‘awkward interactions’ between the ICU staff and relationships with family members.¹⁴⁷

The majority of CCSs indicated that they would respect patient autonomy as regards an informed refusal for treatment as well as complying with a written DNR order, with some accepting a verbal DNR order.

In the context on disclosure of medical information, South African law allows for such disclosure under four strict conditions namely, patients consent, by court order, an Act of Parliament (Mental Health Act, Children's Act, Sexual Offences Act etc.) and disclosure to reciprocal concerned third parties such as the spouse or known life partner.¹⁷² Outside these exceptions, such disclosure would attract criminal charges (violation of provisions under the NHA), civil claims, and charges of professional misconduct by the HPCSA.¹⁷²

In the two scenarios regarding 'family wishes', respondents considered the request least important in scenario 5 (patient in persistent vegetative state with sepsis and organ failure', and did not consider the request at all in the scenario 2 (24 yrs. old with AIDS, PJP in T1 resp. failure and KS of palate). Although this questionnaire assessed 'family wishes', it did not assess the quality nor the frequency of the communication with families, which has been described in other studies as problematic.

In the clinical context of a patient with HIV infection requiring resuscitation, clearly a DNR order from the patient would have to be respected. However in practice, such DNR orders are rarely seen, partly due to physicians not sharing such information with their patients and also due to the low literacy levels of patients presenting to public health institutions in SA.¹⁵⁸⁻¹⁶⁰ 'Do not resuscitate' (DNR) orders may be at the instruction of the patient with a 'living will' or the patient may verbally refuse treatment.¹⁷⁶ Furthermore, the physician may make a medical futility judgment as there is no realistic prospect of reversibility of organ dysfunction, or the patient and/or the family may refuse further care on the grounds of advanced disease making the prospect of resuscitation and subsequent recovery unrealistic.¹⁷⁶

However, these decisions do not preclude the patient access to palliative care and “allows the terminal condition to take its natural cause and thus prevent prolonging the patient’s death”.¹⁷⁶ A living will is an instruction by the patient, while competent, to the treating physicians instructing them “to withhold or withdraw life-sustaining treatment in the event of terminal illness or fatal injury and to allow natural death to take its cause”.¹⁷⁶ In the continuum of care for people living with HIV/AIDS, physicians should share knowledge of advance directives (living-will) with patients and their families, when the disease has progressed to an advanced stage. This would remove many of the ethical dilemmas on emergency intervention when patients present at an advanced stage of disease.

The majority of the CCSs chose to admit the patient, the 18 yr. old, drug O/D scenario so designed as to elicit an acceptance rate close to 100%. In another scenario designed to elicit a 100% refusal to ICU admission, (HIV, CD4 count of 1, PJP, MDR/XDR TB, defaulted HAART and TB treatment for many months), approximately 60% refused admission with approximately 20% agreeing to ICU admission. Patient or surrogate proxy preferences are unlikely to effectively ration ICU care.¹⁶⁸ According to Danis *et al* (1988) in their study ‘Patients’ and Families’ Preferences for Medical Intensive Care’¹⁶⁹, 70% of the patients and families were willing to undergo ICU care again even for one month of survival. In the same study, 8% of patients were unwilling to undergo ICU care to achieve any prolonging of survival. Preferences were poorly correlated with functional status, or quality of life and prognosis. Therefore, in this study, patients chose survival over quality of life.¹⁶⁹

In the two clinical vignettes designed to elicit a response regarding the urgent initiation of HAART in ICU, 58.6% of critical care physicians indicated that the urgent initiation of

HAART was not beneficial for the 70 yr. old patient with advanced HIV infection with T1 respiratory failure as opposed to 73.9% agreeing with the urgent initiation of HAART in the 24 year old patient with advanced HIV infection, PJP with type 1 respiratory failure and possible KS of the palate. The possible effects of age and other age-associated co-morbidities possibly influenced the CCSs on not to initiate HAART in the older patient. No consensus guidelines exist regarding the use of ARV's in ICU.^{320 321}

In Scenario 5 the majority of CCSs would keep the patient who is ventilator-dependent, with sepsis, organ failure and in a persistent vegetative state in ICU. This decision suggests that PLWHA are not discriminated against by CCSs in access to ICU care. Many patients and families believe that they are entitled to the full range of critical care services.¹⁸⁶ In scenario 5 'withdrawal of life support' becomes the focus of attention when a patient has an 'irreversible condition' and continued 'life-sustaining treatment' becomes medically futile.¹⁶³ In response to the question on 'factors influencing decisions regarding Patient A or Patient B for ICU care', respondents rated 'patients with very limited chances of survival (or poor prognostic index, if calculated) as important. However, this did not translate into decisions regarding prioritising the single ICU bed. In response to the withdrawal of care for the single ICU bed occupied by ventilator-dependent patient, in preference for patient with head injury, respondents rated 'principle of first come-first served' and 'withholding therapy is preferable as continued therapy is medically futile'. The point regarding the patient with head injury is that it was a true emergency.

6.6.2 Conclusion

A combination of factors was identified as influencing the decision to admit patients to intensive care. Prognosis and disease status were identified as the main factors influencing

admission. This study was not able to demonstrate significant discrimination towards PLWHA with regards to ICU admission. Unrestricted access to ICU, as demonstrated in this questionnaire, would pose major challenges to future healthcare provision for patients with HIV infection in countries with a high HIV burden, such as SA. The data may be helpful for health policymakers and ICU directors, and serve as a benchmark for future studies on ethical decision-making in the context of HIV/AIDS and ICU care in a resource-limited environment.

6.6.3 Limitations of study

The response rate of 20%, while low, is the norm for questionnaire-based surveys. This allowed for a 9.2% error rate and a 95% confidence level in reporting results. The questionnaire did not explore CCS factors such as religious beliefs or whether state versus private sector influenced responses to the clinical vignettes. A qualitative component would be included in a further study. Although this questionnaire assessed 'family wishes', it did not assess the quality nor the frequency of the communication with families, which has been described in other studies as problematic.

This study was not able to demonstrate significant discrimination towards PLWHA with regards to ICU admission. This may be a real finding however caution must be taken when interpreting the findings given the relatively small sample size for two group comparison. The final sample size in this study is only powered in theory to detect a minimum difference of 30% for comparison of proportions across two groups with 80% power based on the final samples size of 90.

Any bias in decision-making by CCSs in accessing PLWHA to ICU were not validated by the inferential statistics, although decision-making (frequency counts) in scenarios 3 and 5

in the sero-discordant patients would seem to suggest that PLWHA are not subject to discrimination in decisions to admit to ICU. The discrepancies between the CCSs decisions in practice and their answers to vignettes with hypothetical patients cannot be assessed in this study. According to Vincent (1989) in his questionnaire ‘European attitudes towards ethical problems in intensive care medicine: results of an ethical questionnaire’ concluded that “Data computerisation does not allow full expression of complex feelings and opinions.”³⁶ Notwithstanding these limitations, our findings provide a unique insight into the ethical dilemmas that face CCSs in South Africa when dealing with HIV-infected patients who seek or require ICU care.

CHAPTER 7: TO PROPOSE BEST PRACTICE ADMISSION CRITERIA GUIDELINES FOR PATIENTS WITH HIV INFECTION REQUIRING ACCESS TO INTENSIVE CARE IN SOUTH AFRICA

7.1 INTRODUCTION

This chapter seeks to propose best practice admission criteria for patients with HIV infection requiring access to intensive care in South Africa. A comprehensive review of the literature was performed, which focused on the chronological changes that occurred since the beginning of the HIV/AIDS pandemic, including the impact of HAART to put into perspective current progress and new challenges in the management of PLWHA that would influence admission to ICU.

A comprehensive review of the literature was also performed to include new and evolving evidence associated with HIV/AIDS that may influence ICU outcomes i.e. pulmonary disease, cardiac disease, liver disease, renal disease, issues of HIV/AIDS and organ transplantation, HIV/AIDS and non-infectious complications i.e. lung cancer, chronic obstructive pulmonary disease, pulmonary arterial hypertension and immune reconstitution inflammatory syndrome (IRIS). The chapter concludes with a systematic review and meta-analysis of HIV/AIDS and predictors of the survival of critically-ill HIV-infected patients admitted to ICU. This review includes relevant data, where available, from developed and developing countries. A paucity of published data on HIV/AIDS and ICU outcomes were available from the search strategies used for Botswana, India and South Africa when compared to the USA and Brazil. The search strategy was thus expanded to a global search for HIV/AIDS and predictors of survival in ICU.

We performed analyses of the eligible studies from the systematic review to identify which pooled predictors were associated with significant higher mortality risk for PLWHA admitted to ICU.

Eight specific clinical variables were identified in the literature as predicting mortality in ICU. The relevant data from the literature was analysed and presented as prediction tables and figures. This data helped propose best practice admission criteria for patients with HIV infection requiring access to intensive care in South Africa. This study will be the first to address these issues in the developing world. Hence the data from this study will also be of practical benefit to countries in the developing world in terms of formulating best practice admission criteria for patients with HIV infection requiring access to intensive care.

7.2 PNEUMOCYSTIS JIROVECI PNEUMONIA

Respiratory failure due to *pneumocystis jiroveci pneumonia* (PJP) was the most frequent complication of HIV infection, often requiring admission to ICU for MV.³²² The use of ICU resources for HIV-infected patients with PJP has been strongly debated since the first reported cases, raising ethical concerns regarding availability and cost-effectiveness of such level of care. Over-time, the admission for PJP was also influenced by the availability of newer therapies, notably the advent of ART. A historical perspective on PJP and access to ICU will now be discussed, followed by a discussion on the impact of HAART, including its impact in ICU.

7.2.1 PJP and ICU-a historical perspective

Historically, the implementation of ART comprises five distinct eras, namely era 1 (pre-ART), era 2 (addition of adjunctive corticosteroids), era 3 (period of increased mortality), era 4 (period of decreased mortality), and era 5 (advent of HAART). A more detailed discussion follows.

7.2.1.1. ERA 1 (1981-1985) - PRE-ART

The report of PJP in men who have sex with men heralded the presence of HIV/AIDS.³²³ In the mid-1980's, physicians in the USA believed that MV was a poor indication for PLWHA presenting with respiratory failure due to PJP, as it was associated with a 86-100% mortality despite MV.^{324 325} Consequently, there was a dramatic decline in PLWHA admitted to ICU for MV due to respiratory failure.^{324 326} One of the reasons for this decline was cited as the physician's reluctance to provide it.³²⁴ Wachter *et al* (2005) have estimated that it costs US\$200,000 to save a year of life through the use of the ICU for PJP.³²⁷ He further states that ICU care for PJP is a 'cost-ineffective intervention' as the survival rate had fallen in recent years to less than 10%, especially in patients with CD4 counts of less than 50 cells/mm³, patients who develop pneumothoraces while intubated and patients spending more than two weeks in ICU on a ventilator.³²⁷

Bedos *et al* (1999) in their 'Pneumocystis carinii pneumonia requiring intensive care' study also identified that patients with HIV infection and PJP on MV had a poor prognosis.³²⁸ They further identified that delayed ventilation after three days, duration of ventilation of more than five days, nosocomial infections and pneumothorax were predictive of death within three months of ICU admission.³²⁸ Torres *et al* (1995) in their 'Aetiology and prognostic factors of patients with AIDS presenting life-threatening acute respiratory failure' study mention that the median survival time for PJP patients after

discharge from ICU was 49 days, and was not influenced on whether the patients was on MV (median survival 112 days) as compared to those not requiring mechanical ventilation (median survival 154 days).³²⁹ They further comment that as a result of poor outcomes after ICU discharge, a reassessment of ICU admission criteria for PJP patients is required.³²⁹

Wachter *et al* (1995) also mention in their study that ‘the cost-effectiveness of intensive care for patients with PJP...is now below that of many accepted medical interventions’.³²⁷ It is evident that ICU care is expensive and it’s use to prolong the life of a patient with a poor prognosis, as evidenced by these studies, may entail an opportunity cost for saving the life of someone else who stands a better chance of survival.³³⁰

7.2.1.2. ERA 2 (1986-1988)- ADJUNCTIVE CORTICOSTEROIDS

Wachter *et al* , in their ‘Pneumocystis carinii Pneumonia and Respiratory Failure in AIDS: Improved Outcomes and Increased Use of Intensive Care Units’ retrospective cohort study, mention that in their study comprising a cohort of 35 patients (matched for age and PCP therapy) admitted to ICU for PJP, reported that a 40% survival in ICU was recorded (1986-1988) as compared to the earlier cohort (1981-1985).³³¹They had attributed this to the standard use of corticosteroids in this clinical setting, The mortality rates for patients with PJP decreased with the introduction of adjunctive corticosteroids and led to more patients with AIDS, PJP and respiratory failure being admitted to ICU for MV.^{324 332} Their study also identified a higher serum albumin level at the time of ICU admission to be associated with improved survival.³³¹

Additionally, improved cost-effectiveness due to improved survival rates and shorter length of ICU stay was recorded in this era.³³³ In 1986, antiretroviral therapy began with

the first clinical trial of zidovudine. According to Karim, in his book ‘ HIV/AIDS in South Africa’, the ARV treatment era started in 1987, with zidovudine(AZT) being used in a placebo-controlled trial that showed short term benefits to patients with AIDS.³³⁴ He also states that monotherapy did not have sustainable survival benefits when initiated at earlier stages of the disease.³³⁴

7.2.1.3. ERA 3 (1989-1991)-INCREASED MORTALITY

Mortality rates for HIV infected patients increased, possibly as a result of increased admissions to ICU due to renewed optimism.³³⁵⁻³³⁹ New nucleosides were introduced and dual therapy was well established, but these early therapies were regarded as unsuccessful. Karim et al mention that monotherapies such AZT and other non-nucleoside reverse transcriptase inhibitors did not demonstrate improved survival benefits, especially when initiated at earlier stages of the disease.³³⁴ Wachter *et al* mention that in this era, the cost-effectiveness of ICU care for patients with AIDS complicated by PJP had decreased, and survival was strongly associated with the CD⁴ count on hospital admission and the development of pneumothorax on MV.³³³

7.2.1.4. ERA 4 (1992-1995) – DECREASED MORTALITY

Rates of ICU admission remained stable, with an improvement in overall mortality of 37%.³⁴⁰⁻³⁴⁵ Nickas *et al*(2000), in their paper ‘ Outcomes of Intensive Care for Patients With Human Immunodeficiency Virus Infection’ conducted a retrospective chart review for the period 1992-1995, and included all HIV patients needing ICU admission.³⁴⁶ Only 52% of their cohort were on ARV treatment prior to ICU admission. They identified that respiratory failure (47%), sepsis (12%) and neurologic disease(11%) were the most common ICU admission diagnosis.³⁴⁶ In their study 63% of patients survived to discharge, but survival rates at 1,2,3 and 4 years were disappointing at 27 %,18%, 13% and 11%

respectively.³⁴⁶ Their study also identified independent predictors of hospital mortality as low serum albumin, APACHE score, mechanical ventilation, and a diagnosis of PJP.³⁴⁶

The authors acknowledge the limitation of their study being undertaken prior to the widespread use of ART.³⁴⁶

7.2.1.5. ERA 5 (1996 TO PRESENT) - ADVENT OF HAART

The 11th International Conference on AIDS in Vancouver, British Columbia, heralded in the ‘decade of HAART’.³⁴⁷ It was at this conference where researchers announced to the international scientific community ‘viral dynamics data’ that a person infected with the virus produced 10 billion virions/day, validated that this was a viral infection and required antiviral treatment.³⁴⁷ Data at the conference also highlighted the inverse correlation

between viral load and CD4 count, and the threshold of detection of HIV viral load at 15-25 copies/mL.³⁴⁷ Six landmark studies have been regarded as advancing the field of

HAART:

1. 1999- DuPont 006³⁴⁸ - identified the role of efavirenz(NNRTI) as the third drug in combination with 2 NRTIs.
2. 2002- M98-863³⁴⁹ - identified the important role of a protease inhibitor (PI)- based regimen i.e. ritonavir-boosted lopinavir.
3. 2003: ACTG 384³⁵⁰ emphasised the importance of distinguishing between nucleoside pairings, as prior to 2003, the standard recommendation was two NRTIs (any two) plus a third agent.
4. 2004: Gilead 903³⁵¹ - established the role of tenofovir.
5. 2004: 2NN³⁵² - comparison of potency and side effects of efavirenz and nevirapine, and establishing that efavirenz was superior to nevirapine.

6. 2004: ACTG 5059³⁵³ - established that efavirenz- based HAART was superior to the popular triple nucleoside regimen (zidovudine/lamivudine/abacavir).

In the era of combination HAART, mortality and ICU admission rates have changed significantly.^{147 340 344 345 354} The mortality rate as well as incidence of opportunistic infections have decreased significantly for PLWHA.¹⁴⁰ With the advent of HAART, survival in ICU has improved, compared to patients not on HAART. Morris *et al*(2002) have postulated that this may be the result of improved baseline characteristics such as CD4, serum albumin and ‘a changing spectrum of admission diagnosis’.¹⁴⁰ According to Morris *et al* (2002) predictors of mortality are associated with serum albumin levels, APACHE11 score, need for intubation and the diagnosis of PJP.¹⁴⁰

7.3 HIV/AIDS AND INTENSIVE CARE- THE IMPACT OF HAART

The era of ART significantly improved the prognosis of PLWHA, and converted an aggressive terminal illness to a chronic manageable condition, adding many more years of productive life to PLWHA. However, the effect of ART on the decisions by the CCS regarding access to ICU for patients with HIV infection is unknown. The impact of ART on ICU survival is varied and ranges from improved outcomes,^{355 356} to no difference in outcomes,³⁵⁷⁻³⁶⁰ to decreased survival with ART.³⁶¹ Given that ART is now widely available for PLWHA, its influence on decisions by the CCS on admission to ICU for critically ill patients is being debated.

ICU’s see four very distinct populations of patients with HIV /AIDS presenting for critical care¹¹ (Figure 8)

1. Patients with AIDS-defining opportunistic infections, according to the WHO criteria e.g. PJP, bacterial pneumonia, cerebral toxoplasmosis and cryptococcal

meningitis . This category would include AIDS-defining malignancies presenting to the ICU. Their HIV status may be unknown at presentation to ICU. In those patients with known HIV positive status, some may either not have accessed care or have treatment failure. If their HIV status is unknown, then these patients would be deemed the 'late-testers' which comprises approximately 35% of total new diagnosis annually in the USA, but this estimate varies.³⁶² In Washington DC, these 'late-testers' comprise 65% of new ICU diagnoses.¹¹⁹ With an estimated 55 000 new HIV infections in the USA each year,⁵ this proportion of 'late-testers' will increasingly impact on ICU resources.

2. PLWHA accessing ICU services for medical or surgical conditions unrelated to HIV/AIDS, e.g. trauma, elective surgery, pancreatitis, gastro-intestinal bleeding. These patients have the same prognosis as the general population provided their CD4 counts are in the normal range.³⁶³
3. The third group of PLWHA presenting to ICU are complications associated with long-term ARV's as a causal link. These include accelerated atherosclerosis and coronary artery disease, dyslipidaemias, diabetes mellitus, pulmonary arterial hypertension, emphysema or strokes.^{119 364-368} Further studies need to be undertaken concerning the short-term and long-term prognosis of these patients who are on ART.¹¹
4. The fourth group would comprise patients presenting with acute life-threatening toxicities of HAART i.e. acute renal failure, pancreatitis, Stevens Johnson Syndrome hepatic necrosis, lactic acidosis, rhabdomyolysis etc.

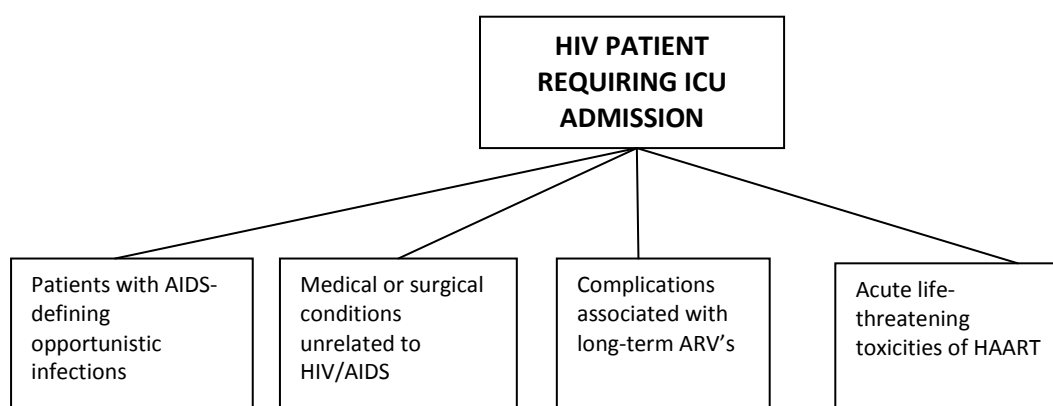


FIGURE 8 HIV PATIENTS REQUIRING ICU ADMISSION

Rates of ICU admission and ICU-related mortality for PLWHA has run a fluctuant course during the AIDS epidemic, depending on the changing demographics of the HIV epidemic, the time of initiation and uninterrupted access to ARVs and patients and physicians attitudes towards ICU care.³²⁰ The University College of London and San Francisco Hospital have tracked trends in ICU epidemiology and outcomes over the course of the AIDS epidemic.^{324 357 369} Risk factors such as intravenous drug use, and heterosexual contact now comprise an increasing number of ICU admissions.^{140 357}

Approximately 40% of patients admitted to ICU are unaware of their HIV status.^{140-142 370} Although respiratory failure remains the most common indication for ICU admission, while other diagnosis such as non-PCP pneumonia, sepsis, cardiac, gastrointestinal, and renal diseases that are often not directly related to underlying HIV disease are becoming more common.^{147 320 340 341 354} This is thought to be due to improved immune-reconstitution of CD⁴, decreasing viral load to below 30 000 copies/mm³ with combination HAART, resulting in the increasing likelihood of non-AIDS associated admission diagnosis.^{320 340 341}
³⁵⁴ In the ART era, ICU to ward survival rates of 70% have been recorded, which is similar to that for patients not infected with HIV matched for illness severity.^{147 357 371 372}

A low haemoglobin, high APACHE score, and need for MV continue to be predictors of higher mortality.^{147 357}

In the San Francisco study, a causal link was made with ICU survival for patients admitted for PCP who received ART in ICU. Their mortality was recorded as 25% as compared to 63% for those patients who did not receive ART.³⁷³ However the London group found a low mortality for severe PCP patients in ICU who did not receive ART, despite ART being available, suggesting that the San Francisco study may not indicate causality. Improved clinical care in ICU accompanied by lower tidal volume positive pressure ventilation may be contributory³²⁰ and constitute independent predictors of survival in ICU for PLWHA.

7.3.1 HIV infection and intensive Care –the complexities of administering HAART

The impact of HAART on ICU survival is varied and ranges from improved outcomes^{355,356} to no difference in outcomes.^{357,358,374 ,360} ART use in ICU presents challenges related to drug delivery, doses, drug interactions, and ARV-associated toxic effects.¹⁴⁷

7.3.2 Drug delivery

All of the approved ARV medications are available as non-pill formulations i.e. liquid or parenteral, of particular significance in ICU where the patient may be intubated and/or on nasogastric feeding.³⁷⁵

7.3.3 Drug absorption

Critical illnesses may complicate the absorption of ARVs with regard to decreased gastric motility^{376 377}, continuous feeding, nasogastric suctioning,³⁷⁸ and gastric alkalisation for

stress-ulcer prophylaxis. Any renal or hepatic insufficiency will require ARV dose adjustments, especially NRTI's and protease inhibitors.^{375 379}

7.3.4 Drug-drug interactions

ARVs, especially NRTI's and ritonavir-boosted regimens of protease inhibitors, have several important interactions with other ARVs and common ICU medications e.g. midazolam, triazolam, proton- pump inhibitors, amiodarone etc. Their drug levels on patients on MV will be boosted by certain ARVs to dangerously high levels and thus close monitoring is required.^{379 380}

7.3.5 ARVs and potentially life-threatening toxic effects

These include hypersensitivity reactions, the Stevens-Johnson syndrome, hepatic necrosis, pancreatitis, and lactic acidosis.³⁷⁵ The CCS has to be especially vigilant in early interventions should such toxic effects occur, as these morbidities carry a high fatality rate, if its detection and appropriate treatment is delayed.³⁷⁵

7.3.6 Treatment strategies in intensive care

The benefits of ARVs are unquestionable as it has changed HIV/AIDS from an acute terminal illness, which has already claimed 25 million lives globally,⁵ to a chronic manageable illness.³²⁰ In the ART era, ICU to ward survival rates of 70% have been recorded, which is similar to that for patients not infected with HIV matched for illness severity.^{371 372 375} From the preceding discussion, it is evident that ART need to be used with caution in ICU. Its benefits in ICU are still being debated. Potential toxicities, many of which are life-threatening especially in the context of hepatic and renal impairment, need to be vigilantly monitored. Complexities regarding the use of ART in ICU, regarding

its absorption, pharmacokinetics and drug-drug interactions have been described. Ethical issues regarding consent for HIV testing and disclosure become increasingly important. These ethical issues have been discussed in the chapter on law and ethics.

7.3.6.1 REGARDING COMMENCEMENT OF ARV'S IN ICU, DO THE RISKS OUTWEIGH THE POTENTIAL BENEFITS?

Many CCSs argue against the use of ARVs in ICU.^{321 360 366 381} No consensus

guidelines exist regarding the use of ARVs in ICU.^{320 321} Huang *et al*¹⁴⁷ advise:

“Initiation of ARV’s should be deferred among patients admitted to the ICU with a condition not related to AIDS. ARV’s should be commenced if the CD4 cell count is below 200 cells per cubic millimeter, and there is a prolonged course in ICU. Patients receiving ARV’s before admission to ICU with evidence of viral suppression (plasma HIV RNA below level of detection), before admission to ICU, should continue their ARV’s. Patients admitted to ICU for an AIDS-defining condition should be considered for ARV’s.”

The decreased toxicities of the newer ARVs and combinations strengthen the argument for their use in ICU.³²⁰ Antiretroviral therapy has increased the life expectancy of patients who are infected with HIV and has reduced the incidence of illnesses associated with AIDS.⁵

Although the availability of ARVs has increased the life expectancy of PLWHA and reduced the incidence of opportunistic infections associated with AIDS, thus turning HIV into a chronic illness, however, the frequency of pulmonary, cardiac, gastrointestinal (GIT), and renal diseases not directly related to underlying HIV disease has increased.¹⁴⁷

^{320 340 341 354}

Continued research would result in validated triage policies regarding admission of PLWHA to ICU and the guidelines addressing the complexities of HAART in ICU.

7.4. HIV/AIDS AND THE CHANGING PATTERNS OF ADMISSION PATHOLOGIES

The following five conditions were reviewed: pulmonary, cardiac, liver and renal diseases, as well as non-infectious complications such as lung cancer, chronic obstructive pulmonary disease, pulmonary arterial hypertension and immune reconstitution inflammatory syndrome.

7.4.1 HIV and pulmonary disease

The improved survival in ICU for patients with PJP is attributed to low tidal volume MV and not the initiation of HAART.³²⁰ Predictors of mortality are associated with the diagnosis of PJP (Table 41, figure10)), APACHE II score (Table 42, figure 11)) and serum albumin levels(Table 48, figure 17)).¹⁴⁰ *Pseudomonas aeruginosa* and *Staphylococcus aureus* are reported to be common nosocomial bacterial infections in PLWHA.^{382 383} Other factors associated with increased risk of mortality for patients admitted to ICU with PJP included age, poor oxygenation at hospital admission, raised serum lactate dehydrogenase enzyme levels, low haemoglobin, low serum albumin, the presence of co-pathogens (cytomegalovirus infection, bacterial pneumonias), high APACHE II score, delay of greater than five days in ICU admission, and the development of pneumothorax during mechanical ventilation. (Table 41, figure 10)

Other common causes of respiratory failure, in the context of HIV/AIDS are bacterial pneumonia and TB requiring ICU admission.³⁸⁴ These are especially prevalent in low and middle income countries where there is a late or inconsistent roll-out of ARVs.³⁸⁵ In 2009, India had the highest global figure of two million new cases of TB, many of which were

co-infected with HIV/AIDS.²³⁴ In SA, the TB-HIV co-infection rate is estimated to be 70% which is further complicated by the emergence of multi drug resistant (MDR) and extremely drug resistant (XDR) TB.^{8 386} In the USA, the early introduction of ARVs has resulted in decreasing numbers of PJP and TB ,which in the pre-ART era were major causes of mortality and morbidity for PLWHA.³⁸⁷ The incidence of invasive pneumococcal disease has also decreased in PLWHA as a result of the widespread use of the pneumococcal vaccine.³⁸⁸ However methicillin-resistant *Staphylococcus aureus* (MRSA) is a nosocomial pneumonia and is considered an independent risk factor for death in PLWHA.³⁸³ It is advised that initial empiric antibiotic regimens must include this possibility.¹⁴⁷

7.4.2 HIV and cardiac disease

ARVs are atherogenic and cause a host of metabolic complications such as dyslipidaemias, insulin resistance, and diabetes.³⁸⁹ In addition to traditional risk factors, patients on ARVs have an increased susceptibility to coronary artery disease and acute coronary syndromes, the management of which would be according to established standard treatment guidelines. However, there is a greater incidence of restenosis of stents on coronary re-perfusion procedures in HIV patients.³⁹⁰ Research suggests the use of the newer, drug-eluting stents, which are associated with a reduced incidence of restenosis.³⁹⁰

7.4.3 HIV and liver disease

Viral hepatitis causing end-stage liver disease is associated with a high mortality and morbidity in PLWHA and requires informed decisions regarding ARVs and hepatitis therapy.^{391 392} Chronic liver disease may be due to chronic alcohol abuse. Lamivudine, emtricitabine and tenofovir are effective against hepatitis B virus (HBV) and is useful in

reducing the chances of resistance to HBV.³⁹³ These drugs, together with pegylated interferon or ribavirin can be used concurrently in ICU for hepatitis C virus infection.³⁹³ However, the potential side-effects of the pegylated interferon or ribavirin i.e. severe neutropenia, thrombocytopenia, and dose-related anaemia, may preclude treatment in critically ill patients with liver failure associated with hepatitis C infection.³⁹³ Patients with end-stage liver failure and HIV infection may be considered as candidates for a liver transplant.³⁹⁴ In a resource limited environment, as canvassed in *Soobramoney*¹⁰⁵ the CCS may be faced with an ethical dilemma concerning the fair allocation of resources, a utilitarian decision. Furthermore, Coquet et al (2010) in their study ‘Survival trends in critically ill HIV-infected patients in the highly active antiretroviral therapy era’ mention that the presence of cirrhosis was associated with poor survival in ICU.³⁹⁵ (Table 45, figure 14)

7.4.4 HIV and renal disease

End-stage renal disease may be the result of HIV-associated nephropathy (HIVAN), hepatitis B or C co-infection, diabetes or hypertension or ARV induced. Tenofovir, a nucleotide reverse transcriptase inhibitor (NtRTI), is nephrotoxic and contraindicated in any patient with a creatinine clearance <50ml/min. The standard of treatment would be dialysis or renal transplant in appropriate patients,³⁹⁴ but in a resource-limited setting, as canvassed in the *Soobramoney* case,¹⁰⁵ the CCS may be faced with ethical dilemmas regarding access to dialysis facilities and eligibility criteria for dialysis, in the context of PLWHA. Acute renal failure, according to Coquet et al is a predictor of poor survival in ICU.³⁹⁵ (Table 45, Figure 13)

7.4.5 HIV/AIDS and organ transplantation

PLWHA on HAART live longer, estimated for a 20 year old on HAART at approximately two thirds the number of years compared to the general population.³⁹⁶ In Europe and North America, epidemiological studies have reported an increasing number of PLWHA developing chronic renal and liver disease requiring transplantation.³⁹⁷⁻³⁹⁹ Some of the causes have been discussed in the preceding paragraphs. Ragni *et al*, in a multicenter study, reported that the survival rates from liver transplantation between HIV-infected and HIV negative patients were similar (72.8% at 24 and 36 months and 81.6% and 77.9% at 24 and 36 months respectively).⁴⁰⁰ This study has identified predictors of poorer survival to transplant as HCV infection (p=0.023), post-transplant ARV intolerance (p= 0.044), post-transplant CD4 count <200cells/mm³ (p=0.005) and post-transplant viral load \geq 400 copies/mL.⁴⁰⁰

Other studies have also shown better outcomes for HIV-HBV co-infected liver transplant patients when compared to HIV- negative/HBV virus co-infected recipients of liver transplants.⁴⁰¹ HIV-HCV co-infected recipients have poor outcomes as a result of a recurrence of HCV infection and graft survival rates are poor.⁴⁰¹ Recent studies have shown that the success of liver and kidney transplants in HIV-infected patients is dependent on undetectable viral load on HAART, CD4 count \geq 100 cells/mm³ or \geq 200 cell/mm³ if history of previous opportunistic infection and no active opportunistic infections.^{402 403} In a Canadian survey, barriers to liver transplant for HIV patients centre around the availability of organs for transplant, the high mortality with HCV co-infection and ‘ surgical team willingness’.⁴⁰⁴ In resource limited countries, such as SA, similar barriers are present, and the ethical dilemma of fair allocation of resources is of paramount importance.

7.4.6 HIV and non-infectious complications

7.4.6.1 LUNG CANCER

HIV-infected patients have an increased rate of non-small cell lung cancer. This causal link is supported by studies that suggest HIV/AIDS may be an independent risk factor for lung cancer, adjusting for estimates of smoking prevalence.^{405 406} Whether HIV plays an oncogenic role in lung cancer is not known.³²⁰

7.4.6.2 CHRONIC OBSTRUCTIVE PULMONARY DISEASE

An increased prevalence of chronic obstructive pulmonary disease (COPD) has been associated with HIV/AIDS.³²⁰ This risk is independent of other risk factors for COPD such as smoking, illicit drug use and previous pulmonary opportunistic infections. Chest computed tomography evidence of increased prevalence of emphysema in the pre-ART era,⁴⁰⁷ and prevalence studies in HIV infected veterans with chronic obstructive pulmonary disease (COPD) in the ART era, have demonstrated this causal link of HIV infection and COPD.⁴⁰⁸

7.4.6.3 PULMONARY ARTERIAL HYPERTENSION

An increased frequency of pulmonary arterial hypertension (PAH) is observed in HIV infected patients.^{409 410} In one study, 35% of HIV infected patients had asymptomatic PAH on screening echocardiography.⁴¹¹ PAH symptoms are of right heart failure and HIV infected patients with PAH are more likely to die of progressive heart failure rather than from other AIDS-related causes.⁴¹² The pathogenesis of PAH in HIV is not fully understood.³²⁰

Immune reconstitution inflammatory syndrome (IRIS) is the paradoxical worsening of clinical status related to recovery of the immune system after immune-suppression in HIV infected patients.⁴¹³ This can occur after initiation of ART which leads to host inflammatory responses to previously recognised or subclinical infections, such as TB, Cryptococcus, PJP, CMV infections etc.⁴¹³ IRIS may also result from inflammatory or immune response to cancer or self-antigens as evidenced by worsening tumours or autoimmune disease.^{414 415}

Initiation of ART in the presence of un-treated or cryptogenic opportunistic infections, or early initiation of ART soon after treatment of an opportunistic infection are more likely to cause IRIS,^{416 417} especially in ARV naïve patients⁴¹⁸ with a low CD4 count.⁴¹⁹⁻⁴²¹ The majority of cases occur within one to three months of ARV initiation although cases may present months later.⁴²¹ Symptoms consist of fever and lymphadenopathy, CXR may show worsening pulmonary infiltrates, nodules or masses, intra-thoracic lymphadenopathy and pleural effusion.⁴¹³ The diagnosis of IRIS is one of the exclusions of the other causes.⁴¹³ The pathology of IRIS is incompletely understood.³²⁰ Most cases of IRIS are mild in severity and the outcomes are good with supportive therapy. The use of steroids may be useful in an excessive inflammatory response.⁴²²

The initiation of ART in patients with opportunistic infections remains controversial.⁴²² Patients already on ART should be continued with ART.³²⁰ However, the initiation of HAART in critically ill patients has not been adequately studied. In this particular subset of patients, toxicities from ART and inflammatory reactions could potentially cause significant harm.³²⁰ More research is needed in this regard.³²⁰ As HIV positive patients

live longer as a result of the efficacy of newer and more effective ART regimens and vigilant treatment of opportunistic infections, the paradoxical increase in the prevalence of HIV/AIDS is expected. In the absence of the universal provision of ART, admissions to ICU for HIV/AIDS related conditions will continue, including admissions as a consequence of the long-term use and toxicities of ARTs, some of which are potentially fatal. Furthermore, as PLWHA live longer, the diseases of the ageing process, such as hypertension, diabetes and coronary artery disease gain increasing importance. However, causal links with PAH, COPD and lung cancers need further investigation.

7.5 HIV/AIDS AND PREDICTORS OF THE SURVIVAL OF THE CRITICALLY-ILL HIV-INFECTED PATIENTS REPORTED IN THE LITERATURE

Intensive care support has advanced dramatically in step with modern technology. Advanced life support is possible even in instances of extreme or advanced illness. However, survival has not improved in parallel with this technology posing a challenge to providers of intensive care to determine when such care is futile. The medical literature abounds with social, moral, ethical and economic debate on this issue, as discussed in the preceding chapters. The debate is vexed by the fundamental concept of equity and justice.

Resource limited settings also have access to modern intensive care albeit, more restricted. These latter settings bear a disproportionate burden of disease which is aggravated by a lack of early intervention leading to more patients needing access to very limited intensive care resources. HIV/AIDS is no exception. South Africa is the epicenter of the HIV/AIDS epidemic and continues to witness an increasing number of patients progressing to

advanced disease warranting critical care. As the numbers of patients receiving antiretroviral treatment increases in South Africa, intensive care will be complicated by the effects of these medications. Patients with HIV/AIDS requiring intensive care will compete with non-HIV infected patients for limited ICU facilities, especially in State funded health care facilities. Utilitarian decisions need to be made on the fair allocation of limited resources, and clinical decisions is thought to be influenced by factors such as the CD4 count, APACHE II score, and the initiation of mechanic ventilation.³⁵⁷

7.5.1 Prognostic factors for ICU survival

7.5.1.1 META- ANALYSIS FOR PREDICTORS OF MORTALITY AMONG HIV POSITIVE PATIENTS ADMITTED TO ICU

We performed an analysis of the eligible studies from the systematic review to identify which pooled predictors were associated with significantly higher mortality risk for PLWHA admitted to ICU. This was done using a meta-analysis approach implemented in Stata 12.0 SE ('metan' procedure) to produce pooled measures of effect (in this case odds ratios) for each predictor and corresponding confidence intervals (CI).The pooled estimates were then also used to produce a relative excess probability of mortality (and associated 95% confidence interval) to allow for relative ordering of importance.

TABLE 40 POOLED MEASURES OF EFFECT (OR) FOR EACH PREDICTOR, AND RELATIVE EXCESS PROBABILITY OF MORTALITY TO ALLOW FOR RELATIVE ORDERING OF IMPORTANCE

Predictor	Studies	Pooled effect size (95 % CI)	Relative excess probability mortality (95% CI) $1/(1+odds)-0.5$
MV	13	4.54 (1.95, 7.13)	0.319 (0.161,0.377)
Sepsis	4	3.37 (1.81, 4.93)	0.271 (0.144,0.331)
Low CD4	5	2.42 (1.65, 3.18)	0.207 (0.122,0.261)
Lower serum Albumin	7	2.32 (1.35, 3.29)	0.199 (0.074,0.267)
Higher Apache score	8	1.14 (1.06, 1.21)	0.032 (0.014,0.048)
Delayed admission	5	1.11 (1.01, 1.21)	0.025 (0.002,0.047)
Lower PaO2	2	1.10 (1.03, 1.17)	0.024 (0.007,0.039)
Δ PCP	2	2.00 (0.56, 3.44)	0.166 (-0.143,0.275)*

* Not significant at 5% level

Based on the meta-analyses for each indicator: MV, sepsis, low CD4, low serum albumin, higher Apache score, lower PaO₂ and delayed admission were significant predictors of higher mortality risk based on pooled estimates (Table 40, figure 9). The descending magnitude of the pooled odds ratio is displayed (Table 40) along with the associated excess mortality probability for a given indicator. For example requiring MV increases the probability of mortality by ~32% (95% CI: 16.1, 37.7).

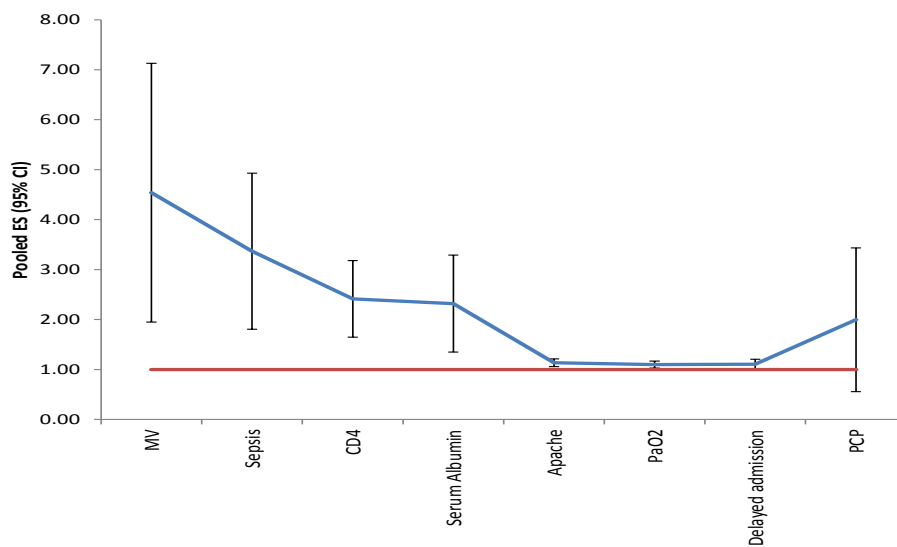


FIGURE 9 POOLED EFFECT SIZE (95 % CI) FOR EACH PREDICTOR

7.5.1.2 PJP DATA AS A PREDICTOR OF INCREASED MORTALITY

Fei *et al* (2009) in their study ‘Severity and outcomes of Pneumocystis pneumonia in patients newly diagnosed with HIV infection: An observational cohort study’ identified age, recent injection use, total bilirubin and serum albumin with poor outcomes in ICU patients admitted for PJP.⁴²³ (Table 41, Figure 10) Wang *et al* (2011) in their study ‘Mortality predictors of *Pneumocystis jirovecii pneumonia* in human immunodeficiency virus-infected patients at presentation: Experience in a tertiary care hospital of northern Taiwan’ identified systolic blood pressure, PaO₂ and decreased lymphocyte count with poor outcomes in ICU for patients with PJP.⁴²⁴ (Table 41, Figure 10)

Radhi *et al* (2008) in their study ‘Outcome of HIV-associated Pneumocystis pneumonia in hospitalized patients from 2000 through 2003.’ identified mechanical ventilation, the complication of pneumothorax on MV and PaO₂ with poor outcomes in ICU for patients with PJP.⁴²⁵ (Table 41, Figure 10) Other studies have identified delay in admission to ICU for PJP and the diagnosis of PJP as independent predictors of poor outcomes in ICU.

Our meta-analysis did not reflect the increased mortality associated with the diagnosis of PJP due to the heterogeneity of co-morbid factors associated with survival in ICU.(Table 41, Figure 10)

TABLE 41PJP DATA AS A PREDICTOR OF INCREASED MORTALITY

Summary	Author	Indicator	Ref summary
(AOR)1.69 (1.08 to 2.65)	Fei 4232009	↑Age	age - (AOR) per 10-year increase-↑mortality
AOR 2.86 (1.28 to 6.42)	Fei 4232009	recent IDU	recent injection drug use-↑mortality
AOR 2.59 (1.19 to 5.62)	Fei 4232009	↑bilirubin	total bilirubin >0.6 mg/d-↑mortality
AOR 3.63 (1.72-7.66)	Fei 4232009	↓albumin	serum albumin <3 g/dl-↑mortality
(AOR) 3.88 (1.17-12.83)	Wang424 2011	↓SBP	systolic blood pressure </=110 mmHg-↑mortality
AOR 4.97 (1.34-18.23)	Wang424 2011	↓PaO2	PaO(2) at room air </=60 mmHg-↑mortality
AOR 8.19 (1.48-45.36)	Wang424 2011	↓Lymphs	lymphocytes </=10% Mortality Prediction-(1=14% mortality; 2=47%;3=75%)
1.99 (1.02-3.90)	Khoulj426 2005	Δ-PCP	PJP-predictor of outcome-↑mortality
26.7 (3.67-194)	Palacios3742006	Δ-PCP	PJP diagnosis predictor of outcome-↑mortality
9.6 (3.8-24.7)	Radhi425 2008	MV	↑Mortality
10.2 (3.5-29.7)	Radhi425 2008	MV	Pneumothorax-↑mortality
1.10 (1.03-1.17)	Radhi425 2008	↑mortality	PAo2(per 1 mm Hg ↑)-↑mortality
9.7 (2.2-42.1)	Wachter3451992	↑mortality	ICU admission after fifth hospital day-↑mortality

Abbreviations: AOR-adjusted odds ratio; IDU-injection drug use; PaO₂- partial pressure of arterial oxygen; PJP-*pneumocystis jereveci pneumonia*; MV-mechanical ventilation; ICU-intensive care unit

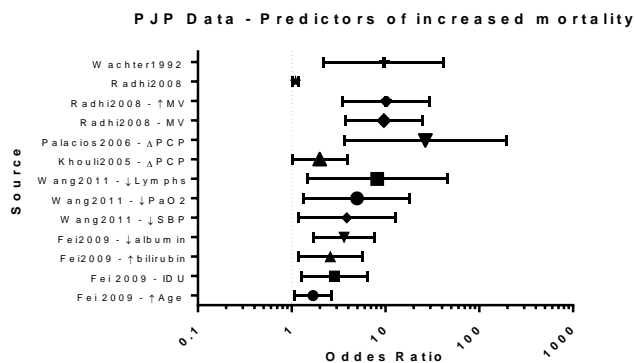


FIGURE 10 PJP DATA-PREDICTORS OF SURVIVAL

7.5.1.3 APACHE II SCORE AS A PREDICTOR OF INCREASED MORTALITY

An increased APACHE II score (range 11-20) on admission to ICU was associated with increased mortality in ICU. (Table 42, Figure 11) Adlakha *et al*(2011), in their 10 year retrospective chart audit on ‘Survival of HIV-infected patients admitted to the intensive care unit in the era of highly active antiretroviral therapy’ identified increasing age (OR 0.74:95% CI 0.53-1.02) per 10 year increase, low serum albumin (OR 1.05: 95% CI 1.00-1.09) per 1g/dl increase(Table 48, Figure 17), a high APACHE II score (OR 0.55 95%CI 0.35-0.87) per 10 unit increase (Table 42, Figure 11), receipt of HAART (OR 2.44:95%CI 1.01-4.94) and the need for MV(OR 0.14: 95% CI 0.06-0.36)(Table 44,Figure 13) as predictive of improved ICU outcome.⁴²⁹ They further recorded a survival to ICU discharge of 78% and hospital discharge of 70% which in their study was comparable to non-HIV-infected patients discharged from ICU and hospital (75% and 68% respectively).⁴²⁹ Additional ICU studies have identified a high APACHEII score, low CD4 count, low serum albumin, the presence of organ failure, SIRS, and sepsis to be important negative predictors to survival in ICU.⁴³⁰

TABLE 42 APACHE II DATA-PREDICTORS OF INCREASED MORTALITY

Summary	Author	Indicator	Ref summary
2.81 (1.57-5.04)	Croda ³⁵⁵ -2009	Apach>19	Apache II >19 associated with increased mortality.
1.12 (1.02-1.23)	Greenberg ⁴²⁷ -2011	↑Apache11	In a multivariable logistic regression model, APACHE II score ↑ mortality
6.04 (1.25-29.22)	van lelyveld ³⁷² -2011	Apach>20	APACHE II score > 20
1.06 (1.01-1.11)	Agarwal ⁴²⁸ -2006	↑Apache11	Mortality associated with Apache 11 score
1.11 (1.05-1.16)	Morris ¹⁴⁰ -2002	↑Apache11	Mortality associated with Apache 11
1.2 (1.1-1.2)	Khouli ⁴²⁶ -2005	↑Apache11	APACHE II score per 1 point increase associated with increased mortality.
2.2 (1.3-4.0)	Vargas-Infante ³⁶⁸ -2007	↑Apache>=13	>=13 higher mortality in ICU
1.82 (1.15-2.86)	Adlakha ⁴²⁹ 2011	↑Apache	Per 10 unit ↓

Abbreviation: APACHE- acute physiology and chronic health evaluation

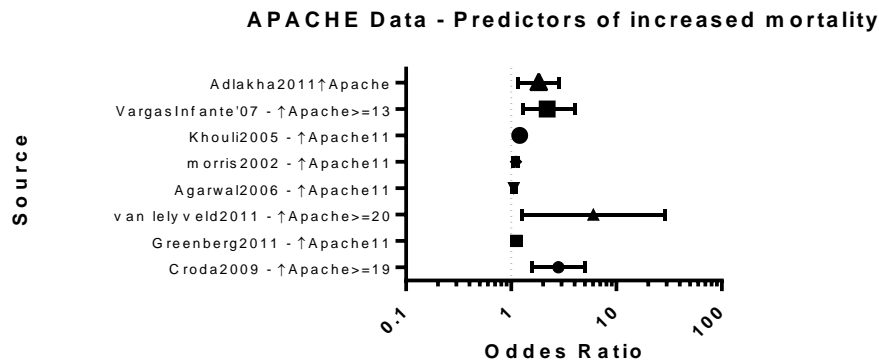


FIGURE 11 APACHE DATA-PREDICTORS OF INCREASED MORTALITY

In our meta-analysis, a mortality of approximately 3.2 % was associated with a high APACHE II score in ICU (95% CI: 1.14, 4.8). (Table 40, figure 9)

7.5.1.4 CD4 COUNT AS A PREDICTOR OF MORTALITY

Studies have shown an increased mortality in ICU for PLWHA with a low CD4 count (<50- < 200 cell/mm³). (Table 43, Figure 12) Chiang *et al*(2011), in their 10 year retrospective study on ‘Admissions to intensive care unit of HIV-infected patients in the era of highly active antiretroviral therapy: etiology and prognostic factors’ found a low CD4 count, sepsis, low serum albumin and a 24 hour hospital to ICU admission delay to be negative predictors of ICU survival.⁴³¹ They also observed that survival in ICU did not depend on prior initiation of ART, ART continued in ICU or ART initiated in ICU.⁴³¹ Corona *et al*(2009) in their study on ‘Caring for HIV-infected patients in the ICU in the highly active antiretroviral therapy era’ concluded that the initiation of ART in ICU was beneficial, but this decision has to be weighed against potential ART toxicities, drug-drug interactions, hypersensitivity reactions and the difficulties of administering ART in ICU.³⁵⁵ In our meta-analysis, a mortality of approximately 21 % was associated with a low CD4 count in ICU (95% CI: 12.2, 26.1). (Table 40, figure 9)

TABLE 43 CD4 COUNT DATA AS A PREDICTOR OF INCREASED MORTALITY

Summary	Author	Indicator	Ref summary
2.24 (1.16-4.31),	Khouli ⁴²⁶ -2005	↓CD4<200	↑mortality
2.10 (1.17-3.76)	Croda ³⁵⁵ -2009	↓CD4<50	independently ↑ICU mortality,
1.036 (1.003-1.069)	Chiang ⁴³¹ -2011	↓CD4	CD4 (per 10-cells/mm ³ decrease) independently ↑ICU mortality,
AOR 5.28 (2.99-9.31)	Agaba ⁴³² -2011	↓CD4<200	↑ICU mortality
3.22 (1.65-6.27)	Palacios ³⁷⁴ -2006	↓CD4<50	CD4+ absolute count <50 cells<10 ⁹ /l-↑ICU mortality

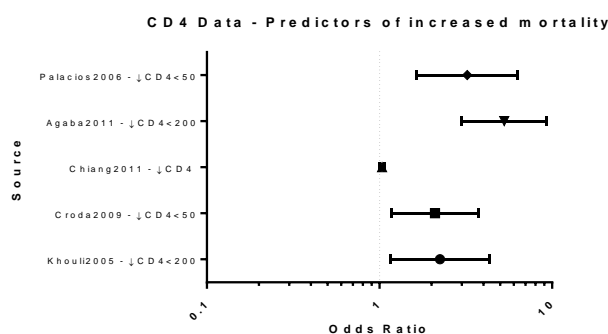


FIGURE 12 CD4 DATA-PREDICTORS OF INCREASED MORTALITY

7.5.1.5 MECHANICAL VENTILATION AS A PREDICTOR OF INCREASED MORTALITY

The need for MV, commonly for PJP, is associated with a high mortality in ICU as a result of sepsis due to endotracheal intubation and consequent nosocomial infections. A high mortality was also associated with barotrauma to the lungs and bilateral pneumothoraces.

(Tables 40, 41, 44. figures 9, 10, 13)

TABLE 44 MECHANICAL VENTILATION DATA AS A PREDICTOR OF INCREASED MORTALITY

Summary	Author	Indicator	Ref summary
40.01(3.01-532.65)	van Lelyveld ³⁷² -2011	MV	MV associated with ↑ mortality within 1 year
5.07 (1.24-20.65)	Agarwal ⁴²⁸ -2006	E/T intubation	endotracheal intubation- ↑mortality
3.2 (1.0-10.2)	Vargas-Infante ³⁶⁸ -2007	MV	MV associated with ↑ICU mortality
6.7 (1.9-23.9)	Bedos ³²⁸ -1999	MV>3days	Delayed mechanical ventilation after 3 days
2.8 (1.1-6.9)	Bedos ³²⁸ -1999	MV>=5days	Duration of mechanical ventilation of > or = 5 days- ↑mortality
15.7 (4.4-56.4)	Radhi ⁴²⁵ -2008	MV	Pneumothorax-↑mortality
14.8 (5.7-38.9)	Radhi ⁴²⁵ -2008	MV	↑Predictor of in-hospital mortality for HIV-infected patients with Pneumocystis pneumonia
0.22 (0.11-0.44)	Banarek ³⁴⁴ -2001	MV	↑ mortality
20.9 (1.9-227.2)	Wachter ³⁴⁵ -1992	MV	↑mortality
6.5 (2.8-14.9)	Palacios ³⁷⁴ -2006	MV	↑ mortality
6.11 (2.73-13.7)	Khoulj ⁴²⁶ -2005	MV	↑mortality
7.14 (2.78-16.67)	Adlakha ⁴²⁹ 2011	MV	↑mortality

Abbreviation: MV- mechanical ventilation; ICU- intensive care unit; E/T-endotracheal

Increase mortality was also associated with any delay in the initiation of MV or any prolonged MV. (Table 44, Figure 13) In our meta-analysis, a mortality of approximately 32% was calculated for PLWHA and MV (95% CI: 16.1, 37.7). (Table 40, figure 9)

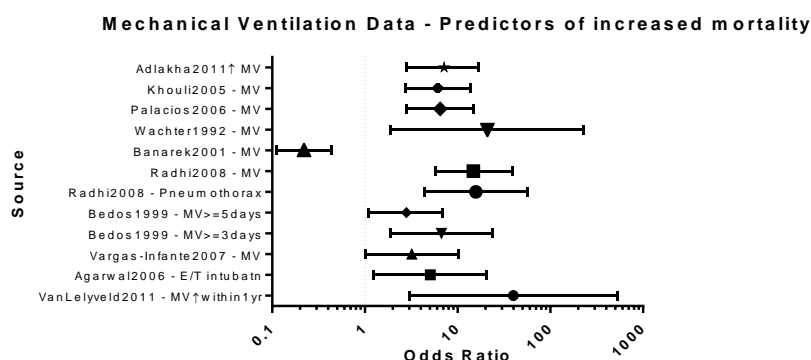


FIGURE 13 MECHANICAL VENTILATION DATA-PREDICTORS OF INCREASED MORTALITY

7. 5.1.6 ORGAN FAILURE AS A PREDICTOR OF INCREASED MORTALITY

Coquet *et al*(2010), in their retrospective study on ‘Survival trends in critically ill HIV-infected patients in the highly active antiretroviral therapy era’ have identified delayed admission to ICU, presence of acute renal failure, cirrhosis, severe sepsis, and ICU admission for coma to be negative predictors for ICU survival.³⁹⁵ (Table 45, Figure 14)

TABLE 45 ORGAN FAILURE DATA AS A PREDICTOR OF INCREASED MORTALITY

Summary	Author	Indicator	Ref summary
2.73 (1.16 to 6.46)	Coquet ³⁹⁵ -2010	Coma	ICU admission for Coma-↑mortality
4.21 (1.63 to 10.92)	Coquet ³⁹⁵ -2010	Acute renal failure	↑mortality
3.78 (1.21 to 11.84)	Coquet ³⁹⁵ -2010	Cirrhosis	↑mortality

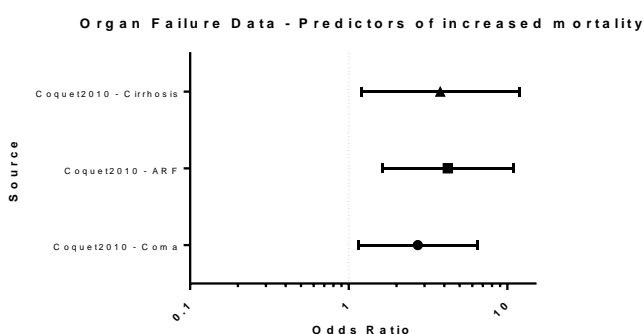


FIGURE 14 ORGAN FAILURE DATA-PREDICTORS OF INCREASED MORTALITY

7.5.1.7. HOSPITAL TO ICU INTERVAL AS A PREDICTOR OF INCREASED MORTALITY

Several studies have identified any delay in ICU admission to be predictive of increased mortality (Table 46, Figure 14) In our meta-analysis, a mortality of approximately 2.5 % was associated with any delay in ICU admission (95% CI: 0.2-, 4.7). (Table 40, figure 9)

TABLE 46 HOSPITAL TO ICU INTERVAL DATA-PREDICTORS OF INCREASED MORTALITY

Summary	Author	Ref summary
2.91(1.11-7.62)	Chiang ⁴³¹ 2011	24 hr delay in admission
3.04(1.29-7.17)	Coquet ³⁹⁵ 2010	Delayed ICU admission Independently increased ICU mortality
2.72(1.23-6.01)	Chiang ⁴³¹ 2011	Hospital-to-ICU interval > 24 hours univariably increased hospital mortality, 2.72 (1.23- 6.01), but not significantly in multivariable analysis
1.10(1.00-1.02)	Cardoso ⁴³³ 2011	Each hour of waiting was independently associated with a 1.5% increased risk of ICU death
		the fraction of mortality risk attributable to ICU delay was 30%

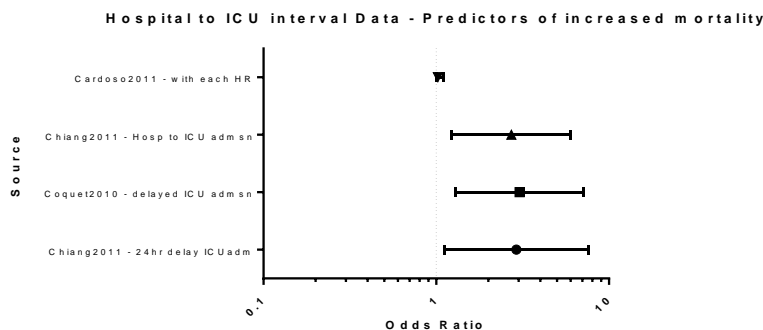


FIGURE 15 HOSPITAL TO ICU INTERVAL DATA- PREDICTORS OF INCREASED MORTALITY

7.5.1.8 SEPSIS AS A PREDICTOR OF INCREASED MORTALITY

Further studies of prognostic factors for in-ICU mortality and six months mortality in HIV critically ill patients, have identified sepsis(Table 47, Figure 16), the initiation of MV within 24 hours, APACHE 11 greater than 19, CD4 count less than 50 cells/mm³ as predictors of mortality in ICU and at 6 months.^{355 368} The initiation of ART in ICU was a positive predictor in many studies.^{78 355 368 393 427 434} Japiassu *et al*(2010) in their study on ‘Sepsis is a major determinant of outcome in critically ill HIV/AIDS patients’ identified severe sepsis, CD4 of 75cells/mm³ and a delay of transfer from general ward to ICU to be negative predictors of survival.⁴³⁴ In our meta-analysis, a mortality of approximately 27 % was associated with sepsis in ICU (95% CI: 14.4, 33.1). (Table 40, figure9)

TABLE 47 SEPSIS DATA AS A PREDICTOR OF INCREASED MORTALITY

Summary	Author	Indicator	Ref summary
3.16 (1.65-6.06)	Croda ³⁵⁵ -2009	↑mortality	Sepsis independently ↑ICU mortality,
2.91 (1.11-7.62)	Chiang ⁴³¹ -2011	↑mortality	Sepsis independently ↑hospital mortality
3.67 (1.53-8.80)	Coquet ³⁹⁵ -2010	↑mortality	Sepsis independently ↑ hospital mortality
5.2 (2.1-12.9)	Bedos ³²⁸ -1999	↑mortality	Sepsis / nosocomial infection independently ↑hospital mortality

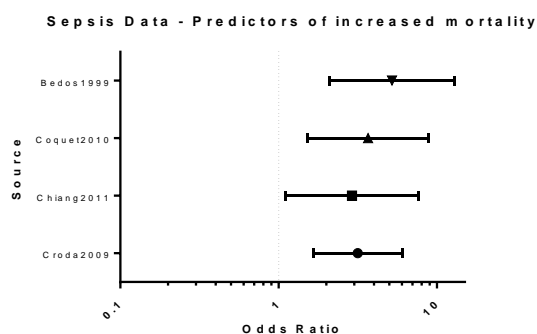


FIGURE 16 SEPSIS DATA-PREDICTORS OF INCREASED MORTALITY

7.5.1.9 SERUM ALBUMIN AS A PREDICTOR OF INCREASED MORTALITY

Fei *et al* (2009) in their study ‘Predicting mortality from HIV-associated Pneumocystis pneumonia at illness presentation: an observational cohort study’ identified age (AOR recent intra-venous illicit drug use (AOR 2.86; 95% CI 1.28 to 6.42; p=0.01), total bilirubin of > 0.6 mg/dl (AOR 2.59; 95% CI 1.19 to 5.62; p=0.02), serum albumin < 3g/dl (AOR 3.63; 95% CI 1.72–7.66; p=0.001) (Table 48, Figure 17), and alveolar–arterial oxygen gradient ≥50 mm Hg (AOR 3.02; 95% CI 1.41 to 6.47, p=0.004) as negative predictors to ICU survival.⁴²³ Using these five variables, they proposed a ‘PCP-Mortality Prediction Score: score 0–1, 4% risk of mortality; score 2–3, 12%; score 4–5, 48%.⁴²³

They further state that the PCP mortality prediction rule stratifies patients by mortality risk at the time of illness presentation and should be validated as a clinical tool.⁴²³

Wang *et al*(2011) in their study ‘Mortality predictors of Pneumocystis jirovecii pneumonia in human immunodeficiency-infected patients at presentation: Experience in a tertiary care

hospital of northern Taiwan' proposed a prognostic indicator for HIV patients with PJP who are admitted to ICU.⁴²⁴ The prognostic indicators are; systolic blood pressure ≤ 110 mmHg (adjusted odds ratio (AOR) 3.88; 95% confidence interval (CI) 1.17-12.83, $p = 0.03$), PaO₂ at room air ≤ 60 mmHg (AOR 4.97; 95% CI 1.34-18.23; $p = 0.01$), and lymphocytes $\leq 10\%$ (AOR 8.19; 95% CI 1.48-45.36; $p = 0.02$).⁴²⁴ With these predictors, he has stratified patients into three groups with increasing risks for mortality, i.e. ≤ 1 predictor -mortality rate 14%, any two predictors 47%, and three predictors 75%.⁴²⁴ Wang *et al* suggest that this predictive score will enable CCSs to efficiently triage and manage such patients should ICU care be required.⁴²⁴ However, this tool needs to be scientifically validated.

In our meta-analysis, a mortality of approximately 20 % was associated with a low serum albumin in ICU (95% CI: 7.4, 26.7). (Table 40, figure 9)

TABLE 48 SERUM ALBUMIN DATA AS A PREDICTOR OF INCREASED MORTALITY

Summary	Author	Indicator	Ref summary
0.27 (0.12–0.61),	Radhi ⁴²⁵ -2008	↓sAlbumin	Serum albumin (per 0.1 g/dl decrease)-↑ mortality
3.5 (1.8-6.6)	Morris ¹⁴⁰ -2002	↓sAlbumin	Serum albumin < 2.6 independently ↑hospital mortality,
1.69 (1.04-2.74	Chaing ⁴³¹ -2011	↓sAlbumin	Lower serum albumin (per 1-g/dl decrease) univariably ↑hospital mortality,
3.5 (1.8-6.6)	Bonarek ³⁴⁴ - 2001	↓sAlbumin	Hypoalbuminaemia-↑mortality
AOR 3.63 (1.72–.66)	Fei-2009 ⁴²³	↓sAlbumin	serum albumin <3 g/dl-↑mortality
1.05(1.00-1.09)	Adlakha ⁴²⁹ 2011	↓sAlbumin	Per 1g/dl ↓

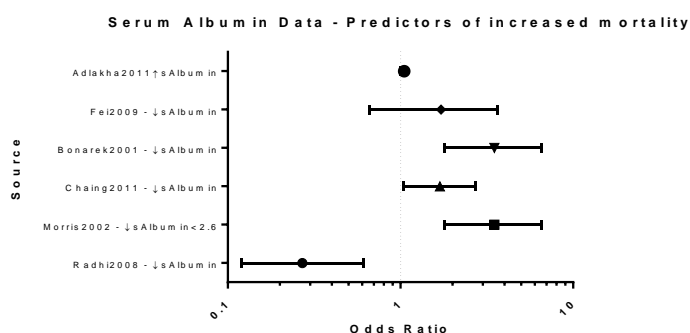


FIGURE 17 SERUM ALBUMIN DATA-PREDICTORS OF INCREASED MORTALITY

Croda *et al*,³⁵⁵ in their ICU study on prognostic indicators for patients with HIV infection on ART found that sepsis, MV in the first 24 hours, APACHE 11 score >19 and CD4< 50 were poor predictors of ICU survival. Caldeira *et al*, in their admission criteria to ICU study found that age, prognostic scores and organ dysfunction were related to refusal of ICU admission for priority 3 and 4 patients.³¹² Using the SCCM criteria,⁶² priority 1(34.6%) comprised critically ill patients who were unstable and needing intensive treatment and monitoring, with significant likelihood of recovery; priority 2 (52.4%) contained stable patients who required intensive monitoring because of the possibility of decompensation; patients in priority 3 were unstable, but had a low likelihood of recovery because of the severity of acute disease or comorbidities; patients in priority 4(14%) had little or no anticipated benefit from ICU admission. Priority 4 patients would be patients ‘too well or too ill’ to benefit from ICU care. In their study, the median time from hospital to ICU admission was a median 12 (5-26) days. According to Caldeira *et al*, the ICU in the tertiary hospital used for the purposes of this study did not have admission or discharge criteria for ICU, and this decision vested solely on the ‘availability, and the knowledge and the experience’ of the most experienced ICU specialist at the institution.³¹²

7.5.2 Discussion

In the context of PLWHA and ICU admission, current literature has identified eight predictors associated with poor survival in ICU. These are the diagnosis of PJP, high APACHE II score, low serum albumin levels, low CD4 count, initiation of mechanical ventilation, sepsis, organ failure and any delay in hospital to ICU admission interval.

Based on our meta-analyses for each indicator: MV, sepsis, low CD4, low serum albumin, higher Apache II score, lower PaO₂ and delayed admission to ICU were significant predictors of higher mortality risk based on pooled estimates (Table 40, figure 9).

In all the literature reviewed, these predictors are not stand-alone but rather a constellation of factors related to the survival of PLWHA in ICU.

The benefits of ARVs are unquestionable as they have transformed HIV/AIDS from an acute terminal illness, to a chronic manageable illness.³²⁰

The initiation of ART in ICU was a positive predictor in many studies.^{78 355 368 393 427 434}

The decreased toxicities of the newer ARVs and combinations strengthen the argument for their use in ICU.³²⁰

Potential toxicities, many of which are life-threatening especially in the context of hepatic and renal impairment, need to be vigilantly monitored and managed. Complexities regarding the use of ART in ICU, regarding its absorption, pharmacokinetics and drug-drug interactions have been described. Continued research is needed to validate policies on the initiation of HAART in ICU.

This is validated by improved survival of PLWHA in ICU who have been on HAART. In the ART era, ICU to ward survival rates of 70% have been recorded in HIV-infected patients, which is similar to that of the general medical population.^{147 357} The use of low tidal volume ventilation has been associated with improved survival as it minimises the risk of pneumothorax. Non-invasive ventilation using a continuous positive airway pressure (CPAP) ventilation is showing promise for patients with PJP, especially in a resource-constrained environment, as it is inexpensive, does not require ICU care or specialised staff, and could be used in any health facility with an oxygen source as it

delivers low tidal volume pressures and negates the two biggest predictors of mortality associated with mechanical ventilation for PJP, i.e. nosocomial infection with consequent sepsis and organ failure and pneumothorax.⁴³⁵ Further randomised studies need to validate these preliminary studies.⁴³⁵

Kramer *et al*(2010),⁴³⁶ in their study ‘A predictive model for the early identification of patients at risk for a prolonged intensive care unit length of stay’ mention that” studies have repeatedly shown that a small percentage (7% to 11%) of lengthy ICU admissions account for a large proportion (40% to 50%) of resources use.^{437 438} As patients with a prolonged ICU stay consume a disproportionate amount of resources, their early identification can assist in improving unit efficiency. Identifying these patients early can improve patient throughput by signaling a need for discharge planning or exploration of care alternatives. These alternatives might include palliative care consultation⁴³⁹, early mobility therapy^{440 441}, transfer to an in-hospital chronic ventilator unit⁴⁴², or discharge to a long-term acute care facility.”^{443 444}

7.5.3 Conclusion

CCSs, in the light of the data presented, still need to make ethically challenging decisions regarding PLWHA and whom to admit to ICU. None of the physiological severity criteria such as APACHE, SOFA etc were designed to triage patients into ICU^{445 446} and this presents a fundamental void in the guidelines to intensive care provision. We propose that general guidelines to the CCS i.e. is the patient ‘too well or too ill’ for ICU care and whether there is a ‘realistic prospect of reversibility of organ dysfunction’ should apply equally to PLWHA requiring ICU care. These data may be helpful for health policy makers

and ICU directors and serve as a benchmark for future studies on decision-making in the context of HIV/AIDS and intensive care in a resource limited environment.

CHAPTER 8: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

This is the first comprehensive project to investigate the ethical dilemmas that Critical Care Specialists encountered in the admission of patients with HIV infection to intensive care in South Africa. The study found:

1. The ICU bed availability in South Africa is way below that of the USA, used as the international norm, and the problem in SA is worse in the public sector as compared to the private sector, and there are widespread variations across the provinces regarding ICU bed and CCS availability.
2. Strong regulatory and ethical frameworks exist to protect the rights of PLWHA and access to ICU, and in terms of rationing of scarce resources, the *Soobramoney* case precedent would not be justifiable for PLWHA and access to intensive care as it would not pass the central requirements of 'suitability, necessity and proportionality' and would therefore be unreasonable in its application.
4. South Africa, despite its late-rollout of ART, has made significant gains in its HIV/AIDS treatment, care and support programmes and is walking the same path as Brazil of having a strong human rights impetus as evidenced by court actions by the *TAC*, government declaring HIV/AIDS a national emergency, thus granting it access to manufacture and parallel import generic ARVs, and access to triple

therapy at a CD4 count of 350cells/mm³. However, in its determined efforts to control the pandemic of HIV/AIDS, some countries, notably Botswana and South Africa are accused of violating international treaties.

4. This study indicates that PLWHA are not discriminated against with regard to admission to intensive care, and they are not subjected to unfair value-laden judgments, such as medical futility decisions.

5. The literature indicated that, in respect of PLWHA, specific variables influence their survival in ICU. Clinical prediction tools should be considered as an aid to clinical judgment on decisions on whom to admit to ICU, and rational decision making should include central questions such as 'Is the patient too ill or too well for ICU care?' and is there a reasonable prospect of 'reversibility of organ-dysfunction'? Non-invasive ventilation using a continuous positive airway pressure (CPAP) ventilation mask is showing promise for patients with PJP, especially in a resource-constrained environment.

8.2 DISCUSSION

This study found that the ICU bed availability in South Africa is well below that of the USA, used as the international norm. This discrepancy is worse in the public sector compared to the private sector. The problem is exacerbated by the fact that South Africa has a disproportionately large burden of people living with HIV/AIDS as compared to the USA. In the USA, the total ICU bed availability is 93 555 and the ICU bed to population ratio is 1: 3356. In contrast, the total ICU bed availability in South Africa is 4719 beds, with 25% (1186 beds) in the public sector catering for 80% (40.5 million) of the

population. The private sector has 75% (3533 beds) catering for largely medically insured and fee-for service patients (10 million) of the population. Furthermore, there are wide discrepancies across the provinces, with the Western Cape having a public bed: population ratio of 1:30 000 and Limpopo province having 1:150 000 bed: population ratio. Apart from the widespread variations across the provinces, provinces such as Limpopo have no CCSs to render this level of care.

It is important to note that with the National Health Insurance plan envisaged for South Africa, the total intensive care unit bed availability would be 4719, which would translate to a bed: population ratio of 1:10 000. The NHI would not solve the huge discrepancies of access to intensive care across the provinces. Bhagwanjee *et al* , in their 2005 ‘National Audit of Critical Services’ concluded that in view of the huge discrepancies of intensive care unit bed availability in the country, there is a compelling need for regionalisation of intensive care services in the country. The discrepancy with intensive care unit bed availability in the country, when viewed in the context of HIV/AIDS adds an additional level of complexity. In South Africa, approximately 7% of people living with HIV/AIDS (360 000) are in stage 4 disease, many requiring intensive care unit admissions for opportunistic infections and sepsis, organ failure, complications related to ART toxicities, or for complications unrelated to HIV infection. Although respiratory failure remains the commonest indication for ICU admission, other diagnosis such as non-PCP pneumonia, sepsis, cardiac, gastrointestinal, and renal diseases that are often not directly related to underlying HIV disease are becoming more common. Furthermore, these patients will need to compete for an intensive care unit bed with members of the general population not infected with HIV who require this level of care.

The shortage of ICU beds in South Africa results in CCSs being under pressure to deliberate on resource allocation decisions for competing patients. However their decisions must respect provisions under law regarding rationing of health care services and not to be refused emergency care. Prescribed ethical codes of conduct and existing professional guidelines must also be taken into consideration. The lack of explicit guidelines and admission policies for PLWHA and ICU care could result in CCSs excluding patients from ICU on the basis of their HIV status. This action would be unconstitutional (s27) and indeed criminal as it would constitute a statutory violation of the National Health Act in terms of access to emergency care. It would also be ethically unacceptable as ‘The Code of Ethics for Emergency Physicians’ in the USA and the Health Professions Council of South Africa ‘Guidelines on the management of patients with HIV/AIDS’ imposes an ethical duty on a physician not to discriminate against a patient on the basis of their HIV status.

The attitude and perception survey conducted as part of this study showed that CCSs decisions to admit patients living with HIV/AIDS were consistent with these ethical and professional guidelines. An important finding was the absence of discrimination against PLWHA and access to intensive care. In keeping with published guidelines, doctors considered the prognosis of the acute disease and of the underlying disease as most important. Most of the CCSs cited availability of an ICU bed as influencing the decision to admit. Surprisingly, a large number would admit to ICU ‘patients who may live for several years but whose quality of life is very poor according to the doctor’s opinion’.

Our survey further demonstrated that PLWHA are not subject to medical futility decisions. In South Africa, the patients Constitutional right to life (s11) and the right not to be refused emergency care (s27) would compel the CCS to resuscitate the patient, irrespective of their HIV status. This right is further entrenched in the National Health Act 61 of 2003. In the USA, the patient has a Constitutional right to life and right to emergency care. This right is further entrenched by the American Health Securities Act 2009, Federal Emtala Law, and the newly enacted Patient Protection and Affordable Care Act of 2010.

In South Africa, the constitutionally sound basis for rationing has been canvassed in the case of *Soobramoney*. The court found that Addington Hospital's eligibility policy for renal dialysis was transparent and not discriminatory, as it prioritised its limited resources (dialysis machines) to those patients suitable for renal transplant with expected improved quality of life and not dependent on expensive dialysis. The court's decision to deny Mr Soobramoney renal dialysis is significant as it endorsed the reasoning that limited resources should not be wasted on futile care but prioritised to the most deserving patients meeting scientifically validated triage/eligibility criteria where cure was a reasonable outcome.

In terms of s27 (right not to be refused emergency care) and s 36 ('Limitation clause' contained in the Bill of Rights), conventional wisdom would dictate that, like in *Soobramoney*, PLWHA should be denied access to intensive care, a scarce resource, as they have a chronic terminal illness for which there is no cure, and that ARV care, treatment and support programmes arguably are in the realms of palliative care.

However, with the advent of HAART, PLWHA admitted to intensive care, have similar outcomes as for the general population accessing intensive care. In the ART era, ICU to

ward survival rates of 70% have been recorded, which is similar to that of the general medical population. The three month and long-term outcomes of HIV/AIDS patients admitted to the ICU improved dramatically. Similar results were found in Switzerland and the USA. The benefits of ARVs are unquestionable as it has changed HIV/AIDS from an acute terminal illness, which has already claimed 25 million lives globally, to a chronic manageable illness. Brazil's remarkable and world-renowned success in controlling its HIV/AIDS programs has resulted in a decrease in 80% of HIV-related hospital admissions.

In a study in the Western Cape, South Africa, the initiation of ART had the effect of reducing the 6 month mortality from 12.7% to 6.6%, i.e. approximately 50% for the study period 2001-2005. In another South African study in KwaZulu-Natal, South Africa, from 2002-2003 and 2004-2006, the effect of ARV initiation had reduced the mortality for PLWHA for women by 22% and men by 29%.

In both the USA and SA, legal precedents have been set regarding informed consent, refusal of consent and issues around emergency consent. This has direct relevance to patients admitted to ICU, where patients may refuse ICU admission, a do-not-resuscitate (DNR) order or living will may be presented to the CCS, and surrogate decision-making for patients who lack consent-making capacity as a result of severe illness. These precedents apply equally to people living with HIV/AIDS, and in SA, with increasing literacy of the population and advocacy by the profession, such issues would become more prevalent. Patients, in their state of wellness should be counseled on issues of organ-donor preferences and advanced directives concerning life-support in intensive care, which would remove many of the ethical dilemmas currently faced by CCSs.

Intensive care unit shortages are a global problem in public health ICUs, but particularly so in developing countries, including South Africa, where ICU beds are in short supply and only account for 1-2% of all acute care beds. Therefore, CCSs need some moral framework on triage decisions and priority setting to help with such value-laden decisions. Rational approaches to ethical-decision making such as consequentialism would support the CCS in making triage or rationing decisions in ICU, a scarce and expensive utility. Despite these rational approaches to decision-making, difficult personal decisions still need to be made by the individual CCS working in HIV endemic regions on the effective triage of ICU admissions of PLWHA based on individual case presentations, availability of resources, and applicable ethical principles. The central questions should be ‘is the patient too ill or too well for ICU care?’ and is there a reasonable prospect of ‘reversibility of organ-dysfunction’?

Daniels ‘accountability for reasonableness’ provides a moral framework for ethical decision-making and priority setting with the central requirements being relevance, publicity, revision, and enforcement. The central tenets of this framework are theoretically grounded in justice theories emphasising democratic decision-making. It is based on what ‘fair-minded’ people can agree are relevant; rationales for such decisions must be publicly accessible; when justifiably challenged, it must be revised; and that institutional managers must ensure its fair application. Interestingly, Daniels ‘accountability for reasonableness’ conforms to administrative law principles of procedural fairness and administrative justice, as canvassed in the *Grootboom* and *TAC* decisions.

As Cleary *et al* (2011), mention in their paper on ‘Claims on health care: a decision-making framework for equity, with application to treatment for HIV/AIDS in South Africa’, issues around fair allocation must encompass rational thinking on issues such as ‘the notion of a claim’ and ‘communitarian claims’. These theories focus on the fact that an individual is a member of a community or society, and the individual is viewed as having a claim on health care, and society has a reciprocal obligation to provide the care. However, Cleary *et al* also mention that “claims are not absolute with respect to their being met, and when not all can be met, society needs to allocate resources to those individuals with relatively stronger claims”. The revised Oregon Medicaid Plan is one such example that restricts access for certain medical interventions that are marginally beneficial relative to their costs as judged by a public body with community input. It is important to mention that in the Oregon Medicaid Plan, PLWHA have equal access to medical care, including access to intensive care.

Professional associations have developed criteria for admission to ICU for the general population. These criteria should be equally applicable to PLWHA, as their outcomes in ICU, in the era of HAART, is similar to that of the general population matched for risk. The Society of Critical Care Medicine (SCCM)-USA , has issued four criteria for admission to ICU, i.e. priority 1 to priority 4 categories. Priority 3 patients were unstable patients, but had a low likelihood of recovery because of the severity of acute disease or because of comorbidities and multi-organ failure; patients in priority 4 had little or no anticipated benefit from ICU admission. Priority 4 patients would be patients too well or too ill to benefit from ICU care. Priority 3 and 4 patients would often include PLWHA with sepsis and multi-organ failure, where there is no reasonable prospect of ‘reversibility of organ dysfunction’. In this circumstance, survival to ICU discharge would be unlikely.

The American Thoracic Society (ATS) has also deliberated on this issue and its Bioethics Task Force had issued a policy document on the 'Fair Allocation of Intensive Care Resources'. which includes a patients 'sufficient medical need; a certain degree of potential benefit (excludes patients who are permanently unconscious or severe irreversible lack of cognitive function'; and regarding the 'single ICU bed' to admit patients meeting the thresholds of medical need and benefit, on a first-come, first-served basis. The ATS criteria does not make specific mention of HIV/AIDS as their criteria of 'sufficient medical need' and ' a certain degree of potential benefit' is equally applicable to PLWHA as it is for the general population not infected with HIV/AIDS. Therefore, in terms of eligibility criteria for PLWHA and admission to ICU, general guidelines advised by the professional bodies for use by the general population not infected with HIV/AIDS should be equally applicable to PLWHA, i.e. is the patient 'too ill or too well to warrant ICU admission?', and is there a realistic prospective of 'reversibility of organ dysfunction'?

In all the literature reviewed, several factors predict mortality in HIV infected patients in ICU. Regarding PJP as a predictor of survival in intensive care a low haemoglobin, high APACHE 11 score, and the need for MV continue to be predictors of higher mortality. Increasing age, low serum albumin, low CD4 count, sepsis and organ failure are poor predictors of survival in ICU. A 24 delay from ward to ICU admission also carries a negative predictive outcome. However, these predictors should not be viewed in isolation but rather a constellation of factors which may involve all eight predictors influencing the survival of a patient with HIV/AIDS in ICU. Therefore it would be misleading to discuss each as a stand-alone predictor, but rather as a complex constellation of factors.

On the use of ICU prognostic systems in deciding between competing patients, the ATS states that these predictive tools are only of value to the patient already receiving ICU care. Furthermore, these tools are limited by their accuracy due to the statistical nature of their deviation and the heterogeneity of the reference populations. Marti *et al* (2012) in their ‘ Prediction of severe community-acquired pneumonia: a systematic review and meta-analysis’ study conclude that clinical prediction rules, because of their varying specificity, sensitivity and heterogeneity across different clinical environments should be regarded as an aid to clinical judgment. Organ dysfunction scores such as Sequential Organ Dysfunction Assessment (SOFA) may have a predictive value and may influence decisions to withhold ICU care.

In the context of critical care for PLWHA, antiretroviral therapy and unresolved questions regarding its use in the ICU add an additional level of complexity to already complicated legal and ethical issues. These include HIV testing and disclosure, the administration of antiretroviral medications, important potential drug interactions with medications commonly used in the ICU, and controversies surrounding the use of ART in the ICU. The professional bodies also give the CCS the autonomy to limit life-saving interventions when the prospect of meaningful recovery is unlikely. These professional guidelines are subject to individual interpretation and are not explicit in terms of guiding the profession on issues of ‘medical futility’ as there is no gold standard definition of medical futility, and its definition varies across the professional bodies.

Comparative studies of Botswana, Brazil, India and South Africa indicate their differing resources and levels of political will. Brazil’s treatment, care and support programmes commenced with a strong human rights ethos. The government had issued a ‘ compulsory

licence' to manufacture its own ARVs, thus bypassing international patency laws, and making ARVs available to its people. Furthermore, the government was pro-active in establishing a national health programme, thus incorporating the resource-rich private sector onto its treatment, care and support programmes, including access to intensive care for PLWHA. This was as a result of an agreed upon capitation fee programme in the light of a national health crisis. Further-more, every public health facility in Brazil has an infectious disease specialist employed for complicated case presentations. Brazil also had the foresight to commence triple therapy in 1996 at a CD4 count of 350 cells/mm³. South Africa, despite its late-rollout of ART, is walking the same path as Brazil of having a strong human rights impetus as evidenced by court actions by the *TAC*, government declaring HIV/AIDS a national emergency, thus granting it access to manufacture and parallel import generic ARV's, and access to triple therapy at a CD4 count of 350 cells/mm³. The proposed national insurance plan, based on Brazil's model, has been adopted by government, with R1 billion allocated this financial year for its revitalisation programmes of public health facilities in preparation for full implementation by 2016.

Botswana is regarded as a success story in Africa regarding its ART coverage of 93% and effective treatment, care and support programmes. However, in its determined efforts to control the pandemic of HIV/AIDS, some countries, notably Botswana and South Africa are accused of violating international treaties in terms of enacting laws that criminalise certain behaviour of PLWHA. Their governments have passed these laws with the contention that the rights of all citizens need to be protected, and that alleged rapists in particular need to be compulsorily tested for HIV infection to protect the rights of their victims. These contentious laws violate the human rights of an alleged rapist in terms of

the 'presumed innocent' clause contained in most countries constitutions. India's 'mandatory HIV testing policies' is also a violation of the ethical principle of autonomy, India is yet to sign its National Aids Programme into public health policy, as some of its provisions legally acknowledge, directly and indirectly, prostitution, illicit intravenous drug use and lesbian relationships, which are presently unlawful in India. Unlike India, SA has made concerted legal efforts towards non-discriminatory criteria for PLWHA. Global Health Initiatives have supported HIV care, treatment and support programmes in many emerging countries, but this source of funding is presently under treat as a result of the global economic recession. This threatens to reverse many of the successes attained thus far by countries such as South Africa, Brazil, Botswana and India whose programmes are heavily reliant on these sources of funding. The SA health system is structured to meet the basic demands of patients needing medical care. Human rights issues, such as voluntary HIV counselling and testing and issues of patient confidentiality are in line with international treaties. Access to triple HAART is free to deserving patients in public health facilities meeting the new ARV initiation guidelines which include the initiation of combination ART for patients with a CD⁴ count of 350 cells/mm³ or WHO stage 3 or 4 disease, all patients co-infected with drug sensitive or resistant TB irrespective of CD⁴ count, all pregnant women with CD⁴ < 350 cells/mm³ to lifelong ART, and test all children below the age of 5 years and treat all who test positive with ARVs.⁴⁵

8.3 CONCLUSIONS

This study indicates that South Africa has made many legal provisions to protect the rights of its HIV infected citizens, and that PLWHA are not discriminated against with regard to admission to intensive care, nor are they subjected to unfair value-laden judgments, such as medical futility decisions. ICU admission policies must exist, which must be fair, equitable, transparent and must meet with societal approval, and when justifiably challenged, must be subject to revision. This would minimise subjectivity by CCSs concerning admissions to ICU, especially in our context of PLWHA. With the advent of ART, the prognosis of PLWHA has improved to that of the general population, and existing institutional triage guidelines for admission to ICU should be used for PLWHA. However, individual value laden decisions still need to be made by the CCS on admission to ICU for all patients, including PLWHA, on the basis of a number of factors including co-morbid conditions and the ‘reversibility of organ dysfunction’. In terms of these guidelines, patients that are ‘too well or too ill’ would be deemed not eligible for ICU admission. These decisions, made many times on a daily basis by the CCS, are at the interface of law, ethics and medicine. In *Soobramoney v Minister of Health, KwaZulu-Natal* Sachs J observed that:

“In all the open and democratic societies based upon dignity, freedom and equality with which I am familiar, the rationing of access to life-prolonging resources is regarded as integral to, rather than incompatible with human rights approach to health care.”

However, such decisions by the profession must fair in its application and must stand the ‘test of reasonableness’ legally and ethically. The Siracusa principles adopted by the ICESCR spells out five criteria concerning human rights and restrictions to public health

based on resource limitations. The burden of proof still falls on those who want to restrict rights, and concrete scientific and public health evidence is needed, specifically with response to Siracusa Principle 5 which states that “ it cannot be unreasonable or discriminatory in its application”. Daniels ‘Accountability for reasonableness’ provides a moral-framework for such ethical decision-making.

8.4 RECOMMENDATIONS AND BEST PRACTICE IMPLEMENTATION

In South Africa, the following recommendations are made and current health policy implementations are acknowledged as a result of this study:

1. The National Department of Health has implemented routine ‘provider-initiated HIV testing with opt-out’ for all patients presenting to any public health facility as of 2010. This would have the effect of de-stigmatising HIV/AIDS and bring it in line with management strategies of other chronic diseases such as hypertension and diabetes, which carries no stigma or discrimination with it. This would also remove much of the ethical dilemmas surrounding HIV/AIDS such as issues of breaches of confidentiality, HIV testing in ICU for patients lacking capacity to consent, legal and ethical issues regarding occupational blood-splash and needle-stick injuries etc.
2. HIV/AIDS should be a notifiable disease as this would lead to its destigmatisation. It would also have the effect of collating national and regional demographic statistics more accurately and would inform public health policy for priority programmes for high-risk population at greatest risk e.g. trucking corridors, those populations affected by high teenage pregnancies and high illicit and recreational substance abuse etc.

3. Contact tracing of HIV and TB treatment defaulters would be easier by creating an electronic national database across the provinces, including for patients with Tuberculosis, as defaulters to treatment pose a major challenge and threat to public health as regards drug resistant HIV and TB.

4. Critical care specialists should have a clear plan of triage for admission to ICU using the same institutional guidelines used to admit other categories of patients to intensive care, as the era of ART has changed their outcomes significantly to that of the general population accessing ICU. Their three and six monthly survival post-ICU discharge has also improved significantly in the era of HAART. The huge discrepancy of ICU beds in SA across the provinces makes a compelling argument for the regionalisation of ICU beds.

5. The National Health Insurance Plan envisaged for South Africa would make available more ICU beds (1:10 000) for the population. However a public-private partnership needs to occur, as in Brazil and Botswana, to optimise care, treatment and support programmes for PLWHA, including access to ICU.

6. Critical care nurses need to be an integral part of the decision-making process regarding medical futility decisions, including the family and the patient concerned.

7. An Ethics Committee or an ethics consultant placed at each institution with ICU facilities would help with ethically challenging decisions, especially on withholding or withdrawing of intensive care.
8. Clinical prediction tools should be considered an aid to clinical judgment on decisions on whom to admit to ICU, including for PLWHA.
9. The use of low tidal volume ventilation has been associated with improved survival. Non-invasive ventilation using a continuous positive airway pressure (CPAP) ventilation mask is showing promise for patients with PJP, especially in a resource-constrained environment, as it is inexpensive, does not require ICU care or specialised staff, and could be used in any health facility with an oxygen source as it delivers low tidal volume pressures and negates the two biggest predictors of mortality associated with mechanical ventilation for PJP, i.e. nosocomial infection with consequent sepsis and organ failure and pneumothorax. Further randomised studies need to validate these preliminary studies.
10. Ongoing continuing medical education programmes should be an important component of skills development, especially with regards to making ethically challenging decisions on withholding or withdrawing ICU care, as well as for issues of consent, confidentiality, advanced directives and DNR orders.
11. Innovative changes, such as the implementation of fast-track anaesthesia and enhanced post-anaesthesia care unit capabilities, the development of sub-intensive, intermediate and step-down units, and the increased use of non-invasive

ventilation in regular wards, rather than only in ICUs, would decrease the need for ICU beds. These changes would have the desired effect of decreasing the need for CCS in favour of increasing the number and scope of practice of hospitalists/generalists. This would also decrease the need for ICU care, and decrease hospital length of stay and costs.¹²

8.5 LIMITATIONS

There are several limitations to this study that need to be considered when interpreting each component. There was no way for the investigators to determine the extent to which the critical care specialists responses to the case vignettes did not reflect their real life practice decision. Since anonymity was ensured in the informed consent process one may assume that this was minimal. The response rate of 20% to the questionnaire survey, while low, is quite compatible with postal, self-completed questionnaires. This 20% response allowed for a 9.2% error rate and a 95% confidence level in reporting results. There was an under-representation of three provinces in South Africa, namely Mpumalanga, Limpopo and Northern Cape, but there is no reason based on the survey of ICU facilities in South Africa to assume that the responses would be any different to that in the other six provinces.

The nature of the survey did not permit acquisition and analysis of qualitative information about critical care specialist's insights and factors that pattern their responses to the hypothetical case based scenarios. Application of statutory regulations that may govern decisions regarding access to ICU care for the hypothetical case scenarios is based on the interpretation of the investigators. Some of these are backed up by case precedents such as

the *Soobramoney v Minister of Health (KwaZulu-Natal)* case in South Africa. Unless legally challenged it is generally impossible to predict how the courts may argue in the setting of legal challenges. We attempted to present as balanced a view as possible, and our conclusions must be considered in this context. Notwithstanding these limitations, the findings in this project provide a unique insight into the ethical dilemmas that face critical care specialists in South Africa when dealing with HIV infected patients who seek or require intensive care. Several case precedents suggest that our interpretation is valid.

REFERENCES

1. WHO/UNAIDS/UNICEF (2011) 'Global HIV/AIDS Response: Epidemic update and health sector progress towards Universal Access 2011' accessed at http://www.who.int/hiv/pub/progress_report2011/summary_en.pdf on 1/08/2012.
2. UNAIDS report on the global AIDS epidemic 2010 accessed at http://www.unaids.org/globalreport/global_report.htm on 11/07/2012.
3. South Africa Global AIDS Response Progress Report 2012 accessed at http://www.unaids.org/en/dataanalysis/monitoringcountryprogress/progressreports/2012countries/ce_ZA_Narrative_Report.pdf on 11/07/2012.
4. UNAIDS Report on the Global AIDS Epidemic 2010 accessed at http://www.unaids.org/globalreport/Global_report.htm on 6/03/2012.
5. AIDS epidemic update 2009 accessed at http://data.unaids.org/pub/Report/2009/JC1700_Epi_Update_2009_en.pdf on 11/09/2010.
6. Mbeki's mistake. *Nature*;2007;448(7155):727-27.
7. WHO Global Health Observatory Data Repository accessed at <http://apps.who.int/gho/data/node.main.623?lang=en> on 11/10/2013.
8. National Strategic Plan for HIV and AIDS, STIs and TB, 2012-2016 accessed at http://www.sanac.org.za/files/uploaded/519_NSP%20Draft%20Zero%20110808%20pdf%20%20final.pdf on 25/02/2012.
9. The HIV & AIDS and STI Strategic Plan for South Africa (NSP 2007-2011) accessed at http://www.info.gov.za/otherdocs/2007/aidsplan2007/hiv_aids_sti_strategic_plan_s_a.pdf on 27/03/2012.
10. Harrison D, An Overview of Health and Health care in South Africa 1994 – 2010: Priorities, Progress and Prospects for New Gains commissioned by the Henry J. Kaiser Family Foundation accessed at <http://www.doh.gov.za/docs/reports/2010/overview1994-2010.pdf> on 25/02/2012.
11. Masur H. Caring for AIDS patients in the ICU: expanding horizons. *Chest* 2009;135(1):1-2.
12. Halpern NA, Pastores SM. Critical care medicine in the United States 2000-2005: an analysis of bed numbers, occupancy rates, payer mix, and costs. *Critical Care Medicine* 2010;38(1):65-71.[<http://dx.doi.org/10.1097/CCM.0b013e3181b090d0>]
13. Bhagwanjee S, Scribant J. National audit of critical care resources in South Africa – unit and bed distribution. *SAMJ* 2007;97(12):1311-14.
14. Naidoo K, Singh J, Lalloo U. A critical analysis of ICU/HC beds in South Africa: 2008-2009. *SAMJ* 2013;103(10):751-53. [<http://dx.doi.org/10.7196/SAMJ.6415>]
15. Jeena PM, McNally LM, Stobie M, Coovadia HM, Adhikari MA, Petros AJ. Challenges in the provision of ICU services to HIV infected children in resource poor settings: a South African case study. *J Med Ethics* 2005;31(4):226-30. [<http://dx.doi.org/10.1136/jme.2003.004010>]
16. WMA Handbook of Medical Ethics, 2005 accessed at http://www.wma.net/en/30publications/30ethicsmanual/pdf/ethics_manual_en.pdf on 23/10/2013.
17. American College of Emergency Physicians 'ACEP 2011 Policy Document' accessed at <http://www.acep.org/content.aspx?id=32334> on 15/08/2011.
18. Ethical Guidelines for Good Practice with regard to HIV, Health Professions Council of South Africa-Guidelines for good practice in the Health Care Professions, Booklet 11 accessed at

- http://www.hpcsa.co.za/downloads/psychology/industrial_psychology/hpcsa_good_practice_hiv.pdf on 23/10/2013.
19. Luce JM, White DB. A History of Ethics and Law in the Intensive Care Unit. *Crit Care Clin* 2009;25(1).
 20. Lanken PL, Terry PB, Adler DC, Brooks-Brunn JA, Crawford SW, Danis M, *et al.* Fair Allocation of Intensive Care Unit Resources-Position Statement by the ATS Bioethics Task Force. *Am J Resp Crit Care Med* 1997;156(4):1282-301.
 21. Hadorn D C. Setting health care priorities in Oregon: cost-effectiveness meets the rule of rescue *JAMA* 1991;265:2218-25.
 22. Kohn R, Rubenfeld G, Levy M, Ubel P, Halpern S. Rule of rescue or the good of the many? An analysis of physicians' and nurses' preferences for allocating ICU beds. *Intensive Care Medicine* 2011;37(7):1210-17. [<http://dx.doi.org/10.1007/s00134-011-2257-6>]
 23. Levin P D, Sprung C L. *Critical and Intensive Care Ethics. The Cambridge Textbook of Bioethics.* United Kingdom: Cambridge University Press, 2008:462-68.
 24. Singh JA, Ngwenya C. *Bioethics.* In: Dada MA, McQuoid-Mason DJ, editors. *Introduction to Medico-Legal Practice:* Butterworths, 2001:35-43.
 25. Mathiva L. ICUs worldwide: An overview of critical care medicine in South Africa. *Critical Care* 2002;6(1):22 - 23.
 26. Question & Replies No 2071 to 2100-Number of ICU Beds in SA Public Hospitals by Parliamentary Monitoring Group accessed at <http://www.pmg.org.za/node/19587> on 21/02/2012.
 27. *Health Annals 2008* by the Hospital Association of South Africa accessed at http://www.hasa.co.za/media/uploads/documents/file/2009-02-26/On_the_Brink_2.pdf on 20/03/2012.
 28. Constitution of the United States Of America accessed at <http://www.constitution.org/cons/constitu.htm> on 11/09/2010.
 29. Office of the UN High Commissioner for Human Rights(OHCHR) 'South Africa Homepage' accessed at <http://www.ohchr.org/english/countries/za/index.htm> on 9 /03 2012.
 30. Convention on the Elimination of ALL Forms of Discrimination against Women.1981 accessed at <http://www.un.org/womenwatch/daw/cedaw/> on 17/12/2010.
 31. United Nations Convention on the Rights of the Child (CRC). New York: United Nations, 1989.
 32. International guidelines on HIV/AIDS and human rights, 2006 consolidated version,UNAIDS and OHCHR accessed at http://data.unaids.org/Publications/IRC-pub07/jc1252-internguidelines_en.pdf on 19/03/2012.
 33. International Covenant on Civil and Political Rights accessed at www.unhchr.ch/html/menu3/6/a_ccpr.htm on 29/09/2007.
 34. United Nations Universal Declaration of Human Rights. G. A. Res. 217A (III), UN GAOR, Res. 71, UN Doc. A/810. New York: United Nations,1948.
 35. Escher M, Perneger T V, Chevrolet J-C. National questionnaire survey on what influences doctors' decisions about admission to intensive care. *BMJ* 2004;329(7463):425-. [<http://dx.doi.org/10.1136/bmj.329.7463.425>]
 36. Vincent JL. European attitudes towards ethical problems in intensive care medicine: Results of an ethical questionnaire. *Intensive Care Medicine* 1990;16(4):256-64. [<http://dx.doi.org/10.1007/bf01705162>]
 37. Giannini A, Consonni D. Physicians' perceptions and attitudes regarding inappropriate admissions and resource allocation in the intensive care setting. *Br. J. Anaesth.*;2006;96(1):57-62. [<http://dx.doi.org/10.1093/bja/aei276>]

38. StataCorp. 2011. Stata Statistical Software: Release 12. College Station, TX: StataCorp LP.
39. A critical look at critical care. *Lancet* 2010;376(9749):1273.
[[http://dx.doi.org/10.1016/s0140-6736\(10\)61896-x](http://dx.doi.org/10.1016/s0140-6736(10)61896-x)]
40. Mathers CD, Loncar D. Projections of Global Mortality and Burden of Disease from 2002 to 2030. *PLoS Med* 2006;3(11):e442.
[<http://dx.doi.org/10.1371/journal.pmed.0030442>]
41. HIV Surveillance Report: Diagnoses of HIV Infection and AIDS in the United States and Dependent Areas, 2011; Vol. 23. accessed at www.cdc.gov/hiv/statistics on 9/07/2013.
42. United Nations Millenium Project accessed at
<http://www.unmillenniumproject.org/goals/index.htm> on 26/02/2012.
43. Stats South Africa -Statistical releaseP0302-2010 accessed at
<http://www.statssa.gov.za/publications/P0302/P03022010.pdf> on 24/02/2012.
44. Stats SA Mid-Year Population Estimates 2011 accessed at
<http://www.statssa.gov.za/publications/P0302/P03022011.pdf> on 20/03/2012.
45. Deptment of Health South Africa, The South African Antiretroviral Treatment Guidelines 2013 accessed at
<http://www.sahivsoc.org/upload/documents/2013%20ART%20Treatment%20Guidelines%20Final%2025%20March%202013%20corrected.pdf> on 12/10/2013.
46. US Department of Health and Human Services- National Health Expenditure Data-2009 accessed at
http://www.cms.hhs.gov/NationalHealthExpendData/02_NationalHealthAccountsHistorical.asp#TopOfPage on 1/09/2012.
47. Centres for Medicare and Medicaid Services accessed at
http://www.cms.gov/NationalHealthExpendData/02_NationalHealthAccountsHistorical.asp# on 17/02/2012.
48. The Global Fund: a bleak future ahead. *Lancet* 2010;376(9749):1274.10.1016/s0140-6736(10)61897-1.
49. Centres for Medicare and Medicaid Services-National Health Expenditures 2010 Highlights-USA accessed at
http://www.cms.gov/NationalHealthExpendData/02_NationalHealthAccountsHistorical.asp#TopOfPage on 22/02/2012.
50. Johnson J,The Ryan White HIV/AIDS Program-2011 accessed at
<http://www.fas.org/sgp/crs/misc/RL33279.pdf> on 5/10/2013.
51. How the Affordable Care Act Helps People Living with HIV/AIDS: 2011 and Beyond- U.S. Department of Health & Human Services, Washington DC accessed at
<http://www.whitehouse.gov/healthreform/healthcare-overview> on 18/02/2012.
52. Patient Protection and Affordable Care Act of 2010: Summary, Analysis, and Opportunities for Advocacy for the Academic Emergency Physician accessed at
<http://onlinelibrary.wiley.com/doi/10.1111/j.1553-2712.2010.00802.x/pdf> on 26/02/2012.
53. The WHITE HOUSE-Office of the National AIDS Policy-National HIV/AIDS Strategy for the United States 2010 accessed at <http://www.aids.gov/federal-resources/policies/national-hiv-aids-strategy/nhas.pdf> on 18/02/2012.
54. National Health Insurance in South Africa-Policy Paper accessed at
<http://www.info.gov.za/view/DownloadFileAction?id=148470> on 25/02/2012.
55. Giya G, Mukotsanjera-Kowayi V. South Africa's National Budget- HIV & AIDS- from policy to action2010/2011 In: IDASA, editor, 2010.

56. Healthcare in South Africa 2012 accessed at http://www.medioclubsouthafrica.com/index.php?option=com_content&view=article&id=102:healthcare&catid=34:developmentbg#expenditure on 25/02/2012.
57. The Charter of the Public and Private Health Sectors of The Republic Of South Africa accessed at <http://www.doh.gov.za/docs/misc/healthcharter.pdf> on 26/02/2012.
58. Lin SM, Wang TY, Liu WT, Chang CC, Lin HC, Liu CY, *et al.* Predictive factors for mortality among non-HIV-infected patients with pulmonary tuberculosis and respiratory failure. *Int J Tuberc Lung Dis* 2009;13(3):335-40.
59. Johnson LF. Access to Antiretroviral Treatment in South Africa, 2004-2011. *The Southern African Journal of HIV Medicine* 2012(43):22-27.
60. Samb B, Evans T, Dybul M, *et al.* An assessment of interactions between global health initiatives and country health systems. *Lancet* 2009;373(9681):2137-69. [http://dx.doi.org/10.1016/s0140-6736(09)60919-3]
61. American College of Emergency Physicians accessed at <http://www.acep.org/> on 26/02/2012.
62. Task Force of the American College of Critical Care Medicine. Guidelines for intensive care unit admission, discharge, and triage. *Critical Care Medicine*, 1999; 27:633-8.
63. Brill J, Spevetz A, Branson RD, Campbell GM, Cohen H, Dasta JF, *et al.* Critical care delivery in the intensive care unit: defining clinical roles and the best practice model. *Critical Care Medicine* 2001;29(10):2007-19.
64. Vincent J-L, Singer M. Critical care: advances and future perspectives. *Lancet* 2010;376(9749):1354-61. [http://dx.doi.org/10.1016/s0140-6736(10)60575-2]
65. Angus DC: Caring for the critically ill patient: challenges and opportunities. *JAMA* 2007; 298:456-458.
66. Luce JM, Rubenfeld GD: Can health care costs be reduced by limiting intensive care at the end of life? *Am J Resp Crit Care Med* 2002; 165:750-754.
67. Angus DC, Barnato AE, Linde-Zwirble WT, *et al.*: Use of intensive care at the end of life in the United States: An epidemiologic study. *Critical Care Medicine* 2004; 32:638-643.
68. Milbrandt EB, Kersten A, Rahim MT, *et al.*: Growth of intensive care unit resource use and its estimated cost in Medicare. *Critical Care Medicine* 2008; 36:2504-2510.
69. Stockwell DC, Slonim AD, Intensive care unit costs: to infinity and beyond or not? *Critical Care Medicine* 2008; 36:2676-2678.
70. Angus DC, Kelley MA, Schmitz RJ, White A, Popovich J. Caring for the critically ill patient. Current and projected workforce requirements for care of the critically ill and patients with pulmonary disease: can we meet the requirements of an aging population? *JAMA* 2000;284:2762 - 70.
71. Scribante J, Bhagwanjee S. National audit of critical care resources in South Africa - open versus closed intensive and high care units. *SAMJ* 2007;97(12 Pt 3):1319-22
72. van Zyl Smith R, Burch V, Willcox P. The need for appropriate critical care service provision at non-tertiary hospitals in South Africa. *SAMJ* 2007;97(4):268-72.
73. Edbrooke DL, Minelli C, Mills GH, Iapichino G, Pezzi A, Corbella D, *et al.* Implications of ICU triage decisions on patient mortality: a cost-effectiveness analysis. *Crit Care* 2011;15(1):R56. [http://dx.doi.org/cc10029 [pii]10.1186/cc10029]
74. Wunsch H, Angus DC, Harrison DA, Collange O, Fowler R, Hoste EA, *et al.* Variation in critical care services across North America and Western Europe. *Crit Care Med* 2008;36(10):2787-93, e1-9. [http://dx.doi.org/10.1097/CCM.0b013e318186aec8]

75. Adhikari N, R F, Bhagwanjee S, Rubenfeld G. Critical care and the global burden of critical illness in adults. *Lancet* 2010;376(9749):1339-46. [http://dx.doi.org/10.1016/S0140-6736(10)60446-1]
76. Carr G, Addyson D K, Kahn J M. Variation in Critical Care Beds Per Capita in the United States: Implications for Pandemic and Disaster Planning. *JAMA* 2010;303(14):1371-72. [http://dx.doi.org/10.1001/jama.2010.394]
77. Halpern NA. Can the costs of critical care be controlled? *Curr Opin Crit Care* 2009;15(6):591-6. [http://dx.doi.org/10.1097/MCC.0b013e328332f54f]
78. Kelley MA, Angus D, Chalfin DB, Crandall ED, Ingbar D, Johanson W, *et al*. The critical care crisis in the United States: a report from the profession. *CHEST* 2004;125:1514 - 17.
79. Zilberberg MD, Luippold RS, Sulsky S, Shorr AF. Prolonged acute mechanical ventilation, hospital resource utilization, and mortality in the United States. *Critical Care Medicine* 2008;36(3):724-30.
80. African lessons for 1st World ICU's accessed at <http://www.criticalcare.org.za/images/presentations/Professor%20S%20Bhagwanjee.pdf> on 10/10/2013.
81. UNGASS 2006 Progress Report on Declaration of Commitment on HIV and AIDS Republic of South Africa accessed at http://www.unaids.org/en/hiv_docs/2006globalreport/default.asp on 7/10/2013.
82. Flynn M, Reddy S, Shepherd W, *et al*: Fast-tracking revisited: Routine cardiac surgical patients need minimal intensive care. *Eur J Cardiothorac Surg* 2004; 25:116–122.
83. Muehling BM, Halter GL, Schelzig H, *et al*: Reduction of postoperative pulmonary complications after lung surgery using a fast track clinical pathway. *Eur J Cardiothorac Surg* 2008; 34:174–180.
84. Pedoto A, Heerdt PM, Postoperative care after pulmonary resection: postanesthesia care unit versus intensive care unit. *Curr Opin Anaesthesiol* 2009; 22:50–55.
85. Eachempati SR, Hydo LJ, Barie PS, The effect of an intermediate care unit on the demographics and outcomes of a surgical intensive care unit population. *Arch Surg* 2004; 139:315–319.
86. Ranhoff AH, Rozzini R, Sabatini T, *et al*: Subintensive care unit for the elderly: A new model of care for critically ill frail elderly medical patients. *Intern Emerg Med* 2006; 1:197–203.
87. Hill NS, Where should noninvasive ventilation be delivered? *Respir Care* 2009; 54:62–70.
88. Wachter RM, The state of hospital medicine in 2008. *Med Clin North Am* 2008; 92:265–273.
89. McQuoid-Mason DJ, Dada MA. The National Health Act: Some Implications for Family Practice. *CME* 2006; 24(1):12-14.
90. Medical Schemes Act 131 Of 1998 accesses at <http://www.bhfglobal.com/files/bhf/files/MSREGS19July2004.pdf> on 12/09/2010.
91. Rosedale K, Smith ZA, Davies H, Wood D. The effectiveness of the South African Triage Score (SATS) in a rural emergency department. *SAMJ* 2011;101(8).
92. Matzopoulos RG, Prinsloo M, Butchart A, *et al*. Estimating the South African trauma caseload. *Int J Inj Contr Saf Promot* 2006;13:49-51.
93. Bradshaw D, Groenewald P, Laubscher R, *et al*. Initial burden of disease estimates for South Africa, 2000. *SAMJ* 2003;93:682-88.
94. The Constitution of the Republic of South Africa (Act No.108 of 1996) accessed at <http://www.info.gov.za/documents/acts/1996.htm> on 09/09/2011.

95. National Health Act 61 OF 2003 accessed at <https://securejutastat.ukzn.ac.za/nxt/print.asp?NXTScript=nxt/gateway.dll&NXTHost=securejutastat.ukzn.ac.za&d=&multi=0&pb=0&isrc=yes&f=save&> on 12/08/2010
96. Emergency Medical Treatment and Active Labor Act, 42 USC 1395dd (2000).
97. Congress of America S. 703: American Health Security Act of 2009 accessed at <http://www.govtrack.us/congress/bill.xpd?bill=s111-703&tab=summary> on 19.02/2012.
98. American Medical Association Code of Medical Ethics accessed at http://www.ama-assn.org/ama/pub/physician-resources/medical-ethics/code-medical-ethics/opinion203_print.html on 14/09/2010.
99. HPCSA Guidelines for Good Practice in the Health Care Professions Booklet 1 accessed at http://www.hpcsa.co.za/downloads/conduct_ethics/rules/generic_ethical_rules/booklet_1_guidelines_good_prac.pdf on 5/03/2012.
100. Protecting Access to Emergency Care by The Florida College of Emergency Physicians 2002 accessed at <http://www.acep.org/assets/0/16/648/674/988/994/1000/E6B6A64E-D24E-47C4-8F83-BBA9A5BD8E7C.pdf> on 12/09/2009.
101. South African Triage Score Group. The South African Triage Score Manual accessed at www.triagesa.co.za/acrobat/policy200707.pdf on 11/09/2011.
102. Wallis L. South African Triage Score (2007) accessed at http://www.medibank.co.za/south_african_triage_manual.pdf on 1/04/2012.
103. Bruijns SR, Wallis LA, Burch VC. A prospective evaluation of the Cape triage score in the emergency department of an urban public hospital in South Africa. *Emerg Med J* 2008;25(7):398-402. [http://dx.doi.org/25/7/398 [pii] 10.1136/emj.2007.051177]
104. Sanders AB. *Emergency and Trauma Medicine Ethics*. In: Singer PA, Viens AM, editors. *The Cambridge Textbook of Bioethics*. United Kingdom: Cambridge University Press, 2008:469-74.
105. *Soobramoney v Minister of Health (KwaZulu-Natal)* (R) [1998] JOL 1825 (CC) accessed at [http://butterworths.ukzn.ac.za.ezproxy.ukzn.ac.za:2048/nxt/gateway.dll?f=template_s\\$fn=default.htm\\$vid=mylnb:10.1048/enu](http://butterworths.ukzn.ac.za.ezproxy.ukzn.ac.za:2048/nxt/gateway.dll?f=template_s$fn=default.htm$vid=mylnb:10.1048/enu) on 9/03/2012.
106. Cameron E 'Using the law in the HIV pandemic: sword or shield' Lecture at Birkbeck College, London 28 June 2007 accessed at <http://www.aidsmap.com/South-Africas-Justice-Edwin-Cameron-irrational-fear-and-stigma-feed-increasing-calls-for-criminal-HIV-transmission-laws/page/1427669/> on 9/03/2012.
107. London L, Baldwin-Ragaven L. Human Rights Obligations in Health Care. *CME* 2006;24(11):20-24.
108. Singh JA., Global health governance and ethics. In: Upshur R and Pinto A editors. *An Introduction to Global Health Ethics*. Routledge :2012: 58-72.
109. International Covenant on Economic, Social and Cultural Rights accessed at http://en.wikipedia.org/wiki/International_Covenant_on_Economic,_Social_and_Cultural_Rights on 11/09/2010.
110. ECOSOC. The Siracusa principles on the limitation and derogation provisions in the International Covenant on Civil and Political Rights. In: Geneva:, editor, 1985.
111. Gruskin S, Loff B. Do human rights have a role in public health work. *Lancet* 2002;360(9348):1880.

112. Singh J, Govender M, Mills EJ. Do human rights matter to health? *Lancet* 2007;370(9586):521-27. [[http://dx.doi.org/10.1016/s0140-6736\(07\)61236-7](http://dx.doi.org/10.1016/s0140-6736(07)61236-7)]
113. WHO Office of the United Nations High Commissioner for Human Rights Fact Sheet No. 31 The Right to Health accessed at <http://www.ohchr.org>. on 4/11/2013.
114. The Right to Health Fact Sheet No. 31; Office of the United Nations High Commissioner for Human Rights and World Health Organization accessed at <http://www.ohchr.org/Documents/Publications/Factsheet31.pdf> on 9/03/2012.
115. CEDAW 'Concluding observations of the Committee on the Elimination of Discrimination against Women: South Africa' (A/53/38/Rev 1) (1998) paras 100-137.
116. CRC 'Concluding observations of the CRC: South Africa' (CRC/C/15/Add/122) (2000) para 31.
117. *Hurley v Eddingfield*, 59 NE 2d 1058 (Ind 1901).
118. *Campbell v Mincey*, 413 F Supp 16 (ND Miss 1975), aff'd 542 F 2d 573 (5th Cir 1976).
119. Castel AD, Jolaosho T, Woolfork M, *et al.* Presented at: 15th Conference on Retroviruses and Opportunistic Infections (February 2008, Boston, MA), Late to test: concurrent diagnoses in a city with high AIDS prevalence—Washington DC, 1997–2006.
120. *St Anthony Hospital v United States Department of Health and Human Services*.2002;United States Court of Appeals,Tenth Circuit No.00-9529 accessed at <http://caselaw.findlaw.com/us-10th-circuit/1432730.html> on 31/03/2012.
121. The World Health Report-Health Systems Financing-The path to universal coverage Executive Summary accessed at http://www.who.int/whr/2010/10_summary_en.pdf on 26/02/2012.
122. *Strauss SA, Doctor, Patient and the Law 1991; 3: 93.*
123. *Schloendorff v. Society of New York hospitals*, 211 NY 125, 105 NE:1915.
124. *Salgo v. Leland Stanford Jr. Board of Trustees*, 317 PZA 170, 1957.
125. *Cobbs v. Grant*, 8 Cal 3d 229; 502P: 2d 1, 1972.
126. *Government of the Republic of SA v Grootboom* 2001 (1) SA 46 (CC) para 41.
127. *Government of the Republic of South Africa v Grootboom* 2001 (1) SA 46 (CC) 83.
128. *Government of the Republic of SA v Grootboom* 2001 (1) SA 46 (CC) para 52.
129. *Minister of Health v Treatment Action Campaign* (2) 2002v(5) SA 721 (CC).
130. *Minister of Health v Treatment Action Campaign* (TAC) (2002) 5 SA 721 (CC).
131. *Mazibuko v City of Johannesburg*.
132. *Mazibuko v City of Johannesburg*, para 67.
133. Office of the United Nations High Commissioner for Human Rights and the Joint United Nations Programme on HIV/AIDS, International Guidelines on HIV/AIDS and Human Rights: 2006 Consolidated Version, Second International Consultation on HIV/AIDS and Human Rights (Geneva, September 23-25, 1996) and Third International Consultation on HIV/AIDS and Human Rights (Geneva, July 25-26, 2002). Geneva: UNAIDS, 2006 accessed at www.ohchr.org/english/issues/hiv/guidelines.htm On 20/06/2010.
134. SAHRC 'Report – site visits and investigation – Eastern Cape hospitals' (2003), accessed at http://www.sahrc.org.za/eastern_cape_hospitals_report.PDF 9/03/2012.
135. SAHRC: 'Gay men should be allowed to donate blood' Mail & Guardian 20 January 2006, accessed at http://www.mg.co.za/articlePage.aspx?articleid=261914&area=/breaking_news/breaking_news_national/ on 9/03/2012.

136. Promotion Of Equality And Prevention Of Unfair Discrimination Amendment Act 52 OF 2002 accessed at <http://securejutastat.ukzn.ac.za/NXT/gateway.dll?f=templates&fn=default.htm> on 12/11/2010.
137. *Castell v De Greef* 1994 (4) SA 408 (C).
138. Carstens P, Pearmain D. *Foundational Principles of South African Medical Law* p27-31. First Edition ed. Pietermaritzburg: LexisNexis, 2007 p 27-31.
139. *C v Minister of Correctional Services* 1996 (4) SA 292 (T).
140. Morris A, Creasman J, Turner J, Luce JM, Watcher RM, Huang L. Intensive care of human immunodeficiency virus-infected patients during the era of highly active antiretroviral therapy. *Am J Respir Crit Care Med* 2002;166:262 - 67.
141. Casalino E, Wolff M, Ravaud P, Choquet C, Bruneel F, Regnier B. Impact of HAART advent on admission patterns and survival in HIV-infected patients admitted to an intensive care unit. *Aids* 2004;18(10):1429-33.
142. Vincent B, Timsit JF, Auburtin M, Schortgen F, Bouadma L, Wolff M, *et al.* Characteristics and outcomes of HIV-infected patients in the ICU: impact of the highly active antiretroviral treatment era. *Intensive Care Medicine* 2004;30(5):859-66. [<http://dx.doi.org/10.1007/s00134-004-2158-z>]
143. Narasihman M, Posner A, DePalo V, Mayo P, Rosen M. Intensive care in patients with HIV infection in the era of highly active antiretroviral therapy. *CHEST* 2004;125:1800 - 04.
144. Halpern SD. HIV testing without consent in critically ill patients. *JAMA* 2005;294:734-37.
145. Lin RY, Astiz ME, Saxon JC, Rackow EC. Altered leukocyte immunophenotypes in septic shock: studies of HLA-DR, CD11b, CD14, and IL-2R expression. *Chest* 1993;104:847-53.
146. Feeney C, Bryzman S, Kong L, Brazil H, Deutsch R, Fritz LC. T-lymphocyte subsets in acute illness. *Critical Care Medicine* 1995;23:1680-85.
147. Huang L, Quartin A, Jones D, Havlir DV. Intensive care of patients with HIV infection. *NEJM* 2006;355:173 - 81.
148. World Health Organisation. Guidance on provider-initiated HIV testing and counselling in health facilities. Geneva: WHO; 2007 accessed at http://whqlibdoc.who.int/publications/2007/9789241595568_eng.pdf on 19/03/2012.
149. Naidoo K, Govender K. Compulsory HIV testing of alleged sexual offenders – a human rights violation. *SAJBL* 2011;4(2):95-101.
150. Legislation in Botswana-The World Law Guide accessed at <http://www.lexadin.nl/wlg/legis/nofr/oeur/lxwebot.htm> on 10/03/2012.
151. HIV/AIDS and Human Rights in Botswana-Centre for Human Rights,Univ of Pretoria;2004 accessed at www.csa.za.org/filemanager/download/90/Botswana.pdf on 18/06/2011.
152. Taegtmeier M, Beeching N. Practical approaches to HIV testing in the intensive care unit. *J Intensive Care Med* 2008;9(1):37-41.
153. Centres for Disease Control and Prevention. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. Atlanta: CDC; Sept 2006 accesses at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm> on 19/03/2012.
154. Mappes T, DeGrazia D. *Ethical Theories. Biomedical Ethics. Fifth Edition ed.*: McGraw-Hill; 2001. p. 27-38.

155. Hallgarth MW 'Consequentialism and Deontology' *The Concise Encyclopedia of the Ethics of New Technologies* 1998 73-85.
156. Moodley K. *Medical Ethics, Law and Human Rights-A South African Perspective* South Africa: Van Schaik Publishers, 2011.
157. Beauchamp T L, Childress F. *Principles of Biomedical Ethics*. New York: Oxford University Press, 1979, p 99-240.
158. Curtis JR, Patrick DL, Caldwell ES, Collier AC. Why Don't Patients and Physicians Talk About End-of-Life Care?: Barriers to Communication for Patients With Acquired Immunodeficiency Syndrome and Their Primary Care Clinicians. *Arch Intern Med* 2000;160(11):1690.
159. Haas JS, Weissman JS, Cleary PD, Goldberg J, Gatsonis C, Seage GR, 3rd, *et al*. Discussion of preferences for life-sustaining care by persons with AIDS. Predictors of failure in patient-physician communication. *Arch Intern Med* 1993;153(10):1241.
160. Wachter RM, Luce JM, Hearst N, Lo B. Decisions about resuscitation: inequities among patients with different diseases but similar prognoses. *Ann Intern Med* 1989;111:525 - 32.
161. McQuoid-Mason D. Emergency medical treatment and 'do not resuscitate' orders: When can they be used? *SAMJ* 2013;103(4):223-25.
[<http://dx.doi.org/10.7196/SAMJ.6672>]
162. Guidelines For The Withholding And Withdrawing Of Treatment. Pretoria:HPCSA,2008. accessed at
http://www.hpcsa.co.za/downloads/conduct_ethics/rules/guidelines_withholding_withdrawing_treatment.pdf on 13/08/2010.
163. The Texas Advance Directives Act of 1999 accessed at
<http://www.statutes.legis.state.tx.us/docs/hs/htm/hs.166.htm> on 31/03/2012.
164. Timsit J-F. Open the intensive care unit doors to HIV-infected patients with sepsis. *Critical Care (London, England)* (London, England) 2005;9(6):629-30
165. Martin D K, Gibson J L, Singer P A. *Priority Setting*. In: Singer PA, Viens AM, editors. *The Cambridge Textbook of Bioethics*. United Kingdom: Cambridge University Press, 2008:251-56.
166. Wild C, Narath M. Evaluating and planning ICUs: methods and approaches to differentiate between need and demand. *Health Policy* 2005;71(3):289-301.
[<http://dx.doi.org/S0168851004001162> [pii] 10.1016/j.healthpol.2003.12.020]
167. Upshur R. Principles for the Justification of Public Health Intervention. *Canadian Journal Of Public Health* 2001;93(2):101-03.
168. Osborne M, Evans TW. Allocation of resources in intensive care: A transatlantic perspective. *Lancet* 1994;343(8900):778.
169. Danis M, Patrick DL, Southerland LI, Green ML. Patients' and families' preferences for medical intensive care. *JAMA* 1988;260:797-802.
170. *In re Quinlan*, 755 A2A 647 (NJ), cert denied, 429 70 NJ 10, 355 A2d 647 (1976) accessed at <http://legal-dictionary.thefreedictionary.com/Quinlan,+in+Re> on 10/09/2013.
171. *Clarke v Hurst* NO 1992 (4) SA 630 (D) accessed at
[http://butterworths.ukzn.ac.za.ezproxy.ukzn.ac.za:2048/nxt/gateway.dll?f=templates&\\$fn=default.htm\\$vid](http://butterworths.ukzn.ac.za.ezproxy.ukzn.ac.za:2048/nxt/gateway.dll?f=templates&$fn=default.htm$vid) on 1/09/2009
172. McQuoid-Mason DJ, Dada MA. eds. *Introduction to Medico-Legal Practice: Legal Aspects of Medical Practice*; Butterworths; 2001. p. 13-23.

173. *Cruzan, by her Parents And Co-Guardians v. Director, Missouri Department Of Health* decided by Supreme Court of the United States 497 U.S. 261 June 25, 1990, accessed at <http://law2.umkc.edu/faculty/projects/ftrials/conlaw/cruzan.html> on 1/04/2012.
174. Omnibus Budget Reconciliation Act of 1990. Public Law No. 101–508 accessed at <http://thomas.loc.gov/cgi-bin/bdquery/z?d101:H.R.5835> on 24/10/2013.
175. Oregon Health Plan accessed at <http://www.oregon.gov/oha/pages/action-plan/index.aspx> on 10/09/2013.
176. McQuoid-Mason DJ, Emergency medical treatment and ‘do no resuscitate’ orders: When can they be used? *SAMJ* 2013; 103(4):223-225. [<http://dx.doi.org/10.7196/SAMJ.6672>]
177. Hadorn D C. *Assessing the performance of mortality prediction models*. Santa Monica, CA: RAND, 1993.
178. Mooney G, 2003. *Economics, Medicine and Health Care*. Harlow, UK:Pearson Education Limited.
179. Levit K, Smith C, Cowan C, *et al*: Trends in U.S. health care spending, 2001. *Health Aff (Millwood)* 2003; 22:154–164.
180. Brill R, Spevetz A, Branson RD, *et al*: Critical care delivery in the intensive care unit: Defining clinical roles and the best practice model. *Critical Care Medicine* 2001; 29:2007–2019.
181. Chalfin DB, Cohen IL, Lambrinos J. The economics and cost-effectiveness of critical care medicine. *Intensive Care Med* 1995;21:952-61.
182. Halpern NA, Pastores SM, Greenstein J. Critical care medicine in the United States 1985-2000: An analysis of bed numbers, use, and costs *. *Critical Care Medicine* 2004;32(6):1254-59.
183. Bion JF, Bennett D: Epidemiology of intensive care medicine: Supply versus demand. *Br Med Bull* 1999; 55:2–11.
184. Ward NS, Teno JM, Curtis JR, Rubenfeld GD, Levy M. Perceptions of cost constraints, resource limitations, and rationing in United States intensive care units: Results of a national survey. *Critical Care Medicine* 2008;36(2):471-76. [<http://dx.doi.org/10.1097/CCM.0B013E3181629511>]
185. Levin P D, Sprung C L. Intensive care triage-The hardest rationing decision of them all *Crit Care Med* 2006;34(4):1250-51.
186. Daniels N, Why saying no to patients in the United States is so hard. *NEJM* 1986;314:1381–1383.
187. Danis M, Patrick D L, Southerland L I, Green M L. Patients' and Families' Preferences for Medical Intensive Care. *JAMA* 1988;260(6):797-802. [<http://dx.doi.org/10.1001/jama.1988.03410060067029>]
188. Levinsky NG, The doctor's master. *NEJM* 1984; 311:1573–1575.
189. Angell M, The doctor as double agent. *Kennedy Institute of Ethics Journal* 1993; 3:279–286.
190. Truog RD, Brock DW, Cook DJ, Danis M, Luce JM, Rubenfeld GD, *et al*. Rationing in the intensive care unit - 'The Task Force on Values, Ethics, and Rationing in Critical Care (VERRICC)'. *Critical Care Medicine* 2006;34(4):958-63.
191. Callahan D, *Setting Limits: Medical Goals in an Aging Society*. Washington DC, Georgetown University Press, 1995.
192. Chelluri L, Grenvik A, Silverman M. Intensive Care for Critically Ill Elderly: Mortality, Costs, and Quality of Life: Review of the Literature. *Arch Intern Med* 1995;155(10):1013-22. [<http://dx.doi.org/10.1001/archinte.1995.00430100033004>]

193. Demoule A, Cracco C, Lefort Y, *et al.* (2005). Patients aged 90 years or older in the intensive care unit. *J Gerontol A Biol Sci Med Sci* 60: 129-32.
194. Sprung CL, Geber D, Eidelman LA, *et al.*:Evaluation of triage decisions for intensive care admission. *Critical Care Medicine* 1999; 27:1073–1079.
195. Joynt GM, Gomersall CD, Tan P, *et al.*: Prospective evaluation of patients refused admission to an intensive care unit: Triage, futility and outcome. *Intensive Care Med* 2001; 27:1459–1465.
196. Strauss MJ, LoGerfo JP, Yeltatzie JA, *et al.* :Rationing of intensive care unit services. An everyday occurrence. *JAMA* 1986; 255:1143–1146.
197. Singer DE, Carr PL, Mulley AG, *et al.*: Rationing intensive care—Physician responses to a resource shortage. *NEJM* 1983; 309:1155–1160.
198. Garrouste-Orgeas M, Montuclard L, Timsit JF, Reignier J, Desmettre T, Karoubi P, *et al.* Predictors of intensive care unit refusal in French intensive care units: a multiple-center study. *Critical Care Medicine* 2005;33(4):750-5.
[<http://dx.doi.org/00003246-200504000-00009> [pii]]
199. Del Guercio LR, Triage in cold blood. *Critical Care Medicine* 1977; 5:167–169.
200. Daniels N, 2004. How to Achieve Fair Distribution of ARTs in 3 by 5: Fair Process and Legitimacy in Patient Selection. Geneva: World Health Organization accesses at www.who.int/ethics/en/background-daniels.pdf on 6/08/2012.
201. Cleary SM, Mooney GH, McIntyre DE. Claims on health care: a decision-making framework for equity, with application to treatment for HIV/AIDS in South Africa. *Health Policy and Planning* 2011;26:464-70.
[<http://dx.doi.org/1093/heapol/czq081>]
202. Mooney G, “Communitarian claims” as an ethical basis for allocating health care resources. *Soc Sci Med* 1998 47:1171–80.
203. Ward NS, Teno JM, Curtis JR, Rubenfeld GD, Levy MM. Perceptions of cost constraints, resource limitations, and rationing in United States intensive care units: results of a national survey. *Crit Care Med* 2008;36:471-76.
204. Hippocratic corpus . The Art. In: Reiser SJ, Dyck AJ, Curran WJ, editors. *Ethics in Medicine: Historical Perspectives and Contemporary Concerns*. Cambridge, Mass: MIT Press; 1977. pp. 6–7.
205. Aphorisms. In Chadwick J, Mann WN, trans. *The Medical Works of Hippocrates* Oxford: Blackwell Scientific Publications. 1950. 149.
206. Fine RL. Medical futility and the Texas Advance Directives Act of 1999. *Proc (Bayl Univ Med Cent)* 2000;13(2):144-7
207. Kouwenhoven WB, Jude JR, Knickerbocker GG. Closed-chest cardiac massage. *JAMA* 1960;173:1064-7.
208. *Gilgunn v. Massachusetts General Hospital* Suffolk County Superior Court, 42 (1995).
209. Youngner SJ. Who defines futility? *JAMA* 1988;260(14):2094-5.
210. Schneiderman LJ, Jecker NS, Jonsen AR. Medical futility: its meaning and ethical implications. *Ann Intern Med* 1990;112(12):949-54.
211. Lo B, *Resolving Ethical Dilemmas: A Guide for Clinicians*. Baltimore: Williams & Wilkins; 1995. *Futile interventions*; pp. 73–81.
212. American Medical Association. Medical futility in end-of-life care: report of the Council on Ethical and Judicial Affairs. *JAMA* 1999;281:937-41.
213. Smith ML, Gremillion G, Slomka J. Texas hospitals’ experience with the Texas Advance Directives Act. 2007;35:1271–6. *Critical Care Medicine* 2007;35:1271-76.

214. Withholding or Withdrawing Life-Sustaining Medical Treatment by the American Medical Association accessed at <http://www.ama-assn.org/ama/pub/physician-resources/medical-ethics/code-medical-ethics/opinion220.page> on 14/08/2011.
215. Opinion 2.03 - Allocation of Limited Medical Resources by the American Medical Association,2004 accessed at <http://www.ama-assn.org/ama/pub/physician-resources/medical-ethics/code-medical-ethics/opinion203.page> on 17/02/2012.
216. The Ethics Committee of the Society of Critical Care Medicine. Consensus statement of the Society of Critical Care Medicine's Ethics Committee regarding futile and other possibly inadvisable treatments. *Critical Care Medicine* 1997;25:887-91.
217. Wilson B. The private sector response to AIDS in Botswana. *Lancet Infect Dis* 2007;7(12):766. [http://dx.doi.org/10.1016/s1473-3099(07)70274-8]
218. The Impact of AIDS, United Nations Department of Economic and Social Affairs Population Division accessed at <http://www.un.org/esa/population/publications/AIDSimpact/AIDSWebAnnounce.htm> on 24/10/2013.
219. United Nations Development Programme;Human Development Report 2011 ' Sustainability and Equity: A Better Future for All accessed at <http://hdr.undp.org/en/reports/global/hdr2011/download/> on 24/10/2013.
220. WHO/UNAIDS/UNICEF (2011) 'Global HIV/AIDS Response: Epidemic update and health sector progress towards Universal Access 2011'.
221. Stover J, Fidzani B, Molomo BC, Moeti T, Musuka G. Estimated HIV trends and program effects in Botswana. *Plos One* 2008;3(11):e3729-e29.
222. Health Statistics-2009;Central Statistical Service-Ministry of Health,Botswana accessed at http://www.cso.gov.bw/index.php?option=com_content1&parent_id=370&id=429&nid=370 on 22/02/2012.
223. Parker R, Building the foundations for the response to HIV/AIDS in Brazil: the development of HIV/AIDS policy, 1982–1996. *Divulgação em Saúde para Debate*. 2003;27:143–183.
224. Okie S. Fighting HIV — Lessons from Brazil. *NEJM* 2006;354:1977-081.
225. Over M, Heywood P, Gold J, *et al*. HIV/AIDS treatment and prevention in India: modeling the costs and consequences accessed at <http://siteresources.worldbank.org/INTINDIA/Resources/IndiaARTReport1.pdf> on 7/03/2012.
226. UNAIDS Country Progress Report India 2011 accessed at http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2010countries/india_2010_country_progress_report_en.pdf on 14/09/2013.
227. Chandrasekaran P, Dallabetta G, Loo V, Rao S, Gayle H, Alexander A. Containing HIV/AIDS in India: the unfinished agenda. *Lancet Infect Dis* 2006;6(8):508-21. [http://dx.doi.org/10.1016/s1473-3099(06)70551-5]
228. Grover A, Citro B. India: access to affordable drugs and the right to health. *Lancet* 2011;377(9770):976-77. [http://dx.doi.org/10.1016/s0140-6736(10)62042-9]
229. UNAIDS The Global Aids Epidemic 2006 accessed at http://www.unaids.org/en/hiv_docs/2006GlobalReport/default.asp on 29/04/2009.
230. Teja VD, Sudha T, Lakshmi V. Causes and pattern of mortality in HIV-infected, hospitalized patients in a tertiary care hospital: a fourteen year study. *Indian J Med Sci* 2007;61(10):555-61.
231. Devi P, Arora U, Yadav S, Malhotra S. Seroprevalence of HIV infection among the patients attending various emergency departments in a tertiary care hospital. *Indian*

- Journal of Sex Transmiss Dis and AIDS* 2010;31(1):27-9.
[<http://dx.doi.org/10.4103/0253-7184.68997IJSTD-31-27> [pii]]
232. Balarajan Y, Selvaraj S, Subramanian S. Health care and equity in India. *Lancet* 2011;377(9764):505-15. [[http://dx.doi.org/10.1016/s0140-6736\(10\)61894-6](http://dx.doi.org/10.1016/s0140-6736(10)61894-6)]
233. WHO. Revised GBD 2002 estimates for countries accessed at http://www3.who.int/whosis/menu.cfm%20?path=evidence,burden,burden_estimates,burden_estimates_2002N,burden_estimates_2002N_2002Rev_country%20&language=english on 7/03/2012.
234. John T, Dandona L, V. S, Kakkar M. Continuing challenge of infectious diseases in India. *Lancet* 2011;377(9761):252-69. [[http://dx.doi.org/10.1016/s0140-6736\(10\)61265-2](http://dx.doi.org/10.1016/s0140-6736(10)61265-2)]
235. WHO World Statistics, India 2011 accessed at Accessed at <http://www.who.int/countries/ind/en/> on 4/11/2013.
236. Government of India. National Health Accounts–India. National Health Accounts Cell. Ministry of Health and Family Welfare, Government of India. New Delhi. 2009. accessed at http://www.who.int/nha/country/ind/india_nha_2004-05.pdf on 26/10/2013.
237. Government of India. National Health Accounts–India (2004–05)–with provisional estimates from 2005-06 to 2008-09).National Health Accounts Cell. New Delhi: Ministry of Health and Family Welfare, 2009 accessed at http://planningcommission.nic.in/reports/genrep/health/National_Health_Account_04_05.pdf on 24/10/2013.
238. Kumar AK, Chen LC, Choudhury M, Ganju S, Mahajan V, Sinha A, et al. Financing health care for all: challenges and opportunities. *Lancet* 2011;377(9766):668-79. [[http://dx.doi.org/10.1016/s0140-6736\(10\)61884-3](http://dx.doi.org/10.1016/s0140-6736(10)61884-3)]
239. Health Infrastructure, national health profile (NHP) of India–2008. New Delhi: Central Bureau of Health Intelligence, Government of India, 2008. accessed at <http://cbhidghs.nic.in/sitemap.asp> on 26/10/2013.
240. United Nations Office of the High Commissioner for Human Rights, Monitoring the core international human rights treaties accessed at <http://www.ohchr.org/EN/HRBodies/Pages/TreatyBodies.aspx> on 11/08/2013.
241. Constitution of India accessed at http://india.gov.in/govt/constitutions_india.php on 7/03/2012.
242. Law Commission of India. 201st report. Emergency medical care to victims of accidents and during emergency medical condition and women under labour. New Delhi: Ministry for Law and Justice, Government of India; 2006 accessed at <http://lawcommissionofindia.nic.in/reports/rep201.pdf> on 7/03/2012.
243. Tandon A. Ailing medical services in India. *Indian Journal of Medical Ethics* 2011;VIII(2):129.
244. Kapadia F, Singh M, Divatia J, Vaidyanathan P, Udwardia FE, Raisinghaney SJ, et al. Limitation and withdrawal of intensive therapy at the end of life: practices in intensive care units in Mumbai, India. *Critical Care Medicine* 2005;33(6):1272-5.0[<http://dx.doi.org/0003246-200506000-00014> [pii]]
245. *P Rathnam v Union of India* 1994(3) Supreme Court Cases 394-430.
246. *Gain Kaur v State of Punjab* 1996 Supreme Court; 83:12578-12564 accessed at www.indiankanoon.org/doc/542988/ on 26/10/2003.
247. Mani RK. Limitation of Life Support in the ICU: Ethical issues relating to end of life care. *Indian J Crit Care Med* 2003;7:112-17.

248. Medical Council of India. Indian Medical Council (Professional conduct, Etiquette and Ethics) Regulations. 2002. Gazette of India dated 06.04.02, accessed at <http://www.medindia.net/education/mci-guidelines.asp> on 7/03/2012.
249. Kaur V, Singh G. Ethical and legal issues in AIDS. *Indian J Crit Care Med* 2008;29(2):63-67.
250. Mani RK, Amin P, Chawla R, Divatia JV, Kapadia F, Khilnani P. Limiting life-prolonging interventions and providing palliative care towards the end-of-life in Indian intensive care units. *Indian J Crit Care Med* 2005;9(96):96-107.
251. Jayaram R, Ramakrishnan N. Cost of intensive care in India. *Indian J Crit Care Med* 2008;12(2):55-61. [<http://dx.doi.org/10.4103/0972-5229.42558>]
252. The Workmen of State Pencil Manufacturing Industries of Madhya Pradesh, CWP No 5143 of 1980, 1980 accessed at www.legalindia.in/indian-perspective-of-right-to-health on 26/10/2013.
253. *Francis Coralie Mullin vs The Administrator, Union Territory of Delhi*, 2 SCR 516, 1981 accessed at <http://www.manupatrainternational.in/supremecourt/1980-2000/sc1981/s810513.htm> on 26/10/2013.
254. *Consumer Education and Research Centre vs Union of India*, 3 SCC 42, 1995 accessed at <https://www.elaw.org/node/1988> on 26/10/2013.
255. *Paschim Baga Khet Mazoor Samiti vs State of West Bengal*, AIR 1996 SC 2426, 1996. accessed at <http://www.sciencedirect.com/science/article/pii/S0140673607612367> on 12/06/2013.
256. Yeolekar ME, Mehta S. ICU care in India-status and challenges. *J Assoc Physicians India* 2008;56:221-22.
257. Prayag S. ICUs worldwide: critical care in India. *Critical Care* 2002;6(6):479-80.
258. Merck (2009) 'African Comprehensive HIV/AIDS Partnerships' (ACHAP) accessed at <http://www.merckresponsibility.com/> on 10/03/2012.
259. Harvard School of Public Health AIDS Initiative: 'KITSO Training Program' accessed at http://www.aids.harvard.edu/research/kits0_more.html on 10/03/2012.
260. UNAIDS World AIDS Day Report | 2012 http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2012/gr2012/JC2434_WorldAIDSday_results_en.pdf (accessed 17/01/2012).
261. Gruskin S, Mills E J, Tarantola D. History, principles, and practice of health and human rights. *Lancet* 2007;370(9585):449-55. [[http://dx.doi.org/10.1016/s0140-6736\(07\)61200-8](http://dx.doi.org/10.1016/s0140-6736(07)61200-8)]
262. United Nations Commission on Human Rights, Protection of Human Rights in the Context of HIV and AIDS, UN Document E/CN.4/1994/L.60 (March 1, 1994) accessed at www.portal-stat.admin.ch/iaos2000/gruskin_final_paper.doc on 26/10/2013.
263. Universal Declaration on Bioethics and Human Rights-UNESCO,2005 accessed at <http://unesdoc.unesco.org/images/0014/001461/146180e.pdf> on 7/03/2012.
264. Belizán JM, Cafferata ML, Belizán M, Althabe F. Health inequality in Latin America. *Lancet* 2007;370(9599):1599-600. [[http://dx.doi.org/10.1016/s0140-6736\(07\)61673-0](http://dx.doi.org/10.1016/s0140-6736(07)61673-0)]
265. Berkman A, Garcia J, Munoz-Laboy M, Paiva V, Parker R. A critical analysis of the Brazilian response to HIV/AIDS: lessons learned for controlling and mitigating the epidemic in developing countries. *Am J Public Health* 2005;95(7):1162-72. [<http://dx.doi.org/AJPH.2004.054593> [pii]10.2105/AJPH.2004.054593]
266. Hudson RA, ed. Brazil: A Country Study. Washington: GPO for the Library of Congress, 1997. accessed at <http://countrystudies.us/brazil/> on 6/03/2012.

267. Brazil - 2010 Country Progress Report accessed at <http://www.unaids.org/en/regionscountries/countries/brazil/> on 6/03/2012.
268. The Second National Strategic Framework for HIV and AIDS:2010-2016 accessed at http://www.aidstar-one.com/sites/default/files/prevention/resources/national_strategic_plans/Botswana_2010-2016.pdf on 10/03/2012.
269. HIV and AIDS in South Africa 2010 accessed at <http://www.avert.org/aidssouthafrica.htm> on 24/02/2012.
270. Office of the UN High Commissioner for Human Rights (OHCHR) 'Botswana accessed at <http://www.ohchr.org/EN/countries/AfricaRegion/Pages/BWIndex.aspx> on 10/03/2012.
271. Constitution of Botswana 1966 (as amended) accessed at http://www.chr.up.ac.za/undp/domestic/docs/c_Botswana.pdf on 10/03/2012.
272. Human Rights Protected-Nine Southern African Countries report of HIV,AIDS and the Law 2007 by Aids and Human Rights Research Unit-Pretoria University accessed at http://www.chr.up.ac.za/undp/other_docs/Human%20rights%20protected.pdf on 18/06/2011
273. Public Health Act 44 of 1971 accessed at http://www.chr.up.ac.za/undp/domestic/docs/legislation_39.pdf on 10/03/2012.
274. Medical Council (Professional Conduct) (Amendment) Regulations 77 of 1999 accessed at www.elaws.gov.bw/sub_export.php?id=421 on 26/10/2013.
275. Molatlhegi & Associates, Consultancy Services for Review of Laws and Policies Relating to HIV/AIDS: Final Report submitted to NAC Sector on Ethics, Law and Human Rights accessed at http://www.bonela.org/doc/brela_vol2_2008.pdf on 10/03/2012.
276. Stegling C. The Botswana Review of Ethics, Law and HIV/AIDS. *Botswana Network on Ethics, Law and Human Rights(BONELA)* 2009;3(1)
277. *Makuto v The State* 2000 2 BLR 131 (CA) accessed <http://www.elaws.gov.bw/displaylrpage.php?id=468&dsp=2> on 13/09/2013.
278. Penal Code (Amendment) Act 5 of 1998 accessed at www.chr.up.ac.za/undp/domestic/docs/legislation_38.pdf on 26/10/2013.
279. Caruso N, Chandra A, Kestler A. Development of Emergency Medicine in Botswana. *African Journal of Emergency Medicine* 2011;1(3):108-12. [http://dx.doi.org/10.1016/j.afjem.2011.08.002]
280. Beyrer C, Gauri V, Vaillancourt D. Evaluation of the World Bank's assistance in responding to the AIDS epidemic: Brazil Case Study. Washington, D.C.: The World Bank, 2005. Accessed at http://www.worldbank.org/oed/aids/main_report.html. on 24/03/2012.
281. Nunn AS, da Fonseca EM, Bastos FI, Gruskin S. AIDS treatment in Brazil: impacts and challenges. *Health Aff (Millwood)* 2009;28(4):1103-13. [http://dx.doi.org/28/4/1103 [pii]10.1377/hlthaff.28.4.1103]
282. Galvao J. Brazil and access to HIV/AIDS drugs: a question of human rights and public health. *Am J Public Health* 2005;95(7):1110-6. [http://dx.doi.org/AJPH.2004.044313 [pii]10.2105/AJPH.2004.044313]
283. Melchior R, Nemes MIB, Basso CR, *et al.* Evaluation of the organizational structure of HIV/AIDS outpatient care in Brazil. *Rev Saúde Pública.* 2006;40:1-9.
284. Safreed-Harmon K, Human Rights and HIV/AIDS in Brazil, 2008 accessed at http://www.gmhc.org/files/editor/file/ti_poz_0408.pdf on 22/03/2012.

285. Constitution of Brazil accessed at <http://www.v-brazil.com/government/laws/constitution.html> on 6/03/2012.
286. Zarrilli S, The case of Brazil-Brazil's Universal Health System 1997 accessed at <http://www.who.int/trade/en/THpart3chap11.pdf> on 6/03/2012. *United Nations Conference on Trade and Development*. Geneva, Switzerland.
287. Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. *Lancet* 2011;377(9779):1778-97. [[http://dx.doi.org/10.1016/s0140-6736\(11\)60054-8](http://dx.doi.org/10.1016/s0140-6736(11)60054-8)]
288. Ministry of Health of Brazil, National Coordination for STD and AIDS. Drugs and AIDS. The Brazilian Response to HIV/AIDS: Best Practices. Brasilia, Brazil: Ministry of Health; 2000:116–130 accessed at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449335/> on 26/10/2013.
289. Portela MC, Lotrowska M. Health care to HIV/AIDS patients in Brazil. *Rev Saúde Pública* 2006;40(40(Supl)).
290. Brazilian Department of STD, AIDS and Viral Hepatitis. Datasus; Sistema de Monitoramento de Indicadores do Programa Nacional de DST/Aids - MONITORAIDS accessed at <http://www.aids.gov.br> on 25/03/2012.
291. de Ávila A, Vitória M, The experience of providing universal access to ARV drugs in Brazil. *Divulgação em Saúde para Debate*. 2003;27:247–264.
292. Response Magazine +2005: experiences of the Brazilian AIDS Programme. Brasília, Brazil: Ministry of Health, Brazilian Program for STD/AIDS.
293. Numbers of AIDS-Related Hospitalizations and Patients Receiving Antiretroviral Therapy in Brazil and Rates of Hospitalization among Such Patients, 1998–2004, Data from Brazil's DATASUS (the database of the central health system) and National STD and AIDS Program. accessed at <http://www.nejm.org/action/showImage?doi=10.1056/NEJMp068069&iid=f01> on 24/03/2012.
294. Godinho AM, Lanziotti LH, Salome de Moraes B. Informed consent: the view of lawyers and courts *Rev. Bras. Anesthesiol.* 2010;60(2).
295. Aisengart RM Between norms and practice: decision making in the health / disease *Physis* 2011;21(4).
296. Weyland K, Social movements and the state: the politics of health reform in Brazil. *World Dev.* 1995; 23(10):1699–1712.
297. Weyland K, The Brazilian state in the new democracy. *J Interamerican Stud World Aff.* 1997;39(4): 63–94.
298. Ventura M, Strategies to promote and guarantee the rights of people living with HIV/AIDS. *Divulgação em Saúde para Debate*. 2003;27:239–246.
299. Raupp Rios R, Legal responses to the HIV/AIDS epidemic in Brazil. *Divulgação em Saúde para Debate*. 2003;27:228–238.
300. Bacon O, Pecoraro M, Galvão J, Page-Shafer K. HIV/AIDS in Brazil. AIDS Policy Research Center, University of California San Francisco. 2004.
301. Galvão J, Brazil and access to HIV/AIDS drugs: a question of human rights and public health. *Am J Public Health* 2005 Jul;95(7):1110–6.
302. Marins JRP, Jamal LF, Chen SY, *et al.* Dramatic improvement in survival among adult Brazilian AIDS patients. *AIDS* 2003;17:1675-82.
303. Saraceni V, Cruz MM, Lauria LM, Durovni B, Trends and characteristics of AIDS mortality in the Rio de Janeiro City after the introduction of highly active antiretroviral therapy. *Brazilian Journal of Infectious Diseases*. 2005;9:209-15.
304. Greco DB, Simao M. Brazilian policy of universal access to AIDS treatment: sustainability challenges and perspectives. *AIDS* 2007;21 Suppl 4:S37-45.

- [<http://dx.doi.org/10.1097/01.aids.0000279705.24428.a300002030-200707004-00006> [pii]]
305. Orlando JM, Livianu J, Giannini A, Terzi RG, Moock M, David CM. Intensive Care in Brazil: A Descriptive Analysis. *Critical Care Medicine* 1999;27(12):A45.
 306. Taylor P. *Brazil ICU Statistics*. Berkshire: The World Federation of Societies of Intensive and Critical Care Medicine 2011.
 307. Simchen E, Sprung CL, Galai N, *et al*. Survival of critically ill patients hospitalized in and out of intensive care units under paucity of intensive care unit beds. *Critical Care Medicine* 2004;32(8):1654-61. [<http://dx.doi.org/00003246-200408000-00004> [pii]]
 308. Franklin C, Rackow E C, Mamdani B, Burke G, Weil M H. Triage considerations in medical intensive care. *Arch Intern Med* 1990;150:1455-59.
 309. NIH Consensus Conference. Critical care medicine. *JAMA* 1983;250:798-804.
 310. Mulley AG, The allocation of resources for medical intensive care. In: Presidents Commission for the Study of Ethical Problems in Medicine and Biomedical Research: Securing Access to Health Care. Washington (DC): Government Printing Office; 1983. p.285-311.
 311. Kollef MH, Shuster DP. Predicting ICU Outcomes with Scoring Systems: Underlying Concepts and Principles. *Critical Care Clinics* 1994; 101-18.
 312. Caldeira VM, Silva Junior JM, Oliveira AM, Rezende S, Araujo LA, Santana MR, *et al*. Criteria for patient admission to an intensive care unit and related mortality rates. *Rev Assoc Med Bras* 2010;56(5):528-34[<http://dx.doi.org/.S0104-42302010000500012> [pii]]
 313. Brazilian Society of Critical Care. Resolution No. RDC-7 OF 24 February 2010 accessed at <http://www.medicinaintensiva.com.br/resolucao-07-anvisa-uti.htm> on 22/03/2012.
 314. Gaziano TA, Pandya A, Steyn K, Levitt N, Mollentze W, Joubert G, *et al*. Comparative assessment of absolute cardiovascular disease risk characterization from non-laboratory-based risk assessment in South African populations. *BMC medicine* 2013;11:170. [<http://dx.doi.org/10.1186/1741-7015-11-170>]
 315. Azoulay E, Pochard F, Chevret S, Vinsonneau C, Garrouste M, Cohen Y, *et al*. Compliance with triage to intensive care recommendations. *Critical Care Medicine* 2001;29(11):2132-6.
 316. Sprung C. L, Eidelman LA. Triage decisions for intensive care in terminally ill patients. *Intensive Care Med* 1997;23(10):1011-4.
 317. Lanken PN, Terry PB, Adler DC, Brooks-Brunn J, Crawford SW, Danis M, *et al*. Fair allocation of intensive care unit resources. American Thoracic Society,. *Am J Resp Crit Care Med* 1997;156(4 Pt 1):1282-301.
 318. Appelbaum PS, Grisso T. Assessing patients' capacities to consent to treatment. *NEJM* 1988;319:1635-38.
 319. McQuoid-Mason DJ, Dada MA. *The National Health Act: Some Implications for Family Practice*. *CME* 2006;24(11):12-14.
 320. Morris A, Crothers K, Beck J M, Huang L. An official ATS workshop report: Emerging issues and current controversies in HIV-associated pulmonary diseases. *Proc Am Thorac Soc* 2011;8(1):17-26. [<http://dx.doi.org/8/1/17> [pii]10.1513/pats.2009-047WS]
 321. Lanoix JP, Andrejak C, Schmit JL. Antiretroviral therapy in intensive care. *Med Mal Infect* 2011;41(7):353-8. [[http://dx.doi.org/S0399-077X\(11\)00167-3](http://dx.doi.org/S0399-077X(11)00167-3) [pii] 10.1016/j.medmal.2011.05.001]

322. Bennett RL, Gilman SC, George L, Guze PA, Bennett CL. Improved outcomes in intensive care units for AIDS-related *Pneumocystis carinii* pneumonia: 1987-1991. *Journal for Acquired Immunodeficiency Syndrome* 1993;12(6):1319-21.
323. Centers for Disease Control (CDC). *Pneumocystis pneumonia*-Los Angeles. MMWR Morb Mortal Wkly Rep. 1981;30:250-252.
324. Wachter R M, Luce J M, Turner J, Volberding P, Hopewell P C. Intensive care of patients with the acquired immunodeficiency syndrome. Outcome and changing patterns of utilization. *Am Rev Respir Dis* 1986;134:891 - 96.
325. Murray JF, Felton CP, Garay SM. Pulmonary complications of the acquired immunodeficiency syndrome. Report of National Heart, Lung, and Blood Institute Workshop. *NEJM* 1984;310:1682
326. Curtis JR, Greenberg DL, Hudson LD, Fisher LD, Krone MR, Collier AC. Changing use of intensive care for HIV-infected patients with *Pneumocystis carinii* pneumonia. *Am J Resp Crit Care Med* 1994;150:1305-10.
327. Wachter RM, Luce JM, Safrin S, Berrios DC, Charlebois E, Scitovsky AA. Cost and outcome of intensive care for patients with AIDS, *Pneumocystis carinii* pneumonia, and severe respiratory failure. *JAMA* 1995;273:230 - 35
328. Bedos JP, Dumoulin JL, Gachot B, Veber B, Wolff M, Regnier B, *et al.* *Pneumocystis carinii* pneumonia requiring intensive care management: survival and prognostic study in 110 patients with human immunodeficiency virus. *Critical Care Medicine* 1999;27(6):1109-15.
329. Torres A, El-Ebiary M, Marrades R, Miro JM, Gatell JM *et al.* Aetiology and prognostic factors of patients with AIDS presenting life-threatening acute respiratory failure *Eur Respir J.* 1995 Nov;8(11):1922-8.
330. Osborne M, Patterson J, Ethical allocation of ICU resources: a view from the USA. *Intensive Care Medicine* 1996 Oct; 22(10):1010-1014.
331. Wachter RM, Russi MB, Bloch DA, Hopewell PC, Luce JM. *Pneumocystis carinii* Pneumonia and Respiratory Failure in AIDS: Improved Outcomes and Increased Use of Intensive Care Units. *American Review of Respiratory Disease* 1991;143(2):251-56. [<http://dx.doi.org/10.1164/ajrccm/143.2.251>]
332. Banks RA, Lindley KJ, Pozniak AL. AIDS: a problem for intensive care. *Intensive Care Medicine* 1985;11(4):169-71.
333. Wachter RM, Luce JM, Safrin S, Berrios DC, E C, Scitovsky AA. Cost and Outcome of Intensive Care for Patients With AIDS, *Pneumocystis carinii* Pneumonia, and Severe Respiratory Failure. *JAMA* 1995;273(3):230-35. [<http://dx.doi.org/10.1001/jama.1995.03520270064033>]
334. Wood R. Antiretroviral therapy. In: Abdool Karim SS, Abdool Karim Q, editors. *HIV/AIDS in South Africa*. New York, United States of America: Cambridge University Press, 2005:504-23.
335. Layon AJ, D'Amico R. Intensive care for patients with acquired immunodeficiency syndrome - medicine versus ideology. *Critical Care Medicine* 1990;18(11):1297-99.
336. Friedman Y, Franklin C. Admission of AIDS patients to a medical intensive care unit: causes and outcomes. *Critical Care Medicine* 1990;18(3):346-47.
337. Smith RL, Levine SM, Lewis ML. Prognosis of patients with AIDS requiring intensive care. *CHEST* 1989;96(4):857-61.
338. Wachter RM, Luce JM, Lo B, Raffin TA. Life-sustaining treatment for patients with AIDS *Chest* 1989;95(3):647-52.

339. Rogers PL, Lane HC, Henderson DK, Parrillo J, Masur H. Admission of AIDS patients to a medical intensive care unit: causes and outcome *Critical Care Medicine* 1989;17(2):113-17.
340. Rosen M J, Narasimhan M. Critical care of immunocompromised patients: human immunodeficiency virus. *Critical Care Medicine* 2006;34(9 Suppl):S245-50. [http://dx.doi.org/10.1097/01.CCM.0000232491.15369.AB00003246-200609001-00011 [pii]]
341. Corona A, Raimondi F. Critical care of HIV-infected patients in the highly active antiretroviral therapy era. *Minerva Anestesiologica* 2007;73(12):635-45.
342. Lazard T, Retel O, Guidet B, Maury E, Valleron AJ, Offenstadt G. AIDS in a medical intensive care unit: immediate prognosis and long-term survival. *JAMA* 1996;276(15):1240-5.
343. De Palo VA, Millstein BH, Mayo PH, Salzman SH, Rosen MJ. Outcome of intensive care in patients with HIV infection. *Chest* 1995;107:506 - 10.
344. Bonarek M, Morlat P, Chene G, Rapin D, Hilbert G, Pillet O, *et al.* Prognostic score of short-term survival in HIV-infected patients admitted to medical intensive care units. *International Journal of STD & AIDS* 2001;12(4):239-44.
345. Wachter RM, Luce JM, Hopewell PC. Critical care of patients with AIDS. *JAMA* 1992;267(4):541-47.
346. Nickas G, Wachter RM. Outcomes of intensive care for patients with human immunodeficiency virus infection. *Archives of Internal Medicine* 2000;160:541 - 47.
347. Bartlett JG. Ten Years of HAART: Foundation for the Future. *Medscape* 2006.
348. Cohen GM, Werner L, Gengiah S, Naidoo K. Role of Education in HIV Clinical Outcomes in a Tuberculosis Endemic Setting. *Journal of the International Association of Providers of AIDS Care* 2013. [http://dx.doi.org/10.1177/2325957413488185]
349. Walmsley S, Bernstein B, King M, *et al.* Lopinavir-ritonavir versus nelfinavir for the initial treatment of HIV infection. *NEJM* 2002;346:2039-2046.
350. Robbins GK, De Gruttola V, Shafer RW, *et al.* Comparison of sequential three-drug regimens as initial therapy for HIV-1 infection. *NEJM*. 2003;349:2293-303.
351. Gallant JE, Staszewski S, Pozniak AL, *et al.* Efficacy and safety of tenofovir DF vs stavudine in combination therapy in antiretroviral-naïve patients: a 3-year randomized trial. *JAMA*. 2004;292:191-201.
352. van Leth F, Phanuphak P, Ruxrungtham K, *et al.* Comparison of first-line antiretroviral therapy with regimens including nevirapine, efavirenz, or both drugs, plus stavudine and lamivudine: A randomized open-label trial, the 2NN Study. *Lancet* 2004;363:1253-1263.
353. Gulick RM, Ribaud HJ, Shikuma CM, *et al.* Triple-nucleoside regimens versus efavirenz-containing regimens for the initial treatment of HIV-1 infection. *NEJM* 2004;350:1850-1861.
354. Morris A, Masur H, Huang L. Current issues in critical care of the human immunodeficiency virus-infected patient. *Critical Care Medicine* 2006;34(1):42-9. [http://dx.doi.org/00003246-200601000-00006 [pii]]
355. Croda J, Croda M, Neves A, De Sousa dos Santos S. Benefit of antiretroviral therapy on survival of human immunodeficiency virus-infected patients admitted to an intensive care unit. *Critical Care Medicine* 2009;37(5):1605-11]
356. Vargas-Infante YA, Guerrero ML, Ruiz-Palacios GM, Soto-Ramirez LE, Del Rio C, Carranza J, *et al.* Improving outcome of human immunodeficiency virus-infected

- patients in a Mexican intensive care unit. *Arch Med Res* 2007;38(8):827-33.
[[http://dx.doi.org/S0188-4409\(07\)00231-7](http://dx.doi.org/S0188-4409(07)00231-7) [pii]10.1016/j.arcmed.2007.05.007]
357. Dickson SJ, Batson S, Copas AJ, Edwards SG, Singer M, Miller RF. Survival of HIV-infected patients in the intensive care unit in the era of highly active antiretroviral therapy. *Thorax* 2007;62(11):964-68. [<http://dx.doi.org/10.1136/thx.2006.072256>]
358. Khouli H, Afrasiabi A, Shibli M, Hajal R, Barrett CR, Homel P. Outcome of critically ill human immunodeficiency virus-infected patients in the era of highly active antiretroviral therapy. *J Intensive Care Med* 2005;20(6):327-33.
[<http://dx.doi.org/20/6/279> [pii]10.1177/0885066605281087]
359. Palacios R, Hidalgo A, Reina C, de la Torre M, Marquez M, Santos J. Effect of antiretroviral therapy on admissions of HIV-infected patients to an intensive care unit. *HIV Med* 2006;7(3):193-6. [<http://dx.doi.org/HIV353> [pii]10.1111/j.1468-1293.2006.00353.x]
360. Miller RF, Allen E, Copas A, Singer M, Edwards SG. Improved survival for HIV infected patients with severe *Pneumocystis jirovecii* pneumonia is independent of highly active antiretroviral therapy. *Thorax* 2006;61(8):716-21.
361. Corona A, Raimondi F. Critical care of HIV-infected patients: still a dilemma for Italian intensivists--results of a multicentre survey. *European Journal Of Anaesthesiology* 2010;27(4):377-82.
362. Centers for Disease Control and Prevention (2003) Late versus early testing of HIV: 16 Sites, United States, 2000–2003. *MMWR Morb Mortal Wkly Rep* 52:581–586 accessed at <http://depts.washington.edu/hivaids/cpa/data/PresentationData.xml> on 8/11/2013.
363. Centers for Disease Control and Prevention. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. Atlanta: CDC; Sept 2006 accessed at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm>
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm> on 19/02/2012.
364. Crothers K, Thompson BW, Burkhardt K, Morris A, Flores SC, Diaz PT, et al. HIV-associated lung infections and complications in the era of combination antiretroviral therapy. *Proc Am Thorac Soc* 2011;8(3):275-81.
[<http://dx.doi.org/8/3/275> [pii]10.1513/pats.201009-059WR]
365. Friis-Møller N, Reiss P, Sabin CA, et al. (2007) Class of antiretroviral drugs and the risk of myocardial infarction. *NEJM* 356:1723–1735.
366. Rosen MJ. Intensive Care of Patients With Human Immunodeficiency Virus Infection: Time to Take Another Look. *Journal Of Intensive Care Medicine* 2005;360-63.
367. Smith C, Sabin CA, Lundgren JD, Thiebaut R, Weber R, Law M, et al. Factors associated with specific causes of death amongst HIV-positive individuals in the D:A:D Study. *Aids* 2010;24(10):1537-48.
368. Vargas-Infante YA, Guerrero ML, Ruiz-Palacios GM, Soto-Ramírez LE, Del Río C, Carranza J, et al. Improving outcome of human immunodeficiency virus-infected patients in a Mexican intensive care unit. *Archives of Medical Research* 2007;38(8):827-33.
369. Nickas G, Wachter RM. Outcomes of intensive care for patients with human immunodeficiency virus infection. *Arch Intern Med* 2000;160:541-7.
370. Narasimhan M, Posner AJ, DePalo VA, Mayo PH, Rosen MJ. Intensive care in patients with HIV infection in the era of highly active antiretroviral therapy. *Chest* 2004;125:1800-4.

371. Casalino E, Mendoza-Sassi G, Wolff M, *et al.* Predictors of short- and long-term survival in HIV-infected patients admitted to the ICU. *Chest* 1998;113:421-429.
372. van Lelyveld SF, Wind CM, Mudrikova T, van Leeuwen HJ, de Lange DW, Hoepelman AI. Short- and long-term outcome of HIV-infected patients admitted to the intensive care unit. *Eur J Clin Microbiol Infect Dis* 2011. [<http://dx.doi.org/10.1007/s10096-011-1196-z>]
373. Morris A, Wachter RM, Luce J, Turner J, Huang L. Improved survival with highly active antiretroviral therapy in HIV-infected patients with severe *Pneumocystis carinii* pneumonia. *Aids* 2003;17(1):73.
374. Palacios R, Hidalgo A, Reina C, de la Torre MV, Márquez M, Santos J. Effect of antiretroviral therapy on admissions of HIV-infected patients to an intensive care unit. *HIV Medicine* 2006;7(3):193-96. [<http://dx.doi.org/10.1111/j.1468-1293.2006.00353.x>]
375. Tan DH, Walmsley SL. Management of persons infected with human immunodeficiency virus requiring admission to the intensive care unit. *Critical Care Clinics* 2013;29(3):603-20. [<http://dx.doi.org/10.1016/j.ccc.2013.03.010>]
376. Heyland DK, Tougas G, King D, Cook DJ. Impaired gastric emptying in mechanically ventilated, critically ill patients. *Intensive Care Medicine* 1996;22:1339-44.
377. Tarling MM, Toner CC, Withington PS, Baxter MK, Whelpton R, Goldhill DR. A model of gastric emptying using paracetamol absorption in intensive care patients. *Intensive Care Medicine* 1997;23:256-60.
378. Mimoz O, Binter V, Jacolot A, *et al.* Pharmacokinetics and absolute bioavailability of ciprofloxacin administered through a nasogastric tube with continuous enteral feeding to critically ill patients. *Intensive Care Medicine* 1998;24:1047-51.
379. Department of Health and Human Services. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents accessed at <http://www.AIDSinfo.nih.gov> on 3/03/2012.
380. National HIV/AIDS Clinicians' Consultation Center. Dosage form modifications and renal/hepatic dosing of antiretrovirals accessed at http://www.ucsf.edu/hivcntr/Clinical_Resources/Pharmacy/HIVDosageTable_NC_11_17_05.pdf on 3/03/2012.
381. Lewden C, Salmon D, Morlat P, Bevilacqua S, Jouglu E, Bonnet F, *et al.* Causes of death among human immunodeficiency virus (HIV)-infected adults in the era of potent antiretroviral therapy: emerging role of hepatitis and cancers, persistent role of AIDS. *Int J Epidemiol* 2005;34(1):121-30. [<http://dx.doi.org/dyh307>] [pii]10.1093/ije/dyh307]
382. Petrosillo N, Nicastrì E, Viale P. Nosocomial pulmonary infections in HIV-positive patients. *Curr Opin Pulm Med* 2005;11:231-235.
383. Franzetti F, Grassini A, Piazza M, *et al.* Nosocomial bacterial pneumonia in HIV-infected patients: risk factors for adverse outcome and implications for rational empiric antibiotic therapy. *Infection* 2006;34:9-16.
384. Morris A, Lundgren JD, Masur H, Walzer PD. Current Epidemiology of *Pneumocystis Pneumonia*. *Emerging Infectious Diseases* 2004;10(10).
385. World Health Organization. Global tuberculosis control: epidemiology, strategy, financing: WHO report 2009. 2009;Publication no. WHO/HTM/TB/2009.411 accessed at http://www.who.int/tb/publications/global_report/2009/en/ on 8/11/2013.
386. Samper S, Martin C. Spread of extensively drug-resistant tuberculosis. *Emerging Infectious Diseases* 2007;13:647-648.

387. Hooshyar D, Hanson DL, Wolfe M, Selik RM, Buskin SE, McNaghten AD. Trends in perimortal conditions and mortality rates among HIV-infected patients. *AIDS* 2007;21:2093–2100.
388. Flannery B, Heffernan RT, Harrison LH, Ray SM, Reingold AL, Hadler J, Schaffner W, Lynfield R, Thomas AR, Li J, *et al.* Changes in invasive pneumococcal disease among HIV-infected adults living in the era of childhood pneumococcal immunization. *Ann Intern Med* 2006;144:1–9.
389. Grinspoon S, Carr A. Cardiovascular risk and body-fat abnormalities in HIV-infected adults. *NEJM* 2005;352:48-62.
390. Hsue PY, Giri K, Erickson S, *et al.* Clinical features of acute coronary syndromes in patients with human immunodeficiency virus infection. *Circulation* 2004;109:316-9.
391. Alberti A, Clumeck N, Collins S, *et al.* Short statement of the first European Consensus Conference on the treatment of chronic hepatitis B and C in HIV co-infected patients. *J Hepatol* 2005;43:1098.
392. Nunez M, Soriano V. Management of patients co-infected with hepatitis B virus and HIV. *Lancet Infect Dis* 2005;5:374-82.
393. Corona A, Raimondi F. Caring for HIV-infected patients in the ICU in the highly active antiretroviral therapy era. *Current HIV Research* 2009;7(6):569-79.
394. Roland ME, Stock PG. Review of solid-organ transplantation in HIV-infected patients. *Transplantation* 2003;75:425-9.
395. Coquet I, Pavie J, Palmer P, Barbier F, Legriel S, Mayaux J, *et al.* Survival trends in critically ill HIV-infected patients in the highly active antiretroviral therapy era. *Crit Care* 2010;14(3):R107. [<http://dx.doi.org/cc9056> [pii]10.1186/cc9056]
396. The Antiretroviral Therapy Cohort Collaboration. Life expectancy of individuals on combination antiretroviral therapy in high-income countries: A collaborative analysis of 14 cohort studies. *Lancet* 2008;372:293-9.
397. Krentz HB, Kliewer G, Gill MJ. Changing mortality rates and causes of death for HIV-infected individuals living in Southern Alberta, Canada from 1984 to 2003. *HIV Medicine* 2005;6:99-106.
398. Bica I, McGovern B, Dhar R, *et al.* Increasing mortality due to endstage liver disease in patients with human immunodeficiency virus infection. *Clin Infect Dis* 2001;32:492-7.
399. De Silva TI, Post FA, Griffin MD, Dockrell DH. HIV-1 infection and the kidney: An evolving challenge in HIV medicine. *Mayo Clin Proc.* 2007;82:1103-16.
400. Ragni MV, Belle SH, Im KA, Neff G, *et al.* Survival of human immunodeficiency virus-infected liver transplant recipients. *J Infect Dis* 2003;188:1412-20.
401. Samuel D, Weber R, Stock P, Duclos-Vallée JC, Terrault N. Are HIV-infected patients candidates for liver transplantation? *J Hepatol* 2008;48:697-707.
402. Roland ME, Stock PG. Liver transplantation in HIV-infected recipients. *Semin Liver Dis* 2006;26:273-84.
403. Miró JM, Agüero F, Laguno M, *et al.* Liver transplantation in HIV/hepatitis co-infection. *J HIV Ther* 2007;12:24-35.
404. Cooper CL, DeForest J, Gill J, Lalonde R; CTN Co-infection Core Group. Barriers preventing liver transplantation in Canadians with HIV infection – perceptions of HIV specialists. *Can J Gastroenterol* 2007;31:179-82.
405. Kirk GD, Merlo C, Driscoll P, *et al.* HIV infection is associated with an increased risk for lung cancer, independent of smoking. *Clin Infect Dis* 2007;45:103–110.
406. Engels EA, Brock MV, Chen J, *et al.* Elevated incidence of lung cancer among HIV-infected individuals. *J Clin Oncol* 2006;24:1383–1388.

407. Diaz PT, King MA, Pacht ER, *et al.* Increased susceptibility to pulmonary emphysema among HIV-seropositive smokers. *Ann Intern Med* 2000;132:369–372.
408. Crothers K, Butt AA, Gibert CL, *et al.* Increased COPD among HIV-positive compared to HIV-negative veterans. *Chest* 2006;130:1326–1333.
409. Opravil M, Pechere M, Speich R, *et al.* HIV-associated primary pulmonary hypertension. A case control study. Swiss HIV cohort study. *Am. J. Respir. Crit. Care Med* 1997;155:990–995.
410. Petrosillo N, Chinello P, Cicalini S. Pulmonary hypertension in individuals with HIV infection. *AIDS* 2006;20:2128–2129.
411. Hsue PY, Deeks SG, Farah HH, *et al.* Role of HIV and human herpesvirus-8 infection in pulmonary arterial hypertension. *AIDS* 2008;22:825–833.
412. Mehta NJ, Khan IA, Mehta RN, *et al.* HIV-related pulmonary hypertension: analytic review of 131 cases. *Chest* 2000;118:1133–1141.
413. *Aid for Aids Clinical Guidelines 6th ed (2007)*
414. DeSimone JA, Pomerantz RJ, Babinchak TJ. Inflammatory reactions in HIV-1-infected persons after initiation of highly active antiretroviral therapy. *Ann Intern Med* 2000;133:447–454.
415. French MA, Lewin SR, Dykstra C, *et al.* Graves' disease during immune reconstitution after highly active antiretroviral therapy for HIV infection: evidence of thymic dysfunction. *AIDS Res Hum Retroviruses* 2004;20:157–162.
416. Lortholary O, Fontanet A, Memain N, *et al.* Incidence and risk factors of immune reconstitution inflammatory syndrome complicating HIV-associated cryptococcosis in France. *AIDS* 2005;19:1043–1049.
417. Lawn SD, Wood R. When should antiretroviral treatment be started in patients with HIV-associated tuberculosis in South Africa? *SAMJ* 2007;97:412, 414–415.
418. Shelburne SA, Visnegarwala F, Darcourt J, *et al.* Incidence and risk factors for immune reconstitution inflammatory syndrome during highly active antiretroviral therapy. *AIDS* 2005;19:399–406.
419. Jevtovic DJ, Salemovic D, Ranin J, *et al.* The prevalence and risk of immune restoration disease in HIV-infected patients treated with highly active antiretroviral therapy. *HIV Med* 2005;6:140–143.
420. Ratnam I, Chiu C, Kandala NB, Easterbrook PJ. Incidence and risk factors for immune reconstitution inflammatory syndrome in an ethnically diverse HIV type 1-infected cohort. *Clin Infect Dis* 2006;42:418–427.
421. French MA, Price P, Stone SF. Immune restoration disease after antiretroviral therapy. *AIDS* 2004;18:1615–1627.
422. Skelly MJ, Holzman RS, Merali S. S-adenosylmethionine levels in the diagnosis of *Pneumocystis carinii* pneumonia in patients with HIV infection. *Clin Infect Dis* 2008;46:467–471.
423. Fei MW, Kim EJ, Sant CA, Jarlsberg LG, Davis JL, Swartzman A, *et al.* Predicting mortality from HIV-associated *Pneumocystis pneumonia* at illness presentation: an observational cohort study. *Thorax* 2009;64(12):1070-76. [<http://dx.doi.org/10.1136/thx.2009.117846>]
424. Wang HW, Lin CC, Kuo CF, Liu CP, Lee CM. Mortality predictors of *Pneumocystis jirovecii* pneumonia in human immunodeficiency virus-infected patients at presentation: Experience in a tertiary care hospital of northern Taiwan. *J Microbiol Immunol Infect* 2011;44(4):274-81. [[http://dx.doi.org/S1684-1182\(11\)00053-3](http://dx.doi.org/S1684-1182(11)00053-3) [pii] 10.1016/j.jmii.2010.08.006]

425. Radhi S, Alexander T, Ukwu M, Saleh S, Morris A. Outcome of HIV-associated Pneumocystis pneumonia in hospitalized patients from 2000 through 2003. *BMC Infect Dis.* 2008;8:118.
426. Khouli H, Afrasiabi A, Shibli M, Hajal R, Barrett C R, Homel P. Outcome of critically ill human immunodeficiency virus-infected patients in the era of highly active antiretroviral therapy. *Journal Of Intensive Care Medicine* 2005;20(6):327-33.
427. Greenberg JA, Lennox JL, Martin GS. Outcomes for critically ill patients with HIV and severe sepsis in the era of highly active antiretroviral therapy. *J Crit Care* 2011.S0883-9441(11)00391-1 [pii] [<http://dx.doi.org/10.1016/j.jcrc.2011.08.015>]
428. Agarwal R, Gupta D, Ray P, Aggarwal AN, Jindal SK. Epidemiology, risk factors and outcome of nosocomial infections in a Respiratory Intensive Care Unit in North India. *The Journal Of Infection* 2006;53(2):98-105.
429. Adlakha A, Pavlou M, Walker D A, Copas A J, Dufty N, Batson S, *et al.* Survival of HIV-infected patients admitted to the intensive care unit in the era of highly active antiretroviral therapy. *International Journal of STD & AIDS* 2011;22(9):498-504. [<http://dx.doi.org/10.1258/ijsa.2011.010496>]
430. Afessa B, Green B. Clinical course, prognostic factors, and outcome prediction for HIV patients in the ICU. The PIP (Pulmonary complications, ICU support, and prognostic factors in hospitalized patients with HIV) study. *Chest* 2000;118(1):138-45.
431. Chiang H, Hung C, Lee C, Chen H, Chen M, Sheng W, *et al.* Admissions to intensive care unit of HIV-infected patients in the era of highly active antiretroviral therapy: etiology and prognostic factors. *Crit Care* 2011;15(4):R202.
432. Agaba PA, Makai R, Apena L, Oche O. Clinical characteristics and predictors of mortality in hospitalized HIV-infected Nigerians. *Journal of Infection in Developing Countries* 2011;5:377-82.
433. Cardoso LT, Grion CM, Matsuo T, Anami EH, Kauss IA, Seko L, *et al.* Impact of delayed admission to intensive care units on mortality of critically ill patients: a cohort study. *Crit Care* 2011;15(1):R28. [<http://dx.doi.org/cc9975>] [pii]10.1186/cc9975]
434. Japiassu A, Amancio R, Mesquita E, Medeiros D, Bernal H, Nunes E, *et al.* Sepsis is a major determinant of outcome in critically ill HIV/AIDS patients. *Crit Care* 2010;14(4):R152.
435. Ragab FA, Ahmad GH, Andraos AW, Zaky SH, Fawzy H. Conventional Vs Non Invasive Ventilation In Acute Respiratory Failure. *Australian Journal of Basic & Applied Sciences* 2009;3(3):2232-42.
436. Kramer AA, Zimmerman JE. A predictive model for the early identification of patients at risk for a prolonged intensive care unit length of stay. *BMC Med Inform Decis Mak* 2010; [<http://dx.doi.org/10.27.1472-6947-10-27>] [pii]10.1186/1472-6947-10-27]
437. Wong DT, Gomez M, McGuire GP, Kavanagh B. Utilization of intensive care unit days in a Canadian medical-surgical intensive care unit. *Crit Care Med* 1999;27:1319-24.
438. Zimmerman JE, Kramer AA, McNair DS, Malila FM, Shaffer VL. Intensive care unit length of stay: Benchmarking based on Acute Physiology and Chronic Health Evaluation (APACHE) IV *Critical Care Medicine* 2006;34:2517-29.
439. Norton SA, Hogan LA, Holloway RG, Temkin-Greener H, Buckley MJ, T. Q. Proactive palliative care in the medical intensive care unit: Effects on length of stay for selected high risk patients. *Critical Care Medicine* 2007;35:1530-35.

440. Needham DM. Mobilizing patients in the intensive care unit. Improving neuromuscular weakness and physical function *JAMA* 2008;300:1685-90.
441. Morris PE, Goad A, Thompson C, Taylor K, Harry B, Passmore L, *et al.* Early intensive care unit mobility therapy in the treatment of acute respiratory failure. *Critical Care Medicine* 2008;36:2238-43.
442. Gracey DR, Hardy DC, Koenig GE. The chronic ventilator-dependent unit: A lower cost alternative to intensive care. *Mayo Clin Proc.* 2000;75:445-49.
443. Seneff MG, Wagner D, Thompson D, Honeycutt C, Silver MR. The impact of long-term acute-care facilities on the outcome and cost of care for patients undergoing prolonged mechanical ventilation. *Critical Care Medicine* 2000;28:342-50.
444. Scheinhorn DJ, Hassenpflug MS, Votto JJ CD, Epstein SK, Doig GS, Knight EB, *et al.* Ventilation Outcomes Study Group. Post-ICU mechanical ventilation at 23 long-term hospitals: A multicenter outcomes study. *CHEST* 2007;131:85-93.
445. Suter P, Armaganidis A, Beaufils F, Bonfill X, Burchardi H, Cook D, *et al.* Predicting outcome in ICU patients. *Intensive Care Med* 1994;20:1-8.
446. Marti C, Garin N, Groscurin O, Poncet A, Combescure C, Carballo S, *et al.* Prediction of severe community-acquired pneumonia: a systematic review and meta-analysis. *Crit Care* 2012;16(4):R141. [<http://dx.doi.org/cc11447> [pii]10.1186/cc11447]
447. Alvarez-Martinez M. J, Moreno A, Miro J M, Valls M E, Rivas P V, de Lazzari E, *et al.* Pneumocystis jirovecii pneumonia in Spanish HIV-infected patients in the combined antiretroviral therapy era: prevalence of dihydropteroate synthase mutations and prognostic factors of mortality. *Diagnostic Microbiology and Infectious Disease* 2008;62(1):34-43.
448. Powell K, Davis JL, Morris AM, Chi A, Bensley MR, Huang L. Survival for patients With HIV admitted to the ICU continues to improve in the current era of combination antiretroviral therapy. *CHEST* 2009;135(1):11-7. [<http://dx.doi.org/chest.08-0980> [pii]10.1378/chest.08-0980]
449. Barbier F, Coquet I, Legriel S, Pavie J, Darmon M, Mayaux J, *et al.* Etiologies and outcome of acute respiratory failure in HIV-infected patients. *Intensive Care Medicine* 2009;35(10):1678-86.
450. Rees PH. HIV/AIDS: the first 25 years-a view from Nairobi. *East Afr Med J* 2008;85(6):292-300.

ANNEXURES
ANNEXURE A1 POST-GRADUATE EDUCATION COMMITTEE
AND ETHICS APPROVAL

7 April 2009

Student number : 783786096

Dr K. Naidoo
No. 2, Quartet
273 Musgrave Road
Berea
4001



Dear Dr Naidoo,

PhD : "To explore ethical dilemmas engaged by emergency care practitioners in treating stage 4 AIDS"

I have pleasure in advising you that at a meeting of the Postgraduate Education Committee held on 7th April 2009, it was recommended to the Faculty Board that you be accepted as a candidate for the degree of Doctor of Philosophy to be supervised by Professor U.G. Laloo, Department of Internal Medicine.

Enclosed please find the following:

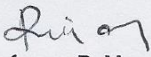
- Proforma Invoice
- Hand book for 2009 on CD
- Guide to the procedures for Postgraduate study
- General Academic Rules and Rules for Students
- Guide for presentation of Dissertation/Thesis
- Supervisor Record
- Student-Supervisor Agreement

Please call at the Postgraduate Office at the Medical School by **Tuesday, 21 April 2009** to finalise your registration.

Please submit a full protocol to the Postgraduate Office within three months of registration. Protocol forms are accessible on the LAN as follows:
V:\USRISTAFF\GENERAL\POSTGRAD

I trust that your research will be both stimulating and productive, and wish you success in this venture.

Yours sincerely


Professor P. Moodley
Dean's Assistant : MMedSc & PhD
Postgraduate Education Committee
HD/NaidooK

cc Professor U.G. Laloo
Dept. of Internal Medicine

Studies may not begin without Postgraduate and Ethics approval.
A research application form is accessible on the student LAN. Completed forms are to be submitted to Postgraduate Education Administration.

Postgraduate Education administration
Medical School Campus

Postal Address: Private Bag 7, Congella 4013, South Africa



UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI

RESEARCH OFFICE
Biomedical Research Ethics Administration
Westville Campus, Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: BREC@ukzn.ac.za

Website: <http://research.ukzn.ac.za/ResearchEthics/BiomedicalResearchEthics.aspx>

01 April 2011

Dr. K Naidoo
Dept of Family Medicine, 2nd Floor, George Cambell Building
Howard College Campus
University of KwaZulu-Natal

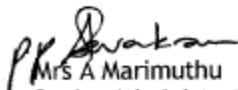
Dear Dr Naidoo

PROTOCOL: To explore Ethical Dilemmas by Physicians in the provision of critical care to patients with HIV infection. REF: BE089/010

EXPEDITED APPLICATION - RATIFICATION

This letter serves to notify you that at a full sitting of the Biomedical Research Ethics Committee meeting held on **08 March 2011**, the Committee **RATIFIED** the sub-committee's decision to approve the above study.

Yours sincerely


Mrs A Marimuthu

Senior Administrator: Biomedical Research Ethics



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INYUVESI
YAKWAZULU-NATALI

12 October 2011

Professor UG Lalloo
Department of Medicine
Nelson R Mandela School of Medicine

Dear Professor Lalloo

PROTOCOL: "The Ethical Dilemmas of Critical Care Physicians Encountered in the Admission of Patients with HIV infection to intensive care"
Naidoo K 783786096 – PhD Family Medicine

At a meeting of the Postgraduate Education Committee held 11 October 2011, your request for approval of protocol amendment 03 October 2011 has been noted and approved.

New title: "The Ethical Dilemmas of Critical Care Specialists Encountered in the Admission of Patients with HIV Infection to Intensive care"

Yours sincerely

Professor SJ Botha
Chair: Postgraduate Education Committee

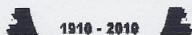
CC. Dr K Naidoo

Biomedical Research Ethics Committee
Westville Campus

Postgraduate Education Administration
Medical School Campus

Postal Address: Private Bag 7, Congella, 4013, South Africa

Telephone: +27 (0) 31 260 4327 Facsimile: +27 (0)31 260 4401 Email: heslopd@ukzn.ac.za Website: www.ukzn.ac.za



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Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: BREC@ukzn.ac.za

Website: <http://research.ukzn.ac.za/ResearchEthics/BiomedicalResearchEthics.aspx>

28 October 2011

Dr. K Naidoo
Dept of Family Medicine, 2nd Floor, George Cambell Building
Howard College Campus
University of KwaZulu-Natal

Dear Dr Naidoo

PROTOCOL: To explore Ethical Dilemmas by Physicians in the provision of critical care to patients with HIV infection. REF: BE089/010

We wish to advise you that your application dated 03 October 2011 requesting approval of Amendments for the above mentioned study has been noted and approved by a sub-committee of the Biomedical Research Ethics Committee. Please note that protocol deviation has also been noted by the Committee.

This approval will be ratified by a full Committee at its next meeting taking place on **08 November 2011**.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'A Marimuthu'.

Ms A Marimuthu
Senior Administrator: Biomedical Research Ethics

ANNEXURE B KAP SURVEY- “THE ETHICAL DILEMMAS OF CRITICAL CARE SPECIALISTS ENCOUNTERED IN THE ADMISSION OF PATIENTS WITH HIV INFECTION TO INTENSIVE CARE.

INFORMATION DOCUMENT FOR CRITICAL CARE SPECIALIST

Dear Colleague

My name is Dr K Naidoo. I am conducting a study as part of my PhD degree entitled: “**CRITICAL CARE SPECIALISTS’ ATTITUDES AND PERCEPTIONS CONCERNING ICU ADMISSIONS FOR PATIENTS WITH HIV INFECTION**” under the supervision of Professor Umesh Laloo and Professor Jerome Singh. This study has received ethics approval from the Research Ethics Committee of the University of KwaZulu-Natal **Approval No. BE 089/010** *(For the purposes of participation in this study a Critical care Specialist will be defined as a specialist registered with the Critical Care Society of South Africa (CCSSA), South African Thoracic Society (SATS), and specialist Physicians, Surgeons, Paediatricians and residents/fellows registered with the relevant Colleges of Medicine/Emergency Medicine/Surgeons/Paediatricians/Anaesthetists of South Africa.)*

In the event of any problems or concerns/questions you may contact the researcher:

Dr Kantharuben (Ruben) Naidoo
Principal Specialist/Lecturer
Department of Family Medicine
Master of Laws(Medical Law)
Nelson R Mandela School of Medicine/ KZN Department of Health
Tel: 031 2604485 ; 031 4605000
Cell: 084 444 8466
Fax :031 4689654
e-mail: naidook@ukzn.ac.za

or

The UKZN Biomedical Research Ethics Committee, contact details as follows:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: [BREC@ukzn.ac.za](mailto: BREC@ukzn.ac.za)

Short overview of the study

HIV/AIDS is one of the main challenges facing South Africa today. It is estimated that of the 33.4 million people worldwide living with the human immunodeficiency virus in 2008, more than 67% were from sub-Saharan Africa. As a result South Africa, as a resource constrained country with a high burden of disease, needs to use best available evidence of outcomes for patients with HIV infection and ICU care, with respect to applicable laws, ethical principles and clinical guidelines to enable appropriate use of scarce resources.

The purpose of this study is *to develop best practice admission criteria for patients with HIV infection requiring intensive care in South Africa.*

The study would be in two parts.

1. The first part would be by search of the literature to study the health impact of HIV/AIDS and the regulatory and ethical framework in South Africa (a resource constrained country) compared with the USA (a resource rich country) concerning patients with HIV infection and access to intensive care services. A search of the literature would also be undertaken to establish current best practices by Critical Care Specialists regarding HIV infection and admission to intensive care in Brazil, India and Botswana as comparative emerging economies to South Africa, all with universal health coverage and with a high burden of HIV infection
2. The second part of the study would be to conduct a descriptive, non-experimental, anonymous attitudes and perception survey amongst Critical Care Specialists in South Africa and who, in the normal scope of their work, are all involved in decisions regarding the provision of intensive care to patients with HIV infection.

It is hoped this study will yield guidance to critical care specialists in South Africa in the form of proposed best-practice admission criteria for patients with HIV infection requiring intensive care.

I would appreciate your participation in the survey component of my research. **Your participation is purely voluntary.**

The study will be conducted as an anonymous structured self-administered questionnaire. Your identity will remain anonymous and your response will remain confidential to the extent permitted by law.

There are no risks attached as the study is by anonymous questionnaire and the scenarios are hypothetical. Your completed questionnaire will be analysed electronically by Mr Stephan Van de Linde-Biostatistician-UKZN.

There is no compensation for participating in the survey.

You have the right to refuse participation in the study and you may withdraw from the study at any point, without fear of prejudice.

The Questionnaire is in **THREE** parts:

- A. DEMOGRAPHIC CHARACTERISTICS OF CRITICAL CARE SPECIALIST PARTICIPATING IN QUESTIONNAIRE SURVEY.**
- B. SURVEY OF CRITICAL CARE SPECIALISTS' PERCEPTIONS REGARDING ICU ADMISSIONS.**
- C. POTENTIAL DETERMINANTS OF ADMISSION TO ICU.**

Clinical vignettes using hypothetical patients are used. Ethical issues regarding patient informed consent and confidentiality do not arise.

A 'Yes' tick box on the questionnaire would confirm your consent for participation in the questionnaire survey. The format of the questionnaire does not request the names or addresses of the participating Critical Care Specialist nor the name of the Institution/ICU you are practicing in.

For the purpose of this study, a self-administered questionnaire is submitted for your completion.

Please tick in the box below to indicate your consent to participation in the anonymous questionnaire survey.

YES	<input type="checkbox"/>
NO	<input type="checkbox"/>

A. DEMOGRAPHIC CHARACTERISTICS OF CRITICAL CARE SPECIALIST PARTICIPATING IN QUESTIONNAIRE SURVEY.

1. Gender

Male	<input type="checkbox"/>
Female	<input type="checkbox"/>

2. Age

Below 40	<input type="checkbox"/>
-----------------	--------------------------

40-49	
50 or more	

3. Primary specialty

Anaesthesiology	
Pulmonology	
Internal Medicine/Cardiology	
Surgery	
Paediatrics	
Other	

4. Intensive care experience

4 years or less	
5 to 10 years	
10 years or more	

5. Proportion of total professional responsibilities devoted to intensi care

Less than 25%	
25-50%	
50-75%	
More than 75%	

6. Province of Practice

KwaZulu-Natal	
Western Cape	
Eastern Cape	
Gauteng	

North West	
Limpopo	
Northern Cape	
Free State	
Mpumalanga	

7. Type of Hospital Facility

Public	Regional	
	Tertiary	
Private		

8. No. of beds in Hospital

Less than 500	
500-749	
750 or more	

9. No of ICU beds

6 or less	
7-12	
13-18	
18 or more	

10. Type

General	
----------------	--

Surgical	
Medical	
Paediatric	
Coronary	

11. Role in ICU

Director	
Senior staff	
Fellow/resident	
Visiting consultant	
No formal role	

**B. SURVEY OF CRITICAL CARE SPECIALISTS’
PERCEPTIONS REGARDING ICU ADMISSIONS**

**FOR THE FOLLOWING 15 QUESTIONS PLEASE TICK THE MOST APPROPRIATE
ANSWER IN THE BOX PROVIDED.**

- 1. IS THE ICU ADMISSION LIMITED BY THE NUMBER OF AVAILABLE BEDS? –
CHOOSE ONE**

Generally	
Often, commonly	
Sometimes, uncommonly	
(almost) never	

- 2. DO YOU SOMETIMES ADMIT TO ICU?**

	YES	NO
--	-----	----

PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE DOCTOR'S OPINION</u>		
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE PATIENT'S OPINION</u>		
PATIENTS WITH VERY LIMITED CHANCES OF SURVIVAL (OR POOR PROGNOSTIC INDEX IF CALCULATED)		
PATIENTS WITH NO HOPE OF SURVIVAL FOR MORE THAN A FEW WEEKS		

3. THE MEDICAL INFORMATION -THE DIAGNOSIS, TREATMENT, PROGNOSIS GIVEN TO THE PATIENT IS: -CHOOSE ONE

A. Always complete, without exception	
B. Depends on the type of disease and the severity of the prognosis	
C. Depends on the type of patient (personality, perceived wishes, suicidal, depressed etc.)	
D. b&c	

4. BEFORE PERFORMING THE FOLLOWING ELECTIVE PROCEDURES, THE INFORMED CONSENT OF A CONSCIOUS PATIENT IS REQUIRED:

	Yes-written consent	Yes-oral consent	No consent required
HIV COUNSELLING AND TESTING			
INTUBATION AND VENTILATION			
SURGERY			
DIALYSIS			
BLOOD TRANSFUSION			

5. IF A COMPETENT PATIENT REFUSES THE INTERVENTIONS THAT YOU CONSIDER NECESSARY AND VITAL-CHOOSE ONE

You try to convince the patient, but if insistent, accept his decision	
You proceed with treatment, contrary to the patients wishes	
You advise the patient that you will no longer take care of him	

6. DO YOU CURRENTLY COMPLY WITH DNR (DO NOT RESUSCITATE) ORDERS IN THE EVENT OF CARDIAC ARREST? – CHOOSE ONE

YES, WRITTEN DNR ORDERS	
YES, VERBAL DNR ORDERS	
NO. THESE ORDERS WOULD LIMIT THE CARE TO THESE PATIENTS.	
NO. ONE SHOULD ATTEMPT TO RESUSCITATE EVERY PATIENT IN THE ICU.	

7. IF DNR ORDERS ARE USED, ARE THEY, AS A GENERAL RULE:

DISCUSSED WITH THE PATIENT?	YES	
	NO	
DISCUSSED WITH THE FAMILY?	YES	
	NO	

8. IN PATIENTS WITH NO REAL CHANCE OF RECOVERING A MEANINGFUL LIFE, DO YOU SOMETIMES:

	YES	NO
WITHHOLD SOPHISTICATED THERAPY (I.E. NOT START MECHANICAL VENTILATION, DIALYSIS ETC.)		
WITHDRAW SOPHISTICATED THERAPY (I.E. DISCONTINUE MECHANICAL VENTILATIUON, DIALYSIS ETC.)		

9. "LIMITED CARE" (WITHHOLDING THERAPY) VERSUS WITHDRAWING THERAPY: - CHOOSE ONE

THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS. WHENEVER POSSIBLE WITHHOLDING THERAPY IS PREFERABLE.	
THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS."LIMITED CARE" IS GENERALLY VERY DIFFICULT AND SOMETIMES HAZARDOUS. MAXIMAL TREATMENT SHOULD BE PROVIDED AND WITHDRAWN IF THE SITUATION BECOMES HOPELESS.	
NETHER CAN BE ACCEPTED. THE ICU PHYSICIAN SHOULD PRESERVE LIFE AT ALL COSTS.	

10. THE DECISION ABOUT TERMINAL CARE DOES INVOLVE: - CHOOSE ONE

A.THE MEDICAL STAFF	
B. THE ICU STAFF(INCLUDING NURSES)	
C. THE PATIENT AND/OR FAMILY	
D. A&C	
E. B&C	

11. CAN AN ETHICS CONSULTANT/COMMITTEE HELP IN THESE DECISIONS REGARDING ICU ADMISSION?

	YES	NO
PATIENT HAS NO FAMILY		
FAMILY INSISTS WITHHOLD OR WITHDRAW CARE		
FAMILY INSISTS EVERYTHING TO BE DONE		

12. SHOULD MEDICAL EDUCATION PROGRAMMES (CME) INCLUDE MORE DISCUSSIONS ON ETHICAL ISSUES?

YES	
NO	

C. POTENTIAL DETERMINANTS OF ADMISSION TO ICU

- 1. A 70 year old man (A) presents with acute hypoxemic respiratory failure requiring immediate intubation. The patient has advanced HIV disease complicated by AIDS wasting syndrome, disseminated candidiasis, and pulmonary hypertension, all of which have contributed to his poor functional status at baseline. You are the physician on duty at the ICU and you are requested to admit the patient to ICU for mechanical ventilation.**

PLEASE RATE YOUR ADMISSION TO ICU RANGING FROM 1(STRONGLY DISAGREE WITH ICU ADMISSION) TO 5 (STRONGLY AGREE WITH ICU ADMISSION).

STRONGLY DISAGREE	DISAGREE	UNCERTAIN	AGREE	STRONGLY AGREE
1	2	3	4	5

1.1 WITH REFERENCE TO YOUR DECISION ABOVE PLEASE SELECT THE FIVE (5) MOST IMPORTANT DETERMINANTS THAT HAVE INFLUENCED YOUR DECISION FROM THE LIST PROVIDED BELOW AND RANK THEM IN ORDER OF IMPORTANCE FROM 1-5 WITH 1 BEING THE MOST IMPORTANT AND 5 THE LEAST IMPORTANT IN THE BOX ON THE NEXT PAGE

POTENTIAL DETERMINANTS

- A. PROGNOSIS OF ACUTE DISEASE
- B. PROGNOSIS OF UNDERLYING DISEASE
- C. PATIENTS AGE
- D. RESOURCES
- E. HUMAN RIGHTS
- F. PATIENT PREFERENCES
- G. FAMILY WISHES
- H. CULTURAL CONSIDERATIONS
- I. FINANCIAL IMPLICATIONS FOR FAMILY(E.G. SOLE BREADWINNER)
- J. SOCIOECONOMIC STATUS
- K. PHYSICIAN EXPERIENCE

- L. POLICY OF INTENSIVE CARE UNIT
- M. THREAT OF LITIGATION
- N. BED USED TO THE PREJUDICE OF ANOTHER PATIENT

MOST IMPORTANT	VERY IMPORTANT	IMPORTANT	PROBABLY IMPORTANT	LEAST IMPORTANT
1	2	3	4	5

1.2 REGARDING WITHHOLDING THERAPY (WITH REFERENCE TO THE ABOVE SCENARIO) – CHOOSE ONE

THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS. WHENEVER POSSIBLE WITHHOLDING THERAPY IS PREFERABLE.	
THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS."LIMITED CARE" IS GENERALLY VERY DIFFICULT AND SOMETIMES HAZARDOUS. MAXIMAL TREATMENT SHOULD BE PROVIDED AND WITHDRAWN IF THE SITUATION BECOMES HOPELESS.	
NEITHER CAN BE ACCEPTED. THE ICU PHYSICIAN SHOULD PRESERVE LIFE AT ALL COSTS.	

1.3 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE FOR THIS PATIENT?

	YES	NO
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE DOCTOR'S OPINION</u>		
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE PATIENT'S OPINION</u>		
PATIENTS WITH VERY LIMITED CHANCES OF SURVIVAL (OR POOR PROGNOSTIC INDEX IF CALCULATED)		
PATIENTS WITH NO HOPE OF SURVIVAL FOR MORE THAN A FEW WEEKS		

1.4 DO YOU BELIEVE THAT THE URGENT INITIATION OF HAART IN THIS PATIENT WOULD INFLUENCE HIS ICU OUTCOMES AND IMPROVE HIS GENERAL PROGNOSIS?

YES	
NO	

2. A 24 year old woman is brought to the A/E by her concerned husband. She is known to your hospital and her hospital records are made available to you. She is HIV positive and awaiting her CD 4 count. She is also awaiting a biopsy of a suspicious lesion on her palate, clinically thought to be Kaposi's sarcoma.

She is wasted and now presents with haemoptysis for 2 weeks duration.

She is in severe respiratory distress and is restless. Her respiratory rate is 36br /min, HR 108, BP 90/45, T 38, 6 °C and O₂ saturation is 45%.

On auscultation, her chest is clear. A blood gas analysis shows the patient to be in Type 1 respiratory failure. A chest X-Ray shows mediastinal widening with hilar lymphadenopathy and left mid-zone consolidation. You are requested to admit the patient to ICU for mechanical ventilation.

Her husband wants to know details from you as to what is exactly wrong with his wife regarding her deterioration in health.

Her husband further pleads with you to do everything to save her life.

2.0 WOULD YOU DISCLOSE THE WIFE'S HIV STATUS TO THE HUSBAND?

YES	
NO	

2.1 WHAT INFORMS YOUR DECISION ABOVE?

	YES	NO
KNOWLEDGE OF LAW		
ETHICAL CODE OF CONDUCT-HPCSA		
PERSONAL DUTY-BASED DECISION.		

2.2 WOULD YOU CONSIDER THE URGENT INITIATION OF HAART BENEFICIAL FOR THIS PATIENT IF ADMITTED TO ICU?

YES	
NO	

2.3 PLEASE RATE YOUR ADMISSION TO ICU RANGING FROM 1 (STRONGLY DISAGREE WITH ICU ADMISSION) TO 5 (STRONGLY AGREE WITH ICU ADMISSION).

STRONGLY DISAGREE	DISAGREE	UNCERTAIN	AGREE	STRONGLY AGREE
1	2	3	4	5

2.4 WITH REFERENCE TO YOUR DECISION ABOVE PLEASE SELECT THE FIVE (5) MOST IMPORTANT DETERMINANTS THAT HAS INFLUENCED YOUR DECISION FROM THE LIST PROVIDED BELOW AND RANK THEM IN ORDER OF IMPORTANCE FROM 1-5 WITH 1 BEING THE MOST IMPORTANT AND 5 THE LEAST IMPORTANT IN THE BOX PROVIDED

POTENTIAL DETERMINANTS

- A. PROGNOSIS OF ACUTE DISEASE
- B. PROGNOSIS OF UNDERLYING DISEASE
- C. PATIENTS AGE
- D. RESOURCES
- E. HUMAN RIGHTS
- F. PATIENT PREFERENCES
- G. FAMILY WISHES
- H. CULTURAL CONSIDERATIONS
- I. FINANCIAL IMPLICATIONS FOR FAMILY (E.G. SOLE BREADWINNER)
- J. SOCIOECONOMIC STATUS
- K. PHYSICIAN EXPERIENCE
- L. POLICY OF INTENSIVE CARE UNIT
- M. THREAT OF LITIGATION

N. BED USED TO THE PREJUDICE OF ANOTHER PATIENT

MOST IMPORTANT	VERY IMPORTANT	IMPORTANT	PROBABLY IMPORTANT	LEAST IMPORTANT
1	2	3	4	5

2.5 REGARDING WITHHOLDING THERAPY (WITH REFERENCE TO THE ABOVE SCENARIO) –CHOOSE ONE

THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS. WHENEVER POSSIBLE WITHHOLDING THERAPY IS PREFERABLE.	
THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS."LIMITED CARE" IS GENERALLY VERY DIFFICULT AND SOMETIMES HAZARDOUS. MAXIMAL TREATMENT SHOULD BE PROVIDED AND WITHDRAWN IF THE SITUATION BECOMES HOPELESS.	
NEITHER CAN BE ACCEPTED. THE ICU PHYSICIAN SHOULD PRESERVE LIFE AT ALL COSTS.	

2.6 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE FOR THIS PATIENT?

	YES	NO
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE DOCTOR'S OPINION</u>		
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE PATIENT'S OPINION</u>		
PATIENTS WITH VERY LIMITED CHANCES OF SURVIVAL (OR POOR PROGNOSTIC INDEX IF CALCULATED)		
PATIENTS WITH NO HOPE OF SURVIVAL FOR MORE THAN A FEW WEEKS		

3. A 75 YEAR OLD PATIENT (A) PRESENTS TO THE A/E AT THE REGIONAL HOSPITAL IN T1 RESPIRATORY FAILURE. HE IS WASTED AND HAS ORAL CANDIDIASIS. CHEST EXAMINATION IS CLINICALLY CLEAR. C-XRAY SHOWS GROUND GLASS SHADOWING CONSISTENT WITH PJP. THE PATIENT REQUIRES VENTILATION. HIS CD4 COUNT IS 1 AND HAS DEFAULTED HIS HAART FOR MANY MONTHS.

IN PARALLEL ,YOU ARE ALSO PRESENTED WITH AN 18 YEAR OLD PATIENT (B) FOR DRUG OVERDOSE (SUICIDE ATTEMPT) AND IN SEVERE RESPIRATORY DEPRESSION WITH UNCONTROLLABLE SEIZURES REQUIRING ICU CARE FOR VENTILATION.YOU HAVE ONLY 1 VENTILATOR BED AVAILABLE.

3.1 WHICH PATIENT WOULD YOU IMMEDIATELY PRIORITIZE FOR THE 1 AVAILABLE VENTILATOR BED?

PATIENT A	
PATIENT B	

3.2 WITH RESPECT TO YOUR DECISION ABOVE, PLEASE SELECT THE FIVE (5) MOST IMPORTANT DETERMINANTS THAT INFLUENCED YOUR DECISION FOR ICU ADMISSION FROM THE LIST PROVIDED BELOW AND RANK THEM IN ORDER OF IMPORTANCE FROM 1-5 WITH 1 BEING THE MOST IMPORTANT AND 5 THE LEAST IMPORTANT IN THE BOX PROVIDED BELOW

POTENTIAL DETERMINANTS

- A. PROGNOSIS OF ACUTE DISEASE
- B. PROGNOSIS OF UNDERLYING DISEASE
- C. PATIENTS AGE
- D. RESOURCES
- E. HUMAN RIGHTS
- F. PATIENT PREFERENCES
- G. FAMILY WISHES
- H. CULTURAL CONSIDERATIONS
- I. FINANCIAL IMPLICATIONS FOR FAMILY(E.G. SOLE BREADWINNER)
- J. SOCIOECONOMIC STATUS
- K. PHYSICIAN EXPERIENCE

- L. POLICY OF INTENSIVE CARE UNIT
- M. THREAT OF LITIGATION
- N. BED USED TO THE PREJUDICE OF ANOTHER PATIENT

MOST IMPORTANT	VERY IMPORTANT	IMPORTANT	PROBABLY IMPORTANT	LEAST IMPORTANT
1	2	3	4	5

3.3 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE IN PATIENT A?

	YES	NO
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE DOCTOR'S OPINION</u>		
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE PATIENT'S OPINION</u>		
PATIENTS WITH VERY LIMITED CHANCES OF SURVIVAL (OR POOR PROGNOSTIC INDEX IF CALCULATED)		
PATIENTS WITH NO HOPE OF SURVIVAL FOR MORE THAN A FEW WEEKS		

3.4. SHOULD THERE BE NO ICU BEDS AVAILABLE AT YOUR HOSPITAL WITH PATIENT A BEING ONE OF THE PATIENTS ALREADY ON VENTILATION, AND PATIENT B PRESENTS AS AN EMERGENCY REQUIRING AN ICU BED FOR VENTILATION, WOULD YOU JUSTIFY WITHDRAWING PATIENT A FROM VENTILATION ON THE GROUNDS OF: - CHOOSE ONE

THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS. WHENEVER POSSIBLE WITHHOLDING THERAPY IS PREFERABLE.	
THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS."LIMITED CARE" IS GENERALLY VERY DIFFICULT AND SOMETIMES HAZARDOUS. MAXIMAL TREATMENT SHOULD BE PROVIDED AND WITHDRAWN IF THE SITUATION BECOMES HOPELESS.	
NEITHER CAN BE ACCEPTED. THE ICU PHYSICIAN SHOULD PRESERVE LIFE AT ALL COSTS. RATHER MOVE PATIENT B TO A HIGH -CARE UNIT	

3.5. WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION TO WITHDRAW FURTHER ICU CARE TO PATIENT A?

	YES	NO
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE DOCTOR'S OPINION</u>		
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE PATIENT'S OPINION</u>		
PATIENTS WITH VERY LIMITED CHANCES OF SURVIVAL (OR POOR PROGNOSTIC INDEX IF CALCULATED)		
PATIENTS WITH NO HOPE OF SURVIVAL FOR MORE THAN A FEW WEEKS		

3.6 ON RECOVERY IN ICU PATIENT B REQUESTS AN HIV TEST AS SHE WAS SEXUALLY ASSAULTED 2 WEEKS AGO.SHE STILL APPEARS DEPRESSED. YOU WOULD RESPOND ACCORDINGLY:

	YES	NO
PERFORM THE TEST -PRINCIPLE OF BENEFICIENCE,AUTONOMY		
DO NOT PERFORM THE TEST -NON-MALEFICIENCE; PROCESS OF COUNSELLING FIRST.		

4. A 55 YEAR OLD PATIENT (A) PRESENTS TO THE A/E AT THE REGIONAL HOSPITAL IN T1 RESPIRATORY FAILURE. HE IS WASTED AND HAS ORAL CANDIDIASIS. CHEST EXAMINATION IS CLINICALLY CLEAR. C-XRAY SHOWS GROUND-GLASS SHADOWING CONSISTENT WITH PJP. THE PATIENT REQUIRES VENTILATION. HIS CD4 COUNT IS 1 AND HE HAS DEFAULTED HIS HAART FOR MANY MONTHS. IN ADDITION HE HAS DEFAULTED HIS TB TREATMENT SEVERAL TIMES AND IS AWAITING AFB CULTURE AS IT IS SUSPECTED THAT HE MAY HAVE MDR/XDR TB.

4.1. PLEASE RATE YOUR ADMISSION TO ICU RANGING FROM 1(STRONGLY DISAGREE WITH ICU ADMISSION) TO 5 (STRONGLY AGREE WITH ICU ADMISSION).

STRONGLY DISAGREE	DISAGREE	UNCERTAIN	AGREE	STRONGLY AGREE
1	2	3	4	5

4.2. YOU WOULD JUSTIFY YOUR DECISION AS FOLLOWS : -CHOOSE ONE

THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS. WHENEVER POSSIBLE WITHHOLDING ICU CARE IS PREFERABLE.	
THE ICU PHYSICIAN SHOULD PRESERVE LIFE AT ALL COSTS.	
PATIENT SHOULD NOT BE ADMITTED TO ICU AS HE HAS SEVERAL CO-MORBID CONDITIONS, SHOWN POOR COMMITMENT TO TREATMENT AND HIS MDR/XDR TB POSES A HEALTH RISK TO THE ICU TEAM AND PATIENTS AND PUBLIC IN GENERAL.HE SHOULD BE REFERRED TO AN ISOLATION FACILITY FOR PALLIATIVE CARE.	

4.3 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE FOR THIS PATIENT?

	YES	NO
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE DOCTOR'S OPINION</u>		
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE PATIENT'S OPINION</u>		
PATIENTS WITH VERY LIMITED CHANCES OF SURVIVAL (OR POOR PROGNOSTIC INDEX IF CALCULATED)		
PATIENTS WITH NO HOPE OF SURVIVAL FOR MORE THAN A FEW WEEKS		

4.4. WITH RESPECT TO YOUR DECISION, PLEASES SELECT THE FIVE (5) MOST IMPORTANT DETERMINANTS THAT INFLUENCED YOUR DECISION REGARDING ICU CARE FROM THE LIST PROVIDED BELOW AND RANK THEM IN ORDER OF IMPORTANCE FROM 1-5 WITH 1 BEING THE MOST IMPORTANT AND 5 THE LEAST IMPORTANT IN THE BOX PROVIDED BELOW

POTENTIAL DETERMINANTS

- A. PROGNOSIS OF ACUTE DISEASE
- B. PROGNOSIS OF UNDERLYING DISEASE
- C. PATIENTS AGE
- D. RESOURCES
- E. HUMAN RIGHTS
- F. PATIENT PREFERENCES
- G. FAMILY WISHES
- H. CULTURAL CONSIDERATIONS
- I. FINANCIAL IMPLICATIONS FOR FAMILY(E.G. SOLE BREADWINNER)
- J. SOCIOECONOMIC STATUS
- K. PHYSICIAN EXPERIENCE
- L. POLICY OF INTENSIVE CARE UNIT
- M. THREAT OF LITIGATION
- N. BED USED TO THE PREJUDICE OF ANOTHER PATIENT

MOST IMPORTANT	VERY IMPORTANT	IMPORTANT	PROBABLY IMPORTANT	LEAST IMPORTANT
1	2	3	4	5

5. A 40 YEAR –OLD MALE PATIENT (PATIENT A) IS ADMITTED TO THE ICU FOLLOWING A MVA IN WHICH HE SUFFERED SEVERE HEAD AND ABDOMINAL INJURIES. HE IS KNOWN TO BE HIV POSITIVE WITH HIS CD4 COUNT PENDING. AFTER FOUR WEEKS IN THE ICU, THE PATIENT’S NEUROLOGICAL CONDITION HAS STABILIZED WITH MINIMAL FUNCTION (THE PATIENT DOES NOT COMMUNICATE BUT WITHDRAWS ALL FOUR LIMBS TO PAINFUL STIMULI). FOLLOWING NUMEROUS BOUTS OF SEPSIS, THE PATIENT IS DEVELOPING RENAL FAILURE. HE IS ANURIC, HYPERKALAEMIC, AND ACIDOTIC.HE IS ALSO VENTILATOR DEPENDANT AND ON HIGH DOSES OF INOTROPES.THE PATIENTS FAMILY STATES THAT

IN THEIR CULTURE, LIFE CONTINUES UNTIL THE HEART STOPS BEATING. THE FAMILY REQUESTS THAT ALL RESUSCITATIVE EFFORTS BE CONTINUED, INCLUDING DIALYSIS.

IN PARALLEL, A SECOND PATIENT (PATIENT B) WITH SIMILAR INJURIES, BUT WITH METASTATIC PROSTATE CANCER, IS ADMITTED TO THE A/E AND REQUIRES AN ICU BED. IN ADDITION TO HIS TRAUMATIC INJURIES, HOWEVER, HE IS WHEEL-CHAIR BOUND AS A RESULT OF DEMENTIA. NO ICU BEDS ARE CURRENTLY AVAILABLE. ²³

5.1 WHICH PATIENT, A OR B, WOULD YOU PRIORITIZE THE USE OF AN ICU BED?

PATIENT A	
PATIENT B	

5.2 WITH RESPECT TO YOUR DECISION, PLEASES SELECT THE FIVE (5) MOST IMPORTANT DETERMINANTS THAT INFLUENCED YOUR DECISION FOR ICU CARE FROM THE LIST PROVIDED BELOW AND RANK THEM IN ORDER OF IMPORTANCE FROM 1-5 WITH 1 BEING THE MOST IMPORTANT AND 5 THE LEAST IMPORTANT IN THE BOX PROVIDED BELOW

POTENTIAL DETERMINANTS

- A. PROGNOSIS OF ACUTE DISEASE
- B. PROGNOSIS OF UNDERLYING DISEASE
- C. PATIENTS AGE
- D. RESOURCES
- E. HUMAN RIGHTS
- F. PATIENT PREFERENCES
- G. FAMILY WISHES
- H CULTURAL CONSIDERATIONS
- I. FINANCIAL IMPLICATIONS FOR FAMILY (E.G. SOLE BREADWINNER)
- J. SOCIOECONOMIC STATUS
- K. PHYSICIAN EXPERIENCE
- L. POLICY OF INTENSIVE CARE UNIT
- M. THREAT OF LITIGATION
- N. BED USED TO THE PREJUDICE OF ANOTHER PATIENT

MOST IMPORTANT	VERY IMPORTANT	IMPORTANT	PROBABLY IMPORTANT	LEAST IMPORTANT
1	2	3	4	5

5.3 WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING PATIENT A?

	YES	NO
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE DOCTOR'S OPINION</u>		
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE PATIENT'S OPINION</u>		
PATIENTS WITH VERY LIMITED CHANCES OF SURVIVAL (OR POOR PROGNOSTIC INDEX IF CALCULATED)		
PATIENTS WITH NO HOPE OF SURVIVAL FOR MORE THAN A FEW WEEKS		

5.4. WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION IN PATIENT B?

	YES	NO
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE DOCTOR'S OPINION</u>		
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE PATIENT'S OPINION</u>		
PATIENTS WITH VERY LIMITED CHANCES OF SURVIVAL (OR POOR PROGNOSTIC INDEX IF CALCULATED)		
PATIENTS WITH NO HOPE OF SURVIVAL FOR MORE THAN A FEW WEEKS		

5.5 SHOULD THERE BE NO ICU BEDS AVAILABLE AT YOUR HOSPITAL WITH PATIENT A BEING ONE OF THE PATIENTS ON VENTILATION, AND PATIENT B PRESENTS AS AN EMERGENCY REQUIRING AN ICU BED FOR VENTILATION, YOU WOULD JUSTIFY WITHDRAWING PATIENT A FROM VENTILATION ON THE GROUNDS OF(CHOOSE ONE):

THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS. WHENEVER POSSIBLE WITHHOLDING THERAPY IS PREFERABLE AS CONTINUED THERAPY IS MEDICALLY FUTILE	
THESE HAVE BECOME UNAVOIDABLE IN SOME PATIENTS."LIMITED CARE" IS GENERALLY VERY DIFFICULT AND SOMETIMES HAZARDOUS. MAXIMAL TREATMENT SHOULD BE PROVIDED AND WITHDRAWN IF THE SITUATION BECOMES HOPELESS.	
NEITHER CAN BE ACCEPTED. THE ICU PHYSICIAN SHOULD PRESERVE LIFE AT ALL COSTS.	
PRINCIPLE OF FIRST-COME-FIRST-SERVED BASIS	

5.6. WOULD YOU ACCESS PATIENT A TO DIALYSIS FOR THE FOLLOWING REASONS?

	YES	NO
DEONTOLOGIC DUTY		
FAMILY WISHES		
MEDICALLY FUTILE		
MINIMAL NEUROLOGICAL FUNCTION		
POSITIVE HIV STATUS(POSSIBLE HIVAN)		
EXISTING UNIT POLICY FOR HIV POSITIVE PATIENTS REQUIRING DIALYSIS		

5.7. WHAT FACTORS LISTED BELOW WOULD INFLUENCE YOUR DECISION REGARDING ACCESS TO ICU CARE FOR BOTH PATIENTS A AND B IF ICU BEDS ARE AVAILABLE?

	YES	NO
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE DOCTOR'S OPINION</u>		
PATIENTS WHO MAY LIVE FOR SEVERAL YEARS BUT WHOSE QUALITY OF LIFE IS VERY POOR <u>ACCORDING TO THE PATIENT'S AND FAMILIES OPINION</u>		
PATIENTS WITH VERY LIMITED CHANCES OF SURVIVAL (OR POOR PROGNOSTIC INDEX IF CALCULATED)		
PATIENTS WITH NO HOPE OF SURVIVAL FOR MORE THAN A FEW WEEKS		
DEONTOLOGICAL DUTY TO CARE IRRESPECTIVE OF UNDERLYING MEDICAL CONDITION.		

With Acknowledgement:

1. Levin PD, Sprung CL. Critical and Intensive Care Ethics. *The Cambridge Textbook of Bioethics*. United Kingdom: Cambridge University Press, 2008:432-468.
2. Vincent JL. European attitudes towards ethical problems in intensive care medicine: Results of an ethical questionnaire. *Intensive Care Medicine* 1990; 16(4):256-264.
3. Escher M, Perneger TV, Chevrolet J-C. National questionnaire survey on what influences doctors' decisions about admission to intensive care. *BMJ* 2004; 329(7463):425-.

ANNEXURE C PREDICTORS OF THE ICU OUTCOME OF THE CRITICALLY ILL HIV-INFECTED PATIENT REPORTED IN THE LITERATURE

Predictors of ICU OUTCOME in HIV					
Main predictors of critically ill HIV-infected patient ICU outcomes present in the literature					
No	Variables	odds ratio (CI 95%)	p values	Refere nce#	comments
*1	Haart-pre-admission				
			0.009	447	No association
		0.14 (0.02-0.84)	0.03	333 345	predicted non-ICU admission Low CD4 and pneumothorax on MV
*2	Not on HAART	1.8(1.02-3.2)		140	No prior HAART univariably increased hospital mortality, 1.8(1.02-3.2), but not significantly in multivariable analysis
				448 426 395 434 431	Powell No association Khouli No association Coquet No association Japiassu No association Chiang No association
				355	Croda "No prior HAART Independently increased ICU mortality,"
3	HAART initiated in ICU	2.00 (1.41-2.86)		355	No ART use in ICU independently increased 6-month mortality,
		(0.31-0.98)		355	ICU initiation of HAART better prognosis
4	Non-AIDS-associated admission				

	diagnosis				
5	ICU admission after fifth hospital day				
6	Inotropic support	4.48	0.03	⁴⁴⁹	Independent predictor of mortality-vasopressor use
			<0.001	⁴⁴⁹	Vasoactive drugs -P1-46.2% mortality
			<0.001	⁴⁴⁹	P2-16.7%
			<0.001	⁴⁴⁹	P3-42.3%
			<0.001	⁴⁴⁹	P4-35.3%
		3.82 (1.81-8.07)	0.0007	³⁷⁴	Poor predictor of outcome
7	Respiratory Failure(%) Admission to ICU in HAART ERA				
				¹⁴⁰ ⁴⁴⁸ ⁴²⁶ ³⁹⁵ ³⁶⁸ ³⁵⁵ ⁴³⁴ ⁴³¹	Morris 40.7% Powell 42.3% Khouli 30% Coquet 58.8% Vargas -Infante 51% Croda 33.1% Japiassu 29% Chiang 44.4%
			0.01	⁴³¹	PaO ₂ <60 mm Hg at admission was a predictor of ICU admission
8	PJP (%) Admission in HAART era			¹⁴⁰ ⁴⁴⁸ ³⁹⁵ ⁴³¹ ³⁵⁵	Morris 10.7% Powell 13.8% Coquet 18.7% Chiang 8.1% Croda 23.2%
		(AOR)1.69(1.08 to 2.65)	0.02	⁴²³	Fei PCP Mortality prediction Rule age - (AOR) per 10-year increase

		AOR 2.86(1.28 to 6.42)	0.01	⁴²³	recent injection drug use
		AOR 2.59(1.19 to 5.62)	0.02	⁴²³	total bilirubin >0.6 mg/d
		AOR 3.63(1.72– 7.66)	0.001	⁴²³	serum albumin <3 g/dl
		AOR 3.02(1.41 to 6.47)	0.004	⁴²³	alveolar–arterial oxygen gradient ≥50 mmHg
				³²⁰	Morris Improved survival of PCP NOT dt HAART but better ICU care and low tidal pressure ventilation. Incl. in PAH,COPD and LUNG cancers
		(AOR) 3.88(1.17- 12.83)	0.03	⁴²⁴	3 independent predictors of PJP mortality in ICU Wang -systolic blood pressure ≤110 mmHg
		AOR 4.97(1.34- 18.23)	0.01	⁴²⁴	PaO(2) at room air ≤60 mmHg
		AOR 8.19(1.48- 45.36)	0.02	⁴²⁴	lymphocytes ≤10% 1=14% mortality;2=47%;3=75%
		0.30(0.11- 0.82)	0.001	¹⁴⁰	PCP-predictor of survival in multivariate analysis
		0.30 (0.11- 0.82)	0.02	³⁴⁴	PJP diagnosis predictor of outcome
		1.99 (1.02- 3.90)	0.044	⁴²⁶	PJP diagnosis predictor of outcome
		26.7 (3.67- 194)	0.002	³⁷⁴	PJP diagnosis predictor of outcome
9	PJP associated with			³⁴⁵	Low CD4 and pneumothorax on MV

	pneumothorax				
10	APACHE II score				Chiang 19 -ve predictor(15-25)
		2.81(1.57-5.04)	2.18	³⁵⁵	
		1.12 (1.02-1.23)		⁴²⁷	In a multivariable logistic regression model, only the APACHE II score was significantly associated with hospital mortality
		6.04(1.25-29.22)		³⁷²	APACHE II score > 20
		1.06(1.01-1.11)		⁴²⁸	Mortality assoc with Apache 11 score
			<0.001	³¹²	Caldeira SCCM-P1-127.3±8.6
			<0.001	³¹²	P2-20.8±7.4
			<0.001	³¹²	P3-34.9±10.5
			<0.001	³¹²	P4-23.5±0.7
		1.11 (1.05-1.16)	0.0001	¹⁴⁰	Mortality assoc with Apache 11
		1.2 (1.1-1.2)	<0.001	⁴²⁶	APACHE II score per 1 point increase
11	APACHE II score < 13	(1.3-4.0)		³⁶⁸	>=13 higher mortality in ICU
		6.1 (3.0-12.4)	0.001	³⁴⁴	APACHE II score < 13
12	SAPS II		P<10(-3)	³⁴⁴	1.5 for 10 points higher -predictive of mortality
		6.1(3.0-12.4)	0.001	¹⁴⁰	APACHE II score < 13
		1.05 (1.03-1.07)	<0.0001	³⁷⁴	predictive of mortality
*13	Normal serum albumin	[AOR], 2.08(1.41 to 3.06)	0.002	⁴⁴⁸	Higher serum Albumin associated with Inc survival
		0.27 (0.12–0.61),	0.002	⁴²⁵	Serum albumin (per 0.1 g/dl increase)-inc mortality
*14	Serum albumin < 2.6 g/dl	3.5 (1.8-6.6)		¹⁴⁰	Serum albumin < 2.6 Independently increased hospital mortality,

		1.69 (1.04-2.74)		⁴³¹	Lower serum albumin (per 1-g/dl decrease) univariably increased hospital mortality, 1.69 (1.04-2.74), but not significantly in multivariable analysis
		3.5(1.8-6.6)	0.001	¹⁴⁰	Albumin > 2.6g/dl-inc survival
		3.5 (1.8-6.6)	0.001	³⁴⁴	hypoalbuminaemia
		0.47 (0.33-0.68)	<0.001	⁴²⁶	Albumin, per 1 gr/dl, increase
15	Normal CD4 + absolute count /ml				
		2.24 (1.16-4.31),		⁴²⁶	CD4 < 200 univariably increased hospital mortality, 2.24 (1.16-4.31), but not significantly in multivariable analysis
		AOR 3.63(1.72–7.66)	0.001	⁴²³	serum albumin <3 g/dl
					Japiassu-No association
*16	CD4 + absolute count < 50 cells/ml	2.10 (1.17-3.76)		³⁵⁵	CD4 < 50 Independently increased ICU mortality,
		1.036 (1.003-1.069)		⁴³¹	CD4 (per 10-cells/mm3 decrease) independently increased hospital mortality,
		AOR 5.28(2.99-9.31)		⁴³²	CD4 < 200
		3.22 (1.65-6.27)	0.0006	³⁷⁴	CD4+ absolute count <50 cells<10-power9/1
17	Mechanical ventilation	AOR, 6.11(2.73 to 13.72)	0.001	⁴⁴⁸	absence of MV assoced with incr survival
		3.92(2.20-	2.25	³⁵⁵	MV within 24 hrs-positive predictor

		6.96)			
		40.01(3.01-532.65)		372	MV assoced with incr mortality within 1 yr
		5.07(1.24-20.65)		428	endotracheal intubation-inc mortality
		(1.0-10.2)		368	MV assoc with incr ICU mortality
		(61-92%)		447	MV-80% mortality
			< 0.001	447	PaO(2) <60 mm Hg atICU admission during the 1st week were predictors of mortality
		8.48	<0.0001	449	Factors independently associated with mortality were mechanical ventilation
		6.7(1.9-23.9)		328	delayed mechanical ventilation after 3 days
		2.8(1.1-6.9)		328	duration of mechanical ventilation of > or = 5 days
		14.8 (5.7-38.9),	< 0.001	425	Predictors of in-hospital mortality for HIV-infected patients with Pneumocystis pneumonia
			<0.001	312	Mechanical ventilation invasive %- P1-66.7%
			<0.001	312	P2-29.1%
			<0.001	312	P3-76.9%
		0.22 (0.11-0.44)	0.001	344	MV assoced with incr mortality
			0.0003	450	PJP associated with pneumothorax
		20.9 (1.9-227.2)	0.01	345	MV assoced with incr mortality
		6.5 (2.8-14.9)	<0.0001	374	MV assoced with incr mortality
		6.11 (2.73-13.7)	<0.0001	426	MV assoced with incr mortality
			<0.001	312	P4-64.7%
18	Delayed intubation > 48 hrs				
19	Pneumothorax	5(1.7-14.7)		328	pneumothorax -predictive of death in

					3 months
		15.7 (4.4-56.4),	< 0.001	⁴²⁵	Pneumothorax
			0.033	⁴⁵⁰	PJP assoc with Pneumothorax
		3.05 (1.42-6.56)	0.004	⁴²⁶	Pneumothorax
20	Kaposi's sarcoma				
21	Origin of admission(T/F vs direct to ICU admission)				
*22	Sepsis(%)			¹⁴⁰ ⁴⁴⁸ ³⁹⁵	Morris 11.9% Powell 20.3% Khouli 13% Coquet 23.9% Varga -Infante 26%
					Powell "No significant difference between outcomes with sepsis and respiratory failure"
		3.16 (1.65-6.06)		³⁵⁵	Sepsisindependently increased ICUmortality,
		2.91 (1.11-7.62)		⁴³¹	Sepsis independently increased hospital mortality
		3.67 (1.53-8.80)		³⁹⁵	Sepsis independently increased hospital mortality
		5.2(2.1-12.9)		³²⁸	Sepsis /nosocomial infection independently increased hospital mortality
			0.01	³¹²	Septic Shock%-P1-6.4% mortality
			0.01	³¹²	P2-0%
			0.01	³¹²	P3-25.9%
			0.01	³¹²	P4-21.2%
23	Neurological problem (%)				
					Chiang 33.3% Morris 12.4%

					Powell 16.3% Khouli 18% Coquet 32% Varga -Infante 15% Croda 19.4% Japiassu 22.7% Chiang 11.9%
			<0.001	³¹²	Coma %-P1-25.4% mortality
			<0.001	³¹²	P2-3.5%
			<0.001	³¹²	P3-30.8%
			<0.001	³¹²	P4-35.3%
24	Organ Failure	2.73(1.16 to 6.46)		³⁹⁵	ICU adm for Coma-poor prognosis
		4.21(1.63 to 10.92)		³⁹⁵	ARF
		3.78(1.21 to 11.84)		³⁹⁵	Cirrhosis
		AOR 2.59(1.19 to 5.62)		⁴²³	total bilirubin >0.6 mg/d
			0.002	³¹²	Dialysis%-P1-14.3% mortality
			0.002	³¹²	P2-2.9%
			0.002	³¹²	P3-11.5%
			0.002	³¹²	P4-11.5%
25	HAART toxicity				
*26	ICU admission after third hospital day		0.002	⁴³³	significant increase in ICU mortality rates with a delay in ICU admission
		(11.2 to 44.8)		⁴³³	the fraction of mortality risk attributable to ICU delay was 30%
		(1.006 to 1.023)	0.001	⁴³³	Each hour of waiting was independently associated with a 1.5% increased risk of ICU death
		9.7 (2.2-42.1)	0.002	³⁴⁵	ICU admission after fifth hospital day
27	Lymphoma				

28	Age	(AOR)1.69(1.08 to 2.65)	0.02	⁴²³	age - (AOR) per 10-year increase
		1.16(1.06-1.27)		³⁷²	Independent predictor of 1 yr mortality
			0.014	³¹²	SCCM Priority1-63.6±13.9
			0.014	³¹²	Priority2-61.3±16.1
			0.014	³¹²	Priority 3-69.0±13.3
			0.014	³¹²	P4-11.5
29	Admission-others (%)				Morris 35% Powell 21.1% Khouli 39% Varga -Infante 21% Croda 16.2% Japiassu 27.3% Chiang 13.3%
		[AOR]for survival, 2.9(1.5- 5.8)	<0.002	³⁴¹	Non-AIDS associated admission diagnosis-better survival
		AOR 2.86(1.28 to 6.42)	0.01	⁴²³	recent injection drug use
		AOR 3.02(1.41 to 6.47)	0.004	⁴²³	alveolar–arterial oxygen gradient ≥50 mm Hg
		2.9 (1.5-5.8)	0.002	³⁴⁴	Non-AIDS-associated admission diagnosis
		2.9(1.5-5.8)	0.002	¹⁴⁰	Non-AIDS-associated admission diagnosis
					Lewden ARV toxicities-!% Hep B 2%/HepC 9% Bact Ie-6% AIDS-related deaths-47%(era of HAART) Non-Hodgkins Lymphoma-23% CVS 7%

					Cancer not related to AIDS-20%
30	Median CD4 count (cells/mm ³)				Morris 64 Powell 109 Khouli 85 Croda 39 Japiassu75 Chiang 30
31	Hospital to ICU interval	AOR, 2.91(1.11 to 7.62)		⁴³¹	24 hr delay in admitn
		3.04(1.29 to 7.17)		³⁹⁵	Delayed ICU admission Independently increased ICU mortality
		1.05	0.01	⁴⁴⁹	time from hospital admission to ICU admission
		2.72 (1.23-6.01),		⁴³¹	Hospital-to-ICU interval > 24 hours univariably increased hospital mortality, 2.72 (1.23-6.01), but not significantly in multivariable analysis
32	Serum LDH (per 100 U/l increase)	1.3 (1.09–1.65),	0.005	⁴²⁵	Predictors of in-hospital mortality for HIV-infected patients with Pneumocystis pneumonia
33	ICU stay*		<0.001	³¹²	SCCM P1-7.6±10.8 days
			<0.001	³¹²	P2-4.4±7.6
			<0.001	³¹²	P3-6.7±4.2
			<0.001	³¹²	P4- 21.2±30.0
34	Hospital stay before ICU admission*		0.817		
			0.817		
			0.817		
			0.817		
35	Multivariate analysis of ICU places refused				

SCCM	P1	0.292(0.096-0.891)	0.031	EN REF 305 312	
	P3	2.616(0.700-9.780)	0.153		
	P4	1.007(0.234-4.337)	0.993		
	AGE	1.010(0.993-1.029)	0.25		
	Referred		0.131		
	Clinical	1.365(0.522-3.568)	0.526		

ANNEXURE D CORRESPONDENCE WITH WORLD FEDERATION OF SOCIETIES IN CRITICAL CARE MEDICINE

22/02/2012

Dear Mr Turner

I am a registered PhD student at the Univ.. of KwaZulu-Natal working on a study entitled-"Ethical Dilemmas Encountered by Critical Care Specialists in the Admission of HIV infected patients to Intensive care", which has University and Ethics approval.

I have included the USA (resource-rich country), as well as South Africa,Brazil,India and Botswana as comparative emerging economies ,all with universal health coverage and with a high burden of disease.

I am examining Law,Ethics and clinical guidelines in these respective countries.

The end-objective, would be to develop a decision-making tree (triage document) regarding ICU admissions for people with HIV infection, particularly PCP respiratory infection, in a **resource-limited environment for use in SA and** possibly for Sub-Saharan Africa.

Could you help me in quantifying the numbers of ICU beds and whether in private or public sector in the USA, for the purposes of this study.

Your help and information would be duly acknowledged in this study.

Yours sincerely

Ruben Naidoo

Dr K Naidoo (RUBEN)

Principal Specialist

Dept. of Family Medicine

Master of Laws (Medical Law)

Nelson R Mandela School of Medicine

University of Kwa-Zulu Natal

Tel. No. 031 - 2604485

Fax No. 031 - 2604465

Cell No. 084 444 8466

email: naidook@ukzn.ac.za

Hello Dr Naidoo

Thank you for contacting the World Federation via our website and for your enquiry regarding the number of ICU beds in Brazil.

Based on data submitted to us by the Associacao de Medicina Intensiva Brasileira (AMIB) in 2011, there are 25367 ICU beds in Brazil contained in 2342 Intensive Care Units.

I hope this information answers your enquiry.

Phil

Phil Taylor

Executive Director - WFSICCM

Tel: +44 (0) 1189 701204 Direct Line

Mobile: +44 (0) 7702 285271

Email: phil@ininhs.com

Mail: 2 Lordswood, Silchester, Reading, Berkshire. RG7 2PZ.UK

Web: www.ininhs.com

Web: www.world-critical-care.org



Hello Ruben

I'm afraid the World Federation does not hold data on the number of ICU beds in the USA, South Africa, India or Botswana. To briefly explain:

We request data on the number of ICU beds from our member Societies each year. However this depends on whether the national Society actually collects this data. There can sometimes be an issue in certain countries about the criteria which define an "Intensive Care Unit" and therefore what constitutes an ICU bed. The Brazilian Society have always maintained good records of bed numbers in their country but the others have not provided any data. I'm sorry to write in such disappointing terms.

Have you contacted the Societies directly? If not, you can find all their contact details on our website.

All the best,

Phil

Phil Taylor

Executive Director - WFSICCM

Tel: +44 (0) 1189 701204 Direct Line

Mobile: +44 (0) 7702 285271

Email: phil@ininhs.com

Mail: 2 Lordswood, Silchester, Reading, Berkshire. RG7 2PZ.UK

Web: www.ininhs.com

Web: www.world-critical-care.org



ANNEXURE E CORRESPONDENCE WITH CRITICAL CARE SPECIALISTS- USA AND CANADA- LETTERS OF PERMISSION TO USE DATA

E1 PROF ROBERT A FOWLER-DEPARTMENTS OF MEDICINE, SUNNYBROOK HEALTH SCIENCES CENTRE, 2075 BAYVIEW AVENUE, ROOM D478, TORONTO, ON, CANADA

From: Kantharuben Naidoo <Naidook@ukzn.ac.za>
Date: Sunday, 8 September, 2013 3:15 AM
To: RAFMacbook <rob.fowler@sunnybrook.ca>, "Adhikari, Dr. Neill" <Neill.Adhikari@sunnybrook.ca>, "satsb@uw.edu" <satsb@uw.edu>
Subject: RE: Permission requested

Hi Rob,
Thank you for your words of encouragement. Could you please afford me the privilege of a full copy of your paper in WORD format.
I would probably extrapolate data, and reference the source.
I thank you for your help.
Sincere regards
Ruben

From: Fowler, Rob Dr. (Medicine) [<mailto:Rob.Fowler@sunnybrook.ca>]
Sent: Saturday, September 07, 2013 10:23 PM
To: Kantharuben Naidoo; Adhikari, Dr. Neill; satsb@uw.edu
Subject: Re: Permission requested

Hi there.
We are collectively flattered!
I'm sure all of us would love to have you use the slide.
Alas, the Lancet is the group that grants permission or not for full figure reproduction. You could use the data and generate your own figure and quote the data from that paper and it'd maybe be simpler; however, Lancet is probably pretty good about reproductions. Are you ok to contact them?
Rob

From: Kantharuben Naidoo <Naidook@ukzn.ac.za>
Date: Saturday, 7 September, 2013 3:22 PM
To: "Adhikari, Dr. Neill" <Neill.Adhikari@sunnybrook.ca>, RAFMacbook <rob.fowler@sunnybrook.ca>, "satsb@uw.edu" <satsb@uw.edu>
Subject: Permission requested

Dear Neill, Rob and Sats,
It was great meeting you at the WFCCM in Durban.
I write to you to request you kind permission for the use of your PPT slide as attached.
I am working on revisions to my PhD- Ethical Dilemmas Encountered in the Admission of HIV infected patients to Intensive Care and your slide would add value in my HIV/AIDS/ICU- health impact chapter.
I would surely acknowledge you as the source and reference accordingly.
Sincere regards
Ruben

E2 PROF NEIL ADHIKARI-DEPARTMENT OF CRITICAL CARE MEDICINE, SUNNYBROOKHEALTH SCIENCES CENTRE AND INTERDEPARTMENTAL DIVISION OF

CRITICAL CARE, UNIVERSITY OF TORONTO AND TRAUMA, EMERGENCY, AND CRITICAL CARE PROGRAM, SUNNYBROOK
HEALTH SCIENCES CENTRE, TORONTO, ONTARIO, CANADA

From: <Adhikari>, "Dr. Neill" <Neill.Adhikari@sunnybrook.ca>
Date: Sunday, 13 October, 2013 2:07 PM
To: Kantharuben Naidoo <Naidook@ukzn.ac.za>, "satsb@uw.edu" <satsb@uw.edu>, RAFMacbook <rob.fowler@sunnybrook.ca>
Cc: "Satish Bhagwanjee (satsb007@yahoo.com)" <satsb007@yahoo.com>
Subject: RE: Request for Help

Hi Ruben,

Looks like the WWAMI program is a medical education collaboration among 5 states: <http://www.uwmedicine.org/education/wwami/Pages/default.aspx>

The ICU data in each of the 5 states may have come from a US federal database via Jeremy Kahn: kahnjm@upmc.edu

neill

E3 PROF JEREMY M KAHN-ASSOCIATE PROFESSOR OF CRITICAL CARE, MEDICINE AND HEALTH POLICY & MANAGEMENT-UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE AND GRADUATE SCHOOL OF PUBLIC HEALTH

Hello Ruben. Sorry I did not respond to your previous e-mail. It somehow got lost in the shuffle.

I'm not exactly sure what data you are interested in. These slides look like ICU beds and hospital beds for 5 regions in the Northwest United States. I got this information from a publically available data source, so you are happy to use them.

We've published using these data:

<http://jama.jamanetwork.com/article.aspx?articleid=185666>

You are of course welcome to use the data in these slides. If you are interested in more granular data about ICU bed supply in the United States, I can point you to the same publically available data source that I used. Unfortunately, none of my research is specific to HIV. Anecdotally, in the 1980's a large proportion of ICU patients in many urban ICUs had HIV. However, in the era of HAART, which is widely available in the US, it is rare that we ever see an HIV patient.

best,

jk

Jeremy M. Kahn, MD MS
Associate Professor of Critical Care, Medicine and Health Policy & Management
University of Pittsburgh School of Medicine and Graduate School of Public Health
phone: 412.683.7601
e-mail: kahnjm@upmc.edu

From: Kantharuben Naidoo [<mailto:Naidook@ukzn.ac.za>]

Sent: Wednesday, October 23, 2013 9:57 AM

To: Kahn, Jeremy

Subject: Permission to use data from

Dear Prof Kahn,

I am working on my PhD on 'Ethical dilemmas of critical care specialists encountered in the admission of patients with HIV/AIDS to intensive care' under the supervision of Profs U G Lalloo and Jerome Singh. The USA has been used as a re-rich country wrt. ICU beds and Botswana, Brazil and Brazil have been used as comparator countries to South Africa, with a high burden of disease and universal health coverage.

The study has received full approval by the Univ. of KwaZulu-Natal and the Research Ethics Committee of UKZN.

I was very interested in the presentation by Prof Bhagwanjee, a class mate and colleague who hails from UKZN, Durban, who presented at the Critical care conference in Durban in 2011.

I was very interested in two ppt. slides in particular (as attached), and wish to request your permission to use/reference your data as presented with reference to the primary source. I

would be grateful for any further data you may have on HIV/AIDS and impact on ICUs in the USA.

I thank you for your kind consideration, and would be very interested in any updated ICU data you may have for the USA.

Sincere regards and gratitude

Ruben Naidoo

ANNEXURE F CORRESPONDENCE WITH CRITICAL CARE SOCIETY FOR SOUTHERN AFRICA

F1 CCSSA- 1 AUGUST 2011

Dear Dr Naidoo, I did forward your mail to Prof Mer.

I have not seen him since we have come back from congress.

From: Kantharuben Naidoo [<mailto:naidook@ukzn.ac.za>]
Sent: 01 August 2011 10:15 PM
To: critcare@tiscali.co.za; mervyn.mer@wits.ac.za
Cc: Rudo.mathivha@wits.ac.za
Subject: Dr K Naidoo-PhD

Dear Lorraine,

As discussed at the COPICON 2011, my previous mail to Prof Mer did not meet with any response. I am currently registered for a Phd study at the Univ. of KwaZulu-Natal on a topic entitled: **THE ETHICAL DILEMMAS OF CRITICAL CARE SPECIALISTS ENCOUNTERED IN THE ADMISSION OF PATIENTS WITH HIV INFECTION TO INTENSIVE CARE** under the supervision of Prof UG Lalloo and Prof Jerome Singh. This study has received higher degrees and ethics approval from UKZN.

Part of my study involves an anonymous questionnaire survey to ALL critical care Specialists on the CCSSSA database: entitled: "CRITICAL CARE SPECIALISTS' ATTITUDES AND PERCEPTIONS CONCERNING ICU ADMISSIONS FOR PATIENTS WITH HIV INFECTION"

My request to you is for a copy of the database with e-mail addresses of Critical Care Specialists to conduct this anonymous questionnaire study.

The study, when completed, hopefully will yield a triage tool/decision-tree regarding patients with Hiv infection and ICU care in a resource-limited environment. Issues of confidentiality will be in strict adherence to the ethical rules of conduct governing this study and as enunciated in the UKZN Biomedical Research Ethics Committee rules of conduct. (Copy of Annexure attached)

I trust that my request will be favourably considered.

Thanking you in anticipation

Yours sincerely

Ruben Naidoo

F2 CCSSA 21 AUGUST 2011

He is on sabbatical at present but I will print it off and give it to him when I meet with him.

Regards Lorraine

From: Kantharuben Naidoo [<mailto:naidook@ukzn.ac.za>]
Sent: 21 August 2011 10:07 PM
To: critcare@tiscali.co.za; mervyn.mer@wits.ac.za
Cc: Rudo.mathivha@wits.ac.za
Subject: Dr K Naidoo-PhD

Dear Lorraine,

As discussed at the COPICON 2011, my previous mail to Prof Mer did not meet with any response. I am currently registered for a Phd study at the Univ. of KwaZulu-Natal on a topic entitled: **THE ETHICAL DILEMMAS OF CRITICAL CARE SPECIALISTS ENCOUNTERED IN THE ADMISSION OF PATIENTS WITH HIV INFECTION TO INTENSIVE CARE** under the supervision of Prof UG Lalloo and Prof Jerome Singh. This study has received higher degrees and ethics approval from UKZN.

Part of my study involves an anonymous questionnaire survey to ALL critical care Specialists on the CCSA database: entitled: "CRITICAL CARE SPECIALISTS' ATTITUDES AND PERCEPTIONS CONCERNING ICU ADMISSIONS FOR PATIENTS WITH HIV INFECTION"

My request to you is for a copy of the database with e-mail addresses of Critical Care Specialists to conduct this anonymous questionnaire study.

The study, when completed, hopefully will yield a triage tool/decision-tree regarding patients with Hiv infection and ICU care in a resource-limited environment. Issues of confidentiality will be in strict adherence to the ethical rules of conduct governing this study and as enunciated in the UKZN Biomedical Research Ethics Committee rules of conduct. (Copy of Annexure attached)

I trust that my request will be favourably considered.

Thanking you in anticipation

Yours sincerely

Ruben Naidoo

F3 CCSSA 2 JUNE 2012

Dear Dr Naidoo, Prof Mer is on sabbatical until end November.

Regards Lorraine

2 June 2012

Dear Prof Mer,

I have corresponded with you previously in this regard (31/08/2011) whereby I was informed by Lorraine that you were on leave.

My request to you is for a copy of the database with e-mail addresses of Critical Care Specialists on the CCSSA database to conduct this anonymous questionnaire study. This information would be treated with confidence and for the sole purpose of conducting this PhD study.

Alternatively, could you provide me with the absolute numbers of Critical and Intensive care Specialists on your database.

I am currently registered for a Phd study at the Univ. of KwaZulu-Natal on a topic entitled: **THE ETHICAL DILEMMAS OF CRITICAL CARE SPECIALISTS ENCOUNTERED IN THE ADMISSION OF PATIENTS WITH HIV INFECTION TO INTENSIVE CARE** under the supervision of Prof UG Lalloo and Prof Jerome Singh. This study has received higher degrees and ethics approval from UKZN.

Part of my study involves an anonymous questionnaire survey to ALL critical care Specialist entitled: "CRITICAL CARE SPECIALISTS' ATTITUDES AND PERCEPTIONS CONCERNING ICU ADMISSIONS FOR PATIENTS WITH HIV INFECTION"

The study, when completed, hopefully will yield a triage tool/decision-tree regarding patients with Hiv infection and ICU care in a resource-limited environment. Issues of confidentiality will be in strict adherence to the ethical rules of conduct governing this study and as enunciated in the UKZN Biomedical Research Ethics Committee rules of conduct.

I trust that my request will be favourably considered.

Thanking you in anticipation

Yours sincerely

Ruben Naidoo

ANNEXURE G CORRESPONDENCE WITH SOUTH AFRICAN THORACIC SOCIETY

2 June 2012

Dear Amelia,

I trust that you are well.

I am currently working on my PhD and doing a data analysis of my KAP survey which includes Critical Care Specialists and Thoracic and Pulmonary Care specialists.

Could you help me by providing the number of Thoracic and Pulmonology Specialists on your database? This number would be treated as confidential and would only be used for the purposes of my study.

I thank you for all your help and support in my study.

Best regards

Ruben

Dr Kantharuben(Ruben) Naidoo

Principal Specialist/Lecturer

Department of Family Medicine

ANNEXURE H CORRESPONDENCE WITH PROF K MOODLEY- HEAD OF BIOETHCS UNIT - STELLENBOSCH UNIVERSITY

From: Kantharuben Naidoo [<mailto:naidook@ukzn.ac.za>]
Sent: 19 March 2010 09:35
To: bioethics@sun.ac.za; Moodley, K, Prof <km@sun.ac.za>
Subject: Dr Ruben Naidoo -PHD Protocol

Dear Keymanthri,

I hope you are well and that your book publication is proceeding as planned. I look forward to reading it.

Thank you very much for agreeing to give input on my draft proposal " To Explore Ethical Dilemmas by Physicians in the provision of critical care to patients with HIV infection ."

With kind regards
Ruben

Dear Rubin

At last I have had a chance to look at your proposal.

I think it is well done and a very worthwhile topic.

You have researched the topic well and your planned survey sounds very interesting.

The only thing missing is a discussion of the limitation clause of the Constitution and the Siracusa Principles.

Will chat further later.

Regards
Keymanthri

ANNEXURE I CORRESPONDENCE WITH DEPARTMENT OF HEALTH- SOUTH AFRICA

I 1

Dear Anban,

I have taken note of Camille's mail, and have henceforth attached the required documents of motivation to you and letters of approval for this study from UKZN Higher degrees Committee and Ethics Committee approval.

I hope this would suffice in obtaining the required information for the purposes of this study.

Sincere regards

Ruben

Dr K Naidoo (RUBEN)

Principal Specialist

Dept. of Family Medicine

>>> "Camille Shamburg" <ShambC@health.gov.za> 3/16/2012 11:51 AM >>>

Dear Dr Naidoo

I followed up with Ms Wolmarans on the research requested. She has indicated that unfortunately the information is not available at hand. It will therefore take quite some time for her to gather the information.

She has also indicated that a formal letter of agreement (addressed to her Supervisor: Mr Thulani Masilela) is required, indicating what the information will be used for, before they can release any information.

I have copied Dr Pillay in this e-mail so that he may guide us as to the way forward.

Apologies for any inconvenience caused.

Kind regards

Camille

Camille Shamburg

Financial Planning & Health Economics

Tel: +27 12 395 8171

Fax: +27 12 395 9238

Fax 2 E-mail:0866329712

E-mail: Shambc@health.gov.za

>>> "Kantharuben Naidoo" <naidook@ukzn.ac.za> 3/16/2012 10:51 AM >>>

Dear Cameel,

with reference to my e-mail to Dr A Pillay in Feb 2012, and my telephonic conversation with him yesterday, 1/03/2012, he has advised that he had requested you to help with the necessary data as per my previous mail to him. I look forward to your help in this very important study.

"Dear Anban.

Thank you for an excellent Health Summit which was well organised and presented. I thank you and Olive and the rest of the team for putting together an excellent programme which was thought-provoking and inspiring. At the end of the summit, there was no doubt that NHI is the way to go as a health policy priority.

As mentioned to you at the Summit, I am presently engaged with my PhD study entitled:
THE ETHICAL DILEMMAS OF CRITICAL CARE SPECIALISTS ENCOUNTERED IN THE
ADMISSION OF PATIENTS WITH HIV INFECTION TO INTENSIVE CARE under the supervision of
Prof Lalloo and Prof Jerome Singh.

I aim to examine the regulatory (legal) frameworks, ethical frameworks and the current scientific evidence in the USA (as a first world, resource rich country) to determine possible best practices.

I also intend to compare SA in terms of the above frameworks to comparative emerging countries with a high burden of disease i.e. HIV/AIDS, such as Brazil, India and Botswana to determine possible best practice.

The objective of the study is to develop a best-practice decision tree/triage tool for HIV/AIDS patients with regard to access to ICU in a resource constrained environment (SA/Sub-Saharan Africa) in terms of the applicable legal framework, ethical constraints and the best available scientific evidence.

The study has received Higher degrees and BREC approval by UKZN.

I have already commenced data collection at the COPICON 2011 in terms of an anonymous (tick-sheet) Attitudes and Perception Survey- "CRITICAL CARE SPECIALISTS' ATTITUDES AND PERCEPTIONS CONCERNING ICU ADMISSIONS FOR PATIENTS WITH HIV INFECTION".

Anban, could you provide me with any information that you may have on this subject, which will duly be acknowledged in this study? Could you provide me with the numbers of ICU beds across the country, by type and whether private or public sector? Any triage protocols for HIV/AIDS and access to health-care and ICU including dialysis would be most appreciated and would be acknowledged.

I look forward to your response and thank you once again for the good work and stewardship in this difficult time of health transformation. Your advocacy strength clearly came out in your policy amendments and eventual legislative changes to the pharmacy-cost structures.

With sincere regards

Ruben Naidoo

Dr K Naidoo (RUBEN)

Principal Specialist

Dept. of Family Medicine

I 2

16 March 2012

Dear Dr Naidoo

I followed up with Ms Wolmarans on the research requested. She has indicated that unfortunately the information is not available at hand. It will therefore take quite some time for her to gather the information.

She has also indicated that a formal letter of agreement (addressed to her Supervisor: Mr Thulani Masilela) is required, indicating what the information will be used for ,before they can release any information.

I have copied Dr Pillay in this e-mail so that he may guide us as to the way forward.

Apologies for any inconvenience caused.

Kind regards

Camille

Camille Shamburg

Financial Planning & Health Economics

Tel: +27 12 395 8171

Fax: +27 12 395 9238

Fax 2 E-mail:0866329712

E-mail: Shambc@health.gov.za

>>> "Kantharuben Naidoo" <naidook@ukzn.ac.za> 3/16/2012 10:51 AM >>>

Dear Cameel,

with reference to my e-mail to Dr A Pillay in Feb 2012, and my telephonic conversation with him yesterday, 1/03/2012, he has advised that he had requested you to help with the necessary data as per my previous mail to him.

I look forward to your help in this very important study.

L

"Dear Anban.

Thank you for an excellent Health Summit which was well organised and presented. I thank you and Olive and the rest of the team for putting together an excellent programme which was thought-provoking and inspiring. At the end of the summit, there was no doubt that NHI is the way to go as a health policy priority.

As mentioned to you at the Summit, I am presently engaged with my PhD study entitled:
THE ETHICAL DILEMMAS OF CRITICAL CARE SPECIALISTS ENCOUNTERED IN THE
ADMISSION OF PATIENTS WITH HIV INFECTION TO INTENSIVE CARE under the supervision of
Prof Laloo and Prof Jerome Singh.

I aim to examine the regulatory (legal) frameworks, ethical frameworks and the current scientific evidence in the USA (as a first world, resource rich country) to determine possible best practices.

I also intend to compare SA in terms of the above frameworks to comparative emerging countries with a high burden of disease i.e. HIV/AIDS, such as Brazil, India and Botswana to determine possible best practice.

The objective of the study is to develop a best-practice decision tree/triage tool for HIV/AIDS patients with regard to access to ICU in a resource constrained environment (SA/Sub-Saharan Africa) in terms of the applicable legal framework, ethical constraints and the best available scientific evidence.

The study has received Higher degrees and BREC approval by UKZN.

I have already commenced data collection at the COPICON 2011 in terms of an anonymous (tick-sheet) Attitudes and Perception Survey- "CRITICAL CARE SPECIALISTS' ATTITUDES AND PERCEPTIONS CONCERNING ICU ADMISSIONS FOR PATIENTS WITH HIV INFECTION".

Anban, could you provide me with any information that you may have on this subject, which will duly be acknowledged in this study? Could you provide me with the numbers of ICU beds across the country, by type and whether private or public sector? Any triage protocols for HIV/AIDS and access to health-care and ICU including dialysis would be most appreciated and would be acknowledged.

I look forward to your response and thank you once again for the good work and stewardship in this difficult time of health transformation. Your advocacy strength clearly came out in your policy amendments and eventual legislative changes to the pharmacy-cost structures.

With sincere regards

Ruben Naidoo

Dr K Naidoo (RUBEN)

Principal Specialist

Dept. of Family Medicine

I 3

Dear Dr Naidoo,

Thank you for your enquiry.

In order to get approval from the Gauteng Department of Health, you will have to submit the documents as follows:

- 1) full research protocol/proposal
- 2) ethics certificate from any South African accredited institution

Our review team includes Dr Likibi and Dr Ikalafeng, but all the documents have to come through myself (Siyabonga) before approval is obtained.

Kind Regards,

Ms Siyabonga Twala

Tel: 011 355 3477



Dear Dr Naidoo,

My apologies for the delayed response. I was offline.

Kindly receive attached spreadsheet as requested.

Regards,

Ms Siyabonga Twala

From: Buthelezi,Thandeka

Sent: Wednesday, March 14, 2012 10:38 AM

To: Twala, Siyabonga (gphealth)

Subject: HOSPITAL BEDS.xls

Morning Siyabonga

Receive the attached information as per request

Regards
Thandeka



ANNEXURE J CORRESPONDENCE WITH CONFERENCE CONVENORS-COPICON-2011

J 1

Hi. I have discussed your request with my co-chairperson Prof Muckart and he has agreed you can go ahead.

Regards

Kennedy

Sent via my BlackBerry from Vodacom - let your email find you!

From: "Kantharuben Naidoo" <naidook@ukzn.ac.za>

Date: Mon, 25 Jul 2011 19:50:39 +0200

To: Kennedy Nyamande<Nyamandek1@ukzn.ac.za>

Cc: Umesh Lalloo<lalloo@ukzn.ac.za>

Subject: Fwd: Ruben Naidoo-PhD

Dera Kennedy,

I thank you for meeting with me on Wednesday,20th at IALCH and for accommodating my request for my PHd questionnaire to be conducted at the Congress.

I have attached my correspondence to Umesh for your reference.Umesh was concerned if you had already informed the Convenors of the Congress of my intention for the abstract presentation and questionnaire survey.

With kind regards

Ruben Naidoo

Dr Kantharuben(Ruben) Naidoo

Principal Specialist/Lecturer

Department of Family Medicine

J2

13 September 2011

Dear Dr Naidoo

Our apologies for forwarding this to you so late, attached please find a copy of the delegate list as requested.

We regret we were unable to retain a copy of Professor Bhagwanjee's presentation given at Congress.

Kind regards

Jan

Jan Candlish

Sue McGuinness Communications & Event Management

T: 011 447 3876

F: 011 442 8094

jan.suemc@tiscali.co.za

ANNEXURE K CORRESPONDENCE WITH ACADEMIC COLLEAGUES- SOUTH AFRICA

K 1 PROF ERIC BATEMAN- DIRECTOR: UNIVERSITY OF CAPETOWN LUNG INSTITUTE (PTY) LTD

Dear Ruben

Thanks for the note. It was good to meet you again. Good luck with the survey and research. I am sure the answers will be interesting and informative.

Regards

Eric

Eric D Bateman

Professor of Respiratory Medicine

Director: University of CapeTown Lung Institute (Pty) Ltd

George Street

Mowbray. 7700

Cape Town. South Africa

Tel: +27 21 406-6901

Fax: +27 21 406 6902

Email: Eric.Bateman@uct.ac.za

Web: www.lunginstitute.co.za(<http://www.lunginstitute.co.za/>)

K 2 PROF KENNEDY NYAMANDE-DEPUTY HEAD –DEPT. OF PULMONOLOGY AND CRITICAL CARE- UKZN AND COPICON 2011 CONVENOR

Ok Reuben. It was a pleasure assisting you and will always do so in future.

You will have my talk.

Cheers

Kennedy

Sent via my BlackBerry from Vodacom - let your email find you!

From: "Kantharuben Naidoo" <naidook@ukzn.ac.za>

Date: 31 Jul 2011 21:50:40 +0200

To: Kennedy Nyamande<Nyamandek1@ukzn.ac.za>

Cc: <lallo@ukzn.ac.za>

Subject: Ruben Naidoo-PhD

Dear Kennedy,

I would like to express my sincere gratitude to you for facilitating and supporting my KAP survey at the COPICON 2011.

I thank you for completing the survey which now amounts to 75 respondents.

I was particularly impressed with your talk on "Practicalities of managing adult HIV in ICU".

Could I please request a copy of your presentation and I will be sure to acknowledge you as the source of any information used for the purposes of my study.

I thank you once again and look forward to further collaboration with your Dept.

With sincere regards

Ruben Naidoo

Dr Kantharuben (Ruben) Naidoo

K 3 PROF KEERTAN DHEDA- ASSOCIATE PROFESSOR OF RESPIRATORY MEDICINE, LUNG INFECTION AND IMMUNITY UNIT, DIVISION OF PULMONOLOGY & CLINICAL IMMUNOLOGY, DEPARTMENT OF MEDICINE, UCT

Dear Ruben

Thanks for your email.

Good luck with your studies and with all good wishes

Keertan

Best wishes

Keertan Dheda, MBBCh, FCP(SA), FCCP, PhD (Lond), FRCP (Lond)

Associate Professor of Respiratory Medicine, Lung Infection and Immunity Unit, Division of Pulmonology & Clinical Immunology, Department of Medicine, UCT

Address: Department of Medicine. J flr.Old Main Bldg. Groote Schuur Hospital.

Observatory, Cape Town, South Africa, 7925.

Tel: +27 21 4066509 , Fax: +27 21 4047651, mobile: (0)845577754

email: keertan.dheda@uct.ac.za or keertandheda@yahoo.co.uk

Website: http://www.lunginstitute.co.za/content/lung_infection.html

K 4 PROF P JEENA-HEAD OF PULMONOLOGY-DEPT. OF PAEDIATRICS-UKZN

Dear Ruben

Sorry for the delay in responding to your mail. Please find enclosed a copy of my presentation at the copicon congress

Best Wishes

Prakash

>>> Kantharuben Naidoo 7/31/2011 10:14 PM >>>

Dear Prakash,

I thank you for an excellent ,insightful and thought-provoking talk on "Practicalities in managing paediatric HIV in ICU"

I have drawn and continue to draw inspiration from your work and publications.

Could I please have a copy of your presentation,purely for study purposes,and I would surely acknowledge you as the source of any information so used.

Prakash,could I request of you to electronically cascade my questionnaire to members of your Critical Care Team for electronic completion and return?

Thanking you in anticipation

With kind regards

Ruben

K 5 PROFESSOR ANTHONY LINEGAR

From: A. Linegar [mailto:al@thoracicsurgery.co.za]

Sent: 05 August 2011 05:42 PM

To: 'SA Thoracic Society'

Subject: RE: Ruben Naidoo-PhD

Hi Ruben,

Good for you. Good study with good potential for impacting clinical decision making.

Regards, Tony

Professor Anthony Linegar

MBChB., FC(Cardio)SA., Ph.D.

Cardiothoracic Surgeon
Suite 210, N1 City Hospital, Goodwood, Cape Town.
University Free State, Faculty Health Sciences.
Research Consultant COHSASA (Council for Health Services Accreditation SA)
Phone: 021-5953360
Fax: 021-5953362

K 6 PROF KARTHY GOVENDER-PROF. OF LAW-UKZN

Correspondence and permission from co-author:
Prof Karthy Govender- Professor of Law- UKZN
Hi Ruben I am happy to consent.
Sent from my BlackBerry® wireless device

From: Kantharuben Naidoo <Naidook@ukzn.ac.za>
Date: Sun, 16 Sep 2012 17:53:42 +0200
To: Karthy Govender<KGovender@ukzn.ac.za>
Subject: Ruben-Request for Permission to Quote/reference Article-'Compulsory HIV Testing'

Dear Karthy,
I hope that you and your family are well.
I am working on my PhD Draft on "*Ethical Dilemmas Encountered by Critical Care Specialists in the Admission of Patients with HIV Infection to Intensive care*" under the supervision of Prof Umesh Lalloo-Critical Care Specialist and Prof Jerome Singh.
I need your permission to quote our article " Naidoo K, Govender K. Compulsory HIV testing of alleged sexual offenders –a human rights violation. *South African Journal of Bioethics and the Law* 2011;4(2):95-101." with regard to our paragraph on the Limitation Clause as canvassed in *Soobramoney* and also to cite the article with regard to a tangential observation that Botswana had enacted the same Law before South Africa, in addition to its 'Harmful HIV-related Behavior Act'.
I trust that the above request would meet with your approval.
I look forward to publishing again with you.
Sincere regards
Ruben

K7 DR DEAN GOPALAN- HEAD OF DEPT. OF ANAESTHETICS AND CRITICAL CARE- UNIV. OF KWAZULU-NATAL

Hi Ruben

Thanks for that.

CCSSA do not have formal guidelines for admission to ICU.
I have attached the SASA guidelines which talk about ICU in general without specifying guidelines.
(Part 6)

Kind regards

Dean Gopalan

Head of Discipline: Anaesthesiology & Critical Care
Nelson R Mandela School of Medicine, UKZN
Durban, South Africa

Tel: +27 (0)31 260 4328
Fax: +27 (0)31 260 4615
Physical Address: Room 420, 4th Floor, 719 Umbilo Road, Durban

K8 DR S PERSADH- CHIEF SPECIALIST- INTENSIVE CARE- INKOSI ALBERT CENTRAL HOSPITAL, DURBAN.

Hello

Please find our policy.

Regards
Santosh
Hello

Physiological state of the patient together with our organ support capabilities usually guides our decision. APACHE, SOFA and MODS scores are ICU scores and cannot be used in the pre-icu area as these scores have not been validated in these areas.

Santosh

From: Kantharuben Naidoo [<mailto:Naidook@ukzn.ac.za>]
Sent: 17 October 2013 12:52
To: Santosh Pershad
Subject: RE: Request for help!

Dear Santosh,
Thank you for profusely your help. Do you use physiological indicators (APACHE,SOFA,MODS etc) in triage decisions for admission to ICU?
Sincere regards and gratitude
Ruben

K9 DR A ANBARAM- HEAD OF CLINICAL UNIT- PULMONOLOGY AND CRITICAL CARE- INKOSI ALBERT CENTRAL HOSPITAL, DURBAN.

From: Dr Anish Ambaram [<mailto:aambaram@gmail.com>]
Sent: 17 October 2013 10:43
To: Kantharuben Naidoo
Cc: Santosh Pershad
Subject: Re: Request for help!

Dear Ruben

Thank you for you email

We do not currently have a specific written document on our admission criteria i.r.o medical ICU but rather subscribe to the general ICU admission criteria for IALCH so I

have discussed this with Santosh Pershad (Chief Specialist - Critical Care) and he has requested that I direct this query to him. I have copied him on this email

Best regards
Anish

Dr Anish Ambaram

MBBCh(Wits), DipPEC(SA), FCP(SA), Cert in Pulm (SA), FCCP

Specialist Physician/Pulmonologist

On Thu, Oct 17, 2013 at 8:06 AM, Kantharuben Naidoo <Naidook@ukzn.ac.za> wrote:

Dear Anish,

I trust that you are well.

I need your help in sourcing the medical ICU admission guidelines for IALCH. I am testing the hypothesis that patients with HIV/AIDS need additional criteria included in the guidelines for admission to ICU.

I would be grateful for your help.

Sincere regards

Ruben

**ANNEXURE L LETTER TO PARLIAMENTARY MONITORING
SERVICE- SOUTH AFRICA
3/09/2012**

Letter to Parliamentary Monitoring Services-South Africa

Dear Sir/Madam,

In reference to the above reply, I note that the Intensive Care Unit statistics for Gauteng Province are missing. Is it available, as I would like to have a copy for my study purposes (attached)?

Yours sincerely

Dr K Naidoo

Dept of Family Medicine

**ANNEXURE M ACADEMIC CORRESPONDENCE-
INTERNATIONAL
M 1 PROF JEAN-LOUIS VINCENT-DEPT. OF INTENSIVE CARE,
UNIV. OF BRUSSELS**

De: Kantharuben Naidoo [mailto:naidook@ukzn.ac.za]

Date: dim. 31/07/2011 22:54

À: Jean-Louis Vincent

Objet : Ruben Naidoo-PhD Study-THE ETHICAL DILEMMAS OF CRITICAL CARE SPECIALISTS ENCOUNTERED IN THE ADMISSION OF PATIENTS WITH HIV INFECTION TO INTENSIVE CARE

Dear Prof Vincent,

Thank you for a very insightful and thought-provoking talk on "Clinical Trials in Intensive Care:-Many Disillusions".In your busy schedule,I unfortunately did not have the privilege of introducing myself to you.Regarding my Phd study,I was influenced by numerous articles that you have published on the rational and cost-effective use of scarce/limited resources viz. the ICU.

In the context of the pandemic of HIV/AIDS in Sub-Saharan Africa,Critical care specialists need to make pragmatic decisions of entry into the ICU based on applicable laws,ethical principals and the best available scientific evidence.

I have successfully submitted a proposal to the Univ. of KwaZulu-Natal-Nelson R Mandela School of Medicine Higher degrees Commottee and Ethics committee to conduct this study.

Towards this end I have conducted an anonymous "Attitudes and Perception Survey amongst Critical Care Specialists encountered in the admission of HIV/AIDS patients to the ICU".In drawing up the survey tool,I was influenced by your" European Survey" which I have acknowledged in the document.

With sincere regards

Ruben Naidoo

sorry that I missed your email which arrived in my junkmailbox !

Congratulations on an excellent work!

Prof. Jean-Louis Vincent

Head Dept of Intensive Care

Erasme Hospital (Free University of Brussels)-Route de Lennik 808-B-1070 Brussels (tel 32.2.555.3380-fax 32.2.555.4555)

Assistant: Marie-Rose André (secrjlv@ulb.ac.be)

International Symposium and other Meetings: <http://www.intensive.org>

ANNEXURE N CORRESPONDENCE WITH INDIAN SOCIETY OF CRITICAL CARE MEDICINE

N 1- DR CHAWLA- INDIAN SOCIETY OF CRITICAL CARE MEDICINE

22 February 2012

Dear Dr Chawla,

RE: Dr K Naidoo-PhD Study-“ Ethical Dilemmas Encountered by Critical Care Specialists in the Admission of HIV infected patients to ICU”.

I am a registered PhD student at the Univ. of KwaZulu-Natal working on a study entitled-"Ethical Dilemmas Encountered by Critical Care Specialists in the Admission of HIV infected patients to Intensive care", which has the Nelsob R Mandela School of Medicine- University of KwaZulu-Natal Higher Degrees and Ethics Approval Number: BE 089/010.

The end-objective would be to develop a decision-making tree (triage document) regarding ICU admissions for people with HIV infection, in a resource-limited environment for use in SA and possibly for Sub-Saharan Africa. The study includes possible ICU best practices in USA, Brazil, India and Botswana.

Could you help me in quantifying the numbers of ICU beds in India, for the purposes of this study?

- (a) How many intensive care units (ICU) are there in each Central and Regional hospital in India by state/Province? Private vs Public?
- (b) Type of ICU-medical/surgical/paediatrics/burns etc?
- (c) How many beds does each unit accommodate?
- (d) Number of nurses working at each unit?
- e) Number of nurses working in the ICU with formal ICU training?

Do you have any triage-Admission criteria in ICU, especially for patients with HIV infection?

Your help and information would remain confidential for the purposes of this study and would be duly acknowledged in the thesis.

I was particularly interested in the Article-"ICU Challenges "by Prof ME Yeolakar, in the 2008 issue of your Journal, but I could not get his mail address

Should you have any concerns in this regard please contact:

The UKZN Biomedical Research Ethics Committee, contact details as follows:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

I would be grateful for any help from ISCCM and look forward to your reply.

Yours sincerely

Ruben Naidoo

M 2- DR SHAH- INDIAN SOCIETY OF CRITICAL CARE MEDICINE
22 FEBRUARY 2012

Dear Dr Shah,

RE: Dr K Naidoo-PhD Study-“ Ethical Dilemmas Encountered by Critical Care Specialists in the Admission of HIV infected patients to ICU”.

I am a registered PhD student at the Univ. of KwaZulu-Natal working on a study entitled-"Ethical Dilemmas Encountered by Critical Care Specialists in the Admission of HIV infected patients to Intensive care", which has the Nelsob R Mandela School of Medicine- University of KwaZulu-Natal Higher Degrees and Ethics Approval Number: BE 089/010.

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- (c) How many beds does each unit accommodate?
- (d) Number of nurses working at each unit?
- (e) Number of nurses working in the ICU with formal ICU training?

Do you have any triage-Admission criteria in ICU, especially for patients with HIV infection?

Your help and information would remain confidential for the purposes of this study and would be duly acknowledged in the thesis.

I was particularly interested in the Article-"ICU Challenges "by Prof ME Yeolakar, the 2008 issue of your Journal, but I could not get his mail address

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Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

Yours sincerely
Ruben Naidoo

ANNEXURE O CORRESPONDENCE WITH BOTSWANA MINISTRY OF HEALTH

O 1- DR NGAIRE CARUSO- CRITICAL CARE SPECIALIST- EMERGENCY MEDICINE, UNIV. OF BOTSWANA

22/02/2012

Dear Dr Ngaire Caruso ,

I congratulate you and your team on your efforts to improve emergency services in Botswana, and particularly, the formation of your Emergency/Critical Care Society.

I am a registered PhD student at the Univ.. of KwaZulu-Natal working on a study entitled-"Ethical Dilemmas Encountered by Critical Care Specialists in the Admission of HIV infected patients to Intensive care", which has University and Ethics approval.

I have included the USA (resource-rich?), as well as South Africa,Brazil,India and Botswana as comparative emerging economies ,all with universal health coverage and with a high burden of disease.

I am interrogating Law,Ethics and clinical guidelines in these respective countries.

The end-objective, would be to develop a decision-making tree (triage document) regarding ICU admissions for people with HIV infection, particularly PCP respiratory infection, in a resource-limited environment for use in SA and possibly for Sub-Saharan Africa.

Ngaire, could you help me in quantifying the numbers of ICU beds and whether in private or public sector in Botswana, for the purposes of this study.

Your help and information would be duly acknowledged in this study.

Yours sincerely

Ruben Naidoo

Dr K Naidoo (RUBEN)

O 2- MS SUSAN THOBEGA- BIOSTATISTICS UNIT, BOTSWANA MINISTRY OF HEALTH
22/02/2012

Dear Ms Susan Thobega,

I am a registered PhD student at the Univ.. of KwaZulu-Natal working on a study entitled-"Ethical Dilemmas Encountered by Critical Care Specialists in the Admission of HIV infected patients to Intensive care", which has University and Ethics approval.

I have included the USA (resource-rich?), as well as South Africa,Brazil,India and Botswana as comparative emerging economies ,all with universal health coverage and with a high burden of disease.

I am interrogating Law,Ethics and clinical guidelines in these respective countries.

The end-objective, would be to develop a decision-making tree (triage document) regarding ICU admissions for people with H1N1 infection, particularly PCP respiratory infection, in a resource-limited environment for use in SA and possibly for Sub-Saharan Africa.

Susan, could you help me in quantifying the numbers of ICU beds and whether in private or public sector in Botswana, for the purposes of this study.

Your help and information would be duly acknowledged in this study.

Yours sincerely

Ruben Naidoo

O 3 MS DIMPO- PUBLIC HEALTH AND BIOETHICS- BOTSWANA MINISTRY OF HEALTH

5Feb 2012

Dear Dimpho,

It was a pleasure meeting you at the SARETI workshop at PMB in 2011. As mentioned to you then, I need your help in getting information regarding HIV/AIDS in Botswana, the current disease burden.

A short preamble of my study is as follows:

As mentioned to you at the Summit, I am presently engaged with my PhD study entitled:

THE ETHICAL DILEMMAS OF CRITICAL CARE SPECIALISTS ENCOUNTERED IN THE ADMISSION OF PATIENTS WITH HIV INFECTION TO INTENSIVE CARE under the supervision of Prof Laloo and Prof Jerome Singh.

I aim to examine the regulatory (legal) frameworks, ethical frameworks and the current scientific evidence in the USA (as a first world, resource rich country) to determine possible best practices.

I also intend to compare SA in terms of the above frameworks to comparative emerging countries with a high burden of disease i.e. HIV/AIDS, such as Brazil, India and Botswana to determine possible best practice.

The objective of the study is to develop a best-practice decision tree/triage tool for HIV/AIDS patients with regard to access to ICU in a resource constrained environment (SA/Sub-Saharan Africa) in terms of the applicable legal framework, ethical constraints and the best available scientific evidence.

The study has received Higher degrees and BREC approval by UKZN.

I have already commenced data collection at the COPICON 2011 in terms of an anonymous (tick-sheet) Attitudes and Perception Survey- "CRITICAL CARE SPECIALISTS' ATTITUDES AND PERCEPTIONS CONCERNING ICU ADMISSIONS FOR PATIENTS WITH HIV INFECTION".

Dimpho, could you provide me with any information that you may have on this subject from Botswana, which will duly be acknowledged in this study? Could you provide me with the numbers of ICU beds across the country, by type and whether private or public sector? Any triage protocols for HIV/AIDS and access to health-care and ICU including dialysis would be most appreciated and would be acknowledged.

Kind regards

Ruben Naidoo

**ANNEXURE P – CORRESPONDENCE WITH PROF SARASPATHY
MEDONCA – FEDERAL TECHNOLOGICAL UNIV. OF PARANA,
BRAZIL- HELPED WITH LANGUAGE TRANSLATION OF 12
SCIENTIFIC ARTICLES-PORTUGUESE TO ENGLISH**

Hi Shirley,

Regarding the article, I have sourced the full text in Portuguese, as attached.

Could you get a translated copy in English for me?

Best wishes

Ruben

Dr Kantharuben(Ruben) Naidoo

Hi Ruben,

I got the article you wanted in English.

Best regards.

Shirley

--- Em **ter, 1/5/12, Kantharuben Naidoo** <naidook@ukzn.ac.za> escreveu:

De: Kantharuben Naidoo <naidook@ukzn.ac.za>

Assunto: Re: BEST WISHES-FROM SHIRLEY

Para: "Saraspathy" <saraspathy@yahoo.com.br>

Data: Terça-feira, 1 de Maio de 2012, 18:52

Hi Shirley,

I trust that you and your family are well?

I am on sabbatical leave and making headway with my PhD.I have pended the 'Rape' article for a short while, but will work on it soon. Shirley, I need your help on sourcing articles in English concerning the 'Code of Ethics' of the Medical Association of Brazil.

I have attached an article , with the abstract in English, and would be grateful if you could source the full text in English for me.

Love and best wishes to you and the family.

Sincere regards

Ruben