

**PATTERNS OF ATTENDANCE AND REFERRALS
TO THE CASUALTY DEPARTMENT AT
HELEN JOSEPH HOSPITAL**

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A research report submitted to the Faculty of Health Sciences, The University of
the Witwatersrand, Johannesburg, in partial fulfillment of the requirements for the
degree of

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DECLARATION

I, Tahera Cassim, declare that this research report is my own work. It is being submitted for the degree of Master of Family Medicine in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

..... [Signature of candidate]

29..... Day of February, 2009

DEDICATION

In memory of my father Ali Mohamed Cassim (1940-1997), to my mother
Zubeida Bibi Cassim, my husband Zakaria Samir and my children
Zahrah, Aqeel, Moosa, Zaynab and Fayzah.

ABSTRACT

Background: Accident and emergency departments (called casualty or emergency departments or emergency rooms in South Africa), worldwide, are facing crisis from overcrowding, and a common perception exists that the ‘inappropriate’ use of the ED (emergency department) resources and services is a major contributing factor. In this research the patients’ visits to the ED at Helen Joseph Hospital (HJH), a secondary level public hospital, in the Gauteng Province in South Africa, was evaluated by using an instrument based on explicit and objective criteria. The aim of the study was to determine the patterns of attendance and referrals to the ED at HJH, to determine if primary health care sector referrals to this facility are appropriate for attendance.

Methods: This study was a descriptive cross-sectional study. The study was conducted on a systematic sample of 348 adult patients attending the ED at HJH, by using a researcher administered questionnaire which included The Hospitals Urgencies Appropriateness Protocol (HUAP) {see (Appendix A)} to determine the appropriateness of the attendance. Information obtained was analyzed using the Epi-info 3.3.2 and Stata 10 statistical packages on a personal computer. The researcher collected and analyzed data on the patients socio-demographic profile, the referral source and referral profile of the patients attending the ED and evaluated and analyzed the appropriateness of the patients attending the ED by using explicit and objective criteria in the HUAP. The researcher explored an association between the patients’ socio-demographic variables and the referral source and the patients’ socio-demographic variables and appropriateness of

attendance. The researcher also explored an association between the referral profile (including the referral source) and the appropriateness of the ED attendance.

Results: Of the 348 patients in the study sample, it was found that 285 (81.9%) were evaluated as appropriate for attendance. Almost three quarter (74.7%) of the patients were self-referred and of these 221 (85%) were appropriate for attendance. Primary health care providers referred 88 (25.3%) patients to the ED, with referral letters and of these 64 (72.7%) were found to be appropriate for attendance. On the HUAP criteria the majority of the patients were appropriate for radiological examinations (62.9%), for admission (32.8%) and for administration of intravenous fluids (26.4%). Self-referred patients were mainly appropriate for having a symptom of emergency (43.5%) and for accidental injuries (27.4%).

Conclusions: Appropriate use by self-referred patients 221 (85%) and appropriate referrals from the primary health sector 64 (72.7%) to the ED represents a significant proportion of the ED attendees (81.9 %) at HJH. Based on the results of the study it is strongly recommended that politicians and health care managers at all levels of care address the appropriateness demands in EDs in order to decrease the overcrowding and overuse of EDs.

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TABLE OF CONTENTS

<u>CONTENTS</u>	<u>PAGE</u>
DECLARATION	ii
DEDICATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	viii
LIST OF FIGURES	xii
LIST OF TABLES	xiii
1 CHAPTER 1: INTRODUCTION	1
1.1 Background information	1
1.2 The importance of appropriate referrals	3
1.3 Policy context and structure of the South African Health Care System	4
1.4 Statement on the problem	9
1.5 Motivation for the study	9
1.6 Definitions and abbreviations	10
1.7 Aim and objectives	18
2 CHAPTER 2: LITERATURE REVIEW	19
2.1 Overcrowding in the ED	19

2.2	Appropriate/ inappropriate use of the ED	20
2.3	Structures to improve ED use	26
3	CHAPTER 3: METHODS	28
3.1	Study design	28
3.2	Study site	28
3.3	Study population	31
3.4	Sampling method	31
3.4.1	Selection or recruitment of subjects	31
3.4.2	Sample size	32
3.4.3	Inclusion and exclusion criteria	34
3.5	Measuring instrument /tool	34
3.6	Pilot study	38
3.7	Sources of bias	39
3.8	Ethics	40
3.9	Data collection	42
3.10	Data analysis	44
3.11	Limitations	44
4	CHAPTER 4: RESULTS	47
4.1	Response rate	47
4.2	Socio-demographic profile	48
4.3	Referral profile	51
4.4	The criteria for classification as appropriate on the Hospitals Urgencies Appropriateness Protocol (HUAP)	55

4.5	Cross tabulation of socio-demographic variables and referral source	60
4.6	Cross tabulation of socio-demographic variables and appropriateness of ED attendance	65
4.7	Cross tabulation of referral profile variables and appropriateness of the ED attendance	68
5	CHAPTER 5: DISCUSSION	74
5.1	Data collection challenges	74
5.2	Response rate	77
5.3	Discussion of results	77
5.3.1	Time of arrival to the ED	77
5.3.2	Socio-demographic profile	78
5.3.3	Appropriateness / Inappropriateness of attendance	84
5.3.4	Appropriateness demand in the ED	85
5.3.5	Source of referral	88
5.3.6	Summary of discussion	93
6	CHAPTER 6: CONCLUSION	94
6.1	Conclusion	94
6.2	Recommendation	96
7	REFERENCES	98

8	APPENDIX	107
8.1	List of appendices	107
8.2	APPENDIX A	108
A1	The Hospitals Urgencies Appropriateness Protocol (HUAP)	A1
A2	Reliability and validity of the HUAP	A2
8.3	APPENDIX B	109
B1	Map of Johannesburg Metro Districts	B1
B2	List of Suburbs coded into regions	B2
8.4	APPENDIX C	110
C1	Copy of questionnaire	C1
8.5	APPENDIX D	111
D1	Human Research Ethics Committee ethical clearance for research	D1
D2	Postgraduate Committee permission to conduct research	D2
D3	Permission to conduct research at HJH	D3
D4	Consent to use the HUAP	D4
8.6	APPENDIX E	112
E1	Copy of informed consent letter used during data collection	E1
E2	Copy of patient information letter and invitation to participate in research document	E2

LIST OF FIGURES

<u>FIGURE</u>		<u>PAGE</u>
Figure 3.1	Sampling : 14 days of 24 hour sampling in the ED at HJH from mid-July until mid-September 2007	32
Figure 4.1	Distribution of patients by residential area	49
Figure 4.2	Distribution of patients by work area	50
Figure 4.3	Distribution of patients by mode of transport to the ED	50
Figure 4.4	Distribution of practitioner-referred patients by location of referring facility	53
Figure 4.5	Distribution of practitioner-referred patients by kind of referring facility	53
Figure 4.6	Distribution of practitioner-referred patients by profession of the referring person	54
Figure 4.7	Distribution of practitioner-referred patients by reason for referral	55

LIST OF TABLES

<u>NUMBER</u>	<u>TITLE OF TABLE</u>	<u>PAGE</u>
Table 1.1	Specialties classified as level 3 services	16
Table 3.1	Clusters, regions, suburbs and suburb distance in kms from HJH in the JHB Metro District	30
Table 3.2	Sampling process: 14 days of 24 hour sampling in the ED at HJH from mid-July to mid-September 2007	33
Table 4.1	Response rate and final sample analyzed.	47
Table 4.2	Demographic variables	48
Table 4.3	Distribution of patients by age and gender	48
Table 4.4	Distribution of patients by employment status	49
Table 4.5	Distribution of patients by times of arrival to the ED	51
Table 4.6	Distribution of patients by referral source	51
Table 4.7	Distribution of practitioner-referred patients by types of referring facilities	52
Table 4.8	Distribution of patients by appropriateness/ inappropriateness of attendance on the HUAP	56
Table 4.9	Distribution of patients by appropriateness criteria for severity	56
Table 4.10	Distribution of patients by appropriateness criteria for treatment	57

Table 4.11	Distribution of patients by appropriateness criteria for diagnostics	57
Table 4.12	Distribution of patients by appropriateness criteria for outcome	58
Table 4.13	Distribution of self-referred patients by appropriateness criteria for self-referred patients	58
Table 4.14	Total number appropriate / inappropriate for the 5 categories of criteria for appropriateness on the HUAP	59
Table 4.15	The association of gender and referral source	60
Table 4.16	The association of age and referral source	61
Table 4.17	The association of employment status and referral source	61
Table 4.18	The association of residential area and referral source	62
Table 4.19	The association of work area and referral source	63
Table 4.20	The association of mode of transport to ED and referral source	63
Table 4.21	The association of times of arrival to ED and referral source	64
Table 4.22	The association of gender and appropriateness of ED attendance	65
Table 4.23	The association of age and appropriateness of ED attendance	65
Table 4.24	The association of employment status and appropriateness of ED attendance	66

Table 4.25	The association of residential area and appropriateness of ED attendance	66
Table 4.26	The association of work area and appropriateness of ED attendance	67
Table 4.27	The association of mode of transport and appropriateness of ED attendance	67
Table 4.28	The association of referral source and appropriateness of ED attendance	68
Table 4.29	The association of patients with/ without referral letter and appropriateness of ED attendance	69
Table 4.30	The association of times of arrival to the ED and appropriateness of ED attendance	69
Table 4.31	The association of type of referral facility and appropriateness of ED attendance	70
Table 4.32	The association of location of referral facility and appropriateness of ED attendance	71
Table 4.33	The association of reason for referral and appropriateness of ED attendance	71
Table 4.34	The association of kind of referring facility and appropriateness of ED attendance	72
Table 4.35	The association of profession of referring person and appropriateness of ED attendance	72

CHAPTER 1

INTRODUCTION

1.1 Background Information.

In South Africa health care expenditure is 8.8% of the gross domestic product (GDP), compared with a global average of 7.9% and an average of 5.1% for other middle-income countries.¹ Evidence demonstrates that health system reforms based on a strong primary health care (PHC) are more cost effective at promoting the health of a population than systems biased towards strong secondary and tertiary care.²

By prioritizing the establishment of good PHC services and dealing with social and economic factors, China, Cuba, Costa Rica and Sri-Lanka, as of 2004 had attained life expectancies of 71-78 yrs despite annual health expenditures of US\$43-\$290 per capita.³ South Africa spends US\$390 per capita, but our life expectancy is only 48 years.³ By the end of the apartheid era tertiary academic health care services were consuming the largest part of the health care budget (59%) in South Africa.⁴

Accident and emergency (A&E) departments (called casualty or emergency departments (ED), or emergency rooms in South Africa), worldwide, are facing crises from overcrowding, and a common perception exists that the “inappropriate” use of ED resources and services is a major contributing factor.⁵ In any health system it is extremely important to understand how the health services are encompassed in that system.⁵ Factors associated with the health

systems, socio-demographics and clinical conditions of patients are associated with overcrowding in the EDs.⁶ These factors have a major impact on the primary healthcare systems, patients, their families, health professionals and the entire community.⁶

Since the early 1990's there has been an increase in hospital ED referrals and hospital admissions in the western world.⁶ In South Africa in the Gauteng province approximately 1 million patients have been attending the EDs of the provincial hospitals for the last three years (2005 April until 2006 March =1034166, 2006 April until 2007 March =1031277 and 2007 April until 2008 March =1029500).⁷

A range of health care professionals including ambulance personal, primary health care practitioners and specialist physicians are responsible for referring patients to the ED. In addition, there are a large number of patients that are self-referred to EDs for health care.⁸

In South Africa patients with problems associated with poverty, trauma and violence and chronic diseases associated with life-style present to the ED of hospitals daily.⁹ The role of the ED is quite diverse, rather than simply being a station for sudden injury or illness these departments offer investigations not readily available or affordable to the general population at their PHC facilities and there are quite pertinent reasons why people choose to attend the hospital EDs rather than their own PHC facilities.⁵

1.2 The importance of appropriate referrals

Appropriate referrals to the ED and ED overcrowding are important because it affects the care of patients with medical conditions that require unplanned visits to the ED. The most vulnerable individuals and groups include the elderly, people arriving by ambulance, people visiting the ED on weekends, children and parents of children, mental health patients, drug and alcohol patients, nursing home patients, people without social support, patients with medical conditions exacerbated by seasonal changes, people with painful conditions, the undiagnosed critically ill patients, seriously ill patients who leave without being seen by a doctor in the ED and patients who are inappropriately discharged from hospital in order to increase bed availability.⁶

Overcrowding in the ED also impacts on ED staff, resulting in work-related stress and decrease staff satisfaction. Many ED staff may choose to decrease their clinical hours in emergency medicine, thus exacerbating workforce problems.⁶ Overcrowding in the ED results in patients being treated in non-treatment areas. Patients located on stretchers in non-treatment areas such as ED corridors, not only block the corridors, but they also affect patient satisfaction and disrupt patient care.⁶

Ambulance bypass or diversion is the situation where ambulances cannot deliver patients to the closest hospital because of ED overcrowding. In those situations where prompt diagnosis and highly specialized medical care is crucial, ED overcrowding can effect timely specialist consultation of the critically ill patients

and can impact or delay transfer of those patients from the ED to the intensive care units (ICU).⁶

Overcrowding in ED increases waiting times, patients are kept in stretchers when they should be in beds in the wards. Pain relief and initiation of antibiotic treatment (e.g. for patients with pneumonia) may be delayed and this impacts on the overall length of hospital stay and hospital costs.⁶

1.3 Policy context and structure of the South African health care system.

Health services in South Africa have always been fragmented, initially on the grounds of the different tiers of government and then on apartheid lines. With the emergence of a strong private sector in the 1980's and the 1983 constitution, health services were further fragmented.¹⁰ The new national health policy plan (ANC 1994), the current constitution and the white paper on local government attempts to unify health care services, but the role of the local government in the provision of health care is not clearly defined.¹⁰ The challenges still facing the country are to define the role of local government and to control the private sector.¹⁰

The post- apartheid governments committee of inquiry into a national health insurance system appointed in 1995, found in their assessments that the most critical problem affecting the health care in South Africa was the weak and fragmented PHC system.¹⁰ The faults of the PHC system were attributable to a combination of problems, critical among which was the mal-distribution of resources (financial, physical and human) between hospitals and the PHC

systems and between rural and urban areas. The problems in health care were further aggravated by the severe mal-distribution of resources between public and private health sectors.¹⁰

In 1992/93 South Africa spent R30 billion on health care of which 60.8% was accounted for by the private sector which provided care for only 23% of the population on a regular basis.¹⁰ Due to the serious burden on the health services over time and to the rapidly expanding HIV/AIDS epidemic and other epidemiological shifts the department of health started a process of restructuring and reprioritizing of health services.¹¹

"The transformation of the public health sector began with streamlining the national department of health, restructuring provincial department of health and devolving considerable powers to the provincial administrations for operational decision-making in health care delivery".¹¹ Currently the district health system (DHS) seems to be the accepted model for the delivery of PHC within the national health system of South Africa based on the National Health Act 2004.¹²

The World Health Organization (WHO, 1984) defines a DHS as follows: "A DHS based on PHC is a more or less self-contained system of the National Health System (NHS). It comprises first and foremost a well defined population, living within a clearly delineated administrative and geographical area whether urban or rural. It includes all institutions and individuals providing health care in that district, governmental, private or traditional. A DHS therefore consists of a large variety of interrelated elements that contribute to health in homes, schools, workplaces and

communities, through the health and other related sectors. It includes self-care and all health care workers and facilities, up to and including the hospital at the first referral level and appropriate laboratory, other diagnostic and logistic support services.”¹²

The districts in South Africa, according to the national health policy are further divided into smaller service delivery areas called community areas (called sub-districts and sometimes called regions by the metropolitan local governments).¹³ These areas provide support services to the clinics services through a 24 hour community health centre (CHC's) or a district hospital. In order for the DHS to achieve success it is critically important to have an adequate referral and support system.¹⁰

Without a proper referral system in place there will be continuous “inappropriate” use of hospital emergency facilities.¹⁰ Evaluations of the EDs referrals habits from step down centers, including community health centers (CHC's), local clinics (LC's), private practices (PP's), non-government organizations (NGO's) and other hospitals (OH) provides insight into the appropriateness of the referrals in relation to the hospital.¹⁰

PHC providers have a pivotal role to play in reducing the demands on the EDs in the hospitals. The utilization of public PHC services in South Africa has increased by greater than 50% over the past eight years with 101 million visits to public health clinics recorded in the financial year 2006/07 compared to 67 million visits received in 1998/99.¹⁴ The increase in the utilization of PHC clinics has been

attributed to the improved access as a result of the construction of more than 1600 clinics closer to where communities live, improved package of care available at the clinics and the removal of user fees.¹⁴

Public PHC clinics are still facing huge challenges with regards to human resource planning and development in order for the health system to deliver adequate and quality health care.¹⁴ Training the numbers, the type and quality of health care workers that are needed to meet the health needs of the people in South Africa remains a huge challenge to the present day government.¹⁴

More registered medical practitioners (72.6%) work in private practices in South Africa and they see an estimated population of 18% of PHC patients in their practices. Only 27.4% of registered medical practitioners work in the public sector and they see an estimated population of 82% of PHC patients.¹⁵

The Gauteng Province

The Gauteng province consists of six districts i.e. Johannesburg Metro District, West Rand District, Sedibeng District, Ekurhuleni District, Metsweding District and the City of Tswane District. The central city in the Johannesburg Metro District is the City of Johannesburg (CoJ). CoJ serves a population of 3 706 406 persons and has displayed the highest rate of population growth (4.1%) per annum and should that growth rate be sustained it is estimated that there will be 4 million people in the city by 2010 and over 10 million people by 2030.¹⁶ The unemployment rate in CoJ is 37.3% and massive migration to the CoJ of mostly poor households has resulted in an increase need for services in this area.¹⁶

Gauteng Province Referral Policy

The referral policy for the Gauteng Province was addressed in the Service Improvement Plan that was approved for the Gauteng Province in 2004.¹⁷⁻¹⁸ The principles adopted included the following:

- That central hospitals would be smaller referral centres with protected centres of excellence. They would have level 3 and level 2 beds, and level 1 beds would be linked away. Gateway clinics would be established to stop off-street access to highly specialized care.
- Regional hospitals will be protected and strengthened to provide first level of referral from district hospitals. This will be through outreach programmes from central hospitals and academic institutions. Existing tertiary services should be shifted to the central hospitals or managed in the regional hospital as satellites of the central hospitals. Strengthened district hospitals with a significant increase in the number of level 1 and step-down beds will support the regional hospitals. Strengthened generalist doctors, family medicine practitioners and mid level worker programmes will support the regional hospital.
- Strengthened DHS priority programmes.
- Strengthened referral networks, patient transport systems and emergency medical services.
- Develop quality assurance programmes and clinical support services.

1.4 Statement on the problem

The global economic crisis and the HIV/AIDS pandemic is overburdening health systems and putting a strain on the human and material resources. The capacity of health systems to deliver health care in an equitable way is slowly declining. There is a need to identify the patients who are referred to hospital EDs and to develop strategies to manage these patients in a rational and cost effective way. Despite the restructuring policy and the increase in the number of PHC facilities in both the public and private there are still a large number of PHC patients that attend the secondary and tertiary hospital EDs for non-urgent problems.¹⁷⁻⁸ Studies of ED use in the United States, most of which use subjective definitions of appropriateness, report anywhere from 11-82% visits as inappropriate or non-urgent.¹⁹

1.5 Motivation for the study

Overcrowding problems experienced by patients and staff in the ED and by the managers of HJH motivated the researcher to conduct this research. The treatment of patients for health problems that could be managed at a lower level of care needs to be investigated. As much as one third of total hospital cost could be saved by treating PHC patients in PHC facilities rather than in district, regional and tertiary hospitals.²⁰

A number of studies have been done in South Africa on the inappropriateness of patient attendance at regional and tertiary hospitals but they were conducted on inpatients in the medical wards²¹⁻²³ and in the outpatient departments.²⁴⁻²⁵ Studies on non-urgent patients, and appropriateness of patients visits, presenting

to EDs in South Africa are limited.²⁶⁻²⁸ The purpose of doing this study on the ED “use” was to explain how the “use” can be reduced in order to serve the needs of the patients better.

This study was conducted in the ED at HJH, a secondary level public hospital situated in a suburb called Auckland Park in the Region B sub-district of the Johannesburg Metro District in the Gauteng province of South Africa.

1.6 Definitions and abbreviations ²⁹

Public Facility: A unit delivering health services where the service provider is a government department or a parastatal organization. These by definition will be not-for-profit.

Private Facility: A unit delivering health services where services are provided by an organization that is not part of government. This may be for profit or not-for-profit.

Non-Government Organization (NGO): A unit owned and managed as a charitable institute or other organization registered under Section 21 of the Companies Act.

Primary Health Care (PHC): The World Health Organization (WHO), contends that defining PHC is fraught with difficulties? An attempt to do so in the United States of America yielded no fewer than 97 definitions and in Europe PHC

definitions differ by country. PHC definitions can be considered in terms of concept, level, content of services, process and team membership (WHO, 2004).³⁰

Primary Health Care Concept: It was in the Alma Ata declaration, in which PHC was defined as “essential health care based on practical, scientifically sound and socially acceptable methods and technology, made universally available to individuals and families in the community through their full participation and at a cost that the community and the country can afford to maintain at every stage of their development in the spirit of self-reliance and self determination” (WHO 1978).³¹

Primary Health Care Strategy: As a strategy, primary health care encapsulates the notion of accessible care, relevance to population needs, integrated services based on community participation, cost-effective and characterized by inter-sectoral collaboration.

Primary Health Care Level: Primary health care as a level in the health system is the level where people first contact the health system and where the majority of their health problems are dealt with. There are generally four major levels: primary health care centres, secondary, tertiary and quaternary hospitals. The interface between these boundaries is dynamic and changing.

Primary Health Care Content: Selective PHC content is defined a set of basic or essential interventions enshrined in the Alma Ata declaration. This essentially

includes a package of services used as a financing tool but also to meet disease burden of predominantly communicable disease, peri-natal and maternal deaths. Comprehensive PHC content includes a wide range of health education, promotion, prevention, curative and rehabilitative and terminal activities.

Primary Health Care Process: It is the gate-keeping role of primary care. PHC level as a process is defined as first contact, frontline, ongoing, comprehensive and coordinated care.

Primary Health Care Providers: What is defined as PHC providers differs by country and context and it is important to have a working definition of what a PHC provider is in South Africa. The Royal College of General Practitioners in the United Kingdoms definition has resonance in the South African context. It defines a PHC professional as “any health professional whose professional qualification is in health care, whose professional qualification is recognized by a statutory registration council approved by parliament, who sees clients/ patients directly without any referral from a health professional, or who works within primary medical or nursing care organizations that offer patients open access” (Pereira 1978 quoted in WHO 2004). PHC providers provide first contact services at a PHC level and include the following:

Nurses : Refers to persons who are trained according to the guidelines laid by the South African Nursing Council and who have acquired a certificate of accreditation from the same body to practice as a nurse and is registered as a

nurse under section 16 of the Nursing Act (Act 50 of 1978, as amended) (South Africa 1998).

Family Practitioners: Refers to generalist medical practitioners working in primary care settings, whether they are in private practice or non-private practice (clinics / community health centres / hospital out- patients / non government organizations etc).

General Practitioners (GP's): In the USA the GP is the "old-style" family doctor who didn't do postgraduate residency (registrars hip) in family medicine. In South Africa GP usually refers to family practitioners in private practice.

Family Physicians: In South Africa the term family physician is used by the Health Professions Council of South Africa (HPCSA) to define family practitioners who have obtained postgraduate qualification in the clinical discipline of family medicine.

Primary Health Care Facilities:

Are defined as facilities in which the above PHC practitioners / providers work and include private and non-private practices (i.e. local clinics (LCs), community health centers (CHCs), non-government organizations (NGOs), district hospitals (DHS) etc). PHC facilities are designed to provide PHC which was defined in 1975 by the American Academy of Family Physicians as "a form of medical care delivery that emphasizes first-contact care and assumes ongoing responsibility for the patient in both health maintenance and therapy of illness. It is personal care involving a

unique interaction and communication between the patient and the physician. It is comprehensive in scope and includes overall co-ordination of the care of the patient's health problems, be they biological, behavioral, or social. The appropriate use of consultants and community resources is an important part of effective primary care”³¹

Emergency Departments (ED) or Casualty Departments:

Emergency departments (EDs) or casualty departments are defined as health care facilities that provide 24-hour services for acute conditions from all medical specialties.

Clinics: Clinics are defined as facilities at which a range of PHC services are provided. It is open at least 8 hours a day Mondays to Fridays.

Gateway Clinics: Gateway clinic is defined as a clinic based in, or very close to, the premises of the hospital.

Community Health Care Centres (CHCs): A community health care centre is defined as a facility at which a range of PHC services are provided. It is open 24 hours a day 7 days a week. It offers emergency and midwifery services.

Level 1 Hospital: A level 1 hospital is defined as a facility at which a range of outpatient (ambulatory care services) and inpatient primary care services are offered. It is permanently open. It has a functional operating theatre where it is

capable of performing basic operations under general anaesthesia (e.g. Caesarean sections). It is open 24 hours a day 7 days a week.

Secondary and Tertiary Level Facilities.

These include level 2 and level 3 hospitals

Level 2 Hospitals: A level 2 hospital is defined as a facility that provides care requiring the intervention of specialists as well as general practitioner services. A hospital providing a single specialist service would be classified as a specialist level 2 hospital. A general level 2 hospital would need to provide and be staffed permanently in at least 5 of the basic specialties of surgery, medicine, orthopaedics, paediatrics, obstetrics and gynaecology, psychiatry, diagnostic radiology and anaesthetics. It is open 24 hours a day 7 days a week.

Level 3 Hospitals: A level 3 hospital is defined as a hospital that provides specialist and sub-specialist care as defined for level 3 services. A specialized level 3 hospital will only have one specialty represented (e.g. cardiology and spinal injuries) but a general level 3 hospital will have sub-specialty representation in at least 50% of the range of Group 1 specialties listed in Table 1 below. In the public sector, these hospitals are defined as tertiary 1 hospitals (also called provincial tertiary hospitals).

Some tertiary hospitals will also provide a defined range (package) of other specialized services (Group 2 specialties in Table 1 below). These are classified as tertiary 2 hospitals (also called national referral hospitals). In a very small

number of hospitals, currently 2, there will be an additional package of sub-specialties (Group 3 specialties in Table 1 below). These are referred to as tertiary 3 hospitals (also called central referral hospitals).

Table1.1: Specialties classified as level 3 services

Group 1 Specialties	Group 2 Specialties	Group 3 Specialties
Anaesthetics	Cardiology	Haematology
Burns	Cardiothoracic Surgery	Hepatology
Clinical Pharmacology	Clinical Immunology	Liver Transplant
Critical care & ICU	Craniofacial Surgery	Clinical Pharmacology
Dermatology	Endocrinology	Dermatology
Diagnostic Radiology	Geriatrics	Maxillofacial Surgery
Ear Nose & Throat	Haematology	
Gastroenterology	Human Genetics	
Infectious Diseases	Medical & Radiation Oncology	
Mental Health	Neurology	
Neonatology	Neurosurgery	
Nephrology	Nuclear Medicine	
Obstetrics & Gynaecology	Paediatric Sub-Specialties	
Ophthalmology	Renal Transplant	
Orthopaedics	Rheumatology	
Paediatric Medicine	Spinal Injuries	
Paediatric Surgery		
Pediatric ICU		
Plastic& reconstructive Surgery		
Rehabilitation Centre		
Respiratory Medicine		
Trauma		
Urology		
Vascular Surgery		

Acute Care: Inpatient care that requires investigation, diagnosis and treatment by a doctor or specialist but which does not imply or require extended periods of treatment beyond a few days.

Chronic Care: Inpatient care that is the result of a condition requiring extended care and or treatment.

Step down or sub acute: In patient care that follows or forms the latter part of an acute episode in which the patient has been investigated, diagnosed is in a stable condition and has a treatment plan but requires ongoing inpatient care for a few days under the allied professions or specialist nursing.

ABBREVIATIONS

WHO	World Health Organization
DHS	District Health System
CHC	Community Health Centre
LC	Local Clinics
NGO	Non Government Organization
PP	Private Practices
HJH	Helen Joseph Hospital
PHC	Primary Health Care
ED	Emergency Department
HUAP	Hospitals Urgencies Appropriateness Protocol
BSc	Bachelor of Science
GPs	General Practitioners
CoJ	City of Johannesburg
MDG	Millennium Development Goals
X-rays	Roentgenograph or Roentgenogram
HIV	Human Immunodeficiency virus
TB	Tuberculosis
AIDS	Acquired Immunodeficiency Syndrome

1.7 Aim and objectives

The aim of the study was to determine the patterns of attendance and referrals to the ED at Helen Joseph Hospital (HJH), in order to determine if PHC sector referrals to this facility are appropriate for attendance.

The objectives of the study are to

1. To determine the socio-demographic variables, such as age, gender, employment status, residential and work area and mode of transport to the hospital, of the patients attending the ED at HJH, from mid-July until mid-September 2007.
2. To determine the referral source and the referral profile of the patients attending the ED at HJH during the above study period.
3. To evaluate the appropriateness of the patients attending the ED at HJH using explicit and objective criteria on the Hospitals Urgencies Appropriateness Protocol (HUAP) during the above study period.
4. To explore an association between the patients' socio-demographic variables and the referral source and to explore an association between the patients' socio-demographic variables and the appropriateness of the ED attendance at HJH during the above study period.
5. To explore an association between the referral profile variables, and the appropriateness of the ED attendance at HJH during the above study period.
6. To make appropriate recommendations based on the findings of the above study.

CHAPTER 2

LITERATURE REVIEW

2.1 Overcrowding in the ED.

“There has been a great debate about low acuity patients (also known as GP patients or GP workload) in the EDs. In the early 1980's it was suggested that the problem of overcrowding was due to the inappropriate use of emergency services by those with non-urgent conditions. Recent evidence has demonstrated that the real reason for overcrowding in EDs in Australia, Canada and other countries is due to the hospital bed occupancy rates above 85% rather than increased presentation of low acuity patients to the EDs.”^{6, 32-33}

Overcrowding in the EDs is also due to the increased complexity, exacerbation of chronic conditions and acuity of patients presenting at the ED. As the population ages, there are a growing number of patients with chronic conditions that require complex assessments and managements. These patients are also identified as frequent attenders. These patients are also most likely to have problems accessing adequate management in their community for their multiple problems and this leads to ED attendances.⁶

Several socio-demographic factors have been identified to affect the use of EDs, including the ability to read and understand health related material, religious festivities (e.g. Ramadaan for Muslims, Christmas parties) and social activities (drinking alcohol), distance from the hospital and convenience for parents.⁶

On the other hand ethnicity, low income, homelessness and insurance status are not determinants for increased ED use.⁶ Mental health problems such as violence, drug abuse and psychological distress such as loneliness have been identified as predictors of ED use.⁶

In a Spanish Study undertaken on appropriateness / inappropriateness of emergency attendance, it was found in their literature review that factors associated with the attendance are younger age, specific diagnostics complaints, patients with no referral letter, cases where more time had elapsed from time of onset of illness process, certain days of the week particularly Mondays, unemployed patients, shorter distance to the hospital, female patients, fewer complementary tests, urban populations, minor traumas, specific social groups especially foreigners, homeless people, the uninsured and certain characteristics of primary care physicians.⁸

A South African study conducted in a Bloemfontein district hospital ED to determine appropriateness of patients' visits, showed that factors associated with attendance where females gender, younger age groups, living in informal settlements near the hospital, presenting for medical and surgical problems, minor injuries, attending after hours and weekends.²⁸

2.2 Appropriate/ Inappropriate use of ED.

It is also recommended that in order to conduct "appropriateness studies" on ED patients it is necessary to define and determine the appropriateness. There are many possible ways to determine appropriateness of attendance. To determine

appropriateness, some studies use nurse triage based on triage or acuity scales, some use physician assessment and diagnostics tests or treatment ordered, some use admission and outcome criteria and other studies use the patients' self-assessment of severity of symptoms.³⁴ A standard or "gold" criterion would have properties of reliability and validity, but unfortunately no standard criterion for reliability and validity for appropriateness of ED use exists.³⁴

Inappropriate attendance in EDs is a big problem all over the world.³⁵ Of the 15 million people annually attending the 227 EDs in Britain, very few are really sick. The exact figure for inappropriate attendees is very variable in different settings ranging from 30-70.³⁵ Inappropriate attenders increase the waiting time of other patients and the workload of ED staff. They cause anxiety on staff and since non-urgent patients are less ill, they create more fuss when wanting attention. There is a need to devise some method for removing non-urgent patients from EDs so that the care of urgent patients is not compromised.⁶

Studies on ED patients in South Africa have been undertaken on patients presenting for different specialties e.g. surgical injuries, and for psychiatry patients.³⁶⁻³⁷ A South African study conducted in the ED at Witbank General Hospital in the Mpumalanga Province to determine the demographic features of assault victims showed that the majority of assault victims were treated in the emergency department and were not admitted for in-hospital treatment (81.4%).³⁶ A South African study conducted in the ED at a national district hospital in Bloemfontein ED showed that more than a third of the patients (37.2%) were inappropriate for attendance.²⁸

A study conducted in Spain at a University Hospital in Elche to evaluate the appropriateness of medical visits to the ED showed that (29, 6%) were evaluated, as inappropriate.⁸ Inappropriateness in this study was associated with younger patients and with use of own transport. In this study it was also found that the most frequent reasons for inappropriateness of the visits was the patient's greater trust in the hospital than in primary care (51%), inappropriate use of the services (18.1 %) and inappropriate referrals by primary care physicians (16.1%).⁸

A study conducted in Australia at Fremantle Hospital ED to determine the overall low acuity patient caseload concluded that inappropriate referrals amount to between (10-14%).²⁰ The above study concluded that low acuity patients form a small but significant percentage of the 24 hour work load and that the vast majority of presentations to the ED were appropriate.³²

A literature review study, conducted by final year Bachelor of Science (BSc) nursing students at Birmingham Polytechnic in England as part of a pilot study into staff perceptions of inappropriate attendance at the ED, looked at what actually constitutes inappropriate attendance, who is responsible for the misuse and why the ED was so often abused.³⁸ The above review covered a span of 158 years, and showed that this problem is indeed not necessarily a modern one but that it has its origins in the last century.³⁸

The above review also found that most ED users were self-referred and that the major reason why people choose the ED is the 24 hour open door policy that is adopted by most EDs.³⁸ The other major reason found for 'inappropriate

attendance' in the above review was the patient's own perception about the severity of the injury or ailment.³⁸

The above review also found that referrals from GP's to the ED were a common practice.³⁸ The reason for the emergency referrals were various and included requests for X-ray services, referral for second opinion, admissions, social reasons and the GP's unwillingness to carry out certain minor procedures in their practices. The review pointed out that the ED is misused by both the public and their doctors.³⁸

A study undertaken in an ED in the East End of London at the London Hospital in the Tower Hamlets District showed that the most frequent reason for self-referral was the patient's perception of the urgency of the condition and the need for immediate attention.³⁹ It also found that patients not registered with their own GP, attended more frequently than registered patients.³⁹

The study above highlights the fact that some GPs used the EDs as convenience substitute for out-patient investigations, and also highlights the fact that although misuse of EDs can be attributed to patients, inadequacies in hospital and general practices could also contribute.³⁹ In order to reduce the number of inappropriate patients, patients need to be educated, they need to be registered with a GP, general practices need to be improved, and there needs to be better communication between general practice and hospital out-patients departments.³⁹

Self-referrals for non-urgent conditions and inappropriate primary care referrals can be found as time consuming and unrewarding to the ED staff and the emergency staff become less motivated to assist them.⁴⁰ Patients are generally not medically trained and they view their attendance as appropriate if a health care provider or giver refers them.⁴⁰ Most patients are aware of alternate care for non-urgent problems, nevertheless a large portion of these people use, and are referred by health care professionals to EDs for non-urgent medical problems.⁴⁰

A study conducted at Muhimbili National Hospital a teaching hospital located in Dar es Salaam, Tanzania showed that out of 11,412 patients seen, 72.5% were self-referrals.⁴¹ For those who were formally referred from other health services, lack of expertise and equipment were the most common reason for referral (95.3%). More than 70% of the patients seen in this study required admissions, though not necessarily at tertiary level, but rather required level 1 bed care.⁴¹

A study conducted in eThekweni in the Kwa-Zulu Natal Province in South Africa on appropriateness of attendance at specialist clinics in secondary and tertiary hospitals showed that 43.6% of the patients could have been managed at a primary care facility.²⁰ The reasons for the attendance to specialist clinics were that the hospital was close to their home (29.1%), they were referred (26%), the best care was offered at the hospital (25%), they were coming after a long time (11.9%), and that the care was affordable (6.6%). This study also showed that the highest proportions of inappropriate patients are seen at paediatric clinics (68.3%) followed by medical clinics (39%).²⁰

A study conducted in Cape Town in South Africa in the ED of four CHCs showed that the case severity of patients was evenly distributed between emergency, urgent and routine care.²⁷ Patients in this study were found to be typically self-referred. The major implication of this study was that the level of care that is provided in CHCs may not be appropriate for serving the needs of patients.²⁷

A study conducted in Britain in Cambridge to determine the appropriateness of referrals from PHC to secondary health care showed that out of 168 referrals 110 referrals were agreed to be appropriate. The reasons for 32 of inappropriate referrals were lack of resources, and 9 were due to a deficiency in the primary health care team.⁴²

The above study highlighted the importance that many theoretically avoidable referrals were due to managers and politician's decisions about allocations, but some inappropriate referrals could be avoided by assessment of the GP's need for further knowledge and skills. This study also provided more evidence to justify the transfer of local resources from secondary to primary care and it also confirmed that there is poor communication between secondary and primary health care.⁴²

In a study conducted in an ED in the Netherlands it was found that out of the 5234 patients surveyed over a three month period, the majority (84%) of the patients were self-referred younger patients with minor trauma and infrequently required diagnostics (37 %), treatment (49 %) or admission (4 %).⁴³ The referred patients were older and 41% required admission. This study showed that in this busy

centre the acuity of self-referred patients was low, with little diagnostic testing, few interventions and resuscitations, and this has both teaching and practice implications.⁴³

2.3 Structures and systems to improve ED use.

In the Netherlands the healthcare is organized in a two-tiered system, with a network of community-based general practitioners providing PHC and hospitals providing specialist care. The GPs serve as gatekeepers referring chronic patients to the hospital based specialty clinics and emergency patients to the EDs for urgent specialist's consultation. Patient can also go directly to the ED for evaluation.⁴³ The above setting, therefore creates two groups of patients i.e. the referred patients who are seen by specialist's services and the self-referred patients who are first seen by the emergency physicians.

It has been shown that interventions such as developing transit lounges, observation wards, and redesigning ED facilities improve patient flow in EDs.⁴⁴⁻⁴⁵ Initiatives such as improving communication systems and applying learning organization principles are also effective at improving ED flow.⁴⁶⁻⁴⁷ It has been reported that interventions to improve access to radiology, pathology and other services can significantly reduce access block and ED overcrowding and also improve patient satisfaction.⁴⁸ Access to GP services within the hospital has received mixed reviews. It has been considered unsuccessful in some hospitals in Australia and effective in the Netherlands.⁴⁶⁻⁴⁸

Other interventions to reduce hospital admissions have included chronic disease management in the community, home support initiatives such as hospital in the house programme, specialist community health care and discharge planning.⁶ Changes in triage systems to fast track mental health problems and minor injuries have also reduced waiting times in the emergency.⁶ The above measures do not affect access block but they do improve care for non-urgent patients waiting to be seen in the ED.⁶

CHAPTER 3

METHODS

3.1 Study design

This study is a cross-sectional descriptive study of the patients attending the ED at HJH.

3.2 Study Site

The study was conducted in the ED at HJH, a regional (level 2) public hospital, situated in Auckland Park in the Region B sub-district of the Johannesburg Metro District in the Gauteng Province. HJH has a six hundred-bed facility, and is part of a complex with the Rahima Moosa Hospital (previously called Coronation Hospital) situated approximately 3 kms away in the same region.

HJH provides inpatient, outpatient and emergency medical, surgical, psychiatric and orthopedic services. Rahima Moosa Hospital provides obstetric and gynecological services and pediatric services, and these services are not rendered at the HJH. Region B sub-district of the Johannesburg Metro District has a catchments population of 225399.⁴⁹ HJH is easily accessible to patients in all the regions in the Johannesburg metro district by road transport.

The city of Johannesburg metropolitan area extends from Orange Farm in the South, to Midrand in the North, to Witpoortjie (Roodeport) in the West and to Modderfontein/ Bruma in the East. It includes the Johannesburg CBD, Randburg, Soweto, Lenasia, Alexandra and Sandton (See Appendix B). Within the

Johannesburg Metro District there are 99 public sector local authority and provincial clinics, 8 public sector CHCs, 1 public sector district hospital and 6 mobile vans that service 14 points. There are also 2 NGOs i.e. Witkoppen Clinic and Alexandra Health Centre.¹²

The Johannesburg Metro District is supported by 3 regional hospitals (i.e. Rahima Moosa, Helen Joseph and Edenvale), two tertiary level hospitals [Chris Hani-Baragwanath hospital (CHB) and the Charlotte Maxeke Johannesburg General hospital (Jhb-Gen)] and two specialist hospitals (Tara Hospital and Sizwe Hospital).¹² The large network of local authority and provincial clinics, CHCs, NGOs and private practices refer patients to the ED at HJH if necessary.¹²

The Johannesburg Metro District consists of 3 Clusters (Cluster A, B and C) and 7 Regions (Regions A, B, C, D, E, F, and G). HJH is the referral hospital for Regions B and C in Cluster A. CHB is the referral hospital for region D and G in Cluster B. The Charlotte Maxeke Hospital (Jhb- Gen) is the referral hospital in Cluster C for Regions A, E and F. The distance from regions D and G to the hospital is approximately 30 kms, from region A to the hospital is approximately 35 kms and from Regions B, C, E and F approximately 15 kms.⁵⁰⁻⁵¹ (see table 3.1 below)

Table 3.1 Clusters, regions, suburbs and suburb distances in kms from HJH in the Johannesburg Metro District ⁵¹

Cluster	Region	Referral Hospital	Major Suburbs	App distance in kms from HJH
A	B	HJH	Albertskroon	6.48
			Berario *	9.90
			Bostmond *	6.51
			Claremont*	6.50
			Coronationville	3.82
			Crosby*	3.72
			Florida*	8.75
			Fourways	24.67
			Parkhurst *	8.59
			Randburg*	29.95
			Riverlea*	7.83
			Westbury*	4.72
			Honeydew	3.00
			Davidsonville*	19.52
			Roodepoort	17.71
			Helderkruin*	18.33
			Princess*	21.96
			Discovery *	14.78
			Weltervreden Park *	12.66
			Zandspruit*	16.84
B	D	CHB	Eldoradopark	28.55
			Diepkloof	12.55
			Dobsonville	21.72
			Klipspruit West	30.18
			ProteaGlen	39.51
			Ennerdale	42.51
			Lenasia	32.98
			Lenasia South	39.88
			Orange Farm	42.73
C	A	Jhb-Gen	Diepsloot	36.3
			Midrand	33.32
			Witkoppen	23.51
			Sunninghill	28.18
			Edenvale	23.92
			Bruna	12.22
			Alexandra	16.70
			Hillbrow	5.07
			Jeppes Town	10.41
			JHB CBD	27.4
	E	Jhb-Gen		
	F	Jhb-Gen		

HJH= Helen Joseph Hospital * suburbs with clinics referring to HJH

CHB= Chris-Hani Baragwanath Hospital

Jhb-Gen= Charlotte Maxeke Johannesburg General Hospital

3.3 Study Population

The HJH ED attends to approximately 3000 patients per month, approximately 700 patients per week, and about 105 patients per 24 hour cycle.⁵² The sampling population included all adult patients attending the ED at HJH for 14 days during the months of July, August and September 2007. Assuming that approximately 105 patients were attending and sampling every fourth patient would give about 26 patients per day of sampling, it was decided to do sampling for 14 days in order to get an adequate sample size of at least 364 (14*26) patients. The sampling was done from mid-July 2007 on every 4th day until 14 days of sampling were completed. The sampling ended in mid-September 2007. The 14 days of sampling included 2 Mondays, 2 Tuesdays, 2 Wednesdays, 2 Thursdays, 2 Fridays, 2 Saturdays and 2 Sundays.

3.4 Sampling method

3.4.1 Selection or recruitment of subjects

The researcher used a systematic sampling method to select the sample. In order to capture ED utilization during different times of the day the researcher sampled patients over 24 hours / periods of the day for 14 days. To start off with the researcher randomly selected a number from one to four and that corresponding patient from among the first four patients entered in the journal, and thereafter selected every fourth person entered in the journal. (See figure 3.1 below)

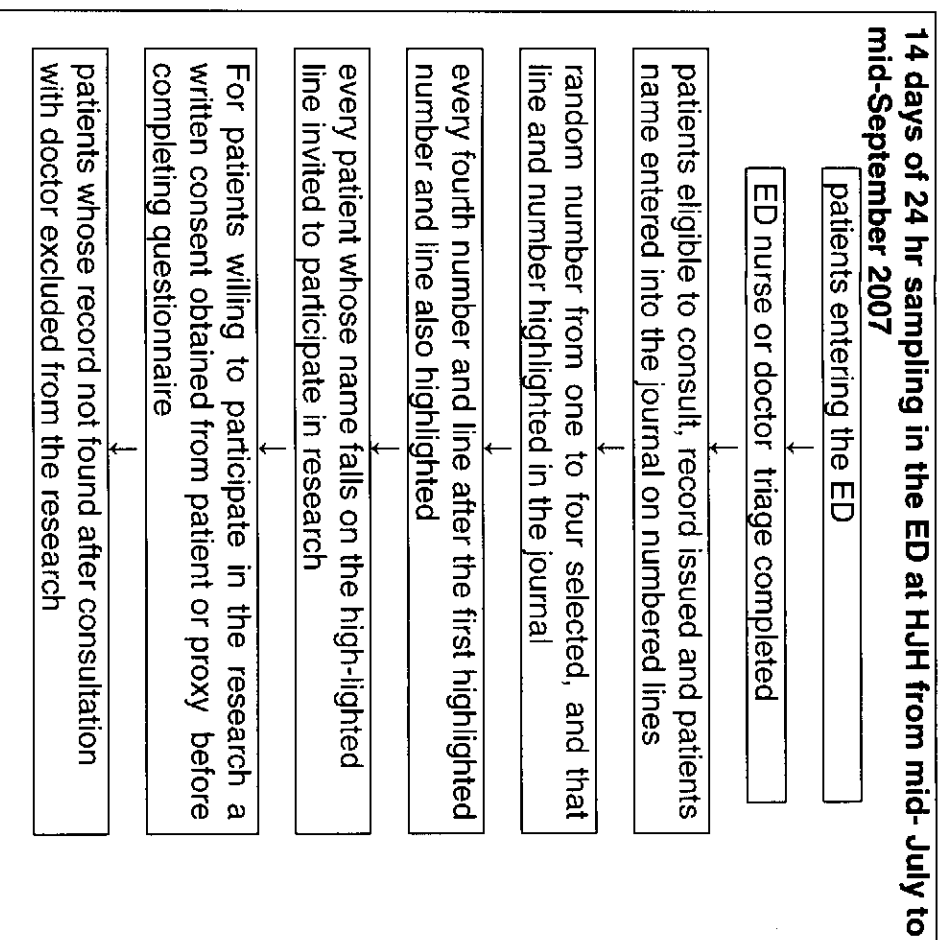


Figure 3.1 Sampling process: 14 days of 24 hr sampling in the ED at HJH from mid-July to mid-September 2007

3.4.2 Sample size

The main outcome of this study is the extent of correct referral to the ED, so the outcome was measured as an appropriate or inappropriate referral, a binary outcome. The researcher used p , the proportion of appropriate referrals as outcome, thus when calculating the sample size required to estimate a proportion p , the maximum sample size $n = (323)$ was obtained when p , the proportion of appropriate referrals was estimated by assumption/ guess to be 70%, inappropriate referrals estimated at approximately 30%, corresponding to a 95% confidence interval and a 5% precision. An assumption is a basic principle that is

accepted as being true, on the basis of logic or reason, without proof or verification (Polit & Hungler 1995:10, 96).

Assuming, that the researcher would have problems with 20% of patients (critical cases, lost record etc), the researcher therefore sampled all 389 patients consenting to partake in this study during the study period of 14 days. Some patients 29 (7.45%) were excluded after consenting to participate because the hospital record went missing, and section C of the questionnaire could not be completed. In cases where the patient or proxy could not or refused to participate in the study the researcher selected the next fourth patient highlighted in the journal until the total sampling was completed. See Table 3.2 below for a summary of the 24 hour sampling for 14 days for this study.

Table 3.2 Sampling: 14 days of 24 hr sampling in the ED at HJH from mid-July to mid-September 2007

14 days sampling	Total patients	Total number consenting	Total lost record/data	Total questionnaires
Sunday	142	35	5	30
Monday	139	32	1	31
Tuesday	121	27	0	27
Wednesday	120	30	0	30
Thursday	148	30	2	28
Friday	130	32	1	31
Saturday	127	26	2	24
Sunday	125	20	4	16
Monday	144	32	2	30
Tuesday	115	18	2	16
Wednesday	127	25	0	25
Thursday	110	27	1	26
Friday	132	20	3	17
Saturday	154	35	6	29
TOTAL	1834	389	29	360

During the 14 days of sampling 1834 patients attended the ED at HJH and every fourth patient was eligible to participate. A total of 389 patients consented to partake in the study. A total of 29 patient records went missing and these patients were excluded from the research. A total of 360 patients were sampled at the end of the sampling period.

3.4.3 Inclusion and exclusion criteria

All adult patients over the age of 18 attending the ED were eligible to be included in the study sample. Critical emergency patients and unstable patients were also included. Recruitment and getting consent of critical or unstable patients was done only when the patient was stabilized. Patients from other provinces, other districts, other sub districts and regions were also included in the sample.

Patients who did not sign informed consent to participate in the study were excluded. Patients under the age of 18 were excluded from the study. All gynecology and pediatric patients were excluded from the study. Patients who consented to participate and were interviewed but whose hospital record was not found again were excluded from the study. Patients with missing data in the records were excluded from the study. Missing questionnaires were also excluded.

3.5 Measuring instrument/ tool

The researcher used a researcher- administered questionnaire as the measuring instrument. (See Appendix C)

3.5.1 Source of the questionnaire

The questions on the questionnaire were formulated by the researcher in the following manner.

Section A of the questionnaire consists of socio-demographic questions. The researcher was assisted by colleagues, and staff from the Family Medicine department at the University of the Witwatersrand, to formulate the questions in this section.

Section B of the questionnaire was formulated by the researcher with assistance from the research supervisor Dr Shabir Moosa, and questions were formulated by using questions that the supervisor had used on a pilot study survey conducted at the Hillbrow CHC. The researcher used the referral letter to complete Section B. For patients with no referral letter Section C5 was completed.

Section C of the questionnaire contains the "Hospital Urgencies Appropriateness Protocol (HUAP)"⁸ which is an instrument / tool in the public domain. (See Appendix A) The HUAP is an instrument designed around explicit criteria that defines as inappropriate cases treated in the ED that could have been resolved in a similar fashion outside the hospital setting. It does not question the appropriateness of the medical care provided in the ED and it assumes that the care was appropriate even if it was not a true emergency.

The HUAP was used in a Spanish study conducted at the ED at Elche Hospital in the Valencia Region in Spain. The Elche Hospital is a regional government public

university hospital. The HUAP tool was validated in an earlier study, in which the prevalence of inappropriate use of ED use was 27%, and the instrument demonstrated excellent intra-reviewer and inter-reviewer reliability, although its validity compared with the judgments of experts, proved to be moderate. The analysis of the predictive value of the HUAP compared with the clinical experts showed that the instrument has a specificity of 0.98 but it has a sensitivity of 0.44.

It also has a high positive predictive value for cases labeled inappropriate (96% of the cases evaluated as inappropriate by the HUAP were considered as inappropriate by the clinicians), but a low negative predictive value for cases considered appropriate (only 59% of the cases that the HUAP considered appropriate were also evaluated as appropriate by the clinicians). (See Appendix A for a summary of the reliability and validity of the HUAP).

The HUAP tool used consists of 5 sections including criteria for severity, treatment, diagnostic intensity, outcome and criteria applicable only to patients in the ED who were not referred by a physician (i.e. self-referred patients). The HUAP tool was preferred and adopted for this research because it was conducted in a setting similar to HJH i.e. the Elche Hospital is also a regional government academic public hospital and their study was also conducted on adult medical patients. The tool is easy to use, it contains simple criteria, with little ambiguity and it can be used with the information that is available in the ED.

A limitation of the HUAP is that it is dependant on the quality of care and accessibility of care in the PHC facilities (e.g. a referral for an intravenous drip

may be appropriate in the ED if there is no intravenous drip available in the clinic). It is a highly reliable instrument and identifies as inappropriate all cases identified as inappropriate by the expert clinical reviewers.⁸ The HUAP tool was used in studies in Spain to determine hospital admission overuse⁵³ and to determine appropriateness of utilization of an ED.^{8, 54}

3.5.2 Content of the questionnaire (See Appendix C)

The first part of the questionnaire includes (1) questionnaire number (2) journal number (3) record number (4) date of data collection and (5) time of arrival to the ED. The questionnaire then consists of 3 Sections (A, B and C as described below).

Section A of the questionnaire: These are questions to determine the socio-demographic features and referral source of the patient. The patient answered these questions directly and includes question A1- A7. (A1) date of birth; (A2) gender; (A3) employment status; (A4) residential and work suburb; (A5) referral to the hospital /or not; (A6) referral letter / or not and (A7) mode of transport to the hospital ED.

Section B of the questionnaire: This section contained questions to determine the referral profile of the patients presenting with referral letters and contains the following 5 questions: (B1) name of the referring facility; (B2) suburb of the referring facility; (B3) kind of referring facility; (B4) profession of the referring person and (B5) reason for referral as written on the referral letter.

Section C of the questionnaire: This section was completed by the researcher by using the patients medical record after the patient was examined by the attending doctor. It contains the Hospitals Urgencies Appropriateness Protocol (HUAP), and includes the following 5 sections: (C1) appropriateness criteria for severity; (C2) appropriateness criteria for treatment; (C3) appropriateness criteria for diagnostic intensity; (C4) appropriateness criteria for outcome and (C5) appropriateness criteria applicable only to self-referred patients.

3.6 Pilot Study

A pilot study using the above questionnaire was conducted on 20 patients, before the data collection for this survey was undertaken. The purpose of the pilot study was to do a trial run of the interview in preparation for the major study (Politt & Hungler 1995: 648). The pilot study was used to determine the amount of time that will be required to complete Section A and B of the questionnaire and to determine logistic problems that may arise during the study.

Section B of the questionnaire was only completed if the patient had a referral letter. It was found that on average Section A and B took 10 minutes to complete, Information regarding the time that it takes to complete Section A and B obtained from the pilot study, was included in the information letter given to the patients when inviting patients to participate in the survey.

The researcher found no problems with the patients understanding of the questions in the pilot survey. The patients who participated in the pilot survey were very co-operative and willing to participate in the research. All the patients

included in the pilot survey left their records in the hospital and the researcher was able to complete Section C of the questionnaire. The patients who participated in the pilot study were not included in the final research sample.

3.7 Sources of bias

In order to overcome any biases during the data collection part of the study the data was collected by the researcher. The same questions were asked to all the participants and the questions were asked in the same manner. Biases occurring due to language difficulties for both the researcher and the patient were overcome by the researcher with the help of an interpreter who knew the patients language. The interpreter was not the same interpreter. On each research data collection day the researcher had an ad hoc arrangement with the nursing staff to interpret the questions and answers for data collection.

The hospital record review was done by the researcher and all criteria for appropriateness noted in the record were recorded on the questionnaire. Bias in data collection was introduced due to incomplete data in the record after consulting with the doctor. On each sampling day doctors attending to patients in the ED were urged and reminded to complete and add all details in the record in order to improve the quality of the data. Biases in data collected for practitioner-referred patients may have been introduced due to missing and lost records.

Information bias was introduced during completion of Section A of the questionnaire when patients started deliberating about employment status and residential area. Patients were reassured from the beginning of the interview that

the information provided to the researcher about their employment status and residential area will not affect the amount of fees paid for services, or their care at the hospital.

3.8 Ethics

The study was conducted in an emergency setting and it was important to include emergency patients in this study in order to meet the study objectives. In emergency situations, the patient was triaged and referred for absolute emergency management immediately. The researcher did not do recruitment and enrollment at this stage, but the researcher followed up with that particular patient when the patient was stabilized. The questionnaire in these cases was completed with the help of a relative/ next of kin if necessary. Patients were not coerced to disclose information if they were unwilling to do so.

The other ethical issue raised was to respect the patient and to provide privacy and ensure confidentiality of the information provided by the patient in order to maintain the dignity of the patient. The participants eligible to partake in the study after being included in the study sample were asked the questions in a private consulting area. In order to ensure that participants will not be identifiable to other people not directly involved in the data collection, or research, and to ensure that patients remained completely anonymous the researcher completed all questionnaires herself. The information provided was maintained as confidential by the researcher and completed questionnaires were kept secured in a locked bag by the researcher.

Patients were not coerced to disclose information if they were unwilling to disclose that information but were reassured at the beginning of the interview that any information disclosed to the researcher would not be used against them or affect their care at the hospital. The patient's right to medical attention was respected and the patients were assured that his/her place in the queue was not to be lost and after the researcher completed the questionnaire, the patient was taken his place in the queue, immediately.

Consent and approval for the study on human subjects was obtained from the Human Research Ethics Committee (HREC) of the University of the Witwatersrand (WITS). Approval and permission to conduct the study was obtained from the Postgraduate Committee of the University of the Witwatersrand (WITS). The reference number of the approved protocol is Protocol Number M070422 ref R14/49 Cassim dated on the 07/05/28 for the purposes of completing research for the Masters in Family Medicine (See Appendix D).

Written consent, support and permission to conduct the study in the ED at HJH was obtained from the superintendent of HJH. Consent and permission to use the Hospitals Urgencies Appropriateness Protocol (HUAP) an instrument in the public domain was obtained from Salvador Peiro, MD, PhD, Health Services Research Unit, Valencia School of Health Services. (See Appendix D)

The personalized introduction and information letter from the researcher to the patients, inviting the patient to participate voluntarily, and ensuring respect, confidentiality and anonymity and giving the patient the option of withdrawing from

the study at any stage or declining to participate in the study was given to every patient invited to participate in the study. All patients who participated in the study signed a written consent form to participate in the research. (See Appendix E)

3.9 Data collection

All information obtained for this study was completed concurrently with the patients visit to the ED at HJH and was recorded by the researcher on data collection days. The data was collected on every 4th day for 14 days in 24 hour cycles, from mid- July to mid-September 2007 in the ED at HJH. On each data collection day data collection was done on a random patient from the first four patients entered in the journal and then every 4th patient entered in the journal after that patient was systematically selected.

The researcher obtained the names of patients from the journal who were eligible to participate in the research (i.e. patients whose names fell on the highlighted line in the journal). The researcher approached the patient and introduced herself to the patient. The researcher then invited the patient to participate in the research. Patients who were willing to participate in the research were then taken to a private area in the ED. A written consent form was signed either by the patient or by proxy.

The questions in Section A of the questionnaire were read out to the patient and appropriate responses were entered in the questionnaire. If the patient had a referral letter the researcher completed Section B of the questionnaire. The patient was then taken back to his place in the queue to consult with the doctor.

The researcher followed up of the outcome of the patient and recorded it. If the patient's hospital record was returned to the clerks, the researcher was able to retrieve the record and complete Section C of the questionnaire.

Some patients brought the record back to the researcher for completion of Section C of the questionnaire. Some admitted patients were followed up in the wards and some were followed up in the emergency department before transfer to the wards. Patients who were very seriously ill were first sent for emergency care and were followed up at a later stage. In this study there was no data to identify the patient, the record number was retained to retrieve /or review the records at a later stage. All necessary measures were implemented to bar access to third parties to confidential information.

Follow up of patients after consulting with the doctor in order to complete Section C of the questionnaire was difficult at times. Some records were lost and the researcher was unable to complete the data in Section C. Patients were generally very co-operative and voluntarily brought their records back to the researcher. For most of the patients included in the study completion of section C was done by obtaining the record from the help desk before the record clerks took the record back to the records department.

3.10 Data Analysis

All questionnaires were collected by the researcher and numbered. The research questionnaire was created in the "make view" section on the Epi Info 3.3.2 statistical programme developed by the Centre for Disease Control in Atlanta,

Georgia. Data was entered on "enter data" section on the same programme. In the primary analysis the whole sample was analysed as a single group. Frequencies and percentages for each variable were calculated.

In the secondary analysis the Stata 10 Statistical package was used to calculate Fishers exact test p- values to determine the association of the socio-demographic factors and referral source and appropriateness of attendance. All calculations were done using the Epi info -3.3.2 statistical program on the personal computer by the researcher, except the Fishers exact test p- values for variables with more than two categories which was calculated on the Stata 10 statistical package by a statistician. The variables were categorized into groups in order to present the data in a more meaningful way. Tables and graphs of the data were developed with an Excel programme. Fisher exact test p-values were selected for statistical significance testing of the data, and tests were done at the 0.05 level of significance.

3.11 Limitations

The study was conducted on patients in an ED setting and all attempts were made to ensure that every patient eligible to participate in the study was included in the study. The hospital records of some patients 29 (7.5%), got lost and the researcher was unable to complete Section C and therefore the appropriateness of the attendance or referral on these patients could not be recorded. This affected the response rate and resulted in small frequencies especially for practitioner-referred patients.

A limitation of this study is that patients attending this facility were not asked to provide a proof of employment and patients may have deliberately lied about employment status in order to pay the minimal fee the hospital. This limitation may have led to information bias for employment status. Patients may have intentionally lied about employment status for fear of having to pay more for the services, and the results on employment status may not reflect the true rate of employment of the ED attendees.

Another limitation is that patients were also not asked for proof of residential address and they may have felt obliged to give a residential area in the catchment area of the hospital for fear of being turned away to another facility. This limitation may have led to information bias for residential area.

The HUAP as a tool for appropriateness has certain limitations and have been discussed (see Appendix A). It is a highly reliable instrument with a high specificity 0.98% and low sensitivity 0.44%. It is also a tool with a low validity when compared with the expert clinician's opinion. (See Appendix A). A limitation of this study is that the HUAP could only be applied after the attending physician had completed all assessment, investigations and management in the ED.

Another limitation of the study is that The HUAP tool used to determine appropriateness of the attendance is an instrument designed around explicit criteria that defines as inappropriate cases treated in the ED that could have been resolved in a similar fashion outside the hospital setting. It does not question the appropriateness of the medical care provided in the ED and it assumes that the

CHAPTER 4

RESULTS

4.1 Response rate

Table 4.1 below summarizes the number of patients attending the ED of HJH during the 14 days of the study. A total of 1834 patients attended the ED and sampling every 4th patient made 443 patients eligible to participate. A total of 389 (87.8%) consented to participate in the study. The patients who were excluded included those who refused to participate in the research (12.2%), those with lost records and missing data (6.6%) and those with missing data (2.7%). Only 348 (78.5%) patients were studied in the final analysis. The response rate for this research was 87.8%.

Table 4.1 Response rate and final sample analysed

14 days Sampling	Total patients	Total eligible	Total Consen- -ing	Lost record	Comple- ted question- naires	Miss- ing data	Total Analy- sed
Sun	142	35	35	5	30	0	30
Mon	139	34	32	1	31	1	30
Tues	121	30	27	0	27	0	27
Wed	120	30	30	0	30	4	26
Thurs	148	37	30	2	28	0	28
Fri	130	32	32	1	31	4	27
Sat	127	32	26	2	24	1	23
Sun	125	21	20	4	16	0	16
Mon	144	36	32	2	30	0	30
Tues	115	28	18	2	16	0	16
Wed	127	31	25	0	25	0	25
Thurs	110	27	27	1	26	2	24
Fri	132	33	20	3	17	0	17
Sat	154	38	35	6	29	0	29
Total	1834	443	389	29	360	12	348

4.2 Socio-demographic profile

4.2.1 Age and gender

Table 4.2 Demographic variables (N=348)

Variable	Categories	Frequency n	Percentage %
Gender			
	Male	181	52
	Female	167	48
Age			
	young adult age(18-24yrs)	35	10.1
	young middle age(25-39yrs)	136	39.1
	older middle age(40-59yrs)	129	37.1
	old age (60-70yrs)	24	6.9
	>70 yrs age	24	6.9

There were more males 181 (52%) than females 167 (48%) in the study sample of 348 patients. For both male and female gender the majority of the patients in the study sample are from the young middle age 136(39.1%) and older middle age groups 129(37.1%) (See Table 4.2 above and Table 4.3 below)

Table 4.3 Distribution of patients by age and gender (N=348)

AGE	GENDER		
Category	Male n (%)	Female n (%)	Total n (%)
young adult age(18-24 yrs)	17(48.6)	18(51.4)	35(10.0)
young middle age (25-39yrs)	82(60.3)	54(39.7)	136(39.1)
older middle age (40-59yrs)	63(48.8)	66(51.2)	129(37.1)
old age (60-70yrs)	11(45.8)	13(54.2)	24(6.9)
>70 yrs age	8(33.3)	16(66.7)	24(6.9)
TOTAL	181(52)	167(48)	348 (100)

For male patients the mean age was 40 years. The majority of the male patients 82 (60.3%) are in the young middle age category (25-39 yrs). For female patients the mean age is 44.5. Most of the female patients 66 (51.2%) are in the older middle age (40-59 yrs) category. (See table 4.3 above)

4.2.2 Employment status

In the study sample there were more unemployed patients 215 (61.8%) than employed 133 (38.2%). Only about 18% of the employed patients were self-employed.

Table 4.4 Distribution of patients by employment status (N=348)

Category	Frequency (n)	Percentage (%)
Employed	133	38.2
(a) employed by employer	117	88
(b) self-employed	24	18
(c) employed by employer and self-employed	8	6
Unemployed	215	61.8
Total	348	100

4.2.3 Residential and work area

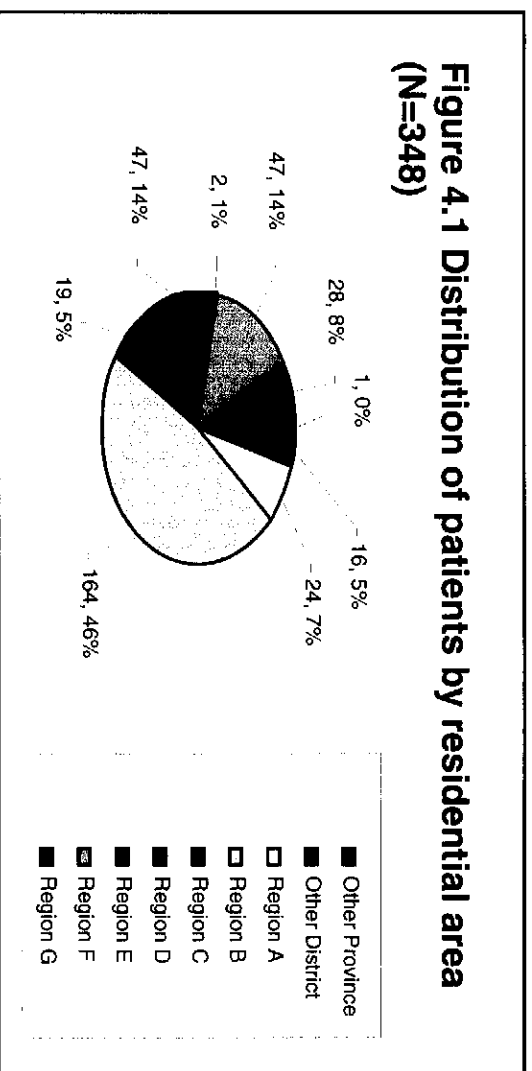


Figure 4.1 Distribution of patients by residential area (N=348)

For residential area it is found that the majority of patients attending this facility live in Region B (46%). A total of 133 (38.2%) of patients indicated that they were employed. Most of the employed patients in the study sample worked in Region B 82 (61.7%) and in Region F 20(15 %). (See figure 4.2 below)

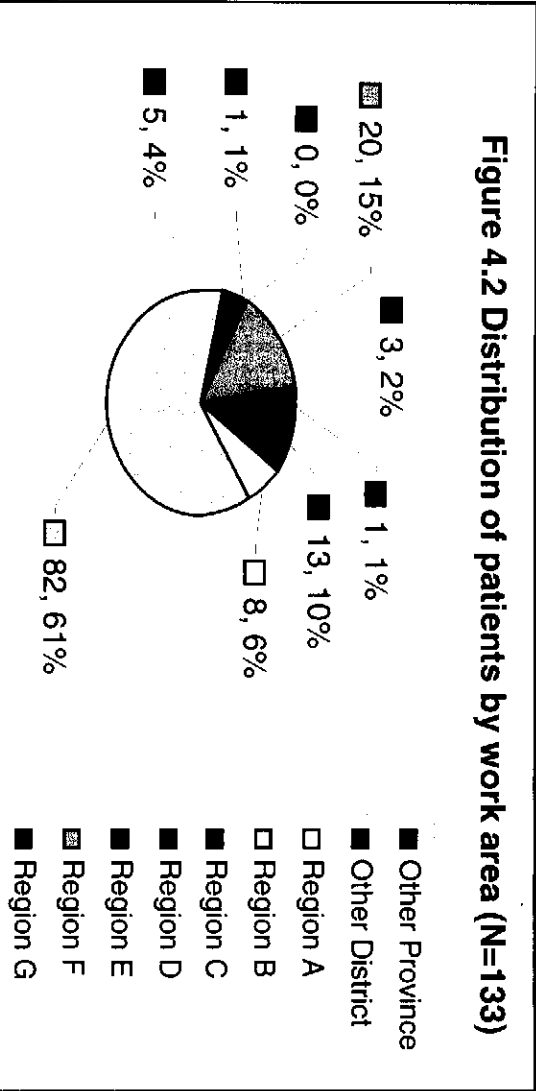


Figure 4.2 Distribution of patients by work area (N=133)

4.2.4 Mode of transport

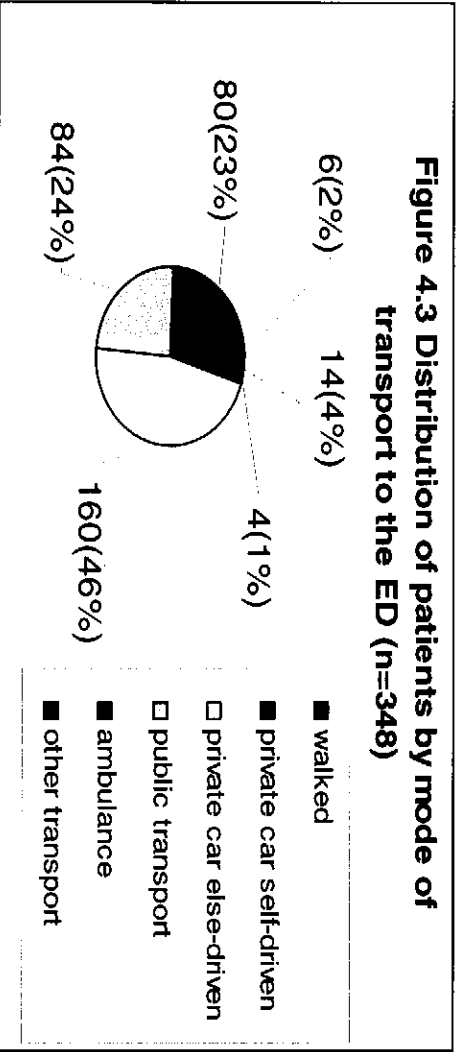


Figure 4.3 Distribution of patients by mode of transport to the ED (N=348)

The most frequent mode of transport to the ED was a private car driven by somebody else 160 (46%). Slightly more patients used public transport to the ED 84 (24.1%) than ambulance 80 (23%).

4.3 Referral Profile

The referral profile variables included the time of arrival to the ED, the source of referral, the type of referring facility, the kind of referring facility, the location of the referring facility, the profession of the referring person and the reason for referral.

4.3.1 Time of arrival at the ED

Most of the patients 199 (55.5%) attended the ED during 08h01 -16h00. See table 4.5 below.

Table 4.5 Distribution of patients by times of arrival to the ED (N=348)

Category	Frequency (n)	Percentage (%)
00h01-08h00	38	10.9
08h01-16h00	199	55.5
16h01-00h00	117	33.6

4.3.2 Referral source

Table 4.6 below shows that almost three quarter of the patients (74.7%) were self-referred.

Table 4.6 Distribution of patients by referral source to ED (N=348)

Category	Frequency (n)	Percentage (%)
Self-referred	260	74.7
Practitioner-referred	88	25.3
Total	348	100

4.3.3 Referral letter

From the total of 348 patients, it was found that 88 (25.3%) of the patients arrived to the ED with referral letters from primary care practitioners and from specialists located outside the hospital.

4.3.4 The types of referring facility

Fewer patients were referred from public facilities 41(46%) than from private facilities 47 (54%). The results are shown in table 4.7 below.

Table 4.7 The distribution of practitioner-referred patients by the type of referring facility (N=88)

Category	Frequency (n)	Percentage (%)
Public Facility	41	46
Private Facility	47	54
Total	88	100

4.3.5 The location of the referring facility

It was found that for the location of the referring facility that there were referrals from all the different regions in the district except Region E. There were also referrals from other districts 6 (7%) and from another province 1 (1%). The largest percentages of the referrals were from practitioners in Region B 35 (39.8%) and from Region C 10 (11.4%) which are the referral regions for HJH in Cluster A. More than 20% of the referrals were from Regions F and G. (see Figure 4.4 below)

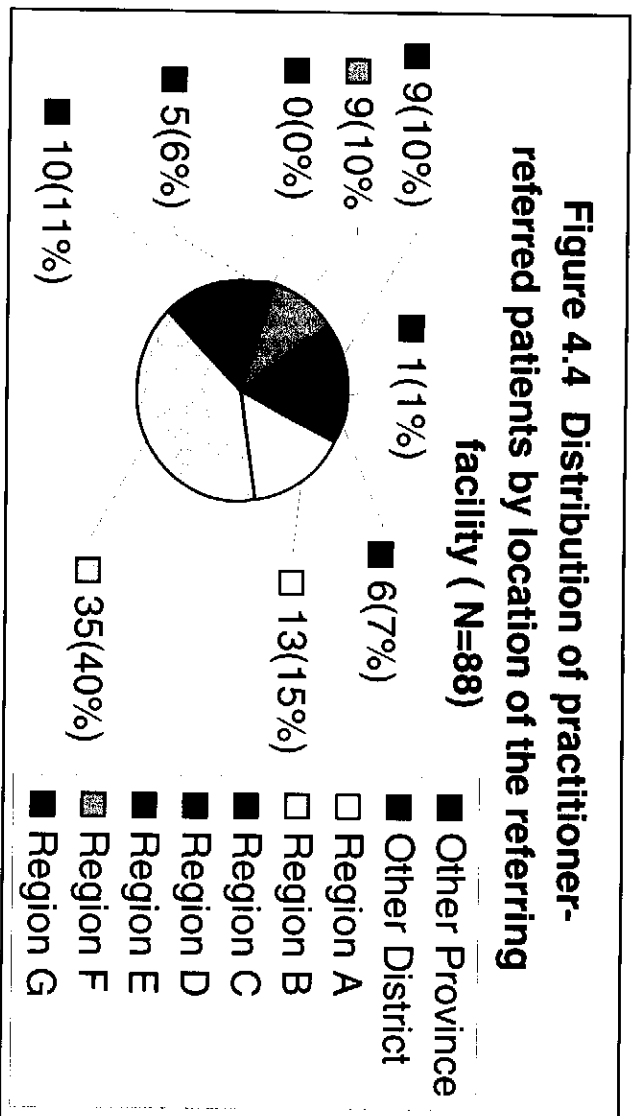


Figure 4.4 The distribution of practitioner-referred patients by location of referring facility (n=88)

4.3.6 The kind of referring facility

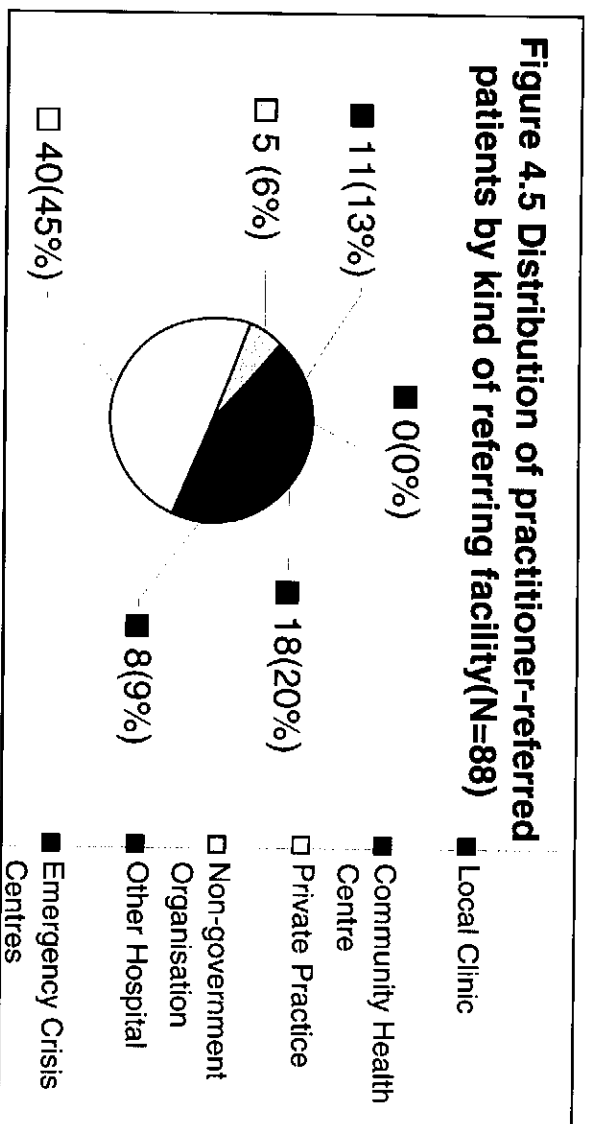


Figure 4.5 The distribution of practitioner-referred patients by kind of referring facility (N=88)

Figure 4.5 above shows the results for the kind of referral facility it was found that more of the patients 40 (45.5%) were referred from private practices compared to those referred from the local clinics 18 (20.5%) and those referred from community health centres 8 (9.1%).

4.3.7 The profession of the referring person

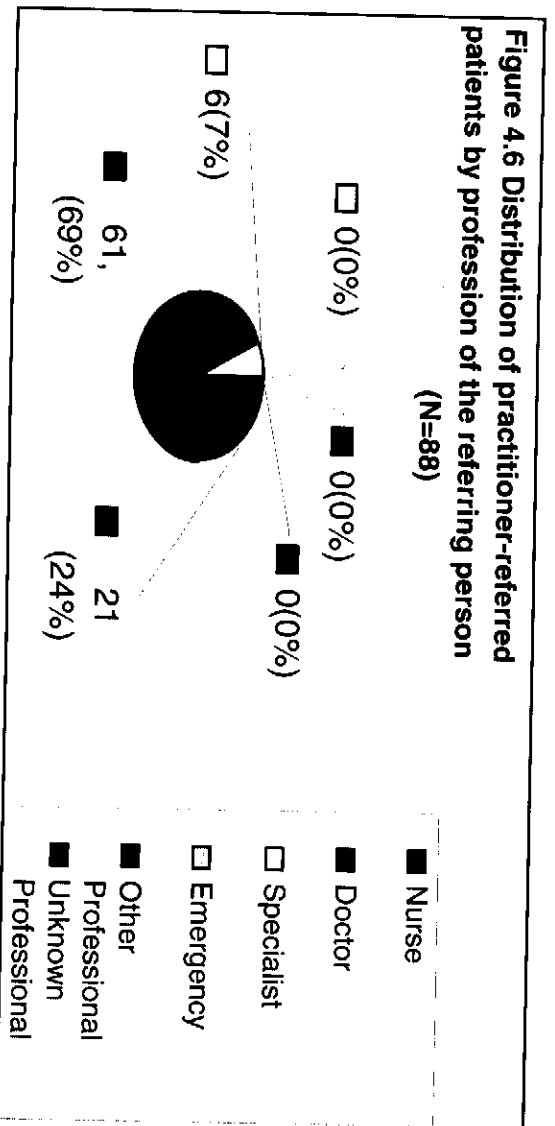


Figure 4.6 The distribution of practitioner- referred patients by profession of the referring person (N=88).

For profession of the referring person it was found that the most of the patients were referred by doctors 61 (69.3%), while nurses referred 21 (23.9%) of the patients and specialists referred 6 (6.8%).

4.3.8 The reason for referral in the practitioner-referred patient

For the reason for referral it was found that the majority 55 (62.5%) of the patients were referred for medical reasons, while 22 (25%) were referred for surgical problems, 7 (8%) were referred for orthopaedic reasons and only 4 (4.5%) were referred for psychiatric reasons.

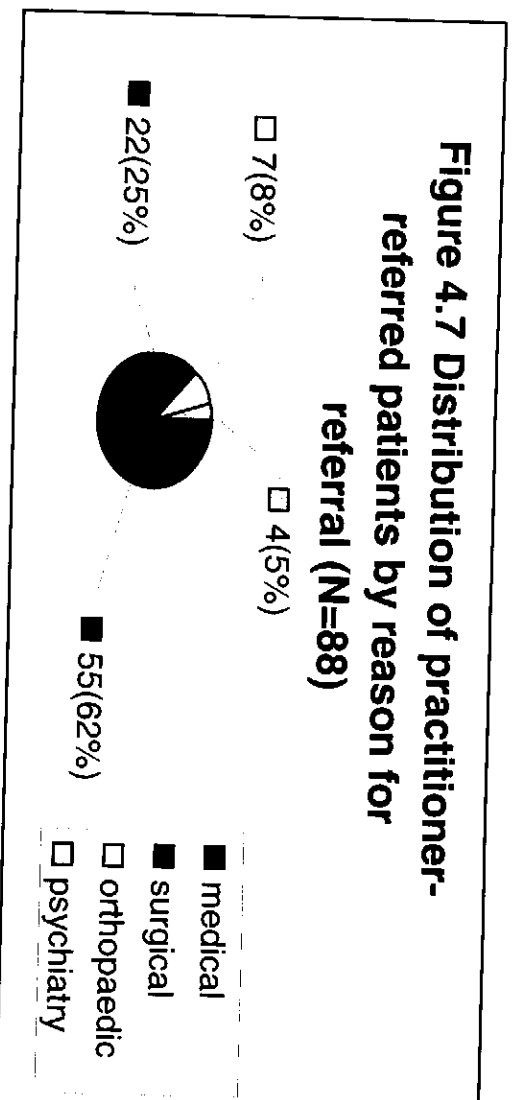


Figure 4.7 The distribution of practitioner –referred patients by reason for referral (N=88).

4.4 The criteria for classification as appropriate on the Hospitals Urgencies Appropriateness Protocol (HUAP)

4.4.1 Appropriate/ Inappropriate for attendance

Section C of the questionnaire included five criteria i.e. (1) appropriateness criteria for severity, (2) appropriateness criteria for treatment, (3) appropriateness criteria for diagnostics, (4) appropriateness criteria for outcome and (5) appropriateness criteria for self- referred patients.

Patients were classified as appropriate for attendance in each section if they met at least one criterion in that relevant section. Some patients met more than one criterion simultaneously and therefore the subtotals for each criterion may not add up and correspond to the total number of appropriate patients.

Patients who did not meet any of the criteria in all sections were classified as inappropriate for attendance. Table 4.8 below is a summary of the number of

patients in the study who met / did not meet the criteria for appropriateness on the HUAP.

Table 4.8 The distribution of patients by appropriateness/ inappropriate of attendance on the HUAP (N=348)

Category	Frequency (n)	Percentage (%)
(1) Appropriate for attendance	285	81.9
(2) Inappropriate for attendance	63	18.1
Total	348	100

It was found that 285 (81.9%) of the patients met at least one criteria for appropriateness in any of the five criteria and was classified as appropriate for attendance.

4.4.2 Appropriateness criteria for severity

Table 4.9 Distribution of patients by appropriateness criteria for severity (N=348)

Category	Frequency (n)	Percentage (%)
(1) Loss of consciousness. Disorientation, Coma etc	18	5.2
(2) Sudden loss of sight or hearing	2	0.6
(3) Altered pulse (< 50 or >140 beats per min)	12	3.4
(4) Altered blood pressure (systolic< 90 or >200, diastolic < 60 or >120)	14	4
(5) Alterations in blood electrolyte gases	4	1.1
(6) Persistent fever (5 days) not controlled with primary care	3	0.9
(7) Active hemorrhage	4	1.1
(8) Sudden loss of functional capacity	5	1.4
(9) Other severity	1	0.3
Total appropriate for severity criteria	42	12.1
Total inappropriate for severity criteria	306	87.9

Of the total of 348 patients, it was found that only 42 (12.1%) of the patients were appropriate for attendance because they met at least one appropriate criteria for severity.

4.4.3 Appropriateness criteria for treatment

Table 4.10 Distribution of patients by appropriateness criteria for treatment (N=348)

Category	Frequency (n)	Percentage (%)
(1) Administration of intravenous fluids	92	26.4
(2) Administration of oxygen	23	6.6
(3) Setting of plaster casts	11	3.2
(4) Surgical intervention	27	7.8
(5) Other treatment	10	2.9
Total appropriate for treatment criteria	135	38.8
Total inappropriate for treatment criteria	213	61.2

A total of 135 (38.8%) were appropriate for attendance because they met at least one appropriate criteria for treatment. In this category more of the patients 92 (68%) were appropriate for the administration of intravenous fluids criterion.

4.4.4 Appropriateness criteria for diagnostics

Table 4.11 Distribution of patients by appropriateness criteria for diagnostics (N=348)

Category	Frequency (n)	Percentage (%)
(1) Monitoring of vital signs	4	1.1
(2) Radiology	219	62.9
(3) Laboratory tests	26	7.5
(4) ECG	82	23.6
(5) Other diagnostic tests	3	0.9
Total appropriate for diagnostics criteria	228	65.5
Total inappropriate for diagnostics criteria	120	34.5

A total of 228 (65.5%) were appropriate for attendance because they met at least one appropriate criteria for diagnostics. In this category more of the patients 219 (62.9%) were appropriate for the radiological tests ordered criterion.

4.4.5 Appropriateness criteria for outcome

Table 4.12 The distribution of patients by appropriateness criteria for outcome (N=348)

Category	Frequency (n)	Percentage (%)
(1) Observation in emergency > 12 hrs	4	1.1
(2) Admitted in hospital	114	32.8
(3) Transferred to another hospital	3	0.9
(4) Died	0	0
(5) Other outcome	0	0
Total appropriate for outcome criteria	121	34.8
Total inappropriate for outcome criteria	227	65.2

A total of 121 (34.8%) were appropriate for attendance because they met at least one appropriate criteria for outcome. In this category more of the patients 114 (32.8%) were appropriate for the admitted to hospital criterion.

4.4.6 Appropriateness criteria for self-referred patients

Table 4.13 The distribution of self-referred patients by appropriateness criteria for self-referred patients (N=260)

Category	Frequency (n)	Percentage (%)
(1) Has an accident	72	27.7
(2) Has a symptom suggesting vital emergency	113	43.5
(3) Has a problem known to the patient	3	1.2
(4) Patient told to come back if urgent	4	1.5
(5) Hospital nearest centre for urgent treatment	1	0.4
(6) Other reason in self- referred patients	2	0.8
Total appropriate for self- referred criteria	193	74.2
Total inappropriate for self- referred criteria	67	25.8

A total of 260 patients were self -referred. Table 4.13 above shows that a total of 193 (74.2%) of self -referred patients were appropriate for attendance because they met at least one criterion in this category. In this category 113 (43.5%) patients had a symptom suggesting vital emergency (e.g. chest pain) and 72 (27.7%) had an accident.

4.4.7 Summary of appropriateness criteria

Table 4.14 below is a summary of the percentages of the patients who were appropriate / inappropriate for all five categories. Of the 348 patients included in this study of patients attending the ED of HJH 285 (81.9%) were appropriate for attendance.

Table 4.14 The total number of appropriate patients for the five categories of criteria for appropriateness on the HUAP

CRITERIA CATEGORY	(N)	Frequency (n)	Percentage (%)
(1) Severity appropriate	348	42	12
Severity inappropriate	348	318	87.9
(2) Treatment appropriate	348	135	38.8
Treatment inappropriate	348	213	61.2
(3) Diagnostics appropriate	348	228	65.5
Diagnostics appropriate	348	120	34.5
(4) Outcome appropriate	348	121	34.8
Outcome inappropriate	348	227	65.2
(5) Self-referred appropriate	260	193	74.2
Self-referred inappropriate	260	67	25.8
TOTAL APPROPRIATE	348	285	81.8
TOTAL INAPPROPRIATE	348	63	18.1

4.5 Cross tabulation of socio-demographic variables and referral source

The frequencies (n) and percentages (%) for the patient socio-demographic variables and frequencies (n) and percentages (%) for self –referred and practitioner –referred patients were obtained, and analyzed using 2 by 2 tables on the Epi-info 3.3.2 statistical package. Fishers exact test p- values were calculated by using the Stata 10 statistical package.

4.5.1 Gender and referral source

Table 4.15 The association of gender and referral source (N=348)

VARIABLE		REFERRAL SOURCE		p-value
GENDER	n (%)	self - referred n (%)	practitioner-referred n (%)	0.527
CATEGORY				
male	181(52)	135 (51.9)	46 (47.7)	
female	167(48)	125 (48.1)	42 (52.3)	
Total	348(100)	260 (74.7)	88 (25.3)	

As can be seen from Table 4.15 above the relationship between gender and the referral source is not statistically significant (p= 0.527).

4.5.2 Age and referral source

As can be seen from Table 4.16 below the relationship between age and referral source is not statistically significant (p= 0.599).

Table 4.16 The association of age and referral source (N=348)

VARIABLE		REFERRAL SOURCE		p-value
AGE	n (%)	Self-referred n (%)	Practitioner- Referred n (%)	0.599
Category				
young adult age (18-24 yrs)	35(11)	26(74.3)	9(25.7)	
young middle age (25-39 yrs)	136(39)	103(75.7)	33(24.3)	
older middle age(40-59 yrs)	129(37)	95(73.6)	34 (26.4)	
old age(60-70 yrs)	24(7)	19(79.2)	5 (20.8)	
(>70 yrs) age	24(7)	17(70.8)	7(29.2)	
Total	348(100)	260(74.7)	88(25.3)	

4.5.3 Employment status and referral source

Table 4.17 The association of employment status and referral source (N=348)

VARIABLE		REFERRAL SOURCE		p-value
EMPLOYMENT STATUS	n (%)	Self-referred n (%)	Practitioner- referred n (%)	0.04
Category				
Employed	133(38)	92(69.2)	41(30.8)	
Unemployed	215(62)	168(78.1)	47(21.9)	
TOTAL	348(100)	260(74.7)	88(25.3)	

As can be seen from Table 4.17 above the relationship between employment status and referral source is statistically significant ($p = 0.04$). Unemployed

patients are more likely to be self-referred than employed patients. Employed patients are more likely to be referred by a practitioner than unemployed patients.

4.5.4 Residential area and referral source

As can be seen from Table 4.18 below the relationship between residential area and referral source is statistically significant ($p = 0.002$). Patients residing in Region B where the hospital is situated are more likely to be referred to and attend this facility than patients from other regions.

Table 4.18 The association of residential area and referral source (N=348)

VARIABLE	REFERRAL SOURCE		p-value
	RESIDENTIAL AREA	Self-referred	
	n (%)	n (%)	Practitioner-referred n (%)
Category			
Other Province	1(0.3)	1(100)	0(0)
Other District	16(4.6)	10(62.5)	6(37.5)
Region A	24(6.9)	11(45.8)	13(54.1)
Region B	164(47.1)	135(82.3)	29(17.6)
Region C	19(5.5)	10(52.6)	9(47.4)
Region D	47(13.5)	34(72.3)	13(72.3)
Region E	2(0.6)	2(100)	0(0)
Region F	47(13.5)	38(80.8)	9(19.1)
Region G	28(8.1)	19(67.8)	9(32.1)
TOTAL	348(100)	260(74.7)	88(25.3)

4.5.5 Work area and referral source

As can be seen from Table 4.19 below the relationship between work area and referral source is statistically significant ($p = 0.007$). Patients working in region B where the hospital is situated are more likely to be referred and to attend this facility than patients who work in other regions.

Table 4.19 The association of work area and referral source (N=133)

VARIABLE		REFERRAL SOURCE		p-value
WORK AREA	n (%)	Self-referred n (%)	Practitioner- referred n (%)	0.007
Category				
Other Province	1(0.8)	1(100)	0(0)	
Other District	13(11.5)	11(84.6)	2(15.4)	
Region A	8(6)	3(37.5)	5(62.5)	
Region B	82(62)	54(65.8)	28(34.1)	
Region C	5(0.4)	5(100)	0(0)	
Region D	1(0.1)	0(0)	1(100)	
Region E	0(0)	0(0)	0(0)	
Region F	20(15)	16(80)	4(20)	
Region G	3(2.3)	2(66.7)	1(33.3)	
TOTAL	133(100)	92(69.2)	41(30.8)	

4.5.6 Mode of transport and referral source

Table 4.20 The association of mode of transport to ED and referral source (N=348)

VARIABLE		REFERRAL SOURCE		p-value
MODE OF TRANSPORT	n (%)	Self-Referred n (%)	Physician-referred n (%)	0.307
Category				
Walked	14(4.0)	12(85.7)	2(14.3)	
Private car self- driven	4(1.2)	4(100)	0(0)	
Private car else-driven	160(45.9)	115(71.9)	45(28.1)	
Public transport	84(24)	63(75)	21(25)	
Ambulance	80(23)	64(80)	16(20)	
Other transport	6(0.2)	2(33.3)	4(66.7)	
TOTAL	348	260(74.7)	88(25.3)	

As can be seen from Table 4.20 above the relationship between the mode of transport to ED and referral source is not statistically significant (p= 0.307).

4.5.7

Time of arrival and referral source

Table 4.21 The association of times of arrival to ED and referral source (N=348)

VARIABLE	REFERRAL SOURCE		p- value
TIME OF ARRIVAL Category	n (%)	Self-referred n (%)	Practitioner-referred n (%)
00h01-08h00	38(11)	32(84.2)	6(15.8)
08h01-16h00	193(55)	132(68.3)	61(31.6)
16h01-00h00	117(33.6)	96(82.1)	21(17.9)
TOTAL	348(100)	260(74.7)	88(25.3)

As can be seen from Table 4.21 above the relationship between the time of arrival to ED and the referral source is statistically significant ($p = 0.01$). Self-referred patients are more likely to attend during the 00h01-08h00 and 16h00-00h00 than during the 08h01-16h00 hours and practitioner-referred patients are more likely to arrive during 08h01-16h00.

In summary for source of referral and socio-demographic variables statistically significant associations were found for source of referrals and employment status $p = (0.04)$, for residential area $p = (0.002)$, for work area $p = 0.007$ and for time of arrival to the ED $p = (0.01)$ (see tables 4.17, table 4.18, table 4.19 and table 4.21 above)

4.6 Cross tabulation of socio-demographic variables and appropriateness of ED attendance.

4.6.1 Gender and appropriateness of ED attendance

Table 4.22 The association of gender and appropriateness of ED attendance (N=348)

VARIABLE		Appropriate (YES)	Appropriate (NO)	p-value
GENDER	n (%)	n (%)	n (%)	0.405
male	181(52)	145(80.1)	36 (19.9)	
female	167(48)	140(83.8)	27(16.2)	
Total	348(100)	285(81.9)	63(18.1)	

As can be seen from Table 4.22 above the relationship between gender and appropriateness of attendance is not statistically significant ($p=0.405$). Of the 181 male patients 145 (80.1%) were appropriate for attendance while 140 (83.3%) of the 167 female patients were appropriate for attendance.

4.6.2 Age and appropriateness of ED attendance

Table 4.23 The association of age and appropriateness of ED attendance (N=348)

VARIABLE		Appropriate (YES)	Appropriate (NO)	p-value
AGE	n (%)	n (%)	n (%)	0.693
young adult (18-24 yrs)	35 (10.5)	24(68.6)	11(31.4)	
young middle (25-39yrs)	136 (39)	113(83.1)	23(16.9)	
older middle (40-59yrs)	129 (37)	105(81.4)	24(18.6)	
old age (60-70yrs)	24(7)	22 (91.7)	2(8.3)	
very old age (>70 yrs)	24(7)	21(87.5)	3(12.5)	
TOTAL	348	285(81.9)	63(18.1)	

As can be seen from Table 4.23 above the relationship between age and appropriateness of the emergency attendance is not statistically significant ($p=0.639$).

4.6.3 Employment status and appropriateness of ED attendance

Table 4.24 The association of employment status and appropriateness of ED attendance (N=348)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
EMPLOYMENT STATUS	n (%)	n (%)	n (%)	0.017
employed	133(38)	101(75.9)	32(24.1)	
unemployed	215(62)	184(85.6)	31(14.4)	
TOTAL	348(100)	285(81.9)	63(18.1)	

As can be seen from Table 4.24 above the association between employment status and appropriateness of the ED attendance is statistically significant ($p=0.017$). Unemployed patients were more likely to be appropriate for attendance (85.6%) than employed people (75.9%).

4.6.4 Residential area and appropriateness of ED attendance

Table 4.25 The association of residential area and appropriateness of ED attendance (N=348)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
RESIDENTIAL AREA				0.88
Category	n (%)	n (%)	n (%)	
Other Province	1(0.2)	1(100)	0(0)	
Other District	16(4.5)	11(68.8)	5(31.2)	
Region A	24(6.8)	20(83.3)	4(16.7)	
Region B	164(47.1)	133(81.1)	31(18.9)	
Region C	19(5.4)	17(89.5)	2(10.5)	
Region D	47(13.5)	39(83)	8(17)	
Region E	2(0.5)	2(100)	0(0)	
Region F	47(13.5)	40(85.1)	7(14.9)	
Region G	28(8)	22(78.6)	6(21.4)	
TOTAL	348	285(81.9)	63(18.1)	

As can be seen from Table 4.25 above the relationship between residential area and appropriateness for attendance is not statistically significant ($p=0.88$).

4.6.5 Work area and appropriateness of ED attendance

Table 4.26 The association of work area and appropriateness of ED attendance (N=133)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
WORK AREA				0.773
Category	n (%)	n (%)	n (%)	
Other Province	1 (0.8)	1(100)	0(0)	
Other District	13(9.8)	9(69)	4(31)	
Region A	8(0.6)	5(62.5)	3(37.5)	
Region B	82(61.7)	64(78)	18(22)	
Region C	5(3.8)	3(60)	2(40)	
Region D	1(0.8)	1(100)	0(0)	
Region E	0(0.0)	0(0.0)	0(0)	
Region F	20(5.7)	14(70)	6(30)	
Region G	3 (0.9)	2(66.7)	1(33)	
TOTAL	133 (100)	99(74.4%)	34(25.6)	

As can be seen from Table 4.26 above the relationship between work area and appropriate for attendance is not statistically significant ($p = 0.773$).

4.6.6 Mode of transport to ED and appropriateness of ED attendance

Table 4.27 The association of mode of transport to ED and appropriateness of ED attendance (N=348)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
MODE OF TRANSPORT				0.002
Category	n (%)	n (%)	n (%)	
Walked	14 (4.0)	10(71.4)	4(28.6)	
Private car self- driven	4(1.1)	2(50)	2(50)	
Private car else- driven	160(46)	129(80.6)	31(19.4)	
Public transport	84(24)	66(78.6)	18(21.4)	
Ambulance	80(23)	75(93.8)	5(6.2)	
Other transport	6(2.0)	3(50%)	3(50)	
TOTAL	348(100)	285(81.9)	63(18.1)	

As can be seen from Table 4.27 above the relationship between mode of transport to ED and appropriateness of ED attendance is statistically significant ($p= 0.002$). Patients arriving to the ED were more likely to be appropriate for attendance than inappropriate for attendance no matter what mode of transport they used. Patients arriving to the ED by ambulance were most likely (93.8%) to be appropriate for attendance than those arriving by other means of transport.

The results from cross tabulation of socio- demographic variables and appropriateness of attendance shows that there are statistically significant associations for employment status ($p=0.017$) and mode of transport ($p=0.002$) (see tables 4.24 and table 4.27 above)

4.7 Cross tabulation of referral profile variables and the appropriateness of ED attendance.

4.7.1 Referral source and appropriateness of ED attendance

Table 4.28 The association of referral source and appropriateness of ED attendance (N=348)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p- value
REFERRAL SOURCE				0.01
Category	n (%)	n (%)	n (%)	
Self-referred	260(74.7)	221(85)	39(15)	
Practitioner-referred	88(25.3)	64(72.7)	24(27.3)	
TOTAL	348(100)	285(81.9)	63(18.1)	

As can be seen from Table 4.28 above the association between the referral source and the appropriateness of attendance is statistically significant ($p= 0.01$).

Self –referred patients (85%) were more likely to be appropriate for attendance than practitioner –referred patients (72.7%).

4.7.2 Referral letter and appropriateness of ED attendance

Table 4.29 The association of patients referred with/ without a referral letter and the appropriateness of ED attendance (N=348)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
REFERRAL LETTER	n (%)	n (%)	n (%)	0.01
referral letter (YES)	88(25.3)	64(72.7)	16(27.3)	
referral letter(NO)	260 (74.7)	221(85)	39(15)	
TOTAL	348(100)	285(81.9)	63(18.1)	

As can be seen from Table 4.29 above the relationship between patients with referral letters and appropriateness of attendance is statistically significant ($p=0.01$). Self- referred patients who attended the ED with no referral letter (85%) were more likely to be appropriate for attendance than those arriving with referral letters (72.7%).

4.7.3 Time of arrival and appropriateness of ED attendance

Table 4.30 The association of times of arrival to ED and appropriateness of ED attendance (N=348)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
TIME OF ARRIVAL				0.572
Category	n (%)	n (%)	n (%)	
00h01-08h00	38(10.9)	29(76.3)	9(23.7)	
08h01-16h00	193(55.5)	158(81.9)	35(18.1)	
16h01-00h00	117(33.6)	98(83.8)	19(16.2)	
TOTAL	348(100)	285(81.9)	63(18.1)	

As can be seen from Table 4.30 above the relationship between the patients time of arrival to the ED and the appropriateness of attendance is not statistically significant ($p= 0.572$).

4.7.4 Type of referring facility and appropriateness of ED attendance

Table 4.31 The association of type of referring facility and appropriateness of ED attendance (N=88)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
REFERRING FACILITY	n (%)	n (%)	n (%)	0.811
Public facility	41 (46.5)	29(70.7)	12(29.3)	
Private Facility	47(53.4)	35(75)	12(25)	
TOTAL	88(100)	64(72.7)	24(27.3)	

It can be seen from Table 4.31 above that there was no statistically significant difference in the appropriateness of referral of patients by the type of referring facility ($p=0.811$). Patients were more likely to be appropriate than inappropriate for attendance no matter which type of facility was referring them.

4.7.5 Location of the referring facility and appropriateness of ED attendance

As can be seen from Table 4.32 below the relationship between the location of the referring facility and the appropriateness of attendance is not statistically significant ($p= 0.302$). Patients referred from any area or region to the ED were more likely to be appropriate than inappropriate for attendance.

Table 4.32 The association of location of referring facility and appropriateness of ED attendance (N=88)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
REFERRAL AREA LOCATION				0.302
Category	n (%)	n (%)	n (%)	
Other Province	1(1.2%)	1(100)	0(0)	
Other District	6(6.8)	5(83.3)	1(16.7)	
Region A	13(14.8)	7(53.8)	6(46.2)	
Region B	35(40)	23(65.7)	12(34.3)	
Region C	10(11.4)	10(100)	0(0)	
Region D	5(5.7)	4(80)	1(20)	
Region E	0(0.0)	0(0.0)	0(100)	
Region F	9(10.3)	7(77.8)	2(22.2)	
Region G	9(10.3)	7(77.8)	2(22.2)	
TOTAL	88(100)	64(72.7)	24(27.3)	

4.7.6 Reason for referral and appropriateness of ED attendance

Table 4.33 The association of the reason for referral and appropriateness of ED attendance (N=88)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
REFERRAL REASON				0.401
Category	n (%)	n (%)	n (%)	
Medical	55(63)	42(76.4)	13(23.6)	
Surgical	22(25)	13(59.1)	9(40.9)	
Orthopedic	7(8)	6(85.7)	1(14.3)	
Psychiatric	4(5)	3(75)	1(25)	
TOTAL	88(100)	64(72.7)	24(27.3)	

As can be seen from Table 4.33 above the relationship between the reason for the referral and the appropriateness of attendance is not statistically significant ($p = 0.401$). Patients were more likely to be appropriate than inappropriate for attendance in all the reason for referral categories above.

4.7.8 Kind of referring facility and appropriateness of ED attendance

As can be seen from Table 4.34 below the relationship between the kind of referring facility and the appropriateness of attendance is not statistically significant ($p = 0.386$). All the different kinds of facilities were referring more appropriate for attendance patients than inappropriate for attendance patients except for the non- government organizations that referred more inappropriate (3) than appropriate patients (2).

Table 4.34 The association of kind of referring facility and appropriateness of ED attendance (N=88)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
KIND OF FACILITY				0.386
Category	n	n (%)	n (%)	
Local clinic(LC)	18(21)	11(61.1)	7(38.9)	
Community Health Centre (CHC)	8(9)	7(87.5)	1(12.5)	
Private Practice(PP)	40(45)	31(77.5)	9(22.3)	
Non- Government Organization (NGO)	5((5.7)	2(40)	3(60)	
Hospital(H)	11(12.5)	8(72.7)	3(27.3)	
Other(O)	6(6.8)	5(83.3)	1(16.7)	
TOTAL	88(100)	64(72.7)	24(27.3)	

4.7.9 Profession of the referring person and appropriateness of ED attendance

Table 4.35 The association of profession of referring person and appropriateness of ED attendance (N=88)

VARIABLE		APPROPRIATE (YES)	APPROPRIATE (NO)	p-value
REFERRING PROFESSION				0.199
Category	n (%)	n (%)	n (%)	
Nurse	21(23.4)	13(61.9)	8(38.1)	
Doctor	61(69.3)	45(73.8)	16(26.2)	
Specialist	6(100)	6(100)	0(0)	
TOTAL	88(100)	64(72.7)	24(27.3)	

As can be seen from Table 4.35 above the relationship between the profession of the referring person and the appropriateness of attendance is not statistically significant ($p=0.199$). The patients referred to the ED by the different categories of professions were more likely to be appropriate than inappropriate for attendance. Of the practitioner-referred patients 100% referred by specialist were appropriate for attendance while 73.8% of patients referred by doctors were appropriate for attendance and 61.9% of patients referred by nurses were appropriate for attendance.

The results from the cross tabulation of the referral profile variables and the appropriateness of the ED attendance shows that there are no statistically significant relationships between the type of referring facility, the location of the referring facility, the kind of referring facility, the profession of the referring person, the reason for the referral and the appropriateness of ED attendance. (See table 4.31, table 4.32, table 4.33, table 4.34 and table 4.35 above). There are statistically significant associations between the patients referral source and appropriateness of the ED attendance ($p=0.01$) and between arriving to the ED with a referral letter and appropriateness of the ED attendance ($p=0.01$) (see table 4.28 and 4.29 above).

CHAPTER 5

DISCUSSION

In this descriptive study, a cross-sectional, systematic sample of adult patients presenting to the ED at HJH were studied by the researcher. The researcher invited patients to participate in the research and completed the questionnaires by interviewing patients in a private area, by using the referral letter and by using the hospital record. The completed numbered questionnaires were collected and analyzed on the Epi Info version 3.3.2 and on the Stata 10 statistical programme. Frequencies, percentages, and Fishers exact test p- values were calculated. An Excel programme was used to create tables.

5.1 Data collection challenges

In this study it is important to firstly point out the numerous challenges encountered in the research process because these probably impact on the data. Firstly triaged by a nurse or a doctor may have biased the study sample towards the more appropriate patients because inappropriate patients were triaged away first. Secondly ambulance patients mostly come into the ED with an intravenous drip inserted already, and since having an intravenous drip was a criterion for appropriateness, this could have biased the sample to more of the appropriate patients.

Another challenge encountered was the process of inviting patients eligible to partake in the research in a completely private setting in the ED. Eligible patients from the journal list were willing to participate in the research but were sometimes

too sick to move to a private area to complete the questionnaire and sign the informed consent, and this process was extremely tedious at times. Sometimes the ED was so overcrowded that moving through the corridors, filled with stretchers to the private interviewing room, was difficult for the very sick patients. Consent by proxy and responses by the proxy were more appropriate in these cases.

Although the patients' race was not particularly sought in the research, it was found that language difficulties were encountered with black patients more than patients of other race. For this research the arrangement with the nursing staff working in the ED to assist as interpreters was an ad hoc arrangement, and was also problematic at time.

Patients may have also felt obliged to lie about their address and residential suburb (despite being reassured at the beginning of the interview that the information provided to the researcher will not affect their care at the hospital), for fear of being refused care at the hospital if they were not residing in the catchment area of the hospital. This may have biased the study results for residential area.

In addition to the above there were some patients who were victims of trauma and had severe pain, some were intoxicated and behaved aggressively and rudely, and some patients were just very sick. Collecting the data on these patients was difficult at times, but was overcome with persistence and patience by the researcher. The patient's medical condition may have resulted in information bias.

The hospital also has a problem of lost records. The records of 29 (7.5%) of the patients sampled in this study were lost and obtaining patients records for completing section C of the questionnaire was extremely difficult. Some patients have up to six records in the record department at HJH.⁵⁶ Patients in this hospital take their records out of the hospital, for better safe keeping because records get lost in the record department, to avoid waiting for the record in the record queue on follow up visits, to get to the doctors queue quickly, to avoid paying on each visit or because they are impatient and cannot wait for the service.⁵⁶

Besides the study limitations due to losses in follow-up of 29 (7.5%) of the patients, lost hospital records are costly, valuable patient information gets lost with cost to hospital implications. Patients who take their records out of the hospital can have access to information which can be used by patients and their lawyers for litigation purposes (it is not just about doctor negligence but about lawyers who see a way of benefiting patients and themselves on legal issues). Over the last ten years claims by patients against doctors in South Africa have risen to where they now equal ten times the country's annual growth rate, resulting in doctors increasingly practicing defensive medicine and some high risk specialists even considering alternate location and career options which will worsens the human resource deficit in the health sector.⁵⁷

It was observed during the data collection process that patients wait up to ten hours in the ED before being transferred to the medical wards and this increases the perception of overcrowding and inappropriate use of the ED. This

available. In this study there was no significant association between time of arrival to the ED and the appropriateness of attendance.

5.3.2 Socio-demographic profile

5.3.2.1 Gender

In this study there are more male compared to females participants. It was found that more males (135) than females patients (125) are self-referred. The greater attendance for males may be due to fact that there is a surgical ED at HJH hospital and due to social and cultural norms i.e. (men being more mobile in the community, using alcohol and engage in aggressive fights with knives etc). Currently 1 in 4 men and 1 in 10 women are believed to be drinking alcohol in a hazardous way.⁵⁹ Large numbers of attendances at the ED are associated directly or indirectly with both alcohol dependant and single occasion risky drinking.⁵⁹ Alcohol drinking may result in trauma due to road accidents, fights, assaults and other traumatic events requiring hospital care.⁵⁹ Twice as many men attend EDs due to alcohol related problems and the majority of these are young adults aged < than 40 years.⁵⁹ It may be possible that because there are no obstetric and gynaecology services at HJH hospital, less females are attending this facility for emergencies. Other studies which include obstetric and gynaecology services showed higher percentages of females (59.2%) and in the young middle aged group.⁴¹ Other studies have also found ED attendance to be associated with self-referred male patients.⁶⁰

For gender and appropriateness of attendance it is found that both male and female patients are appropriate for attendance in > 80% of the patients. There

was no statistically significant association between gender and the appropriateness of the attendance ($p=0.404$). Only one other study in the literature search found an association between female sex and inappropriate use of EDs.⁴¹ This finding was probably due to the specific characteristics of the population examined.⁴¹ Other studies on inappropriateness of ED attenders also found more males were inappropriate for attendance than females.^{8, 39, 60}

5.3.2.2 Age

In this study there were more males than females in the young middle aged group. For age and appropriateness of attendance it is found that the category that was least appropriate for attendance (68.6%) is the young adult category (18-24 yrs). Similar findings were found in a Spanish study where inappropriateness of ED use was associated with subjects in the younger than 40 years age group.⁸ There are more self-referred (79.2%) patients in the old age group (60-70yrs) than in any other age group. In this study 24 patients were studied in the old age category (60-70 yrs) and of these only 2 were inappropriate for attendance. Some studies report abuse of the ED by the elderly.³⁹

5.3.2.3 Employment status

More employed 41(30.8%) patients were referred with referral letters from primary care practitioners (especially GP's) than unemployed 47(21.9%) patients. This may be because more employed people have private medical aid and more employed people can afford services from GP's than unemployed people. When looking at self-referred patients and employment status it is found that there is a statistically significant association ($p=0.04$). Most of the self-referred patients

168(78.1%) are unemployed. It may be that due to the perception of better same day care in the hospital ED, unemployed patients paid the low cost charge of R20 at the hospitals ED although the primary health care services in the public sector are offered to patients for no charge. Holohan et al (1975) found in his study of patients in the ED, that almost half of those interviewed did not mind waiting in a busy ED for their turn, and expressed dissatisfaction in the GPs appointment system.³⁸

There is a statistically significant association ($p=0.017$) between employment status and appropriateness of attendance. More unemployed patients (52.8%) are appropriate for attendance compared to employed people (29.02%) who are appropriate for attendance. These findings and the demographics of the population in Region B coincide with the findings in the literature where inappropriate use of services is associated with unemployed or self-employed people with no medical insurance and who are mainly foreigners.⁵⁴ The city of Johannesburg epidemiological data has shown an unemployment rate of 37%¹² of and massive urban migration into the city centre of people from rural areas and from neighboring and other far away countries (Zimbabwe, India etc). Unemployed people suffer from illnesses related to their poverty, lack of proper nutrition, dehydration and diarrhea, lack of access to tap water and they present to the health care facilities as sick patients requiring intravenous drips and admissions.⁶²

5.3.2.4 Residential and work area

For residential area it is found that there is a statistically significant relationship between the residential area and the referral source ($p=0.002$). Of the 348 patients in the study sample 164(47.1%) of the patients live in Region B and of these 135(82.3%) are self-referred to the hospital. This result is similar to other studies that found an association between ED attendance, self-referrals and shorter distance to the hospital.^{8, 20} It may also be that since patients feel obliged to give an address within the catchment of the hospital in order to justify their treatment they claimed proximity to the hospital and the number of patients living in Region B is high. Lutge et al, found similar findings of patients claiming proximity to the hospital to justify tertiary level services in their study on appropriateness of attendance at out patients departments in secondary and tertiary hospitals.²⁰

For work area there is a statistically significant relationship between the work area and the types of referrals ($p=0.007$). From the 133 (38.2%) of employed patients 82 (61.6%) work in Region B and of these 54 (58%) are self-referred to the ED. Patients working in this region may be attending as self-referrals due to accident related injuries or because of the convenience of short distance to get medical or emergency care. It may also be that they felt ill during working hours and an employer referred them to the hospital ED or that the health care facilities closer to patients homes are closed when they get back from work and patients choose to attend the 24 hour hospital facility in their work area.

For patients who live and work in Region B, the ED is the nearest 24 hour facility. There is no 24 hour CHC in Region B. There are CHC's in Region C (Discovery CHC) and Region F (Hillbrow CHC) which are closest to Region B. Transport and access to Hillbrow CHC is easily available to the patients in Region B, but many patients are afraid to go to Hillbrow in Region F because of the high crime rate in Hillbrow. The Discovery CHC is opened for 24 hours in Region C but there are no bus routes available from all areas in Region B to this facility.⁶²

There is no significant association between the residential area and the appropriateness of the attendance (p=0.88) (see Table 4.24). When looking at the area of residence and the appropriateness attendance it is found that the most inappropriate attendees were from Region G. This finding coincides with the behavior of the patients from the Indian and Black ethnic origins traditionally residing in the Lenasia area in the Region G Sub- District. These patients bypass the referral hospital in Cluster B i.e. The Chris Hani Baragwanath Hospital and attend as self- referred patients to HJH.⁶²

There is no significant association between work area and the appropriateness of the attendance (p=0.773) (see Table 4.25). When looking at the work area and the appropriateness of the attendance it is found that more inappropriate for attendance attendees worked in Region A. These patients attended the hospital because they were sometimes turned away from the larger Tertiary University Hospital {Charlotte Maxeke Johannesburg General Hospital (Jhb –Gen)} in their area due to the strict triage policies and due to the closure of the Jhb-Gen hospitals polyclinic department in 2006.¹⁷⁻¹⁸ These patients may be afraid to go to

the Hillbrow CHC which they are supposed to use, or they may perceive the care in the ED of HJH to be more convenient by getting all necessary investigations done at one facility and not having to travel to another facility for an investigation e.g. X-ray (patients who attended the Hillbrow CHC and who needed an X-ray were referred to Jhb-Gen for the X-ray at the time of the study).⁶²

4.3.2.5 Mode of transport

The most frequent mode of transport is the private car driven by someone else followed by public transport and ambulance. It may be that since the hospital attends to patients from all race groups, the White, Colored and Indian patients (who are mainly from the middle class)¹¹ attending this facility are not making use of the predominantly black public transport system (taxi's) available in South Africa, and they are using a private car driven by someone else. This result could also be due to the poor response of the emergency ambulance services in the district, the patient's perceived need of emergency, the convenience, safety and ease of access to the hospital by a private car.⁶²

For self -referred patients and mode of transport it is found that 64 (80%) of patients that came by ambulance were self -referred. Similar findings were found in another study⁴⁰ where 72.8% of ambulance patients were self -referrals.

There is a statistically significant association between mode of transport and appropriateness of attendance $p=0.002$. Of the 80 patients who come by ambulance 75 (93.8%) were appropriate for attendance and 64 (80%) were self-referred. Most self- referred patients that were brought by the ambulance to the ED had a drip inserted, had problems of diseases related to poverty especially

HIV and TB, and were admitted. "Abuse of ambulance service has previously been reported by Morris & Cross in 51.7% of all cases and by Mestitz in 40% of medical cases." ³⁹

5.3.3 Appropriateness/ Inappropriateness of attendance

The study results show that almost a fifth of the patients (18.1%) used the emergency inappropriately. Another study in South Africa showed almost one third of patients are inappropriate for attendance.²⁸ Studies conducted in Spain^{8, 53-54} report almost 30% inappropriate visits, other countries report percentages from 10-90%⁸ of inappropriate visits and some other studies have reported a range from 11-82% of inappropriate visits.^{41,60}

The specific population and setting in which the study was conducted (the study population includes adults older than 18 years and which excludes paediatric and obstetric and gynaecology patients) may have accounted for the low percentage of inappropriate patients (18.1%) compared to other studies.^{41, 28} The low percentage of inappropriate use may also be due to the fact that the HUAP tool is based on explicit and objective criteria and is expected to identify only those patients who are clearly inappropriate for attendance, it does not question the clinical judgment of the attending emergency practitioner in the ED. The low proportion of inappropriate attendees in this study could be interpreted more efficiently by taking into consideration that most patients were regarded as appropriate by meeting any one criterion in the five criteria for appropriateness on the HUAP, especially radiology in the diagnostic criteria, an intravenous drip administration in the treatment criteria, or admission in the outcome criteria.

In this study there are more unemployed patients than employed patients and more of the patients living and working near to the hospital in Region B that are using this facility. It may that because HJH is a public/ government institution and has overqualified staff (specialists etc) it may be perceived by unemployed patients living in the Region B area as a cheap and convenient place to secure health care. More of the referrals in this study are from doctors, working in private primary health care practices, located in Region B and for medical reasons.

5.3.4 Appropriateness demand in the ED

Large proportions (62.9%) of the patients were given radiological investigations and were appropriate for this criterion alone. It may be that these results were obtained because HJH is an academic teaching hospital with a range of senior doctors, community service doctors and general practitioners offering services in the ED during the 24 hour shifts and X -Rays could have been ordered unnecessarily or because it is easily available. It may also be possible that the ordering of radiological investigation could have been biased by the experience of the attending doctor.

It can be said that although it is the responsibility of the primary care practitioner to be the gate keeper before entry into the ED, it is also the responsibility of the attending ED practitioner to reduce diagnostic investigations and the therapeutic intensity in order to keep the truly non-urgent patients out of the ED of the hospitals. Another study also found that although the attending emergency practitioners at the EDs found that the ordering of X-Rays were not essential, they ordered it anyway because it was easily available.⁸

It was found that a large proportion of the patients (26.4%) were appropriate for attendance on the HUAP for intravenous fluid administration. Intravenous fluid administration could have biased the sample into more of the appropriate for attendance patients when we consider that all patients who come by ambulance have a drip already inserted.

Large proportions of the patients are appropriate for admission (32.8%) in the outcome criteria of the HUAP. The fact that the ED is staffed by junior doctors and sessional doctors also raises up the possibility of inappropriate hospital admissions. Campbell et al, in their study on inappropriate admissions reached an important conclusion that a proportion of patients are inappropriately admitted to hospital.⁶³ In another similar study it was found that 13.4% of internal medicine department admissions were inappropriate and the main reason was the potential for out-patient tests or treatments to be done quickly in the hospital while the patient was admitted because of the long wait for out-patient appointments.⁵⁴ Hospital admissions continue to increase in the western world since 1990.^{6, 44}

It may be that the HIV/AIDS pandemic and associated TB is impacting on the acute beds at all levels of hospitals.¹⁷⁻¹⁸ It may be that although a hospital admission is appropriate, the bed level needed may not be appropriate for a level 2 hospital such as HJH. As part of the service plan improvement the HJH tried to de-link their level 1 admitted patients away from the hospital and outsourced them to Selby Park Hospital, a level one private facility. This attempt was only partially successful. The Chris-Hani Baragwanath Hospital a tertiary level 3 hospital had established a level 1 ward in the hospital to deal with the admitted level 1 patients.

The drawback has been that the cost centres were not well established. It is therefore difficult to evaluate if level 1 beds are cost effective and are having the desired effect.¹⁷⁻¹⁸

From the criteria on the HUAP for self-referred patients it is found that (27.7%) had an accident (i.e. traffic, work related, in a public place etc) and were brought to the ED. Similar findings are seen in a study by Morgan et al.³⁸ Their study showed that, out of 232 patients, 22.8% of the referrals were from the work place, 5,6% of referrals were from an injury in the street and 5,6% of referrals were from schools making a total of 34% of the attendances. These patients were not referred with a referral letter but somebody else (e.g. employer, colleague at work or school teacher) had made a decision that the person must attend the ED.³⁸

In this study it was found that 43.5% self-referred patients are appropriate on the HUAP by meeting the criteria of a symptom suggesting a vital emergency. It may be that since patients vary in their own perceptions of the severity of their ailment or injury the patients in this study could have exaggerated their symptoms.³⁸ Calnan, studied the behaviour patterns of people with minor cuts and noted wide variations in the way they injured assessed their cuts. Two-thirds of those interviewed described their injuries as serious because the 'cut looked deep, or 'it would not stop bleeding'.³⁸ In a similar study on minor illnesses, Calnan found that 85% of respondents thought their illnesses to be serious because "they did not know what it was" or because "it was not an ordinary pain" Fitzgerald et al, in a study into perceived urgency distribution of patients presenting to the ED,

showed that on a linear scale of 0-10 (0 being the lowest score) 90% of the patients tested scored less than 5.³⁸

5.3.5 Source of referral

5.3.5.1 Self-referral

Almost three quarter (74.7%) of the referrals in this study was self- referrals. Pease, et al, found that one major reason why people choose to attend the ED is the 24 hour open door policy adopted by most EDs of the hospitals linked with the difficulty of contacting the GP out of surgery hours.³⁸ In a Spanish study it was found that the major reason for self-referral (51.1%) was the greater confidence in ED than in primary care.⁸

It may be that the patients in this study had personal preferences and tastes and this influenced his/her attendance at a secondary care setting without being referred to this facility. It may also be that the factors associated with health care systems such as availability of health services, personal and financial resources available in bigger hospitals may have influenced the patient to use this health facility.⁶⁶

There are many reasons why people choose to bypass primary care facilities in South Africa. There is evidence from the South African Free Health Care Policy introduced in 1996 to promote greater equity to health, to show that the policy may have encouraged patients with minor ailments to bypass primary health care services and to use secondary and tertiary level care inappropriately.⁶⁴⁻⁶⁶

Demand for health is dependant on a person's income. A person who can afford to pay for services may demand it and pay for the direct costs.⁶⁴

Recent studies by Bitran & Leighton have found that patients in the Sub-Saharan Africa regard the availability of medicines as one of the key indicators of quality of health services.⁶⁶ Access to doctors is also frequently seen as an indicator of good quality health services. Staff attitudes also influence patient's perceptions of service quality, rude primary care nurses and lack of caring by health personnel can be a deterrent to service utilization at primary care level.⁶⁴

Other studies report that shortages of medication, mixing medications with water, slow staff, lack of X-ray facilities, lack of doctors, no confidentiality, problems not taken seriously, staff too slow, staff go on long lunch and the negative attitude of nurses especially rudeness are among the problems that patients perceive as poor quality of services in primary care clinics.⁶⁷

Sempere-Selva et al, found that 79.3% self-referrals in their study on inappropriate use of an accident and emergency departments.⁸ Fry, in his study into casual attendances in the ED found that 62% referred themselves, Conway showed a reduction in this figure, with 37% of the patients in his study using the method of self-referral, Davidson et al and Cliff & Wood showed similar figures for self-referral, 67% and 57% respectively.³⁸

The greater proportion of appropriateness of attendance for self-referred patients could be due to the fact that self-referred patients included those who had a symptom suggesting a vital emergency (43.5%) and for having an accidental

injury (27.7%) and were not given any treatment outside the hospital and were appropriate for treatment or diagnostic tests (e.g. X-rays) done in this hospital. Similar findings were found in other studies.⁸ Still other studies showed that more inappropriate attendances were associated with self-referrals than practitioner-referred patients.^{60, 53}

5.3.5.2 Practitioner-referral

This study found that a significant proportion of the patients (25.3%) attending the emergency were referred with referral letters from both private (13.5%) and public health care facilities (11.8%). The referrals from GP's may be due to the fact that many patients who visits GP's use private medical aid and when these resources are expanded the GP's refer patients to the public hospitals as an alternative cost effective solution (this study was conducted in from mid-July to mid-September when private medical care funds get depleted).

Referral from the GP to the ED is not an uncommon practice worldwide. Crombie, in his survey of 410 patients, found that (26.3%) of the patients attending had been referred by their GP, Conway in a similar survey of 2511 patients, found that 40.8% were GP referrals.³⁸ As ED units are usually staffed by junior medical staff, Pease asked why the GP should require the opinion of a junior doctor especially as GPs are more experienced doctors. He argued that the GP referral was just a way of jumping the queue to get the patient admitted to the hospital.³⁸

Myers carried out a postal survey and found that GPs tend to avoid regular handling of certain procedures due to lack of facilities in their practices and

routinely refer these cases to hospitals.³⁸ Holohan et al found that in fact, GPs were not willing to treat minor trauma in their practices and prefer to refer these patients to the ED which exacerbates the problems already encountered in the overcrowded ED.³⁸

David et al found that GPs use EDs for a variety of reasons, mainly for x-rays, out patient department appointments, admissions, and social reasons and for a second opinion. Fry stated in his study that 40% of the general practitioners referrals were a misuse of the ED because they could have been dealt with through other channels.³⁸

It is found that (51%) of referrals are from primary care practices located in region B and C which are the areas that can refer to HJH. The other 49% of referrals are from every where in the district and from other provinces and other districts. This finding may be highlighting the fact that the referral system in the district is haphazard and has not been fully implemented by all primary care practices and practitioners. The service improvement strategy for the implementation of the Service Improvement Plan which was approved in March 2004 was communicated to all levels of hospitals and to the districts responsible for primary care in numerous meetings, the problem is that it was not communicated to the public or to the primary care practitioners working in private practices.¹⁷⁻¹⁸

The referral facility and appropriateness of attendance it is found that there is no statistically significant association ($p=0.386$). There is no significant association between the referring facility location and the appropriateness of the attendance

Patients travel for up to 40 km from different regions in the district to attend the ED at HJH. It may be that the patients perception of better care in a hospital ED that influences patients to attend the ED.

The result shows all primary care facilities are referring patients to the ED. It may be that there is need for improving services offered in primary care facilities and more training in terms of updating staff skills and that there is a need for improving primary care facilities referrals. Studies have shown that clinical guidelines do not improve referral rates.⁶⁸ There was no significant association for the type of referral facility and the appropriateness of the attendance ($p=0.811$).

For the reason for referral and appropriateness of attendance it is found that there was no statistically significant relationship $p=0.401$. For the reason for referral it is found that more of the medical referrals are appropriate for attendance than the surgical referrals. This result could be biased because suturing only was considered inappropriate for most of the surgical patients, while medical patients were appropriate for diagnostics tests especially radiological investigations ordered.

For the profession of the referring person and appropriateness of attendance it was found that there is no statistically significant relationship ($p=0.199$). Only (61%) of nurse referrals were appropriate for attendance, while (73.8%) doctor referrals and (100%) of specialists referrals were appropriate for attendance. It may be that there is a need for updating the skills of nurses and doctors in primary health care in order to decrease the inappropriate referrals.

5.3.6 Summary of discussion

This study undertaken in the ED at HJH a secondary level hospital has shown that (81.9%) of the patients are appropriate for attendance on the HUAP. The overcrowding in the ED at HJH is due to delayed movement of admitted patients as well as non-urgent patients attending or being referred for small interventions that are either not available at the primary care facilities or because patients choose to bypass the primary care facility and attend the ED.

Patients' health seeking behaviour, socio-demographic factors, health worker behaviour and health system factors all contribute to attendance at secondary level facilities for problems that could be resolved at lower level of care.

The appropriateness demands in the ED include radiological investigations, admissions, and for administration of intravenous drips. Self-referred patients were mainly appropriate for having a symptom of emergency and for accidental injuries.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

Patients attend the ED daily for problems related to trauma and violence, accidental injuries, disease related to poverty such as AIDS and TB and for complications from chronic problems, and the use of these facilities is increasing.

The national department of health has planned a number of health related millennium development goals (MDGs), in order to meet the demands of the people. The improvement of health service delivery, the strengthening of human resources, improvement of the quality of care, strengthening of the hospital infrastructure and improving primary care services are already top priorities. The country is also trying to improve EDs and emergency medical services for the 2010 FIFA World Cup.

The study on the patterns of attendance and referrals to the ED at HJH was supported by the management of HJH and very well accepted by the participants in this research. The management and staff of HJH reflected that there was an urgent need for such research due to the problems of overcrowding in the ED that were encountered on a daily basis.

From the sample of 348 patients it was found that (81.9 %) of the ED attenders were appropriate for attendance by using the HUAP criteria for appropriateness. Large proportions of the study sample were found to be appropriate for radiological services in the diagnostic category, administration of intravenous

fluids in the treatment category, for admissions in outcome category and for symptoms of severity (e.g. chest pain) in the self-referred category. The HUAP tool is a useful tool to measure these appropriate demands.

These results of this study shows that it is necessary for hospitals to concentrate more on implementing strategies to change the health services that we offer by taking into account the appropriateness demand, and concentrate less on the inappropriate attendances and referrals. Further research on appropriateness of admissions, radiological investigations and of intravenous drips administration can be undertaken in order to assess the appropriateness of ED visits in hospitals. The issue of chest pain as an urgent symptom needs to be explored in further research in self-referred patients.

The Hospitals Urgencies Appropriateness Protocol (HUAP) is not only a tool for measuring the overuse of hospital resources but it can also be used as an instrument or tool for designing new strategies to avoid such overuse. In the case of inappropriate admissions the hospital could think about creating an online quick and efficient telephonic service to the primary health care practitioners in the districts as well as to the practitioners working in the ED. This initiative could decrease the number of referrals to the ED and subsequently decrease the number of patients appropriate for admissions.

The study showed that only 72.7% of patients were appropriately referred from primary health care practitioners. There is a need for primary health care practitioners and primary health care facilities to increase their scope of services

and to extend their hours of services, in order to accommodate the needs of their patients. The department of health and academic departments at the universities have a responsibility to increase the skills and knowledge of primary health care practitioners and increase and upgrade the infrastructure of the primary health care facilities in order to avoid unnecessary referrals.

Measures in the ED to erect barriers to non -urgent use such as after hour's co-payment fees and fees for emergency ambulance services are options. Refusal of the attending ED practitioners to see the patient for real non- urgent cases is not recommended because of the ethical issues concerning refusal of care to patients, due to the patients right to be seen at a health care facility of his/her choice. The Patients Right Charter is displayed in the EDs and patients are aware of their rights.

6.2 Recommendations

Recommendations would include

- 1) That the hospital managers review its record system. Robust, long term data collection and analysis systems with integrated information technology systems with GP practices and nursing homes.
- 2) Hospital managers should address the problem of access block, i.e. availability of medical beds and essential bed management processes in the wards to decrease the overcrowding in the ED. There is a need to increase the number of step-down beds and to assess whether internal or outsourcing of step-down beds is more cost effective.

- 3) Further research on the waiting time of admitted patients in the ED is highly recommended in this hospital, to improve patient satisfaction.
- 4) Intervention such as redesigning the ED (e.g. transit lounges, observation wards and holding bays) could improve the flow of patients.
- 5) Interventions to improve access to radiology, pathology and other services can significantly reduce overcrowding in the emergency and improve patient satisfaction, especially for primary practitioner-referred patients.
- 6) Changes in the triage system such as fast track for minor injuries and non-urgent problems can significantly improve the care for non-admitted patients.
- 7) Interventions to reduce hospital use and hospital admission could include chronic disease management in the community, hospital discharge planning and home support care programmes especially for the elderly.
- 8) Urgent mapping of referral routes from all levels of facilities, to all stake holders including private and public sector facilities and health care providers
- 9) Use the media to educate the general public about the importance of the referral system in Gauteng and of the referral routes.

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LIST OF APPENDICES

APPENDIX A

- **A1** The Hospitals Urgencies Appropriateness Protocol (HUAP)
- **A2** Reliability and Validity of the HUAP

APPENDIX B

- **B1** Map of the Johannesburg Metro District Regions
- **B2** List of Suburbs coded into Regions

APPENDIX C

- **C1** Copy of Questionnaire

APPENDIX D

- **D1** Human Research Ethics Committee Ethical Clearance for Research
- **D2** Post Graduate Committee Permission to Conduct Research.
- **D3** Consent to conduct research at Helen Joseph Hospital.
- **D4** Consent to use the HUAP

APPENDIX E

- **E1** Copy of the informed consent form used during data collection.
- **E2** Copy of the patient information and invitation to participate in research document.

APPENDIX A

(A1) The Hospitals Urgencies Appropriateness Protocol (HUAP)

(A2) Reliability and Validity of the HUAP

INAPPROPRIATE USE OF THE EMERGENCY DEPARTMENT

Scempe-Selwa et al

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APPENDIX 1.

Hospital Urgencies Appropriateness Protocol (HUAP).

- 1 **Criteria of severity**
 - 1.1 Loss of consciousness, disorientation, coma, insensitivity (sudden or very recent)
 - 1.2 Sudden loss of sight or hearing
 - 1.3 Alterations in pulse rate (<50/>140 beats/min) or arrhythmia
 - 1.4 Alterations in blood pressure (systolic <90/>200 mm Hg; diastolic <50/>120 mm Hg)
 - 1.5 Alterations in electrolytes or blood gases (not to be taken into account in patients with chronic alterations of these parameters: chronic kidney failure, chronic respiratory disease, etc)
 - 1.6 Persistent fever (5 d) not controlled after treatment in primary care
 - 1.7 Active hemorrhage (eg, hematemesis, epistaxis, melena), excluding superficial wounds that only require suture
 - 1.8 Sudden loss of functional capacity of any part of the body
- 2 **Criteria for treatment**
 - 2.1 Administration of medicine or fluids intravenously (except to maintain pathway)
 - 2.2 Administration of oxygen
 - 2.3 Setting with plaster casts (excluding bandaging)
 - 2.4 Surgical intervention or procedure
- 3 **Criteria for diagnostic intensity**
 - 3.1 Monitoring of vital or constant signs every 2 h
 - 3.2 Radiology or any type
 - 3.3 Laboratory tests (except glycemia in diabetic patients seeking care for reasons other than diabetes and glycemia tests with glucose test sticks)
 - 3.4 ECG (except in patients with chronic cardiopathy who present for nonrelated problems)
- 4 **Other criteria**
 - 4.1 Patient has been in observation in A&ED >12 h
 - 4.2 Patient is admitted to hospital or transferred to another hospital or dies in A&ED
 - 4.3 Others in patients referred by physician (specify)
- 5 **Criteria applicable only to self-referred patients**
 - 5.1 Has had an accident (traffic, work-related, in public place,...) and needs to be examined
 - 5.2 Symptoms suggesting vital emergency: chest pain, dyspnea with rapid onset, labored breathing, acute abdominal pain
 - 5.3 Condition known to patient that usually leads to hospitalization
 - 5.4 Told by physician to go to A&ED if symptoms develop
 - 5.5 Requires primary medical care rapidly and hospital is closest center
 - 5.9 Other circumstances in self-referred patients (specify)

LIST OF REASONS FOR INAPPROPRIATE USE OF HOSPITAL A&ED

- Patients referred by a physician**
 - 1.1 Case not emergency; does not require immediate attention
 - 1.2 Patient requires immediate attention that can be obtained outside hospital setting
 - 1.3 Referred by outpatient clinic to speed up diagnosis
 - 1.4 Referred by mistake
 - 1.9 Others: specify
- 2 **Self-referred patients**
 - 2.1 **Excessive wait in other health care services:**
 - 2.1 Waiting list for surgery
 - 2.2 Waiting list for hospital outpatient consultation
 - 2.3 Waiting consultation at hospital outpatient clinic (long wait between appointments)
 - 2.4 Waiting consultation with nonhospital specialist
 - 2.5 Waiting consultation in primary care (with appointment)
 - 2.6 Waiting diagnostic tests requested by primary care physician or nonhospital specialist
 - 2.7 Waiting diagnostic tests requested by hospital
 - 2.9 Others: specify
- 3 **Inadequacy of ongoing care**
 - 3.1 Primary care office is closed (after hours or weekends)
 - 3.2 Physician delay for home visit (primary care, in the day)
 - 3.3 Physician delay for home visit (out-of-hospital emergency service, during the day)
 - 3.4 Cannot contact primary care center
 - 3.5 Cannot contact out-of-hospital emergency service, during the day
 - 3.9 Others: specify
- 4 **Patient does not know how to use health care service**
 - 4.1 No primary care physician has been assigned
 - 4.2 Does not know address of primary care physician or telephone number
 - 4.3 Is not aware of out-of-hospital emergency service/does not know telephone number or address
- 4.9 Others: specify
- 5 **Patient has more confidence in hospital or distrusts primary care services**
 - 5.1 Has gone to primary care physician but does not "trust" him/her
 - 5.2 Has gone to out-of-hospital emergency service, but does not "trust" it
 - 5.3 Came directly to A&ED
 - 5.4 Is patient of hospital (outpatient) and believes will receive better care in A&ED
 - 5.9 Others: specify
- 6 **Convenience of patient and problems with patient's environment**
 - 6.1 Lives close to hospital/will be away from work too long/will get rapid care/more convenient...
 - 6.2 Patient characteristics: low intellectual quotient, hypochondriac, simulating illness...
 - 6.3 Wants specific exploration (radiology, laboratory tests,...)
 - 6.4 Family wants patient admitted
 - 6.5 Court or police order
 - 6.9 Others: specify
- 9 **Others: specify**

*The HUAP is an instrument in the public domain.

(A1)

APPENDIX 2.

Validation of the HUAP

Conceptual framework. The conceptual framework initially considered was to define inappropriate visits to the hospital A&ED as visits that were referred by a physician or were self-referred that, because of the degree of severity and/or level of attention provided, could have been attended on another health care level. This framework can be visualized through a table with double entries in function of the degree of urgency and the level of attention required, which would provide for 4 possible situations: hospital emergencies, primary care emergencies, cases requiring hospital attention but that are not emergencies, and nonurgent cases that can be resolved on the primary care level. However, a preliminary analysis of this framework indicated that it would be extremely difficult to place rigid separations between the different levels of attention required in each type of emergency. On the one hand, the level of attention provided by primary care could vary according to the venue, hour of the day, whether it was a working day, holiday, or other situation. On the other hand, the evaluation would become a retrospective judgment (once the degree of severity, and treatment and the diagnostic tests provided were known) of a decision to refer the patient, or a self-referral, that was made before this information was available. Furthermore, in some situations, treating primary care emergencies in the A&ED may be a reasonable strategy. For example, during the night when few people come, it may be more efficient to treat primary care emergencies in the hospital A&ED because these departments must remain open, and the cost of treatment is limited to the variables. In these cases, this may be cheaper than opening new services that involve structural costs. Furthermore, it was believed that developing an instrument sensitive to all of these nuances would result in a very complex one, filled with conditional situations, that would interfere with achieving some of the objectives sought: to design an instrument that is simple, and quickly interpreted, with a minimum of ambiguity, based on information that is readily available in the clinical records of an A&ED. All of these circumstances led to a change in the initial concept to design an instrument that would maximize the classifications labeled as "appropriate" of hospital emergencies (specificity), at the cost of losing sensitivity and classifying as "appropriate" some of the emergencies that could have been solved on the primary care level and some situations that, although they require hospital attention, are not urgent. The target population was set as patients older than 14 years visiting a hospital A&ED for an acute complaint, with the exception of obstetric cases. The instrument was designed to take measurements in groups (not in individuals), both concurrently with the visit or retrospectively, through the review of the clinical records of the A&ED. It was not designed to be used prospectively for triage. On the basis of this framework, the following dimensions were considered of interest: (1) the patient's clinical severity; (2) the intensity of the services provided—treatment, diagnostic tests, need for prolonged observation or admission—vis-à-vis the availability of the same services on the primary care level; and (3) certain specific situations that would justify an appropriate self-referral.

Design of the questionnaire and face validity. Once these dimensions had been defined, an extensive review of the literature was conducted. Focus was placed on the instruments and design criteria used to identify appropriate visits to an A&ED or hospital admissions retrospectively. Triage instruments were also examined. On the basis of the criteria defined in these studies, and after a review of the Spanish literature, several preliminary versions of the Hospital Urgencies Appropriateness Protocol (HUAP) were produced. These versions were used to eliminate redundant criteria; revisions were made, incorporating the suggestions of clinicians with experience in hospital A&EDs and primary care. Various emergencies manuals were reviewed to ensure that all potentially severe processes were always identified as appropriate, either on the basis of the symptoms (severity) or of the treatment and diagnostic tests administered in these cases. Specifically, the following pathologic conditions were verified to ensure that they were always identified as emergencies: cardiovascular problems (cardiac arrest, infarct of the myocardium, ischemic syndromes without infarct, cardiac arrhythmia, pulmonary edema, hypertension crisis, pulmonary emboli, peripheral embolism, aortic dissection, cardiac tamponade), respiratory problems (respiratory failure, asthmatic crisis, pneumothorax, pulmonary atelectasis, acute laryngeal obstruction, pleural effusion), digestive problems (upper digestive tract hemorrhage, acute abdomen, ileum, acute hepatic failure), renal problems (acute renal failure), problems affecting endocrinology and metabolism (diabetic ketoacidosis, hypoglycemia, Addisonian crisis, thyrotoxic crisis, hyper-

calcemia, tetany), cerebrovascular and neurologic problems (cerebrovascular accident, transitory ischemia, hypothyria, convulsions, spinal compression, ascending poliomyelitis), and others (myasthenia gravis and cholinergic crisis, tetanus, intoxications, acute psychosis, delirium tremens, anaphylactic shock, septic shock, fractures). **Reliability and validity.** To evaluate the reliability and validity of the HUAP, a random selection was made of 100 medical records (IMR) of patients who went to the A&ED of the Hospital of Elche between May 1996 and April 1997. The IMRs of pediatric patients (<14 years), obstetric cases, and cases treated directly by the trauma service were excluded from the sample.

To establish intrareviewer reliability, the 100 IMRs were reviewed with the HUAP by 1 of the authors, a member of the A&ED medical staff. Two months later, he reviewed them again. To establish interreviewer reliability, the results of the initial reviews were compared with the assessment of the same 100 IMRs by a second physician with 9 years of experience in the same department, who had previously been trained in the use of the HUAP. To establish the validity of the HUAP, 2 more physicians in the A&ED, with 10 and 14 years of experience in hospital emergencies, reviewed the same 100 IMRs together, without the HUAP. They assessed the need for hospitalization in each case on the basis of their own clinical judgment. These reviewers received no previous training in the review of IMRs and were not familiar with the design of the instrument. In all instances, all of the documents contained in the IMRs were available. These included administrative data, reports for discharge from the A&ED, hospital admission, admission to the observation unit where pertinent, medical orders and annotations, nursing annotations and graphs, interconsultation reports, radiographs and other diagnostic and therapeutic tests, and the results of laboratory tests. The average time necessary to review each IMR was 10 minutes.

The reliability of the HUAP was defined as the degree of reproducibility of the results when the instrument was used by the same reviewer on 2 separate occasions after a time lapse, or by different observers. Reliability was evaluated through various agreement indexes between pairs of reviewers. The observed agreement index (O_1) is defined as the rate between concordant cases—appropriate or not—in 2 separate reviews and the total of the cases. The specific agreement index (S_1) is defined as the rate between the cases judged to be inappropriate in 2 separate reviews, and the total of the cases that at least 1 of the reviewers assessed as inappropriate.

This index provides a better evaluation than the O_1 in the assessment of emergencies considered inappropriate, because it is independent of the usually high degree of agreement in emergencies considered appropriate. Cohen's κ statistic was used to correct for agreement due to chance, and to make it possible to estimate the statistical significance (and corresponding confidence intervals [Is]) between the difference in the degree of agreement that would be expected by chance (value 0) and the degree of agreement observed (perfect agreement, not produced by chance, value 1). For the interpretation of the κ statistics, it has been suggested that values higher than 0.75 should correspond to excellent agreement levels; values between 0.75 and 0.40 would correspond to moderate to good agreement, and values below 0.40 would represent lower agreement. The term "validity," or more precisely "validity of criteria," refers to the measure to which the results obtained agree with the true results or with a "gold standard." In this study, validity was evaluated by assessing the degree of agreement between the results obtained in the first review of the HUAP and the clinical judgment of the physicians evaluating the IMRs on the basis of their own criteria alone. The indexes used to evaluate the validity of criteria were the same as those used to measure reliability (O_1 , S_1 , and κ). To evaluate the predictive validity of the HUAP, its sensitivity, specificity, and predictive values were calculated by comparing the results obtained with it with the judgment of the clinical reviewers.

The results of the analysis of the intrareviewer reliability of the instrument showed full agreement between the 2 reviews conducted at 2 different times (O_1 1.00, S_1 1.00, κ 1.00, κ 95% CI 1.00 to 1.00). The results of the analysis of intrareviewer agreement presented a single case of disagreement, with high agreement indexes (O_1 0.99, S_1 0.96, κ 0.97, κ 95% CI 0.93 to 1.00). When assessing the validity of criteria compared with expert clinical judgment, both the O_1 (0.68) and the S_1 (0.43) showed low agreement levels, and κ was between values for moderate to low levels of agreement (κ 0.39, κ 95% CI 0.24 to 0.53). These discrepancies occurred because the clinical reviewers considered that 55% of the cases were inappropriate compared with only 24% considered inappropriate by the HUAP. Only in 1 case did the HUAP consider a visit inappropriate when the clinical reviewers considered it appropriate. Finally, analysis of the predictive value of the HUAP compared with the clinical experts showed that the instrument has a specificity of 0.98, but that its sensitivity is only 0.44. It has high predictive value for cases labeled inappropriate

(A2)

96% of the cases evaluated as inappropriate by the HJAP were considered inappropriate by the clinicians), but low negative predictive value (only 59% of the cases that the HJAP considered appropriate were also evaluated as appropriate by the clinicians).

The HJAP behaved as a highly reliable instrument, both in the test-retest analysis as well as in the interreviewer analysis. Although this high reliability contrasts with its low validity compared with the experts' judgment, it is noteworthy that with the exception of 1 case, all cases identified as inappropriate by the HJAP were evaluated in the same way by the clinical reviewers. Therefore, as seen in the analysis of its predictive value, the HJAP behaved as an instrument with high specificity, but low sensitivity (always when compared with the subjective judgment of experts).

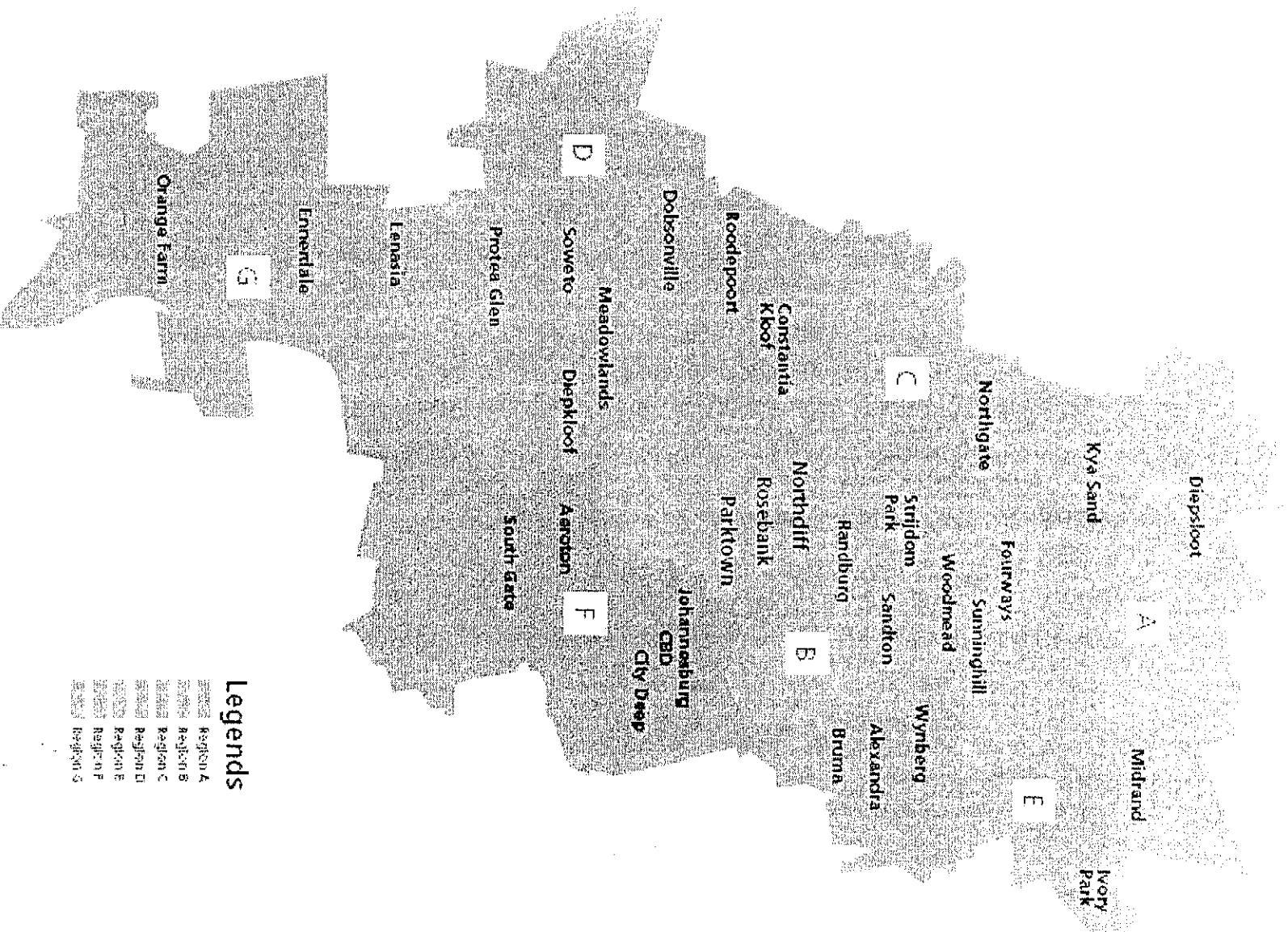
After reviewing the single case that the HJAP considered inappropriate but that the experts considered appropriate (which is the same case where the 2 reviewers also disagreed in the interobserver reliability analysis), it was concluded that the first reviewer had applied the criteria incorrectly.

These results were those that were expected, given the criteria for creating the HJAP and considering that it is an instrument designed to maximize reliability (the capacity to reproduce results when it is used by different people at different times) and specificity (avoid labeling appropriate emergencies as inappropriate). These features were achieved in part at the expense of sacrificing sensitivity and increasing percentage of false appropriates. This design was preferred for 4 basic reasons: (1) it makes it possible, as stated previously, to compare 1 hospital with another; (2) it prevents the loss of apparent validity that would occur if appropriate cases were identified as inappropriate, a particularly critical aspect when contemplating the widespread use of the instrument; (3) it adopts as the standard real practice and not an ideal standard; (4) it constitutes an instrument that is easy to use, and that contains simple criteria, with little ambiguity, that can be used with the information that is habitually available in an A&ED.

APPENDIX B

B1 Map of the Johannesburg Metro District Regions

B2 List of Suburbs coded into Regions



- Legends**
- Region A
 - Region B
 - Region C
 - Region D
 - Region E
 - Region F
 - Region G

Figure B3 Johannesburg Metro District divided into Regions A – G

A

Aanwins
 Abbotsford
 Aeroton
 Alan Manor
 Albertskroon
 Albertville
 Aldara Park
 Alexandra
 Allens Nek
 Alsef
 Althea AH
 Amalgam
 Ambot
 Amorosa
 Anchorville
 Antwerp
 Armadale
 Atholhurst
 Atholl
 Atholl Gardens
 Auckland Park
 Austin View

B

C1 Bagleyston
 B1 Ballindean
 F1 Barbeque
 F2 Bassonia
 B2 Batavia
 B3 Belgravia
 B4 Bellairs Park
 E1 Bellevue
 C2 Benmore Gardens
 C3 Benrose
 G1 Berario
 B5 Berea
 C4 Berghron
 C5 Bertrams
 G2 Beverley Gardens
 E2 Bezuidenhout Valley
 D1 Birdhaven
 B6 Birnam
 B7 Blackheath
 B8 Blairgowrie
 B9 Bloubostrand
 E3 Blue Haven
 Blue Hills
 Booyseans Reserve
 Bordeaux
 Boschkop
 Boskruin
 Bosmont
 Botesdal
 Boundary Park Breunar
 Braamfontein Werf
 Braampark
 Bramley
 Bramley Park
 Bramley View
 Bridle Park
 Brixton
 Broadacres
 Bromhof
 Bromhof Ext 2
 Bruma
 Brushwood Haugh, Bush
 Bryanbrink
 Bryanston
 Buccleuch
 Bultfontein
 Bush Hill

C

B10 Carenvale
 C6 Carlswald
 A1 Casey Park
 F3 Chartwell
 C7 Cheltondale
 F4 Chislehurst
 C8 Chrisville
 F5 City and Suburban
 B11 City Deep
 F7 City West - Denver
 B12 Claremont
 F8 Clynton
 B13 Commercica
 F9 Comptonville
 B14 Constantia Kloof
 E4 Corlett Gardens
 B15 Coronationville
 B16 Cottesloe
 B17 Country Life Park
 B18 Country View
 A2 Cowdray Park Ext 1
 B19 Craighall
 A3 Craighall Park
 F10 Cramerview
 B20 Cresta
 C10 Creswell Park
 C11 Croesus
 B21 Crosby
 A4 Crown
 C12 Crown Gardens
 B22 Crown North
 B23 Crowthorne
 B24 Crystal Gardens
 B26 Culembeek
 E6 Cynildene
 A5
 B27
 A6
 C13
 B28
 E7
 C14
 B29
 B30
 E8
 A7
 B33

(b2)

D	E	F
Dainfern	A12 Eagles Nest	F21 Fairland
Dalecross	B50 East Town	B66 Fairmount
Daniel Brink Park	B51 Eastcliff	B61 Fairmount Ridge
Darrenwood	B52 Eastgate	F22 Fairview
Davidsonville	C19 Ebony Park	E18 Fairvale
De Wetshof	E14 Edenburg	A14 Fairview
Delarey	B53 Edenvale	B62 Fairway
Dennehof	B54 Elandspark	E19 Fairwood
Devland	D3 Elcedes	F23 Farm Klipfontein
Dhlamini	D4 Eldorado Estate	F24 Farmall
Diepkloof	D5 Eldorado Park	G4 Fellside
Diepsloot	A13 Electron and Ext 1	D10 Ferndale
Discovery	C20 Elladoone	F25 Ferndale Exts
Dobsonville	D6 Elton Hill	F26 Ferreiraasdorp
Doornfontein	F19 Emdeni	B63 Finetown
Doornkop	D8 Emmarentia	D11 Fleurhof
Dorelan	E15 Ennerdale	B64 Fioraciffe
Douglasdale	B55 Epsom Downs	G5 Florida and Exts
Douglasdale Exts	B56 Erand	B65 Florida Glen and Exts 1,4 B75
Driefontein	B57 Evans Park	A15 Florida Hills and Exts 2, 4B76
Driefontein	C22	F27 Florida Lake
Drieziek	G3	Florida North and Exts
Droste Park	F20	B78 Florida Park
Dube	D9	B79 Florida Park Exts
Dunhill	E16	C26 Florida View
Dunkeld	B58	B80 Fontainebleau
Dunkeld West	B59	B81 Forbesdale
Dunsevern	E17	B82 Fordsbury
Duxberry	B60	F30 Forest Hill
		F31 Forest Town
		B83 Formain
		E23 Fourways
		B84 Fourways Exts
		A17 Framton
		F32 Frankenwald
		E24 Franklin Roosevelt Park
		B85

G

Gallo Manor
Gallo Manor and Exts
Geluksdal
Georginia
Gillview
Glen Athol
Glen Austin
Glen Austin AH Ext
Glen Dayson
Glenadrienne
Glenanda
Glensk
Glenhazel and Exts
Glenkay
Glennifer
Glensan
Glenvista
Golden Harvest
Goudrand
Grasmere
Greenside
Greenside East
Gresswold
Greymont
Groblerpark

H

E25 Haddon
B86 Halfway Gardens
G7 Halfway House Estate
C27 Hamberg
F33 Harveston
B87 Hawkins Estate
A18 Haylon Hill
E26 Headway Hill
C28 Heckroodt Circle
B88 Helderkruijn
F34 Heriotdale
F35 Highlands
B89 Highlands North
E27 Hiltonia
B90 Homestead Park
E28 Honey Hill
F36 Honeydew
C29 Hoogland
C30 Horison
G8 Horison Park
B91 Horison View
B92 Houghton Estate
B93 Houtkoppes
B94 Hunters Hill
C31 Hurl Park
Hurlingham
Hurst Hill
Hyde Park

I

F37 Illovo
A19 Inadan
E29 Inanda
C32 Industria
C33 Industria North
B95 Industria West
C34 Ivory Park
A21
D12
C35
F38
F39
B96
G9
B97
C36
C37
C38
C39
C41
C40
B98
A22
C42
B100
B101
B103
B104

B105
A23
B106
B107
B108
B109
A24

J
 Jabavu
 Jabulani
 Jacanlee
 Jeppestown
 Jeppestown South
 Johannesburg
 Johannesburg North
 Judith's Paarl
 Jukskei Park

K
 D13 Kelland
 D15 Kelly Ridge
 B110 Kelvin
 F40 Kelvin View
 F41 Kenilworth
 F42 Kensington
 C43 Kensington B
 F43 Kentview
 B112 Kew
 Kew
 Khyber Rock
 Kibler Park
 Kilarney
 Kilarney
 Kimbult
 Klevehill Park
 Klipfontein
 Klipfontein
 Klipriviersberg
 Klipriviersberg
 Klipriviersberg Estate
 Kliprivierssoog
 Kliprivierssoog Estate
 Klipspruit
 Klipspruit West
 Kloofendal
 Kya Sand
 Kya Sand Exts 3, 4
 Kyalami
 Kyalami Business Park
 Kyalami Estates

L
 B113 La Rochelle
 C45 Lake View Estate
 E30 Lakeside
 E31 Langlaagte North
 F44 Laser Park
 E32 Lawley
 B114 Lea Glen
 B115 Lenaron
 B116 Lenasia
 E33 Liefde en Vrede
 B117 Lindbro Park
 F45 Lindberg Park
 B118 Linden
 B119 Lindhaven
 C46 Lindley
 B120 Linksfield
 B121 Linksfield North
 C47 Linksfield Ridge
 F46 Linnmeyer
 F47 Little Falls
 D17 Littlefillan
 D18 Lombardy East
 D20 Lombardy West
 D22 Lone Hill and Exts
 C48 Lone Hill Exts
 A26 Longdale and Exts 2,4
 C49 Lorentzville
 A27 Lougherin
 A28 Lyme Park
 A29 Lyndhurst

F48
 F49
 E34
 B122
 C50
 G10
 B123
 D23
 G11
 F50
 E35
 F51
 B124
 C51
 A30
 E36
 E37
 E38
 F52
 C52
 B125
 E39
 E40
 B126
 A31
 B127
 F53
 D25
 B128
 E41

M	N	O	
Magalies View	B129 Naledi	D39 Oakdene	F68
Magaliesig	B130 Nancefield	D40 Oaklands	B162
Malanshof	B131 Nasrec	F63 Oakmere AH	G14
Malvern	F54 Naturena	D42 Oerder Park	B163
Manufacta	C53 New Brighton	B154 Oliveenhoutpoort	C62
Mapelta	D26 New Centre	F64 Olivedale	B164
Maraiburg and Exts 1, 2	B132 New Doornfontein	F65 Olivedale Exts	C64
Marlboro	B133 Newclare	B155 Ontdekterspark	C65
Marlboro Gardens	E42 Newlands	B156 Oospoort	E46
Maroeladal	A32 Newtown	F66 Ophirton	F69
Marshallis	F55 Nietgedacht	A35 Orange Farm	G15
Marshalltown	F56 Noordekrans	C56 Orange Grove	B165
Martindale	B135 Noordhang	C57 Orchards	B166
Maryvale	B136 Noordwyk	A36 Orlando	D43
Mayfair and Ext 1	B137 Norscot	B157 Orlando East	D44
Mayfair West	B138 North Champayne Estate	A37 Orlando West	D45
Mayfield Park	F58 North Doornfontein	F67 Ormonde	F70
Meadowhurst	C54 North Parkwood	B158 Osummit	B167
Meadowlands	D27 Northcliff	B159	
Meadowlands East	D29 Northcliff Exts	C58	
Meadowlands West	D30 Northern Acres	B160	
Melrose	B139 Northgate	C59	
Melrose Estate	B140 Northriding	C60	
Melrose North	B141 Northwood	C61	
Melville	B142 Norwood	B161	
Meredale	F59		
Micor	B143		
Mid-Ennerdale	G12		
Midridge Park	A33		
Mill Hill	B144		
Milligate Farm	A34		
Mmesi Park	D31		
Modderfontein	E43		
Moffat View	F60		
Mofofo Central	D32		
Mofofo North	D33		
Mofofo South	D34		
Molapo	D35		
Moletsane	D36		
Mondeor	F61		
Montclare	B145		
Montgomery Park	B146		
Montroux	B147		
Moodie Hill	B148		
Moret	B149		
Morningside	B150		
Morningside Ext 17	E44		
Morningside Hills	B151		
Morningside Manor	B152		
Morningside Manor	E45		
Moroka	D37		
Moroka North West	D38		
Mostyn Park	C55		
Mountain View	B153		
Mulbarton	F62		

P	Q	R
Paarlshoop	B168	Quellerina
Pageview	F71	B183
Panorama	C66	Rabie Ridge
Park Central	F72	Racecourse
Parkhurst	B169	Radiokop
Parkmore	B170	Raedene Estate
Parktown	B171	Rand Leases
Parktown Ext 1	B172	Randjespark
Parkview	B173	Randpark
Patynn	F73	Randpark Ext
Paulshof	A38	Randpark Ridge
Paulshof Exts	B174	Randparkrif
Pennyville	B175	Randview
Percelia Estate	B176	Raumarais Park
Petervale	B177	Reefhaven
Phiri	D46	Regency
Pierrneef Park	B178	Regents Park
Pimville	D47	Rembrandt Park
Pimville Eastern Buffer	D48	Rembrandt Ridge
Pine Park	B179	Reuven
Plooyville	A39	Rewlatch
Poortjie	G16	Reynolds View
Poortview	C67	Richmond
Power Park	D49	Ridgeway
Praegville	B180	Riepen Park
President Park	E47	Rietvallei
President Ridge	B181	Risana
Princess	C68	Risidale
Prolecon	F74	Rispark
Protea	D50	Rivasdale
Protea Glen	D51	River Bend
Protea North	D52	Riverclub
Protea South	D53	Riverlea
Putcoton	B182	Riviera
		Rivonia
		Robertsham

S	T	U	G18
Salfred	A44	Talboton	E54
Salisbury Claims	F88	Technikon	C85
Sandhurst	B205	The Gables	F99
Sandown	B206	The Gardens	B219
Sandpark	C78	The Hill	F100
Sandringham	E50	Theta	F101
Savoy Estate	B207	Thornhill	E55
Saxonwold	B208	Tladi Tshiawelo	D58
Sebenza Ext 6	E51	Towerby	F102
Selby	F89	Townsvlew	F103
Selwyn	C79	Tres Jolie	C86
Senaokane	D57	Trevallyn	A47
Sharonlea	C80	Triomf	B220
Silvamonte	E52	Trojan	F104
Simba	B209	Troyeville	F105
Solridge	B210	Tulisa Park	F106
Sonneglans	C81	Turf Club	F107
South Hills	F90	Turffontein	F108
South Kensington	E53		
Southdale	F91		
Southfork	F92		
Southgate	F93		
Spes Bona	F94		
Springfield	F95		
Stafford	F96		
Steeledale	F97		
Stormill	B211		
Strathavon	B212		
Stretford	G17		
Strijdompark	B213		
Strijdompark Exts	C82		
Strubensvallei	C83		
Suideroord	F98		
Sundowner	C84		
Sunningdale	B214		
Sunningdale Ridge	B215		
Sunninghill	A45		
Sunnyside	B216		
Sunrella	A46		
Sunset Acres and Ext 1	B217		
Sydenham	B218		

V

Van Wyksrust AH
Vandia Grove
Victoria
Village Main Ext 3
Vorna Valley

G19
B221
B222
F109
A48

W

Waverley
Weltevredenpark
Wendywood
Wesco Park
Westgate Park
Whiteridge
Wibsey Dip
Wierda Valley
Wilfordon
Wilgeheuwel
Wilgespruit 190-1q
Willaway
Willowild
Wilropark
Windsor Glen
Witkoppen
Witpoort
Witpoortjie
Woodlands
Woodmead
Wynberg
Wynberg Ext 4

E56
C87
E57
E58
C88
B223
B224
B225
C-3
C-3
C-1
A-9
B-15
C-2
B-17
A-1
A-1
C-4
B-19
E-10
E-1
E

Y

Yeoville

Z

Zakariyya Park
Zandspruit 191-1q
Zola
Zondi
Zonnehoeve
Zwartkop/Rooiwa

F110
G20
C95
D59
D61
C96
A52

APPENDIX C

C1 Copy of Questionnaire

Patterns of attendance and referrals to the Helen Joseph Hospital Casualty Department

Questionnaire number	
-------------------------	--

Journal number	
-------------------	--

Time of arrival	
--------------------	--

DATE	D	M	Y

Hospital /File number	
--------------------------	--

--

SECTION A

QUESTIONS FOR THE PATIENT TO ANSWER DIRECTLY.

A1. What is your date of birth?
Enter patients
date of birth in box

--

A2. What is your gender?

Tick male/female

MALE	FEMALE
------	--------

A3.1. Are you employed?

Tick YES/NO

YES	NO
-----	----

If the patient answers YES to question 3 above then ask the following questions

A3.2. Are you employed by an employer?
Tick YES/NO

YES	NO
-----	----

A3.3. Are you self employed?
Tick YES/NO

YES	NO
-----	----

A4.1. Where do you live? Enter the patients residential suburb in the space below

--

A4.2. Where do you work? Enter patients work suburb in the space below

--

A5. Where you referred to the hospital? Tick YES/NO

YES	NO
-----	----

A6. Do you have a referral letter? Tick YES/NO

YES	NO
-----	----

A7. What mode of transport did you use to come to the hospital?

A7.1 Walked to hospital.

YES	YES
-----	-----

A7.2 Private vehicle self driven.

YES	NO
-----	----

A7.3 Private vehicle driven by somebody else.

YES	NO
-----	----

A7.4 Public transport e.g. taxi , bus

YES	NO
-----	----

A7.5 Ambulance.

YES	NO
-----	----

A7.6 Other modes of transport.

YES	NO
-----	----

State other in A 7.6 above in the space below

--

(C1)

SECTION B

USE THE PATIENTS REFERRAL LETTER TO COMPLETE SECTION B

B1. What is the name of the referring facility? Enter facility name below

B2. What is the suburb of the referring facility? Enter suburb below

B3. What kind of facility is the patient referred from? Tick appropriate box below

B3.1 Local clinic LC	☐
B3.2 Community Health Centre-CHC	☐
B3.3 Private Practice-PP	☐
B3.4 Non Government organization-NGO	☐
B3.5 Another Hospital-H	☐
B3.6 Referred by paramedics/ emergency services -EMS	☐
B3.7 Other Facility not stated above-O	☐

State other facility in B3.7 above space below

B4. What is the profession of the referring person? Tick appropriate box below

B4.1 Nurse (N)	☐
B4.2 Doctor (D)	☐
B4.3 Specialist (S)	☐
B4.4 Emergency service paramedic. (E)	☐
B4.5 Not stated on referral letter (U)	☐
B4.6 Other profession not stated above (O)	☐

State other profession in B4.6 in the space below

B5. What is the reason for referral as stated on the referral letter?

Copy exact words written on the referral letter in the space below.

SECTION C

HOSPITALS URGENCIES APPROPRIATENESS PROTOCOL (HUAP)

USE PATIENTS RECORD TO COMPLETE SECTION C.

This section contains appropriateness criteria for severity, for treatment, for diagnostics, criteria of appropriateness in terms of outcome and criteria of appropriateness applicable to self referred patients.

C1. APPROPRIATENESS CRITERIA OF SEVERITY.

- C1. The patient experienced any of the following severity criteria? Tick YES/NO**
- C1.1** Is there any record of loss of consciousness, coma
disorientation insensitivity? (sudden or very recent)

YES	NO
YES	NO
- C1.2** Is there any record of loss of sight or hearing?

YES	NO
-----	----
- C1.3** Is there a record of alteration of pulse rate (< 50 > 140 beats per minute)
or arrhythmia?

YES	NO
-----	----
- C1.4** Is there a record of alteration of blood pressure (systolic < 90/ > 200 mmHg;
diastolic < 60/ > 120 mmHg) ?

YES	NO
-----	----
- C1.5** Is there record of alterations in electrolyte or blood gases? (not to be taken into
account in patients with chronic alterations of these parameters: chronic kidney
failure, chronic respiratory disease etc)

YES	NO
-----	----
- C1.6** Is there a record of persistent fever not controlled after treatment in primary care?

YES	NO
-----	----
- C1.7** Is there a record of active hemorrhage (e.g. hematemesis, epistaxis, melena etc)
excluding superficial wounds that only require suture?

YES	NO
-----	----
- C1.8** Is there a record of loss of functional capacity of any part of the body?

YES	NO
YES	NO
- C1.9** Is there other criteria of severity not stated above/
State or specify other criteria for severity in (C1.9) above, in the space below

--

C2 APPROPRIATENESS CRITERIA FOR TREATMENT.

- C2. What treatment was administered for this patient in casualty? Tick YES/NO**
- C2.1** Was fluid or medicine administered intravenously to this patient?
(except to maintain an open intravenous line)

YES	NO
-----	----
- C2.2** Was the patient given oxygen?

YES	NO
-----	----
- C2.3** Did the patient receive setting of plaster casts?

YES	NO
-----	----
- C2.4** Was this patient given any surgical intervention or procedure?

YES	NO
-----	----
- C2.9** Other urgent treatment not stated above was ordered?

YES	NO
-----	----
- State or specify other urgent treatment ordered in (C2.9) above in the space below*

--

C3 APPROPRIATENESS CRITERIA FOR DIAGNOSTIC INTENSITY

C3. What diagnostic procedures were ordered for the patient in the casualty? Tick YES/NO

C3.1 Was monitoring of vital or constant signs ordered every 2 h?

YES	NO
-----	----

C3.2 Was radiology of any type ordered?

YES	NO
-----	----

C3.3 Were any laboratory tests ordered for this patient?

YES	NO
-----	----

(except glycaemia in diabetic patients seeking care for reasons other than diabetes and glycaemia tests with glucose test sticks)

C3.4 Was ECG ordered for this patient? (except in patients with chronic cardiopathy who present for non related problems)

YES	NO
-----	----

C3.9 Was any other diagnostic procedure not stated above ordered?

YES	NO
-----	----

State or specify other diagnostic procedures ordered in (C3.9) in the space below

--

C4 APPROPRIATENESS CRITERIA FOR OUTCOME OR DISPOSAL OF THE PATIENT

C4 Is the outcome of this patient any of the following?

Tick YES/NO

C4.1 The patient is in observation in the casualty for more than 12 hours?

YES	NO
-----	----

C4.2 The patient is admitted to this hospital?

YES	NO
-----	----

C4.3 The patient is transferred to another hospital?

YES	NO
-----	----

C4.4 The patient died in the casualty?

YES	NO
-----	----

C4.9 Other outcome in practitioner referred patients?

YES	NO
-----	----

State or specify other appropriate outcomes in referred patients in (C4.9) above in the space below.

--

C5. APPROPRIATENESS CRITERIA APPLICABLE ONLY TO SELF REFERRED PATIENT

COMPLETE QUESTION C5 BELOW FOR SELF REFERRED PATIENTS

C5. Criteria for appropriate attendance applicable to self referred patients only?

Tick yes/no

C5.1 The patient has had an accident in the last 24 hrs

YES	NO
-----	----

(traffic, work related, in a public place, etc) and needs to be examined?

C5.2 The patient has symptoms suggesting vital emergency: chest pain, dyspnea with rapid onset, labored breathing, acute abdominal pain.

YES	NO
-----	----

C5.3 The patient has a condition (known to patient) that needs urgent hospital treatment or usually needs hospitalization?

YES	NO
-----	----

C5.4 The patient was told by a health care practitioner to attend casualty if symptoms get worse or if symptoms develop?

YES	NO
-----	----

C5.5 The patient requires primary medical rapidly and the hospital is closest centre?

YES	NO
-----	----

C5.9 The patient is attending for other circumstances that requires urgent treatment?

YES	NO
-----	----

State or specify other circumstances if yes to (C5.9) above, in the space below

--

END OF QUESTIONNAIRE

APPENDIX D

- **(D1) Human Research Ethics Committee Ethical Clearance for Research**
- **(D2) Post Graduate Committee Permission to Conduct Research.**
- **(D3) Consent to conduct research at Helen Joseph Hospital.**
- **(D4) Consent to use the HUAP**

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

R14/49 Cassim

CLEARANCE CERTIFICATE

PROTOCOL NUMBER M070422

PROJECT

Patterns of attendance and referrals to the
Helen Joseph Hospital Caeciliat Department

INVESTIGATORS

Dr T Cassim

DEPARTMENT

Family Medicine

DATE CONSIDERED

07.05.04

DECISION OF THE COMMITTEE*

APPROVED UNCONDITIONALLY

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 07.05.28

CHAIRPERSON 
(Professors PE Cleaton-Jones, A Dhai, M Vorster,
C Feldman, A Woodiwiss)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Moosa S Dr

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and ONE COPY returned to the Secretary at Room 10005, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. I agree to a completion of a yearly progress report.

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

(b1)



Faculty of Health Sciences
Medical School, 7 York Road, Parktown, 2193
Fax: (011) 717-2119
Tel: (011) 717-2075/6

Dr T Cassim
P O Box 2002
Lenasia
1820
South Africa

Reference: Mrs Alison Mclean
E-mail: mcleanam@health.wits.ac.za
10 July 2007
Person No: 8505190
PAG

Dear Dr Cassim

Master of Family Medicine: Approval of Title

We have pleasure in advising that your proposal entitled "*Patterns of attendance and referrals to the Helen Joseph Hospital's Casualty Department*" has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

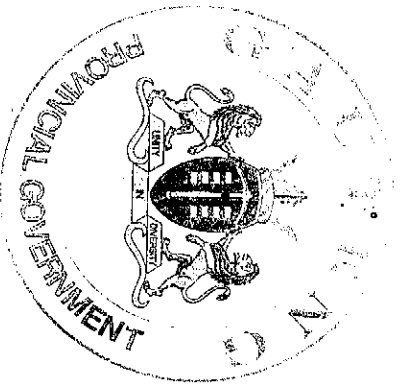
Yours sincerely

A handwritten signature in black ink, appearing to read 'Sandra Benn', with a horizontal line underneath.

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

(D2)

DEPARTMENT OF HEALTH



Dr P Govender

Tel: 011 4890092

Fax: 011 489 0841

Email: paigelza@hotmail.com

19 February 2007

Dr T Cassim

Department of Family Medicine Wits University

Dear Dr Cassim

Re: Permission to conduct research at Casualty Department of Helen Joseph Casualty. Principal Investigator: Dr T Cassim.

Study Title: Patterns of attendance and referrals to the Helen Joseph Hospitals Casualty Department.

Contact Details: Tel: 011 854 4407

Fax: 011 8547024 Cell: 0827860056

With reference to the above study we are pleased to inform you that Dr Cassim has been granted permission to conduct research at the Casualty (Emergency Department) at Helen Joseph Hospital from May 2007 until July 2007.

I understand that the study will involve interviews with patients accessing services at the hospital as well as reviews of referral letters and records of the patients. Permission is granted to copy information from the referral letter and from the medical record for the study purposes.

We would also like the study to follow the protocol as outlined in your study proposal and should there be any changes, Senior Medical Superintendent should be informed immediately. At the end of the study Dr Cassim will be expected to share her research findings with the Helen Joseph Hospital Management. Dr Cassim may also be invited to Helen Joseph Hospital or the Department of Health to come and present her research findings.

To assist you in your research we will undertake to bear the costs of printing the questionnaire and other relevant forms.

Thank you


Dr P Govender
Senior Medical Superintendent
Dr Govender
MBBS
0866113

(D3)

From: Salvador Peiro [speiro@comv.es]

Sent: 15 May 2007 02:15 PM

To: Dr Tahera Cassim and Mr Zakaria Samir

Subject: Re: PERMISSION

Dear Dr. Cassim,

We registered the HUAP in the public domain, and it can be used freely for research purposes and activities that contribute to improving healthcare services. The copyright say that the use of the HUAP is authorised "as long as the final users implement it free of charge, and cite its source in the documents generated by its use".

So, you have permission to use the HUAP and the list of reasons of nonurgent care. I hope it will be useful for your project. Regards

*Salvador Peiro, MD, PhD
Health Services Research Unit
Valencia School of Health Studies*

----- Original Message -----

From: Dr Tahera Cassim and Mr Zakaria Samir

To: Salvador

Sent: Tuesday, May 15, 2007 4:24 PM

Subject: PERMISSION

Re : Research in South Africa

To Professors/ Doctors

I am an English speaking South African student, in the Department of Family Medicine currently completing my research for my Masters Degree in Family Medicine at the University of the Witwatersrand in South Africa. I have accessed an article Titled: Inappropriate Use of an Accident and Emergency Department: Magnitude, Associated Factors, and Reasons- An Approach With Explicit Criteria by Teresa Sempere- Selva, Salvador Pjero, Pilar Sendra-Pina, Consuelo Martinez-Espin, and Inmaculada Lopez- Aguilera in my literature search. I am requesting your permission to use the Hospital Urgencies Appropriateness Protocol (HUAP) and the complementary list of inappropriate use of Hospital A&ED formulated by researchers in that article for my research on Patterns of referral and attendance of patients at a Casualty Department in a teaching Hospital in South Africa. I await your urgent communication to me. Dr Tahera Cassim. E-MAIL : habibty@nweb.co.za

(D4)

APPENDIX E

E1 Copy of the informed consent form used during data collection.

E2 Copy of the patient information and invitation to participate in research document.

CONSENT FORM FOR AN INDIVIDUAL INTERVIEW
AND FOR REFERRAL LETTER AND RECORD REVIEW

Concerning participation in a Research Project.

TITLE OF RESEARCH PROJECT

Patterns of attendance and referrals to The Helen Joseph Hospital Casualty

Department.

Researcher: Dr Tahera Cassim.

I have been invited by Dr Tahera Cassim to take part in a study. The explanation of the research is clear and well explained to me, and I have been given a chance to ask questions. I understand that my participation in the study is voluntary and that I can withdraw from the study at anytime. I have been assured that any information I divulge will be kept confidential and that confidentiality will be maintained by the researcher. I understand and I been reassured that my participation is completely anonymous and that I cannot be identified in anyway, by people not directly involved in the research.

I know that the results of this research will be used for scientific and educational purposes and that may include being published. I agree to this, provided my privacy is guaranteed.

I hereby agree to participate in this Research Project.

Patients Initials and Surname: _____

Patient Signature: _____

Place: _____

Date: _____

Statement by Dr Tahera Cassim.

I have given written and oral information regarding this Research Project to the participant.

I agree to answer any future questions concerning the Project as best as I am able. I will adhere to the protocol as it has been approved.

DR TAHERA CASSIM

SIGNATURE: _____

PLACE: _____

DATE: _____

(E1)

INFORMATION DOCUMENT

Date: June 2007

Research Title: Patterns of attendance and referrals to the Helen Joseph Hospital Casualty Department.

Invitation to participate in research project.

Dear patient at the Helen Joseph Casualty Department, Greetings to you.

With the approval of the hospital, I Dr Tahera Cassim a student in The Family Medicine Department am doing a study on your referral / attendance to the casualty department. You are hereby invited to participate in my study. In this study I want to learn more about patients attending the casualty and the referrals to the casualty from outside clinics, centers, practices and hospitals. I also want to learn about the doctors, nurses and specialists who are referring you to the casualty. Your participation in this study will give me information on how to improve services between outside clinics etc and hospitals. You have been selected as part of a sample of 355 patients needed for the study.

You may choose if you want to take part in the study or if you want to decline to participate. If you choose to decline to participate in the study, your care at the hospital will not be affected in any way. If you choose to partake in the study you will be asked to sign a consent form for me, and I will ask you to assist me by answering some questions and by allowing me to use details from your file and referral letter to fill in a questionnaire that I have prepared. The questions will take about ten minutes to complete. You will be given complete privacy to complete the form with me.

If you feel you don't want to answer any question you are free to do so. You are also free to withdraw from the study at any stage. Your name, identity number and your personal contact details are not included anywhere on the questionnaire to ensure that you cannot be identified on the questionnaire and that you remain anonymous. The information you provide is confidential and will only be made available to my supervisor and myself. The completed questionnaires will be analyzed and used for the purpose of completing a research report for degree purposes only.

The study results will be forwarded to The Superintendent of this hospital who has given me permission to conduct the study in this casualty, after my research has been completed, and may be published. If you require any information about this study you are welcome to contact me on the numbers given below.

Thank you for your time and for assisting me.

Dr Tahera Cassim (Family Medicine student at University of the Witwatersrand - WITS) Principal medical officer at the Polyclinic Department at Helen Joseph Hospital.

My contact details are as follows: Telephone: (011 4891011) Cell: 082 786 0056

e-mail: habibty@mweb.co.za

Contact details of the Human Research Ethics Committee:

Secretary: Ms Anisa Keshav Te (011) 717-1234 Fax (011 339-5708

e-mail: keshava@research.wits.ac.za

(E2)