An Evaluation of the Role of an Intermediate Care Facility in the Continuum of Care in Western Cape, South Africa.

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I dedicate this to my late dad Mavangana Simeon Mabunda who never lived long enough to see my dream realised

DECLARATION

I Dr Sikhumbuzo Advisor Mabunda hereby declare that the work presented in this dissertation/thesis is original work based on data collected at the Booth Memorial Hospital in the Western Cape Province of South Africa. The dissertation is a selection of analyses done for a study on de-hospitalised care in the Western Cape. This work was done under the supervision of Professor Leslie London (University of Cape Town) and Dr David Pienaar (Western Cape Department of Health). None of the work in this dissertation has been presented for any prior degree. The Vancouver referencing style has been used to acknowledge work of others (whether quoted verbatim or paraphrased or referred to). Neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other University. I empower the University to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

Signature: Signed by candidate

Date: 13 February 2015

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STRUCTURE OF THE DISSERTATION

PART A is the protocol as approved by the University of Cape Town, Faculty of Health Sciences Research Ethics Committee (HREC), which includes the background and justification for the study, the aims, objectives, methodology and study logistics. References are also included at the end of the protocol.

PART B is a structured literature review that was conducted for this dissertation as prescribed in the University of Cape Town MMed dissertation guidelines.

PART C is a publication-ready manuscript presented in the form of an article for the BMC Health Services Research Journal. The manuscript is based on research conducted following the protocol presented in Part A, but not all study objectives contained in the protocol could be included in one article. The manuscript comprising Part C only reports on those objectives related to describing the model of service provision at an Intermediate Care facility in Cape Town. The other objectives will be addressed in other articles. Specifically, even though elements from a 12-item WHODAS and ICF were used in data collection, the WHODAS findings are not reported in this manuscript. These findings will be reported in a separate publication.

PART D includes all appendices and supporting documents.

Appendix A includes the Questionnaires (isiXhosa and Afrikaans translations not included but are available from the author)

Appendix B is the Codebook

Appendix C is the Ethics Approval letter for the study

Appendix D is the approved title amendment letter

Appendix E is the Instruction for Authors document as copied from the BMC Health Services Research Journal; available from: [http://www.biomedcentral.com/bmchealthservres/authors/instructions]

ABSTRACT

BACKGROUND: A comprehensive Primary Health Care approach includes clear referral and continuity of care pathways. South Africa lacks data that describe Intermediate Care (IC) services and its role in the health system. This study aimed to describe the model of service provision at an IC facility and the role it plays in the continuity of care in Cape Town.

METHODS: Sixty-eight patients (65% Response Rate) were recruited in a prospective cohort design over a one month period in mid-2011. Patient data were collected from a clinical record review and an interviewer-administered questionnaire, administered at a median interval between admission and interview of 11 days to assess primary and secondary diagnosis, knowledge of and previous use of Home Based Care (HBC) services, reason for admission, demographics and information on referring institution. A telephonic interviewer-administered questionnaire to patients or their family members post-discharge recorded their vital status, use of HBC post-discharge and their level of satisfaction with care received at the IC facility.

A Cox regression model was run to identify predictors of survival and the effect of a Care-plan on survival. Seventy staff members (82%) were recruited in a cross-sectional study using a self-administered questionnaire to describe demographics, level of education and skills in relation to what they did for patients and what they thought patients needed.

RESULTS: Of the 68 participants, 38% and 24% were referred from a secondary and tertiary hospital, respectively, and 78% were resident of a higher income community. Stroke (35%) was the most common single reason for admission at acute hospital. The three most common reasons reported by patients why care was better at the IC facility than the referring institution was the caring and friendly staff, the presence of physiotherapy and the wound care. Even though a large proportion of the IC inpatients had been admitted in a health facility on the year preceding the study, only 13 patients (21%) had used a Community Health Worker (CHW) ever before and only 25% (n=15) of the discharged patients had a confirmed CHW visit post-discharge. The presence of a Care-plan was significantly associated with a 62% lower risk of death (Hazard Ratio: 0.380; CI 0.149–0.972). Notably, 46% of staff members reported performing roles that were outside their scope of practice and there was a mismatch between what staff reported doing and their actual tasks. In addition, of the 57 patients that could be traced on follow-up 21(37%) had died.

CONCLUSION: Patients and family understood this service as a caring environment that is primarily responsible for rehabilitation services. Furthermore, a Care-plan which extends beyond admission could have a significant impact on reducing mortality. IC services should therefore be recognised as an integral part of the health system and it should be accessed by all who need it.

Key Words: *Subacute care; Sub-acute care; Intermediate Care; Step-down facilities; Stroke Rehabilitation; Continuity of care; Care plan; Cape Town; South Africa*

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List of Acronyms

ACSM	Advocacy Communication and Social Mobilisation
ADL	Activities of Daily Living
AIDS	Acquired Immune Deficiency Syndrome
ALOS	Average Length of Stay
BMH	Booth Memorial Hospital
BoD	Burden of disease
BP	Blood Pressure
CBS	Community Based Services
CCW	Community Care Worker
CHC	Community Health Centre
CI	95% Confidence Interval
CMH	Cecilia Makiwane Hospital
CSP	Comprehensive Service Plan
DeHS	Demographic Health Survey
DHS	District Health Services
DM	Diabetes Mellitus
DVT	Deep Vein Thrombosis
EC	Eastern Cape Province
EN	Enrolled Nurse (Staff Nurse)
ENA	Enrolled Nursing Assistant (Axillary Nurse)
EPWP	Expanded Public Works Programmes
EU	European Union

GFJ	GF Jooste hospital
GMC	Gatesville Medical Centre
GSH	Groote Schuur Hospital
HAART	Highly Active Antiretroviral Treatment
HAST	HIV/AIDS/Sexually Transmitted Infection (STI) & TB unit
HBC	Home Based Care
HCBC	Home Community Based Care
HHA	Home Health Agencies
HIV	Human Immune Virus
HPT	Hypertension
IC	Intermediate Care
ICF	International Classification of Functionality
IQR	Interquartile Range
IRF	Inpatient Rehabilitation Facilities
LTCH	Long Term Care Hospital
LTFU	Lost to Follow Up
NGT	Nasogastric Tube
NPO	Non-Profit Organisation
NPPHCN	National Progressive Primary Health Care Network
NSH	New Somerset Hospital
OPD	Outpatients Department
OT	Occupational Therapy
PGWC	Provincial Government of the Western Cape.
PHC	Primary Health Care
PVD	Peripheral Vascular Disease

PN	Professional Nurse
RCW	Rehabilitation Care Workers
RR	Risk Ratio
SAC	Subacute
SACW	Subacute Care Ward
SNF	Skilled Nursing Facilities
TB	Tuberculosis
TBH	Tygerberg Hospital
UCT	University of Cape Town
VHW	Victoria Hospital
WC	Western Cape Province
WHO	World Health Organisation
WHODAS	World Health Organisation Disability Assessment Schedule

PART A: PROTOCOL

1. INTRODUCTION

1.1 Background

It's been more than three decades since delegates at the Alma–Ata conference declared the importance of Primary health care "as part of development in the spirit of social justice".[1] The Primary Health Care (PHC) approach "outlined a strategy which would respond more equitably, appropriately and effectively to basic health-care needs".[2] Countries have moved at a different pace in ensuring that, such a basic human need is accessed by all individuals and communities.[2, 3]

Developing countries like Zimbabwe combined their attainment of independence with the recognition of the importance of Primary health care and specifically community participation. To increase the accessibility of health services to its citizens the government launched a national village health worker programme. This was seen as a practical way of extending health services to the rural populations.[4]

South Africa seems to have been slow at adopting primary health care as the "driving principle for health care provision in South Africa.[5] This is one of the factors that prompted the establishment of the National Progressive Primary Health Care Network (NPPHCN) in 1987. This Non-government health advocacy organisation was apolitical at the tense political times in the country. It was primarily founded to develop a PHC strategy for South Africa. Their advocacy programmes increased community participation and helped with skill development of individuals in communities to become "skilled health workers".[6]

It is therefore encouraging to see the South African national department of health releasing the Primary health Care (PHC) re-engineering discussion documents.[7] Of interest in this discussion document is a model that formally incorporates Community Based Services (CBS) into the District Health Service (DHS).[7] The discussion document poses a huge challenge to the country's nine provincial departments of health which have had different CBS models, if any, thus far.[7]

The Western Cape's Community Based Services (CBS) sub-programme supports the healthcare 2010 and Comprehensive Services Plan (CSP) aims of devolving healthcare services; diverting and de-hospitalising patients being inappropriately treated in acute services. Several Non-profit organisations (NPOs) are contracted to render the services primarily through community care workers (CCWs).[8, 9] The European Union (EU) for a number of years funded the Community Care Worker's programme but ended its funding in March 2010 when the contract expired. Funding for these programmes is currently derived from different sources, such as the conditional grant, the provincial department of health budget and the expanded public works programme (EPWP).[9, 10]

CBS has three key components dehospitalised care; Integrated adherence support (including HAST); and prevention and promotion (including Advocacy Communication and Social Mobilisation (ACSM)).[8] This study mostly focuses on the first component of dehospitalised care and will also have a small focus on the second component.

Dehospitalised care supports the aim of reducing hospitalisation and providing care at an appropriate level in a community setting. It covers five types of services.[8, 9]

- Subacute care facilities: provide care for clients discharged from acute hospitals;
- Palliative care facilities: provide short term care to terminally or chronically ill patients;
- Chronic Lifelong care facilities: for clients with severe disabilities who need long term (minimum 90 days) and twenty four hour care;
- Community mental health services: for clients with intellectual disabilities or psychiatric problems; and
- Home Community Based Care (HCBC) services: Patients/clients receiving health services from home. [8, 9]

With a structure this broad, questions are bound to arise with regards to accountability measures and; monitoring and evaluation tools (M&E). Thus far it has not been possible to derive such reliable tools but this study will serve as part of the process to develop effective community based services in the Western Cape.[9, 10, 11, 12] Due to the complexity of CBS this study will only focus on Sub-acute care and Booth/ Booth Memorial hospital will be the CBS component under study. Booth Memorial Hospital (BMH) is a 106-bed model facility, with subacute and palliative care services offered, with a diverse patient population. In addition to that there is a diverse constituency of health professionals in the same facility, it therefore is convenient to utilise such a facility for assessing the Burden of Disease, staff competencies and packages of care in dehospitalised care facilities.

1.2 Motivation for the study

CBS in the Western Cape is fragmented, lacks a credible data collecting tool, staff competencies poorly defined and as a result it is not clear if CBS can cope with the clients utilising its services. It is further unclear how the burden of disease of clients seen at BMH compares to the provincial Burden of Disease.

The staff competencies and skills required to service these patients is also poorly defined, for an example whether nursing services, rehabilitative, medical, pharmaceutical or nutritional care is required, either individual or combined. It would also be important to learn the package of care which would offer the best patient outcome.

The fragmentation in CBS arises because of multiple reasons; that includes the multiple NPOs servicing CBS and with different funding sources without a clear funding stream. This is partly historical due to the previous agreement with the EU. There are no credible monitoring and evaluation tools that assess the quality of care provided by the caregivers. [9, 10, 11, 12]

In addition to this, there was a lack of African and South African based literature on de-hospitalised care. Most of the African literature found on CBS was mainly focused on Home Based Care and mostly in relation to HIV/AIDS.[13]

1.3 Purpose

The Western Cape Department of health District Health System (DHS) directorate wants to look at a few issues regarding CBS. This includes looking at ways of improving on the existing services offered and look at a model that would be required to have more facilities like Booth Memorial Hospital. Findings from this study will therefore make recommendations on CBS.

1.4 Aim and Objectives

Aim:

To determine the burden of disease in dehospitalised care and further assess provider competencies in delivering care.

Objectives:

1. To determine the demographic characteristics of patients utilising BMH;
2. To determine the demographic characteristics of BMH staff;
3. To determine the capacity (number of patient beds and utilisation) of BMH;
4. to describe the referral system (where were patients referred from, by whom, who are patients referred to on discharge, where do patients go to on discharge) in dehospitalised care services;
5. to determine the point prevalence of underlying conditions and clinical complications of clients in BMH;
6. to determine average length of stay of clients in BMH;
7. to describe multidisciplinary teams currently servicing patients in BMH;
8. to describe facilities and equipment available in/to BMH;

9. to determine the quality of discharges in terms of; presence of an appropriate care plan; readiness of discharge into community and; clinical condition on discharge;
10. to determine patient satisfaction with clinical care and services received at BMH;
11. to describe family participation in dehospitalised care;
12. to determine new clinical skills needed at BMH;
13. to determine the possible role of mid-level worker or HCA at BMH.

2. METHODS

2.1 Definition of terms

Acute: An illness which has become severe or recently noted.

Booth/Booth Memorial Hospital (BMH): A subacute care facility in the Western Cape Province; South Africa.

Carer, caregiver, care-worker: Anyone who cares for a patient whether qualified or unqualified. It can be nursing, social, rehabilitative, psychological or basic needs of daily living e.g. washing, feeding, toilet, bed making etc.

Chronic condition: An infectious or none infectious disease state for which a patient has to take daily medication for at-least three months to either be cured, none symptomatic or prevent progression.

Community Based Services (CBS): Health services given to a patient either at home or in a facility close to the community that completely excludes surgical and invasive procedures.

Day staff: A member of staff who works anytime between 07h00 and 16h00.

Health care assistant (HCA): A health worker who is also known as a mid-level worker mostly works under supervision, such as a physiotherapy assistant, clinical assistant, nursing assistant.

Health institution: Hospital or clinic

Home Based Care (HCBC/HBC): It is a service rendered to clients from home, either in the home of the client or caregiver.

Institution: a place of safety e.g. old age home, foster home, hospice.

Multidisciplinary: A diverse team of professionals that has more than one profession represented

Palliative/Respite care: A patient with a terminal illness with a poor prognosis of survival.

Patient/client: An individual who utilises services

Subactute: A patient admitted for an acute condition who has completed the acute medication e.g. antibiotics or has improved from the admission state.

2.2 Study design- Two Sub studies

Because of the nature of the study objectives two sub -studies will be used for the study.

Firstly

A prospective cohort study design will be used to assess clients and families of those admitted to Booth Memorial Hospital from the 27th of June to the 26th of July 2011. This study design has been chosen because it allows for temporality on events that occur from the time of admission at BMH and the follow-up appointment. Clients will initially be asked to participate in the study while admitted at BMH. Where clinical information and /or treatment plans on admission are not clear, the referring hospitals will be consulted for clarification.

Clients will be expected to respond to a questionnaire on basic demographic information and medical history. Some of the clinical information will be collected from the BMH medical records. Clients are expected to be admitted at BMH for a maximum of six weeks and a minimum of one day, after which they have to be discharged. The design will also allow for a calculation of the point prevalence of conditions patients have as in-patients at BMH.

Arrangements will be made with clients, family member(s) and/or caregivers before clients are discharged from BMH for a follow up component of the study (either through a visit or telephonic contact). These visits will have a researcher administered questionnaire, which follows up from the initial questionnaire completed as an in-patient at BMH. This component of the study will take place anytime between one and six weeks after discharge from BMH. This sub-study will be done over a period of twelve weeks.

Secondly

An interview/questionnaire survey (Cross-sectional study design) will be conducted with all clinical staff members of BMH. This study design was chosen because it was a snapshot study that helped to answer all the study's objectives (pertaining to staff) at a single interview and there was no-need for a follow up on staff interviewed. A cross-sectional study design was also found to be appropriate because of the limited resources availed for the study.

2.3 Population and sampling

The study population is all patients who access Booth Memorial Hospital. Participants will be clients and/or families of those admitted to Booth Memorial hospital between the 27th of June 2011 and 26th of July 2011. A 30 day period was chosen based on the estimation that it takes approximately 1 calendar month for all 106 beds to be fully occupied (between 2 and 4 admissions per day). The minimum anticipated sample for the study is therefore. Furthermore, because the study is a prospective cohort a sample size of 106 will be feasible to follow-up.

All clinical staff working at Booth Memorial hospital at the time of the study whether employed or volunteering before the 01st of May 2011 will be voluntary asked to participate in study. Night staff will not be excluded from study. Staff who were employed for less than 2-months before the commencement of the study will be excluded.

No formal sample size calculation will be undertaken since the study aims to recruit all staff study's inclusion criteria.

2.4 Measurements.

2.4.1 Instruments

Clinical staff will be given an English and confidential self-reporting questionnaire. No names will be written on questionnaire. All questionnaires will however, be numbered with a three digit identification number so that track can be kept of the questionnaires printed, distributed and received back. Detailed consent forms will be attached to each questionnaire with a three digit corresponding number to be able to track forms if they accidentally separate.

Negotiations will be held with hospital management for staff to participate in the study for 30-minutes of their shift. Completed questionnaires will be dropped off at an allocated drop box or given to the researcher.

Clients (patients) will be assessed through a researcher-administered questionnaire. These questionnaires will further be divided into two parts; one while admitted at BMH and the second while discharged for at-least one week and a maximum of six weeks after discharge. Clients, who die after having participated in study as an in-patient but subsequently die after discharge from BMH, will be included in follow-up phase of study.

A record review instrument will collect information on prescribed medication, the inpatient care-plan (care received from each professional) and the discharge plan. The discharge plan will be considered as a continuation of the care-plan outside the facility. If it's not present, a care-plan will be listed as absent.

The second questionnaire will either be completed through a telephonic interview, a home visit or an institutional visit if institutionalised further. Questionnaires to patients/family members will be in the respondent's preferred language (English, Xhosa or Afrikaans). Staff at BMH will be requested to assist in Afrikaans interpretation if the researcher cannot speak the language spoken by clients.

Because this is a prospective study, names of participants will need to be taken and linked to the questionnaire. Once the second questionnaire is answered the name will be removed from the questionnaire. Participants will need to be reassured that the study is confidential and taking their names doesn't eliminate the need to maintain confidentiality. Identifiers will be kept securely under lock in the researcher's office.

The ICD-10 coding will be used to code for Burden of disease (BoD) data and the International Classification of functionality (ICF) coding will be used to assess the functional state of patients and deduce their rehabilitative needs. The ICF is a universal, multi-purpose resource for classifying functioning and disability in a wide range of sectors; for example in education and transportation as well as in health and community services.[14]

The WHO disability assessment schedule (WHODAS 2.0) is a standardised instrument developed by WHO to measure health and disease across cultures. WHODAS 2 does not target a specific disease and can be used to compare disability due to different diseases.[15] Both the WHODAS 2.0 and the ICF will thus be used alongside each other.

Incidental comorbidities e.g. dental problems will also be coded and reported on in final results even though they won't be receiving treatment for that at BMH.

Staff competencies will be assessed based on the treatment and discharge plans of clients seen participating in the study. Secondly responses of staff members to a case study that assess rehabilitative needs of a patient in a SAC facility will also assist in assessing the current competencies.

The quality of care will be measured by assessing the appropriateness of discharge of patients from facility and the health state of patients 2-6weeks post discharge. The ICF classification will be used to look at the state of the patient on admission and the state of the patient on discharge.

2.4.2 List and definition of variables

The staff questionnaire will examine basic demographic variables including, educational qualifications, profession, skills, understanding of role in team and views on health care assistants.

The initial patient/client and family questionnaire (and record review instrument) will examine the demographics including presence or absence of spouse; bread winner in family; employment; grants received; medical history; referring institution; previous hospitalisations and/or institutionalisation; all medication and treatment modalities patient is on at admission; presence of chronic medical condition, disease complications including disability; treatment and care plan at BMH; discharge plan.

The second questionnaire aims to look at family satisfaction with care received at BMH; Their views on appropriateness of discharge; clinical progress or deterioration; continuity care plan and involvement of home-based care post discharge.

2.4.3 Validity and Reliability of Instruments

The questionnaires will have closed and open ended questions. There is a chance of a reported or information bias because of either the uncertainty of being victimized if questionnaire is traced back to the respondent. The questionnaires will be fully confidential and it will not be discussed with the management of BMH.

Reliability will be enhanced by using standardised instruments for assessing level of functioning and disability. The ICF and WHODAS 2.0 instruments will be used for this purpose (questionnaires adapted from ICF and WHODAS 2.0). [39, 40]

Even though open ended questions could result in different responses the study will hope that respondents will be honest in their responses. Some parts of the staff questionnaire have been adopted from the advanced practice nursing (APN) data collection toolkit, a validated and reliable instrument.[16]

Information bias will be minimised by using the above mentioned instruments. Selection bias might also result as this study will be done over a specific month and season and conditions that fall out of the winter season might be excluded. This bias is however, minimised because all participants have an equal chance of participating in study.

Loss to follow up/ attrition bias could result after patients have been discharged. This will be minimised by getting full contact details of patients and that of a next of kin, on admission into study. Those patients who die after discharge from BMH will not be considered as loss to follow up and will thus be included in the final analysis of the second phase of the patient study.

2.4.4 Pilot Study

Five, day-staff members were asked to participate in a pilot study (20th to the 23rd of June 2011). Based on the pilot study questions with jargon were re-phrased.

10 patients/clients who were hospitalised at BMH on the 20th -23rd June 2011 were selected at random to participate in a pilot study. Any questions that needed to be amended were corrected before the final study. If there was a need to add translations to questionnaires this was also done accordingly.

The record review instrument was also piloted to ensure applicability in the study. This was done on the 20th to the 23rd of June 2011 at BMH.

3. DATA MANAGEMENT AND ANALYSIS

3.1 Statistics

All data collected will be captured and coded on EpiData version 3.1 (epidata association, Denmark) and imported for analysis onto STATA 11.1 (stata Corp LP, college station, Texas, USA) and Microsoft excel 2010 (Microsoft corporation, Seattle, USA). Data validation settings will be used to prevent double entries by subject number and to minimise erroneous field entries.

Staff skills, perceived patient care needs (by staff) and patient care needs (from record review) will be categorised according to common themes. These themes will be selected as part of post-hoc analysis based on the responses given.

Table 1: Main Outcomes, Independent variables and Statistical tests

Dependant/Outcome Variables		**Independent/predictor Variables**		**Statistic**
Variable	**Variable Type**	**Variable**	**Variable Type**	
Stroke	Binary	Hypertension Diabetes Mellitus Hypercholesterolaemia	Binary	Chi-squared or Fisher's exact test
Status (alive or dead)	Binary	Subacute care ward versus Palliative care ward	Binary	Kaplan Meier survival estimate
Status (alive or dead)	Binary	Age (years)	Numerical (continuous)	Cox Proportional Hazard Model
		Stroke status	Binary	
		Care-plan (Yes/No)	Binary	
		Confirmed CHW visit	Binary	

The distribution of numerical variables will be explored using the Shapiro Wilk test, box and whisker plot and/or the histogram. Numerical data that is not normally distributed will be reported using non-parametric statistics (median and Interquartile Range (IQR)). The mean and the range will be used to report on normally distributed data.

Before means and medians from two different populations could be compared, the variance ratio test will be used to test the equality of variances. The relevant two sample t-test or the Satterthwaite's modified t-test or the Wilcoxon sum rank test (Mann-Whitney test) will be used depending on the equality of variances and as to whether the variables are normally distributed or not. The paired t-test (parametric) or the Wilcoxon sign rank test (non-parametric) will be used to compare the length of stay at the referring institution and BMH.

The 95% Confidence Interval (CI) will be used to estimate the precision of estimates. Two categorical variables will be compared using 2 X 2 tables and the expected frequencies will be calculated to determine the type of test to use on determining the extent of relative associations. If the expected frequencies are ≥ 5 then the Chi-squared test (Chi ^{2}) will be used and if the expected frequencies are < 5 then the Fisher's exact test will be used.

Since this study consists of a cohort and a cross-sectional study the Risk Ratio (RR) is the relative measure of association used to report on the extent of associations between two categorical variables. The level of significance: 5% (p-value < 0.05).

The Kaplan –Meier survival method will be used to estimate the time of survival in the study (from enrolment to death or lost to follow up). The Cox Proportional Hazard model will be used to predict the relationship between survival and variables thought to predict survival (**Table 1**). Variables that will be considered is Age (years), Strokes versus non-strokes, a confirmed CHW visit and a care-plan that extends beyond BMH versus the absence of a care-plan.

Model selection techniques will compare and nest models using the Aikaike's Information Criterion (AIC). A model with the lowest AIC will be selected as the best model to predict survival. The test of the proportional hazard assumption (Schoenfield residuals) will be used to confirm the validity of the overall proportional hazard assumption.

3.2 Dummy Tables

Table 2: Dummy of data capturing sheet

Subject number	Age (yrs)	Sex	Home Language	…	…
023					
071					
103					
…					
…					

Table 3: Dummy Relative association between HPT and Stroke

HPT	Stroke		Total
	Yes	No	
Yes			
No			
Total			
Prevalence Risk Ratio: 95% CI: p-value: Test Statistic: Chi-squared statistic or Fisher's exact test			

4. ETHICS AND COMMUNICATION

All participants (staff or clients) will complete a signed informed consent. The consent will be; signed by the client or family member if it is not possible for the client to sign. Family members will be interviewed on behalf of patients who are unable to participate due to their medical condition. All possible participants will be encouraged but not coerced or forced into the study. It will be emphasised to clients that their care will not be affected if they decide not to participate. Similarly, staff will be assured that they will not be penalised or prejudiced if they decide not to participate. However, every effort will be made to make it easier for participation.

Time will be requested from management of BMH for staff and clients to participate in the study. The process will be clearly communicated to all participants with enough time for clarities and questions.

This protocol will be taken to the UCT faculty of health sciences ethics committee for approval of study. Study results and report will be given the property of the Western Cape Department of health and policies governing dissemination of study materials will be applicable.

There are, however, unpredictable factors which might present challenges during the course of the study. It is possible to come across issues of patient mismanagement while reviewing the client records or, find that on follow-up clients were prematurely discharged and should in actual fact still be in a facility. This will present an ethical difficulty and dilemma.

If such is encountered it would be in the best interest of the client, to find a non-undermining, non-offending and non-provoking way to discuss with the clinicians concerned, not revealing that it came as a complaint from the client. All advocacy measures on behalf of clients, will take precautions to ensure that they are not victimised by the researchers' actions. Notwithstanding the above, measures will be taken to ensure that the clinical management of such identified clients is reviewed.

Ethics approval was obtained from the University of Cape Town's Health Sciences Faculty, Human Research Ethics Committee (HREC) on the 03rd of June 2011 with HREC reference number HREC 265/2011.

5. RESOURCES

The Principal Investigator (PI) will oversee collection and analysis of data and completion of questionnaires. Questionnaires will be printed from the Department of Health's offices at Norton Rose House. Some questionnaires will be translated from English to isiXhosa or Afrikaans, and that will be done by Western Cape Department of Health employees at no additional costs. Telephone, fax and internet will also be at the Western Cape Department of Health. Transport costs will be borne by the researcher.

A working station will need to be negotiated with the management of Booth memorial hospital for the duration of the study. Space for a questionnaire's drop –box will also need to be negotiated. No budget allocated or sponsorships for this study.

6. LOGISTICS

A copy of the final protocol will be taken to the ethics committee for approval. A day will be required to meet with the management of BMH to discuss logistics (15 June 2011) and get staff profile. Five days will be required to pilot questionnaires and instruments. This will be done between 15 June and 22 June 2011.

Data collection will be done between the 27th of June and 23rd September 2011. Data collection will take 12weeks and an extra week has been allocated for public holidays and other unforeseen circumstances.

Data analysis will start from the 01st of September (overlap with data collection) to the 22nd of October. Report compilation will start from the 31st of October to the 02nd of December 2011.

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PART B: LITERATURE REVIEW

1. SEARCH STRATEGY

Searches were done between the 13th April 2011 and 10th of March 2014 of the following databases and resources: Pubmed; South African Medical Research Council (MRC) database; EBSCO; OVID; Google Scholar; Public Library of Science (PLoS); University of Cape Town (UCT) Library; UCT Health Sciences Librarians; and the Western Cape Department of Health. The search looked for publications released before the 10th of March 2014 and restricted selection to those published or translated into English.

Search strings used included:

‘primary’ AND ‘health’ AND ‘care’; ‘burden’ AND ‘of’ AND ‘disease’ AND ‘global’ OR ‘south africa’ OR ‘africa’; ‘community’ AND ‘based’ AND ‘service(s)’; ‘community’ AND ‘based’ AND ‘care’; ‘home’ AND ‘based’ AND ‘care’; ‘subacute’ OR ‘intermediate’ OR ‘postacute’ AND ‘care’; ‘sub-acute’ OR ‘post-acute’ AND ‘care’; ‘dehospitalis(z)ed’ AND ‘care’; ‘de-hospitalis(z)ed’ AND ‘care’; ‘de-institutionalis(z)ed’ AND ‘care’; ‘community’ AND ‘care’ AND ‘worker’; ‘community’ AND ‘care’ AND ‘giver’; ‘health’ AND ‘care’ AND ‘assistant(s)’; ‘long-term’ and ‘care’; ‘multi-disciplinary’ AND ‘health’ AND ‘care’ AND ‘team’. Prefixes and/or suffixes commonly used included: ‘south africa’ OR ‘south african’; ‘africa(n)’; ‘developed nations OR countries’; ‘developing nations OR countries’.

Even though most of the literature used for the review is material sourced from credible, peer reviewed scientific and/or medical and health sciences journals, some credible and valid grey literature material was used from the internet (including documents from the World Health Organisation and the South African Department of Health). There was no geographical restriction to articles sourced. A total of 683 articles were shortlisted for the review based on article reference lists (hand searched articles already selected), abstracts and/or titles. Following this search criteria some articles were either found not to be directly relevant to this topic and/or the literature review or they lacked English translations for their abstracts or articles and were thus excluded. After critical review, only 71 articles were used for the final review presented in this document.

Even though much research has been published on subacute care, it was clear there is a gap related to African and South African research in this area of care.

2. OBJECTIVES OF THE LITERATURE REVIEW

1. To describe various models of de-hospitalised care services and subacute care discussed in literature.
2. To describe the policy context in South Africa and the Western Cape Province for Subacute care.

3. REVIEW OF RELEVANT LITERATURE

3.1 BACKGROUND

3.1.1 Primary Health Care

It has been more than three decades since delegates of the Alma–Ata conference declared the importance of Primary Health Care "as part of development in the spirit of social justice".[1] The Primary Health Care (PHC) approach "outlined a strategy which would respond more equitably, appropriately and effectively to basic health-care needs".[2] In 1978, delegates were confident that the PHC approach would ensure the attainment of health for all by the year 2000. A principled decision delegates agreed on was that PHC needed to prioritise those most in need and that for PHC to provide comprehensive health care it "…should be sustained by integrated, functional and mutually supportive referral systems…".[1]

A PHC approach advocates for health promotion, preventive services, curative services, rehabilitative and palliative services. This approach was underpinned by 5 principles of:

- Access to health services
- Community participation
- Health promotion
- Intersectoral collaboration
- Use of appropriate technology

Decision makers at the landmark Alma-Ata conference must have been aware that for the proposed PHC approach to be successful, there would need to be major changes not only within the health sector but also in other sectors and in community structures and processes as well.[2] Changes that needed to be made included the redistribution of existing resources and a reorientation and a broadening of health personnel skills to enable them to respond appropriately to the challenges of implementing PHC.[1,2] Health for all would also only be realised if there was an integration of a human rights approach to public health.[3]

Reviews on the potential and progress of the Alma-Ata declaration over the past 35 years do note some successes including the re-orientation of services and the development of new types of personnel.[2] It is however, generally felt that countries moved at a different pace in ensuring that, the ambitious goal of "Health for All" was realised.[2,4] This is primarily because the declaration was non-binding on Governments.[4] This thus resulted in a failure to deliver universal and accessible healthcare even long after the year 2000.[5]

3.1.1 Differences between Primary Health Care and Primary Care

An issue that arose soon after the Alma-Ata conference is the confusion caused by the distinction between Primary Care (PC) and Primary Health Care (PHC).[1,2,6] These are similar terms used to denote different concepts and a distinction is key in any health system.[6]

A way of looking at Primary Care is a definition by Starfield[7] that looks at PC as a "level of a health service system that provides entry into the system for all new needs and problems, provides person-focused (not disease-oriented) care over time, provides care for all…" [6,7] PC can also be understood as the element within Primary Health Care that focuses on health care services,[6,8] including health promotion, illness and injury prevention, and the diagnosis and treatment of illness and injury.[6,9]

Primary Health Care on the other hand should be reserved to describe an approach to health policy and service provision which includes both services delivered to individuals and population-level functions and which derives from the Alma-Ata principles already described above.[1] As Sanders puts it, PHC is an approach on which the whole health system should be organised.[2]

The term Primary Care is more widely used in developed country literature than Primary Health Care which is preferred in developing countries.[8] Whilst these terms are not meant to be interchangeable, confusion has persited with many developing country governments referring to Primary Health Care facilities when they mean Primary Care facilities or services.[6] This review will refer to the broader concept of Primary Health Care[1] when using the term PHC.

3.2 Burden of Disease

A close scrutiny of the global burden of disease demonstrates clearly that the PHC approach is as relevant today as it was back in 1978.[5,10] Just as in developed countries, low and middle income countries have over the years experienced an increasing prevalence of chronic non-communicable illnesses.[5,11,12] The increasing prevalence of non-communicable diseases in developing nations can be attributed to the ageing of populations, urbanisation and globalisation of risk factors.[11]

While chronic non-communicable diseases (NCDs) account for almost 60% of global mortality, the majority of deaths (±80%) from NCDs occur in low and middle-income countries.[12] The most common causes of NCD related deaths globally are those attributable to cardiovascular disease (including hypertension) accounting for ±30% of cases, chronic respiratory disease (7%), and diabetes mellitus (2%).[12,13] NCDs like cardiovascular disease and diabetes do not only contribute to high mortality rates but also have high morbidity rates globally.[14] The 2010 Global Burden of Disease (GBD) study showed that hypertension is not only responsible for "…9.4 million deaths…" globally but also responsible for "…7% disability…".[14]

The 2010 GBD study went further to show that while the global life expectancy has increased, people are not necessarily enjoying an improved quality of life.[14] This is because, over the past few decades, more and more people live many years of their lives with chronic illnesses, multiple comorbidities and an ever increasing prevalence of disability.[14]

Marrone et al.[15] found that stroke is the leading cause of death in South America and the leading cause of disability in a middle income country like Brazil.[15] Among the most frequent risk factors in many of these strokes, hypertension and diabetes mellitus were prevalent in ±75.1% and 22.6% of cases respectively.[15] Even though there are similarities in the BoD between South America and Sub-Saharan Africa and South Africa, there are equally many differences.[16,17,18] Differences include the fact that the high chronic NCD burden in Sub-Saharan Africa is accompanied by a persistently high burden of infectious disease such as malaria, Tuberculosis and HIV/AIDS.[16]

South Africa's healthcare is characterised by having to manage a quadruple burden of disease made up of the HIV/AIDS epidemic, diseases and conditions related to poverty and under-development, non-communicable chronic diseases and injuries.[17,19] South Africa is known to have the largest number of individuals who have been infected by HIV globally.[17] Whilst NCDs were found to account for 37% of deaths and 16% of disability adjusted life years[16] in South Africa's Burden of Disease (BoD) Study for the year 2000, HIV/AIDS accounted for the most (37%) Disability Adjusted Life Years (DALYs) lost and accounted for 25% of all deaths.[16,20]

It is however, important to mention that even with South Africa's burden of disease, NCDs "…are more prominent than expected….especially hypertension and type 2 diabetes".[18] Hypertension is also said to be the single most common reason for a primary care visit.[18,21] A community survey among South Africa's adults above the age of 50 years by Peltzer et al.[21] previously found a high prevalence of hypertension (77.3%).[21] Hypertension was further found to be strongly associated with having a stroke and "greater limitations on activities of daily living (ADL) and Instrumental Activities of Daily Living (IADL)".[21]

All these trends therefore require a systems approach where services are integrated across the health sector.[19] Primary Health Care can therefore not only be viewed as being only useful in offering primordial and primary prevention but also as an approach that can be used for secondary and tertiary prevention strategies.[1,10] The original declaration was very clear about the type of comprehensive health care that would advance the needs of all citizens of the world from the onset.[1] Relevant today as it was back in 1978, a PHC approach to care should address "…the main health problems in the community, providing promotive, preventive, curative and rehabilitative services…".[1]

3.3 International De-hospitalised Care Services models

The above disease profile points to the need for services able to deal with the burden. This is relevant both internationally and in South Africa. Countries like the USA, Canada, Sweden and the UK have been concerned about their ageing populations.[22-29] Their main source of concern is that older people often have at least one long term condition such as diabetes, arthritis and/or hypertension.[27,30] This may result in complex and repeated admissions either due to an exacerbation of the chronic condition or emergence of a complication such as a stroke or chronic kidney disease.[27,30]

The care of older people therefore addresses 'complex' health and social needs and as such requires complex management systems coupled with reliable continuity in their care.[27,28,30,31,32] Even though such care may be time consuming for the treating team it has to be sustained and intensive at all times.[27,31]

One of the major achievements of the comprehensive PHC approach has been the success of Community Based Services programmes.[2,4] Demonstrated in the literature is that different countries and, in some instances states or provinces, have developed different models of community based services (CBS).[22-27] These different CBS models have been applied in different contexts in different parts of the world over the years.[22-34] These services can broadly be classified into three categories: chonic care; physical and mental health; and palliative care.

The literature seems to be in agreement that older people generally have a negative attitude towards institutionalisation in old age homes.[27,29] Therefore, a system of managing them in their own homes or closer to their homes is preferable to institutionalisation.[27,29] In Canada a system that includes home visiting nurses, therapists, homemakers, respite care and day programs has been found effective for this purpose.[25]

Others have looked at CBS as a dignified way of caring for those with mental and physical disabilities.[33] This, on one hand, allows those with disabilities to live in their own communities and function independently for as long as possible.[33] In the UK over the years many specialised mental health care centres have been closed. Such care has been devolved to management in communities.[22,34]

Patients nearing end of life requiring palliative care have also benefited from CBS.[35,36,37] Such patients would include but not limited to elderly people with dementia or cancer and patients with HIV/AIDS.[35,36,37] Services both in hospices and managed at home through home-based care have been found "effective in improving the quality of life (QoL)".[35]

CBS also plays a role in lessening the ever increasing pressure on the acute services.[22,23] There has been a growing feeling that some patients are inappropriately placed in acute hospital beds.[25] These are patients who should be managed either in subacute, long-term facilities or in the community from home by either a family member or community care workers.[22,23,24,25]

This therefore indicates that mental health services, respite/palliative care, subacute/intermediate care, long-term care and home based care form the core structure of a de-hospitalised service model of care,[38,39] even though they may be applied or prioritised differently in different contexts. For example, in comparing the long-term systems of Sweden and the US, it is evident that Sweden spends more on long-term care "(services financed by the public sector and subsidised by the private sector)" than the US.[39]

3.4 Primary Health Care and De-hospitalised care models in South Africa

South Africa seems to have been slow at adopting primary health care as the driving principle for health care provision.[5] This has to be viewed in the context that the South African democratic government inherited a highly fragmented and bureaucratic health system from the old apartheid system, which provided health services in a discriminatory manner.[40]

The first democratic government in South Africa showed its intentions of developing a unified health system early on by drafting a "*White Paper for the transformation of the Health System in South Africa*"[41] policy document released in 1997. This document uses Primary Care and Primary Health Care interchangeably as similar concepts.[5,6,41] This is evident when the document makes reference to Primary Health Care facilities and Primary Health Care level while it in actual fact meant to use the term Primary Care.[41] As discussed earlier, Primary Health Care is an approach and cannot be reduced to a level of care or facility.[1,6]

It was however, encouraging to see the South African national department of health releasing the Primary health Care (PHC) re-engineering discussion documents in the 2010/11 financial year.[42] Of particular interest in this discussion document is a model that formally incorporates CBS in the form of Community Health Workers (CHWs) into the District Health Service (DHS).[42] The discussion document poses a huge challenge to the country's nine provincial departments of health which have had different CBS models.[42]

The Western Cape Government CBS sub-programme aims to devolve healthcare services and to divert and to de-hospitalise patients being inappropriately treated in acute services.[43] Before the 2012-13 financial year CBS in the Western Cape had three key components, de-hospitalised care; Integrated adherence support; and prevention and promotion (including Advocacy Communication and Social Mobilisation (ACSM)).[43]

De-hospitalised care supports the aim of reducing hospitalisation and providing care at an appropriate level in a community setting. Before the 2012-13 financial year de-hospitalised care covered five types of services:[43,44]

- Subacute care facilities: provide care for clients discharged from acute hospitals;
- Palliative care facilities: provide short term care to terminally or chronically ill patients;
- Chronic Lifelong care facilities: for clients with severe disabilities who need long term (minimum 90 days) and twenty four hour care;
- Community mental health services: for clients with intellectual disabilities or psychiatric problems; and
- Home Based Care (HBC) services: Patients/clients receiving health services from home.[43,44]

In the South African context, factors which have had a key role in shaping SAC and other related services over time include the growth of the HIV epidemic, changing approaches to the management of HIV/AIDS (including universal access to treatment programmes), and the more recent recognition of the increasing burden of NCDs.[16,20,21,45] The general shift is towards the management of chronic lifelong conditions and ensuring the necessary service delivery platforms to enable this.[16,20,45,46,47]

Several Non-profit organisations (NPOs) are contracted to render community based services primarily through CHWs.[43,44] The European Union (EU) for a number of years funded the CHW programme but ended its funding in March 2010 when the contract expired. Funding for these programmes is currently derived from different sources, such as the conditional grant, the Provincial Department of Health budget and the Expanded Public Works Programme (EPWP).[44,48]

In 2011 when this study commenced the Western Cape Department appointed a task team to revise the Subacute Care policy.[46,47] The task team comprised of leading academics and experts from the University of the Western Cape, University of Stellenbosch, University of Cape Town and the South African Medical Research Council. This resulted in the development of the Intermediate Care Policy Framework which revised the operations of de-hospitalised care and Subacute Care when the document was approved in September 2012.[46] The task team proposed Intermediate Care as a more accurate description of the mixture of services offered in de-hospitalised care.

Intermediate Care broadly included patients requiring post-acute care, restorative and rehabilitative, and palliative care, incorporating the first four bullets of the services previously included under the ambit of 'Community Based Services (CBS) in the Western Cape. This definition more closely reflects the actual nature of services delivered, rather than being tied to the funding stream that supported these services previously in the province. However, because the term 'sub-acute care' is widely used in the literature, this study will continue to use the term SAC for comparability, but will interpret what is meant by SAC in light of the policy shift to locating SAC within the ambit of all forms of Intermediate Care.[46]

3.5 Subacute care services

This section that follows aims to provide conceptual clarity on Subacute/Intermediate Care drawing on the international literature. Subacute care should be seen as an extension of hospital care which overlaps with rehabilitation but it should also be noted that not all subacute care is rehabilitative.[49] The challenge with subacute care facilities does not only lie in the fact that these institutions have different names for a similar service across the world but also because the models and packages of care are different depending on the environment.[49 –57]

In the United States of America subacute care facilities are interchangeably known as Postacute Care (PAC) or Subacute care (SAC) facilities.[50] These services are accessed in a wide range of settings that include Skilled Nursing Facilities (SNFs), inpatient rehabilitation facilities (IRFs), long-term care hospitals (LTCHs) and in their own residents from home health agencies (HHAs). This, therefore, presents a challenge for comparing services.[50] The distinction between the services offered at these facilities is that IRFs are certified as hospitals oriented towards rehabilitation, provide at least 3 hours of multi-disciplinary therapy a day, have 24-hour nursing staff, and have a medical doctor to oversee care daily.[50]

SNFs have 8-hour nursing staff, follow a medical doctor's plan of care, provide a medical doctor's oversight within 30 days and have nurses on call daily for a 24-hour period. HHAs on the other hand provide home-based care, therapy, nursing care and assistance from home health aides based on a medical doctor's orders. LTCHs are services offered to patients who are expected to have an average length of stay (ALOS) exceeding 25 days.[50] The diversity in the American model therefore demonstrates how difficult it is to compare services offered under the rubric of Subacute care.[49-55]

In the UK, intermediate care facilities describe all services that meet all the criteria in Table 1.[56] Facilities used for intermediate care needs in the UK include geriatric day hospital; hospital-at-home schemes and home-based rehabilitation; community hospitals; rapid response teams, community assessment and rehabilitation teams (CARTS); nurse-led units; social service schemes; day centre rehabilitation and; residential care rehabilitation.[56] This intermediate care model has, however, faced challenges in changing staff skills and attitudes to the needs of communities.[56] Even though the intermediate care policy was formally adopted as national policy as far back as 2001, integrating this service with "…mainstream services has been especially difficult".[56]

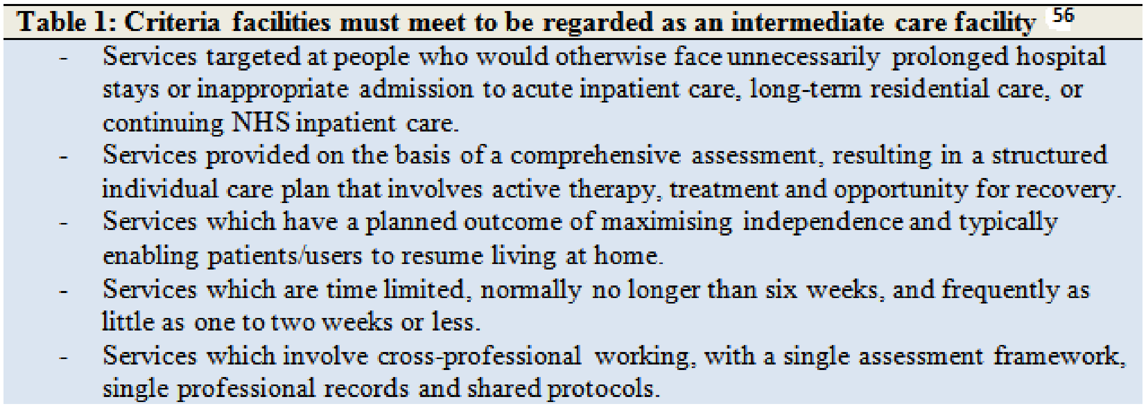

Table 1: Criteria facilities must meet to be regarded as an intermediate care facility [56]

- Services targeted at people who would otherwise face unnecessarily prolonged hospital stays or inappropriate admission to acute inpatient care, long-term residential care, or continuing NHS inpatient care.
- Services provided on the basis of a comprehensive assessment, resulting in a structured individual care plan that involves active therapy, treatment and opportunity for recovery.
- Services which have a planned outcome of maximising independence and typically enabling patients/users to resume living at home.
- Services which are time limited, normally no longer than six weeks, and frequently as little as one to two weeks or less.
- Services which involve cross-professional working, with a single assessment framework, single professional records and shared protocols.

Australians use the term subacute care to describe "…interim care, intermediate care and post-acute care".[57] Their model of subacute care "…includes rehabilitation, palliative care, psychogeriatric care, geriatric evaluation and management and maintenance care".[57] In Australia this type of care is offered on either an inpatient or outpatient basis and it can take place as a substitute for acute hospitalisation or directly after discharge from acute hospitalisation.[57]

What the subacute care models of the USA, UK and Australia have in common is that such care needs to enhance the "…quality of life and/or functional status".[57] Other than the fact that subacute care facilities are characterised by the presence of multi-disciplinary care teams, the care offered is also less intensive than that provided in acute facilities.[54,56,57] As a result the system has less dependence on "…high-tech monitoring or complex diagnostic procedures".[54]

Notably there are few studies published in the South African and African literature on Subacute or Intermediate Care services. Where studies were found on de-hospitalised care they focused mainly on HBC in relation to HIV/AIDS**.**[37,58-61] The only information acquired on South African CBS and subacute care models was the information from the South African National Department of Health Subacute Care policy guideline, the Western Cape Provincial Department of Health planning documents and the Western Cape Intermediate Care Policy review undertaken between 2011 and 2012.[43,46,47,62,63] South Africa's discussion document on the development of Subacute policy guideline suggests that a continuum of care includes both acute and subacute modalities.[63] The policy document goes further to recommend a number of principles for SAC which include the fact that:[63] SAC must be an integral part of healthcare services; must be the gateway to successful discharge planning; facilities/services usually encompass HIV/AIDS, convalescence, terminal, rehabilitation (physical or psychiatric), and long-term care (physical or psychiatric); must be an in-facility service; must be in the community; the outcome of admission to SAC must be measurable on three parameters (acuity, functionality and home readiness); SAC must collect outcomes data; must be professional nurse driven; and that SAC must become an integral part of all revitalised hospitals' clinical management.[63]

3.6 De-hospitalised Care Services funding models

While international literature seems to be in agreement with the importance of de-hospitalised services in health, there seems to be different and contrasting views on a number of the specifics and benefits in implementing such a program.[33,39] Issues of contention include the funding model, staffing models, cost effectiveness and family satisfaction to mention but a few.[33,39]Another issue on which there is consensus is that poorly coordinated and poorly resourced service models lead to unacceptable patient outcomes such as repeated hospitalisation.[27]

Some countries use multiple non-profit organisations (NPO) while others have multiple for-profit organisations to deliver community-based services within the same system.[25,29,64] This fragmentation has, in many instances, been noted to result in unnecessary competition and antagonism between the providers at the expense of the patient.[25,29,64] As a result, there might be problems of poor coordination between hospitals and de-hospitalised care services. Continuity of care is therefore vital to good quality care.[29]

3.7 De-hospitalised Care benefits and efficiency

Another area with differing views noted in the literature is with regards to cost-effectiveness of de-hospitalised care and whether such services automatically translate to a more cost-effective system than hospitalisation.[2] For example, Wistow expressed doubt about their cost-effectiveness, arguing that such claims are "largely untested".[25] As has been noted in other parts of the world, decreased hospitalisation and replacement of long-term beds with community based alternatives results in a paradoxical increase in day and outpatient cases.[25] This is supported by claims that expansion of home-based services might attract users who would otherwise not have been hospitalised and that will therefore not necessarily translate into reduced patient pressures in hospitals.[65]

Some literature suggests that families benefit from community based alternatives because they save on transport costs to hospitals if relatives are at home or closer to home.[29,66] In contrast, other researchers suggest that there are many hidden costs borne by families directly and indirectly if clients are managed at home.[38] These costs will include multiple phone calls for assistance, special dietary requirements, hiring a helper and, at times, adjustments to the house. Families may also suffer psychological effects if a patient who should be hospitalised is discharged prematurely to the community.[25]

As McCoy et al.[38] note, delays in discharge can also result in patients receiving sub-optimal rehabilitation and post-acute care in a hospital ward when they could be better looked after at home or in a dedicated intermediate care facility.[38] On the other hand, it has been noted that a poor quality discharge will result in an increased readmission rate.[67] This, therefore, suggests that the discharge process needs to be carefully managed and there must be clear communication lines between the hospital and Intermediate Care otherwise this will result in poor quality care.[27,38]

3.8 Staff competencies and packages of care Subacute Care/Intermediate Care services

Research has also examined the staffing models used in SAC, with systems using either professional and/or non-professional staff to deliver care.[34] The literature seems to be in agreement that nursing duties are crucial to SAC.[25] Views, however, diverge with regards to the 'skill mix', and the level of qualification needed e.g. nurses or other professionals if any.[32] There have also been diverse views on the role and need for medical doctors in SAC.[32,34,68,69]

Whichever model managers employ, it is imperative to establish an effective mix of staff that can be achieved with the available resources, taking into consideration local priorities.[68] Some SAC models have had combinations of a nursing, medical, rehabilitation, social roles (with or without counseling), nutritional and pharmaceutical roles.[27,33,36,70] The literature has also demonstrated the effective combination of some or all these skills to produce multidisciplinary health care teams.[36,67,71]As a cost saving measure, some authorities have introduced a new 'cadre' of health provision in SAC.[32]

Terms describing these cadres include Health Care Assistants (HCAs), support workers, generic support worker; clinical support worker; healthcare support worker; caregiver; care-worker; care team assistant; nursing assistant; ward assistant; community care worker; home carer; scientific helper; doctors' assistant; and even `bedmaker'.[32] Managers claim that the introduction of HCAs was a necessary and vital response to resource constraints and to the declining availability of nursing staff on the wards or in the community.[32] Managers may further claim that it is easier to multi-skill HCAs than a professional.[32]

What is, however, a cause for concern is that HCAs are at times expected to give drugs without supervision, practice phlebotomy, run therapeutic groups, organise and chair client review meetings, give advice on the phone, write care plans, provide a speech therapy assessment, going on ward rounds with doctors and asked for their views which is, tasks which are typically outside their scope of practice and could result in potential litigation.[32,68,70]

There has, in recent times, been a growing focus on rehabilitation competencies for mid-level workers.[46,47,32,68,70] In South Africa's Western Cape Province this cadre of midlevel worker is known as a Rehabilitation Care Worker (RCW) but their career pathway and progression are yet to be concluded.[46,47]

The skills of HCAs or RCW may be acquired either through experiential learning or specific on- or off-the-job training, and are verified by internal and external assessors from the nursing and/or educational professions.[32,47] There is still contention as to what proportion of learning should be based in the ward and what in the classroom.[32] Some HCAs have intentions of professional growth to become registered nurses.[32]

An area of contention in literature is that of the 'professional ideology' of nursing that nursing services may only be offered by those with a statutory qualification.[34] Other studies have demonstrated that clients can be more satisfied with care delivered by health care assistants; and this has in some instances led to greater organisational effectiveness.[34,68] Another view suggests that increased use of less qualified staff will not be effective in all situations but might instead give rise to hidden costs associated with skill dilution.[34,68] This argument cites factors such as higher absence and turnover rates of less qualified staff; higher levels of unproductive time because HCAs have less autonomy and capacity to act independently, and reported concerns about possible harm to patients if HCAs are required to work beyond their technical or legislated capacity.[68]

4. CONCLUSION

In order to revitalise the vision of "health for all" that was first declared in 1978, subacute care can be one such vehicle that can be used to help realise this vision.[1,2] This is because Intermediate care can serve as an interface between acute services and Primary Care services (including community based services) and thus ensuring that there is continuity of care.

It is however, of concern that there is a huge literature gap of South African and African research on SAC or Intermediate Care and other de-hospitalised care subtypes.[49,52,58,61] Even the research that has been conducted in developed nations like the USA is compared to "… a grab-bag of research and demonstration projects".[35]There is certainly a huge gap on the literature on many aspects of SAC or Intermediate Care services and thorough research on many of these aspects will need to be undertaken.

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PART C: DISSERTATION / MANUSCRIPT

Title: An Evaluation of the Role of an Intermediate Care Facility in the Continuum of Care in Western Cape, South Africa.

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ABSTRACT

BACKGROUND: A comprehensive Primary Health Care approach includes clear referral and continuity of care pathways. South Africa lacks data that describe Intermediate Care (IC) services and its role in the health system. This study aimed to describe the model of service provision at an IC facility and the role it plays in the continuity of care in Cape Town.

METHODS: Sixty-eight patients (65% Response Rate) were recruited in a prospective cohort design over a one month period in mid-2011. Patient data were collected from a clinical record review and an interviewer-administered questionnaire, administered at a median interval between admission and interview of 11 days to assess primary and secondary diagnosis, knowledge of and previous use of Home Based Care (HBC) services, reason for admission, demographics and information on referring institution. A telephonic interviewer-administered questionnaire to patients or their family members post-discharge recorded their vital status, use of HBC post-discharge and their level of satisfaction with care received at the IC facility.

A Cox regression model was run to identify predictors of survival and the effect of a Care-plan on survival. Seventy staff members (82%) were recruited in a cross-sectional study using a self-administered questionnaire to describe demographics, level of education and skills in relation to what they did for patients and what they thought patients needed.

RESULTS: Of the 68 participants, 38% and 24% were referred from a secondary and tertiary hospital, respectively, and 78% were resident of a higher income community. Stroke (35%) was the most common single reason for admission at acute hospital. The three most common reasons reported by patients why care was better at the IC facility than the referring institution was the caring and friendly staff, the presence of physiotherapy and the wound care. Even though a large proportion of the IC inpatients had been admitted in a health facility on the year preceding the study, only 13 patients

(21%) had used a Community Health Worker (CHW) ever before and only 25% (n=15) of the discharged patients had a confirmed CHW visit post-discharge. The presence of a Care-plan was significantly associated with a 62% lower risk of death (Hazard Ratio: 0.380; CI 0.149–0.972). Notably, 46% of staff members reported performing roles that were outside their scope of practice and there was a mismatch between what staff reported doing and their actual tasks. In addition, of the 57 patients that could be traced on follow-up 21(37%) had died.

CONCLUSION: Patients and family understood this service as a caring environment that is primarily responsible for rehabilitation services. Furthermore, a Care-plan which extends beyond admission could have a significant impact on reducing mortality. IC services should therefore be recognised as an integral part of the health system and it should be accessed by all who need it.

Key Words: *Subacute care; Sub-acute care; Intermediate Care; Step-down facilities; Stroke Rehabilitation; Continuity of care; Care plan; Cape Town; South Africa*

INTRODUCTION

It has been more than three decades since delegates of the Alma–Ata conference declared the importance of Primary Health Care "as part of development in the spirit of social justice".[1] The Primary Health Care (PHC) approach "outlined a strategy which would respond more equitably, appropriately and effectively to basic health-care needs".[2] Countries have moved at a different pace[2] in ensuring that the concept of access to healthcare is not misunderstood as being limited to curative services but also as being inclusive of preventive and rehabilitative care.

A principle on which delegates agreed was that PHC needed to prioritise those most in need and that for PHC to provide comprehensive healthcare it "…should be sustained by integrated, functional and mutually supportive referral systems…".[1] The comprehensiveness of care which includes continuity of care pathways, Community Based Services, preventive, rehabilitative and curative care is key to the enablement of access to care adopted at the Alma-Ata conference.

PHC is, however, often confused with Primary Care and the distinction between these distinct concepts but similar sounding terms is important.[1,2,3] Primary Care describes a narrower concept of services delivered to individuals in clinics, community health centres or community based services i.e. a level of care, and is often conflated with Primary Health Care in developing countries.[3,4]

Primary Health Care on the other hand is a broader term which derives from core principles of Alma-Ata and describes an approach to the organisation of the health system that includes services delivered to individuals (Primary Care services) and public health-type functions.[3] Any references to PHC in this article therefore refers to the broader, longer term concept which views PHC as a holistic approach to health care.[3]

A PHC approach will therefore not only enhance an equitable access to health services but will also ensure that there is continuity of care in the health system and at all stages in the care pathway.[1,3] This is indeed consistent with South Africa's first democratic government’s White Paper for the transformation of the Health System in South Africa, which aimed to develop a unified health system.[5] South Africa’s 2008 discussion document on the development of Subacute policy guideline emphasised this point by suggesting that a continuum of care includes both acute and subacute modalities.[6] It is generally agreed therefore that subacute care (SAC) should be seen as an extension of hospital care which overlaps with rehabilitation.[7]

A challenge in defining subacute care is that institutions providing similar service may be given different names across the world and those models and packages of care are different depending on the location.[8-14] For example, in the USA Subacute Care (SAC) may be interchangeably described as Postacute Care.[8] These services are accessed in a wide range of settings that include Skilled Nursing Facilities (SNFs), inpatient rehabilitation facilities (IRFs), long-term care hospitals (LTCHs) or the patients’ own residences from home health agencies (HHAs).[8] These services (IRFs, SNFs, HHAs and LTCHs) differ in the extent of multidisciplinary therapy, the duration and nature of nursing care and the form of a medical doctor back up.[9]

In the UK, SAC facilities are known as “intermediate care facilities”[13] and are offered in facilities which include geriatric day hospitals; hospital-at-home schemes and home-based rehabilitation; community hospitals; rapid response teams, community assessment and rehabilitation teams; nurse-led units; social service schemes; day centre rehabilitation and; residential care rehabilitation.[13] These facilities are designed for patients who would face a prolonged hospital stay at acute hospitals. Admission is limited to six weeks, has a planned outcome of maximising independence and is rendered by a multi-disciplinary care team.[13]

The Australian SAC model “…includes rehabilitation, palliative care, psychogeriatric care, geriatric evaluation and management; and maintenance care”.[14] This type of care is offered on either an inpatient or outpatient basis and it can take place as a substitute for acute hospitalisation or directly after discharge from acute hospitalisation.[14]

What the SAC models of the USA, England and Australia have in common is that such care needs to enhance the “…quality of life and/or functional status”,[14] and is generally delivered by multi-disciplinary care teams, at intensity lower than that provided in acute facilities.[13,14,15] As a result, the system has less dependence on "…high-tech monitoring or complex diagnostic procedures".[15] It is however, also evident [8-15] that it is difficult to generalise about SAC and to make comparisons of services offered within SAC because of the great variability in definitions of what is included as SAC in different settings.

In the South African context, factors which have had a key role in shaping SAC and other related services over time include the growth of the HIV epidemic, changing approaches to the management of HIV/AIDS (including universal access to treatment programmes), and the more recent recognition of the increasing burden of Non-Communicable Diseases (NCDs).[16,17,18,19] The general shift is towards the management of chronic lifelong conditions and ensuring the necessary service delivery platforms to enable this.[16,17,19,20,21]

Notably, there are few studies published in the South African and African literature on SAC or any Intermediate Care (IC) component e.g. step-down facilities and chronic lifelong care centres; and the research available is closely tied to HIV-related HBC in South Africa.[22-26] The only South African information specific to Community Based Services (CBS) and subacute care models is from the South African National Department of Health Subacute Care policy guideline, WC Provincial Department of Health (DoH) Annual Performance Plans and the Western Cape Intermediate Care Policy review undertaken between 2011 and 2012.[6,7,20,21]

In 2012, the WC provincial DoH reviewed its SAC policy,[20,21] and a task team report led to the development of an Intermediate Care Policy Framework in September 2012, which revised the organisation of what was delivered as a Subacute Care programme in the health department.[20,21] Intermediate Care broadly included patients requiring post-acute care, restorative and rehabilitative, and palliative care. The policy did not, however, only propose a broader and comprehensive definition of the services offered in de-hospitalised care but also proposed the introduction of a new cadre of mid-level workers known as Rehabilitation Care Workers (RCWs).[20,21] For the rest of the paper, the definition of SAC used reflects this concept of intermediate care and the term IC is used throughout the paper.[20,21]

This study was initiated in response to the strategic opportunity identified by the Western Cape DoH for IC to improve the efficiency of the health system, and to address the lack of South African data needed for planning of an efficient District Health System (DHS) based on a PHC approach. The biggest IC facility in Cape Town designated for subacute and palliative care in 2011, in which services were delivered by a wide range of health professionals who service a wide range of patients' needs, was selected for this study.

The aim of the study was to describe the model of service provision of a large IC facility in Cape Town and explore the role it plays in the continuum of care. This was achieved through an evaluation of (i) Patient profile and admission history; (ii) Patient Care needs; (iii) Intermediate Care Human Resources and Transport; (iv) How Intermediate Care was understood by Patients and Staff; and a description of (v) Patient Outcomes. The results of the study were to be used within the health department to develop appropriate packages of care required for IC across the WC province. The study also examined survival at follow up as an outcome and whether age in years, the presence of a Care-plan, a confirmed Community Health Worker visit, and the presence of a stroke were associated with survival amongst IC patients.

METHODS

Study setting

In South Africa, the DHS refers to a geographically defined functional area for healthcare delivery in primary care and District (level 1) hospital level care.[4,5] The DHS in the Western Cape comprises 6 Districts, five of which are classified as rural and one (Cape Town Metro District) is located in urban Cape Town. More than 65% of the WC population reside within the Cape Town Metro District (Statistics South Africa, Census 2011) and, as such, this District is further divided into 8 sub-districts which are paired up to form 4 substructures. It is at the substructure level where the governance powers are decentralised by Provincial management.

At the time of the study the WC had nine SAC facilities, which were located in four of the six Districts (3 rural and the Cape Town Metro). After the IC policy review and the change in definition of SAC the WC province was noted to have 25 IC facilities serving the population.[20,21]

The IC chosen for the study is a private not-for-profit hospital contracted to deliver comprehensive services to the public with 106 beds; 84 beds allocated to subacute services/ Subacute Care Ward (SACW) and 22 beds allocated to respite/palliative care, respectively. The SACW housed patients needing respite, convalescent and rehabilitative care. This facility was previously a maternity hospital delivering more than 27000 babies from 1917 and then transformed to a long-term frail age facility in 1965 before being converted to a SAC hospital in 1999.

All patients admitted through the palliative care section did not pay for their hospitalisation at the facility since this section was completely subsidised. Those admitted through the SACW were expected to pay a fee of R35 per day (± US$3.5) which was waived if they were unemployed or indigent. A sliding scale of R40 (±US$4) to a maximum of R200 (±US$20) per day was applicable to those who had an income of more than R2000 (±US$200) per month. The hospital also provides transport at a fee to patients who need to go to hospital for their follow up appointments during their stay. This fee ranged from R150 (±US$15) for the closest facilities to R300 (±US$30) for transportation to the furthest facility.

The South African health system recognises three nursing categories, an Enrolled nursing assistant or ENA who have a 6-12 month nursing certificate, an Enrolled Nurse or EN has a 2 year nursing Diploma and a Professional nurse has a 4-year degree or 4-year Diploma. In this study, a caregiver refers to a lay health worker who renders basic care needs in IC. Even though caregivers do have basic training to carry out their duties they do not have any professional qualification.

Study design, Population and Sampling

The study used a multi-method evaluation/approach to capture provider and patient factors in IC.

Firstly, to assess patient factors, a prospective cohort study was conducted on clients admitted to IC between the 27th of June and 26th of July 2011. All clients admitted in that period were eligible and based on the fact that the facility had a Bed Utilisation Rate of ±100% for the 106 beds, the study aimed to recruit atleast 100 patients into the study. The study excluded participants who were admitted into IC outside of these dates and those who were not competent to consent and whose family members were not available to consent on their behalf.

Data were collected during the course of their admission in IC using (i) a record review and (ii) an interviewer-administered questionnaire in one of the three official Provincial languages (English, isiXhosa and Afrikaans). The median interval between admission and interview was 11 days (IQR: 2.5-18.5 days). In cases where clients consented but had difficulty participating because of poor health status, family members were interviewed to assist with responses on behalf of clients. However, even when family members were interviewed, the subjects for participation remained the patients.

Arrangements were made for post discharge follow-up with clients, family member(s) and/or caregivers before clients were discharged from IC by securing a telephonic contact. The follow-up comprised an interviewer-administered questionnaire in the same language as the one used at admission and was administered by telephone at an average of 9 weeks (range 5-13 weeks) post-discharge.

Secondly, a cross-sectional survey of all staff members employed at 1st of May 2011 was conducted, using a self-administered questionnaire.

Inclusion criteria were (i) staff who worked directly with patients at the IC facility, and (ii) been employed at the facility for a minimum of approximately two months before the commencement of the study (27 June 2011) and (iii) delivering clinical services. Exclusion criteria were staff members who were appointed at the IC facility after the 1st of May 2011.

Measurements

Record review instrument:

To obtain information on diagnoses, medication (prescribed and/or over the counter) and the patient's Care-plan, information was abstracted from medical records using a standardised data capture form. The form also recorded the specific treatment plans from physiotherapists (PT), occupational therapists (OT), medical doctor, speech therapist, social worker and nursing staff. In instances where clinical information and/or treatment plans were not clear on admission, the referring institutions were consulted for clarification.

Record reviews of patients provided an inventory of the range of care services provided at the institution. These were coded into 6 themes in a process of post-coding and these themes formed a template for evaluating care provided to patients. Themes included (i) Activities of Daily Living (ADL) e.g. washing patient, toileting, shaving, feeding, etc; (ii) nursing care e.g. oxygen administration, suture removal, insulin administration, health education, etc; (iii) specialised care (IC specific) e.g. catheter insertion, dispensing, wound care, phlebotomy, etc; (iv) rehabilitation e.g. voice exercise, wheelchair training, transferring from bed to wheelchair, creative skills, etc; (v) administration e.g. admission, discharges, delegation of duties, etc; and (vi) social work & other e.g. disability grant application, family participation, placement, etc.

Client questionnaire at IC facility:

The client questionnaire included elements adapted from the International Classification of Functionality (ICF).[27] This standardised and validated instrument was developed by the World Health Organisation (WHO) to measure health, disease and disability across cultures including South Africa. This questionnaire included demographic information, medical history, patterns and reasons for previous healthcare utilisation and information on difficulties being experienced by patients due to health conditions. Demographic information included questions on marital status, employment status, source of income, residential information and the presence of family support including information on the number of adults living with the patient.

Their medical history and health information included information on the primary diagnosis (the diagnosis which resulted in their current admission), the referring institution, a list of chronic conditions patients had, the use of an assistive device(s) and information on previous IC and/or CBS access. In addition, patients were asked about their perception of their health status in the prior 30 days. The clinical folder was considered to be the more reliable source of clinical information if there was any discrepancy between information in the folder and information from patients.

Record review post discharge:

The discharge plan information captured from the clinical folder at discharge included the place to which a patient would be discharged, contact information, whether the patient had been referred to HBC and whether there was a Care-plan beyond their admission at IC. A Care-plan was defined as a plan which detailed the care which a patient should receive while admitted at IC issued by the referring institution and a discharge plan of how the patient would be managed in the home environment after discharge issued by the Intermediate Care facility.

Client questionnaire post discharge:

A telephonic follow-up interview was conducted to assess the clinical state of the client (improved or deteriorated), their vital status (alive or dead), the satisfaction with care received at the IC facility and referring institution and also if they accessed any other health services since discharge from IC.

Patients were deemed eligible for a CHW visit if they needed health education e.g. compliance with chronic medication, further wound care, continued rehabilitation and assistance with ADLs with or without nursing care e.g. Directly Observed Treatment for TB. The number of patients who were eligible for a CHW visit excluded the patients who died at IC and the patients who died while referred to an acute hospital from IC. Eleven patients who were not traced on follow-up are assumed not to have had a CHW visit since this was not confirmed.

Staff questionnaire

A standardised instrument was designed exploring demographic factors, skills and competencies and piloted to be applicable to the study setting. Staff demographic data included their level of education using a three level ordinal scale for highest level of education completed; these three levels represented (1) grade 8-11, (2) Matric or Grade 12 and (3) tertiary education.

Respondents were asked about their skills and about the needs for care of the patient (**Table 1**) that consume most of their time. Staff skills and patient care needs were categorised according to the same six themes identified in the record review, as described above.

STATISTICAL ANALYSIS

All data collected were captured and coded on EpiData version 3.1 (epidata association, Denmark) and exported for analysis onto STATA 12.1 (stata Corp LP, college station, Texas, USA) and Microsoft excel 2010 (Microsoft corporation, Seattle, USA). Data validation settings were used to prevent double entries by subject number and to minimise erroneous field entries.

Each patient respondent and each staff respondent could generate between 1 and 8 perceived care needs, care provided or staff skills. Numerical data that was not normally distributed was reported using non-parametric statistics (median and Interquartile Range (IQR)). The mean and the range were used to report on normally distributed data. The 95% confidence interval (CI) is used to report on the precision of estimates. The level of significance for hypothesis testing was set at 5% (p-value < 0.05).

The variance ratio test was used to test the equality of variances to determine the statistical test to use for comparing patient age by sex of patients, and by admission ward and the age of staff by gender. For normally distributed data with equal variances, the two-sample t-test was used to compare continuous variables; otherwise the Wilcoxon Sum-rank test was used. The Wilcoxon signed rank test was used to compare the length of stay between the referring institution and IC as this variable was not normally distributed.

The Kaplan –Meier survival method was used to estimate the time of survival in the study (from enrolment to death or lost to follow up). Cox's proportional hazard model was used to predict the relationship between survival and variables thought to predict survival (Care-plan and accounting for age and a stroke diagnosis as possible confounders).

A model with only the presence of a Care-plan was statistically significant using the Aikaike's Information Criterion. A model with the other predictor variables (Age (years), presence of stroke and a confirmed CHW visit) has also been included. The Schoenfield residuals showed that the individual covariates and the overall proportional hazard assumption was valid (global p-value: 0.767).

Ethics approval was granted by the University of Cape Town (UCT) Faculty of Health Sciences, with Ethics approval number/ HREC REF: 265/2011. Informed consent was obtained from all study participants prior to their participation. Family members legally entitled to do so, gave consent and participated on behalf of patients who could not communicate.

RESULTS

PATIENT PROFILE AND ADMISSION HISTORY

Of the 105 patients who were admitted in the IC facility between the 27th of June to the 26th of July 2011, 68 (65%; CI: 55–74%) were interviewed **(Figure 1)**. Non-participants included 11 patients (10%) who met the study's inclusion criteria, but were not medically fit to give consent and whose families could not be contacted; 15 patients who died before interview (14%); and 11 patients (10%) discharged before being interviewed. There were no refusals in both the initial and the follow-up interview.

The length of stay at their first institution prior to referral to IC was significantly shorter ($p < 0.0001$; median 14 days; IQR of 8-23 days and a maximum of 62 days) than their stay in IC where the median length of stay was 31 days (IQR 17.5–41 days; with a maximum stay of 111 days or ±16 weeks).

The average duration to participant follow-up post discharge was 60 days (95% CI: 57–64 days; range 35 to 91 days). Eleven participants could not be traced at follow-up for the reasons listed in **Figure 1**, which resulted in a Lost-to-Follow-up (LTFU) of 16.2% (95% CI: 8.4–27.1%), with the majority of these patients being those who had been admitted in the palliative care section of the SAC facility (n=7).

Patients were evenly divided between males and females (see **Table 3** for patients' demographics) and seventy-nine percent of these clients were in the SACW (n=54) of the facility and the other 21% (n=14) of clients were admitted in the palliative care section of the facility. Of the 14 patients admitted in the palliative care section, 79% (n=11) had both HIV/AIDS and Tuberculosis.

Most participants were permanent residents of the WC (91%; n=62) and 9% (n=6) were clients from the neighbouring Eastern Cape Province (EC) who had primarily come to the WC for medical care. **Table 2** shows that the vast majority (90%; n=61) of all participants were from within the City of Cape Town Metro and only one individual from a rural Western Cape district was admitted in the facility.

Only 10% (n=7) of clients were in paid employment. Most were either retired (41%; n=28), unemployed for health reasons (24%; n=16) or unemployed because they were unable to find employment (21%; n=14). Most respondents (n=40 or 59%) reported receipt of a social grant, such as an old age grant (42%; n=28), disability grant (10%; n=7), child support grant (3%; n=2) and three received employer benefits due to health reasons or retrenchment.

In terms of marital status, patients were either single (n=26 or 38%), married (n=19 or 28%) or widowed (n=14 or 22%). A majority of participants (50%) stayed in a home they owned, 6% (n=4) of participants were homeless (living on streets), 7% (n=5) stayed in an institution (old age home or a place of safety); and 37% (n=25) did not stay in a house they owned but either rented a place or lived with friends or relatives.

Family support, framed as having a person to care for them, was reported by 75% (n=51) of clients. An equal number of participants (n=18 each) reported being cared for by a first degree relative (spouse, child, parent or sibling) and by other relatives. For just over one third (n=18) of the participants with a carer, the carer was reported as living at a different household to the respondent. The median number of adults living in the respondent's permanent household was reported as 2 adults (IQR 1–3) and the median number of adults who were employed in the household was reported as 0.5 (IQR 0–1).

All patients were referred from other services within the Metro District and notably only 22% (n=15) of participants were referred from a different substructure to that in which the IC facility was located. A majority of these patients had been referred from a secondary hospital (38%; n=26), tertiary hospital (24%; n=16) and from 3 district (level 1) hospitals (16%; n=11) in the same substructure as the IC facility. Notably, only 7% (n=5) of referrals were from a tertiary hospital from a different substructure as the IC facility. Of all the participants interviewed, 41% (n=28) reported being hospitalised in the previous year.

An important finding is that during the course of their admission at IC only fifty three percent of the respondents (n=35) admitted to knowing of HBC or CHWs; 21% (n=13) of clients had used HBC at some time in the past; and 5 of the 29 (17%) participants who had been admitted in the previous year had made use of HBC. A Care-plan which extended beyond their admission at IC was present in 69% (95% CI 56.7%-79.8%; n=47) of patient records.

PATIENT CARE NEEDS

Stroke was found to be the most prevalent condition (**Table 4**) leading to admission (35%; n=24). Conditions needing an amputation of one or both lower limbs such as cellulitis, peripheral vascular disease (PVD) and other forms of gangrenous limbs were prevalent in 18% (n=12) of clients interviewed. Tuberculous meningitis and seizures of unknown aetiology were present in 16% (n=11) of participants.

Of the sample, 84% (n=56) were found to have been diagnosed and on treatment for at least one chronic condition. Hypertension (HPT) was prevalent in 53% (n=36) of clients sampled and this was followed by HIV (21%; n=14), TB (19%; n=13) and Diabetes Mellitus (DM at 18%; n=12).

Most clients (85%; n=58) came to IC using at least one assistive device, most commonly a wheelchair (n=39 or 67%), a quadripod (n =10 or 17%) or crutches (n=9 or 16%). Some of these clients were using a wheelchair temporarily while recovering while others were bedbound. Pressure ulcers were noted in 12% (n=8) of participants and 75% (n=6) of these were noted as present before admission to IC. On average, participants were completely unable to carry out usual day-to-day household activities for 16 days in the past month (CI: 14–19) because of health reasons and they had to reduce or cut back on activities (when excluding the days where they were completely unable) for an average of ±9 days (CI: 7–10).

Prior to referral to IC, stroke patients did not have a significantly shorter length of stay in the referring facility than non-stroke patients (median 13.5 and 14 days, respectively; p-value =0.059). At the IC facility, stroke patients' median length of stay was slightly longer than non-stroke patients (32.5 versus 30.5 days, respectively; p=0.748) although the difference was not statistically significant.

According to the patient record **(Table 5)** nursing (82%), specialised care (66%) and rehabilitation care (63%) accounted for the largest number of services received by patients while at IC.

When staff were asked about the skills that they believed they have and the patient needs that take up most of their working time, ADLs were reported more frequently than any of the other care categories (**Table 5**). Administrative skills were reported as the second least frequent skill possessed by staff and also reported as the lowest patient care need perceived according to staff.

Table 5 further shows that staff reported more patient care needs than the skills they have to cope with, on ADLs, rehabilitation, and social work care. When compared with the record review, staff showed a shortfall in rehabilitation skills to be able to meet patient care needs.

INTERMEDIATE CARE HUMAN RESOURCES AND TRANSPORT

There were 85 employees who met the study's inclusion criteria. Seventy staff members participated, representing a Response Rate of 82% (CI: 73–90%). Two staff members refused to participate and other non-respondents (n=13) were those on leave. Most staff members were female (83%; CI: 9–28%). The median age was 42 years (IQR 31–54). Male staff were younger (median age 32 years) than female staff (median 43 years; p-value=0.024).

Staff comprised of a mix of categories including caregivers (44%; n=31), nursing (44%; n=31), medical (n=1), rehabilitation (7%; n=5), social work (n=1) and pharmacy (n=1) staff. Rehabilitation staff included 2 physiotherapists, a speech therapist, an OT and an OT assistant.

The majority of staff (89.6%; 95% CI: 79.7–95.7%) felt that IC provided adequate supervision and support for junior staff. Wound care, NGT insertion, catheter insertion and the administration of medication were reported more frequently as the tasks which mid-level workers could perform at IC under supervision.

IC staff were also confident that a mid-level worker could perform ADLs unsupervised. Other tasks which staff thought could be performed by a mid-level worker unsupervised include wound care, collection of vital signs e.g. temperature reading, administration and the transfer of patients from bed to chair.

Of the 57 patients and families interviewed at follow-up, 25 respondents (44%; 95% CI 31-58%) indicated they were satisfied with the care received and did not suggest areas of care that needed to be improved in IC. Seven participants wanted more senior nurses and physiotherapists. One participant also felt that transport needed to be improved between IC and their referring hospitals when they go for their outpatient clinic appointments. This participant felt that government needed to cover the cost of this transportation instead of it being for the patient's account. Only 3 respondents (5%; 95% CI: 1-15%) wanted an increased IC length of stay.

HOW INTERMEDIATE CARE WAS UNDERSTOOD BY PATIENTS AND STAFF

When patients or families were interviewed post-discharge and were asked to compare the quality of care they received, 66% reported that care at the IC facility was better, 23% reported it was the same quality and 11% reported it was worse than care at the referring institution. The three most common reasons given why most felt that care was better at the IC facility (n=41) was the caring and friendly staff (n=20 or 49%), the presence of physiotherapy (n=7 or 17%) and the practice of wound care (n=2 or 5%).

Most staff (n= 64 (94.1%; CI: 88.4%-99.9%)) reported that they felt that their role in the facility was consistent with their job description. However, when they were asked if there are any roles outside scope of practice, 46% (95% CI: 33.7–58.1%) of staff members reported that they perform tasks outside their scope of practice.

Of all the tasks said to be outside their scope of practice, wound care was the task most reported (by 17 enrolled nursing assistants (ENAs) and caregivers), followed by the administration of medication and the insertion of a Nasogastric Tube (NGT), which were both reported by four ENAs and caregivers.

PATIENT OUTCOMES

The median survival time of participants was 107 days and of the 57 patients that could be traced on follow-up 21(37%) had died. There was no statistical difference in the risk of death between those admitted in the palliative care section of the hospital and the SACW (p-value=0.567. One third of the deaths (n=7) occurred during their admission at IC and the rest occurred after discharge from IC. While 50% of those admitted in the SACW were expected to survive beyond 107 days the largest survival estimate that could be determined with accuracy among palliative care ward patients is the 25th percentile (69 days).

Table 6 shows that if the model included only the presence of a Care-plan as a predictor of survival, those with a Care-plan had a 62% statistically significant lower risk of death than those without a Care-plan (Hazard Ratio 0.380; CI: 0.149-0.972). When the other variables were added to the model, the risk of death was still reduced (58%) but the Hazard Ratio was no longer statistically significant (Hazard Ratio 0.417; 95% CI: 0.149-1.163). A stroke diagnosis was found to confound the association between the presence of a Care-plan and survival; age was not, however, found to be a confounder. Although the presence of a stroke (versus non-stroke) and a CHW visit (versus no CHW visit) were associated with lower risks of death, these Hazard Ratios (0.534 and 0.770, respectively) were not statistically significant.

Of the 47 patients who reported to have accessed health care post-discharge from IC, 10 received PT and OT and 2 received Speech Therapy. Even though three patients who needed health services post-discharge from IC made use of traditional healing many patients continued to receive ‘W*estern medical care*’ in the form of a CT scan (n=2), emergency operation (n=2), re-admission to an acute hospital (n=2), re-admission to IC (n=1) and making use of psychological services (n=1). Only 15 of the 59 (33%) patients who could have been visited by a CHW had a confirmed CHW visit after their discharge from IC.

DISCUSSION

THE MODEL OF CARE IN THE HEALTH SYSTEM

The study aimed to describe the role of IC in patients requiring post-acute care, restorative and rehabilitative care, and palliative care; and to further describe the role that this model of care plays in the continuum of care. This study was fortunately conducted at a time when the WC Provincial Department of Health was reviewing the policy[20] and this new policy achieved to propose a more accurate description of the mixture of services offered in non-acute services (de-hospitalised care) by using the term Intermediate Care.

When describing Intemediate Care, the WC Department of health describes this area of care as an “…integrated provision of inpatient services formerly referred to as sub-acute, step down, respite, palliative, and some of chronic care under de-hospitalised care services”.[20] The study site mainly offered respite, rehabilitative and minimal palliative services. Of the three basic models described in the WC Intemediate Care policy document (facility based within an acute hospital, facility based on acute hospital premises and facility based not on acute hospital services), the IC studied followed the latter model where Non-Profit Organisation staff provide services with limited support by the Health department such as with the payment of a medical doctor's salary.[20,21]

With a bed capacity of 106-beds, the fact that 105 of these beds were occupied in a 30-day period is indicative of the demand for IC beds. This is further supported by the Bed Utilisation Rate of 94% obtained from the Provincial Information system for the 12 month period ranging from 01 April 2011 to the 31st of March 2012. The results further show that patients and their families appreciate the care they received while at IC mainly because of caring staff. A complex set of skills is key to ensuring that the wide range of care needs required by patients who access IC are met.

In agreement with an assertion by Kane[8] who correctly notes that IC should be viewed as an extension of acute hospital care whose care is mostly rehabilitative, in the WC, IC is poised to form part of integrated care pathways that link community-based primary care and acute hospitals.[8,20,21] In the same article[8] Kane goes further to state that not all of IC functions are rehabilitative, some will include convalescence, palliative and care for the elderly.[8] **Figure 2** depicts the relations between the different levels of service and IC wherein patients are referred into IC from acute hospitals and could be referred back to acute hospitals if they worsen or develop complications or for a routine follow-up.

Under normal circumstances however, IC acts as an intermediary that maintains the continuity of care by ensuring a successful discharge of patients into the community or other appropriate environment such as an old age home or other institutions.[20,21] On discharge from IC patients should have a clear discharge plan which details a referral to HBC and other facets of Primary Care.[20,21] Outpatient appointments at referring institutions would have been issued at the institution which initially referred the patient to IC.

WHO ARE THE PATIENTS

The fact that there was no statistical difference on the access to IC between males and females is consistent with international literature which shows that almost equal proportions of males and females require IC.[11,28,29] However, the average age of our sample was 56 which is generally younger than that of IC users from developed nations.[11,12,14,30] This could be because of the different burden of disease e.g. a high HIV burden in South Africa[30] which results in a younger population requiring IC services. In this study, the majority of patients in the palliative care section (79% or n=11) had HIV/AIDS and TB, and were younger (41 years compared to 60 in the SACW). Gender could not explain the age differences as there was no difference in age by gender.

The marital status data of patients was consistent with the hypothesis by Kane and colleagues[31] which expects IC users to mostly be unmarried because spouses serve as “informal caregivers”.[11,32] However, despite the fact that most participants were not married, there was a median of 2 adults per household and the majority had someone to care for them when ill; this could be confounded by the fact that poorer households are likely to be over-crowded.[33] Nonetheless, more than a third of participants stayed alone and the family member who cares for them was reported to live in a different household from them post-discharge from IC, which would be a motivation for increasing the availability of CHW services.

Although homelessness affected a minority of patients, it is of concern. This not only subjects individuals to unhealthy living conditions but it also makes it difficult to ensure continuity of care when they present in health facilities, as was evidenced during the follow-up, when investigators failed to make contact with all four homeless participants, as compared to the 89% (n=57) of non-homeless participants who were traced on follow-up. Access to health-care for such individuals can only be guaranteed if the DoH has regular and structured working relations with other government departments responsible for welfare and social development.

Stroke was the most prevalent primary condition among patients admitted to the facility, a phenomenon consistent with international literature.[9,11,15,29,30,31] With this high stroke burden in IC it is also possible that there might be much stroke-related need for IC missed in the community. Furthermore, HPT was prevalent in 75% of all stroke patients and almost 85% of the patients sampled had at least one chronic condition. The literature generally attributes hypertension to be a risk factor of over 60% of stroke patients and as much as 86% among IC patients.[34,35]

ACCESS TO INTERMEDIATE CARE

Close proximity to IC facilities and being referred from a teaching hospital are two associations with admission described in literature[11,36] that were evident in the study findings. In this study, most referrals (62%, n=42) into IC were from a secondary and tertiary hospital (both teaching hospitals) situated in the same sub-district as the IC facility. Although most of the patients in this study were of lower socio-economic status, they came from less disadvantaged sub-districts of the City of Cape Town Metro. Inequity of access to IC is suggested by these findings.

It however, remains speculative if the narrow definition of IC that exisisted at the time (defining IC as mainly respite, restorative and rehabilitative care)[7] could have resulted in geographic and socio-economic differences in access and referral to IC. For example, whilst the Klipfontein and Mitchells Plain sub-districts had a palliative care centre, subacute patients from this sub-districts were expected to have largely been referred to the study site and this does not seem to have been the case. The difference in referral to IC might have also arisen as a result of increased awareness and value teaching hospitals put on IC.[11] The hope is that the new policy will widen the definition on IC and so help relieve inequity in care. For example, prior to the policy review patients requiring palliative care could only access palliative care in a handful of facilities but with the policy review they can now access services at any of the 25 IC facilities in the province.

Burdens posed by failure elsewhere in the health system could result in a situation where patients experience barriers to access healthcare services at the facilities nearest to them. This was evidenced in this study with a few patients who travelled from the EC to the WC for healthcare. The challenge is that such inflows of patients will have an impact on the continuity of care plan especially if these patients plan to return to their Provinces of residence after discharge from IC.

These geographic and economic access factors strengthen the views that those admitted to teaching hospitals, those whose hospitals are closest to IC and those who reside in higher income communities will benefit more from IC services as they are more likely to be referred.[9,11,32] It is therefore important for the health system to put structures in place for monitoring equity in access and to preferentially provide access to those currently excluded.

Inequity in access to IC may be aggravated by financial obstacles.[11] Even when already admitted to IC, transport back for follow-up to the referring hospital in this study was largely at the patient's own cost. Studies by Cleary et al.[37] and Goudge et al.[38] found that transport costs contribute the largest proportion of direct patient costs in South Africa. Employment levels amongst respondents were low which meant that out-of-pocket payments are likely to be an obstacle to access referring hospital services while in-patients at IC. The IC facility should therefore provide free transport to all patients whilst they are in the IC facility to prevent this barrier to access. This is a recommendation consistent with that of the Intermediate Care policy task team in the WC.[20,21]

Poorly developed referral systems and poor discharge planning are structural barriers to access to health services.[8] Even though a large proportion of the IC inpatients had been admitted in a health facility on the year preceding the study, only 13 patients (21%) had used a CHW ever before and only 25% (n=15) of the discharged patients had a confirmed CHW visit post-discharge. This does not advance the vision of Alma-Ata to rely "…at local and referral levels, on health workers, including…community workers…".[1,2] This yet unrealised vision of service integration in many countries including South Africa[1,2] can only be achieved if there is a coherent continuity of care pathway from the IC to the community and adequate utilisation of CHWs.[8]

Poor use of CHWs is common in the literature,[39] and may arise because referring hospitals discharge patients without a clear Care-plan; alternatively, IC staff might assume that referral to HBC is the responsibility of the primary referring institution.[11] Staff at IC facilities therefore need to recognise that discharge planning should include HBC referral as part of quality care.[40]

PATIENT CARE NEEDS

As evidenced in the study (**Table 5**), patients mostly received nursing (urinalysis, oxygen administration, etc.), specialised care (e.g. wound care, catheter insertion, etc.) and rehabilitative care. The social work and ADLs are likely to have been under-reported probably because they were likely considered to be routine.[41] For instance, if a patient needed to be dressed or fed (ADL) that was not always recorded.

In addition to the fact that staff largely saw the needs of their patients as consistent with the skills they have, the results also showed some degree of consistency between what staff say about perceived patient needs and what was recorded on the patient folder. Moreover, according to staff, patients need more ADLs, rehabilitation and social work care than staff can provide (**Table 5**), which suggests that management needs to put more emphasis on strengthening these skills and on staff training and up-skilling in these areas of care. This is also in the context of a large proportion of patients (63% or n=43) who received rehabilitation care during their admission at IC.

Although wound care is considered to require specialised nursing care, it featured as the most prominent task that caregivers and ENAs reported performing outside their scope of practice and it has an unavoidable presence in IC.[40] For example, about a quarter of patients required post-surgical wound care and 12% of patients had pressure ulcers. The literature acknowledges[42] that even though pressure ulcers should be preventable, it is impossible in practice to prevent all pressure ulcers.[42] The prevalence of 12% in this study is consistent with rates found in the USA (12%), Germany (7%) and Canada (14%) in IC.[42,43]

A major role of caregivers in pressure ulcer management is the reduction of the prevalence to the lowest rate possible. This includes identification of patients vulnerable to pressure ulcers such as older age, cognitive impairment, physical impairments and impaired sensory sensations.[42,43] Caregivers must therefore be aware of the latest evidenced-based pressure sore preventive techniques for each individual patient.[42,43] It is, however, also encouraging that in this study, staff felt that a skilled caregiver can manage wound care without supervision, a view supported by literature.[40]

A large proportion of patient respondents (n=20 or 49%) and their families favoured IC over their referring institution mainly because of the caring staff, the rehabilitation received in-care (n=7 or 17%) and the wound care (n=2 or 5%). Twenty-six percent (n=12) of patients who sought healthcare services after discharge from IC reported to having continued with rehabilitative care which further emphasises the importance of rehabilitative care after an acute illness.

HUMAN RESOURCES

Sceptics who argue against the inclusion of IC facilities in health care have often based their criticism on the lack of patient monitoring to detect complications in IC facilities.[44] The presence of a sessional and an on-call medical professional and professional nurses at the study site goes some way to address this concern as they will have an ability to screen, assess, prescribe, administer medication and refer to the appropriate level of care when complications are suspected. These professionals also have the ability to suggest a change of drugs if complications are suspected to be due to the drug or if there is no improvement on the initially prescribed treatment.

A new cadre of mid-level worker can be trained on the basic care of diabetic and hypertensive patients by empowering them with skills to monitor glucose, administer insulin (subcutaneous), urinalysis and regular blood pressure monitoring. Because of the high risk of death amongst IC patients, competency in bereavement counselling would also be required for staff who work in this area of care.

However, mid-level workers cannot substitute for professional therapists (such as OTs, PTs and speech therapists) as midlevel workers do not have the ability to identify patients at risk of developing complications such as an embolus or other complications of coronary artery disease.[44] Nonetheless, mid-level workers with combined rehabilitation skills (physiotherapy, occupational therapy and speech therapy) can, however, be trained to safely care for patients under professional guidance. Following the IC policy review[20,21] the WC Provincial Department of Health introduced a new cadre of mid-level workers known as RCWs that will help increase rehabilitation capacity in IC.

However, the experience of clinical associates (an equivalent of a physician associate in the USA); a cadre of health worker who have begun to be trained at South African Universities since 2008, is noteworthy. Because there are still no career pathways and there are fears that clinical associates may not be able to work without adequate supervision.[45] For that reason, the introduction of a new IC mid-level cadre should be done after the career pathways and scope of practice have been clearly developed.[45]

PATIENT OUTCOMES

A key finding of this study which was consistent with literature[44,46] was that IC patients have a high mortality (37% at follow-up amongst those traced). Also consistent with literature[41] and the study hypothesis is the suggestion that a confirmed CHW visit (though not statistically significant) and the presence of a Care-plan were associated with a lower risk of death. Whilst these findings were not statistically significant in the model with all four predictors included, the presence of a Care-plan by itself was found to be significantly associated with a 62% reduction in the risk of death (Hazard Ratio: 0.380; 95% CI: 0.149-0.972). The lack of statistical significance for the protective effect of a confirmed CHW visit may be due to limited study power because of a small sample size. Also having a Care-plan could be an indicator of staff views on whether a patient actually needed one (i.e. their prediction that a patient would survive), rather than itself being a predictor of survival and so be a reflection of an association rather than a causal relationship. Nonetheless, it is plausible to anticipate that a Care-plan that extends beyond an IC facility will be likely to have a beneficial impact on mortality.[41]

HOW SUBACUTE CARE WAS UNDERSTOOD BY CLIENTS AND STAFF

It goes without saying that the optimal utilisation and benefit from IC services is largely dependent on the understanding amongst those who refer to it; patients and family; and IC staff. Even though this study did not assess the appropriateness of the referral to IC, literature describes a phenomenon where patients are either referred to IC prematurely or are referred without a Care-plan.[28,40] Other studies will however, need to be conducted to assess the appropriateness of a referral to the IC facility included in this study.

Patients and family understood this service as a caring environment that is primarily responsible for rehabilitation services. Since this is an understanding that is consistent with literature, [8,9,11,13,28,40] it is important to inform referring institutions of this finding so that they can be in a position to empower patients and their family by educating them that rehabilitative care is only one component of IC. The suggestion by IC staff that IC patients are likely to require ADL care followed by specialised nursing care and rehabilitative care could be interpreted as suggesting that the service mostly caters for convalescence, respite and rehabilitative care respectively. There was however, no literature identified that could be used to compare the understanding of IC by staff.

LIMITATIONS

The study has a number of limitations. Firstly, the findings cannot be extrapolated to other IC facilities elsewhere in the province or country but does help to highlight challenges experienced in this sector of care and how this sector of care relates with acute hospitals and HBC. Furthermore, the study only included patients for a one month period which limits generalisability to the population of patients who access the IC facility throughout the year. Nonetheless, there is no reason to anticipate admissions in this period would have systematically differed from admissions during other times of the year.

Secondly, the response rate of 65% among patients was less than desirable and could have resulted in a response bias if participants not interviewed were statistically different from the participants. The study, however, had a good retention rate amongst patients (84%; 95%CI: 73% - 92%). Based on the above, there is no obvious reason to believe that the non-participants would have given results that are much more different than these results.

Thirdly, a large section of the questionnaires were adopted from instruments standardised and validated for a South African population. An information bias could have, however, resulted as a result of the translation into local languages. It is also recognised that, even though unlikely, the assumption that clinical notes were more accurate than clinical information reported by patients could have resulted in an information bias and thus misclassified patient care needs and diagnoses.

Fourthly, even though the categorisation of staff skills and patient needs was largely based on literature, some of the functions could not be located in literature and this could have thus affected the reliability of this categorisation. Furthermore, the study subjectively uses service provision as a proxy for patient needs and does not address unmet needs such as poor pain control, which could have affected the validity of the findings.

Lastly, it was also initially anticipated that the follow up appointments would be in the form of a home visit but this was not possible due to logistical reasons. Even though the telephonic interview could have indirectly prevented a social desirability bias, some participants might have had difficulty conveying personal information on the phone. This is however, balanced by the fact that all participants were followed up in the same way.

CONCLUSION

The increasing life expectancy and quadruple burden of disease that the country is experiencing[30] requires a coherent and well-structured health system with clear pathways that are accessible to all who need it. Such a system requires a comprehensive PHC approach with clearly defined roles and referral pathways for CHWs/HBC, primary care facilities, acute hospitals and IC facilities. In this way the vision of access to health care will not just be attributed to the Alma-Ata conference delegates but it will also be recognised as an achievable vision of the 21st century.

The presence of a Care-plan that extends beyond a hospital admission could improve the quality of life and reduce mortality after discharge from IC. The data also suggest the benefits of including CHWs in this Care-plan. Future studies should investigate the reasons for the skewed referral pathway that emerged in this study’s findings, where the majority of patients at IC are referred from secondary and tertiary hospitals within the same sub-district. In-light of the study finding that IC was mostly accessed by poorer patients from wealthier communities, a study should be conducted to look in more detail at equity in access to IC.

Mid-level workers could be a useful component of IC care. In addition to ADL skills, they also need to be equipped with social work, communication, speech therapy, OT, basic physiotherapy, basic principles of wound care and basic nursing skills. A major human resource management challenge is to have a clearly defined and clarified scope of practice for all staff members as there currently are roles that staff perform and are said to be outside their scope of practice.

Most important though, would be the recognition by health workers, policy makers and other stakeholders not to view IC services as an optional form of care but as an integral service within the health system.

LIST OF ABBREVIATIONS

ADL	Activities of Daily Living
CBS	Community Based Services
CHW	Community Health Worker
DHS	District Health System
DM	Diabetes Mellitus
EC	Eastern Cape Province (South Africa)
EN	Enrolled Nurse
ENA	Enrolled Nursing Assistant
HBC	Home Based Care
HPT	Hypertension
IC	Intermediate Care
OT	Occupational Therapy
PHC	Primary Health Care
PT	Physiotherapist or Physical Therapist
PVD	Peripheral Vascular Diseases
RCW	Rehabilitation Care Workers
SAC	Subacute Care
SACW	Subacute Care Ward
TB	Tuberculosis
WC	Western Cape Provinces (South Africa)

COMPETING INTERESTS

We declare that we have no conflict of interest.

AUTHORS' CONTRIBUTION

The Principal Investigator (SM) planned, designed, executed, analysed and wrote up the study.

AUTHORS' INFORMATION

The Principal Investigator (SM) is a medical doctor and a Public Health Registrar at the University of Cape Town, South Africa. At the time of the study, the PI was also employed by the Western Cape Provincial Department of Health.

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Table 1: Staff skills and patient needs as reported by staff and as recorded on Clinical notes

ADL	Nursing care	Rehabilitation	Specialised Care	Administration	Social Work
bath patient	oxygen administration	manual patient handling	Catheter insertion	administration	translator
toileting	suture removal	mobilise patient	Administer medication	admissions	communication skills
shaving	subcutaneous insulin	wheel chair training	dispensing	discharging	walk patient
adl assessment	catheter care including emptying urine bag	active exercise	Assessment	teaching	socialise with patient
nailcare	catheter removal	exercise	iv line	supervision	family participation
hair care	vital signs (BP, temperature, input and output chart)	passive exercise	wound care including wound dressing and sterile techniques.	checking medication	liason
turning patient	urinalysis	groupwork	trauma	medication ward stock	dg application
bedmaking	tube feeding	voice exercise	triage	delegation of duties	id application
feeding	insulin (subcutaneous)	movement training	midwifery	meeting procedure	finding family
dressing and undressing patient	suctioning including, tracheostomy care	bed to chair transfer	control drugs	training of subordinates	geriatric care
adl	nursing care	posture correction	iv line maintenance	stock control	placement
pressure care	health education	bed mobility	hiv management	stock replinishment	family liason
hygiene	diet	speech	surgical	order medication	family meeting
socialise with patient	counselling (includes knowledge of patient's condition)	physiotherapy	diagnosing	secretarial duties	sexual abuse counselling
open windows	patient care	occupational therapy	advice on medicines	referral to other health institutions	drug abuse counselling
nappy change	incident report	speech therapy	examining patients	supply drugs to ward	attend to patient's spiritual needs
mouth care	drip aid	neuro-developmental skills	medical	sick notes	empathy
	clean deceased	trunk exercises	neurosurgery	drugs control	social worker
	hgt monitoring	use of assistive devices	reporting incidents	order stock	restrain patient
	hb monitoring	physical assistance	infection control	stock assistive devices	communication
	follow orders	joint mobilisation	gynaecology		interpersonal skills
	assist giving medication	musclepower	wardround		compassionate skills
	first aid	language stimulation	phlebotomy		group work
	tracheostomy care	rehab education	daily report		bereavement counselling
	tlc	speech augmentation	child health		palliative care
	specimen collection	dysarthrria	injection (imi)		
	prepare before procedure	assist physiotherapy(ist)	assist doctor during ward round		
	wax checking	movement return	ngtube insertion		
	escort patient	massaging	professional nurse's duties		
	pop care	balance	arv clinic		
		encourage movement	arvs		
		creative skills	medication		
		sign language	discharge plan		
		communication charts	treatment		
		swallow screen	assist assessment		
		slings and splints	drug compatibility		
		subjective assessment			
		objective assessment			

Table 2: Locality where patients resided before being admitted to SAC by and District, Substructure and Sub-district

District	n (%)	Substructure	n	(%)	Sub-district	n	(%)
Cape Town (Metro)	61 (90)	Southern-Western	35	(51)	Western	23	(34)
					Southern	12	(18)
		Klipfontein-Mitchells Plain	16	(24)	Klipfontein	9	(13)
					Mitchells Plain	7	(10)
		Tygerberg-Northern	5	(7)	Tygerberg	5	(7)
		Khayelitsha-Eastern	5	(7)	Khayelitsha	3	(4)
					Eastern	2	(3)
Cape Winelands			1	(1)	Witzenberg	1	(1)
****Other (Eastern Cape)**						6	(9)

*****Other refers to Participants from the Eastern Cape Province***

Table 3: Demographic Characteristics of patients interviewed

PATIENT DEMOGRAPHICS			
SEX	**n (%)**	**p-value: Two sample test of proportions**	
Male	36 (53)		
Female	32 (47)	0.493	
Total	68		
AGE (YEARS) by Gender	**IQR***	**Median (95% CI)**	**p-value: Wilcoxon sum rank test**
Male	40.9 – 65.3	54.7 (47 – 62)	
Female	54.3 – 68.7	62.0 (58 – 66)	0.173
Total	41.9 – 67.3	59.0 (55 – 62)	
AGE (YEARS) by Admission Ward	**Range**	**Mean (95% CI)**	**p-value: Two Sample t-test**
SACW	21.9 – 87.5	60.0 (55.9 – 64.0)	0.0001
Palliative Ward	22.0 – 65.2	41.3 (34.1 – 48.6)	
MARITAL STATUS	**n (%)**		
Single	26 (38)		
Married	19 (28)		
Widowed	14 (22)		
Separated or Divorced	7 (10)		
Cohabiting	1 (1)		
PLACE OF RESIDENCE	**n (%)**		
Own Home	34 (50)		
Not Own home	25 (36.8)		
Institution	5 (7.4)		
Homeless	4 (5.9)		
Number of adults in household	**Median** = 2	**IQR** = 1-3	
Presence of Carer	**n (%)**		
Yes	51 (75)		
No	17 (25)		
Nature of relations with Carer	**n (%)**		
First degree relative (spouse, child, parent or sibling)	31 (60.6)		
Other relatives	18 (35.3)		
Friend	2 (3.9)		
EMPLOYMENT	**n (%)**		
Paid Employment	7 (10.3)		
Retired	28 (41.2)		
Unemployed	30 (44.1)		
Other **(Self-employed and a student)**	3 (4.4)		
TYPE OF GRANT	n (%)		
Old Age grant (State)	28 (70)		
Disability Grant (State)	7 (17.5)		
Employer benefits	3 (7.5)		
Child Support grant (State)	2 (2)		
Number of adults employed in household	Median = 0.5	IQR = 0 - 1	

*IQR = Interquartile Range

Table 4: Distribution of conditions which led to this admission at referral institution

Prevalent primary conditions	n	(%)
Stroke	24	(35)
PVD, Diabetic ulcer or Gangrenous limb	12	(18)
Tuberculosis (TB), TB meningitis and seizures of unknown aetiology	11	(16)
Fracture or Osteoarthritis	6	(9)
Lower respiratory Tract Infections	4	(6)
CCF-Pericarditis	3	(4)
Lung Cancer	2	(3)
#Other	6	(9)
Total	68	100

#Other includes 1 each of fibrosarcoma, prostate cancer, Eclampsia, Chronic Kidney disease, Bowel perforation and Gastroenteritis, PVD=Peripheral Vascular Disease, CCF=Congestive Cardiac Failure

Table 5: Multi-disciplinary Patient Care received by patients and Perceived Patient Care Needs [a]

Patient care needs/staff skills	Report by staff (n=70)		Patient record review (n=68)
	Staff skills n (%)	**Perceived patient care needs** n (%)	**Patient care provided** n (%)
Activities of Daily Leaving (ADLs)	49 (70%)	57 (81%)	35 (51%)
Nursing care	39 (56%)	36 (51%)	56 (82%)
Specialised care	44 (63%)	40 (57%)	45 (66%)
Rehabilitation care	20 (29%)	26 (37%)	43 (63%)
Social work and other	10 (14%)	16 (23%)	9 (13%)
Administration	19 (27%)	9 (13%)	N/A[1]

---

[a] Elements are not mutually exclusive, e.g. only one ADL was considered if a staff member reported more than one ADL. The same applies for all the other elements for both staff and patients.

Table 6: Cox's Proportional Hazard Model on predictors of survival.

Predictors	Model with all predictors	Model with only Care-plan
	Hazard Ratio (95% CI)[a]	Hazard Ratio (95% CI)[a]
Care-plan	0.417 (0.149 – 1.163)	0.380 (0.149 – 0.972)
Age [b] (10 years)	1.119 (0.827 – 1.514)	
Stroke	0.534 (0.189 – 1.510)	
Confirmed CHW visit	0.770 (0.234 – 2.529)	
	p-value: 0.245	p-value: 0.057

[a] is the 95% Confidence Interval, [b] represents a 10-year increase in age.

Figure 1: Summary of Study Participants (Patients)

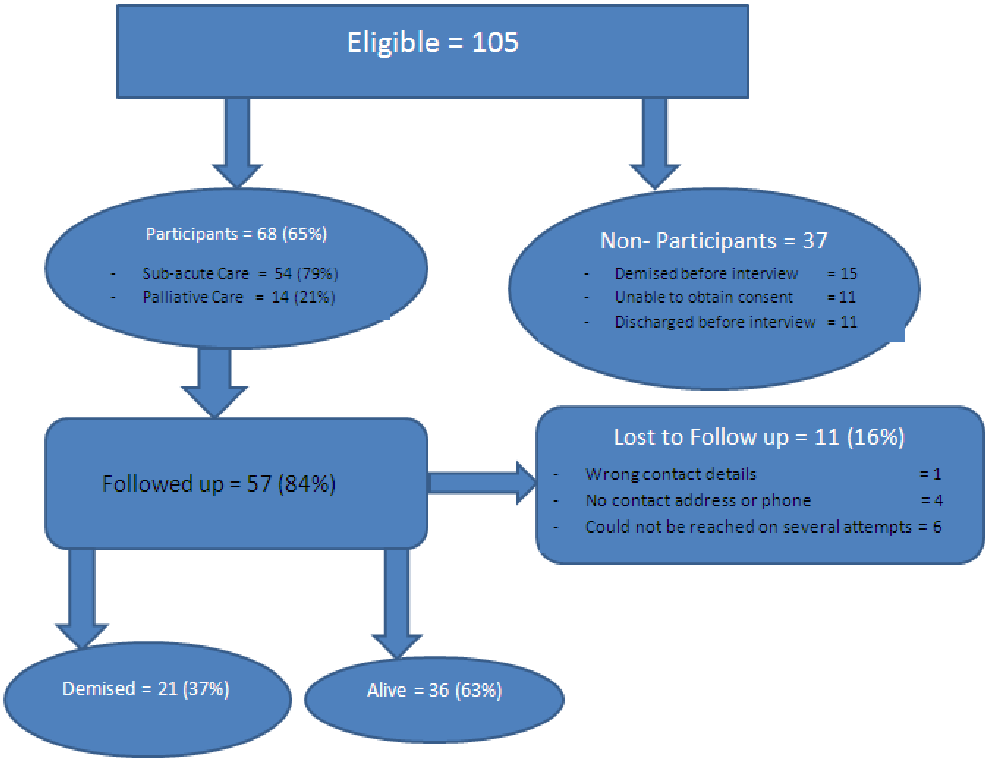
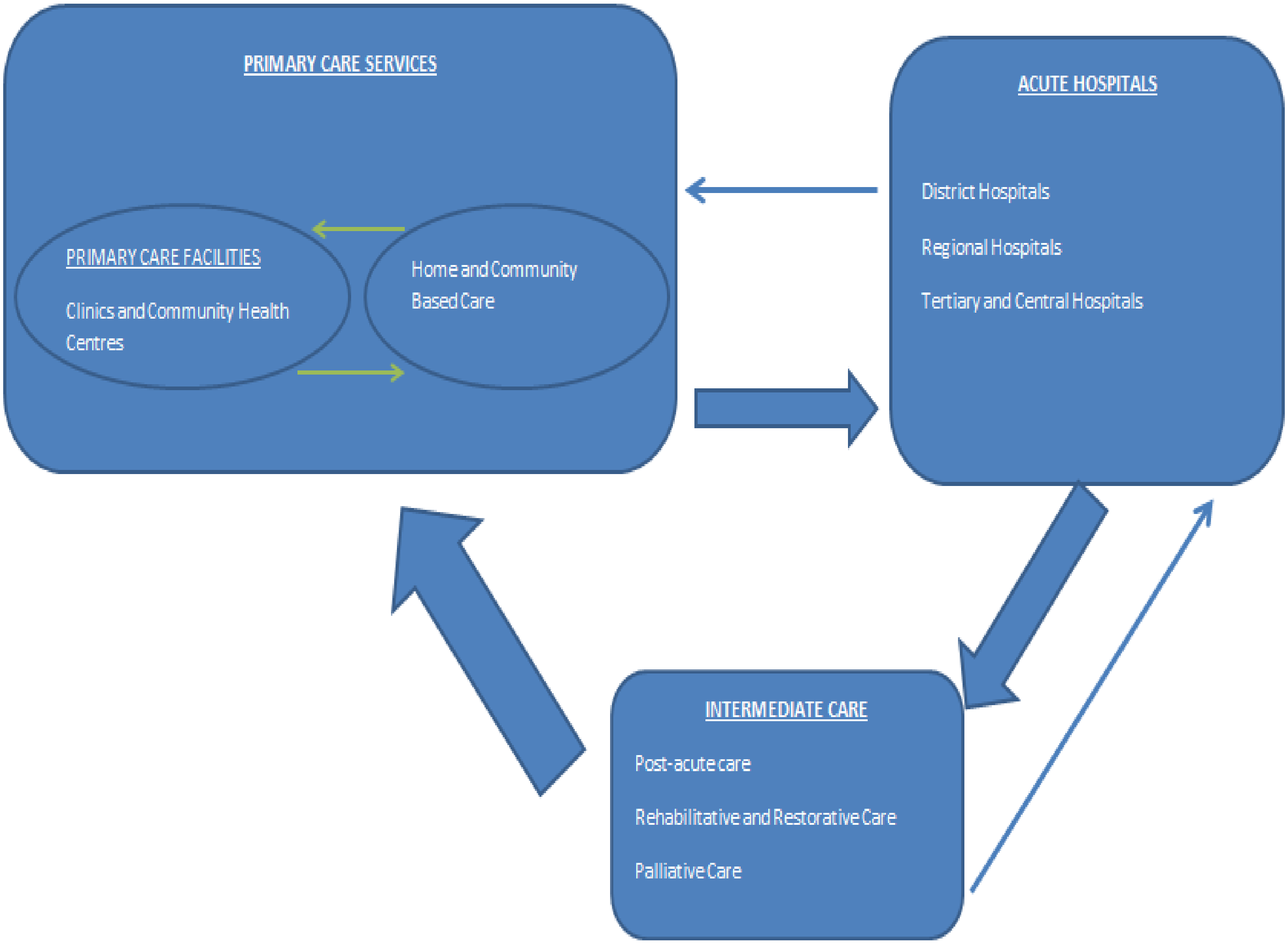


Figure 2: An ideal Continuum of Care pathway in a Health System



PART D: APPENDICES

Appendix A

Study Consents, Questionnaires and Folder review instrument (A1 – A4)

Consent Form (Booth Memorial Hospital patients): Appendix A1 and A2

Principal Investigator: Dr Sikhumbuzo Mabunda

Registrar: Public Health

School of Public Health and Family medicine

University of Cape Town (UCT)

**For clients who have disabilities or illnesses that prevent them from understanding or signing the consent, family members will be asked to consent on their behalf.*

Consent to participate in a study on dehospitalised care in the Western Cape.

I am Dr Sikhumbuzo Mabunda a public health registrar at the University of Cape Town (UCT). I am doing a study on dehospitalised and specifically subacute care in the Western Cape for the provincial Department of Health District Health System (DHS) division. The research has the approval of the Ethics Committee at UCT.

Background

The South African National Department of health is currently researching ways to restructure Primary Health Care; to increase access to healthcare. Central to this is finding out exactly how Community Based Services (CBS) function and operate at the moment; and in the Western Cape dehospitalised care (including Booth Hospital) is a part of CBS. This study will serve as one of the tools of understanding the needs and utilisation of CBS.

Aim

This study aims to know more about the patients who use dehospitalised care (like Booth hospital) and the disease they have; and to further assess provider competencies in delivering care. The burden of disease tells us about the conditions people have who utilise our services; about where and why they were referred to Booth hospital. We also want to look at where our clients go after discharge from Booth Hospital and how their health is a few weeks after discharge.

Confidentiality

All information collected will be confidential. The final report will not contain any names or identifying information. The researcher will write up the report without reference to individual names or identifying information. Your name will be taken so that we can communicate with you. No one other than the researcher will have access to the information.

What will happen in the study?

We will ask you, as the client or a family member of the client to complete a questionnaire and we will review the client's medical records. There will be no additional examinations or tests. There is no cost to you to participate.

Process

The study will be divided into two phases. The first phase will look at the client's state of health on admission, medical background, the treatment plan while in hospital and the discharge plan. For research purposes the client will need to be followed up after discharge, so we will need to get contact details where we can make contact with you.

The second phase of the study will either be done telephonically or through a home or hospital visit a few weeks after discharge at Booth hospital. With this phase of the study we want to assess the progress of our client since discharge from Booth.

You are not forced to take part in the study and once you have started you can withdraw at any stage of the study. The study will involve interview questions and medical assessment of your condition.

**Please tick appropriate option*

- I will participate in the first phase of the study

Yes	
No	

- I will also participate in the second phase of the study

Yes	
No	

I________________________________ Agree that myself/my relative________________________________ hereby consent to participate in the above mentioned study for research purposes and acknowledge and understand the above.

______________________________ Date:

Participant/family member signature

Contact Details:

1. Principal Investigator:

Dr Sikhumbuzo Mabunda

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2. UCT Health Sciences Research Ethics Committee

Chairperson: Professor M Blockman

Health Sciences Faculty

Faculty of Health Sciences Research Ethics Committee

Room E 52-24, Groote Schuur Hospital, Old Main Building

Observatory 7925

Tel: 021 406 6338

Email: Sumayah.ariefdien@uct.ac.za

In-Patient Questionnaire (Appendix A1): Booth Memorial Hospital

Date of Admission: *Date of Administration:*

Home Language:

A. Demographic information			
Question no	**Question**	**Response**	
1.	Full Name (s)		
2.	BHM file number		
3.	Sex (*tick appropriate*)	*a) Female*	
		b) Male	
4.	Date of Birth		*Age:*
5.	Address and phone number		
6.	What is your current Marital status? (*tick most appropriate*)	*a) Never Married*	
		b) Married	
		c) Separated	
		d) Divorced	
		e) Widowed	
		f) Other (specify)	
7.	Where do you live?	*a) A home that you own*	
		b) Institution e.g old age home (specify)	
		c) A house that someone else owns (specify their relationship to you, if any)	
		d) Other Specify	

8.	Which is your nearest town?		
9.	Which suburb or township do you live?		
10.	i) Are you currently (on)…..? (*select the single best option*)	*a) Paid employment*	
		b) Self- employed	
		c) Non-paid work, such as volunteer/charity	
		d) student	
		e) Retired	
		f) Unemployed (health reason)	
		g) Unemployed (other reason)	
		h) Other (please specify)	
	ii) Do you receive any grants?	*a) Yes (specify type and source of grant)*	
		b) No	
	iii) Do you have other sources of income e.g business (specify)	*a) Yes (specify)*	
		b) No	
11.	How many adults live with you in the house?		
12.	How many adults are employed in the household?		
13.	i) When sick do you have a family member who looks after you? (*tick appropriate answer*)	*a) Yes*	
		b) No	
	ii) What relationship do you have with this person?	*a) spouse*	
		b) parent	
		c) brother or sister	
		d) other (specify)	

	iii) Do they live with you?	*a) Yes*	
		b) No	
14.	i) Where will you stay on discharge?	*a) A home that you own*	
		b) Institution e.g old age home (specify)	
		c) A house that someone else owns (specify their relationship to you)	
		d) Other (specify)	
		e) I don't Know	
	ii) When you are discharged do you have someone to look after you?	*a) Yes (who are they?)*	
		b) No	
15.	Alternative contact details		

B. Health information

16.	Which hospital or health institution referred you to Booth?		
17.	Medical condition that led to this admission?		
18.	What were you told you would benefit, by being referred to Booth? or What reasons were you given when being referred to Booth?		
19.	Who made the decision that you should be referred to	*a) Doctor*	

	Booth? (not necessarily the person who wrote the referral letter) it could be someone influential like the hospital manager	*b) Nurse*	
		c) Family	
		d) Other (specify)	
20.	Please tell me more about your recent admission at ……………… (referring health institution), from when you were admitted, until you were referred to Booth and how long you were there.		
21.	Why were you admitted at …………. hospital/health institution?		
22.	How do you rate your physical health in the past month?	*a) Very good*	
		b) Good	
		c) Moderate	
		d) Bad	
23.	Do you have any condition(s) for which you take daily regular medication (Chronic)?	*a) Diabetes*	
		b) Hypertension	
		c) Epilepsy	
		d) Asthma	
		e) HIV	
		f) TB	
		g) Cancer (specify)	
		h) Other (specify)	
		i) None	
24.	Were you ever involved in a serious accident?	*a) Yes (Specify)*	
		b) No	
25.	Did you ever have any <u>significant injuries</u> that had an impact on your level of functioning? (such as a through	*a) Yes (specify)*	

	a car accident, soccer, etc.)	*b) No*	
26.	I. Have you ever been hospitalised in the last year? (2010/2011)	*a) Yes*	
		b) No	
	II. If Yes, please specify reason(s), when and for how long?		
27.	I. Are you taking any medication (either prescribed or over the counter)	*a) Yes*	
		b) No	
	II. If Yes, please specify major medication		
28.	Do you use any assistive devices such as glasses, hearing aid, wheelchair, etc.?	*a) Yes (specify)*	
		b) No	
29.	Additional significant information on your past and present health		

C. Difficulties due to health Conditions: In the past 30 days how much difficulty did you have in

None	Mild	Moderate	Severe	Extreme or cannot do
1	2	3	4	5

30.	Standing for long periods such as 30 minutes?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
31.	Taking care of your household responsibilities?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
32.	Learning a new task, for example learning how to get to a new place?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
33.	How much of a problem did you have joining in community activities (for example, festivities, religious or other activities) in the same way as anyone else can?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot	

		do	
34.	How much have you been emotionally affected by your health problems?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
35.	Concentrating on doing something for ten minutes?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
36.	Walking a long distance such as a kilometer (or equivalent)?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
37.	Washing your whole body?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	

38.	Getting dressed?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
39.	Dealing with people you do not know?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
40.	Maintaining a friendship?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
41.	Your day-to-day work?	*a) None*	
		b) Mild	
		c) Moderate	
		d) Severe	
		e) Extreme or cannot do	
42.	Overall, in the past 30 days, how many days were these difficulties present	*Record number of days______*	

43.	In the past 30 days, for how many days were you totally unable to carry out your usual activities or work because of any health condition?	*Record number of days______*	
44.	In the past 30 days, not counting the days that you were totally unable , for how many days did you cut back or reduced your usual activities or work because of any health condition?	*Record number of days______*	
D. General information			
45.	Are you aware of any health services available to people in the community who have the condition that you have?	*a) Yes (specify)*	
		b) No	
Thank you for your participation enjoy your day			
E. Patient multi-disciplinary Treatment and Discharge Plans			
46.	e.g Physiotherapist, Medical doctor, Social worker, Speech therapist, Occupational therapist, etc. **This information will be extracted from patient in-ward medical file to assess the treatment and discharge plans offered by each health professional.**		

Follow up Patient Questionnaire (Appendix A2): After discharge from Booth Memorial Hospital *(patients previously interviewed during their admission at Booth Memorial Hospital)*

BMH File No:

Date of Discharge: *Date of administration:*

1.	Person being interviewed	*a) Patient*	
		b) Relative (specify relation)	
		c) Home based care Worker	
		d) Other (specify)	
2.	i) Is patient alive?	*a) Yes*	
		b) No	
	ii) If no, when did patient die?		
	iii) If no, where did patient die?	*a) Home*	
		b) Hospital	
		c) Institution (specify)	
		d) Other	
3.	When you were discharged from Booth, where did you go?	*a) A home that you own*	
		b) Institution e.g old age home (specify)	
		c) A house that someone else owns (specify their relationship to you)	
		d) Other (specify)	
Since discharge, did you…			
4.	i) need to access any health services including rehabilitative services?	*a) Yes*	
		a) No	
	ii) access services?	*a) Yes*	
		b) No	
	iii) pay for any health services?	*a) Yes*	
		b) No	

	iv) What are these services? (*specify services and place where services were received*)		
	v) Did you use or get a visit from a home based care worker?	*a) Yes*	
		b) No	
5.	When you were discharged, do you think you were ready for discharge?	*a) Yes*	
		b) No (specify)	
6.	What benefits, if any, do you think you received by being at Booth?		
7.	Compare to……..hospital/ referring health institution how do you think the care you received at Booth compared?	*a) Referring hospital was better (specify)*	
		b) Booth Hospital was better (specify)	
		c) No difference in care (specify if both bad or good)	
		d) Other	
8.	i) Do you think you would have benefited more if you had stayed at Booth longer?	*a) Yes*	
		b) No	
	ii) How, would you have benefited?		
9.	Would you say your health is now……than (as) on admission to Booth hospital?	*a) Better*	
		b) Worse	
		c) Same	
		d) Other (specify)	
10.	What in your words did you like at Booth?		
11.	What, in your words, could be improved at Booth?		
12.	i) Are you working or employed now?	*a) Yes*	
		b) No	
	ii) If Yes, what do you do?		
Thank you for your assistance			

Consent Form (Booth Memorial Hospital staff): Appendix A3

Principal Investigator: Dr Sikhumbuzo Mabunda

Registrar: Public Health

School of Public Health and Family medicine

University of Cape Town (UCT)

Consent to participate in a study on dehospitalised care in the Western Cape.

I am Dr Sikhumbuzo Mabunda a public health registrar at the University of Cape Town (UCT). I am doing a study on dehospitalised and specifically subacute care in the Western Cape for the provincial Department of Health District Health System (DHS) division. The research has the approval of the Ethics Committee at UCT.

Background

The South African National Department of health is currently looking at ways of restructuring primary health care in the country. Key to that is looking at the ways Community based services (CBS) functions and operates at the moment; and in the Western Cape dehospitalised care is a part of CBS. This study will serve as one of the tools of understanding the needs and utilisation of CBS.

Aim

This study aims to determine the burden of disease in dehospitalised care and further assess provider competencies in delivering care. To assess provider competencies I/we will need to ask a few questions to clinical staff/volunteers at Booth Memorial hospital.

Process

The study will be done at Booth Memorial Hospital in the form of a questionnaire which will last approximately 30 minutes. The questionnaires will be completed during working hours. The time for participation in the study will be negotiated with the hospital management and communicated to you. The completed questionnaires can be dropped off at the assigned pigeon hole/drop box. You are welcome to withdraw from the study at any stage but we would appreciate your full cooperation. Please complete questionnaire as honestly as possible and without consulting with your colleagues.

Harms and benefits

The study will not have any impact on your current job or contract but it is done to assess areas that need to be improved. There will not be financial compensation to you for participating in the study and you will not make any payments by participating in this study. If you choose not to participate in the study you will not be penalised.

Confidentiality

All information collected will be confidential. The final report will not contain any names or identifying information. The researcher will write up the report without reference to individual names or identifying information. No one other than the researcher will have access to the information.

I, …………………………………………………………………. hereby consent to participate in the above mentioned study for research purposes and acknowledge and understand the above.

Participant signature: Date:

Contact details

1. Principal Investigator: Dr Sikhumbuzo Mabunda P O BOX 768 Rondebosch 7701 Tel: 021 483 9343 Cel: 082 436 0845 Fax: 086 7199 989 Email: simabunda@westerncape.gov.za	2. UCT Health Sciences Research Ethics Committee Chairperson: Professor M Blockman Health Sciences Faculty Faculty of Health Sciences Research Ethics Committee Room E 52-24, Groote Schuur Hospital, Old Main Building Observatory 7925 Tel: 021 406 6338 Email: Sumayah.ariefdien@uct.ac.za

Clinical staff or Volunteer Questionnaire (*Appendix A3*)

Booth Memorial Hospital

Date of administration: *Home Language:*

	A. Demographic information		
1.	Age		
2.	Sex (*tick appropriate)*	a) Male	
		b) Female	
3.	What is your highest qualification?	a) Matric	
		b) degree (specify)	
		c) Diploma	
		d) Other (specify)	
4.	What is the job title that you hold? *Please tick appropriate*	a) Nurse (specify) e.g Auxiliary	
		b) Physiotherapist	
		c) Speech-therapist	
		d) Occupational therapist	
		c) Medical doctor	
		d) Social Worker	
		e) Physiotherapy assistant	
		f) Other (*specify*)	

5.	i)	Is the job you are doing at Booth now, the job that you qualified for?	a) Yes	
			b) No	
	ii)	If No, please explain why?		
6.	How long have you been doing the job you currently do?			
7.	How long have you been doing this job at Booth?			
8.	Are you….?		a) Salaried	
			b) Volunteer	
			c) Other (specify)	
9.	Do you work…..? *please tick any appropriate option(s)*		a) Full-time	
			b) Part-time	
			c) Sessional	
			d) Other *(specify)*	
10.	How many hours do you work in a day/shift?			
11.	How many days do you work in a month?			
12.	Do you work…..? tick most appropriate		a) Only during the day	
			b) Only at night	
			c) At night and during the day	
			d) Other *(specify)*	
13.	Do you work…..? tick most appropriate		a) Only Between Monday and Friday	

		b) Only Friday to Sunday	
		c) Other (*specify*)	
	B. Skills and competencies		
14.	i) Where did you acquire your skills? (*these are appropriate, important practical skills that you need to perform your job not your qualification)* tick most appropriate	a) University or College	
		b) In-service training	
		c) In-ward experience	
		d) Other (specify)	
	ii) Could you list a few (*minimum 5*) of these skills		
15.	i) Please list five patient needs which take up most of your time, e.g washing patient, dressing patient, feeding patient etc.	a) b) c) d) e)	
	ii) Do you feel that these needs fall within your professional responsibilities?	a) Yes	
		b) No	
	iii) If No, why?		
16.	i) Are there any roles outside your scope of practice that you are expected to fulfill?	a) Yes	

		b) No	
	ii) If Yes, please specify		
17.	Do you have adequate supervision?	a) Yes	
		b) No	
18.	*A right handed, Shona speaking (originally from Zimbabwe) patient who has been referred from New Somerset Hospital, (where he was admitted for 2 weeks) has:* - *A 'stroke' which has left the right side of the body weak (can't use right upper and lower limbs)* - *Has aphasia ("difficulty in speaking")* - *Referral included HIV and CD4 count results (HIV Elisa reactive, CD4 58) Not on ARVs yet* **Question:** Please list 5 key skills/ competencies necessary to render a quality service to this client	a) b) c) d) e)	
19.	Does your profession currently have an associated assistant or mid-level worker? e.g Physiotherapist assistant, nursing assistant, careworker etc.	a) Yes	
		b) No	
20.	List five tasks that you think a mid-level worker or assistant could perform at your work place under supervision		

21.	List five tasks that you think a mid-level worker or assistant could perform at your work place without supervision	
22.	Which health profession(s) or skills do you think is currently missing at Booth?	
Thank you for your assistance with the research		

APPENDIX A4: Folder Review Instrument
(Abridged Version)

ID	Date of admission	Patient Care-Needs							
		Drug 1-5	Physio 1-5	OT 1-5	Speech 1-5	Nursing 1-5	Doctor 1-5	Social worker 1-5	Other 1---

APPENDIX B: CODEBOOK

In- Patient Questionnaire

Home Language	
IsiXhosa	0
English	1
Afrikaans	2
Afrikaans / English	3
Swahili	4

Ward	
Subacute care	1
Palliative	2

General (*For questions requiring Yes or No options*)	
Yes	1
No	0
Missing	888
Not Applicable	999

3. Sex	
Male	0
Female	1

6. Marital status	
Never married	1
Married	2
Separated	3
Divorced	4
Widowed	5
Cohabiting	6

7. Where patient lives	
Own home	1
Institution	2
Not own home	3
Other	4

8i). Nearest town	
Umtata	0
Cape town	1
Stellenbosch	2
Ceres	3
Butterworth	4
East London	5

APPENDIX B: CODEBOOK

8ii). Subdistrict or Substructure	
Western	1
Southern	2
Mitchells Plain	3
Klipfontein	4
Northern	5
Khayelitsha	6
Eastern	7
Witzenberg	8
Other	9

8iii). Substructure/District (if not Metro) or Province (if not Western Cape)	
Southern & Western	1
Klipfontein & Mitchells plain	2
Northern & Tygerberg	3
Eastern & Khayelitsha	4
Cape winelands	5
Eastern Cape	6

10i). Employment	
Paid employment	1
Retired	3
Unemployed health – reason	4
Unemployed other – reason	5
Self-Employed	6

13ii). Relationship	
Spouse	1
Parent	2
Sibling (Brother or Sister)	3
Child	4
Friend	5

14i). Discharge	
Own home	1
Not own home	2
Other	3
Don't know	4
Institution e.g. old age home	5

APPENDIX B: CODEBOOK

16. Referring institution	
NSH	1
GSH	2
VHW	3
GFJ/Lentegeur	4
TBH	5
Private / CHC	6
Self-referred	7

17. Primary medical condition	
Stroke / head – injury	0
Cellulitis / pvd / gangrene	1
TB meningitis / seizures	2
CCF / pericarditis	3
Fracture / OA	4
TB / TB spine	5
Lung Cancer	6
LRTI	7
Prostate Cancer	8
Fibrosarcome	9
Eclampsia	10
Chronic kidney disease	11
Bowel perforation	12
Gastroenteritis	13

18. What were you told you would benefit by being referred to BMH?	
Convalescence	1
Physiotherapy	2
Social Work	3
Wound Care	4
Nursing care	5
Rehabilitation	6
Palliative care	7
Speech Therapy	8
Occupational Therapy	9

19. Who made the decision that you should be referred to BMH?	
Doctor	1
Nurse	2
Family	3
Other	4

APPENDIX B: CODEBOOK

21. Specialised services received or procedures (performed) at referring facility	
CT Scan	1
Amputation	2
X-Ray	3
Ex – fix or ORIF / prosthesis	4
Caesarean Section	5
Ultrasound or Dopla	6
Echocardiogram	7
Psychiatrists	8
Prostatectomy / Orchidectomy	9
LP or Lumbar Puncture	10
Nephrologists e.g Renal biopsy	11
Ligament repair	12
Colostomy	13
Tracheostomy	14
MRI	15
Bone Marrow Biopsy	16
Sliding Scale	17
HELLP Syndrome	18
Debridement	19
Treatment Monitoring e.g. TDF-D4T	20
Pericardiocentesis	21

22. How do you rate your physical health in the past month?	
Very good	1
Good	2
Moderate	3
Bad	4

23. Chronic medical condition		
Diabetes	No	0
	Yes	1
Hypertension	No	0
	Yes	1
Epilepsy	No	0
	Yes	1
Asthma	No	0
	Yes	1
HIV	No	0
	Yes	1
TB	No	0
	Yes	1
Cancer specify	No	0
	Yes	1
Other specify	No	0
	Yes	1
None	9	

APPENDIX B: CODEBOOK

23a). Cancer type	
Lung	0
Prostate	1
Chronic Myeloid Leukaemia	2
Fibrosarcoma thigh	3

23b). Other conditions	
Hypercholesterolaemia	0
Dementia	1
Chronic kidney disease	2
Rheumatoid arthritis or Osteoarthritis	3
CP/Cerebellar atrophy/Muscular dystrophy	4
MDE/Schizophrenia	5
Hypothyroidism	7
Chronic Obstructive Pulmonary Disease	8

23c). Previous illness	
Stroke	1
Multiple admissions	2
Nephropathy	3
Tuberculosis	4
Myocardial Infarction	5
Gangrene/Abscess/Peripheral Vascular Disease	6
Lower Respiratory Tract Infection	7
Fracture/OA	8
Accident/Assault	9
Psychiatric illness	10
Diarrhoea	11

APPENDIX B: CODEBOOK

27ii). Prescribed Drugs or over the counter medication			
HCTZ	1	Simvastatin	13
Furosemide	2	Warfarin	14
Enalapril	3	Atenolol	15
Rifinah	4	Aspirin	16
Pyridoxine	5	Metformin	17
Spironolactone	6	Paracetamol	18
Phenytoin	7	Actraphane /Humulin	19
Senokot	8	Amlodipine	20
Allopurinol	9	Thyroxine	21
Oxybutynin	10	Thiamine	22
Carvedilol	11	TDF	23
Omeprazole	12	Lamivudine	24
Efavirenz	25	Vit Bco	50
Morphine	26	Ceftriaxone	51
Tramadol	27	Bactrim	52
Augmentin	28	Prednisone	53
Haloperidol	29	Nuelin	54
Diazepam	30	Combivir	55
Carbamazepine	31	Flupentixol	56
Brufen	32	Fluoxetine	57
Doxazosin	33	Budesonide MDI	58
Gliclazide	34	Amoxicillin	59
Omeprazole	35	Chloroquine	60
		Sulphasalazine	61
GNRH analogue	37	Fenoterol	62
Fluconazole	38	Salmetorol	63
Loperamide	39	Salbutamol MDI	64
Slow-mag	40	Beclometasone	65
Heparin	41		
Valproic acid	42		
Amitriptyline	43		
Isosorbide mononitrate	44		
Stavudine	45		
Lorazepam	46		
Flucloxacillin	47		
Clindamycin	48		
Sorbitol	49		

28i). Assistive device type	
Wheel chair/Bedbound	1
Crutches	2
Quadripod	3

28ii). Other devices	
Eye glasses	1
Forearm splint	2
Tracheostomy	3
Artificial limb	4

APPENDIX B: CODEBOOK

Follow up Patient Questionnaire

1. Person Being Interviewed	
Patient	1
Relative	2
Community Health Worker	2
Other	4

2i). Status	
Dead	1
Alive	0

2iii). Place of death	
Hospital	1
Home	2
Institution	3

3. When you were discharged from BMH, where did you go?	
Home/rental	0
Hospital	1
Institution	2
Relative	3
Friend	4

4iv). Services paid for since discharge from BMH	
ADL	0
Hospital admission	1
OPD/Clinic/GP visit	2
Physiotherapy/Occupational Therapy	3
Speech Therapy	4
BMH readmission	5
Catheter	6
CT scan	7
Dialysis	8
Psychology	9
Theatre	10
Traditional healer	11
Wound care	12

APPENDIX B: CODEBOOK

5ii). Problems patient had when discharged from BMH	
Can’t dress himself	0
Needed intensive physiotherapy	1
Needed more care	2
Short of breath	3
Still a little weak	4
Unable to walk	5
Was homesick	6

6. What benefits do you think you received by being at BMH?	
None	0
Improved	1
ADL/nursing care	2
Health education	3
Physiotherapy	4
Occupational Therapy	5
Speech Therapy	6
Wound care	7
Motivation	8
Off the streets	9
Social work support	10
Survived longer	11

7. Comparing care between referring institution and BMH	
BMH	0
Same	1
Referring	2

7ii). Differences between BMH and referring institution	
Both bad	0
Both good	1
Caring/friendly staff at BMH	2
Longer stay at BMH	3
More medication at referring institution	4
No care at referring institution	5
Physiotherapy at BMH	6
Security at BMH	7
Wound care at BMH	8

8ii). How would you have benefited if you had stayed at BMH for longer?	
Physiotherapy	0
Got stronger	1
Care	2
Speech Therapy	3
Would have been better	4
ADL	5

APPENDIX B: CODEBOOK

9. Would you say your health is now…	
Better	0
Same	1
Worse	2

10. What in your word did you like at BMH?	
Caring staff	0
Clean hospital	1
Good communication	2
Food	3
Homely Environment	4
Nothing	5
Protection from Alcohol	6
Small Hospital	7
Social Activity	8
Social worker	9
Physiotherapy	10

11. What in your words could be improved at BMH?	
Care	0
Careworker training	1
Communication	2
Increased Length of stay	3
More Physiotherapists	4
More food	5
More senior staff/Nurses	6
Nothing	7
Social worker	8
Transport	9

12ii). Type of work patient does	
Clothing Factory	0
Reception	1
Security	2
Self – employed	3

APPENDIX B: CODEBOOK

Clinical Staff or Volunteer Questionnaire

Home Language	
IsiXhosa	0
English	1
Afrikaans	2
Afrikaans /English	3
French	4
Portuguese /English	5

General (*For questions requiring Yes or No options*)	
Yes	1
No	0
Missing	888
Not Applicable	999

2. Sex	
Male	0
Female	1

3. Education	
Grade 8-11	1
Matric	2
Tertiary	3

4. Staff	
Caregiver	1
Medical doctor	2
Enrolled Nurse	3
Enrolled Nursing Assistant	4
Occupational Therapist	5
Occupational Therapy Assistant	6
Pharmacist	7
Physiotherapist	8
Professional Nurse	9
Social worker	10
Speech Therapist	11

8. Are you….?	
Salaried	1
Volunteer	2
Other	3

APPENDIX B: CODEBOOK

9. Do you work…?	
Full-time	1
Part-time	2
Sessional	3
Other	4

12. Do you work…?	
Only during the day	1
Only at night	2
At night and during the day	3
Other	4

13. Do you work…?	
Only between Monday and Friday	1
Only Friday to Sunday	2
Other	3

14i). Where did you acquire your skills?	
University or College	1
In-service training	2
In-ward experience	3
Other	4

14ii). Skills	
Activities of Daily Living	1
Nursing care	2
Specialised nursing/medical	3
Rehabilitation	4
Social work & other	5
Administration	6

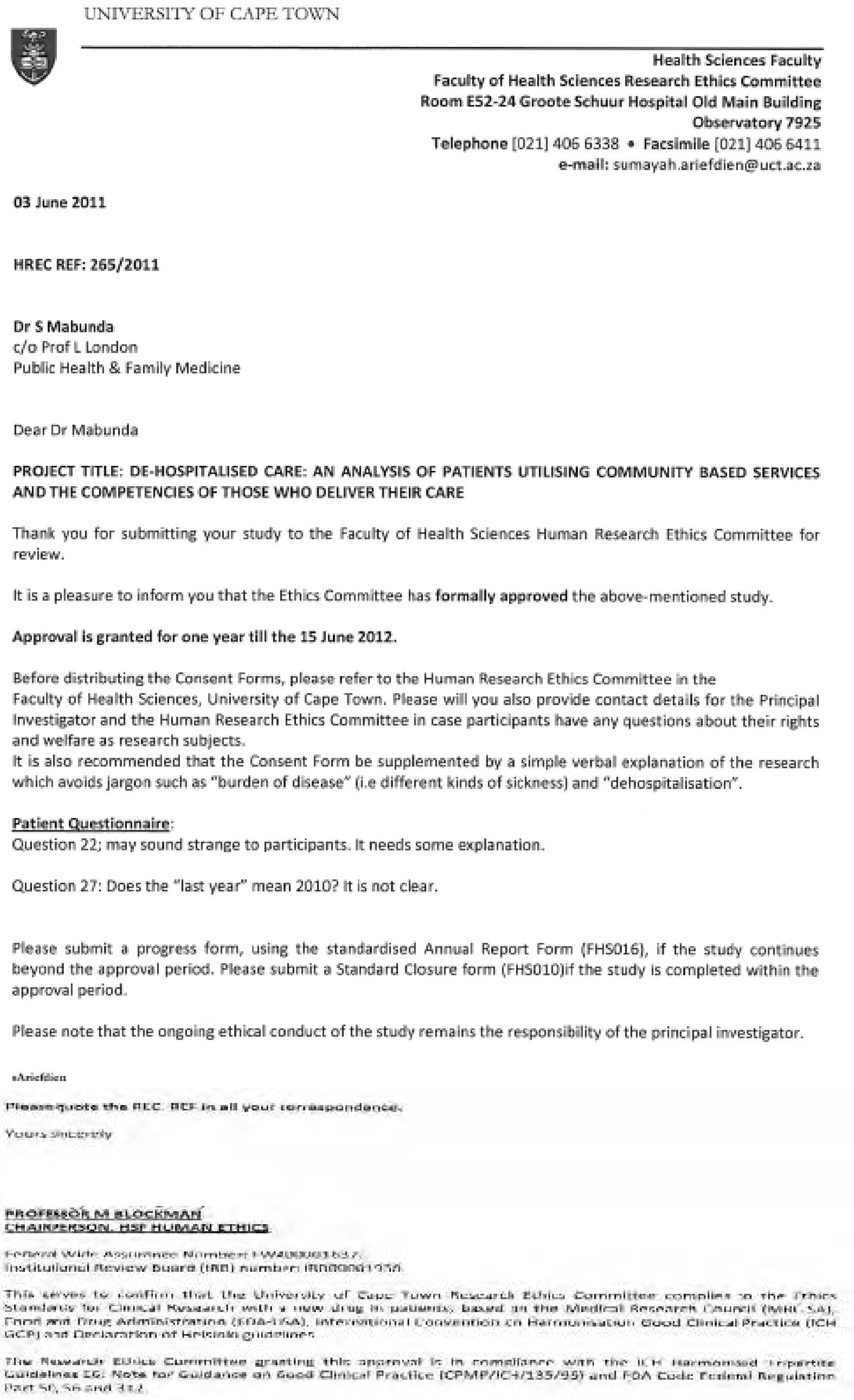
15i). Skills	
Activities of Daily Living	1
Nursing care	2
Specialised nursing/medical	3
Rehabilitation	4
Social work & other	5
Administration	6

APPENDIX B: CODEBOOK

16. Roles outside your scope of practice	
Wound care	1
Administer medication	2
Ngtube insertion	3
Professional Nurse duties e.g phlebotomy	4
Suctioning	5
Attend to patients spiritual needs	6
Secretarial duties	7
Catheter insertion	8

22. Staff categories currently missing at BMH	
Full-time Medical doctor	1
Audiologist	2
Caregivers	3
Clinical Psychologist	4
Dietician	5
Midlevel Nurses	6
Lay Counsellor	7
Physiotherapist or Physiotherapy assistant	8
Porter	9
Professional Nurses	10
Radiographer	11
Social therapist/walker	12
Wad Secretary	13
Wound care technician	14
Volunteers	15
Speech therapist	16

APPENDIX C: ETHICS APPROVAL



UNIVERSITY OF CAPE TOWN

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03 June 2011

HREC REF: 265/2011

Dr S Mabunda
c/o Prof L London
Public Health & Family Medicine

Dear Dr Mabunda

PROJECT TITLE: DE-HOSPITALISED CARE: AN ANALYSIS OF PATIENTS UTILISING COMMUNITY BASED SERVICES AND THE COMPETENCIES OF THOSE WHO DELIVER THEIR CARE

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee for review.

It is a pleasure to inform you that the Ethics Committee has **formally approved** the above-mentioned study.

Approval is granted for one year till the 15 June 2012.

Before distributing the Consent Forms, please refer to the Human Research Ethics Committee in the Faculty of Health Sciences, University of Cape Town. Please will you also provide contact details for the Principal Investigator and the Human Research Ethics Committee in case participants have any questions about their rights and welfare as research subjects.
It is also recommended that the Consent Form be supplemented by a simple verbal explanation of the research which avoids jargon such as "burden of disease" (i.e different kinds of sickness) and "dehospitalisation".

<u>**Patient Questionnaire**</u>:
Question 22; may sound strange to participants. It needs some explanation.

Question 27: Does the "last year" mean 2010? It is not clear.

Please submit a progress form, using the standardised Annual Report Form (FHS016), if the study continues beyond the approval period. Please submit a Standard Closure form (FHS010)if the study is completed within the approval period.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

sAriefdien

Please quote the REC. REF in all your correspondence.

Yours sincerely

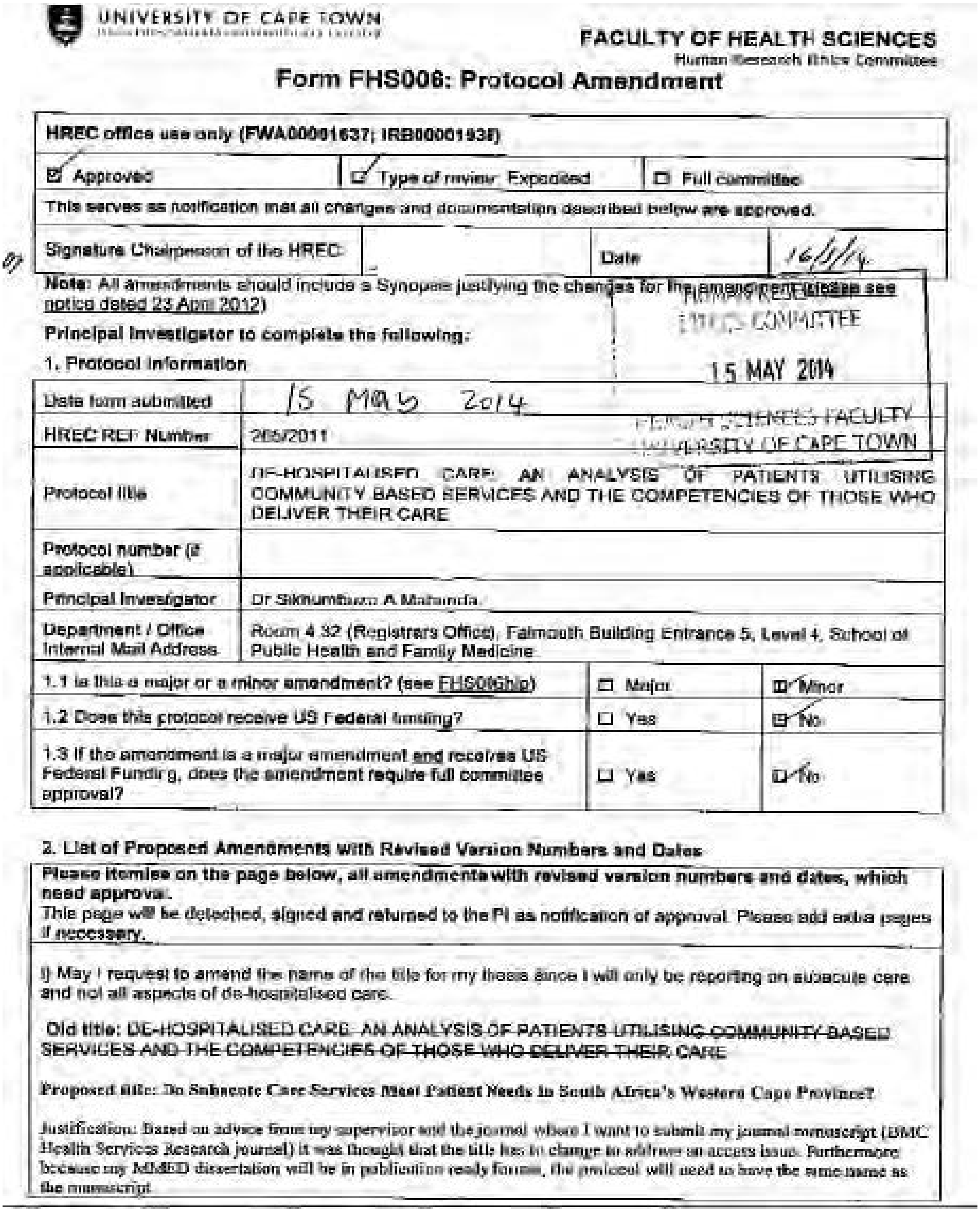
PROFESSOR M BLOCKMAN
CHAIRPERSON, HSF HUMAN ETHICS

Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938.

This serves to confirm that the University of Cape Town Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH GCP) and Declaration of Helsinki guidelines.

The Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

APPENDIX D: PROTOCOL TITLE AMENDMENT



UNIVERSITY OF CAPE TOWN

FACULTY OF HEALTH SCIENCES
Human Research Ethics Committee

Form FHS006: Protocol Amendment

HREC office use only (FWA00001637; IRB00001938)			
☑ Approved	☑ Type of review: Expedited	☐ Full committee	
This serves as notification that all changes and documentation described below are approved.			
Signature Chairperson of the HREC		Date	16/5/14

Note: All amendments should include a Synopsis justifying the changes for the amendment (please see notice dated 23 April 2012)

HUMAN RESEARCH
ETHICS COMMITTEE
15 MAY 2014
HEALTH SCIENCES FACULTY
UNIVERSITY OF CAPE TOWN

Principal Investigator to complete the following:

1. Protocol information

Date form submitted	15 May 2014
HREC REF Number	205/2011
Protocol title	DE-HOSPITALISED CARE: AN ANALYSIS OF PATIENTS UTILISING COMMUNITY BASED SERVICES AND THE COMPETENCIES OF THOSE WHO DELIVER THEIR CARE
Protocol number (if applicable)	
Principal Investigator	Dr Sikhumbuzo A Mabunda
Department / Office Internal Mail Address	Room 4.32 (Registrars Office), Falmouth Building Entrance 5, Level 4, School of Public Health and Family Medicine

1.1 Is this a major or a minor amendment? (see FHS006hlp)	☐ Major	☑ Minor
1.2 Does this protocol receive US Federal funding?	☐ Yes	☑ No
1.3 If the amendment is a major amendment and receives US Federal Funding, does the amendment require full committee approval?	☐ Yes	☑ No

2. List of Proposed Amendments with Revised Version Numbers and Dates

Please itemise on the page below, all amendments with revised version numbers and dates, which need approval.
This page will be detached, signed and returned to the PI as notification of approval. Please add extra pages if necessary.

i) May I request to amend the name of the title for my thesis since I will only be reporting on subacute care and not all aspects of de-hospitalised care.

Old title: ~~DE-HOSPITALISED CARE: AN ANALYSIS OF PATIENTS UTILISING COMMUNITY BASED SERVICES AND THE COMPETENCIES OF THOSE WHO DELIVER THEIR CARE~~

Proposed title: Do Subacute Care Services Meet Patient Needs in South Africa's Western Cape Province?

Justification: Based on advice from my supervisor and the journal where I want to submit my journal manuscript (BMC Health Services Research journal) it was thought that the title has to change to address an access issue. Furthermore because my MMED dissertation will be in publication ready format, the protocol will need to have the same name as the manuscript.

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Instructions for authors

Research articles

Criteria

Research articles should report on original primary research, but may report on systematic reviews of published research provided they adhere to the appropriate reporting guidelines which are detailed in our Editorial Policies. Please note that non-commissioned pooled analyses of selected published research will not be considered.

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Manuscripts must be submitted by one of the authors of the manuscript, and should not be submitted by anyone on their behalf. The submitting author takes responsibility for the article during submission and peer review.

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Overview of manuscript sections for Research articles

Manuscripts for Research articles submitted to *BMC Health Services Research* should be divided into the following sections (in this order):

- Title page
- Abstract
- Keywords
- Background
- Methods
- Results and discussion
- Conclusions
- List of abbreviations used (if any)
- Competing interests
- Authors' contributions
- Authors' information
- Acknowledgements
- Endnotes
- References
- Illustrations and figures (if any)
- Tables and captions
- Preparing additional files

The **Accession Numbers** of any nucleic acid sequences, protein sequences or atomic coordinates cited in the manuscript should be provided, in square brackets and include the corresponding database name; for example, [EMBL:AB026295, EMBL:AC137000, DDBJ:AE000812, GenBank:U49845, PDB:1BFM, Swiss-Prot:Q96KQ7, PIR:S66116].

The databases for which we can provide direct links are: EMBL Nucleotide Sequence Database (EMBL), DNA Data Bank of Japan (DDBJ), GenBank at the NCBI (GenBank), Protein Data Bank (PDB), Protein Information Resource (PIR) and the Swiss-Prot Protein Database (Swiss-Prot).

You can download a template (Mac and Windows compatible; Microsoft Word 98/2000) for your article.

For reporting standards please see the information in the About section.

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The title page should:

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- provide the title of the article
- list the full names, institutional addresses and email addresses for all authors
- indicate the corresponding author

Please note:

- the title should include the study design, for example "A versus B in the treatment of C: a randomized controlled trial X is a risk factor for Y: a case control study"
- abbreviations within the title should be avoided

Abstract

The Abstract of the manuscript should not exceed 350 words and must be structured into separate sections: **Background,** the context and purpose of the study; **Methods**, how the study was performed and statistical tests used; **Results**, the main findings; **Conclusions**, brief summary and potential implications. Please minimize the use of abbreviations and do not cite references in the abstract. **Trial registration**, if your research article reports the results of a controlled health care intervention, please list your trial registry, along with the unique identifying number (e.g. **Trial registration**: Current Controlled Trials ISRCTN73824458). Please note that there should be no space between the letters and numbers of your trial registration number. We recommend manuscripts that report randomized controlled trials follow the CONSORT extension for abstracts.

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Three to ten keywords representing the main content of the article.

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The Background section should be written in a way that is accessible to researchers without specialist knowledge in that area and must clearly state - and, if helpful, illustrate - the background to the research and its aims. Reports of clinical research should, where appropriate, include a summary of a search of the literature to indicate why this study was necessary and what it aimed to contribute to the field. The section should end with a brief statement of what is being reported in the article.

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The methods section should include the design of the study, the setting, the type of participants or materials involved, a clear description of all interventions and comparisons, and the type of analysis used, including a power calculation if appropriate. Generic drug names should generally be used. When proprietary brands are used in research, include the brand names in parentheses in the Methods section.

For studies involving human participants a statement detailing ethical approval and consent should be included in the methods section. For further details of the journal's editorial policies and ethical guidelines see 'About this journal'.

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List of abbreviations

If abbreviations are used in the text they should be defined in the text at first use, and a list of abbreviations can be provided, which should precede the competing interests and authors' contributions.

Competing interests

A competing interest exists when your interpretation of data or presentation of information may be influenced by your personal or financial relationship with other people or organizations. Authors must disclose any financial competing interests; they should also reveal any non-financial competing interests that may cause them embarrassment were they to become public after the publication of the manuscript.

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All contributors who do not meet the criteria for authorship should be listed in an acknowledgements section. Examples of those who might be acknowledged include a person who provided purely technical help, writing assistance, or a department chair who provided only general support.

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All references, including URLs, must be numbered consecutively, in square brackets, in the order in which they are cited in the text, followed by any in tables or legends. Each reference must have an individual reference number. Please avoid excessive referencing. If automatic numbering systems are used, the reference numbers must be finalized and the bibliography must be fully formatted before submission.

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Any *in press* articles cited within the references and necessary for the reviewers' assessment of the manuscript should be made available if requested by the editorial office.

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In press article
Kharitonov SA, Barnes PJ: **Clinical aspects of exhaled nitric oxide.** *Eur Respir J*, in press.

Published abstract
Zvaifler NJ, Burger JA, Marinova-Mutafchieva L, Taylor P, Maini RN: **Mesenchymal cells, stromal derived factor-1 and rheumatoid arthritis [abstract].** *Arthritis Rheum* 1999, **42:**s250.

Article within conference proceedings
Jones X: **Zeolites and synthetic mechanisms.** In *Proceedings of the First National Conference on Porous Sieves: 27-30 June 1996; Baltimore.* Edited by Smith Y. Stoneham: Butterworth-Heinemann; 1996:16-27.

Book chapter, or article within a book
Schnepf E: **From prey via endosymbiont to plastids: comparative studies in dinoflagellates.** In *Origins of Plastids. Volume 2.* 2nd edition. Edited by Lewin RA. New York: Chapman and Hall; 1993:53-76.

Whole issue of journal
Ponder B, Johnston S, Chodosh L (Eds): **Innovative oncology.** In *Breast Cancer Res* 1998, **10:**1-72.

Whole conference proceedings
Smith Y (Ed): *Proceedings of the First National Conference on Porous Sieves: 27-30 June 1996; Baltimore.* Stoneham: Butterworth-Heinemann; 1996.

Complete book
Margulis L: *Origin of Eukaryotic Cells.* New Haven: Yale University Press; 1970.

Monograph or book in a series
Hunninghake GW, Gadek JE: **The alveolar macrophage.** In *Cultured Human Cells and Tissues.* Edited by Harris TJR. New York: Academic Press; 1995:54-56. [Stoner G (Series Editor): *Methods and Perspectives in Cell Biology,* vol 1.]

Book with institutional author
Advisory Committee on Genetic Modification: *Annual Report.* London; 1999.

PhD thesis
Kohavi R: **Wrappers for performance enhancement and oblivious decision graphs.** *PhD thesis.* Stanford University, Computer Science Department; 1995.

Link / URL
The Mouse Tumor Biology Database [http://tumor.informatics.jax.org/mtbwi/index.do]

Link / URL with author(s)
Corpas M: **The Crowdfunding Genome Project: a personal genomics community with open source values** [http://blogs.biomedcentral.com/bmcblog/2012/07/16/the-crowdfunding-genome-project-a-personal-genomics-community-with-open-source-values/]

Dataset with persistent identifier
Zheng, L-Y; Guo, X-S; He, B; Sun, L-J; Peng, Y; Dong, S-S; Liu, T-F; Jiang, S; Ramachandran, S; Liu, C-M; Jing, H-C (2011): **Genome data from sweet and grain sorghum (Sorghum bicolor)**. *GigaScience*. http://dx.doi.org/10.5524/100012.

Clinical trial registration record with persistent identifier
Mendelow, AD (2006): **Surgical Trial in Lobar Intracerebral Haemorrhage**. Current Controlled Trials. http://dx.doi.org/10.1186/ISRCTN22153967

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    - PDF (Adode Acrobat)
- Animations
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Abbreviations should be used as sparingly as possible. They should be defined when first used and a list of abbreviations can be provided following the main manuscript text.

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