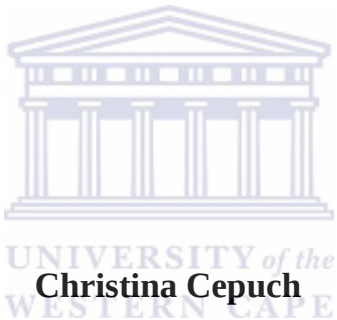
AVAILABILITY OF ESSENTIAL MEDICINES FOR CHRONIC DISEASE VS. COMMUNICABLE DISEASE IN KENYA AS AN INDICATOR OF AGE-RELATED INEQUITIES IN ACCESS



Christina Cepuch

Student Number: 2707342

A mini-thesis submitted in partial fulfillment of the requirements for the degree of Masters in Public Health, School of Public Health, Faculty of Community and Health Sciences, University of the Western Cape

Supervisor: Professor Helen Schneider

May 2012

TEN KEYWORDS

Access

Ageing

Availability

Chronic non-communicable diseases

Communicable diseases

Elderly

Equity

Essential medicines

Kenya

Public health sector

ABSTRACT

Background

A growing concern about possible age-related inequities in health care access has emerged in the increasing debate on the challenges of population ageing and health in sub-Saharan Africa. Older persons may experience systematic exclusion from health services. Viewed as one of the poorest, most marginalized groups in SSA societies, older people are deemed to lack access to even basic, adequate health care. There is an assumption, furthermore, that older persons have *less* access to required health services than do younger age-groups. This suggests an element of age-related inequity. One possible indicator of age-related inequity may be found through measuring the relative availability of essential medicines for chronic non-communicable diseases (NCD), relative to the availability of medicines for communicable diseases (CD).

Aim and objectives

The aim of the study was to compare the availability of essential medicines for NCD and CD in Kenya, as an indicator of age-related inequities in access to health care in Kenya.

The three study objectives were as follows, in public and mission facilities in Kenya:

1. To assess the availability of medicines for the following CD: diarrhoea, HIV, malaria, pneumonia and other infections
2. To assess the availability of medicines for the following NCD common in older populations: arthritis, diabetes, glaucoma, gout, heart disease, hypertension and Parkinson's disease
3. To compare the availability of medicines for CD and NCD and draw conclusions on possible age-related inequities in access.

Study design

Using an adapted version of the HAI / WHO methodology, a cross sectional descriptive survey of medicines availability was conducted. HAI and WHO collaboratively developed a standardized and validated methodology for comprehensively measuring medicines availability, as well as prices, affordability and price components. The survey manual, launched in 2003 and revised in 2008, is available to the public. The methodology involves collecting data on the availability and price of medicines found in a sample of health facilities across sectors of interest within national health systems. If the specific medicine, dose and form being surveyed is available on the day of the survey, then the medicine is documented as being available.

Methods

Random sampling was carried out in six of Kenya's eight provinces, targetting ten facilities per province. Data on availability of the targeted medicines was collected by trained data collectors on pilot-tested data collection forms adapted from the standardized WHO / HAI methodology. The list of medicines included sixteen for communicable diseases to treat infections such as diarrhoea, HIV, malaria, and pneumonia and twelve medicines used to treat non-communicable diseases such as diabetes, arthritis, hypertension, gout, glaucoma, stroke and Parkinson's disease. Availability of medicines was noted by physical observation by a data collector, and calculated as the percentage of facilities where a medicine was found on the day of data collection. The availability of brands and generics was not distinguished and were combined to establish availability of each medicine. Overall availability of all CD and NCD medicines was compared, and within each category between rural and urban areas and between mission and public facilities.

The Ministry of Health was informed of the survey and provided the data collectors with an MOH endorsement letter. The names of facilities participating in the study were recorded on the data collection forms, but not reported. No data on individual patients was collected, and no patients were

interviewed for this survey.

Data were entered into an Excel file and exported to and analyzed with SPSS.

Results

A total of 56 facilities were surveyed: 49 in the public sector and 7 in the mission sector, giving a facility response rate of 93%. Thirty facilities were located in rural settings and 26 were in urban settings.

More CD medicines were available than medicines for NCD. Of a total of 896 individual observations of CD medicines, 632 (70.5%) were recorded as available on the day of visit, compared to 306 (45.5%) of 672 possible individual observations of NCD medicines. These differences were highly significant statistically (chi-square=98.8, $p<0.001$). Furthermore, comparison of availability between urban and rural areas showed statistically significant differences for NCD medicines (40.6% vs. 51.3%, p=0.007), but not CD medicines (72.5% vs. 68.3%, p=0.190). There were no significant differences in availability of medicines in mission compared to public facilities.

Conclusions

This study reveals the low relative availability of medicines for NCDs in Kenya's public and mission sector. Medicines for NCDs were less available in rural vs. urban facilities, but there was no rural vs. urban difference in medicines for CDs. While more research should be carried out to understand the reasons behind these findings, immediate attention to the supply and financing of medicines for NCDs is urgently needed. The relatively lower availability of medicines for NCDs than for CDs may be an indicator of age-related inequities in access to health care in Kenya and calls for more investigations on equity and access to health for older people in Kenya.

DECLARATION

I declare that **AVAILABILITY OF ESSENTIAL MEDICINES FOR CHRONIC DISEASE VS. COMMUNICABLE DISEASE IN KENYA AS AN INDICATOR OF AGE-RELATED INEQUITIES IN ACCESS** is my own work, that is has not been submitted for any degree or examination at any other university, and that all sources I have used or quoted have been indicated and acknowledged by complete references.

Christina Cepuch

ACKNOWLEDGEMENTS

I would like to acknowledge Drs. Siyoi and Mucheru at the Ministry of Health, Dr. Regina Mbindyo from the WHO Kenya Country Office and all the staff at HAI Africa for their dedication and excellent collaboration in medicines work. I would also like to thank the efforts and precision of the twelve data collectors and two data entry clerks. Thank you to Dr. Isabella Aboderin of the Africa Network on Ageing and the Oxford Institute of Population Ageing who kindly provided me her published papers when I could not access them freely online. Thank you to my family for your understanding during this long MPH journey. Finally, a most sincere thank you to the faculty and staff at SOPH, most especially Professor Helen Schneider who has been supportive, patient and dedicated beyond the call of duty. Without her kind persistence, this mini-thesis would never have been done. Its weaknesses and limitations, however, are only mine.

ABBREVIATIONS

ASA	acetylsalicylic acid (aspirin)
CD	Communicable Disease
HAI	Health Action International
HIV	Human Immunodeficiency Virus
MMePA	Monitoring of Medicine Prices and Availability
MOH	Ministry of Health
NCD	Chronic Non-Communicable Disease
ORS	Oral Rehydration Solution
SSA	sub-Saharan Africa
UNIDO	United Nations Industrial Development Organization
WHO	World Health Organization

LIST OF TABLES

TABLE OF CONTENTS

INTRODUCTION

Inequities in access to health care in sub-Saharan Africa

The World Health Organization (WHO) Constitution states "the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being" (WHO, 2008a). The International Covenant on Economic, Social and Cultural Rights further defines "access to health care" as "the availability of specific services; the accessibility of services to the public; the acceptability of the services to different cultures, sexes, and age groups; and the quality of the services" (ICESCR, 2000). The specifics of "accessibility of services to the public" are further developed through defining its four interrelated dimensions: non-discrimination, physical, economic and information accessibility (ICESCR, 2000).

Research on inequity (which is defined as unnecessary, avoidable, unfair and unjust differences (Whitehead, 1992)) in access to health care in sub-Saharan Africa (SSA) has intensified in recent years, as part of a growing global concern with health as a human right, as well as the social determinants of health, the millennium development goals, and universal access to health care including medicines (Braveman and Gruskin, 2003;Whitehead, Dahlgren and Evans, 2001; WHO, 2008a; World Bank, 2005). The research has established that poor people have less access to health care – and experience health inequities – than more advantaged people. Poor people have less access to immunizations, contraception, treatments at health facilities for paediatric diseases like pneumonia and diarrhea, and maternal health services including assisted deliveries (Mutangadura, Gauci, Armah, Woldemariam, Ayalew and Egu, undated; Wagstaff, 2002).

The common focus of the equity debate in SSA has been on the inability of the poor to access required health care due to cost, distance to health facilities (geographical accessibility) and other capacity barriers such as health-seeking behaviour and health knowledge (McIntyre *et al.*, 2006;

Onwujeke, 2005).

Research on peoples' access to health care to date have primarily examined access by socio-economic status such as household indicators of income, expenditure levels or wealth indicators (material assets), and geographical location (rural vs. urban) (Chuma, Gilson and Molyneux, 2007). While the evidence on health inequity is established for poor vs. more advantaged people, very little attention has been given to the exploration and analysis of potential inequities in health care access *within* poor households and/or poor populations (Bakeera *et al*., 2009; Braveman and Gruskin, 2003). Targeted data analyses have been completed on access to health care for *children* (such as immunization rates and access to malaria treatment) (WHO, 2009) but indeed few other analyses on more specific access inequities have been done. To understand if there are also inequities within poor populations, sub-categories of these populations would have to be examined in depth.

Concerns on age-related inequities in access to health care

The challenges of population ageing and health in SSA have led to a growing debate about possible age-related inequities in health care access (Aboderin, 2009; Aboderin and Ferreira, 2009). The debate takes note of recent demographic projections of rapid growth in SSA's older population — from 43 million today to 160 million by 2050 (a sharper rise than for any other world region) (UNPD, 2010) — and revolves around the risks and vulnerabilities of older people to poor health outcomes (Aboderin, 2011).

A key concept in this debate is that older persons experience systematic exclusion from health services. As one of the poorest, most marginalized groups in SSA societies, older people are deemed to lack access to even basic, adequate health care. There is an assumption, furthermore, that older persons have *less* access to required health services than do younger people. This implies a level of age-related inequity (Aboderin and Kizito, 2010).

Preliminary indications of such disparities come from a small number of small-scale qualitative investigations and secondary analyses of national household survey data sets (Aboderin, 2009; McIntyre, 2004; HAI Africa, 2008). However, from these analyses, no absolute evidence of age-related inequities in health care access exists thus far (Aboderin, 2011).

Establishing concrete evidence for age-related disparities would require at least an examination of individual data on health service use (treatment-seeking behaviour, cost burdens, health knowledge) and receipt of care (disease prevention, diagnosis, treatment) among older persons compared to younger age-groups. A further analysis could also be carried out within health systems of the relative availability of basic health services (primary care facilities, essential medicines, diagnostic tests) for old age-related conditions, relative to the provision of services for diseases of younger age-groups (Aboderin and Kizito, 2010).

Essential medicines

The WHO concept of essential medicines was developed over thirty years ago (WHO, 2010). Essential medicines are defined as:

> *"those which satisfy the priority health care needs of the population. They are selected with due regard to public health relevance, evidence on efficacy and safety, and comparative cost-effectiveness. They are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford."* (WHO, 2010).

Access to essential medicines is an integral part of the human right to health (ICESCR, 2000) and encompasses availability, affordability and appropriate use. As such, the availability of essential

medicines to populations is one way of evaluating inequity in access to health care.

Older and younger populations require different 'baskets' of essential medicines to meet their priority health needs: while essential medicines for older persons must include medicines for key chronic non-communicable diseases (NCD), those for younger age-groups do not. In SSA and globally, the leading causes of morbidity, disability and mortality in older populations are chronic NCD whose risk rises sharply with age: in particular hypertension, diabetes, stroke, glaucoma, heart disease, Parkinson's disease, and musculo-skeletal conditions including arthritis. In contrast, the disease burden of children and younger-age adults in SSA is dominated by communicable (infectious) diseases (CD) and non age-related NCD (such as asthma) (WHO, 2008b).

Initial inspection of data from WHO / HAI national surveys on *Medicine Prices, Availability, Affordability and Price Components* in SSA (HAI / WHO, 2010), indeed suggests a relatively lower availability and affordability of chronic NCD essential medicines compared to those for CD. Further indications to this end come from preliminary review on medicines policy in Kenya which reveal that few medicines for NCD are supplied to the lowest level (rural) health facilities (Kenya Medical Supplies Agency, 2008).

Finally, the significant international focus on increasing access to medicines for HIV, tuberculosis, and malaria through a number of well-funded multilateral Global Health Initiatives may indicate a potentially discriminatory prioritization of these communicable diseases over chronic NCD.

Kenyan elderly: demographics, health system access, health profile, access to medicines

In 2005 the population of people aged 60 and older in Kenya was estimated to be 1.4 million (Aboderin and Gachuhi, 2007) and had increased to 1.9 million by 2009 (NCAPD, 2012). This population is forecasted to grow rapidly to 8.02 million by 2050, representing 10% of the total

population (Aboderin and Gachuhi, 2007) and is expected to continue to increase both in absolute number and total population share (NCAPD, 2012). Regardless of the significance of Kenya's elderly people, both in terms of size and growth rate, there is little data on the health status of this population or their use of the health system. Indeed, the most recent demographic and health survey was done in Kenya in 2008 with the aim of providing information to monitor and evaluate the population and health situations in the country (Kenya Bureau of Standards, 2008). The target age groups, however, were 15 – 49 (women) and 15 – 54 (men); no older persons were interviewed.

Some evidence on health-related issues for older people can be extracted from the 2005 Kenya Household Budget Survey (KIHBS, 2005) which revealed that many older people had chronic illnesses, with prevalence increasing proportionately across increasing age bands. Conversely, however, older people under-utilized health services more commonly than younger people do, in both rural and urban setting (KIHBS, 2005). This may be due to older peoples' experiences surrounding access barriers (mainly financial) and exclusion from services (Aboderin, 2011), and their perceptions of the lack of quality in public health services (Aboderin and Kitzito, 2010).

Kenya's health system is guided by its Health Sector Strategic Plan, which is informed by various partnerships, policy documents and commitments, including the Health Policy, the new Vision 2030, Kenya's 2010 constitution, and health resolutions and treaties agreed to at international level. Five-year strategic plans are developed to meet the overall goals and objectives of the health sector, and are implemented based on the Kenya Essential Package for Health (KEPH) approach. The KEPH focuses on interventions towards the improvement of health at six levels, from the community up to national referral hospital level.

The public sector is the backbone of the health system, with significant partners in the private sector (including private-for-profit, non-governmental, and faith-based partners). Indeed, public facilities remain the major provider of health services to Kenyans, accounting for 53% of health facilities (MOH, 2008) and 59% of all in-patient admissions (MOH, 2007). Public facilities also account for 57% of total outpatient visits, whereas private and faith-based health facilities account for 18% and 6% respectively, including 15% of outpatient visits being direct to a retail pharmacy (MOH, 2008).

Public, and some mission, sector health facilities are provided medicines through the government's central medical and supply agency. The agency carries out centralized bulk procurement of essential medicines with funds from the government and development partners. Many medicines are provided free of charge or at subsidized prices, therefore offering the best affordability option for poor people (MOH, WHO, HAI Africa, 2010). There are multiple, parallel medicines supply systems in Kenya, even within the public sector specifically. Vertical programs which include targeted medicines supply exist for treatment programs such as HIV, tuberculosis and malaria however non-communicable diseases do not receive a specific focus in either vertical programming or medicines supply.

Insufficient funding for medicines and the resultant erratic and inadequate supplies to health facilities are ongoing challenges, and over half of all Kenyans have limited access to essential medicines (WHO / HAI, 2010). Research on medicines for chronic diseases specifically has generally been limited to the financial impact of treatment and prevention as a public health approach, but little research has focussed on medicine-specific price and availability, or peoples' ability to afford these medicines. Costing surveys in Kenya have revealed that affordability of treatments for chronic conditions is often much less than for acute conditions (WHO / HAI, 2010). These findings are relevant to the situation of access for older people, due to their requirements of essential medicines for common chronic conditions to meet their priority health needs.

These initial indications, with their related evidence gaps, underscore the importance and timeliness of an investigation of the relative availability and affordability of essential medicines for chronic NCD in Kenya as one indicator of potential inequities in health for older people.

LITERATURE REVIEW

NCDs

Studies on NCDs reveal their increasing burden on mortality and high rates for risk factors – compounded with an ageing population – such as smoking, physical inactivity, increased blood pressure, obesity, increased cholesterol and increased blood glucose. Health systems for NCDs in developing countries generally do not effectively manage and deliver primary health care services related to the ageing population, or the prevention and management of NCDs (Kotwani, 2010). Therefore, significant numbers of people continue to be at risk for NCDs, or are undiagnosed and untreated for an already underlying NCD (WHO, 2011). Once considered diseases of an affluent lifestyle, it is becoming clear that NCDs have also evolved into diseases of poverty, with the poor being at risk of experiencing NCDs' various contributory factors, such as unhealthy diets and inactivity. NCDs currently account for two out of every three deaths globally (WHO, 2011). Of the NCD-related deaths in 2005, half were over age 70 (WHO, 2005).

People with NCDs can place major burdens on health systems and resources because they require long-term treatment. In the literature on availability of medicines, NCDs specifically or diseases mostly experienced by older people (such as osteoarthritis, glaucoma, gout, heart disease and stroke) are not well-differentiated from other NCDs such as asthma, depression and epilepsy – all of which may manifest themselves as chronic diseases from childhood.

Medicines availability

Systematic, comparative research on the availability, cost and affordability (measured in terms of the daily wages of lowest–paid unskilled government workers) of essential medicines has been conducted across many African countries (Cameron *et al.* 2009; HAI Africa, 2008; HAI / WHO, 2010). These surveys have found generally low availability of essential medicines (29.4 – 54.4%) in

the public health sector and unaffordable treatments for both acute and chronic diseases (Cameron *et al*., 2009).

While literature on medicines availability in developing countries is increasing (Balasubramaniam, 1996; Cameron *et al.*, 2009; Myhr, 2000; HAI Africa, 2008; WHO / HAI, 2010), there is currently limited data on the relative availability of NCD medicines and older peoples' access to medicines experiences.

The majority of data on medicines availability have resulted from WHO / HAI medicine pricing surveys. In 2001, Resolution 54.11 was passed at the World Health Assembly which directed the Director-General to investigate systems for voluntary monitoring of medicines prices with "a view to improving equity in access to essential medicines in health systems…" (WHO, 2001). WHO and HAI led the development of the methodology, and a manual was released in 2003 for testing and revision. To date, more than 50 standardized medicine price and availability surveys have been carried out globally. The findings have revealed various barriers to access to medicines, including low availability, significant mark-ups on medicines along the supply chain which negatively affect patient prices, and low affordability especially for the most poor.

The WHO / HAI survey methodology is rigorous and facilitates valid analysis of availability and prices across and among facilities, sectors, and regions. It involves formal data collection of a pre-established list of essential medicines at facility level using a random sampling frame to identify a nationally-representative list of targeted facilities. Survey areas are randomly selected from population-stratified "administrative areas" at a distance no father than one day's travel from the capital city. The major public sector health facilities in the selected areas are selected to "anchor" the selection of the other health facilities and medicines outlets. It is noted that a number of validation studies (in addition to nine pilot studies) were done during the original process of

methodology development. The most important validation study was done in Peru on the sampling frame where it was found that sampling more regions, and those in areas greater than one days car travel from the capital, and in each area from more outlets a greater distance from the main public hospital produced the same price results as using the standard sampling frame (Madden, Meza, Ewen, Laing, Stephens and Ross-Degnan, 2010).

A range of secondary analyses have been carried out from WHO / HAI data, including those on taxes and tariffs on medicines, procurement prices relative to international reference prices, and availability and price of medicines for different geographical locations such as urban vs rural.

Secondary analyses of WHO / HAI survey data has been also been done for various disease groups, including an international comparison of chronic disease medicines regarding price and availability (Gelders, Ewan, Noguchi, and Laing, 2006). The analysis was done medicine by medicine and there was no comparison to medicines for acute diseases. The findings included generally lower availability in the public sector as compared to the private sector; it is noted however that only a limited number of NCD medicines were surveyed.

A limited study in six low- and middle-income countries looked at the availability of selected medicines for heart disease, diabetes, chronic respiratory disease, glaucoma and palliative care. Malawi was the only African country included in the study, and the findings there revealed a 5% median availability of the 32 essential medicines in the public sector (Mendis *et al.*, 2007).

A secondary analysis of availability and price surveys from 36 developing and middle-income countries (including eight from Africa) presented overall findings for a basket of 15 medicines and specific findings for four medicines (two for CD and two for NCD) (Cameron *et al.*, 2009). The use of the standardized WHO / HAI methodology across all surveys allowed for a valid secondary

analysis to be done. For eight surveys from African countries, overall public sector availability of the 15 medicines was 29.4%. The two medicines for CD (amoxicillin and ciprofloxacin) had availability of 81% and 50% respectively as compared to the two medicines for NCD (glibenclamide and salbutamol) with availabilities of 37% and 14%. No comment was made on these differences; there was more focus on price and affordability of medicines for acute vs chronic diseases. While a conclusion on age-related inequities cannot be made from comparing only four medicines, the dramatic difference in availability arguably gives an indication of the need for more study.

Data from 50 WHO / HAI medicine price and availability surveys from low and middle-income countries was analyzed to compare the availability of cardiovascular medicines (van Mourik, Cameron, Ewen and Laing, 2010) and 30 essential medicines for acute and chronic diseases (Cameron, *et al.*, 2011). The findings included generally low availability of medicines for cardiovascular medicines, medicines for other chronic diseases, *and* medicines for acute diseases. Chronic disease medicines had the lowest availability: when the public sector data was analyzed, chronic disease medicines were 36% available (26% for cardiovascular disease medicines specifically) as compared to 53.5% availability of medicines for acute conditions. The least available chronic disease medicines were those used to manage asthma, epilepsy, depression and hypertension. The authors called for a greater response towards the ongoing epidemiological transition in developing countries, and called for more, current, and country specific monitoring of availability and price of medicines for chronic diseases. The study did not specifically consider chronic medicines required by older people.

The standardized WHO / HAI methodology measures both availability and *price* (WHO / HAI, 2010). In summary, there is enormous variability in both price and availability of medicines across regions, and within countries and health systems (Balasubramaniam, 1996; WHO / HAI, 2010). Prices are usually not rationalized with respect to international reference prices (Balasubramaniam,

1996) and impose unfair burdens on the most poor and vulnerable populations (HAI Africa, 2008). Indeed, prices in developing countries are often higher (even double) than those in the developed world such as Europe or North America (Myhr, 2000; WHO / HAI, 2010). While prices are always lowest in the public sector, availability is also generally lowest in this sector (WHO / HAI, 2010). Unable to get the medicines they need at public health facilities, people are thus driven to purchase medicines that are more expensive at private or mission health services (WHO / HAI, 2010; HAI Africa, 2008) or, to go without medicines.

Limitations

For all these studies, the standardized WHO / HAI methodology and recommended sampling frames were used. One of the methodological limitations is that availability is measured on the day of the survey and may not reflect availability over time; the findings reflect only an estimate of the situation. Furthermore, an ideal availability / price monitoring model would involve collecting data from a large number of sites and outlets scattered around the country. To make the monitoring feasible and cost-efficient however, the validated (see above) methodology uses smaller samples of geographic areas and price tracking sites.

Finally, there are limitations of these surveys as an indicator of age-related inequities, including few medicines assessed, and which chronic diseases were chosen (such as asthma, epilepsy and depression, all of which may manifest in childhood and are not considered chronic diseases only of the elderly.)

Equity issues are inherent in the findings of all the price and availability studies, as poor people are the most affected when experiencing low availability and high prices. Age-related inequities, however, have not been considered in any of the price and availability surveys.

METHODOLOGY

Study Aims and Objectives

The aim of the study was to compare the availability of essential medicines for non-communicable diseases (NCD) and communicable diseases (CD) in Kenya, as an indicator of age-related inequities in access to health care in Kenya.

The three study objectives were as follows:

In public (and some mission) facilities in Kenya:

1. To assess the availability of medicines for the following CD: diarrhoea, HIV, malaria, pneumonia and other infections
2. To assess the availability of medicines for the following NCD common in older populations: arthritis, diabetes, glaucoma, gout, heart disease, hypertension and Parkinson's disease
3. To compare the availability of medicines for CD and NCD and draw conclusions on possible age-related inequities in access.

Study Design

Using an adapted version of the HAI / WHO methodology, a cross sectional descriptive survey of medicines availability was conducted. Since little is known about possible age-related inequities in access to medicines, undertaking a descriptive study was a rational approach to first establishing the reality of the situation through observation, measurement and documentation (Beaglehole, Bonita and Kjellstrom, 1997).

Definition of Terms

Essential Medicines – as per WHO definition above

Communicable Diseases (CDs) – treatable, infectious diseases

Non-communicable Diseases (NCDs) – chronic conditions, such as heart and lung disease, cancer, osteoarthritis, hypertension, diabetes, Parkinson's disease

Older / elderly – over the age of 60 years

Urban – towns with more than 50 000 population

Rural – towns at least 25km from the urban centre (for Nairobi, rural is defined as slum areas)

Study Population

The study population was all health facilities (public and mission) in Kenya.

Sampling Procedure and Sample Size

When using the WHO / HAI price and availability survey methodology, a sample size of thirty facilities per targeted health sector pillar (e.g. public, private, mission, etc.) has been shown with a validation study to adequately represent the availability and price situation in the country as a whole with minimum bias (Madden, Meza, Ewen, Laing, Stephens and Ross-Degnan, 2010).

Multi-stage random sampling was done to select facilities to survey. Six survey areas, representing six of the eight provinces were chosen as a representative sample for the country, which included the capital city province, and five more provinces selected using simple random sampling among all which are reachable within one day travel from the capital city. In each province selected, the main public hospital was chosen to "anchor" the sample. Lists were made of all public and mission health facilities within three hours' travel from the six main hospitals, and ten facilities per survey area were randomly selected from the lists, again by drawing random numbers.

The facilities in each sample were chosen from the spectrum of the public and mission sectors: from dispensaries, health centres, and sub-district / district hospitals (classified as "levels II, III and IV" in Kenya's health system classification scheme for both the public and mission sectors) and were sub-

categorized into rural and urban settings. Urban was defined as towns with populations greater than 50 000, while rural was defined as towns (with populations less than 50 000) at least 25km from the urban centre.

The list of medicines sampled for the survey included sixteen medicines for the most common communicable diseases in Kenya, and twelve medicines for chronic non-communicable disease commonly diagnosed in older people such as cardiovascular diseases, stroke, hypertension, gout, glaucoma, arthritis, Parkinson's disease and diabetes. All medicines were referenced from the Kenya Essential Medicines List 2010 and are found in Annex 4. They were selected for study by the author, based on the Kenya EML, relevant Standard Treatment Guidelines, and after discussions and consensus with the MOH Department of Pharmacy and the WHO National Medicines Advisor. It is noted that medicines for tuberculosis were excluded from the list of most common communicable disease medicines, given that they are kept in separate, specialized clinics within health facilities and access to their availability and price data may often not be readily available.

Data Collection

Data on availability of the targeted medicines were collected over one week in April 2012 by twelve data collectors (working in pairs) on pilot tested data collection forms adapted from the standardized WHO / HAI methodology. The data collectors selected included pharmaceutical technologists and non-technical people who had prior experience in health and medicines surveys. They were collaboratively trained at central level by WHO and HAI Africa on the methodology, objectives of the project, and the data collection forms. Availability of medicines was noted by physical observation by the data collector on the day of data collection. A copy of the data collection form is attached as Annex 4.

Reliability

Rigour was ensured in this study by following the established sampling frame with minimal amendments to it. The process of objective measure through direct observation as opposed to subjective measure, recall, or self-reported availability serves to increase the validity of the study. Finally, the tool was been piloted in ongoing collaborative monitoring of medicine price and availability studies.

Data Analysis

The availability of each medicine was recorded in the public and mission facilities visited. Availability was thus noted as the percentage of facilities where a medicine was found on the day of the survey data collection. Availability of brands and generics was not distinguished, in order to establish the complete (overall) availability of each medicine. It is notable that brand name medicines are rarely found in mission or public facilities (WHO / HAI, 2010).

Quantitative analyses of the specific sub-sets of data for key chronic NCD medicines and CD medicines were carried out. Comparisons were made between CD and NCD medicines, between rural and urban areas, and between mission and public facilities. Availability of CD and NCD medicines was calculated as the total number of medicines available as a percentage of all observations done in each category for rural vs. urban and mission vs. public. The Chi-squared test was then used to compare the categories for differences. Finally, to understand if the availability of NCD medicines differed by indication, the availability of each individual medicine was analyzed and compared relative to location and facility type.

Ethical Statement

The Ministry of Health and other key partners were informed of the study and an MOH endorsement letter was obtained from the Deputy Chief Pharmacist (Annex 3); assuring facilities (a) of their (and

their data's) anonymity and (b) that data collectors are not acting in any way as regulators. This letter helped to facilitate data collection at facility level. Collaborative data collection on medicine prices and availability has been regularly done in Kenya across sectors and health facility levels and no public sector facilities resisted giving information to the data collectors.

The names of facilities participating in the study are not reported, and data has been pooled across facilities, minimising any risk of being singled out as a poor performer. No data on individual patients was collected, and no patients were spoken to or involved in any way.

RESULTS

Response rates and description of study facilities

A total of 56 facilities were included in the survey. Two provinces had eight instead of ten facilities surveyed, due to logistical constraints faced by the data collectors, giving a facility response rate of 93%. The sample included 49 public sector facilities and seven mission sector facilities. Thirty facilities were surveyed in rural settings, and 26 in urban settings. This is illustrated in Table 1 below.

Table 1: Description of the Facilities Surveyed

	Facility Type				Total
	Mission		Public		
Urban or Rural	**N**	**%**	**N**	**%**	**N**
Rural	4	57.1	26	53.1	30
Urban	3	42.9	23	46.9	26
Total	7	100	49	100	56

Availability of medicines

The availability of medicines is detailed in Tables 2 below for communicable diseases (CD). Availability is presented as the percentage of the facilities surveyed which had the medicine available. Nearly all the CD medicines (13 out of 16) were available in more than half the health facilities surveyed. The most commonly available CD medicines were oral rehydration solution for diarrhoea and the antibiotic, cotrimoxazole, both available in more than 90% of facilities. The least available CD medicines were those used primarily for the treatment of sexually transmitted infections (ciprofloxacin, ceftriaxone and metronidazole) which were available in less than half the facilities. More than 70% of facilities had anti-retroviral medicines and first-line antimalarial medicines (artemether / lumefantrine) in stock.

Table 2: Availability of medicines for Communicable Diseases

	Frequency of observation (N=896 observations)	**% facilities with medicine available (N=56)**
ORS sachet for 500mL	55	98.2
Cotrimoxazole tab 80/400mg	51	91.1
Albendazole tablet 400mg	48	85.7
Amoxicillin cap / tab 250mg	46	82.1
Amoxicillin susp 125mg/5mL	46	82.1
Cotrimoxazole suspension 8/40 mg/mL	46	82.1
Zinc sulfate dispersible tab 20mg	46	82.1
AZT tablet 300mg	41	73.2
Nevirapine tablet 200mg	41	73.2
AZT / 3TC combination tab 300 / 150mg	40	71.4
Artemether / lumefantrine tab 20/120mg	40	71.4
Quinine dihydrochloride inj 300mg/mL (2mL amp)	35	62.5
Gentamicin injection 10mg/mL or 40mg/mL (2mL amp)	30	53.6
Ciprofloxacin tab 250mg or 500mg	26	46.4
Ceftriaxone powder for inj 250mg or 1g	23	41.1
Metronidazole tablet 200mg or 400mg	18	32.1
Total observations	632	

Table 3 lists the medicines available for non-communicable diseases (NCD). The most available NCD medicine was the anti-inflammatory, ibuprofen. The second most available, aspirin (ASA), is a standard treatment for the majority of people with heart disease or stroke (WHO, 2003). It is an inexpensive and commonly manufactured essential medicine, yet it was only available in 75% of the facilities surveyed. Insulin is a vital life-saving medicine for people with type I diabetes, but its availability was only 43% in the facilities surveyed. Hydrochlorothiazide is also a widely recommended and inexpensive first line treatment for hypertension in older people; it was only found in half of the facilities surveyed. Bar one facility, essential medicines for the treatment of gout (allopurinol) and glaucoma (acetazolamide) were not available at all.

Table 3: Availability of Medicines for Non-Communicable Diseases

	Frequency of observations (N=672 observations)	**% facilities with medicine available (N=56)**
Ibuprofen tab / cap 200mg	45	80.4
ASA (aspirin) tablet 300mg	42	75.0
Furosemide tab 40mg	36	64.3
Metformin tab 500mg	31	55.4
Atenolol tab 50mg	30	53.6
Hydrochlorothiazide tablet 25mg	28	50.0
Benzhexol HCl tablet 5mg	26	46.4
Glibenclamide tab 5mg	26	46.4
Insulin human 30/70 injection (10mL)	24	42.9
Enalapril tablet 5mg	17	30.4
Allopurinol tablet 100mg	1	1.8
Acetazolamide tablet 250mg	0	0
Total observations	306	

NCD grouped by clinical indication are presented in Table 4. Medicines for heart disease were the most available (23.5%), while medicines for Parkinson's disease, gout and glaucoma were the least available (7.4%, 0.3% and 0% respectively).

Table 4: Relative availability of NCD medicines

Disease type	**Total observations (N)**	**Relative Availability (%)**
Heart Disease	83	23.5
Diabetes	81	22.9
High Blood Pressure	75	21.2
Arthritis	45	12.7
Stroke	42	11.9
Parkinson's Disease	26	7.4
Gout	1	0.3
Glaucoma	0	0.0
Total	353	100.0

Comparisons of availability of CD and NCD medicines

Of the 896 possible individual observations of CD medicines, 632 (70.5%) were recorded as

available on the day of visit, compared to 306 (45.5%) of 672 possible individual observations of NCD medicines (Table 5). These difference in availability are statistically significant (chi-squared=98.8, p<0.001).

Table 5: Comparison of overall availability of CD and NCD medicines

	Medicines available (%)	Medicines not available (%)	Total (%)
CD	632 (70.5%)	264 (29.5%)	896 (100%)
NCD	306 (45.5%)	366 (54.5%)	672 (100%)
All medicines	938 (59.8%)	630 (40.2%)	1568 (100%)
p-value (chi-squared test)	chi-sq=98.8, p=<0.001		

Table 6 below reveals statistically significant differences in availability of NCDs medicines between rural and urban facilities (p=0.007), but not for CD medicines (p=0.190).

Table 6: Availability of CD and NCD medicines in rural vs urban facilities

	CD		NCD	
	All observations	**Availability**	**All observations**	**Availability**
Rural	480	348 (72.5%)	360	146 (40.6%)
Urban	416	284 (68.3%)	312	160 (51.3%)
Total	896	632 (70.5%)	672	306 (45.5%)
p-value (chi-squared test)	chi-sq=1.721, p=0.190		chi-sq=7.328, p=0.007	

Table 7 below reveals no statistically significant difference in CDs vs. NCDs medicines when comparing availability in mission and public facilities.

Table 7: Availability of CD and NCD medicines in mission and public facilities

	CD		NCD	
	All observations	**Availability (%)**	**All observations**	**Availability**
Mission	112	75 (66.9%)	84	39 (46.4%)
Public	784	557 (71.0%)	588	267 (45.4%)
Total	896	632 (70.5%)	672	306 (45.5%)
p-value (chi-squared test)	chi-sq=0.602, p=0.438		chi-sq=0.003, p=0.953	

Availability of NCD medicines in urban and rural facilities

To understand how the availability of NCD medicines varied by individual medicine within different settings, the availability was calculated as the percentage of total observations done on each medicine, and was compared between urban vs. rural (Table 8). Only hydrochlorothiazide and insulin 30/70 showed a significant difference in availability by urban and rural comparison.

Table 8: Availability of medicines for NCD by urban vs. rural

	Rural (N=30)		**Urban (N=26)**			
	N	**%**	**N**	**%**	**chi-sq**	**p-value**
ASA (aspirin) tablet 300mg	21	70.0	21	80.8	0.846	0.358
Allopurinol tablet 100mg	0	0.0	1	3.8	1.154	0.284
Atenolol tab 50mg	14	46.7	16	61.5	1.216	0.271
Benzhexol HCl tablet 5mg	12	40.0	14	53.8	1.054	0.306
Enalapril tablet 5mg	9	30.0	8	30.8	0.004	0.951
Furosemide tab 40mg	18	60.0	18	69.2	0.508	0.476
Glibenclamide tab 5mg	14	46.7	12	46.2	0.001	0.969
Hydrochlorothiazide tablet 25mg *	11	36.7	17	65.4	4.513	0.034
Ibuprofen tab / cap 200mg	23	76.7	22	84.6	0.548	0.459
Insulin human 30/70 injection (10mL) *	9	30.0	15	57.7	4.284	0.038
Metformin tab 500mg	15	50.0	16	61.5	0.737	0.391

** statistically significantly different between rural and urban*

DISCUSSION

Medicines for CDs are generally more available than are medicines for NCDs, at 70.5% and 45.5% respectively. The overall availability of NCD medicines is relatively poor in Kenya's public health sector, especially for gout, glaucoma, diabetes and standard treatments for hypertension, all of which were available in less than half the facilities visited. NCD medicines are less available in rural settings (40.6%) than they are in urban settings (51.3%), while medicines for CDs do not reveal a rural vs. urban availability difference.

These results are in line with those of previous studies on availability of medicines in Kenya and other African countries. The most recent data from Kenya on overall availability of a mixed basket of 36 essential medicines (for both CD and NCD combined) was 67% (MOH, WHO, HAI Africa, 2010). Indeed, an analysis of 30 medicines in 40 low- and middle-income countries revealed that medicines for chronic diseases are found less frequently (36%) in the public sector than medicines for acute diseases (53.5%) (Cameron *et al.* 2009).

Other studies have found lower availability of a basket of essential medicines in rural areas (MOH, WHO, HAI Africa, 2010; WHO / HAI, 2010) which was confirmed in these results for NCD medicines specifically. As an apparent response to such ongoing findings in rural areas, Primary Health Care and rural health facilities will have an increased focus in the coming years (Kenya Health Sector Strategic Plan, 2012).

In past studies (MOH, WHO, HAI Africa, 2010; WHO / HAI, 2010) availability was usually comparable in the public and mission facilities. This was similarly found in these results, where there was no significant difference in the availability of NCD and CD medicines between these two sectors.

The burden of NCDs is rising in Africa (WHO, 2008) and the body of evidence on poor availability of medicines for NCDs is becoming established and growing (WHO / HAI, 2010, Cameron *et al.* 2009), yet inadequate attention is being focused on these areas. For many years, priorities and urgencies for funding, training, planning and governmental health strategy have been focused on medicines and vertical programs for CD such as HIV, tuberculosis and malaria. The same urgency and comprehensive approach needs to be applied to NCDs and their treatment.

Low availability of medicines in the public sector potentially forces patients to seek medicines in the private sector, which historically has better availability but higher prices and less affordability (WHO / HAI, 2010). Older persons may already exhibit under-use of health services, and the relative lack of essential medicines for the diseases they most commonly suffer contributes to the under-use. This mini-thesis highlights the need for increased attention towards the management of chronic diseases; financing, selection, procurement and supply of essential medicines; access to medicines for older people; and equity in health systems.

The study has certain limitations. Although based on a validated methodology, the study entails a relatively small sample size of 56 facilities. It is also a snapshot, cross-sectional assessment (subject to delivery schedules) as opposed to a more dynamic average availability over time assessment.

Kenya's health facilities in the public and mission sectors are categorized into six levels according to their infrastructure, budget, human resources, and the types of services (including essential medicines) they offer. It was beyond the scope of this study to further analyze the availability of medicines by facility level but this is a valid idea for a deeper study.

Not all essential medicines for each NCD were studied. For example, only one type of insulin was

surveyed, and no eye-drops for glaucoma were included in the study. Availability findings could also be affected by different strengths or dosage forms from those included in the study.

It is also noted that while HIV is "crossing the line" between being a CD and a chronic disease, for the purposes of this study, medicines to manage HIV were considered as medicines for CD, and indeed HIV prevalence is highest in younger people in Kenya. Finally, there are other reasons besides age-related inequities for the lower prioritization of NCDs vs CDs and this study is limited in its design to comprehensively determine, differentiate and describe the range and depth of these reasons.

CONCLUSIONS AND RECOMMENDATIONS

This study reveals low availability of NCD medicines as compared to medicines for CD. A number of varied factors may lead to the lower availability or prioritisation of essential medicines for NCDs. Inequity -- as a potential age-related factor -- may only be one of them, and this study may be considered an initial step to a deeper analysis on the factors affecting health and medicines access among elderly Kenyans. Studies on other factors, including health worker education and awareness on NCDs and older people, health- and medicines- policy making processes, budgetary allocation for medicines, and treatment guidelines for NCDs could also be carried out to deepen the evidence base on access to medicines for older people in Kenya. A study on the role of local pharmaceutical companies in Kenya in improving availability of NCD medicines could also be considered (UNIDO, 2010).

People with NCDs need a reliable supply of medicines to manage their chronic conditions, and there is an urgent need to improve the availability of NCD medicines in Kenya's public sector. Attention to the procurement, management, supply and financing of medicines for NCDs should be improved: Standard treatment guidelines for NCDs and the National Essential Medicines Lists should be developed, reviewed and revised based on the most current evidence. Health workers training should ensure awareness of guidelines and evidence. National Social Health Insurance should cover medicines for chronic disease.

Access to essential medicines is a human right, and forms the foundation of Kenya's public primary health care system. However, and more than thirty years after the introduction of the essential medicines concept, there remains gravely inadequate amounts of medicines available to those in need. All of the barriers leading to low availability (economic constraints, competing priorities, bureaucratic obstacles, lack of political will) can be overcome to help people in their struggle to

realize their right to health. The elderly are a particularly vulnerable group in this struggle, and special attention to their needs should be an urgent priority for the government and its partners supporting the health sector.

REFERENCES

Aboderin, I. (2009).Later-life exclusion from basic health care: Perspectives from sub-Saharan Africa. *Paper presented at the 19th Congress of the International Association of Gerontology and Geriatrics*, 5-9 July 2009, Paris.

Aboderin, I. and Ferreira, M. (2009). Linking Ageing to Development Agendas in sub-Saharan Africa: Challenges and Approaches. *Journal of Population Ageing*, 1: 51-73.

Aboderin, I. and Gachuhi, M. (2007). First East African Policy-Research Dialogue on Ageing. AFRAN Policy-Research Dialogue Series, Report 01 – 2007. Oxford Institute of Ageing: University of Oxford.

Aboderin, I. and Kizito, P. (2010). Determinants and Dimensions of Health in Old Age in Kenya and Nigeria: Implications for Policy. Report on Progress and Preliminary Findings. Kenya National Coordinating Agency for Population and Development: Nairobi.

Aboderin, I. (2011). Understanding and advancing the health of older populations in sub-Saharan Africa: policy perspectives and evidence needs. *Public Health Reviews*, 32: 357 – 376.

Aschengrau, A. (2006). Ch 6 – Overview of Epidemiologic Study Designs. In *Essentials of Epidemiology in Public Health.* Sudbury: Jones and Bartlett Publishers: 135 – 162.

Bakeera, S.K., Wamala, S.P., Galea, S., State, A., Peterson, S., and Pariyo, G.W. (2009). Community perceptions and factors influencing utilization of health services in Uganda.*International Journal for Equity in Health*, 8: 25 – 37.

Balasubramaniam K. (1996). Health and pharmaceuticals in developing countries: towards social justice and equity. Penang, Malaysia: Consumers International Regional Office for Asia and the Pacific.

Beaglehole, R., Bonita, R., and Kjellstrom, T. (1997). Ch 3 – Types of Study.In *Basic Epidemiology*. Geneva: WHO Publications: 31 – 53.

Braveman, P. and Gruskin, S. (2003). Defining Equity in Health.*Journal of Epidemiology and Community Health*, 57: 254-258.

Cameron, A., Roubos, I., Ewen, M., Mantel-Teeuwisse, A., Leufkens, H., and Laing, R. (2011).Differences in the availability of medicines for chronic and acute conditions in the public and private sectors of developing countries.[Online]. Available: http://www.who.int/bulletin/online_first/10-084327.pdf[Downloaded: 24/03/11 20:00 PM].

Chuma, J., Gilson, L. and Molyneux, C. (2007). Treatment Seeking Behaviour, Cost Burdens and Coping Strategies Among Rural and Urban Households in Coastal Kenya: An Equity Analysis. *Tropical Medicine and International Health*, 12: 673-686.

Gelders, S., Ewan, M., Noguchi, N., and Laing, R. (2006). Price, availability and affordability.An international comparison of chronic disease medicines. Cairo: WHO EMRO.

Health Action International Africa (HAI Africa). (2008). The Costly Access to Essential Medicines in Kenya.HAI Africa, Nairobi, Kenya.

Health Action International /World Health Organization (HAI / WHO). (2010). Medicine Prices, Availability, Affordability and Price Components.[Online].Available: http://www.haiweb.org/medicineprices/ [Downloaded: 16/03/10 20:45 PM].

Hetzel, M.W., Obrist, B., Lengeler, C., Msechu, J.J., Nathan, R., Dillip, A., Makemba, A.M., Mshana, C., Schulze, A., Mshinda, H. (2008). Obstacles to Prompt and Effective Malaria Treatment Lead to Low Community-Coverage in Two Rural Districts of Tanzania. *BMC Public Health,* 16; 317.

ICESCR (2000).The Right to the Highest Attainable Standard of Health.ICESCR General Comment 14, E/C.12/2000/4.

Kenya Medical Supplies Agency (2008). Dispensary and Hospital Facilities Medicines Lists. KEMSA, Nairobi.

Kenya National Bureau of Statistics (2008). Kenya Demographic and Health Survey. [Online]. Available: http://www.usaid.gov/ke/ke.buproc/KDHS_Prel_report_June_2009.doc [Downloaded : 23/04/10 23:00 PM].

Kotwani, A. (2010). Access to essential medicines and standard treatment for chronic diseases. *Indian J Pharmacol*, 42: 127 – 128.

Madden, J.M., Meza, E., Ewen, M., Laing, R.O., Stephens, P., Ross-Degnan, D. (2010). Measuring medicine prices in Peru: validation of key aspects of WHO/HAI survey methodology. *Rev Panam Salud Publica*. 27 (4): 291 – 9.

McIntyre, D. (2004). Health policy and older people in Africa.In Lloyd-Sherlock, P. (Ed), Living longer. Ageing, development and social protection (pp 160-183). London and New York: Zed Books.

McIntyre, D., Thiede, M., Dahlgren, G., Whitehead, M. (2006).What Are the Economic Consequences for Households of Illness and of Paying for Health Care in Low- and Middle-Income Countries. *Social Science & Medicine,* 62: 858-865.

Mendis, S., Fukino, K., Cameron, A., Laing, R. Filipe, A., Khatib, O., Leowski, J, Ewen, M. (2007). The availability and affordability of selected essential medicines for chronic disease in six low- and middle-income countries. *Bulletin of the WHO,* 85 279 – 288.

Ministry of Health (MOH) Kenya. (2007). *Household Health Expenditure and Utilization Survey Report*. MOH, Nairobi.

Ministry of Health (MOH) Kenya. (2008). *Facts and Figures in Health and Health Related Indicators.* MOH, Nairobi.

Ministry of Health (MOH) Kenya, WHO, HAI Africa. (2010). *Access to Essential Medicines in Kenya: a Health Facility Survey*. MOH, Nairobi.

Mutangadura, G., Gauci, A., Armah, B., Woldemariam, E., Ayalew, D., Egu, B. (undated). Health inequities in selected African countries: Review of evidence and policy Implications. [Online]. Available: http://www.uneca.org/aec/documents/Gladys%20Mutangadura_Adrian%20Gauci_Kasirim%20Nwuke_Bartholomew.pdf [Downloaded: 08/04/11 23:20 PM].

Myhr, K. (2000). Comparing prices of essential drugs between four countries in East Africa and with international prices. [Online]. Available: www.accessmed-msf.org/upload/ReportsandPublications/3920012349208/East%Africa.pdf [Downloaded: 23/04/10 22:00 PM].

National Coordinating Agency for Population and Development (NCAPD). (2012). *Policy Brief 12: Are Health Care Services Prepared to Serve Older Persons in Kenya?* NCAPD, Nairobi.

Obrist, B., Iteba, N., Lengeler, C., Makemba, A., Mshana, C., Nathan, R., Alba, S., Dillip, A., Hetzel, M., Mayumana, I., Schulze, A., Mshinda, H. (2007). Access to Health Care in Contexts of Livelihood Insecurity: A Framework for Analysis and Action. *PLoS Medicine, 4:* 1584-1588.

Russell, S. (2004). The Economic Burden of Illness for Households in Developing Countries: A Review of Studies Focusing on Malaria, Tuberculosis and Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome. *American Journal of Tropical Medicine and Hygiene*, 7: 147-155.

United Nations Industrial Development Organization (UNIDO). (2010). *Kenya: Pharmaceutical Sector Profile: Strengthening the local production of essential generic drugs in least developed and developing countries.* UNIDO, Vienna.

United Nations Population Division (UNPD) (2010) *World Population Prospects. The 2008 Revision.*UNDP, New York.

United Nations Population Division (UNPD) (2012). Population Facts [Online]

www.un.org/esa/population [Downloaded: 29/03/12 22:00 PM].

Varkevisser, C.M., Indra, P., and Brownlee, A. (2003). *Designing and Conducting Health Systems Research Projects,* 2, - Data Analysis and Report Writing. WHO and IDRC, Geneva: WHO: 240 – 244.

Van Mourik, M., Cameron, A., Ewen, M., Laing, R.O. (2010). Availability, price and affordability of cardiovascular medicines: a comparison across 36 countries using WHO / HAI data. *BMC Cardiovascular Disorders,* 10: 1 – 9.

Wagstaff A., (2002). Poverty and health sector inequalities. *Bulletin of the World Health Organization.*80 (2): 97 – 105.

Whitehead, M. (1992). The concepts and principles of equity in health. *Int J Health Serv,* 22: 429 – 445.

Whitehead, M., Dahlgren, G., Evans, T. (2001). Equity and Health Sector Reforms: Can Low-Income Countries Escape the Medical Poverty Trap? *Lancet,* 358: 833-836.

World Health Organization (WHO). (2011). WHO Medicines Strategy.[Online].Available: http://www.cptech.org/ip/health/who/wha54.11.pdf [Downloaded: 03/10/11 20:30PM].

World Health Organization (WHO). (2008a) *Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health.*Final Report of the Commission on Social Determinants of Health, WHO, Geneva.

World Health Organization (WHO).(2008b) *Global Burden of Disease. 2004 Update.*WHO, Geneva.

World Health Organization (WHO). (2010). Essential Medicines.[Online].Available: http://www.who.int/medicines/services/essmedicines_def/en/index.html [Downloaded: 03/06/10 22:30PM].

World Health Organization (WHO). (2011). Noncommunicable Diseases Country Profiles 2011.[Online]. Available: http://www.who.int/nmh/publications/ncd_profiles_report.pdf [Downloaded: 01/10/11 21:45PM].

World Health Organization (WHO). (2003). *Prevention of recurrent heart attacks and strokes in low-and middle income populations: evidence-based recommendations for policy makers and health professionals*. WHO, Geneva.

World Health Organization (WHO). (2005). *Preventing chronic disease: a vital investment: overview*. WHO, Geneva.

World Bank. (2005). *World Development Report 2006: Equity and Development.*Washington, DC: World Bank.

ANNEXES

Annex 1. INFORMATION SHEET FOR FACILITY MANAGERS

UNIVERSITY OF THE WESTERN CAPE
School of Public Health

Private Bag X17 ●**BELLVILLE**● 7535 ● South Africa
Tel: 021- 959 2809, Fax: 021- 959 2872

Dear facility manager

I am Christa Cepuch, a student at the SOPH, University of the Western Cape. As part of my Masters in Public Health, I am required to do a research project on a public health issue of relevance. I will be focusing on availability of medicines for communicable versus non-communicable diseases, and how this may be an indicator of poor access to medicines by elderly people. I am accountable to Prof Helen Schneider who is contactable c/o SOPH Fax: 021 959 2872 or by e-mail at hschneider@uwc.ac.za.

The research seeks to achieve three objectives:

In the public sector in Kenya:

1. To assess the availability of medicines for the following communicable diseases (CD): diarrhea, HIV, malaria, pneumonia
2. To assess the availability of medicines for the following non-communicable diseases (NCD) common in older populations: arthritis, diabetes, gout, glaucoma, heart disease, hypertension, stroke
3. To compare the availability of medicines for CD and NCD and draw conclusions on possible age-related inequities in access

Data collection will involve an assessment through observation of the availability of the targeted medicines on the day of the visit, and questions on the prices charged for each medicine. These observations will be done by trained data collectors who will record this information on specially designed forms. These observations are very similar to the routine assessments of medicines availability in Kenyan facilities that you may have participated in already.

Your facility was chosen through a random sampling procedure. The data from your facility will be combined with that of other facilities and your facility's name will not appear in the report and will not be singled out in any way.

There will also be no direct benefits to the facility if you do participate.

Given that the purpose of data collection is research rather than routine operations, you are requested to sign an informed consent form. You are free to withdraw at any stage and this will have no adverse consequences for you or your work. Your identity, as well as that of the information you provide, will remain anonymous.

Please feel free to contact myself, Christa Cepuch at email ccepuch@gmail.com or tel 0733 615 189 or my supervisor, Prof Helen Schneider, of the University of the Western Cape, South Africa via email hschneider@uwc.ac.za.

Annex 2. WRITTEN CONSENT FORM

Date:
Interviewer:
UWC Student no:
Tel: _____ Fax: _____
E-mail:
Institution:
Interviewee's pseudonym:
Place at which the interview was conducted: _____

Thank you for agreeing to allow me to visit your facility. What follows is an explanation of the purpose and process of this visit to which you are requested to sign consent.

I am Christa Cepuch, a student at the SOPH, University of the Western Cape. As part of my Masters in Public Health, I am required to do a research project on a public health issue of relevance. I will be focusing on availability of medicines for communicable vs non-communicable diseases and how this may be an indicator of poor access to medicines by elderly people. I am accountable to Prof Helen Schneider who is contactable c/o SOPH Fax: 021 959 2872 or by e-mail at hschneider@uwc.ac.za.

Data collection involves an assessment through observation of the availability of medicines in your facility on the day of the visit, and questions on the prices charged for each medicine. I will only ask you about the availability of a list of medicines in your facility, and their prices.

At all times, I will keep the source of the information confidential and refer to you and your facility by an anonymous facility code. I shall keep any other records of your participation locked away at all times, and destroy them after the data has been collected.

If there is anything that you would prefer not to discuss, you are free to say so.

I shall keep the contents of the above research confidential in the sense that the pseudonym noted above will be used in all documents which refer to the interview. The contents will be used for the purposes referred to above, but may be used for published or unpublished research at a later stage without further consent. Any change from this agreement will be renegotiated with you.

Signed by interviewer:

Signed by participant:
Date:
Place:

Annex 3. ENDORSEMENT LETTER FROM THE MOH

REPUBLIC OF KENYA

MINISTRY OF MEDICAL SERVICES

PHARMACY AND POISONS BOARD

Telegram: "MINHEALTH" Nairobi
Telephone: 020-2716905/6, 020-3562107
Cellphone: 0733-884411/0720 608811
Fax: 2713409
E-mail: info@pharmacyboardkenya.org

When replying please quote

PHARMACY AND POISONS BOARD HOUSE
LENANA ROAD
P. O. Box 27663-00506
NAIROBI

PPB/MISC/VOL.IV/011/143 **26th October 2011**

To Whom It May Concern

RE: DATA COLLECTION FOR MONITORING MEDICINE PRICES AND AVAILABILITY (MMePA)

In line with its Annual Operational Plan, the Ministry of Medical Services (MoMS) in collaboration with the World Health Organization (WHO) and Health Action International (HAI) Africa undertakes periodic monitoring of medicine prices and availability (MMePA). The MMePA follows methodology developed and validated by WHO and HAI. Its primary objective is to identify issues and gaps on availability and affordability of medicines, and to guide monitoring and evaluation of the revised Kenya National Pharmaceutical Policy.

The methodology requires the collection of price and availability data from a random sample of health facilities in both the public and private sectors.

The data collectors are pharmacists, pharmaceutical technologists, and other experienced data collectors. They have been trained on the methodology and the data collection is scheduled for Oct – Nov 2011, with continued data collection scheduled in Dec 2011, and throughout 2012.

The data will be entered and analyzed centrally. **Complete anonymity of facilities, individual pharmacies and medicine outlets is assured at all times. Please be assured these data collectors are not inspectors of any sort.**

I will be grateful for your facilitation of the data collection through the transparent provision of the information needed for these important efforts.

DR. F.M. SIYOI
For: REGISTRAR

Annex 4. DATA COLLECTION FORM

Kenya Monitoring of Medicines Prices and Availability (MMePA) Data Collection Form - 2012

Facility Name:	Address of facility :	*Urban vs Rural* health facility: *(tick)* ☐ Urban ☐ Rural	
Telephone:	Fax:	Email:	Type of health facility: *(tick)* ☐ Public ☐ Mission
If Public Facility, then which KEPH Level? I II III IV V VI (circle one)	Name and title of data collectors:		Date: (DD/MM/YYYY) / /

Medicine name, dosage form, strength	Lowest KEPH level	Available? ("Yes" or "N/A")	Product name (brand / trade name)	Manufacturer	Pack size found (or "treatment size")	Pack price (or "treatment price")	Unit price (4 digits)	Comments and observations
Acetazolamide tablet 250mg	4						/tab	
Albendazole tablet 400mg	1						/tab	
Allopurinol tablet 100mg	4						/tab	
Amoxicillin susp 125mg/5mL	2						/mL	
Amoxicillin cap / tab 250mg	2						/cap / tab	
Artemether / lumefantrine tab 20/120mg	2						/tab	
ASA (aspirin) tablet 300mg	1						/tab	
Atenolol tab 50mg	4						/tab	
AZT tablet 300mg	4						/tab	
AZT / 3TC combination tab 300 / 150mg	4						/tab	Note if found in combination or separate tablets (only if BOTH there; otherwise "N/A"):
Benzathine penicillin PFI 1.44g (2.4MU) / 5mL	2						/PFI 5mL	

Annex 4. DATA COLLECTION FORM

1

Kenya Monitoring of Medicines Prices and Availability (MMePA) Data Collection Form - 2012

Medicine name, dosage form, strength	Lowest KEPH level	Available? ("Yes" or "N/A")	Product name (brand / trade name)	Manufacturer	Pack size found (or "treatment size")	Pack price (or "treatment price")	Unit price (4 digits)	Comments and observations
Metformin tab 500mg	4						/tab	
Metronidazole tablet 200mg or 400mg	2						/tab	
Morphine injection 10mg/mL (1mL amp)	4						/mL	
Nevirpaine tablet 200mg	4						/tab	
Omeprazole tablet / cap 20mg	4						/tab	
Oral contraceptive pills (daily)	2						/pack of pills	
ORS sachet for 500mL	1						/sachet	
Oxytocin injection 10 IU/mL (1mL amp)	2						/mL	
Quinine dihydrochloride inj 300mg/mL (2mL amp)	2						/mL	
Phytomenadione (vitamin K1) (neonatal use) inj 2mg/0.2mL amp	2						/0.2mL amp	
Salbutamol inhaler 0.1mg (100mcg)/ dose	2						/dose	
Tetracycline eye ointment 1%	1						/tube	
Warfarin tablet 5mg	4						/tab	
Zinc sulfate dispersible tab 20mg	2						/tab	

Kenya Monitoring of Medicines Prices and Availability (MMePA) Data Collection Form - 2012

Medicine name, dosage form, strength	Lowest KEPH level	Available? ("Yes" or "N/A")	Product name (brand / trade name)	Manufacturer	Pack size found (or "treatment size")	Pack price (or "treatment price")	Unit price (4 digits)	Comments and observations
Benzhexol HCl tablet 5mg	4						/tab	(for Parkinson's Disease)
Carbamazepine tablet 200mg	4						/tab	
Ceftriaxone powder for inj'n 250mg or 1g	4						/250mg vial or /1g vial	Pls note which strength found:
Ciprofloxacin tab 250mg or 500mg	2						/tab	Note which strength found:
Cotrimoxazole suspension 8/40 mg/mL	2						/mL	
Cotrimoxazole tab 80/400mg	2						/tab	
Enalapril tablet 5mg	4						/tab	
Ferrous Sulfate / Folic Acid tabs 200mg / 5mg	2						/tab	Note if found as combination tablets or individual tablets please:
Furosemide tab 40mg	4						/tab	
Gentamicin injection 10mg/mL or 40mg/mL (2mL amp)	2						/amp 2mL	
Glibenclamide tab 5mg	4						/tab	
Hydrochlorothiazide tablet 25mg	4						/tab	
Ibuprofen tab / cap 200mg	1						/tab	
Insulin human 30/70 injection (10mL)	4						/vial 10mL	
Magnesium Sulphate injection 500mg/mL (50%) in 10mL amp	3						/10mL amp	
Medroxy-progesterone acetate depot injection 150mg/mL (1mL)	2						/1mL amp	[*Depo Provera*]