Abstract

Kenya’s HIV prevalence is estimated to be 5.6% (KAINS2012) with annual new infections around 71,000 individuals; the youth of ages 15-25 years contributing greatest to this figure with about 35,000. Nine of the 47 counties account for 65% of all new infections in Kenya. Hence, with the available HIV prevention strategies such as behavioral, bio-chemical and structural ones, a new approach which entails use of antiretroviral medicines. This has now been adopted by the National HIV Program and officially launched in early May of 2017.

PrEP regimen recommended for use in Kenya is a double fixed dose combination of Tenofovir/Emtricitabine (300mg/200mg), a pill taken daily by HIV negative individuals in minimization of chances of getting infected. For improved effectiveness at population level, it needs to be used together with other combination prevention methods such as condoms, treatment of sexually transmitted infections (STIs), male circumcision, and healthy lifestyles among others.

PrEP works if well adhered to among persons exposed to multiple sexual partners of unknown HIV status, persons who inject drugs, persons in a discordant relationship, frequent users of pre-exposure prophylaxis, those who experience frequent condom bursts, those frequently diagnosed STIs and anyone who perceives to be at substantial risk.

PrEP does not however offer protection against unwanted pregnancies, STIs, cure HIV and not a HIV vaccine. One can discontinue taking PrEP if serious side effects are experienced, one turns HIV positive, renal dysfunction, where one of the partners in discordant relationship has achieved viral suppression.

PrEP services are now being rolled out countrywide free of charge and initiation and follow up requires a competent healthcare provider.
THE ROLE OF THE NGO/HUMANITARIAN PHARMACISTS IN HARMONIZATION INITIATIVES

By
Dr. Dorothy Amony & Dr. Pearl Ngugi

Abstract
Very often humanitarian organizations supply drugs and medical devices in countries with weak or even nonexistent national drug regulatory authorities. In such situations the pharmacists in these organizations take on the responsibility for the quality of medicines entering their supply chain, in essence acting as a ‘pseudo regulator’.

At present, harmonization initiatives for the East African Community Medicines Regulatory Harmonization (EAC MRH) funded by African Medicines Regulatory Harmonization (AMRH) is at various stages of implementation in each of the partner states and each state has varying regulatory capacity. As a consequence providing much needed medical supplies in these countries comes with delays and often presents legal loopholes that can easily be exploited.

This presentation will seek to highlight the challenges faced by pharmacists in humanitarian organizations in ensuring the supply of quality medicines within their supply chain, the passive role played by the pharmacists in NGO/humanitarian organizations in regulation as well as benefits of regional harmonization to the regulators, industry, healthcare systems and patients.
EFFECTS OF PRINT MEDIA COVERAGE ON THE PERFORMANCE OF PHARMACEUTICAL INDUSTRY IN KENYA

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Background

The media is known to have an agenda-setting effect, and this was back then in history primarily for political news, however over time the transfer of media agenda to public agenda is also now applicable to business news. Therefore more companies are now engaging media to set their agenda by catching the public’s attention and using the media to enhance public comprehension and support for their goods and services. In the case of building corporate reputations, companies use the media to give coverage that builds their corporate reputation among the public (Carroll & McCombs, 2004).

Just like other industries, pharmaceutical companies are geared towards making profits even though they have a social responsibility to develop and produce medicines that have value to life. The majority of Pharmaceutical companies focus on more profitable segments in the global market so that they can continue to remain profitable. However, this strategy has increasingly made them unpopular with policy makers and the public who think otherwise. Therefore the industry has a daunting task to strike a balance between profitability, price controls, parallel imports, increasing research and development costs and counterfeits. Each of these has the potential to reduce the profitability of the Industry and change the Industry’s position in the global market (Cohen, Illingworth, & Schuklenk, 2006). The media are a major source of public information and perceptions about companies heavily relies on media relations. Media reporting plays a significant role in the pharmaceutical industry and, more so on the marketing of pharmaceutical products and services therefore it needs to be of mutual benefit to all stakeholders.

Objective

The overall objective of this study was to find out the effects of print media coverage on the performance of the pharmaceutical industry in Kenya with a focus on sales and corporate image. This study was done through the following specific research questions: Does the Pharmaceutical Industry in Kenya get adequate media coverage, what is the effect of media coverage on the sales of pharmaceutical products and what is the effect of media coverage on the corporate image of pharmaceutical companies in Kenya? Print media in this study focused on the two major daily newspapers that have the widest coverage in Kenya.
Methods
Research design used in this study was descriptive and explanatory studies. The independent variables were good and bad publicity by print media and the dependent variables were the subsequent effects on sales and corporate image of the Pharmaceutical industry. The population used in this research was the entire population of the licensed Pharmaceutical manufacturers in Kenya. These companies ideally represented the Pharmaceutical Industry in Kenya as most of them are also licensed as distributors and wholesalers for pharmaceutical products. This study applied primary data collection methods and the variables were analysed using descriptive statistics by using percentages and frequency distribution. The results were presented using bar charts and graphs. Data analysis was done by Statistical Package for Social Science (SPSS) software.

Results
Findings on whether the Pharmaceutical industry in Kenya got adequate print media coverage established that the pharmaceutical industry gets frequent media coverage although the content of the coverage is inadequate and biased.

The findings on effects of print media coverage on sales of pharmaceutical products established that both positive and negative media coverage/publicity had an effect on sales. Media coverage directly affected sales by influencing regulation and corporate image.

Findings on effects of print media coverage on the corporate image and regulation of the pharmaceutical industry established that regulation followed by corporate image affects the sales of the companies. Corporate image and regulation is affected by media/coverage and publicity. The findings also establish media coverage/ publicity reinforces regulation and prompts the regulator to take action whenever there is positive or negative media coverage.

Conclusion and Recommendations
This study concluded that the Pharmaceutical industry gets frequent print media coverage. However, the content of the print media coverage is inadequate, biased and inaccurate. Media coverage and publicity directly affect the sales of the pharmaceutical products. Regulation followed by corporate image mostly affects sales in pharmaceutical companies. Media coverage and publicity plays a significant role in building the corporate image of a company and also on how the industry relates with the regulator. Companies that get more publicity are more likely to have a better corporate image than companies that get less publicity.

Print media houses should consider having health/Pharma journalism and have trained journalists that can adequately report on health and pharma related issues. To correct the inadequacy in the content of media coverage, the study recommends that the industry should improve media relations. This will lead to an improvement in the content by ensuring that the media has available industry-specific reference points or the right sources of information whenever required.
The study recommends that the Industry association bodies such as Kenya Association of Pharmaceutical Industry (KAPI) and Federation of Kenya Pharmaceutical Manufacturers (FKPM) should be given the responsibility of engaging with media houses to ensure that the Pharmaceutical Industry is given fair print media coverage both in content and frequency.

Key words: Pharmaceutical Industry, Print Media, Corporate Image, Health Journalism, Publicity

IMPACT OF INCONTINENCE ON PEOPLE'S QUALITY OF LIFE IN KENYA

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Introduction;
Incontinence which is classified by WHO as a disease affects 5-7% of our population with prevalence in females being 3 times higher than in men. In Kenya we have an estimated population of over 1.4 million people aged 65 years and above. 82% of heavily incontinent people are in this group. Other factors making incontinence more common among younger people include pregnancy, menopause, lifestyle diseases like Diabetes, stroke among others.

The aim of this survey was to find out the impact incontinence has on these people and their care givers (doctors, nurses, pharmacist, care giving relatives) on their daily life.

Survey methods; Consumer surveys done by the ICS (International Continence Society) and TENA academy were reviewed. These surveys were done with the following group of people;
1-Independent people with incontinence.
2-Doctors and professional care givers.
3- Care givers and close relatives.
4- Pharmacists & employees working in outlets that dispense purpose made products for incontinence.
5- Hospitals and care institutions.

The groups were asked questions related to female incontinence, how they perceive it and the solutions they use. They were also questioned on incontinence, the impact it has on their daily lives, how they perceive it and the solutions they use.

Results and findings;
The survey found out that incontinence leads to mostly 2 problems;
1-hygienic & health related.
2-psychological.
The problem was found to have a huge psychological impact and very low level of awareness of the solutions available.
Conclusions and recommendations;
Health care workers especially doctors, pharmacist, and nurses need to be in the 1st line in identifying, giving information and offering solutions to incontinence sufferers. The general public should also be given relevant information as a way of killing the taboo surrounding incontinence sufferers. Care givers including those at home should have access to products that can be used for incontinence.

The aim of this presentation is to show the gap in information and the patients insights with this problem. With this information, the care giver will be empowered to seek and offer solutions for incontinence.

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QUANTIFICATION OF HIV COMMODITIES IN KENYA: CURRENT CHALLENGES AND PROPOSED SOLUTIONS

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Background:
Early and uninterrupted use of antiretroviral treatment increases lifespan and reduces risk of HIV transmission. Uninterrupted supply of HIV commodities is critical. Supply Chain challenges, including poor quantification (accurate estimation of quantities) jeopardise this objective.

Objective:
To find out the current process of quantification for HIV Commodities, the challenges arising and to proposed solutions for improvement based on best practice.

Research question:
What are the challenges and solutions to the current HIV commodity quantification that will help meet the existing treatment gap for HIV patients in Kenya?

Research methods:
Desk top review of Key assessment and policy documents related to supply chain for HIV/AIDS commodities in Kenya.
Use of semi structured questionnaires with key Informants to obtain the new information and verify existing information.

Data analysis:
The author conducted data extraction and analysis using pivot tables, with common theme questions on the Y axis and respondents on the X axis. Themes were audited by the author after initial entry. Quotes were chosen to represent themes and each interviewee was represented by a number.
**Findings/Results:**

Current challenges in the Quantification of HIV Commodities include inaccurate estimates, poor quality data, untimely submission of data from health facilities or Service Delivery Points (SDP’s), non-involvement of County government staff in Quantification; ill-equipped & inadequate County Health workforce.

**Conclusion:**

Implementation, adherence & monitoring of National Quantification Guidelines 2016. The capacity development of County Health staff especially pharmacists, to participate effectively in quantification. Development of policy and regulatory framework for harmonious working between Counties and NASCOP Quantification Committee. Incorporation of experts in NASCOP Quantification Committee to provide global market intelligence on issues that may affect HIV Commodities. Incorporation of pharmacists from the private sector and NGO’s into the quantification committee.

**Key words:** Kenya, Quantification, Forecasting, HIV Commodities.

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**APPLICATION OF IN VITRO – IN VIVO CORRELATION AS A PREDICTIVE TOOL FOR BIOEQUIVALENCE OF GENERIC PARACETAMOL IMMEDIATE RELEASE ORAL TABLETS**

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**Key words:** IVIVC, paracetamol, generic, bioavailability, in vitro, in vivo

An in vitro – in vivo correlation (IVIVC) model can predict the bioavailability of some drug substances, and militate against the high cost of BE studies, long generic product development lead times, and the exposure of human subjects to drug substances they do not need. In this study a total of three batches of generic paracetamol immediate release oral tablets, and one batch of the comparator product, were subjected to dissolution testing to generate a dissolution profile from which the blood drug concentration – time profile and specifically the bioavailability parameters AUC and Cmax were computed using an IVIVC tool. Statistical analysis demonstrated sameness between the generic product and the reference product. The IVIVC method can thus be a surrogate for in vivo human studies, providing a scientific justification for biowavier for generic products of candidate drug substances.
ABSTRACT

Background: Community pharmacies provide health and medicines services that are valued by all Kenyans. Community pharmacy is essential to the professional provision of medicines to the public in a timely, convenient, affordable and equitable manner. Local community pharmacies also play an essential role in public and preventative health. Subsequently, the community continues to benefit from the increasing number and quality of services and care delivered by community pharmacy. Despite these achievements, challenges exist in regulation of community pharmacy practice in Kenya.

Objectives: To determine the current state of community pharmacy practice in Nakuru, Kericho, Bomet, Narok, Laikipia and Samburu counties and identify challenges, opportunities for collaboration and possible solutions in its Regulation.

Methods: This was a retrospective study among 343 community pharmacy outlets (Wholesale and Retail) inspected between March and December, 2015. The data was extracted from relevant online inspection reports and 35 exit questionnaires from stakeholders. Analysis was carried out to determine the perceptions and challenges.

Results: Regulation of community pharmacy has challenges as identified during the study. A total of 41% respondents indicated unlicensed practitioners/ premises to be the greatest threat. Further, 8% respondents reported corruption among enforcers as a challenge to regulation. Of the respondents surveyed, 10% identified weak legislation as a challenge, 13% indicated inability to identify registration status of products as a challenge, while 3% identified emerging fields (herbals and Cosmetics) as possible threats/ challenges. Of the respondents sampled, 25% felt that current regulation strategies were on track. In all these findings however, there was a lack of insight on the professional’s role in regulating community pharmacy practice.

Conclusions: Successful regulation of community pharmacy requires a double edged approach; self-regulation and Enforcement, where the professional has a core role to play. This role has greatly been neglected, and the professionals have been ‘leaking taps’ in their practice. It is time the pharmacist took his rightful position and responsibility to safeguard community pharmacy practice.

Key Words: Self-regulation, Responsibility
Background: HIV-infected patients are at an increased risk of developing venous thromboembolism (VTE), and minimal data are available to describe the need for extended treatment.

Objective: To evaluate the frequency of and determine predictive risk factors for extended anticoagulation of VTE in HIV-infected patients in rural, western Kenya.

Methods: A retrospective chart review was conducted at the Anticoagulation Monitoring Service affiliated with Moi Teaching and Referral Hospital and the Academic Model Providing Access to Healthcare. Data were collected on patients who were HIV-infected and receiving anticoagulation for lower-limb deep vein thrombosis. The need for extended anticoagulation, defined as receiving ≥ 7 months of warfarin therapy, was established based on patient symptoms or Doppler ultrasound–confirmed diagnosis. Evaluation of the secondary outcomes utilized a univariate analysis to identify risk factors associated with extended anticoagulation.

Results: A total of 71 patients were included in the analysis; 27 patients (38%) required extended anticoagulation. The univariate analysis showed a statistically significant association between the need for extended anticoagulation and achieving a therapeutic international normalized ratio within 21 days in both the unadjusted and adjusted analysis. Patients with a history of opportunistic infections required an extended duration of anticoagulation in the adjusted analysis: odds ratio = 3.42; 95% CI = 1.04-11.32; P = 0.04.

Conclusions: This study shows that there may be a need for increased duration of anticoagulation in HIV-infected patients, with a need to address the issue of long-term management. Guideline recommendations are needed to address the complexity of treatment issues in this population.

Keywords
HIV, venous thromboembolism, warfarin, Sub-Saharan Africa, extended anticoagulation
IMPLEMENTATION OF A POST-GRADUATE DIPLOMA PROGRAMME IN CLINICAL PHARMACY AT THE MOI TEACHING AND REFERRAL HOSPITAL, ELDORET

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ABSTRACT

Background: Data from high-income countries shows that clinical pharmacists are able to prevent medication errors, decrease adverse drug reactions and shorten hospital length of stay. By providing experiential clinical training to pharmacists in Kenya, it is possible to transition pharmacy practice in this setting from a product-focused to a patient-focused service model to achieve similar outcomes. In 2016, the Moi Teaching and Referral Hospital (MTRH) Training School in partnership with Purdue University College of Pharmacy (PUCOP) and the Department of Pharmacology, Moi University School of Medicine (MUSOM) set up a one-year Post-Graduate Diploma (PGD) programme in Clinical Pharmacy that provides experiential clinical training for pharmacists with the aim of enhancing pharmacists’ skills to provide patient-centred care.

Objective: The objective is to describe the implementation and early results of the PGD.

Methods: Prior to 2016, PUCOP had created a Global Health Pharmacy Residency Program (GH-PReP) which was a bilateral exchange program including both Kenyan and North American pharmacists. With the experience of training clinical pharmacy through the GH-PReP, hospital and university leadership gathered key stakeholders from MTRH, MUSOM and PUCOP to come together to develop a curriculum to establish the PGD. The program focused on the development of clinical, management, research and teaching skills. To make it suitable for the local context and to get accreditation from the regulatory body, we applied for the residency to be approved as a PGD programme. The PGD is an experiential clinical pharmacy program with an emphasis on learning through direct patient care together with problem-based and didactic teaching.

Results: The PGD curriculum was approved by the Pharmacy and Poisons Board in 2015 and the first class of 13 students was admitted in January 2016. Four students have been admitted in 2017. Students rotate in each of the following areas: adult internal medicine, paediatrics, surgery, reproductive health, cardiology, critical care, anticoagulation monitoring, HIV, oncology, pharmacovigilance and clinical pharmacokinetics. A research project with a final write up is also
carried out during the year. Key facilitators of implementation success included: guidance from faculty at Moi and Purdue Universities, prior experience with the GH-PReP and early buy-in from MTRH leadership. Implementation challenges included: lack of familiarity with documentation standards for training programs at MTRH, the need to develop new clinical pharmacy services in areas of the hospital where they previously did not exist and the need for innovative publicity strategies targeted towards clinically inclined pharmacists.

**Conclusion:** The PGD programme at MTRH focuses on development of clinical skills in a variety of areas through the use of experiential learning. The enrolment of 17 students thus far shows an interest in gaining this experience. The successes of establishing this program can be attributed to the collaborative nature of the programme during curriculum development and implementation.

**Key Words:** Clinical pharmacy, experiential learning, curriculum development, bilateral collaboration
DRUG DISCOVERY FROM PLANT SOURCES: A REVERSE PHARMACOLOGY APPROACH

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Abstracts
The pharmaceutical industry is fronting serious challenges as the drug discovery process is becoming extremely expensive and critically inefficient. The growing resistance to existing remedies is adding to this inadequacy. New chemical entities, even with increased scientific investigations has failed to advance the success rate in new drug discovery. Strategic options based on natural product discovery, ethnopharmacology and traditional medicines are re-emerging to offer good base as attractive discovery engine. Approaches based on reverse pharmacology may offer efficient development platform for herbal formulation.

This traditional knowledge inspired reverse pharmacology relates to reversing the routine “laboratory to clinic” progress of discovery pipeline to “clinic to laboratory”. Reverse pharmacology is the science of integrating documented clinical experiences and experimental observations into leads by transdisciplinary exploratory studies and further developing these into drug candidates or formulations through robust preclinical and clinical research. In this process “safety” remains the most important starting point and efficacy is a matter of validation. The process of drug discovery using this reverse pharmacology approach will be discussed.

FUNGI ASSOCIATED WITH AFLATOXIN AND FUMONISIN CONTAMINATION IN MEDICINAL HERBAL PRODUCTS ON THE KENYAN MARKET

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The utilization of herbal products has become a major concern due to the possibility of contamination by toxigenic fungi that are mycotoxin producers such as Aspergillus and Penicillium species. The toxic effects of the mycotoxins include immunosuppressive, mutagenic, teratogenic, and carcinogenic activity. Research was carried out to determine the presence of aflatoxins and fumonisins contaminants in herbal medicinal products collected from Eldoret and Mombasa town, Kenya.

The study employed both exploratory and laboratory experimental design. The herbal products were purchased from the market and transported to Kenya Medical Research Institute laboratories for processing and analysis. Fungal contaminants were determined according to Pharmacopoeia and World Health Organization standards. Fumonisins and aflatoxins were quantified using an ELISA based technique.

The herbal products were in the form of tablets (6), capsules (1), liquids (26), oils (5) and powders (62). The predominant mycoflora obtained were distributed into 14 genera; Aspergillus, Penicillium, Saccharomyces, Rhizopus, Rhodotorula, Cryptococcus, Basidiobolus, Mucor, Malbranchea, Absidia, Trichophyton, Scedosporium, Fusarium and Candida. The genus Aspergillus was the most dominant followed by Penicillium. Fungal cfu’s ranged between 0 cfu/sfu/g to >1000 cfu/sfu/g. Aflatoxin levels ranged from <LOD (below limit of detection) to 24 ppb while fumonisin levels ranged from <LOD to >20 ppb.

Powdered herbal products were highly contaminated from the two sites with Eldoret being 75% and Mombasa 42% as compared to the tablets, liquids, capsules and oils analysed. Analysis of variance showed that the rate of fungal contaminants for Eldoret and Mombasa samples had no significant difference (p=0.000). Only 31% of samples met the standards for microbial limits as specified in Pharmacopoeia while majority (69%) did not.

It is recommended that a policy be established to enable regulation of herbal products in the Kenya market at the production and distribution levels.

**Key words:** Fungi, mycotoxins, quality, herbal products, contaminations, detection limits
ANTI-BACTERIAL EFFICACY AND ORGANOLEPTIC PROPERTIES OF HAND RUBS IN THE KENYAN MARKET

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Abstract

Background: Hand hygiene is known to be effective in preventing hospital and community-acquired infections. The increasing number of hand sanitizer brands in Kenyan hospitals and consumer outlets is raising concern of their efficacy and organoleptic properties.

Objective: To evaluate the anti-bacterial efficacy and organoleptic properties of hand sanitizers in Kenya.

Methods: This was an experimental, laboratory-based study of 14 different brands of hand sanitizers (coded HS1-14) available in various retail outlets and hospitals in Kenya. Efficacy was evaluated using standard non-pathogenic Escherichia coli (ATCC 25922), Staphylococcus aureus (ATCC 25923) and Pseudomonas aeruginosa (ATCC 27853) as per the European Standard (EN). The logarithmic reduction factors (RF) were assessed at baseline and after treatment, and log reduction then calculated. Thirty-five and 25 healthy volunteers participated in the efficacy and organoleptic studies respectively.

Results: Four (28.6%) hand sanitizers (HS12, HS9, HS13 and HS14) showed 100% bacterial reduction on all the three bacteria strains. Seven (50%) hand sanitizers had efficacies of <50% against all the three bacteria strains used. In terms of organoleptic properties, gel-based formulations were rated far higher than the liquid formulations with gel-based brands: HS11 and HS12 rated as 'very good' while HS3 and HS8 were rated as 'very poor'.

Conclusion: Fifty percent (50%) of hand sanitizers in the Kenyan market have efficacy that falls below the World Health Organization (WHO) EN and Health Canadian Standards. Of the 14 hand sanitizers found in the Kenyan market, only four showed efficacies that were comparable to the WHO-formulation.

Key words: Hand sanitizer, efficacies, Organoleptic, Log reduction
SHOULD COMMUNITY HEALTH WORKERS PROVIDE EARLY MANAGEMENT OF SEVERE MALARIA IN VERY REMOTE AREAS WITH HIGH MALARIA ENDEMICITY?

Dr. Vivian Rakuomi

Introduction
Though it is recognized that CHWs play a key role in the management of malaria in rural areas where access to health care is limited, they are restricted to management of uncomplicated malaria with oral artemether-lumefantrine. Yet, they may be required to handle cases of severe malaria. Rectal artesunate is a potential tool that can be used by CHWs to provide life saving pre-referral treatment to save lives. In this study, we modeled the costs and benefits of providing rectal artesunate to CHWs as a pre-referral treatment option.

Methods
Given that there is no Kenyan data on the effectiveness of rectal artesunate, we used a decision analytic model in which we compared the costs and effectiveness of pre-referral treatment provided by the following: Community health workers, a low level health facility, and direct access to treatment in a tertiary health facility.

The study was based on a theoretical cohort of children aged less than 5 years residing in remote western parts of Kenya that have high malaria endemicity. The model parameters on costs, case fatality rates and patient demographics were obtained from studies conducted in western Kenya. Data on the costs of commodities was obtained using an in-depth interview with commodity managers in healthcare programs. One-way and probabilistic sensitivity analyses were conducted to determine how model assumptions affected the Incremental cost effectiveness ratio (ICER). Data was analyzed using base-R software version 3.2.2.

Results
The least costly treatment option was early pre-referral treatment provided by a CHW which cost $193 per disability adjusted life year lost averted (DALYs averted). Pre-referral treatment provided at a low level health care facility was slightly more costly and the cost was about 1.1 times that of the service provided by a CHW. The most costly treatment was seeking care directly from a tertiary health care facility without pre-referral treatment which costs twice that of a CHW. Case fatality rates and cost of treatment at tertiary health facility, and referral compliance were the key determinants of cost effectiveness for all the interventions.

Conclusion
Training CHWs to provide early pre-referral treatment using rectal artesunate has the potential to save lives and this policy option needs to be promoted.
Abstract

Background: Chronic Heart Failure is a major health problem with a prevalence of between 1 and 12% in USA and Europe, and approximately 5.7% in Sub-Saharan Africa, and has socio-economic relevance owing to its high prevalence, mortality and impact on young economically active individuals. In 1999 chronic heart failure constituted 3.3% of all medical admissions at Kenyatta National Hospital.

Objective: The purpose of the current study was to determine factors that affect adherence to treatment among patients with Chronic Heart Failure at Kenyatta National Hospital and assess any association between any such factors.

Methodology: This was a descriptive cross-sectional study involving patients >18 years diagnosed with Chronic Heart Failure at Kenyatta National Hospital. Eighty-three eligible and consenting study participants were recruited into the study using a convenient sampling technique. Data were collected by means of an interviewer administered questionnaire adapted from the Revised HF Adherence Questionnaire.

Results: Data from 83 patients was analyzed majority (n=51, 61.4%) of whom were women. The age of the patients ranged from 18 to 80 years with the majority (n= 37, 44.6%), between 21-40 years. Majority (n=58, 68.9%) of the patients considered appointment keeping, compliance to medication (n= 64, 77.1%), dietary restriction (n=59, 72%), regular exercise (n=49 59.0%), smoking cessation (n=59, 71%), and alcohol cessation (n=58, 69.9%) as very important. Fifty three (63.9%) respondents had not failed to take their medicines at any time. Majority (n=72, 86.8%) of the study participants were aware of the disease condition they were suffering from while valvular heart disease was the commonest comorbidity (n= 17 27.9%). The study revealed an association between sex and some adverse drug reactions using Pearson χ² test through bivariate analysis. Sleep disturbances and nausea occurred more in males than females while headache and drowsiness were more prevalent in females and in both cases the relationships were statistically significant (p< 0.05).

Conclusions: Adherence to medicines among patients with Chronic Heart Failure is reasonably high at Kenyatta National Hospital despite patients’ knowledge level about the condition being generally low. Valvular heart disease was the most common comorbidity while hyponatremia was the most prevalent electrolyte disturbance, and tachycardia, vomiting and rash the most common adverse drug effects.
ADDRESSING GAPS IN HIV CARE THROUGH A PHARMACIST-MANAGED HIV-PEER EDUCATOR PROGRAM IN WESTERN KENYA

Sub Theme: Work sharing and Collaboration in Pharmacy Practice

Dr. Mercy Maina

Background: Hospitalized HIV+ patients in sub-Saharan Africa often present with advanced stage HIV and life-threatening opportunistic infections, due to late HIV diagnosis, low rates of engagement in HIV care and poor antiretroviral therapy (ART) adherence [1]. Due to the high level of immunosuppression, the HIV+ hospitalized patients have been associated with high levels of in-hospital (44%) and 1 year (52%) mortality [2, 3].

Setting: MTRH is the second largest referral hospital in Kenya. It has a 800 bed capacity and an average of 600 patients admitted to the internal medicine wards each month[4]. The estimated prevalence of HIV within the medical wards is 10-20%[5].

Methods: At MTRH, two patients diagnosed as HIV positive, adherent on ART and virally suppressed were hired and trained as peer navigators. The HIV+ peer navigators have provided the following services to hospitalized patients: assistance with engaging with outpatient care, medication and adherence counseling, delivery of ART refills, and post-discharge follow-up.

Results: Peer navigators are part of the multidisciplinary health care team involved in providing HIV care within the in-patient medical wards at MTRH. Peer navigators have worked with over 1200 HIV+ in-patients. More than 90% of eligible patients on the inpatient wards were provided with counseling. For patients with known HIV infection, the peers delivered ART to over 240 hospitalized patients.

Conclusion: Task shifting certain HIV care services from medical personnel to trained peers is a feasible strategy in expanding access to antiretroviral therapy in resource limited settings. Within health care systems with parallel infrastructures for the provision of HIV care and other medical conditions, peer navigators form a cost-effect approach to link the two separate systems.
A SURVEY ON APPLICATION OF RADIOPHARMACEUTICALS IN AFRICA

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Introduction
The FDA defines radiopharmaceutical as any drug ‘which exhibits spontaneous disintegration of unstable nuclei with the emission of nuclear particles or photons and includes any nonradioactive reagent kit or nuclide generator which is intended to be used in the preparation of any such substance but does not include drugs such as carbon-containing compounds or potassium-containing salts which contain trace quantities of naturally occurring radionuclides’. Diagnostic radiopharmaceuticals are gamma emitters. In oncology, tumor seeking radiopharmaceuticals preferentially accumulate at the target tumor site thereby providing functional images with a gamma camera. Therapeutic radiopharmaceuticals emit energetic particles such as beta and alpha particles. They accumulate at tumor sites and by emitting energetic particles at or near tumor cells; they kill them by a combination of direct, crossfire and bystander effects.

Methods and materials
A survey of radiopharmaceutical applications in various countries was done via email to selected healthcare workers in the selected countries. The persons were chosen from a radiopharmacy training organized by the IAEA. The responses that were received were analysed collated and analysed using MS excel.

References
Results
The data was collected from various Africa countries. South Africa, Egypt and Morocco are the only countries with PET applications. The other countries only have SPECT applications. Sierra Leone does not have any nuclear medicine applications. All the countries have 131I for therapy. The most common SPECT applications are bone scan, renal scan and thyroid scans. These are done in all countries offering nuclear medicine service. Parathyroid scans offered in Tunisia, Nigeria, Zambia and Ghana. Tunisia and Nigeria offer hepatobiliary and lung perfusion scans. Tunisia does brain imaging and Nigeria does testicular scans.
South Africa, Egypt and morocco offer the whole range of SPECT scans and also have the capacity to blood cell labeling. They also offer the PET scans including fluorodexyglucose for oncology and gallium for neuroendocrine cancers.

Discussion and Conclusion
In the western countries, research and practice in nuclear medicine is very advanced and has very many applications. In the developing countries, very little investment has been made in nuclear medicine and radiopharmacy despite the many advantages it has over other diagnostic imaging techniques. In Africa, only South Africa, Egypt and Tunisia have made many strides in radiopharmaceutical applications. Other countries have not made such investments leading to many patients travelling to these other countries to seek these services. It is important even as Kenya continues to develop to invest in nuclear medicine facilities so as to improve the healthcare capabilities of our hospitals and also to stem the tide of patients seeing these services in other countries.

**ASSESSMENT OF HORMONAL CONTRACEPTIVE USE AMONG WOMEN AT KENYATTA NATIONAL HOSPITAL**

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**Background:** Contraception is the intentional use of temporary, long-term or permanent methods to prevent pregnancy. The consistent and correct use of hormonal contraceptives ensures that unintended pregnancies and pregnancy-related health risks are prevented.

**Objectives:** To determine the prevalence, types and assess level of knowledge on the correct use of hormonal contraceptives among women of reproductive age at Kenyatta National Hospital.
Methodology: A cross-sectional study was carried out between 1st May 2014 and 30th June 2014 at Kenyatta National Hospital where 400 women in their reproductive age were sampled via simple random sampling. Female staff, students and patients between 18 and 49 years who consented to the study were included in the study. Data was collected using an interviewer administered questionnaire and analyzed using SPSS version 20 into descriptive and inferential statistics.

Results: The prevalence of contraceptive use was 42.8%. Contraceptive use was associated with number of children [OR 1.7 (1.3-2.1)] \( p < 0.001 \). Hormonal contraceptives were being used by 56.1% of contraceptive users. Injectable contraceptives were the most popular followed by implants and pills. The choice of contraceptive methods was associated with age [OR 2.003 (1.330-3.017)] \( p = 0.001 \) and level of education [OR 1.697 (1.135-2.539)] \( p = 0.010 \). The level of knowledge on the correct use of hormonal contraceptive use was limited and was associated with the level of education [OR 1.389 (1.144-2.051)] \( p = 0.000 \).

Conclusion: Contraceptive use is low compared to the millennium development goal 5 target of 70%. Injectable contraceptives are the most preferred hormonal contraceptives due to their long duration of action and discretion during use. The level of knowledge on the correct use of hormonal contraceptives is low reducing the effectiveness due to inconsistent and incorrect use.
Though the Pharmacy and Poisons Board formally launched Pharmacovigilance activities in Kenya in 2009, there are many gaps to be filled. In 2016, European and Developing Countries Clinical Trials Partnership funded a collaborative partnership composed of the School of Pharmacy, University of Nairobi, the Pharmacy and Poisons Board and Netherlands Pharmacovigilance Center (Lareb) aimed at meeting some of the gaps.

This partnership seeks to: upscale public participation in pharmacovigilance reporting and promote the oversight of drug regulatory agencies and research and ethics committees to provide oversight over clinical trials. The presentation aims at describing some of the key gaps in pharmacovigilance in Kenya, scope of the partnership and the planned activities. The partnership leverages on the strengths and experiences of each of the partner institutions and how this will contribute to the practice of pharmacovigilance in Kenya.

Key words
Kenya, Pharmacovigilance, public, clinical trials, EDCTP
ABSTRACT

Background: Any disease process depends on its natural history, modified by possible interventions with possibilities of clinical recovery, progression to another disease state or death. These can be captured in Health-Related Quality of Life (HRQoL) studies of the disease. We studied the HRQoL of adult Pneumonia, a common cause of hospitalization in Kenya, causing major health, social and economic impacts, with about 11% of patients with acute disease dying. Problem Statement: Most of the research and surveillance on pneumonia in Kenya had been targeted at the paediatric age groups. Despite the prevalence and the potential fatality of adult pneumonia, information on the HRQoL due to the disease was lacking.

Main Objective: To assess the Health-Related Quality of Life of adults treated for pneumonia in Nairobi in the years 2013-2014. Methodology: The study was conducted in Nairobi, a densely populated city burdened by chronic urban poverty, disease and declining livelihood opportunities. Study design: The over-arching design of the study was descriptive cross-sectional survey with patients surveyed as a census.

Data collection: Data was collected using open data kit (ODK) software. The Standard RAND 36-Item Health Survey (Version 1.0) questionnaire was used to assess the HRQoL. Data analysis: Data obtained was programmed and coded. It was then entered, decoded and analyzed in STATA 10. Descriptive statistics, inferential statistics and Correlation coefficients were generated. Results and output: The 18-29 year age group had an overall HRQoL median score of 32 (IQR, 27-40). These rose with age to cap at median score of 62.5 (IQR, 50-75) for the 65+ years age group. This is at odds with the findings elsewhere. Overall, women had higher HRQoL scores than men.

Conclusion: This assessment of the HRQoL should help in the appreciation of the impacts of pneumonia, hence a basis for an effective mix of health and social program interventions that can reduce the consequences of the disease and enhance the benefits of good health especially in poor neighborhoods.
AN INVESTIGATION OF THE LEVEL OF KNOWLEDGE AND CHALLENGES OF PHARMACISTS WORKING IN COMMUNITY PRACTICE ON ASTHMA MANAGEMENT.

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ABSTRACT
Community Pharmacy remains one of the first point of call for patients seeking help for variety of health issues, indeed there could be more than 1 million visits to pharmacies daily in Kenya. Asthma is among a few medical conditions that many patients presents at a community pharmacy.

There is an increase in the number of people affected by Asthma in Kenya by 7 to 10 percent according to a study done in Africa in 2015. Around 4 million Kenyans were found to be asthmatic and around 600,000 of them live in Nairobi.

A guide to healthcare professionals on the care of individual patients with asthma in Kenya was therefore developed named the Kenya national asthma guidelines. The impact of these guidelines and awareness by the pharmacists and pharmaceutical technologists has never been assessed. In addition, the level of competency and knowledge of pharmacists and pharmaceutical technologists in asthma management has never been studied.

Aim
The aim of this study was to investigate knowledge of pharmacist and enrolled pharmaceutical technologists in asthma management at a community setting and their awareness of the National guidelines.

Methods.
This was a cross descriptive survey. Data was collected by use of structured questionnaires and interviews.

The data was analyzed using SPSS analytical software and presented in graphs and pie charts. Clearance to do the study was done by Kenyatta University Ethical review committee and permission was given by the Department of pharmacy and complementary/ Alternative medicine of Kenyatta University.

Results
The study though done in Kahawa Wendani area, Ruiru and Kilomita found out that majority of the pharmacies were operated by pharmaceutical technologists (34.8%), followed by pharmacists (30.4%). 21.7% were just employees while the rest failed to indicate their positions.
A majority (82.6%) had been in operation for up to five years since registration. Of these, 82.6% had been licensed by the Pharmacy and Poisons Board. The operation hours are mostly over 50 hours a week (26.1%).

95% of the pharmacies get patients with Asthma. All admitted to be trained in Asthma management and 95% of them are aware of guidelines of asthma management. Of these 75% were aware of the National guidelines in Kenya and about 80% have referred a patient for further management.

Only 9.1% were found to use spirometry in diagnosis. A large percentage however read on current asthma treatments between 6 months to 1 year and of them most (40.9%) read on the internet followed by Textbooks (31.8%).

The drugs mostly dispensed were Salbutamol inhaler followed by Prednisolone. Others were like Franol, Aerocort, and Budenoside.

Discussion
The data collected shows that many pharmacists and pharmaceutical technologists have been trained in asthma management. A recommendable number are aware of the guidelines both internationally and locally.

The major barriers to delivery of asthma services were like lack of time of by the pharmacists, and trying not to overstep the doctors role by the pharmacists and pharmaceutical technologists.

Lack of time by both the pharmacists and patients has also contributed a major challenge.

Conclusion
The number of patients with asthma is high in the areas of study. Many patients should be educated on asthma self-management as this contributes a major barrier to asthma management.

Skill based training was recommended by many pharmacists and the use of spirometry should be embraced by pharmacists and pharmaceutical technologists.

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ANTI-OXIDANT ACTIVITY AND PHYTOCHEMICAL SCREENING OF AQUEOUS, METHANOLIC AND ETHYL ACETATE EXTRACTS FROM THREE KENYAN Ruellia Species Viz. Ruellia Prostrata, Ruellia Lineari-bracteolata And Ruellia Bignoniiiflora

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ABSTRACT

The objective of this study was to determine the qualitative phytochemical constituents and anti-oxidant activity of crude extracts from whole plant parts of Kenyan Ruellia species viz. Ruellia prostrata (RPM), Ruellia bignoniiiflora (RBK) and Ruellia lineari-bracteolata (RLB).

Ruellia prostrata (Acanthaceae family) species are perennial creepers with widespread medicinal uses including analgesic and anti-inflammatory activity. Whole parts of the plants were collected, air-dried under shade and organic extraction was done by cold maceration using ethyl acetate and methanol. Aqueous extraction was done by boiling. Anti-oxidant activity was performed based on the ability of the aqueous, methanol and ethyl acetate extracts to scavenge the free radicals produced by 2,2-Diphenyl-1- picryl hydrazyl (DPPH). Ascorbic acid was used as a reference standard. The tests were evaluated at eight concentrations (3.9, 7.8, 15.6, 31.3, 62.5, 125, 250 and 500 ug/ml).

The antioxidant activity of both plant extracts and ascorbic acid increased with increase in extract concentration. Methanolic extract exhibited a higher antioxidant activity with IC50 values in (ug/ml) of 2.9(RLB), 20.6(RPM) and 24.4(RBK). Aqueous extracts revealed IC50 values of 7.2 (RLB), 51.9(RPM) and 66.4(RBK). The ethyl acetate extract showed a lower activity with IC50 values of 22.3(RPM), 29.3(RLB) and 237.17(RBK). Ascorbic acid standard exhibited a comparable activity with IC50 value of 2.1 µg/ml.
The phytochemical screening tests were based on visual observation of colour change and precipitate formation. Phytochemical analysis revealed the presence of terpenoids, saponins, flavonoids, tannins and cardiac glycosides. Flavonoids and tannins are a major group of compounds that act as primary antioxidants. The presence of these compounds could attribute to potent antioxidant activity. The presence of phytoconstituents from plants makes it useful for formulation of analgesic and anti-arthritic formulation for human health care.

**Key Words:** *Ruellia Prostrata, Ruellia Bignoniiflora, Ruellia Lineari-bracteolata, Antioxidant, Dpph, Flavonoids, Tannins, Saponins.*