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Nonparametric Regression and Spatial Variation of Malaria Incidences: Linking Disease Risk to Climatic Variability in Malawi

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Introduction
Malaria is a major public health problem in terms of both morbidity and mortality. Due to severe health economic costs of malaria, there is a need for methods that will help to understand the geographical variation of the disease risk and its association with climate. This paper analyses the variation of hospital diagnosed malaria incidences in relation to Rainfall, Temperatures and Humidity that are measured at district level from 2002 to 2010 in Malawi.

Methods
Using district hospital and health facilities malaria case records and climatic factors, a non-parametric regression model based on generalized additive mixed models (GAMM) was developed. Modeling and inference is within full Bayesian framework through Markov Chain Monte Carlo (MCMC) simulation techniques.

Results
There is a decreasing trend of malaria incidences in the study period and an evidence of spatial variation in the risk of having malaria which is higher in Warm Wet Season (November to March) with RR = 1.07, 95% CI = [1.02-1.07] mainly in districts along lakes and rivers such as Rumphi, NkhataBay, Nkhotakota, Salima, Ntcheu, Balaka, Mwanza, Chikhwawa and Nsanje. Marginal changes in environmental factors greatly affect the risk of increased malaria incidences. Malaria incidences in a given month are strongly positively associated with minimum temperatures of around 20 degree Celsius the previous month.

Conclusions and Recommendations
Modeling the impact of known factors alone is not sufficient to produce a satisfactory fit to the observations, geographical variation needs to be considered to improve the fit and account for heterogeneity. Ignoring a nonlinear relationship may result in misleading estimates of residual spatial surface which would have been overlooked by a parametric linear model. Association between weather and malaria should be considered in the development and implementation of malaria interventions.

History of Malaria Testing Among Out-Patient Adults Receiving Antimalarial Drugs at Queen Elizabeth Central Hospital (QECH), Southern Malawi, 2012

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Introduction
Malaria and febrile illnesses are a leading cause of morbidity among adults in Malawi. The national treatment guidelines are that adults should be given anti-malarial drugs when there is evidence of a positive malaria test result. A cross-sectional study was done with the following objectives: (i) to estimate the proportion of out-patient adult population who had received antimalarial drugs at QECH and had undergone malarial testing; (ii) to estimate the proportion of out-patient adult population with negative malaria test results who received anti-malarial drugs at QECH; (iii) to identify barriers and enablers to access of malaria testing.

Methods
The study was conducted in the out-patient and laboratory departments of QECH, a tertiary level of care hospital in Blantyre, Malawi with peak malaria transmission between November and April. A cross-sectional survey was conducted in 2012 by collecting clinical information on malaria testing from the health passport book of patients who had received antimalarial drugs at QECH. Data were obtained to enable assessment if the patients undergone testing. They were further assessed whether the outcome of the testing was positive or not. A self-administered questionnaire was presented to laboratory workers and prescribers to provide information on enablers and barriers to access to malaria testing.

Results
Of the 315 patients who received antimalarial drugs enrolled, 299 patients (94.9%, 95% CI, 91.7-97.0) had malaria testing while 16 (5.08 %, 95% CI, 3.03-8.28) did not have any diagnostic procedure done.
Seven of 299 patients (2.3%, 95% CI, and 0.95-4.76) tested negative upon diagnosis. Enablers to access of malaria testing after thematic analysis were; availability of reagents and staff as well as knowledge of the National Malaria Policy whilst barriers included lack of testing supplies, inadequate staff, ignorance about the National Malaria Policy and work overload.

Conclusion and recommendations
In general, many patients undergo malaria testing before treatment at QECH. Barriers to access of malaria testing should be addressed by ensuring availability of testing supplies, training of health professionals and supervision with regard to the current malaria treatment guidelines. Thorough reassessment of patients with negative malaria
A Quantitative Measure of Brain Swelling On MRI Scans Predicts Outcome in Pediatric Cerebral Malaria


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Introduction

Increased brain volume, as assessed on MRI scans, is the strongest predictor of death in children with retinopathy-positive cerebral malaria. A simple quantitative measure of brain swelling would be useful in clinical practice. We developed a measure, the SamKam ratio, which increases with progressive brain swelling as intracranial CSF is expelled into the spinal thecal sac. We evaluated the relationships between the SamKam ratio and brain swelling and between the SamKam ratio and outcome in pediatric cerebral malaria.

Methods

Children with retinopathy positive cerebral malaria underwent brain MRI scanning on admission, and then daily while in coma. The SamKam ratio (height of the right parietal lobe/sum of the cerebrospinal fluid anterior and posterior to the pons) was determined by measurements made on midsagittal and coronal scans.

Results

Three independent observers calculated the SamKam ratio on a set of 20 MRI scans, and the Pearson’s correlation coefficient among any two observers was >0.86, showing a high inter-observer agreement. When the SamKam ratio is used to predict severe brain swelling as assessed by two independent radiologists, the area under the receiver operating curve was 0.75. 120 children (mean age 48.8mo SD 27.6mo) with retinopathy positive cerebral malaria underwent brain MRI scanning. Twenty children died; the overall mortality rate was 17%. SamKam ratios ranged between 3.6 and 13. The SamKam ratio on admission was >6.5 in 85% of those who died. Eight patients with initial ratios >6.5 survived and showed declining SamKam ratios on serial scans.

Conclusion and Recommendations

The SamKam ratio is strongly associated with neuroradiological assessments of increased brain volume, and ratios >6.5 predict a fatal outcome in pediatric cerebral malaria. This ratio would be useful in identifying patients who might benefit from adjuvant therapy targeting increased brain volume.

The Accuracy of Paracheck-Pf® In Diagnosing Malaria in Diverse Transmission areas Implementing ICEMR Surveillance System in Malawi

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Introduction

Malaria rapid diagnostic tests (RDTs) are now increasingly used to confirm the diagnosis of malaria. Much attention has been given to the sensitivity of RDTs, but their positive predictive value (PPV) has not been explored, especially in areas such as Malawi, where malaria is endemic. RDTs remain positive for weeks following successful treatment and parasite clearance. In patients with false positive RDTs, evaluation and treatment of alternative diagnoses might be neglected because of the presumed malaria diagnosis. We assessed the positive predictive value of RDTs compared to microscopy and polymerase chain reaction (PCR).

Methods

The Malawi International Center of Excellence in Malaria Research (ICEMR) is conducting malaria surveillance in three different malaria transmission settings: Urban highlands (Blantyre), rural highlands (Thyolo) and rural lowlands (Chikhwawa). In this study, positive results from RDTs were compared with microscopic and molecular detection of malaria infection.

Results

Among all surveillance sites during the rainy season, 25-30% of people with symptoms compatible with malaria had a positive RDT. Overall, the PPV of a positive RDT compared to microscopy was 76.0%.

The RDT PPV was inversely related to transmission intensity. In the moderate transmission intensity regions, PPV was 91.7% (rural highlands) and 72.3% (urban), while in the rural lowland area with intense malaria transmission the PPV was 66.7%. In the areas of moderate transmission, the PPV was higher in adults compared to children under five years of age (97.9% vs. 84.2% and 80.5% vs. 55.6% in the highlands and urban setting respectively). In contrast, in the most intense transmission region, PPV was slightly lower in adults compared to children (64.2% vs. 73.5%). Microscopy is being conducted on additional slides from patients with positive RDTs in both the rainy and dry seasons. Sensitivity and specificity compared to molecular diagnosis will also be reported.

Conclusion and Recommendations

The rate of false positive RDTs is high and is related to age and transmission intensity. This raises the concern that
alternative causes of illness will not be pursued in patients with a positive RDT.

Assessing entomological and parasitaemia prevalence indicators to monitor indoor Residual spraying for Malaria control in Chikhwawa District, Malawi

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Introduction
Indoor residual spraying (IRS) was piloted in Malawi in 2007 by the Presidents Malaria Initiative (PMI) in Nkhota-kota district. Based on the success of these efforts, the Ministry of Health scaled up IRS to six additional districts across Malawi including Chikhwawa, in 2011. The insecticide chosen for this activity was pyrethroid, alphacypermethrin (Fendona). Cases of suspected pyrethroid resistance in Anopheles funestus have been reported in some areas including Chikhwawa, where IRS has been implemented, and potentially compromising malaria control efforts. This project aimed (1) to closely monitor insecticide resistance status of the major malaria vectors; Anopheles gambiae and An. funestus in Chikhwawa; (2) to measure the impact of IRS on vector disease transmission, based on vector species abundance and sporozoite rate; (3) to correlate impact on entomological incidence with malaria prevalence in the human population.

Methods
Three sentinel sites were established in Chikwawa and 6 window exit traps installed at each site. Mosquitoes were captured daily and analysed for species abundance and sporozoites. Separate mosquito collections were carried out for standard WHO insecticide susceptibility assays on the F1 generation An. Gambiae and An. funestus. Anaemia and parasitaemia were determined in children of less than 5 years old within an area of 50 villages that include the sentinel sites, through a continuous rolling malaria indicator survey (rMIS)

Results and Discussion
There was notable reduction in both An. gambiae and An. funestus population, in the sentinel sites following IRS. This correlates with a corresponding decline in anaemia and parasitaemia results in children obtained through rMIS in the area. We found suspected level of insecticide resistance in both Anopheline species to carbamates, organochlorides and pyrethroid insecticides tested, suggesting metabolic based resistance mechanism.

Conclusion and Recommendation
Scaling up IRS in other districts would be the right option for Malawi, based on the entomological and malaria prevalence indicators shown in Chikhwawa. Continuous entomological surveillance proved a powerful low cost complementary monitoring and evaluation tool to assess the impact of IRS. There is therefore need to incorporate entomological and burden monitoring and evaluation assessments to accurately monitor short term impact on vector control efforts.

Assessment of Malaria Control Progress Over A 2-Year Period Using A Continuous ‘Rolling’ Malaria Indicator Survey across age groups in Chikhwawa District, Malawi

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Introduction
In 2011, district wide indoor-residual spraying and the use of Rapid Diagnostic Tests were added to facility-based ACT case-management and the distribution of insecticide treated bednets. Low cost, district-level monitoring and evaluation (M&E) tools that can provide real-time malaria control progress are urgently needed to guide and optimize control efforts and impact.

Methods
From May 2010 we have conducted a continuous ‘rolling’ Malaria Indicator Survey (rMIS) in children aged 6-59 months in 51 villages within Chikhwawa district, Southern Malawi. Monthly collection of standard malaria intervention coverage and burden indicators were conducted by a small team of 2 nurses and 2 field workers, sampling all villages twice a year, using PDAs for data capture. With the increasing focus on universal coverage and transmission reduction, the rMIS was expanded to include older children and adults in the second year (June 2011-May2012).

Results
Findings from the first year (presented last year) identified substantial temporal and spatial variation in intervention coverage and malaria transmission within the area. Preliminary results of this second year rMIS are presented, with a focus on the added value of including older age groups in MIS surveys and control progress over both years.

Conclusions and Recommendations
The continuous MIS approach provided real-time feedback on coverage gaps and burden hotspots, suggesting that this type of M&E surveys could become an intervention in itself if could trigger specific local focused control action, and could strengthen our current arsenal of interventions.

The Evaluation Of Easy Access Groups As A Tool For Monitoring Temporal Changes In Malaria Transmission and Coverage Of Control Interventions In Malawi: The Evalmal Study

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Introduction
Currently recommended tools for measuring transmission reduction involve large, logistically and financially demanding
population-based Malaria Indicator Surveys (MISs) done at intervals of 2 – 5 years. Since malaria transmission intensity and disease incidence can vary within a country, programmatic decisions are often made at district level. Timely, valid, cost-effective district level estimates of short- and medium-term control progress are urgently needed to support the move towards the control and elimination of malaria. The main objectives are to determine if malaria intervention coverage and transmission burden estimates using Easy Access Groups (EAGs) are similar to the estimates obtained from household level probability samples (‘eMIS’ study, the gold standard).

As secondary aims we will determine if rolling surveillance in EAGs will provide valid estimates of temporal trends in population-level intervention coverage, malaria disease burden and transmission, and assess if EAGs are suitable as district-level tool for use in national control programs in terms of feasibility, logistics, and cost.

**Methods**

Children >4 months presenting at the EPI vaccination clinic at Chikwawa District Hospital, any accompanying older sibling(s) aged <15 years, and their parents/guardians were surveyed monthly since April 2011. A modified version of the RBM MERG MIS questionnaire was administered to the parent/guardian. A finger blood sample was collected for a blood film, a malaria rapid diagnostic test, haemoglobin assessment and a filter-paper blood spot for serology.

**Results**

Findings from the first one year of the study will be presented (Apr 2011 – Mar 2012), comparing the estimates derived from the EPI EAG to those from the eMIS.

**Conclusions**

EPI EAG sampling provides a promising option to collect data on coverage and burden indicators from the general population.

**MRI Findings in Brain Injured Survivors of Pediatric Cerebral Malaria**

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**Introduction:**

Almost 30% of cerebral malaria CM survivors experience neurologic sequelae, including epilepsy, developmental delays and behavioral disorders. We describe the MRI findings in 38 brain injured pediatric retinopathy positive CM survivors 6-24 months post infection and correlate these findings to acute clinical features and post-CM sequelae.

**Methods**

We conducted a prospective exposure-control cohort study of 132 retinopathy positive cerebral malaria survivors. During follow-up, brain injury symptoms were evident in 42/132 and 38 of these 42 children had brain MRIs for further evaluation. All children had MRIs on the 0.35T GE Signa Ovation magnet

**Results**

25/38 (66%) were male, mean age at infection 38 months. Sequelae included behavioral disorders 12 (32%), developmental delay 23 (60%) and epilepsy 9 (24%). Common MRI findings included gliosis (53%), periventricular high T2 signal (53%), atrophy (47%), subcortical white matter high T2 signal (18%) and focal cortical lesions (16%). Those with behavioral disorders were more likely to have normal MRIs (68.4 vs. 31.6%; p=0.02) than those with epilepsy or developmental delays. Acute focal seizures during CM were associated with later atrophy (100% vs. 44.4%; p=0.05). Several acute clinical factors were assessed in an exploratory analysis. Acute papilledema during CM was associated with chronic gliosis (p=0.02). Acute peripheral retinal whitening was associated with the development of chronic periventricular white matter changes (p=0.007).

**Conclusion**

Most brain injured survivors of pediatric CM have subsequent structural abnormalities on MRI. Acute retinal abnormalities may offer critical insights into the pathogenesis of brain injury in CM. Prospective studies with acute serial brain MRIs and fundoscopy are underway.

**Recommendations**

Acute fundoscopic findings may be used to identify pediatric CM sufferers that are at risk of developing chronic brain changes and neurologic sequelae, allowing targeted appropriate clinical care.

**Home assessment and initiation of ART: A Cluster Randomised Trial in Blantyre, Malawi**

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**Introduction:**

A major contributor to the poor rates of linkage from HIV testing and counselling (HTC) to antiretroviral therapy (ART) initiation in many countries in sub-Saharan Africa is prolonged delays in completion of ART eligibility assessments (WHO clinical staging, CD4 count measurement). This study investigates whether a strategy of home assessment and initiation of ART has a major impact on the extent to which community-based HTC translates into: uptake of ART; uptake of HTC; willingness to confide positive HIV status to a local community-counselor; and retention on and adherence to ART.
Methods
Fourteen urban clusters received access to community-based HIV testing (with option of self-testing) and were randomly allocated to receive either referral for clinic-based ART eligibility assessment and initiation (control arm), or home eligibility assessment and initiation (intervention arm). Between January and November 2012, per-capita cluster HTC episodes and ART initiations were recorded using community and ART clinic registers. Here we report baseline cluster- and individual-level characteristics. Trial endpoints will be reported in late 2012.

Results
Following cluster boundary demarcation, 16,800 adults (≥18 years) in 6700 households underwent enumeration, with demographic and socioeconomic indicators balanced between study arms. Since January 2012, 6571 cluster residents underwent community-based HTC with 445 (15%) positive disclosures to community counsellors. In, 129 home ART assessments, 85 (66%) participants met ART eligibility criteria, with 71/129 (55%) having CD4<350 cells/ul, 22/129 (17%) in WHO stage 3/4 and 12/129 (9%) pregnant or breast-feeding. 84/85 (99%) of ART eligible participants started ART at home and linked to ongoing clinic-based care.

Conclusions and Recommendations
There has been high early uptake of community-based HTC and home assessment and initiation of ART. Should this strategy prove effective in formal trial analysis, it has the potential to improve upon the current poor rates of retention in HIV care seen in many national programmes.

Uptake, Accuracy and Linkage into Care Following Access to Community-Based Self-Testing For HIV in Blantyre, Malawi

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Introduction
The aim of the study was to investigate uptake, accuracy and HIV care seeking following self-testing for HIV in three high density suburbs of NW Blantyre

Methods
28 clusters (~1,200 adults each) were randomised to intensified HIV/TB prevention or standard of care (SOC). Residents were recruited to provide HIV testing and counselling (HTC) services from their homes in intervention clusters, and trained in HTC. They offer OraQuick ADVANCE™ for self-testing or standard HTC. 5% of participants are followed-up for quality assurance (QA) HTC.

Results
Demand has been ~500 tests/week, with overwhelming preference for self-testing at home. Of 3,237 participants (29% all adult residents) in Feb-April 2012, 194 (6%) confided positive results to counselors and 144 accessed HIV care. Confirmatory HTC showed 144/144 (100%) true-positives. QA in the community showed 100% agreement (11 positive, 70 negative, 54 declined retesting).

Participants were asked to return used kits with a self-completed questionnaire. Of 1,834 evaluated, agreement between laboratory-read of returned kits and stated self-read results was 97.7% with sensitivity 84.0% (95%CI 77.7%-89.1%) and specificity 98.7% (95%CI 98.1%-99.2%). Of 1,338 respondents, 95.9% would recommend self-testing to friends and family, and private self-testing was the preferred “next test” for 63.8% and 58.2%, respectively, of women and men.

Conclusion and Recommendations
Uptake of self-testing for HIV under this model has been high. Specificity is high, but with indications of suboptimal sensitivity that have not yet been confirmed through formal QA. Linkage into care after a preliminary positive self-test appears reasonable. Supportive self-testing strategies should be considered as one of the option for increasing uptake of regular, repeat HTC.

Routine Hemoglobin Measurement at ART Eligibility Assessment: Increasing Access to ART Where CD4 Counting is Not Available

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Introduction
WHO recently changed the CD4 threshold from 250 to 350 cells/L, aiming to increase access to ART, but CD4 counting is not widely available in Malawi. Unexplained hemoglobin concentration ≤8g/dL is a WHO Clinical Stage III condition which makes patients eligible to start ART. However hemoglobin is not routinely measured when adult are assessed for ART eligibility. We hypothesized that routine hemoglobin measurement could increase access to ART when CD4 cannot be determined, and that the current hemoglobin cut-off of ≤8g/dL may not correlate well with the new CD4 threshold. The aim of the study was to study the role of routinely measuring hemoglobin at assessment of eligibility for anti-retroviral therapy (ART) in resource limited settings.

Methods
We determined clinical stage of HIV positive, ART-naive, adult outpatients at Queen Elizabeth Central Hospital, with standardized history and physical examination. Subsequently
we measured hemoglobin (HemocueR, a non-expensive, simple, validated method) and CD4 count. The number identified as eligible for ART by clinical assessment alone and by additional hemoglobin measurement was counted and calculated as a percentage of patients with CD4 ≤350 cells/μL. On the basis of the correlation of hemoglobin levels with CD4 counts we determined an alternative hemoglobin clinical stage III cut-off.

Results
338 patients were assessed, of whom 226 (67%) had CD4 ≤350 cells/μL. 36/226 (16%) were identified as eligible for ART by clinical assessment alone, 48/226 (21%) when hemoglobin was also measured using the existing threshold (≤8g/dL) and 74/226 (34%) using an alternative cut-off (≤10 g/dL). Only 6 patients had hemoglobin ≤10 g/dL and CD4≥350 cells/μL.

Conclusion and recommendations
Measuring hemoglobin alongside clinical assessment increased identification of patients with CD4 ≤350 cells/μL, but the increase was meaningful only if a revised cut-off of <10 g/dL was used. Our findings are relevant to increase access to ART in settings where CD4 counting is unavailable.

HIV Associated Neurocognitive Disorder and Depression in Anti-Retroviral Clinic
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Introduction
HIV associated neurocognitive disorder (HAND) is classified into minor neurocognitive disorder (MNCID) and HIV-associated Dementia (HAD). The prevalence of HAND in sub-Saharan Africa (SSA) is 14-45%, largely based on International HIV Dementia Scale (IHDS) estimations. Depression is common in HIV-infected patients but its overlap with HAND has not been studied in SSA. We aimed to evaluate the utility of the IHDS and formal neuropsychological testing and to describe the relationship between HAND and depression in adult ART outpatients at Queen Elizabeth Central Hospital (QECH).

Methods
ART outpatients >18 years with a positive IHDS (score≤10) were enrolled along with an equal randomly selected number with a negative IHDS. Enrolment involved a battery of neurocognitive tests (Hopkins verbal learning test-revised, timed gait, color trails 1&2, finger tapping, grooved pegboard, semantic verbal fluency and WAIS digit symbol). HAND was diagnosed according to Antinori criteria (2006) using previously published normative values from a cohort in SSA. Depression was assessed using a Chichewa translated Self-Reporting Questionnaire (SRQ20), validated in Malawi.

Results
Of 195 patients screened 76 (39%) were IHDS positive. A subset of 113 patients (58 [51%] IHDS positive) underwent neuropsychological testing. Of these, 53.8% had HAD, 20.4% had MNCID and 74.3% had no neurocognitive impairment. The sensitivity of the IHDS for HAND was 76%, the specificity 56%. Forty-five (40%) patients diagnosed with probable depression had no significant difference in demographics, CD4 count, and time on ART, IHDS score or number of impaired neurocognitive domains compared to those without depression.

Conclusion and Recommendations
Formal neurocognitive testing is feasible, but time consuming. IHDS is a useful alternative screening tool for identifying HAND. Depression and HAND are common among adult ART patients, similar to previous studies in SSA. Depression did not affect neurocognitive testing performance. Further work is needed to define the burden and consequences of MNCID in SSA.

Experiences and Challenges in Sexual and Reproductive Health for Adolescents Living With HIV in Malawi, Mozambique, Zambia and Zimbabwe
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Introduction
An increasing number of children living with HIV are growing into adolescence where they face new sets of challenges. In resource constrained settings, few psychosocial and sexual and reproductive health (SRH) services provide appropriate support for these adolescents.

Methods
A large multi-country cross-sectional observational study was conducted in Malawi, Mozambique, Zambia and Zimbabwe, looking at the experience of adolescents aged 10-19 [n=1901 (boys=847, girls=1054)]. Gender specific experiences from rural and urban settings were explored in each country.

Data was collected using in-depth interviews with adolescents (n=150) and guardian/parents (n=46), focus group discussions (n=68), participant observation (3 months) and a knowledge, attitude and practice survey (n=1498). Data were analysed through a triangulation approach.

Results
Preliminary analyses reveal that key challenges for adolescents living with HIV include accessing information on SRH; disclosing their status to peers; talking about sex and HIV in the context of a relationship, within families and with health
service providers; planning to have children; and emotional well-being. HIV represents a complex challenge for adolescents who lack safe and nonjudgmental environments to talk about safer-sex options and pregnancy, whilst it is assumed by families and health providers that sexual activities should not start before adulthood. Few health services provide support tailored to adolescents; health providers give out inappropriate information and frequently breach confidentiality, resulting in further marginalizing adolescents living with HIV.

**Conclusion and Recommendations**

Despite variations between the four countries and in rural vs. urban settings, the attitude of health care providers and the lack of family-centered approaches result in inadequate support for adolescents when they first experience sexual and love relationships. The study provides evidence that new policies and funding for HIV in low income settings must include safer-sex advice and SRH interventions, training for health workers and families in order to provide adolescents with skills to make choices about relationships, safer-sex and HIV disclosure.

**Knowledge Of, Attitudes Toward, And Practice Of Oral Sex In Zomba District, Malawi**

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**Introduction**

There is a large body of medical evidence pointing to the low risk of (unprotected) oral sex for HIV transmission, but little evidence on how Malawians currently practice and view it. This study examines the current status of oral sex in Malawi's Zomba District: what do people know about it, what are their attitudes toward it, and to what extent and how is it currently practiced.

**Methods**

We conducted a set of 8 FGDs (N=93), as well as a set of 464 survey interviews, in a local area surrounding a rural trading center in Malawi's Zomba District; participants were sexually active adults aged 18-49. The surveys included a representative household sample (N=424) and targeted interviews with sex workers and male clients (N=40). We analyzed the FGDs using NVivo in order to elicit key themes regarding the knowledge of, attitudes toward, and practice of oral sex in the local area (KAP); guided by these themes we employed Stata to construct relevant summary statistics and correlations for the surveys.

**Results**

Oral sex is currently neither widely known nor widely practiced, and people currently regard the practice as taboo. However, of the people who have tried oral sex, the vast majority state that they enjoyed it. 49.6% of people have heard of oral sex: 47.4% in rural areas and 78.2% in the peri-urban trading center. The prevalence of actually trying oral sex is 11.0% (10.8% rural, 14.8% T/C). In bivariate analyses, having tried oral sex is negatively and significantly correlated with age and positively and significantly correlated with income. Among men, trying oral sex is negatively and significantly associated with being circumcised.

**Conclusions**

The low prevalence of oral sex in Zomba District, and the positive evaluations of the people who have tried it, imply that there could be scope for the practice as a safer sex strategy in the region. Future research will continue to explore attitudes and practices and potential links with HIV prevention programs.

**The Use of Interpersonal Communication Networks for Improved Access to HIV/AIDS Services: A Case Study of Mzuzu University**

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**Introduction**

The Use of Interpersonal Communication Networks is vital for the improvement of access to HIV/AIDS Services in Malawi. A Study was carried out at Mzuzu University to assess the role of interpersonal networks with health workers and other support persons for accessing HIV/AIDS services. Primarily, the study investigated the level of knowledge on HIV/AIDS services amongst the students on campus, access to HIV/AIDS messages and services, and the interaction between students and health workers at the clinic.

**Methods**

The study adopted a mixed approach which consisted of questionnaires constructed by means of closed and open-ended questions. In data analysis, triangulation was used and the results were compared with observations in literature review.

**Results**

The results show that students displayed the least knowledge in the areas of PMCT, Family planning and sexually transmitted infections (STI'S). 77% of the respondents do not use family planning services while 81.2% of the respondents do not discuss issues regarding access to HIV/AIDS services. The results also show that university students get messages on HIV/AIDS services from a variety of sources such as friends/peers, health professionals, fellow church members and family members.

**Conclusion and Recommendations**

Interpersonal communication needs to be enhanced among students if the fight against HIV/AIDS is to be won.
If male circumcision is effective in reducing HIV transmission: Does this have any impact on sexual activities (safe or unsafe) of sexually active youths, adults and sexual workers in Mangochi- southern Malawi

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Introduction
In 2007 the WHO and UNAIDS recognized male circumcision (MC) as an effective intervention for HIV prevention especially in areas where HIV acquisition and transmission through heterosexual is high like sub Saharan Africa. Research evidence has also shown that MC reduces the risk in acquisition of STIs and other infections including papilloma virus and cervical cancer. According to DHS 2004, it was only 20.7% of men aged between 15 and 49 who were circumcised hence Majority males in Malawi are not circumcised apart from very few who are mainly circumcised on religious and traditional/tribal beliefs. The study assessed knowledge, attitude and practices on protected or unprotected sexual activities in the light of recent study findings on HIV transmission and MC.

Methods
Using qualitative and quantitative methods, 13 in-depth interviews, 9 Focus Group Discussions, a general situation analysis and key Informant interviews were conducted to collect data among circumcised young and adult males(7 interviews, 4FGDs), uncircumcised young and adult males. The youths interviewed were those who have undergone initiation (circumcision) during the past five to eight years (6 interviews, 5FGDs) and sexual workers (13 interviews and FGDs). 4 Key Informant Interviews were conducted with Religious leaders (Islam and Christianity) and with Initiation councillors (Ngalibas). Data was being analysed on a continuous and ongoing basis in line with the knowledge, attitude and practice as per the study methodology. In summary 78 males aged between 15 and 39 and 33 sexual workers aged between 12 and 27 were interviewed.

Results
The Research evidence on MC is increasing unprotected sexual activities amongst circumcised male youths, adults and sexual workers as evidenced as follows: 74% of circumcised males interviewed indicated that in the light of the study findings on MC as an effective way of reducing HIV transmission, they don’t see the importance of practicing protected or safer sex; 52% of sexual workers interviewed indicated that they are always strict and strong in demanding safe sex (use of a condom) when the male partner is uncircumcised while they are always soft on the same when the male partner is circumcised.

Conclusion and Recommendation
There are increased unprotected sexual activities involving circumcised males as a result of the study findings on MC.

Evaluation of Suitability of ‘John White’ Rat As Animal Model Of Alloxan Induced Type I Diabetes Mellitus
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Introduction
Globally there is an increasing incidence of type 1 diabetes and many African countries continue to fail to access and afford insulin and oral anti-hyperglycemic agents. Surveys of the global burden of disease indicate that non-communicable diseases such as diabetes will become the leading cause of mortality worldwide by 2030. It is therefore imperative that appropriate models be developed from resources that are locally available. The aim of the study was to evaluate “John White”, a local Malawian strain of rat (bred and kept by many Malawians as a pet), as a suitable animal model of alloxan-induced type I diabetes mellitus.

Methods
The study was conducted at College of Medicine, BMS department. Healthy adult male rats used in the study were procured from Bunda College of Agriculture. Diabetes was induced in 36 male animals by a single intraperitoneal administration of 150 mg/kg alloxan monohydrate solution dissolved in citrate buffer. Animals exhibiting fasting blood glucose in excess of 11 mmol/l were considered diabetic and selected for the study. Blood glucose concentrations and body weights were evaluated in the animals in acute and chronic study formats. Statistical comparisons were carried out by using ANOVA to compare the blood glucose levels and body weights among the diabetic groups against normal control group, with p <0.05.

Results
Animals that were administered with alloxan became susceptible to diabetes and demonstrated fasting blood glucose concentrations averaging 18.3 mmol/l against normal control values of 3.1 mmol/l. OGGT results demonstrated that diabetic animals that were treated with insulin favourably responded to glucose challenge with a drop in blood glucose values of up to 5 mmol/l. Long term studies for a period of three weeks showed that the hyperglycaemic condition in the diabetic control group was not transient but permanent.

Conclusion and recommendations
The results of the present study have demonstrated that ‘John White’ rat is a suitable animal model for alloxan induced type I diabetes. The present model may be used for studies that test therapeutic agents where the main mechanism of action is lowering blood glucose for periods of up to three weeks.

The Burden of Unknown Diabetes Mellitus at Chancellor College 2012
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Introduction
There are challenges in diagnosing Diabetes Mellitus (DM) which has a familial predisposition and also occur in those leading an affluent lifestyle. The aim of the study was to determine how many staff and students are living with DM unknowingly as well as establish how many are at risk and to
find the most likely predisposing factor to DM.

Methods
Blood sugar, Blood Pressure, Weight and Height was checked in 40 randomly selected Chancellor College students and staff with no DM regardless of family history between May and July, 2012.

Results
14 of the 40 participants had high blood pressure (BP), 18 participated regularly in exercises with 8 being partially active and 14 reported no involvement at all. 22 participants of the 40 had Body Mass Index (BMI) ≥25. There was no one with DM that the study found but 5 cases of prediabetes and 3 cases of hypoglycemia were found. Female staff and students had a higher risk of developing DM than their male counterparts possibly due to women's poor participation in physical activity. Male staffs were at an increased risk than male students possibly due to differences in age but the risk did not differ between female staff and female students possibly because they both participate poorly in physical activity and they also didn’t differ much in age and lifestyle as most of the female students were mature as well as postgraduates.

Conclusion
The study showed that increase in age, lack of physical activity and affluence are the likely predisposing factor to DM development at Chancellor College.

Starting A New Haemodialysis Unit At Queen Elizabeth Central Hospital – Activities And Outcomes from The First Year Of Service

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Introduction
A 3 station, free at the point of access, haemodialysis unit was initiated at QECH in October 2011. The unit is staffed by clinicians, nurses, a dietician, technical and orderly staff. The aim of the study was to document the operational activities and clinical outcomes of the new haemodialysis unit at Queen Elizabeth Central Hospital.

Methods
Patient demographic, clinical diagnosis and health outcomes were collected prospectively using Microsoft Access and analysed using Microsoft Excel

Results
Overall, 18 patients have received haemodialysis. Of these, 15 (83.3%) were admitted with ESKD. Their mean age was 40.1 years (range 15.0-68.0), 11 (73.3%) were males and 5 (33.3%) were HIV positive (26.7% were on ARVs). Of 6 incidents ESKD patients started on dialysis, all presented in extremis without prior knowledge or documentation of kidney disease, 9 were transferred from other units. The case fatality rate since the service began is 5 (33.3%), 8 (53.3%) remain on maintenance haemodialysis all of whom have a functioning or maturing arterio-venous fistula. In 8/15 (53.3%) patients, the cause of ESKD was unknown. The median duration on haemodialysis for ESKD was 196 days (range 98-2385). Of 3 (16.7%) patients admitted with AKI, two were cholera cases and 1 was a postpartum haemorrhage case. Their mean age was 46.7 years (range 40-55), 1 (33.3%) male. Of these 1 (33.3%) died and the rest made a full recovery. The mean duration of dialysis for AKI was 6.2 days.

Conclusion and Recommendations
The haemodialysis unit offers quality services for patients with ESKD and AKI. The majority of patients present with advanced kidney disease requiring emergency initiation of both maintenance and acute dialysis, and overall mortality is high. Human and clinical resource investments are urgently needed in Malawi to initiate services for early detection and management of acute and chronic kidney injury to prevent late presentation and death due kidney disease.

Psychological Distress Among Adolescents Before, During And After Unsafe Induced Abortion In Malawi

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Introduction
Unsafe induced abortion among adolescents in Malawi is common but little is known about the psychological experiences of the adolescents before, during and after undergoing the unsafe induced abortion. The study aimed at exploring the psychological experiences of adolescents before, during, and after undergoing unsafe induced abortion in Malawi.

Methods
A descriptive study that utilized qualitative methods was conducted on 18 adolescents that were purposively sampled while seeking post abortion care services at the Gynaecological ward of Queen Elizabeth Central Hospital in Blantyre, Malawi. Data was collected through in-depth face to face interviews using a semi structured interview guide and was manually analysed using content analysis.

Results
Two themes emerged from the findings; psychological distress before and during unsafe induced abortion and psychological distress after the unsafe induced abortion. Before, and during unsafe abortion, the adolescents were worried about disruption of their education. In addition they feared loss of family support and complications of unsafe abortion. They were angry and frustrated because they were rejected by their partners. After abortion, the participants felt guilty and regretted to have killed their babies, and committed sin. They suffered loss and grieved for their children.

Conclusion and recommendations
Adolescents undergo traumatic experiences before, during and after undergoing unsafe abortion. There is need for counselling and support services to address the psychological pains. A comprehensive psychological counselling should therefore be an integral part of post abortion care services in all health facilities of Malawi.
Indignity, Exclusion, Pain And Hunger: The Impact Of Musculoskeletal Impairments In The Lives Of Children In Malawi

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Introduction

Although 80% of children with disabilities - including children with musculoskeletal impairments (MSIs) - live in developing countries, instruments to evaluate the impact of rehabilitation interventions on Quality of Life (QoL) in these settings are rare. Moreover, the components of QoL as defined in high income settings may not be the most relevant and culturally appropriate concepts to evaluate in low income settings. This study aimed at identifying the concept(s) that should be evaluated when assessing the impact of rehabilitation on QoL in children with MSIs in Malawi, Africa.

Methods

We conducted a qualitative study in 4 districts in Malawi using a data-led approach to data analysis. A total of 169 participants took part in 57 in-depth interviews, focus group discussions and observations. Participants included children with MSIs (aged 2-10 years), their elder siblings, parents/guardians, teachers, community leaders, health workers, and adults who experienced MSIs as children.

Results

The themes that consistently emerged as being most important in the lives of children with MSIs in Malawi was Participation and Dignity. Children with MSIs strived to be included in three main daily participatory activities (playing with friends, household chores, going to school) but were excluded from each for a variety of reasons including being unable to walk long distances. Indignity was experienced on a regular basis, mainly from being mocked by friends and peers. Apart from being an important outcome in itself, Indignity was a major barrier to the participation of children with MSIs, as they would withdraw or abstain from participation to avoid indignity.

Conclusion

Concepts relevant to QoL in children with MSIs, such as participation in play, household chores, and school, are essential to assess in developing evaluative instruments to measure the effectiveness of rehabilitation interventions targeting both the child and the community.

Modelling distribution of Under-Five child diarrhoea across Malawi

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Introduction

Diarrhoea is one of the commonest causes of childhood mortality in Malawi. One approach to estimating a child’s amount of risk is by use of statistical models, which has not been widely utilized in the country. This study investigated effects of socio-economic and biodemographic factors on the child’s risk to diarrhoea by applying classical and modern semiparametric models.

Methods

To isolate dominant factors, Logit, Poisson, and Bayesian models were fitted to 2006 Multiple Indicator Cluster Survey data. The comparison between Logit and Poisson models was done via chi-square’s goodness-of-fit test. Credible and confidence intervals were used to compare results from Bayesian and Logit/Poisson model. Modelling and inference in Bayesian method was done through Markov Chain Monte Carlo techniques.

Results

The results from all three models showed that weaned children had less chances of catching diarrhoea compared with those who were still breastfeeding. Further, children from families that were sharing toilets were at higher risk than those whose families were not sharing toilets. Besides, children from central and southern regions were respectively at higher risk than those from northern region. The Bayesian model further revealed that the risk of catching diarrhoea increased with child’s age from 0-11, peaked at 12-23, and decreased with age after 23 months. The same model showed that children living along Lake Malawi or Shire River had less chances of catching diarrhoea compared to those from highlands. However, both classical and Bayesian models ruled out influence of mother’s education, child’s area of residence (rural or urban), and source of drinking water on child’s risk.

Overall, directions of estimates from Bayesian model were similar to those of Poisson or Logit model, but Poisson provided better fit than Logit model.

Conclusion and Recommendations

The findings imply that classical and semiparametric models are equally helpful, while Poisson is better than Logit model when estimating child’s risk to diarrhoea. In addition, child’s age, breastfeeding status, region of stay, and toilet-sharing’s status are useful factors for determining the child’s risk.
Role of Traditional Birth Attendants in maternal health: trends of antenatal consultations
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Introduction
Malawi is one of the countries with high maternal mortality rate in literature the rate and ration seem to mean the same thing. The literature is talking of maternal mortality rates but we can substitute the word rates with ratio. Involvement of Traditional Birth Attendants (TBAs) in child delivery is regarded as one contributing factor. Since 2007, there have been four policy shifts with respect to involvement of TBAs in child delivery. Now, the government intends to assign TBAs another role. Although there have been such policy shifts, no comprehensive studies have been done to investigate contribution of TBAs to maternal health in order to make evidence-based policies. The study aimed at examining the extent to which pregnant women consult TBAs.

Methods
Through government’s support, trained TBAs have been collecting and written records of pregnant women they have been attending to during antenatal checks and child delivery. We collected records from a trained TBA in Mulanje covering a 4-year period (1998 to 2001). We also undertook one-on one interviews with the TBA and discussions with selected pregnant women and guardians were also conducted.

Results
2077 pregnant women made antenatal visits to the TBA during the 4 year period. On average, 519 women attended antenatal checkups at the TBAs premises annually. The highest number of women was in 1999 and the lowest in 1998, with an average of 10 women per month.

Interviews revealed that women consult TBAs because of the kindness of the TBAs, abusive treatment from hospital staff (such that some women who lived near a hospital walked longer distances to get to a TBA), cultural reasons (women felt comfortable to be attended to by a TBA because she was elderly and respected other than a young or male attendant as is sometimes the case in hospitals), perception (women believed that more women died in hospitals than at TBAs place hence hospital was perceived to be not a safe place).

Conclusion and recommendations
Many women consult TBAs due to several reasons, some of which are difficult to change immediately. As government is reassigning new roles to TBAs, issues raised in this paper need to be considered in order for the policy to be implemented effectively.

Assessment of Risk Factors of Obstetric Fistula on Women in Malawi
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Introduction
Maternal mortality and morbidity remain a clear and stark challenge to public health in developing countries. Studies (Johnson, 2007; Phiri, 2010 & Banda, 2007) indicate that Obstetric fistula remains a major contributor to the maternal morbidity rate in Malawi. Although the condition is preventable and treatable, the condition remains prevalent in most of the developing countries, where several unexplored social, cultural and poor health system factors are attached to. The study aimed at exploring potential causes of Obstetric fistula by describing and comparing characteristics of women with fistula managed at Zomba Central Hospital (ZCH) and National wide.

Methods
A Case-control study, comparing cross-sectional (DHS) and retrospective (ZCH) data. A purposive sample of 115 Cases and simple random sample 460 Controls treated at ZCH from August to December 2011 were involved. Comparison of 442 women with fistula was undertaken from all women interviewed in 2010 MDHS, from June 2010 to November 2010.

Case notes were reviewed to obtain data on socio-demographic and obstetric characteristics, clinical details, causation pregnancy and treatments provided. Both descriptive and inferential statistical analyses were carried out using SPSS.

Results
Of 112 women treated at ZCH, 34.31% had spent 2 days or longer in labour. 31.7% of women were divorced, and 62.4% were at parity 1. 51.9% of deliveries were by Caesarean Section and 69% of babies were stillborn. National data suggested that 91.2% were from rural areas and were almost twice at risk (odds ratio, 1.75) of developing fistula. Most women weighed at least 50 kg (mean weight, 55.38 Kg) and were slightly taller (mean, 156.79 cm) than average female height of 155 cm in Malawi. Median age at marriage was 17 and at first birth was 19 years. 30% delivered at home.

Logistic regression and chi-square results showed that residence, poverty, parity, mode of delivery, low status and age at birth significantly associate with development of fistula.

Conclusion and Recommendations
More OF occurs in areas where early marriage and pregnancy before pelvic maturity is attained is common. Higher ages at fistula development than is usually the case, may indicate that poor access to Emergency Obstetric Care contributes more to this problem. Reduction of cases would require creation of efficient and effective systems of maternity care for women.

Income and child mortality in developing countries: a systematic review
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Introduction
National Income is an important determinant of child
survival, particularly in low-income countries. The extent to which increased per capita income is responsible for decreases in child mortality in the developing world is unclear. We aimed to quantify the relationship between gross national income and infant and child mortality, using the tool of systematic review and Meta-analysis to produce a pooled estimate. The study examined the relationship between national income and child mortality in developing countries.

**Methods**

We searched freely accessible databases, Pubmed and Google Scholar for full-text English language studies, in March 2012. Our selection criteria: studies that used an internationally comparable measure of income, such as Gross Domestic Product (GDP) per capita and examined the relationship between income and infant or child mortality in developing countries, there was no time limit. Our search strategy was - (“infant mortality” OR “child mortality”) AND (income OR “Gross Domestic Product (GDP) per capita” OR “GDP per capita purchasing power parity (PPP)” OR wealth OR poverty) AND (“low income countries” OR “developing countries”). A random effect Meta-analysis model was applied to the estimates from the eligible papers using Comprehensive Meta-analysis version 2, to generate a pooled estimate of the elasticity. (Elasticity means the % change in child mortality if the GDP increases by 1 %.)

**Results**

Pubmed and Google Scholar yielded 1,014 and 16,600 citations respectively. On review of titles and abstracts, after secondary search and removal of duplicates 81 articles were retained for full text review. Thirty papers fulfilled selection criteria. All papers used multiple linear regression of income on mortality. We produced a pooled estimate of those papers which used log transformed income and log transformed mortality. Our findings shows that national income has a pooled elasticity of -0.335 (95%CI -0.424 to -0.246) on infant mortality and -0.291 (95%CI -0.428 to -0.153) on child mortality while the overall pooled estimate was -0.325 (95%CI -0.430 to -0.219). Heterogeneity across studies was very high, with an I2 statistic of 97% and Cochrane’s Q test p<0.01.

In Malawi, the under-five mortality is 110/1000 live births, an increase in GDP Per capita PPP of 100% would be expected to be associated with a fall in mortality to 77/1000 live births.

**Conclusion**

Low GDP is an important driver of child mortality in developing countries. An increase in GDP per capita PPP of 1% is associated with a reduction in child mortality by 0.3%.

Extrapolation requires caution given the very high degree of heterogeneity.

**Assessing Escherichia coli, and Salmonella contamination in goat meat and beef sold in Zomba urban**

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**Introduction**

The study's objectives were to detect and quantify E. coli and Salmonella spp. in beef and goat meat and determine possible sources of contamination.

**Methods**

A total of 12 Samples were collected in two different days from three major markets in Zomba urban; Chinamwali, Mpondawino and Zomba main markets, and then cultured in VRBA (violet red bile agar) and SS agar (salmonella shigella agar) and incubated at 44oC and 37oC. Colonies were counted after 24 hours for VRBA and 48 hours for SS agar.

**Results**

From the findings; 57.4% and 11.2% of the sampled goat meat and beef from Mpondawino market had salmonella respectively, E.coli in the same samples was 37.7% in goat meat and 9.1% in beef.

Samples from Zomba Market had 62.6% of E.coli in goat meat and 51.3% in beef, while 59.8% of these samples had salmonella in goat meat and 46.3% in beef. Finally, samples from Chinamwali market had 0.1% of E.coli in goat meat and 59.1% in beef; Salmonella on the other hand was rare in all the samples; 0.005% in goat meat and 0.1% in beef. There was also presence of other bacteria like Shigella and other enteric bacteria.

**Conclusion and Recommendation**

Samples from Mpondawino and Zomba markets had high E.Coli and salmonella contamination than Chinamwali. In general, retail beef and goat in Zomba urban is highly contaminated with E.coli and salmonella which can lead to some health complications. It is being recommended that general hygiene among retail meat sellers need to be emphasized to reduce the level of contamination of such pathogenic bacteria.

**Antigen specific vaccine responses in HIV-exposed and unexposed children**

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**Introduction**

In Malawi, there are an increasing number of infants who are exposed to HIV in utero by their HIV positive mothers. Since the successful intervention of anti-retroviral, children born from HIV-infected mothers are more commonly being born HIV-negative. These children have been shown to have a higher incidence of morbidity and a four-fold increase of mortality in the first year of life- particularly from lower respiratory tract infections- when compared to children born to HIV-negative mothers. It is unknown whether this is due to foetal immune system exposure to HIV and its viral proteins, or to increased exposure to maternal co-infections and abnormal in utero cytokine environment.

Investigating vaccine antigen responses included in the routine Malawian childhood vaccination schedule, in HIV-exposed and unexposed children, will allow us to ascertain the extent to which HIV exposure affects the generation of vaccine specific memory responses in these infants.

**Methods**

The methods used are B-cell cultured ELISPOTs to investigate the generation of B-cell memory to Haemophilus influenzae type b conjugate vaccine in two cohorts of mother-infant pairs: HIVunexposed, and HIV-exposed. Alongside ELISA from plasma samples collected longitudinally to investigate the titre of serum anti-polyribosylribitol phosphate (anti-
PRP) antibody. Overnight IFNγ ELISPOTS detecting T-cell responses to HIV GAG peptide pools will determine HIV exposure in the two cohorts. Finally, immunopheno-typing will show profiles of immune activation and senescence between HIV-exposed and unexposed infants.

Results

Preliminary results show, overnight IFNγ responses to a GAG peptide pool in infants at 6 weeks and 14 weeks of age. Also, memory responses to vaccine antigens have been found across different age groups following vaccination in the B-cell assays.

Conclusion

More data is needed to be able to draw conclusions at this stage

Assessment of microbiological safety and vitamin C stability in selected four fruit juices sold in Lilongwe, Malawi.

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Introduction

Juice is the liquid that is naturally contained in fruit and vegetable tissue and fruit juice is increasingly becoming popular because of its countless health related benefits. Consumers are increasingly becoming aware of their right to safe food and food safety is now a global issue on almost all processed foods including fruit juices and attempts are being made by many food regulating bodies globally to ensure safer and quality food products. Juices obtained from retail shops in Tripoli, Libya tested positive to certain bacteria like Escherichia coli and Staphylococcus aureus (Al-jeda and Robinson, 2002) and bottled orange juice was found to lose up to 35% vitamin C in three months when exposed to light (Ryley and Kajda, 1994)). The main objective of the study was to assess the microbiological safety and vitamin C stability in selected four fruit juices within their best before dates sold within Lilongwe city.

Methods

In this study, eighty samples from four different types of fruit juices (Mango, orange (two types) and baobab) were purchased locally from shops within Lilongwe city. For each fruit juice type used, twenty samples were used and among the fruit juices samples used, two were processed locally and two imported. The samples were refrigerated at 5 oC prior to use and microbiological analysis was carried out for bacterial counts and total coliforms using spread plate technique (using nutrient agar) and three tube most probable number (using lauryl tryptose broth) respectively. The samples were incubated at 30°C for 48 hours for the bacterial counts and 30°C for 24 hours for the total coliforms. Vitamin C stability was assessed by determining the vitamin C content in the four fruit juices using titration method as outlined by AOAC (1984). All the samples used were within their best before dates and the assessment for microbiological safety and vitamin C stability was carried out twice for a period of two weeks.

Results

The results revealed that the mean total coliform forming units for all the four different fruit juices was 3.96 x 10^4 cfu/ml which was above the maximum recommended level of 1.0 x 10^3 cfu/ml while the mean total bacterial count was 8.42 x 10^4 cfu/ml which was below the maximum recommended level of 1.0 x 10^5 cfu/ml. There was also presence of fecal coliforms in one of the locally processed fruit juice which suggested poor hygienic practices in the processing of the fruit juices. The results further revealed that vitamin C degradation as a reflection of stability within the best before dates was found not to be significant in all the four different fruit juices.

Conclusion and Recommendations

It can be concluded from the results that all the four different fruit juices used in the study had higher total coliform forming units than the maximum recommended level and therefore pose a health hazard to consumers. The presence of fecal coliforms in some of the juices suggested poor hygienic practices in the processing of the juices. It can be further concluded that vitamin C degradation as a reflection of stability was not significant within the best before dates of the four fruit juices.

Understanding Innate Immune Functions Of Peripheral Blood Monocytes

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Introduction

Monocytes play an important role in host immunity as precursors of tissue macrophages. Macrophages are mainly involved in phagocytosis and killing of pathogens. The innate immune functions of monocytes prior to differentiation into tissue macrophages and the impact of HIV on these functions are not well described. To address this knowledge gap, we assessed phagocytic, oxidative burst and proteolytic functions of blood monocytes obtained from healthy, asymptomatic HIV-uninfected and HIV-infected adult volunteers using novel quantitative assays that our group has developed recently.

Methods

We recruited 45 HIV-uninfected, 34 chronically HIV-infected, and 7 acutely HIV-infected healthy volunteers. We isolated peripheral blood mononuclear cells (PBMCs) and measured the phagocytic, oxidative burst and proteolytic capacity of monocytes using fluorochrome-conjugated silica beads and flow cytometry. For phagocytosis, silica beads conjugated with streptavidin-IgG and streptavidinhorseradish peroxidase (HRP) were used to assess internalisation via Fc and mannose receptor, respectively. Oxidative burst and proteolysis were measured using assays that use silica beads carrying a fluorogenic reporter and a calibration fluorochrome. When the beads are internalized by monocytes, they gain fluorescence intensity proportional to the degree of activity in the phagosomal compartment. The readout (Activity Index) is the ratio of the mean substrate fluorescence and the mean calibration fluorescence.
Alveolar Macrophage Innate Immune Function in HIV-Infected African Adults

K.C. Jambo; D.H. Banda; D.G. Russell; R.S. Heyderman; H.C. Mwandumba

Introduction

HIV-infected individuals are at high risk of lower respiratory tract infections (LRTIs) even during early infection when the peripheral blood CD4+ T-cell count is relatively high. Alveolar macrophages (AM) and T cells are the predominant cell types in the alveoli. We have previously demonstrated that antigen-specific bronchoalveolar CD4+ T cell responses to respiratory pathogens are impaired in HIV-infected adults. The effect of HIV on AM function is, however, still poorly understood. This is mainly due to the lack of appropriate methods for detecting HIV-infected cells. Using novel flow cytometry-based assays developed by our group, we aimed to assess the effect of HIV on AM function.

Methods

We recruited 45 HIV-uninfected and 34 asymptomatic HIV-infected healthy Malawian adults. We obtained AM by bronchoscopy and bronchoalveolar lavage (BAL). HIV-infected AM were detected using a novel flow cytometry-based FISH assay that involves probing target HIV mRNA using a pool of 48 fluorophore-labeled oligonucleotides. This FISH assay was coupled with novel flow cytometry-based bead assays that measure phagocyte function.

Results

The phagocytic ability and oxidative burst function of AM was not significantly different between HIV-infected and HIV-uninfected adults. However, AM from HIV-infected adults had reduced proteocytic function than those from HIV-uninfected adults (1.25 vs. 1.52; p=0.04). We found that only less than 1% of AM were productively infected with HIV and these infected cells were predominantly ‘small’ alveolar macrophages. The proportion of small AM was not significantly different between HIV-infected and HIV-uninfected adults. We, however, found that HIV-infected small AM had reduced phagocytic ability compared to their HIV-uninfected counterparts from the same individual (62.4 vs 45.5%, p=0.03).

Conclusion and Recommendations

The findings demonstrate that our assays can reliably detect HIV-infected AM in BAL from HIV-infected adults and also measure their innate immune functions. The results have shown that proteocytic function is impaired in alveolar macrophages from HIV-infected adults and that a group of small alveolar macrophages dominate in harbouring HIV and have impaired phagocytic function. The findings suggest that some AM innate functions are impaired in HIV-infected individuals and this may contribute to rendering HIV-infected adults more susceptible to lower respiratory tract infections.
Conclusion and Recommendations

The call for evidence-based policy is likely to be received as problematic when, as with acyclovir and nevirapine, the issue does not touch controversies especially those related to religion and ethnic politics. But, when a core issue that identifies ethnicities is at the centre of controversy and it threatens what powerful local actors consider being in their best interest – there is invariably opposition. Thus reframing a new policy to minimize controversy – and in the case of MC, from “MC” to “voluntary medical MC” might result in actors’ reflection and thus provide a path towards resolution.

Building Safe Healthcare Systems: Fighting the war against medical errors and Improving Patient Safety in Developing Countries

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Introduction

Healthcare is not usually safe as it is intended to be. Everyday many people get injured and die in hospitals silently as a result of preventable medical harm. The problem of medical errors (MEs) remains a global challenge. It is estimated that MEs affect one in 10 patients worldwide. The incidence of MEs is however more serious and challenging in developing countries such as Malawi. MEs are not only costly, but they can also have disastrous effects on patients, staff, institutions and nations. Pursuing patient safety strategies entails promoting global health and efficiency of healthcare systems. In many countries including Malawi, the incidences of MEs are underreported or unreported. This may not only indicate ignorance of the problem, but also a deficiency in the healthcare systems. This paper identifies priorities and strategies to reducing MEs and improving patient safety in developing countries, such as Malawi.

Methods

This is a desk research based on systematic literature review. A search on PubMed and Medline databases was carried out using key words “medical errors” “patient safety” and “developing country”.

Results

The search retrieved 154 articles dating back to 2000. Of these, 87 were dropped because they consisted of anecdotal case studies. A further 26 articles were dropped because they were focusing on errors related to specific causalities. In total 41 articles were read. The following are the identified priorities and strategies that can help to reduce MEs and promote patient safety in developing countries such as Malawi: (a) establishment of patient safety legislations, policies and guidelines (b) development and strengthening of healthcare accreditation systems (c) creating awareness on patient safety and stakeholders’ involvement (d) creating patient safety culture (e) promotion of safe clinical practices and use of technology (f) developing effective incident reporting systems (g) improving healthcare staffing levels, education and training (h) control on use and sale of medicine (i) promoting research.

Conclusion

In order to successfully win the war against MEs, strong commitment and application of “a bundle of strategies” are essential. MEs will continue to claim many lives silently in developing countries such as Malawi, unless immediate attention and effort is made to prevent the problem.

Study of Ethnobotany and Phytochemistry of Pavetta Crassipes Leaves and Calotropis Procera Bark

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Introduction

This study set out to analyse the phytochemistry of two medicinal plants locally used by herbalists Pavetta crassipes leaves and Calotropis procera bark from Malawi. The specific objectives of the study are: To extract Pavetta crassipes leaves and Calotropis procera bark using 80% methanol and 100% methanol respectively. To isolate compounds using open column and medium pressure liquid chromatography. To elucidate the structures of isolated pure compounds using nuclear magnetic resonance spectral techniques.

Methods

The research design was an experimental method. The dried Pavetta crassipes leaves (2900g) and Calotropis procera bark (4500g) was extracted with 3L 80% methanol and 100% MeOH respectively, at room temperature after 72 hours. Using various column chromatographical techniques each of the extracts was isolated to get the pure compounds. The isolated pure compounds were elucidated and characterized using Proton Nuclear magnetic Resonance Spectrum (1H NMR), Carbon Nuclear Magnetic Resonance (13C NMR), Heteronuclear Multiple Bond Coherence (HMBC),Heteronuclear Single Quantum Coherence (HSQC), Distortionless Enhancement via Polarization Transfer (DEPT), Nuclear Overhauser Effect Spectroscopy (NOESY) and Correlation Spectroscopy (COSY).

Results

The elucidation of pure compounds from Pavetta classipes yielded flavonoid Quercetin-3-O-rutinoside (1), Chlorogenic acid (2) and Methyl chlorogenate (3) and Calotropis procera yielded taraxasteryl acetate (4) and calactin (5).

Building A Knowledge Translation Platform in Malawi to Advance Evidence-Informed Policy and Practice

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Introduction

Knowledge Translation (KT) is increasingly concerned with addressing the underutilization of evidence based research and program experience to improve health systems in low-income countries. Through an innovative KT approach linking implementation to research, Dignitas International, a medical NGO based in the South-East of Malawi, actively promotes the translation of science and implementation based knowledge, use of new technologies, and innovation in treatment and care in order to influence national HIV policies and improve practice.
Methods
This KT strategy focuses on building the capacity of policy makers, researchers, and program implementers in Malawi, with the aim to increase the involvement of local stakeholders in research processes, from conceptualization to analysis and dissemination. Specific methods include a political context, interest and influence analysis; the formulation of key messages adapted to different audiences; and combined training of policy makers and researchers.

Results
This strategy, sponsored by WHO, has led to the establishment of a Knowledge Translation Platform (KTP) for Malawi which links key in-country research and policy actors. Communities of Practice are being set up to provide specialized fora between experts and national stakeholders, and the interface with the media was strengthened as an important channel of communication. A number of KT outputs helped in documenting programmatic and research experience, including publications, workshops and trainings, policy briefs, documentaries and case studies. Amongst other outcomes, these KT efforts will contribute to promote changes in current health policy and practice in Malawi.

Conclusions
The KTP promotes a coordinated approach in evidence-informed health policy-making processes in Malawi. Strengthening KT in Malawi provides an opportunity to understand and analyze how to best support the uptake of research findings and program experience in policies at national level as well as globally. Setting up KT activities enhances the understanding and use of evidence in policy making as well as in program design and implementation.

Poster Session
ART Reduces HIV Transmission: Does This Increase Unprotected Sexual Behaviours Between HIV+ And HIV- Individuals
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1. Given-Secret Consultants

Introduction
Recent studies on ART have revealed that ART reduces viral load hence in some cases it is regarded as a preventative measure in the reduction of HIV/AIDS transmission. In the light of this finding, the study wanted to analyse the general perspectives, behaviours versus safer/unprotected sex of the sexual active adults, PLHIV and HIV- discordant couples as far as HIV/AIDS prevention and reducing its transmission is concerned.

Methods
A four months ethnographic data was collected from PLHIV (on ART) and discordant couples from different support groups in Mangochi within age bracket of 25 to 48. Structured questionnaires were administered to sexually active adults (men, boys/girls, and women) who were not aware of their HIV status from the Area of T/A Mponda.

Results
Out of the 9 PLHIV and 7 discordant couples interviewed (who were on ART), 7 PLHIV and 4 discordant couples indicated that they have had unprotected sex with men/women (those who do not know their HIV status) regardless of the fact that they were aware that these partners had HIV. With a conclusion that the HIV transmission risk is lower in people on ART hence to engage themselves in unprotected sex. While on the other part 33 sexually active men and women (without knowledge of their HIV status) out of 50 interviewed indicated that despite the fact that they were aware of the HIV status of the other partner (PLHIV) but the fact that the partner is on ART, they went ahead to have unprotected sex.

Conclusion and Recommendations
There is increased unprotected sexual activities involving or between PLHIV (on ART) and those who have not yet undergone VCT. Results of a Clinical study already done to ascertain if all people on ART have a reduced Viral load and after how long do a person on ART have this reduced viral load such that the HIV Virus cannot be transmitted should be disseminated so that the public must be aware of this fact, although there are many ways to prevent this.

ART triple combination- does it have any impact on the health of the mother after delivery
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Introduction
World Health Organisation’s (WHO) Prevention of Mother to Child Transmission (PMTCT) guidelines endorse the use of ART Triple combination (3TC,TDF,EFV) for all HIV+ pregnant women in order to reduce vertical transmission (post, intra and utero partum), much as this antiretroviral treatment is critical for maternal health in the sense that babies are born without the HIV infection, however in some cases child bearing potentially increases viral load making mothers prone and vulnerable to other opportunistic diseases that eventually kills them.

Our objective was to find out if ART Triple Combination administered to HIV+ pregnant women which potentially decreases HIV transmission risks through utero/pari partum (during pregnancy), intra partum (during delivery) and post partum (during breastfeeding) have any impact on the Health of the mother herself after delivery.

Methods
A qualitative study using both FGD and In-depth Interviews were conducted. We interviewed 38 PLWHA from 27 Support Groups in Mangochi. Out of the 38, 21 were men and 17 women. The interview were based on knowledge, attitude and practice. Data was being analysed on a continuous and ongoing basis in line with the knowledge, attitude and practice as per the study methodology.

Results
Of the 21 men interviewed, 12 (52%) indicated that they have at least lost a wife who was HIV+ five to eight months after giving birth despite the fact of them being on ART regimens. Out of the 17 women interviewed, 6 (35.2%) indicated to have knowledge of 1 to 2 of their female group members...
(HIV+) who died or whose health started deteriorating soon after giving birth. ART Triple Combination versus child bearing choices for HIV+ mothers puts the mother at risk, prone and vulnerable to other opportunistic diseases and death

Conclusion and Recommendation
Since child bearing is a woman’s reproductive right and that the use of contraceptive by HIV+ women is not compulsory, it is a fact that a lot of HIV+ women are falling pregnant simply by choice and own desire to have children because of issues of age, new marriages and others putting their own health at risk. A wide scope of Research in this area is urgently needed.

Mathematical modelling of the prevalence of malaria; a case study of zomba district
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Introduction
The study’ objective was to understand the prevalence, transmission and control of the Malaria epidemic through Mathematical Modeling.

Methods
The study was done at Zomba District Health Office from July 2009 to June 2010. An SEIR (Susceptible-Exposed-Infected-Removed) model was used in the study. The model was used to determine criteria for control of malaria epidemic and to compute the basic reproduction and effective reproduction numbers. To come up with an optimal epidemiological threshold, secondary data from the Zomba District Health Office was used as a guide. Matrix Laboratory (MATLAB-6.5) package was used to implement a model that analyses data to understand prevalence estimates, in this, recruitment rate, contact rate and removal rate as some of the variables used.

Results
A simulation of the basic malaria model (with total population N, compartmentalized into Susceptible-Exposed-Infected-Removed) in the absence of any intervention was done and then a simulation of the malaria model with data from Zomba DHO as guide. Since there was no figure of the population left with no intervention, a theoretical population of 32,300 people was used. Without intervention, at the steady state about 90% would be affected. An R₀ of 1.4303 that was found illustrates that the contact rate between the vectors and the host is severe. A decrease in contact rate (which may include, for example use of mosquito nets) and an increase in removal rate (which may include, for example treatment of Malaria) results in a corresponding decrease in prevalence and threshold, R₀, showing an improvement on the proportion of the sick people when interventions are included.

Conclusions and Recommendations
From the research, numerical results indicate the effect of the two controls; protection and treatment in the reduction of exposed and infected members of each of the populations. The results also highlight the effects of some model parameters; infection rate and removal rate which are significant in the control of malaria.

MODELLING DISTRIBUTION OF UNDER-FIVE CHILD DIARRHOEA ACROSS MALAWI
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Introduction
Diarrhoea is one of the commonest causes of child mortality in Malawi. One approach to estimating a child’s amount of risk is by use of statistical models, which has not been widely utilized in the country.
This study investigated effects of socio-economic and demographic factors on the child’s risk to diarrhoea by applying classical and modern semiparametric models.

Methods
To isolate dominant factors, Logit, Poisson, and Bayesian models were fitted to 2006 Multiple Indicator Cluster Survey data. The comparison between Logit and Poisson models was done via chi-square’s goodness-of-fit test. Credible and confidence intervals were used to compare results from Bayesian and Logit/Poisson model. Modelling and inference in Bayesian method was done through Markov Chain Monte Carlo techniques.

Results
The results from all three models showed that weaned children had less chances of catching diarrhoea compared with those who were still breastfeeding. Further, children from families that were sharing toilets were at higher risk than those whose families were not sharing toilets. Besides, children from central and southern regions were respectively at higher risk than those from northern region. The Bayesian model further revealed that the risk of catching diarrhoea increased with child’s age from 0-11, peaked at 12-23, and decreased with age after 23 months. The same model showed that children living along Lake Malawi or Shire River had less chances of catching diarrhoea compared to those from highlands. However, both classical and Bayesian models ruled out influence of mother’s education, child’s area of residence (rural or urban), and source of drinking water on child’s risk.
Overall, directions of estimates from Bayesian model were similar to those of Poisson or Logit model, but Poisson provided better fit than Logit model.

Conclusion
The findings imply that classical and semiparametric models are equally helpful, while Poisson is better than Logit model when estimating child’s risk to diarrhoea. In addition, child’s age, breastfeeding status, region of stay, and toilet-sharing’s status are useful factors for determining the child’s risk.
Potential Risk of Contracting Schistosomiasis in Fishponds of Nthondo and Chinthembwe in Ntchisi District, Central Malawi

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Introduction

Schistosomiasis is a very serious parasitic disease that affects humans and other domestic livestock.

The disease is caused by worm-like parasites (trematodes) of genus Schistosoma. Commonly found in Malawi are Schistosoma haematobium and Schistosoma mansoni. Freshwater snails such as Bulinus globosus, Biomphalaria pfeifferi and Melanoids species are the intermediate hosts of the parasites. They breed in slow moving or standing waters. People who are in frequent contact with such waters are at potential risk of contracting schistosomiasis. Fish farmers of Nthondo and Chinthembwe were at potential risk of contracting schistosomiasis from fishponds.

The purpose of the study was to investigate whether fish farmers of Nthondo and Chinthembwe were at potential risk of contracting schistosomiasis from fishponds. The sites had 145 and 51 fishponds respectively. In 2008 the prevalence of schistosomiasis in Ntchisi was 35.4% and most patients were coming from the two areas hence the research. Malawi treated 43,222 people in 2008.

Methods

The study was conducted in dry season (September - October 2008) and rainy season (February-March 2009).64 fishponds were surveyed, 47 in Nthondo and 17 in Chinthembwe. The vector snails were tested for infection and those which did not vomit cercariae were crushed and examined under a microscope for prepatent stages of the parasite. Fish farmers were interrogated on presence and use of pit lattines.

Results

Twenty fishponds (43%) in Nthondo and 5 (29%) in Chinthembwe had vector snails of Schistosoma mansoni (Biomphalaria Pfeifferi). Bulinus globosus of Schistosoma haematobium were found in Nthondo only. 10% of fishponds in Nthondo and 1% in Chinthembwe had infected vector snails.

Abundance of vector snails was greater in dry season than in rainy season with the average of 195 and 402 in Nthondo and Chinthembwe respectively. In rainy season mean pattern was 112 and 203 for the two study sites in the same order. Coincidentally, descriptive analysis demonstrated that the contact with pond water by fish farmers is more in dry season (71%) than in rainy season (43%). Risk factor analysis showed that more 42 (68%) fish farmers use pond water for bathing as some 28 (45%) fish farmers defecate in the bush surrounding fish ponds.

The study established that fish farmers of Nthondo and Chinthembwe were at risk of contracting schistosomiasis as 43% and 29% of fishponds harboured vector snails of schistosoma parasites respectively. Some vector snails vomited the cercariae.

Conclusion and Recommendations

It was recommended that: Vector snail control programme be put in place to keep fishponds free from vectors; fish farmers be tested and treated from schistosomiasis yearly; fish farmers be encouraged to build and use pit lattines.

Development And Validation Of A GPS-Based “Map Book” System For Categorizing Cluster Residency Status Of Community Members Living In High-Density Urban Slums In Blantyre, Malawi

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Introduction

A significant methodological challenge in implementing community-based cluster randomized trials (CRTs) is how to accurately categorize cluster residency status where data are collected distant to households. This study set out to validate a map book system for use in urban slums with no formal address systems, having shown inaccurate classification using address descriptions.

Methods

Twenty-eight non-contiguous clusters were demarcated in high-density urban slums in Blantyre, Malawi. Antiretroviral therapy (ART) initiators at three clinics were asked to identify themselves as cluster residents (yes/no, and which cluster) using map books. A random sample of ART initiators was used to validate map book categorization against GPS coordinates taken from participants’ households.

Results

Of the 202 ART initiators, 48 (23.8%) were categorized using the map book system as in-cluster residents, 147 (72.8%) as out-of-cluster residents and 7 (3.4%) were unsure. Agreement between cluster allocation using map books and GPS was 100% in the 20 adults selected for validation, and 95.0% (kappa=0.96, 95% CI: 0.84, 1.00) in a further 20 adults categorized as in-cluster residents, giving an overall agreement of kappa=0.97 (95% CI: 0.90, 1.00)
Conclusion and Recommendations

Using map books, cluster residents were rapidly and accurately classified. If validated elsewhere, this approach could be of widespread value, allowing accurate categorization without home visits.

Reduced Risk for Placental Malaria in Iron Deficient Women

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Introduction

The study aimed at describing iron status in relation to placental malaria controlling for several confounding factors.

Methods

A case control study in pregnant Malawian women was undertaken in Chikhwawa Southern Malawi. Pregnancy characteristics and blood samples were obtained at delivery. A full blood count was performed and serum ferritin and transferrin receptor quantified by enzyme-linked immunoassay. DNA analysis was used to identify genetic polymorphisms for ABO phenotype, hemoglobin HbS, and glucose-6 phosphate dehydrogenase deficiency. Placental tissue was obtained and malaria histology classified as active, past or no malaria infection.

Results

A total of 112 infected cases (mean age 23.8 years) were identified and were compared with 110 control women (mean age 25.2 years) who were identified with no evidence of acute infection only OR was 0.3, 95% CI (0.2 - 0.8) p = 0.006 whereas in 39.6% of all infected cases with acute, chronic or past PMI, the odds ratio (OR) for ID was 0.4, 95% CI (0.2 - 0.8) p = 0.01. When significant variables were included in the multivariate regression model, weight loss (OR 3.36, 95% CI 1.18-9.59), fever (OR 2.44, 95% CI 0.90-6.32)), night sweats (OR 3.30, 95% CI 1.13-9.52) positive TST (OR 8.08, 95% CI 2.35-28.00) and positive IGRA (OR 16.66, 95%CI 6.25-41.60) were independent predictors of culture positive TB in malnourished children using stepwise logistic regression with p-to enter 0.05 and p-to remove 0.1. The sensitivity of IGRA was higher than TST in both HIV infected and HIV uninfected malnourished children with TB.

Conclusion

Reduced Risk for Placental Malaria in Iron Deficient Women

Women with either acute, or acute and chronic placental malaria were less likely to have iron deficiency than women without placental malaria infection. There is a priority to establish if reversing iron deficiency through iron supplementation programs either prior to or during pregnancy enhances malaria risk.

Evaluation of clinical features, tuberculin skin tests and interferon gamma release assays in the diagnosis of tuberculosis in malnourished children

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Introduction

The clinical diagnosis of tuberculosis (TB) in children with malnutrition and the discrimination of TB cases from those with other infections is challenging. Therefore, we evaluated the utility of clinical features, tuberculin skin testing and interferon gamma release assay in the diagnosis of TB in this population.

Methods

A prospective study that investigated malnourished children aged between 6 months and 14 years admitted to Queen Elizabeth Central Hospital from 2008 to 2011. These children were categorized as active TB and non-TB based on sputum culture results. WAZ-scores were used to determine the nutritional status. Clinical features independently predictive of TB were modeled by multivariate analysis and a comparison made between the Tuberculin Skin test (TST) and Interferon gamma release assay (IGRA), as predictors of TB.

Results

Overall, 177 children were enrolled of whom 50 had culture positive TB and 127 were non-TB (TB excluded). Using univariate analysis, children with TB were more likely to present with fever (p= 0.016), weight loss (p= 0.013), a history of TB contact (p= value 0.039) and a positive TST (p= <0.005). When significant variables were included in the multivariate regression model, weight loss (OR 3.36, 95% CI 1.18-9.59), fever (OR 2.44, 95% CI 0.90-6.32)), night sweats (OR 3.30, 95% CI 1.13-9.52) positive TST (OR 8.08, 95% CI 2.35-28.00) and positive IGRA (OR 16.66, 95%CI 6.25-41.60) were independent predictors of culture positive TB in malnourished children using stepwise logistic regression with p-to enter 0.05 and p-to remove 0.1. The sensitivity of IGRA was higher than TST in both HIV infected and HIV uninfected malnourished children with TB.

Conclusion

Weight loss, fever, night sweats and a positive TST independently predict culture positive TB in children, even in the presence of malnutrition. IGRA are more sensitive than TST, but their high cost and laboratory requirements prevent routine use in resource poor countries.
The acquisition and development of resistance to beta lactam antibiotics in Streptococcus pneumoniae
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Introduction
Streptococcus pneumoniae is a major bacterial pathogen in Malawi, causing a range of diseases including meningitis and bacteraemia. It is the leading cause of meningitis and second leading cause of bacteraemia amongst patients in QECH, with disease being focused among the young and Immune suppressed. The pneumococcus has had a long history of antibiotic treatment globally, and in recent years vaccines have also been introduced to protect against this pathogen. However, the pneumococcus is infamous for its ability to rapidly develop resistance to antibiotics and avoid vaccine protection. Beta lactam antibiotics, such as penicillin and ceftriaxone are currently favoured for the long-term treatment of pneumococcal diseases, as resistance is acquired much more rapidly to other classes of antibiotics. The aim of this study is to determine the importance of horizontal gene transfer in the acquisition of beta lactam resistance, and to better elucidate the path by which beta lactam resistance occurs in a clinical setting.

Methods
This study is based on the use of second generation sequencing technologies to analyse whole bacterial genomes of pneumococci and other oral streptococci.

Results
Investigation into the mechanisms by which beta-lactam antibiotic resistance arises has had a long history, albeit of varying results. The beta lactams are known to target a group of bacterial cell wall synthesis proteins, yet there appear to be a number of different pathways by which resistance can arise in these genes. Recent experiments further suggest that other genes may also be important for resistance to occur. Intra- and inter-species genetic transfer has additionally been implicated in the development of antibiotic resistance among pneumococci.

Conclusion
It is hoped that the findings of this study will aid antibiotic administration in the treatment of pneumococcal disease, and so prolong the effectiveness of these treatments into the future.

Disability inclusion in poverty reduction strategy papers
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Introduction
People with disabilities have limited access to health services and other social amenities because they are overlooked during policy development. The African Policy on Disability and Development (APODD) project aimed to document and analyse research evidence that informs the inclusion of people with disabilities in national and international development policy initiatives. It was important to identify actions that can be taken to encourage inclusion of this group in Poverty Reduction Strategy Papers (PRSPs) and to facilitate access to services.

Methods
A multi-method qualitative case study design was used, employing five complimentary methods of data collection: Key Informant Interviews, Focus Group Discussions, Critical Incident Technique, Nominal Group Technique (NGT) and the Force Field Analysis (FFA). The participants were from government and non-governmental organisations, including disabled peoples' organisations and the donor community. All interviews were audio-taped and transcribed verbatim. A thematic content analysis was conducted through coding data for common trends and emerging themes.

Results
The study indicated that there was a wide PRSP consultative
process. However, people with disabilities were involved only in the 2nd PRSP process. There was a general lack of knowledge and awareness of disability issues at policy and grassroots levels. Negative attitudes continued to marginalise people with disabilities at all levels of society. Participants’ major concerns were about disabled people’s limited access to basic amenities such as health, food, education and employment.

**Conclusion and Recommendations**

Although disability issues were not prioritised in the initial PRSP process; there was minimal inclusion of disability in the subsequent document. There was also a lack of implementation and follow-up of disability related commitments to facilitate service provision for this group. Since disability is a crosscutting issue, there is a need for all Government Ministries to include disability matters in their policies instead of relegating to the Ministry of Disability.

Knowledge, attitudes and beliefs on contributing factors to low back pain among low back pain patients attending outpatient physiotherapy treatment in Malawi

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**Introduction**

Low back pain (LBP) is a growing health problem worldwide, its aetiology is multifactorial, and there is no consensus on the exact cause and contributing factors to LBP. Literature indicates that educating patients on their LBP enhances their knowledge and changes the negative attitudes and beliefs regarding their pain. The aims of the study were to identify patients’ knowledge, attitudes and beliefs on the contributing factors to LBP, among patients attending physiotherapy outpatient treatment in Malawi, and to establish the source of the patient’s knowledge about their LBP.

**Methods**

The study was carried out at physiotherapy outpatient departments of Kamuzu and Queen Elizabeth Central hospitals. A quantitative cross-sectional survey was done, using a self-administered questionnaire; the participants were recruited using convenient sampling method. The Statistical Package for Social Sciences (version 19.0) was used for data capturing and analysis. Descriptive and inferential statistics was used to summarize data. The Chi-square test was used to determine any association between variables and the Alpha level of significance was set at 0.05. All ethical issues were sought and followed throughout the study period.

**Results**

There were 205 LBP patients participated in the study. The mean age of the sample was 47.74 years, (SD=13.29). Females constituted 53.2% of the sample. Most participants were partially knowledgeable about the course and causes of LBP and more than half (67%) portrayed negative attitudes and beliefs about LBP. A statistically significant relationship between knowledge, attitudes and beliefs was noted (p=0.04).

**Conclusion and Recommendations**

LBP management programs should include education programs aimed at empowering patients with knowledge regarding LBP, its contributing factors as well as changing their negative attitudes and beliefs about their pain. Patient education may enhance the achievement of treatment goals. Thus, patient education should also be part of intervention regimens in the curricula for health professionals.

**Quality of Maternal and Neonatal Care Provided by Health Workers Trained in Basic Emergency Obstetric and Neonatal Care in Phalombe District in Malawi**

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**Introduction**

The study’s objective was to evaluate the quality of care provided by health workers trained in basic emergency obstetric and neonatal care and assess perception of quality of care by both providers and clients. Three basic emergency obstetric and neonatal care facilities and one comprehensive emergency obstetric and neonatal care in Phalombe district in Malawi.

**Methods**

Data was collected through interviews with 13 health workers trained in basic emergency obstetric care and exit interviews with 79 women in postpartum period who had delivered at the facility.

Observations were also done on women in labour using Reproductive Health Standards checklist as well as case review of management of complications. Data was analysed using content analysis for qualitative part and using SPSS 19.0 for quantitative part.

**Results**

The results found that all the facilities were not providing care according to standards. Using the Reproductive Health Standard checklist to score the facilities through observing care provision all facilities performed far much below the recommended 85%. The median score for the facilities was 30%. Results also revealed that management of complications is not done according to standards; management was not according to protocol. Both providers and clients agreed that quality of care provided is low due to factors such as lack of material resources, providers not having adequate skills and providers not providing care as expected by clients.

**Conclusion and Recommendations**

Despite trainings having been conducted and more basic emergency care sites set up, this have not translated into quality care due to various reasons. Concerns raised by clients about care provision calls for an immediate intervention if the clients are to continue patronize these facilities. It is recommended that health workers who have been trained in basic emergency obstetric care should be mentored to ensure that the care they provide is according to standards and in a manner which is appreciated by the clients. It is also recommended that the government get committed in providing both human and material resources to these facilities to enable health workers work effectively.
Nursing in Malawi: an emotive subject

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Introduction

Research evidence suggests declining standards in the quality of care within healthcare settings in Malawi and this negatively impacts on the preparation of nursing students for their role as future nurses. The study explored the clinical learning experience for undergraduate nursing students in Malawi, the aim being to gain an understanding of the nature of their experience.

Methods

This was a hermeneutic phenomenological study and the setting was Kamuzu College of Nursing. The sample was selected purposively and consisted of 30 undergraduate nursing students. Conversational interviews were conducted to obtain participants’ accounts of their clinical learning experience and a framework consisting of procedural steps guided phenomenological analysis.

Results

The findings portray the emotions and the stress which nursing students encounter as a consequence of practising in resource poor settings. There is evidence of ‘care deficit’ due to the severe nursing shortage which is prevalent in most clinical settings in Malawi. The findings also illustrate loss of professional pride among some of the practising nurses, evidenced by lack of commitment, negligence and negative attitudes. Sometimes patients are communicatively mistreated. However, the study also reveals that there is a remnant of nurses who are committed and caring which shows that all hope is not lost.

Conclusion and Recommendations

The findings portray the problems and challenges which KCN students encounter during their clinical learning experience and problems at both the teaching hospitals and KCN as an educational institution.

“The ‘Lifeworld’ of Malawian undergraduate student nurses

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Introduction

In the ‘lifeworld’ of student nurses, the clinical learning experience is quite indispensable. It plays a vital role in preparing them for their future nursing career.

Methods

This was a hermeneutic phenomenological study which explored the clinical learning experience. The study setting was Kamuzu College of Nursing (KCN). The sample was selected purposively, consisting of thirty participants and conversational interviews were conducted to obtain students’ accounts of their experience. A framework developed by modifying Colaizzi’s procedural steps guided the phenomenological analysis in this study.

Results

The study findings indicate that the clinical learning experience is challenging and the themes which portray this include: ‘we cover shortage,’ ‘learning in a hard way,’ ‘lost sheep’ and biased clinical assessments. There is severe nursing shortage in most clinical settings in Malawi and nursing students appear to be a potential workforce. There is also gross lack of supplies, which causes nursing students to learn in a hard way. The study also portrays lack of support to students during clinical placements and learning is substantially self-initiated, hence the perception of being like ‘lost sheep.’ The findings reflect a deficit in leadership of practice learning.

Conclusion

The study findings portray the problems and challenges which KCN students encounter during their clinical learning experience and problems at both the teaching hospitals and KCN as an educational institution.

“Demand side and provider cost at the maternity waiting home at Mchinji district hospital, Malawi”

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Introduction

The cost of inputs for providing health services i.e. medicines, food stuff and staffing consumes a larger percentage of a health budget of the health. Currently no information is available on the cost incurred by the hospital in managing the maternity waiting home at Mchinji District hospital. At the same time the cost incurred by waiting mother and her guardian whilst waiting for delivery is also crucial taking into consideration that good health service delivery must ensure that all people especially the poor, utilize health services while being protected against financial hardships associated with paying for them. The study had four objectives: (i) establish the unit cost incurred by the hospital per waiting mother during the financial year 2009/2010; (ii) establish the costs incurred by the mothers during the period of stay in the waiting home during the period of study; (iii) find out the perceptions of the waiting mothers and their guardian as regards the waiting home at Mchinji district hospital and (iv) to find out perceptions of the district health management team on maternity waiting homes as regards the cost implications to the hospital.

Methods

The study was conducted at Mchinji district hospital in Mchinji district, Malawi from June 2011 to August 2011. It was descriptive cross sectional cost analysis using the step-down approach of cost analysis for the providers’ perspective. A descriptive cross-sectional survey to get information from the waiting mothers and the managers perceptions of the maternity waiting home. The data were analyzed based on the study objectives. Computer packages i.e. SPSS 16.0 and
Microsoft Excel version 2007 was utilized to analyze the data.

Results

The total cost of providing maternal services at Mchinji district hospital maternity waiting home in the financial year 2009/2010 was MK 8,043,452.80 which is equivalent to US$52,917 (Exchange rate 1 US$ =MK152) and the unit cost per waiting mother in the financial year 2009/2010 was MK 7,448 (US$49). The provision of meals to waiting mothers contributed the highest proportion (86%) to the total expenses incurred by the hospital.

Conclusion

Running a maternity waiting home is costly to the provider especially when food is provided to waiting mothers. Mothers find it difficult to sustain their stay in the waiting home especially with long periods of stay. It is therefore recommended that the Ministry of Health should develop a policy guideline for maternity waiting home for Malawi. It should include issues like the structure, social amenities required and financing mechanisms.

The effectiveness of community-based nutrition education on the nutrition status of under-five children in developing countries: a systematic review

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Introduction

Under nutrition continues to be one of the main health problems affecting children under the age of five years in developing countries. Community-based nutrition education programme is one of the approaches used to reduce the prevalence of malnutrition in this age group. The study aimed at examining the best available evidence on the effectiveness of community-based nutrition education in improving the nutrition status of under-five children in developing countries.

Methods

The search was conducted utilising the following data bases: Cumulative Index to Nursing and Allied Health Literature, EMBASE, Medline, and Web of Knowledge. The following key words were used: Children, Community- based nutrition education and Nutrition Status. To be included the studies had to be: randomised controlled trials, quasi experimental, primary research from peer- reviewed journals, written in English, conducted in developing countries and with outcomes of increase in weight and height. Implementers were health care providers and/or trained peer counsellors. The studies used nutrition education or counselling as interventions. These were delivered within the community. 9 studies were identified for the critical appraisal process. The Joanna Briggs Institute critical appraisal check-list for experimental studies was utilised.

Results

The nutritional status of children in all studies improved and this was evidenced by increases in weight, height and mean arm circumference and reduced morbidity. However, there were varied results regarding the effects of the intervention on the nutrition status of children.

Conclusion

This systematic review provides additional evidence that community-based nutrition education is effective in improving the nutrition status of under-five children in developing countries. However, with only seven studies caution should be applied as a conclusion cannot be drawn from this review.

Is Using Multiple Imputation Better than Complete Case Analysis of Missing Binary Outcome Data In Randomized Trials?

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Introduction

The potentially major impact of missing observations on the ability to make causal inferences from epidemiological and clinical trials is well recognized. Complete case (CC) analysis is a common approach for analyzing incomplete data. This substantially simplifies the analytical process, but it reduces the sample size available for analysis, thereby reducing the statistical efficiency of group effect comparisons. Furthermore, the comparisons may be seriously biased, and hence any inferences drawn may not be generalisable. The study aimed at comparing the performance of Multiple Imputation (MI) with complete case analysis methods for bias and coverage in datasets with missing binary outcomes from randomized studies.

Methods

Using statistical simulations, we compared the performance of MI and CC analysis methods to handle missing binary outcome data. The parameters used in the simulations were based on a real historical randomized study. Data was generated to be missing at random. The outcome of interest was risk difference which is a commonly used measure of effect by clinical researchers. We also compared the methods when both group proportions are close to a boundary (i.e. success rates close to 100%), which often results in model failure.

Results

Both CC and MI (with group included in the imputation) yielded unbiased estimates with similar precision levels of approximately 95% coverage for missing levels of up to 30%. When both group proportions were close to the boundary, CC analysis and MI still produced unbiased estimates and had similar coverage of approximately 94%.

Conclusions

When some outcome data are missing, CC analyses are at least as unbiased as MI and they have similar coverage. MI performs well only when the correct imputation model is used, rendering it less robust than the CC analysis approaches.
Assessing factors that affect access and use of health care services by people with disabilities: a case study of Zomba district.

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Introduction
The study aimed at establishing factors that affect access and usage of health care services by people with disabilities.

Methods
This study was carried out in T/A Malemia in Zomba district. We used both qualitative and quantitative methods of research. We used purposive and simple random sampling to draw a total sample of 60 comprising of 40 people with disabilities and 20 health care personnel.

Results
80% of people with disabilities reported health care services are not accessible to them as they are located far from them which is compounded by difficulties of transportation. 50% of people with disability reported various challenges with usage of health care services which included; prejudices by both health professionals and fellow patients, lack of appropriate medications and specialized personnel and departments. While health care professionals 40% stated that lack of specialized training makes them feel uncomfortable to attend to people with disabilities while 60% of them felt they attend to people with disability with promptness but that sometimes they lack appropriate medication while a few reported that people with disabilities as “problem” patients in hospitals because they demand a lot.

Conclusion and Recommendations
People with disabilities face enormous challenges as regards to access and use of health care services. The challenges range from long distances to a health facility, poor transport, stigma held by health professionals and lack of specialized departments and professionals. While we recommend a bigger research with a countrywide representative sample, we however feels government with its stakeholders should train specialized personnel, build more specialized units in rural areas so that people with disabilities can access quality health care.

ART treatment delays are shortening with rapid scale up: an analysis of eight years of programmatic outcomes in Blantyre, Malawi

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Introduction
Impressive achievements have been made towards achieving universal coverage of antiretroviral therapy (ART) in sub-Saharan Africa. However, the effects of rapid ART scale-up on treatment delays have not been well described.

Methods
A retrospective cohort study covering eight years of ART initiators was conducted at Queen Elizabeth Central Hospital (QECH) in Blantyre, Malawi. Routinely collected data were extracted from the electronic monitoring system of the ART clinic. The time between most recent positive HIV test and ART initiation was calculated and temporal trends in delay to initiation were described. Factors associated with time to initiation were investigated using multivariate regression analysis.

Results
From 2004-2011, there were 12,771 new ART initiations at QECH (57% female; 11% children [0-10 years] and 5% adolescents [10-20 years]). Male initiators were likely to have more advanced HIV infection at initiation than female initiators (69% vs. 63% in WHO stage 3 or 4). There were declines in treatment delay over time; in 2005 the longest mean delay was observed (75.0 days) and in 2011 the shortest (34.5 days). CD4 count <50 cells/ul (adjusted geometric means ratio [aGMR]: 0.57, 95% CI: 0.45-0.73) was associated with shorter ART treatment delay. Women (aGMR: 1.11, 95% CI: 1.02-1.21), children (aGMR: 1.20, 95% CI: 1.01-44) and patients diagnosed with HIV at a site outside QECH (aGMR: 1.52, 95% CI: 1.38-1.67) experienced longer delays.

Conclusion and Recommendations
Sustained rates of low ART treatment delay during rapid scale-up that appear to shorten over time, suggest that universal access to ART can be achieved using the public health approach. However, the longer delays for women, children and patients diagnosed at outlying sites emphasises the need for targeted interventions to support equitable access for these groups.
Comparison between ordered multinomial logit and bayesian ordered probit models in estimating risk factors for motor vehicle accidents in Malawi

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Introduction
Road accidents are a threat to lives of productive citizens of many countries. In Malawi, road accidents have been attributed to a number of causes amongst which include human, adverse environmental and physical factors. Efforts to reduce severe road accidents by addressing such factors have been done, however, more safety studies aimed at identifying risk factors associated with severity of road accidents are recommended. In addition, detailed statistical analysis of road safety studies are required to replace the extensively used simple statistical analysis tools such as frequencies and chi-square for meaningful inference. The study was aimed at demonstrating analysis of accidents data using statistical modelling approaches. It employed Ordered Probit (OP) and ordered Multinomial Logit (MNL) models.

The study was based on a 1993 to 2007 motor vehicle accident dataset collected by the National Road Safety Council of Malawi. Models were fitted using variables that passed a Pearson chi-square test of association at a 0.05 significance level with a response variable accident severity. Categories of accident severity include fatal, serious and minor in that order. Parameter estimates from both models were used to identify risk factors associated with severity of accidents. Model estimates from BOP and OMNL were also compared using DIC and AIC criterion to identify a better model explaining the data.

Results
The results showed that BOP produced better estimates. Physical variables of lighting condition of the day, driving in dry weather and road conditions, and driving in straight roads were observed to significantly increase probability of an accident severity ($P < 0.05$ and CI((-0.578167, 0.739572), (0.0030842, 0.1210447), (-0.170252, 0.870271) respectively)).

Conclusion
The results therefore suggest that driving carelessly in conditions stipulated by the significant physical variables contribute to increased incidents of severe accidents. Drunk driving and risk taking behaviours were the main risk behaviours identified in the study.

Lived Experiences of Stigma and Discrimination of HIV Positive Mothers Participating in Prevention of Mother to Child Transmission (PMTCT) Program in Three Health Facilities in Blantyre

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Introduction
The objective of the study was to explore lived experiences of stigma and discrimination of HIV positive mothers participating in Prevention of Mother to Child Transmission Program in three health facilities in Blantyre district.

Methods
The study adopted a qualitative approach. A phenomenological research design was used to describe the experiences. In depth interviews were held with 10 HIV+ women from Queen Elizabeth Central Hospital, Mlambe hospital and Mpemba health centre.

Results
Results showed that the mothers were stigmatised and discriminated as they chose feeding options, as they disclosed their status to their husbands and relatives, when people lacked knowledge about PMTCT issues and as they intended to marry and have children. Furthermore, their children shared the stigma and discrimination.

Conclusion
The study confirmed that mothers were stigmatised and discriminated because of participating in PMTCT program especially through feeding options, revealing their status to their husbands and relatives, because the community lacked knowledge on PMTCT and as they intended to marry and have children. The worst thing was that the community also stigmatised children belonging to these mothers.

Preliminary findings of a prevalence survey of gestational diabetes in urban Blantyre

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Introduction
Gestational diabetes mellitus (GDM) is associated with worse maternal and fetal outcomes, including pre-eclampsia, macrosomia and increased risk of developing diabetes for the fetus. Risk factors include advanced maternal age, multiparity, obesity, family history of diabetes and being black. The reported prevalence in African countries are 0-11%. The prevalence of GDM in Malawi is not known. The aim of the study was to determine the prevalence of GDM in women attending antenatal clinics at a central hospital and urban health centres in Blantyre, Malawi.

Methods
Since 1st June 2012, consecutive women presenting for initial or follow-up ante-natal visits at Queen Elizabeth Central Hospital (QECH) and Chilomoni Health Centre were consented to have a screening random blood glucose (RBG), with the intention of doing an oral glucose tolerance test (OGTT) for those with RBG > 200mg/dL.

Results
593 women have been screened (QECH n=244, Chilomoni n=349). Mean age 25.6 years (range 14 -41 years), mean gestational age 29 weeks (range 4 – 41weeks), 76.7% were in third trimester. Reported risk factors included gestational age 29 weeks, obesity (MUAC > 31), none were obese (MUAC > 32 cm). 20.4% reported poor outcomes in previous pregnancies. Mean RBG was 93.1mg/dL and the highest RBG in any subject was160 mg/dL.

Conclusion and Recommendations
So far, using RBG as a screening tool, no suspected cases of GDM have been identified, even in women with risk factors present. This may reflect the rarity of the condition, poor
Community engagement in HIV self-testing: community responses to the HITTB intervention

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Introduction
The study set out to evaluate a community liaison system through: 1) exploration of community responses to the introduction of HIV self-testing using an informal reporting system to optimise dialogue between researchers and communities and 2) monitoring of safety through mortality reporting.

Methods
A community liaison system was established to feedback community concerns regarding the HITTB HIV self-testing intervention. 28 community clusters elected 112 cluster representatives with secondary roles as key informants reporting on mortality and TB suspects. Six monthly participatory workshops are conducted with cluster representatives to review community concerns and develop appropriate responses.

Results
The community liaison system provided informal access to community-based concerns. By May 2012 (3 months into the trial) 362 issues were raised by 159 individuals in control and intervention clusters. Of these 50% were from Ndirande, 20% from Chilomoni and 30% from Likhubula ward. More women raised concerns than men (48% versus 28% of all concerns) whilst mixed groups discussed 24% of issues.

Main concerns related to lack of availability of self-testing (40%), suggesting a strong community preference for access to self-testing. Gender related issues around decision-making and choice was the second most frequent issue (20%) followed by varying statements concerning approval of self-testing (17%). Additional concerns included misunderstandings of ongoing care pathways, about the reason for the trial and some suspicions of witchcraft. The reliability of saliva versus blood-based tests and issues of confidentiality were also raised. 36 deaths had been reported during the same period.

Conclusion
An informal community liaison system is a vital component of community-based health interventions to optimise community engagement and monitor responses to the trial. Self-testing is likely to provide a popular addition to HIV testing opportunities.

Recommendation
This model should be replicated to encourage dialogue in other community-based studies. Concerns should be addressed before HIV self-testing becomes widely available. Careful attention should be paid to community gender dynamics to minimise potential harms.

Assessing the causes and determinants of perinatal mortality at Kamuzu Central Hospital in Lilongwe, Malawi.

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Introduction
The study aimed at assessing the associations with perinatal mortality (PNM) among women delivering at Kamuzu central hospital (KCH) in Lilongwe, Malawi

Methods
Retrospective data review of patients’ files on deliveries which occurred from 1st July 2010 to 30th June 2011. Data were entered on Microsoft Access and analysed using STATA 11.0. Pearson’s Chisquare, Fisher’s exact tests, Univariable and Multivariable Logistic Regression Analyses were used to describe the association of risk factors with PNM. All statistical tests were conducted at 95% confidence level. Adjusted odds ratio (AOR) was used to describe the strength of an association.

Results
A total of 2, 294 deliveries were analyzed. Perinatal mortality rate (PNMR) was 58.4 per 1000 births. Half of early neonatal deaths were caused by prematurity (n=12) while 21% were caused by asphyxia (n=7). The factors that were independently associated with PNM were living in semi-urban areas compared to urban areas (AOR: 22.83, CI: 4.40-118.45), birth weight between 1000g and 1499g compared to birth weight of ≥2500g (AOR: 14.87, CI: 4.45-49.77), parity of 2 and parity of ≥5 compared to parity of 1 (parity 2:AOR: 2.12, CI: 1.35-3.29, parity ≥5:AOR: 5.51, CI: 1.54-19.68), breech and caesarean section (C/S) deliveries compared to normal deliveries (breech: AOR: 5.30, CI: 2.16-13.0, C/S: AOR: 1.80, CI: 1.15-2.81) and Apgar score of 1-3 compared to Apgar score of 4-6 (AOR: 23.09, CI: 1.62-329.97).

Conclusion and Recommendations
KCH has a high PNMR which is more than national average. The high rate could be attributed to complicated cases handled by the hospital which are referred from other facilities. Therefore, improving health workers’ skills in recognition of foetal problems during labour, family planning and perinatal care resource allocation coupled with good referral systems and timely interventions can help to reduce PNM at KCH.
Health workers’ perspective on use and documentation on partograph in two urban hospitals in Lilongwe, Malawi.

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Introduction

At Bwaila and Ethel Mutharika Maternity units in Lilongwe, one woman dies every month from child birth complications. Most of these complications are unpredictable but preventable by correct use of partograph. Partograph is an effective tool in detecting abnormal labour. If correctly used, timely interventions can be instituted hence morbidity and mortality of mother and baby can be reduced.

The objectives of the study were to assess the extent of the utilisation of partograph in the two units and to explore factors enhancing and inhibiting the correct use of the partograph.

Methods

A mixed method study was conducted from July –December 2011. Retrospective partograph review was conducted, followed by focus group discussions with nurse midwives and individual interviews with nurse midwives and clinicians working in Labour and Postnatal wards at the two units. Partograph reviews were analysed in SPSS version 18.0 and descriptive statistics were run while FGD and interviews were analysed using content analysis.

Results

Findings showed that the partograph was not properly used. Only 18 (4%) of 464 labour charts had information on all sections of the labour chart correctly filled in. Less than 5% charts had information correctly filled in on each parameter of the three components on the partograph. The improper utilisation of the partograph was attributed to shortage of staff, negligence, staff not appreciating the importance of partograph, skill incompetence, lack of supportive supervision and lack of motivation among staff. Among the enhancers to partograph use was uninterrupted supplies of partograph papers and all health workers had formal training in the midwifery and obstetric care.

Conclusion and Recommendations

The partograph is sub optimally used at the two units; therefore, health workers are unable to detect problems in the mother and baby during labour. Problems are missed or detected late because of inconsistent use of the partograph. Supervision should be strengthened. Nurse midwives should be provided with refresher training in correct and consistent use of partograph.

Together in sexual and reproductive health (SRH) rights: a policy and strategies analysis on men’s involvement in promoting women’s SRH rights in Malawi

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Introduction

By 2010, 807 of 100,000 maternal mortality rates (MMR) were being registered at national level in Malawi. Despite efforts, Malawi is still grappling with high Maternal/Neonatal Deaths (MND). Close to 60% of women in Malawi are in marriage. However, these married women’s enjoyment of Family Planning, Maternal and Neonatal (FPMN) health rights which could reduce MND continue to be under threat because no effective policy and strategies exist on male involvement in their wives’ SRH rights.

The study aimed at exploring the impact that promoting male involvement at policy and strategies level shall have on women’s exercise of FPMN health right.

Methods

The study targeted married women and men in Nsanje and Thyolo districts, Malawi. Approached qualitatively the study was informed by the grounded theory coupled with a review of FPMN policies and strategies. Key Informants [n=27 (Females=15, Males=12)] and community members [n=63 (Females=36, Males=27)] were involved in focus group discussion, participant observation and interviews. Content analysis was used to come up with themes from the data sets.

Results

The study found that Ministry of health (MoH) policy and strategies on FPMN health as SRH rights are women centered and this is in conflict with marriage’s shared responsibility standard. It was found that men are largely decision makers on SRH issues yet they are being sidelined in the women centered strategies. This is negatively impacting on women’s FPMN health right enjoyment. The study also found that men are willing to be involved in their wives FPMN health issues.

Conclusion

The study established that through male involvement in their wives FPMN health, the high MND rates in Malawi could be reduced. It is recommended that men’s willingness to participate should be capitalized on and hence MoH and other partners need to equip men with information and skills.
Part of solution: men’s willingness to be involved in their wives family planning; maternal and neonatal health in Malawi

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Introduction

Sexual and Reproductive Health (SRH) has been recognized as a component of overall health throughout the life cycle for both men and women. In Malawi, it is often assumed that men are not willing to be involved in their wives SRH. The aim of this study was to find out if men are willing and ready to be involved in their wives` SRH if policy and strategies are practically inclusive.

Methods

Target population was married men and women in Nsanje and Thyolo districts. Approached qualitatively the study was informed by the grounded theory coupled with a desk review. Key Informants [N=27 (F=15, M=12)] and community members [N=63 (F=36, M=27)] participated in Focus Group Discussions, participant observation and interviews. Content analysis was used to come up with themes from the data sets.

Results

The study found that men are willing to be involved in their wives’ Family Planing (FP) Maternal and Neonatal (MN) health despite the continued Ministry of health (MoH) women centered policy and strategies in dealing with MN health issues in Malawi. There is lack of deliberate engagement with men on the practical involvement expected of them as information is usually women centered. The study found that men can be involved in supporting wives’ FP choices, usage and seeking alternative FP methods. Men are ready to be part of the wife’s Anti Natal Clinic (ANC) visits, knowledge of danger signs, meeting needs like blood donation arrangement, transport provision, arrange for competent providers, even on supporting wife on Anti-Retroviral Therapy (ART). Men can support nutritional needs of wives before and after delivery, help in baby nursing among others.

Conclusion

The study established that men are willing to be involved in their wives’ FPMN health. It is recommended that men’s willingness to participate should be capitalized and hence MoH and other partners need to equip men with practical information and skills on the level of their involvement as through this, the high MN death rates in Malawi may be reduced.

Extended monitoring and evaluation of registering tuberculosis patients in Blantyre

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Introduction

TB remains a major public health problem worldwide. In 2011, 5.8 million cases of TB were notified to national TB programmes (NTPs). The targets set by the Stop TB Partnership to demonstrate reduction in TB incidence and to halve the 1990 TB prevalence and mortality by 2015, show world commitment to deal with the problem. Effective electronic monitoring and evaluation (M&E) systems are important to keep track of the progress towards the targets. NTPs in low resource settings still rely on paper based M&E systems and have challenges in achieving microbiological ascertainment of TB cases due to inadequate laboratory services.

The aim of the study was to establish electronic registration of TB patients, including routine culture, in order to allow reporting of trends in sub-district case notification rates (CNR) and to better define burden of TB in patients registering for TB treatment. The study was done at TB registration centres in Urban Blantyre, and households in 3 residential suburbs (Ndirande, Likhubula and Chilomoni)

Methods

An extended monitoring and evaluation system was developed in collaboration with Blantyre District Health Office. One sputum specimen was collected for culture from all registering TB patients. Culture request forms captured all fields in the paper-based TB register. Fields were added to the form to provide sub-district location. Data were entered into an electronic TB register. Population size and demography were estimated from household enumeration in the 3 target suburbs that included 40,756 individuals, and from the 2008 National census.

Results

Target suburbs had an adult population of 108,000, and HIV prevalence of 18.5%. In a 12 month period (2011/12), 958 adult TB patients were registered; of whom 699 (73.0%) were HIV positive. Adult TB case notification rate (CNR) was 887 per 100,000 overall; 3,497 per 100,000 for HIV-positive adults, and 295 per 100,000 for HIV-negative adults (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3). CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).CNRs were highest in the 30 to 34 year old age group (1,220 (incidence rate ratio for HIV 11.9; 95% CI 10.5 to 13.3).
Conclusion
There are high TB case-notifications in adults living in suburbs of Blantyre, with over 1% of middle-aged and older adults treated for TB each year. There is need for intensified TB control efforts and better understanding of the drivers of TB transmission in these communities.

High sensitivity detection of trypanosomes in tsetse flies from Liwonde National Park
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Introduction
Human Africa Trypanosomiasis (HAT) (Sleeping Sickness) is caused by trypanosomes (tryps) and transmitted by tsetse flies. Control of HAT depends on accurate diagnosis of these parasites followed by a proper treatment of infected patients. The challenge however, is the unavailability of highly sensitive tests that would detect tryps even in low parasitaemias in humans. RIME LAMP stands for loop mediated isothermal amplification (LAMP) and have six highly sensitive primers designed from a repetitive insertion mobile element (RIME) of the known DNA sequences of the sub-genus Trypanozoon. The objective of the study was to evaluate the sensitivity of RIME LAMP technique for the detection tryps in tsetse flies.

Methods
280 live tsetse flies were dissected and their mid-guts collected into 56 vials of five mid-guts each. We screened for tryps in the mid-guts by microscopy. DNAs were extracted from the pooled samples using Qiagen DNA extraction Kit and screened for tryps using conventional PCR and RIME LAMP techniques. The LAMP assays were performed at 60o Celsius for 60 minutes in a water bath. Positive samples were visualized by addition of SYBER Green 1 to LAMP products and by gel electrophoresis.

Results
Out of the 56 field samples analyzed, 44 were positive for tryps through RIME LAMP assay whereas no positive result was detected from both parasitology and conventional PCR analyses. We also managed to identify four species in Liwonde: Trypanosoma congolense savannah (T.c.s); T. e. kilifi, Trypanosoma brucei (T.b) and T. vivax.

Conclusion and Recommendation
We conclude that RIME LAMP is very sensitive than parasitology and conventional PCR. We recommend that this exercise be carried out in all our game reserves in order to identify areas a high risk of HAT so that proper measures are taken for its eradication.

Masculinity, healthcare care-seeking, and tuberculosis prevention in Blantyre, Malawi
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Conclusion and Recommendations
Access to care services in Malawi may be hampered by challenges that make them inconvenient for men to utilise. Health systems may be unresponsive to men's circumstances in the way that they are organized. Re-organisation of patient flow management at facilities, introduction of concepts concerning patient rights and gender-specific sensitivities, work-life balance policies that free men's time for health matters, and community initiatives that permit both women and men greater opportunities for income generation may all facilitate enhanced healthcare seeking by men.
Lablite: Baseline Mapping Survey of Decentralized ART Service Provision in Malawi

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Introduction

Malawi is one of three countries within the Lablite project, which aims to support effective decentralised ART roll-out in Africa.

Methods

The Lablite project started with a baseline survey of ≥20 health facilities selected in Malawi, Uganda and Zimbabwe, representing different regions and facility levels. The survey started in October 2011, aiming to describe ART delivery. Data was collected using a questionnaire. Here we present the Malawi data.

Results

By March 2012, the survey had been completed in 21 facilities (18 primary care facilities, 2 secondary care facilities and 1 tertiary facility); in Phalombe (14), Lilongwe (4) and Chitipa (3). Most facilities were rural/peri-urban (15/18 primary, 1/2 secondary). Primary care facilities served a median (range) population of 29,275 (10,842–1,897,168); urban primary care facilities served larger populations; secondary care facilities served populations of 29,721 and 50,015.

Primary care facilities were staffed predominantly by nurses/midwives (mean (range) 4.1 (0-16) per facility) and health surveillance assistants (mean (range) 16 (0-31) per facility). All facilities provided HTC, all but 1 provided CPT and PMTCT, and 13/21 facilities provided ART (10/18 primary care, including 1 Lighthouse clinic). In primary care facilities, stock outs of HIV test kits and CPT in July, August, September 2011 occurred in 10/17 and 12/17 facilities respectively. In facilities providing ART, the number of patients on ART was median (range) 364 (87-9,600) in primary care, 2,438 and 4,860 in secondary care, 17,453 in tertiary care.

Children on ART constituted 6%, 9% and 4% of ART patients in primary, secondary and tertiary facilities respectively. Stock-outs of ART for adults, children and PMTCT occurred in 1/13, 2/13 and 5/20 facilities. 5/13 facilities had on-site CD4 testing. CD4 was used for ART initiation in 7/13 facilities, often in selected patients with 4/13 using post-ART CD4s if clinically indicated. 2/13 facilities (both in Lilongwe) had viral load available.

Conclusions

ART roll-out is well underway in Malawi, with evidence supporting task-shifting in primary care. There is need to strengthen supply chain management systems for HIV-test kits and drugs.

Shifting art service provision: health care workers’ experience and challenges in Malawi and Zimbabwe

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Introduction

In the context of the decentralisation of ART services in Sub-Saharan Africa, health care workers (HCWs) face new challenges linked to the availability of resources and training. A qualitative baseline study was conducted as part of a large implementation study (Lablite) which aims to evaluate strategies to optimise clinical management of ART and minimise routine laboratory monitoring to support ART decentralisation in Malawi and Zimbabwe.

Methods

Focus group discussions (n=41) were conducted with HCWs from 14/19 health facilities in Malawi/Zimbabwe respectively. Participants were regularly delivering ART and included different HCWs cadre levels. Using a focus group guide, discussions explored issues related to work conditions, training, perception of care, and overall satisfaction with current ART service provision.

Results

Strong similarities were found between experiences of HCWs in Malawi and Zimbabwe. The introduction of ART services was perceived as having increased HCWs’ workloads; challenges, including low salaries, long working hours, inadequate equipment, staff shortages and drug stock outs, contributed to lowering staff morale and job satisfaction. In Malawi, lack of HIV-test kits was perceived to put HCWs at risk of HIV transmission (HCWs unable to check patients’ serostatus); in Zimbabwe, poor infrastructure compromised confidentiality and quality of care. In both countries, HCWs associated training opportunities with enhanced professional status; they identified the need for focused training on ART provision which should be made available more equitably, with opportunities provided at all levels and not just to senior personnel.
Conclusion
Providing novel and equal opportunities for HCWs’ training focused on ART delivery may improve service provision, HCWs’ morale and overall job satisfaction, and contribute to raising the perceived level of professional status of HCWs involved in delivering ART in Zimbabwe and Malawi. Further investigation, as part of the Lablite implementation study, will examine the perceived challenges of HCWs in relation to training and ART service provision.

Demand for male medical circumcision
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Introduction
Three randomized control trials have found that medical male circumcision reduces the likelihood of contracting HIV for men by up to 60 percent. Given these findings, the WHO and UNAIDS called for scale-up of voluntary medical male circumcision to 80 percent coverage in priority countries. To reach this goal Malawi would need to circumcise over 2 million men by 2015. The objectives of the study were: 1) To quantify the actual demand for voluntary medical male circumcision; 2) To identify which types of men are most likely to voluntarily become circumcised; 3) To estimate the willingness to pay by randomly varying the price of circumcision; and 4) To apply the findings to cost-benefit calculations of male circumcision scale-up.

Methods
A baseline survey was conducted in Lilongwe among a representative sample of 1,600 uncircumcised adult men. At the end of the survey, each respondent received a voucher for a subsidized male circumcision at the local partner clinic with the amounts of the vouchers randomly assigned. Data from the clinic were collected and follow-up interviews conducted one year later indicating whether men received male circumcision.

Results
Demand ranged from 3.3 to 8.9 percent from clinic and self-reported data. The subsidy had a significant effect on the medical male circumcision: decreasing the price from 900MKW ($6) to 50MKW ($0.30) increased the probability of circumcision by 5.3 percentage points. Men who at baseline either abstained from sex or who used a condom during their last sexual encounter were significantly more likely to get circumcised. Our results imply 61 percent fewer infections averted and a 42 percent increase in net costs per HIV infection averted during the 5 year scale-up processes compared to previous estimates of a full scale-up to 80 percent circumcision.

Conclusion and Recommendations
Simply providing free medical male circumcisions was not enough to generate sufficiently high demand that would induce significant population level benefits. Medical male circumcision attracts men with a propensity to protect themselves. Because the first-adopters of male circumcision are those who face the least risk of HIV infection, the estimated benefits of scaling-up male circumcision will not be realized until a majority of men at high risk of HIV are circumcised. How to incentivize high risk adult men in endemic areas to get circumcised is an important question for future research.

“We are doing these things in an underground way”: structural barriers to HIV prevention and service utilization among MSM in Malawi

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Introduction
Approximately 21% of men who have sex with men (MSM) in Malawi are living with HIV. We previously reported that only 35.2% had ever been tested for HIV and 17.5% avoided seeking health services. To develop a combination HIV prevention intervention program for MSM in Malawi, we conducted qualitative research to assess barriers and facilitators to HIV prevention for MSM and solicit input into the development of intervention options.

Methods
Qualitative themes were drawn from 13 interviews conducted in May 2011 among MSM, irrespective of sexual identity. Interviews were conducted by a local community-based NGO that provides services for MSM.

Results
Participants reported that sexuality and same-sex practices were often hidden; disclosure fears were related to concern of unintentional disclosure to others and/or expectations of social or family rejection. MSM diagnosed with HIV are at greater risk for stigma and marginalization and blamed for infection. Stigma and rejection were attributed to criminalization of homosexuality and recent religious and public displays of homophobic sentiment. The hidden nature of same sex practices was linked to high risk practices, transactional sex, inconsistent condom use, and reduced care seeking for STIs related to anal sex. HIV prevention messaging targets heterosexual relationships, creating the perception that MSM are not at risk for HIV.

The overwhelming response among participants, when asked how barriers could be removed for MSM, was that policy change to decriminalize homosexuality would mitigate barriers to disclosure and access to services.

Conclusion
Male-male relationships are criminalized in Malawi, punishable by imprisonment; thus, MSM are at greater risk for HIV transmission due to hidden nature of sexual practices and reduced health seeking behaviors. While structural change may not occur rapidly, HIV prevention programs can quickly address HIV risks for MSM within such contexts, targeting low HIV risk awareness through messaging; ensuring confidentiality; and strengthening health worker knowledge of health risks/care for MSM.
The quality of uncomplicated malaria case management in Malawi—findings from national health facility survey

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Introduction
Prompt and effective case management of uncomplicated malaria with artemesinin-based combination therapy (ACT) is a cornerstone of malaria control and is important for preventing progression to severe disease and death. Patients seeking care must be appropriately assessed, diagnosed, and treated for malaria. We conducted a nationally representative survey of public health facilities in Malawi to examine malaria case management quality and assess factors related to correct treatment.

Methods
A total of 107 public health centers and hospitals were sampled in all 29 districts of Malawi in April–May 2011, during peak transmission. At these facilities, 2,019 patients seeking curative care at outpatient departments were interviewed after their consultation. Blood smears were taken and later double-read by experienced microscopists. Bivariate and multivariate logistic regression analysis was used to examine factors associated with correct malaria treatment.

Results
Thirty-four percent of all patients presenting to outpatient departments in Malawi had malaria (positive exit interview blood smear and fever/history of fever), including 46% of children <5 years and 27% of patients 5+ years (p<0.001).
Only 67% of patients with malaria were prescribed an ACT. Among patients with malaria, only 73% were diagnosed by clinicians with malaria; 6% were diagnosed with malaria but not prescribed ACTs. Clinicians did not assess fever/history of fever in 27% of all patients.
Microscopy was functional at only 24% of sampled facilities, and RDTs were not yet available. Among patients without malaria, 31% were nevertheless prescribed an ACT. Only patient-level factors, including high temperature, spontaneous complaint of fever, and no complaint of cough, were significantly related to correct malaria treatment, but no health worker- or health facility-level factors, including ACT stocks or availability of microscopy, were associated with the outcome in multivariate logistic regression modeling.

Conclusion and Recommendation
Malawi has a high burden of uncomplicated malaria, as more than one-third of patients at public facilities have malaria. Nearly one-third of patients with malaria do not receive effective treatment. At the same time, overtreatment of malaria is common. Improved assessment of fever in patients is critical, especially as rapid diagnostic tests are rolled out in Malawi, to ensure that patients are systematically tested for malaria and treated accordingly.

Risky quality compromises in the sourcing, preparation, storage and dosing of traditional medicine as practised by local people in Zomba, Malawi.

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Introduction
About 80% of the developing countries’ population relies on traditional Medicine for their primary healthcare. It is based on approaches and beliefs that incorporate plant, animal and spiritual therapies among others. Its practices are cheap, usually decided and done at a house-hold or an individual’s level. The study aimed at assessing common life threatening practices that could compromise quality from handling to administration of traditional medicine in Zomba district.

Methods
Research methods used were participant observation and semi-structured interviews between November 2011 and May 2012. A total of 25 traditional medicine practitioners were involved where 10 were herbalists and 15 were home-made traditional medicine practitioners. 7 herbalists were involved in the participant observation and semi-structured interviews while 3 herbalists and 15 home-medicine practitioners took part in the interviews and quasi-statistics were used to analyze data.

Results
Medicinal plants and tools are sourced from any place. 16 practitioners clean their starting plant material. The tools used are the same used in their daily kitchen work. Water used is not pretreated in any way. Eight consented to the possibility of newer illnesses to patients resulting from uncleanliness of utensils. Variations extended from sourcing through preparation, storage containers and forms, duration and dosage administration. Solid forms are stored at a maximum of 4 months while for liquids, 5 days. Some patients still use stale liquids based on beliefs.

Conclusion and Recommendation
There are no standard operating procedures laid down in the general practice of traditional medicine and everyone does as they please. Lack of proper quality assurance measures risk contaminating and overdosing patients with particular chemical constituents hence complicating existing health problems. There is need for realistic mandatory policies that should be laid down and enforced on all traditional medicine practitioners to adhere to standard ethically and chemically approved procedures (SOPs) to save lives.
Spatial modelling of perinatal mortality in Mchinji district.

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Introduction
The main aim of the study was to quantify small-scale geographical variations in perinatal mortality, and estimating risk factors associated with perinatal mortality in Mchinji, Malawi.

Methods
The study modeled the binary of infant’s dying in the first 7 days of life, hence logistic regression approach was appropriate to quantify the effects of the risk factors. The Bayesian STAR modeling approach was applied to account for the influence of both individual and contextual factors on perinatal mortality and jointly accounting for the nonlinear effects of continuous covariates, spatially structured variation, unstructured heterogeneity and fixed effects. Socio-demographic and delivery factors were considered in the study. Modelling and inference used the fully and empirical Bayesian approaches. The methodology was applied to analyze the prevalence and risk factors of perinatal mortality, using data from 2005 to 2010 collected by MaiMwana project in Mchinji district in Malawi.

The number of subjects considered for analysis is 7,834. The estimates of the fixed effects are: sleeping under insecticide treated net (OR = 0.75, CI: 0.61, 0.94); previous pregnancy (OR = 0.55, CI: 0.39, 0.78); first ANC visit in first trimester (OR = 2.67, CI: 1.42, 5.06); first ANC visit in second trimester (OR = 1.95, CI: 1.05, 3.48); blood pressure test (OR = 0.53, CI: 0.40,0.70); blood sample test (OR = 1.65, CI: 1.18, 2.23); syphilis test (OR = 0.58, CI: 0.38, 0.82); pregnancy danger signs advice (OR = 0.20, CI: 0.15, 0.27); receiving Tetanus Toxoid Vaccination (OR = 2.60, CI: 1.65, 2.10); malaria prophylaxis (OR = 1.59, CI: 1.10, 2.30); skilled birth attendant (OR = 0.74, CI: 0.58,0.95); normal labour duration (OR = 0.38, CI: 0.28, 0.49); gestation period of at least 9 months (OR =0.09, CI: 0.07, 0.11); and normal delivery through birth canal (OR = 0.19, CI: 0.13, 0.28).

Results
Perinatals from mothers with the age range of 24 to 40 years had reduced prevalence of dying whereas those from mothers with the age of less than 24 years and greater than 40 years were associated with higher prevalence of dying. After accounting for all significant covariates, high perinatal mortality (OR ≥ 1) was observed in zones close to Mchinji Boma and some eastern part of the district whereas low perinatal mortality (OR ≥ 1) was observed in zones located in the central and western parts of the district.

Conclusion and Recommendations
The findings of the study have shown that modelling fixed effects only using generalized linear models cannot produce satisfactory results as evidenced from the DIC values, theSTAR model had the DIC value of 1755.51 whereas the GLM had 1782.28. The challenge to minimize perinatal mortality requires addressing the unmeasured covariates if we are to come up with effective interventions as a nation.

Community home based care; potential tool for promotion of PMTCT and other reproductive health interventions
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Introduction
The study assessed the potential of Community Home Based Care (CHBC) as a tool in the promotion of Prevention of Mother to Child Transmission of HIV (PMTCT) and other reproductive health interventions.

Methods
The study was a retrospective study using routinely collected patient data from the Bangwe Home Based Care Project, Blantyre, Malawi. A total of 714 patient records were reviewed using a proforma.

Results
The majority (76.2%) of patients entering the project were in the reproductive age group (15-49), and 58.4% were female. 6.1% of the females were pregnant at entry into the home based care programme. No data was collected concerning pregnancy on follow up visits.

On entry into the programme, only 52.3% of patients had had an HIV test and of those who had not been tested, 82% did not want an HIV test. No assessment of the patient’s family planning needs was recorded in the patients’ charts.

Conclusions and Recommendations
Home Based Care has the potential to opportunistically meet the need for PMTCT or referral to a PMTCT clinic, need for family planning methods, as well as the need for opt-out VCT.

It creates the opportunity to meet multiple patient needs whether in a single visit or through referral, thereby increasing uptake of reproductive health interventions by PLWHA. Home based Care in Malawi needs to consider assessing and meeting patients’ sexual and reproductive health needs such as need for PMTCT, family planning, prevention and treatment of STIs, VCT, and cervical cancer screening.

Changing clinical needs of people living with aids and receiving home based care in Malawi— the Bangwe home based care project 2003-2008—a descriptive study.
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Introduction
Home based care (HBC) has been an important component of the response to the AIDS epidemic in Africa, and
particularly so before antiretroviral therapy (ART) became available. Home based care is thought to become unnecessary now that ART is available in many African countries. The objective of the study was to assess the changing need for comprehensive HBC as an ART programme becomes available.

Methods

Information obtained at initial assessment and follow up visits of patients receiving HBC were combined to assess case severity, survival and the response to treatment. This information was used to assess trends in mortality and the incidence, duration and severity of common symptoms over a six year period in a defined urban population in Malawi.

Results

1266 patients, of whom 1190 were followed up and of whom 652 (55%) died, were studied. 282 (25%) patients died within two months of being first seen with an improvement between 2003-2005 and 2006-2008 of reduced mortality from 28% to 20%. 341 (27%) patients were unable to care for themselves on first assessment and 675 (53%) had stage 4 AIDS disease.

Most patients had a mix of symptoms at presentation. There were significant barriers to accessing ART with 156 (51%) of 304 stage 3 or 4 patients first assessed in 2007 or 2008 not receiving ART. Over the six year period new HBC cases reduced by 8% and follow up visits increased by 9% a year.

Conclusions

Since the availability of ART in the local health facilities the need for HBC services had not changed much. In terms of quantity of care the number of new patients seeking HBC reduced by 8% a year.

In terms of content of care, while there had been a marginal increase in self-care the severity of illness had not changed and the survival of a significant proportion of patients generated the need for repeat visits, which increased by 9% a year. In conclusion, although the content has changed the need for HBC has not diminished despite the availability of ART.

Knowledge, attitude and treatment preferences for presumptive signs of neonatal sepsis in Ntchisi district

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Introduction

The study assessed knowledge levels, attitude and treatment preferences for presumptive signs of neonatal sepsis in Ntchisi district, describe socio–economic and cultural factors influencing treatment preferences for the condition.

Methods

The study took place in Chinguluwe and Nkhunzi Health Centers and communities surrounding them.

Data was collected through individual interviews with 247 randomly selected women who had given birth within the past year and attending immunization clinic, key informant interviews with Traditional Birth Attendants and health service providers. Hyper or hypothermia, refusing to breast feed, overly sleepy, paleness etc. was used as presumptive signs of neonatal sepsis. SPSS was used for analyzing the quantitative data. Qualitative data was analyzed using content analysis.

Results

Knowledge levels for presumptive signs of neonatal sepsis are low. About 40% of the interviewed women mentioned two danger signs that they would recognize as dangerous in a neonate. Traditional treatment is more preferred even for serious signs. Delays characterize health seeking behavior for sick neonates. Fifty nine percent of the neonates that were taken to the health facility did so after a day or more than a day had passed

Conclusion and Recommendations

There is generally low knowledge for presumptive signs of neonatal sepsis amongst women in this community regardless of their age, level of education and religion. Communities attach social cultural explanations to the cause, preventive measures and treatment for the condition. It is therefore recommended that government should raise awareness of neonatal sepsis in this community and encourage use of health center treatment. It should also carry out a similar study at a larger scale to establish national knowledge levels on this condition.

Pre-vaccine phenotypic and genotypic characterisation of streptococcus pneumoniae serotype 1 in Malawi

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Introduction

Streptococcus pneumoniae serotype 1 causes a high proportion of invasive pneumococcal disease (IPD) and is included in the 13-valent polysaccharide conjugate vaccine (PCV13). The aim of this study was to determine pre-vaccine prevalence and antibiotic susceptibility of serotype 1 in IPD in Malawi for future evaluation of vaccine impact. Whole-genome sequencing of a selection of isolates enabled us to investigate variation in protein vaccine candidate genes.

Methods

Pneumococcal isolates were obtained from adults and children with suspected bacteraemia or meningitis admitted to the Queen Elizabeth Central Hospital, Blantyre, Malawi over an 8-year period (Jan 2004 –Dec 2011). Whole-genome sequencing of 26 isolates was performed.

Results

Serotype 1 was responsible for 21.1% of all IPD between, 2004-2011. Yearly prevalence fluctuated between 13.9 and
Introduction
The Malawi MRI Facility opened in 2008. As with any newly available technology, normative MRI data are needed for effective clinical and research applications.

Methods
A representative, community-based sample of children 9-14 years old were screened for neurodevelopmental problems. Demographic data, medical history and environmental exposures were ascertained. Eligible children underwent a general medical examination, the Neurologic Examination for Subtle Signs (NESS) and a brain MRI. Descriptive findings and analyses to identify risk factors for MRI abnormalities are detailed.

Results
102/170 households screened had age-appropriate children. 2/102 children had neurologic problems—one each with cerebral palsy and epilepsy. A total of 96/100 eligible children were enrolled. Mean age was 11.9 years (SD 1.5), 43(45%) male. No acute MRI abnormalities were seen. NESS abnormalities were identified in 6/96 (6%). Brain abnormalities were found in 16 (23%) including mild diffuse atrophy in 4(4%), periventricular white matter changes/gliosis in 6(6%), multifocal punctate subcortical white matter changes in 2(2%), vermian atrophy in 1(1%), empty sella in 3(3%), and multifocal granulomas with surrounding gliosis in 1(1%). Having an abnormal brain MRI was not associated with age, sex, antenatal problems, early malnutrition, febrile seizures, an abnormal neurologic examination or housing quality (all p's > 0.05). Radiographic evidence of sinusitis was seen in 29 (30%). MRIs were the same day as the child's examination and none of the children had complaints indicative of sinusitis. No predictors of radiographic sinusitis were identified.

Conclusions and Recommendations
Incidental brain MRI abnormalities are common in normal Malawian children. Radiologic evidence of “sinusitis” is evident in a third of healthy children. The frequency of these MRI findings in a community based sample of healthy children should be considered when unanticipated abnormalities are identified on a brain MRI.

Brain Imaging In Normal Kids (BRINK): A community-based MRI study
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Conclusion
Serotype 1 S. pneumoniae is the commonest serotype in IPD in Malawi. Yearly fluctuation in prevalence of this serotype should be considered in vaccine impact studies and the high level of resistance to some antibiotics warrants further surveillance. Absence of some protein vaccine candidates in our sequenced strains suggests that the prevalence of such candidates should be investigated in pneumococci from different parts of the world before development of a new vaccine.
The central areas need attention in addition to the lower shire and disease mapping should be encouraged for targeted disease intervention.

Decentralization of antiretroviral treatment services in rural health centres in Malawi: the experience of lighthouse clinics

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Introduction
ART services in Malawi have historically been largely provided within hospitals and Urban Health Centres, making access to ART challenging for patients in rural areas. In order to address this inequity, the Lighthouse Trust established a mentoring programme for healthcare workers in rural health centres within Lilongwe district.

Methods
Between September 2009 and December 2011, in conjunction with the Lilongwe DHO, five of the twenty-four rural health centres (RHC’s) were selected. All had at least some ART trained staff, but none were providing ART services. The local population was sensitized regarding the introduction of ART services in their areas. A mentoring team, consisting of a clinician and a nurse, visited the RHC’s once a week, then after 12 weeks, the mentored clinicians were assessed to determine whether they could independently provide ART services. Only successful RHC’s were handed over to the HIV/AIDS Department for certification and quarterly supervision.

Results
914 patients were enrolled at the five rural HC. 520 patients were started on ART while the rest received pre-ART services. All five RHC’s were eventually certified as stand-alone ART sites, though some took a longer than others due largely to the transfer-out of trained staff, and to a perceived lack of ownership by service providers. The inability to check CD4 counts meant that only patients who were WHO stage III and IV were able to start ART.

Conclusion
ART decentralization makes ART accessible to patients living in rural areas. Standard ART staff training without a subsequent mentoring programme, was not observed to result in ART service provision.

Similar mentoring programmes should be adopted by other ART clinics to ensure quality services in rural areas. Looking to the future, introducing point of care CD4 machines in the RHC’s would allow eligible WHO I&II patients to also access ART.

Use of family planning in northern Malawi
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Introduction
Malawian women bear on average six children, and many pregnancies are unintended. The Karonga Prevention Study (KPS) operates a demographic surveillance site (DSS), and offers the opportunity for a community based evaluation of local family planning (FP) uptake in collaboration with the district FP team. Conventional assessments of FP do not always capture switching of methods/facilities.

Methods
A quantitative study is using an innovative method for collecting FP data using patient-held records to build a prospective longitudinal dataset which will allow exploration of continuity of use and method/provider-switching, and which can be linked to the DSS database. All 8,176 women aged 15-49 living in the Karonga DSS were invited to have a FP card attached to the inside front page of her health passport. When a woman receives FP, the health provider records on her card the date, method received and provider-type. After one year, the FP cards will be collected for data entry and analysis.

Results
Data collection is at an early stage but details of recruitment to the study are available. 6,753 women (83%) were issued with a FP card. Acceptance was highest in the 40+ age-group (89%), and lowest in the under-20 age-group (74%). Reasons for not being issued with a card included “missing” (8%). Frank refusals were low (1%).

Conclusions
Family planning data usually come from surveys or routine data collected at health facilities. This study will enable better understanding of how women “shop around” for services, and whether they maintain continuity of use.

Impact of baseline health status of HIV positive pregnant mothers on mothers retention in PMTCT in Malawi
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Dream Centre

Introduction
Retention in care is the main challenge for HIV treatment program in sub-Saharan Africa especially for PMTCT. This paper is aimed at comparing retention in HIV+ pregnant women getting life-long HAART due to poor baseline health status and those starting HAART with good baseline health status who interrupted HAART six months after delivery.
Methods

Patient population included 292 HIV-positive pregnant women receiving antiretroviral prophylaxis from pregnancy to breastfeeding have been enrolled in the study from February 2008 to February 2009. Women with less than 350 CD4 cell count per _L have not stopped HAART while the others did stop HAART six months after delivery when the infant were weaned. All the patients have been followed up until 24 months after delivery.

Results

Among the 292 women 47 were lost before 24 months (18 before 6 months post-partum, and 29 after that time). The Kaplan-Meier probability of loss to follow-up was 16.4% (95% CI 12.1-20.7%). The percentage of lost-to-follow up for the women with higher baseline CD4 count of more than 350 cells was 23 % (33/139)while those with lower baseline cd4 of less than 350 was 9.1% (14/153) respectively. The probability of loss to follow-up was significantly higher among women with > 350 CD4+/mm3 at baseline than among those having < 350 CD4+/mm3 (p=0.001, log-rank test). The most part of the lost-to-follow up events occurred between 7 and 24 months after delivery (29/47).

Interestingly the Relative Risk of being Lost-to Follow up from the seventh month after delivery, compared with the first six months after delivery was 2.2 (CL95% 0.8-5.7) among the women with baseline CD4 count lower than 350 cells/mm3 while it was 3.0 (1.4-6.6) among the ones with more than 350 baseline CD4 count. This is showing that the treatment interruption at six months is not be the main factor affecting the retention after the first six months of newborns’ life.

Conclusion

Women with good baseline health status have relatively higher default rate than those with poor baseline health status. However, retention on care is strongly enhanced in program offering triple therapy to all HIV positive pregnant women irrespective their health status because the lost top follow up rate is much lesser than the average of 80% observed in Malawi before the implementation of the new guidelines. Baseline health status does not seem the only reason for being lost/to/follow up.

Reasons for being lost to follow up should be further studied in order to further minimize the attrition rate.

Factors affecting job satisfaction and commitment among medical interns in Malawi

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Introduction

Along with influencing career decisions, job satisfaction and commitment may contribute to the quality of health care provided by medical interns. The objectives of the study were: i) to determine levels of job satisfaction and commitment among Malawian medical interns; ii) to identify and rank factors in terms of their potential influence on intern job satisfaction and commitment in Malawi.

Methods

This was a cross-sectional study that attempted to include all medical interns (those holding undergraduate medical degrees) working in Malawi when questionnaires were distributed, in December 2011. Sixty-one of the seventy medical interns identified returned a six-part, self-administered job satisfaction survey. Questionnaire items addressed ten “factors”: working hours and pay, work content, working conditions, workplace relationships with senior staff, workplace relationships with peers, educational environment, internal factors (those primarily influenced by individual attitudes and values), quality of life outside of work, autonomy and self-worth at work, and future career prospects.

Respondents were directly asked to indicate their level of job satisfaction and commitment each on two occasions: near the beginning and end of the questionnaire. Quantitative analysis (frequency comparisons and unpaired t tests comparing mean Likert scale responses to individual questionnaire items) allowed for indirect determination of overall job satisfaction and ranking of the aforementioned factors in order of importance.

Results

Sixty-nine percent (n = 42/61) then 57% (n = 34/60) of respondents identified themselves as satisfied with their jobs. Ninety-seven percent (n = 59/61 then 58/60) of respondents declared commitment to their jobs. The factors that were found to influence job satisfaction most strongly were also those that the interns were least satisfied with: pay, working hours, and working conditions.

Conclusions and Recommendations

The results suggest areas for qualitative research to glean specific details about the determinants of job satisfaction among interns. These details can then be used to guide future interventions aimed at improving job satisfaction among Malawian medical interns.

P Assessing aflatoxin level in groundnut flour sold in Zomba and Blantyre markets

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Introduction

Chronic exposure to aflatoxins in diet may have health effects on humans. This study aimed at assessing aflatoxin knowledge among marketers and consumers of groundnut flour, identifying groundnut flour processing practices of marketers in Blantyre and Zomba cities and to determine aflatoxins levels in groundnut flour sold in markets in Zomba and Blantyre.

Methods

Thirty marketers and 70 consumers were interviewed. Consumer quality expectations for groundnut flour were investigated. A total of 30 groundnut flour samples were collected from seven markets in Blantyre and Zomba targeting 40% of the marketers in each market. Thin Layer Chromatogram followed by scanning on Camag Scanner • using CB extraction method – (AOAC 968.22) was used to determine total aflatoxins, and aflatoxins B1, B2, G1 and G2.
Junior secondary school and 89% of the students thought teachers reported the life skills curriculum to be relevant for drug abuse, cerebral malaria and violence. Some 77% of that affect and influence social and mental health such as signs and symptoms, prevention and complications were not morbidity and highest mortality, their mode of transmission, physical health topics such as top 5 diseases causing highest urbanization as social topics are not also included. Similarly Men having sex with men, lack of social support and divorce, foster parents and adoption and bereavement.

Mental health topics not included in the curriculum include social and physical health topics but most areas were deficient. A total of 186 people (16 teachers and 170 teachers) participated. The curriculum contained aspects of mental, A ‘clinical’ audit of the content and experience of teachers and students of junior secondary health education curriculum in public schools of Blantyre, Malawi.

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Introduction
The study aimed at assessing if the Junior Secondary Health Education covers all the aspects of health which are physical, social and mental health, and to assess if the curriculum addresses the top five diseases that have the highest morbidity and mortality in Malawi.

Methods
The study was done in Secondary schools in Blantyre, Malawi. Qualitative and quantitative Clinical audit data were collected on teachers and students. Manually the curriculum was reviewed by using a checklist. Data recorded on the questionnaires were entered into Microsoft EXCEL and later analyzed using EPI INFO.

Results
A total of 186 people (16 teachers and 170 teachers) participated. The curriculum contained aspects of mental, social and physical health topics but most areas were deficient. Mental health topics not included in the curriculum include adolescent fears, adolescent fantasies, bullying, separation and divorce, foster parents and adoption and bereavement. Men having sex with men, lack of social support and urbanization as social topics are not also included. Similarly physical health topics such as top 5 diseases causing highest morbidity and highest mortality, their mode of transmission, signs and symptoms, prevention and complications were not included. The curriculum also did not contain specific factors that affect and influence social and mental health such as drug abuse, cerebral malaria and violence. Some 77% of teachers reported the life skills curriculum to be relevant for Junior secondary school and 89% of the students thought the Health Education curriculum is relevant.

Conclusions and recommendations
The study has uncovered some of the deficiencies of the health education curriculum. The subject is relevant but students and teachers reported some deficiencies. Therefore it is recommended that Life Skills teachers should undergo specific training to deliver the material well. Well written teachers’ guide books should be introduced to help teachers deliver the material easily. The curriculum should also be revised to include topics that are missing.

The impact of HIV on nasopharyngeal carriage of streptococcus pneumoniae in children from Malawi

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Introduction
The aim of the study was to investigate the impact of HIV on serotype distribution in carriage and determine the prevalence of serotype co-colonisation

Methods
From a wider cohort of 238 samples, a subset (n=116) of nasopharyngeal samples was collected from children who were either HIV negative (n=79) or HIV positive (n=37) including both longitudinal and cross-sectional data sets. To determine serotypes present, purified DNA was analysed using a molecular serotyping microarray. Whole genome sequencing was performed on strains, which could not be serotyped by the array method.

Results
We detected 49 distinct serotypes and 5 non-typtables, including all the serotypes covered by the 13-valent pneumococcal conjugate vaccine (PCV13). Serotype distribution was not influenced by HIV status. PCV13 coverage was 52% excluding non-typtables. Co-colonisation rates were high at 40%, with co-colonised samples expressing two (27%), three (11%) or four capsular types (2%). Cocolonization was slightly higher in HIV negative than HIV positive children but this did not reach significance. The impact of anti-retroviral therapy (ART) on pneumococcal carriage was determined by analysing longitudinal samples collected pre and up to 12 months post ART. The data indicates cocolonisation increases post ART following immune reconstitution. The array also revealed 12 isolates with non-standard combination of identifiable capsular polysaccharide (cps) genes.

Conclusions and Recommendations
Serotype distribution was similar between HIV positive and HIV negative subjects in our study. We observed a significant heterogeneity of non-vaccine serotypes in circulation, which may provide fertile ground for serotype
replacement disease post vaccination. The high rate of co
colonisation may promote horizontal gene transfer between
strains, consequently affecting vaccine efficacy and spread
of antimicrobial resistance. The variation at the cps locus
is crucial to the antigenic diversity of the pneumococcus
and therefore impact on current vaccine strategies. We
recommend further work using sensitive molecular
serotyping techniques to determine carriage profiles pre and
post vaccination, and monitor serotype replacement disease
and spread of vaccine escape strains.

Mathematical modelling of the prevalence of malaria; a
case study of Zomba district
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Introduction
The aim of the study was to understand the prevalence,
transmission and control of the Malaria epidemic through
Mathematical Modelling.

Methods
The study was done at Zomba District Health Office from
July 2009 to June 2010
An SEIR (Susceptible-Exposed-Infected-Removed) model
was used in the study. The model was used to determine
criteria for control of malaria epidemic and to compute the
basic reproduction and effective reproduction numbers.
To come up with an optimal epidemiological threshold,
secondary data from the Zomba District Health Office was
used as a guide. Matrix Laboratory
(MATLAB-6.5) package was used to implement a model
that analyses data to understand prevalence estimates, in this,
recruitment rate, contact rate and removal rate as some of
the variables used.

Results
A simulation of the basic malaria model (with total population
N, compartmentalized into Susceptible- Exposed-Infected-Removed)
in the absence of any intervention was done and then a simulation of the malaria model with data from
Zomba DHO as guide. Since there was no figure of the population left with no intervention, a theoretical population
of 32, 300 people was used. Without intervention, at the
steady state about 90% would be affected. An R0 of 1.4303
that was found illustrates that the contact rate between the
vectors and the host is severe. A decrease in contact rate
(which may include, for example use of mosquito nets) and
an increase in removal rate (which may include, for example treatment of Malaria) results in a corresponding decrease in
prevalence and threshold, R0, showing an improvement on
the proportion of the sick people when interventions are
included.

Conclusions and Recommendations
From the research, numerical results indicate the effect of the two controls; protection and treatment in the
reduction of exposed and infected members of each of the
populations. The results also highlight the effects of some
model parameters; infection rate and removal rate which are
significant in the control of malaria.

Antenatal Sex prediction by the Leopold Manoeuvres in rural area
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Introduction
Most parents nowadays are anxious to know the gender of the child before is born for various reasons, some in
order to buy appropriate clothes or decorate the room with
appropriate colours if the child is a boy or a girl.
In most developing countries, access to ultrasound in rural
areas is a major challenge due to reasons such as lack of
electricity and trained personnel. The aim of our study was
to determine if the foetal lie can be correlated to the gender of
the foetus.

Methods
This is a prospective, observational study conducted in
order to determine whether a certain intrauterine position is
specific for a certain gender.
Pregnant women who presented from 32 weeks gestation
with the foetus in cephalic presentation were included in this
study; those in breech, transversal presentations and twins
were excluded.
Our observations were conducted at St Anne’s hospital
where obstetrical ultrasound scans were performed on top of the routine Leopold manoeuvres during the antenatal
visits, and at Liwaladzi health centre where only the Leopold
manoeuvres are performed, and we checked the gender at
birth in order to confirm our previous findings.

Results
Our observation showed that Male foetuses tend to lie on
the right side of the uterus, while female foetuses to the left
side of the uterus in the majority of cases.

Conclusion
The sex of the foetus can be confidently predicted during
the Leopold manoeuvres from 32 weeks of gestation where
the ultrasound scan is not available.

Dynamics of host CD4 t-lymphocyte responses to
Mycobacterium tuberculosis during treatment of pulmonary tuberculosis
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Introduction
The aim of this study was to understand host Mycobacterium
tuberculosis (Mtb)-specific immune responses, and how they
relate with bacterial clearance from sputum, during anti-
tuberculosis treatment in patients on first line Pulmonary TB
chemotherapy at Queen Elizabeth Central Hospital, Malawi.

Study Methods
Peripheral blood and sputum were collected from smear
positive TB patients, before and after 14, 28 and 56 days
of treatment. Mtb-specific IFN-γ secreting and proliferative
capacity of CD4+ T cells was evaluated by an ELISPOT,

and FACS respectively. These assays measure Mtb-specific effector and central memory CD4+ T cell responses. Mtb clearance from sputum was evaluated by ZN stain and MGT liquid culture.

**Results**

Preliminary results showed clearance of Mtb in over 60% of patients by day 14 following treatment. On the other hand, a reduction in Mtb-specific IFN-γ secreting CD4+ T cells, and an improvement in their proliferative capacity, was observed during the course of treatment.

**Conclusion/Recommendations**

Data collected so far suggests a relationship between host immune response and bacterial load in PTB patients during anti-tuberculosis treatment. Further evaluation of how early host immune responses could be used to predict anti-tuberculosis treatment outcome will be carried out.

**Development of A Novel Electronic Medical Records System For Palliative Care**

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**Introduction**

The study aimed at designing electronic medical records software capable of tracking patients and generating aggregate data for palliative care programs in low-resource settings.

**Methods**

The study took place at Family Centered Care Unit, St. Gabriel’s Hospital in Namite, Malawi. The database, DataPall, was constructed in Microsoft Access. The file can also be run using Microsoft Access Runtime, a free download for PCs that do not have Microsoft Access. Additionally, a series of corresponding patient forms and registers allow for easy data input.

**Results**

Prior to the introduction of DataPall, the palliative care program at St. Gabriel’s relied upon paper registers for recordkeeping. Clinical staff spent up to three days compiling data for the hospital’s annual report and quarterly reports to the Ministry of Health. In particular, staff had difficulty disambiguating the number of patients treated from the total number of episodes recorded.

Moreover, the extant registers did not allow for sufficient documentation of the breadth of the unit’s activities. DataPall allows staff members to efficiently input patient records and track changes in patient status. Additionally, it allows for more accurate calculation of the number of patients served versus the number of appointments, or episodes, provided. Finally, the report feature generates a comprehensive report of the patients served and services provided in a customizable timeframe.

**Conclusion and Recommendations**

DataPall has been implemented as a pilot program at St. Gabriel’s Hospital as well as the Tiyanjane Clinic at Queen Elizabeth Central Hospital in Blantyre. Pending feedback from these entities, the program will be further refined and more broadly implemented to meet the needs of palliative care providers in Malawi.

**Detection of schistosomiasis in pre-school children and their mothers in Chikhwawa district, Malawi**

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**Introduction**

The study aimed at determining the prevalence and infection intensity of schistosomiasis in pre-school children (and their mothers) in Chikhwawa District and evaluates risk factors associated with disease.

**Methods**

The study was done in 12 villages nearby Chikhwawa within the lower Shire River Valley, as enrolled within an ongoing rolling Malaria Indicator Survey. A cross sectional survey was carried out inspecting children (n= 208), aged one to five years, and their mothers (n=165). Single stool, urine and fingerprick samples were examined using parasitological and serological diagnostic testing. Case-history questionnaire data were also collected as well as clinical examination on each child. All patients found infected were treated with praziquantel (40mg/kg).

**Results**

Mean child age was 2.9 years with a male to female ratio of 1.1. Overall 94.5% of mothers and 49.5% of children were sero-positive for schistosomiasis by SEA-ELISA. Some 25.0% of mothers and 10.7% of children were excreting eggs of S. haematobium, with 1.0% and 25.0% of children presenting with macro- and micro-haematuria, respectively. Infections with S. mansoni were also detected with 24.8% of mothers and 9.1% of children positive on urine CCA-dipssticks. General awareness of schistosomiasis was poor, 97.0% of the women had little or no knowledge of the disease, despite a quarter having had previous treatment. Despite all villages having access to safe water via boreholes, almost a third of women regularly washed their clothes in environmental water; some 42% of their pre-school children spend more than 30 minutes daily in or around these water margins.

**Conclusions and Recommendations**

Schistosomiasis is much more prevalent in these communities than previously thought and likely gives rise to a previously cryptic burden of disease. Control measures, such as access to praziquantel, should be expanded immediately to include younger children with the intention of averting future morbidity. Health education for mothers is clearly needed.
Comparison of nurses’ and families’ perception of family needs in critical care unit at referral hospitals in Malawi

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Introduction
Critical illness generates stress response in both the patient and family members. While it is important to engage in aggressive management of critically ill patients, nurses must reconcile this with family care.

Methods
A descriptive research design that utilized quantitative method to obtain data. A convenience sample of 124 participants (nurses, n= 62; family members, n= 62) was drawn from six critical care units at three referral hospitals namely Mzuzu, Kamuzu and Queen Elizabeth Central Hospitals. Data were collected using a questionnaire developed from the Critical Care Family Needs Inventory (CCFNI). STATA version 10 was used to analyze data. Descriptive and inferential statistics were computed and used to report the findings.

Results
The need ‘to have explanations of the environment before going into the critical care unit for the first time’ was rated most important by the nurses (mean, 3.81). The need ‘to talk to the same nurse every day’ was considered least important (mean, 1.32). Family members ranked the need ‘to feel that the hospital personnel care about the patient’ as most important (mean, 3.84) and perceived the need ‘to be alone at any time’ as least important (mean, 1.34). Both groups identified assurance need category as most important (nurses’ mean score percentage, 90%, families’ mean score percentage, 92%).

Conclusion
Generally, there were similarities between nurses’ and families’ perception of family needs. The results will help to guide nursing education, clinical practice and management on family care during critical illness.

Detection of HIV-infected cells in the lung using a flow cytometry-based fluorescence in situ hybridization (fish) technique

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Introduction
HIV infects a variety of cells that play crucial roles in host immunity. CD4+ T-lymphocytes are predominantly infected; the effects of HIV on these cells and adaptive immunity are well described.

HIV also infects cells of the innate immune system such as macrophages but how this affects their functions is poorly understood due to lack of appropriate methods for detecting HIV-infected cells within cell populations. We therefore aimed to develop a reliable technique for identifying HIV infected cells.

Methods
We recruited 15 HIV-uninfected and 15 HIV-infected healthy, asymptomatic adults and obtained alveolar macrophages (AM) from the lungs by bronchoscopy and bronchoalveolar lavage (BAL). HIV infected AM were detected using a novel flow cytometry-based FISH technique that involves probing target intracellular HIV mRNA using a pool of fluorophore-labeled oligonucleotides probes derived from the Gag and gp120 genes of HIV-1. The technique was tested and optimised in vitro by fluorescence microscopy and flow cytometry using human T-lymphocyte cell line (8E5) which contain a single defective proviral genome of HIV. AM were analyzed by flow cytometry; results are given as medians with IQR.

Results
The FISH technique detected HIV mRNA in 8E5 cells with 95% sensitivity. HIV-infected cells comprised <1% of the total AM population obtained from chronically HIV-infected, antiretroviral naive individuals (0.2[0.1-0.3]%). No HIV-infected cells were detected in HIV-uninfected individuals. Comparison of Gag and gp120 probes detected similar proportions of HIV-infected AM.

Conclusion
The FISH technique is reliable and reproducible for detecting HIV-infected cells. The technique has great potential and can be coupled with other flow cytometry-based assays of phagocyte function which our group has also developed to assess the effect of HIV on multiple phagocyte functions. We plan to use the technique to investigate the effects of antiretroviral therapy on macrophage function, and on HIV-infected macrophage and monocyte populations in blood or lungs.
Prevalence of lymphatic filariasis antigenaemia and microfilaraemia in hiv-infected and hiv- uninfected individuals in northern Malawi

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Introduction
Lymphatic Filariasis (LF) and HIV infection are major public health problems worldwide and individuals may be co-infected. Recent data from Karonga district suggest overall decline in LF antigenaemia over the last decade and an interaction between HIV and LF with reduced microfilarial (MF) counts in HIV-infected individuals. We set out to investigate this LF/HIV interaction further by assessing LF antigenaemia and microfilaraemia in HIV-infected and HIV-uninfected individuals in the context of on-going LF control activities in Karonga.

Methods
Using stored samples and quality-controlled data we measured circulating filarial antigenaemia (CFA) and MF counts by HIV status in two cross-sectional studies nested within a clinical trial on dosage of antifilarial agents in the Songwe area in northern Karonga and within on-going DSS and annual HIV sero-surveys in southern Karonga.

Results
Of 312 individuals with known LF antigenaemia enrolled from the Songwe area, 29 (9.3%) were HIV infected, 249 (79.8%) were HIV-uninfected while 34 (10.9%) had unknown HIV status. Microfilariae were detected in 12 (41.4%) of HIV-infected and 123 (49.4%) of HIV-uninfected (p=0.40). Geometric mean MF count was 29.5 in HIV-infected and 123 (49.4%) of HIV-uninfected (p=0.40). Geometric mean CFA concentration was 859 in HIV-infected and 1553 in HIV-uninfected (p=0.28).

Conclusions
LF antigenaemia and microfilaraemia prevalence rates are not affected by HIV infection status but HIV-infected individuals had non statistically significant lower levels of microfilaraemia and statistically significant lower LF antigenaemia suggesting some LF and HIV interaction.

Whether this will impact on LF control strategies in this area remains unclear and is under study.

Factors affecting adherence within Prevention of Mother To Child Transmission programs (PMTCT): Option B+
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Introduction
In July, 2011 the Ministry of Health (MOH) implemented Option B+, providing all HIV-infected pregnant women with lifetime access to ART. Option B+ proposes to expand PMTCT coverage, reduce maternal mortality, and further reduce mother to child transmission (MTCT). Uptake of PMTCT services is essential to ensuring expanded coverage, however patient defaulting remains a challenge. The aim of the study was to determine factors affecting patient adherence within PMTCT programs.

Methods
This qualitative study examines the factors affecting patient adherence within PMTCT programs. HIV positive pregnant and lactating women initiated on the 5A regimen (first line treatment for all pregnant and lactating women) were interviewed at weekly antenatal and postnatal clinics. Qualitative in-depth interviews (n=30) and (6) focus group discussions were conducted with active program participants and defaulters. Semi-structured interviews (n=25) were also conducted with health care providers.
Patient default rates were calculated for all women initiated on the 5A regimen between October, 2011 and October, 2012 to capture the first 12 months of Option B+ implementation.

Results
From (175) women initiated on the 5A regimen, 78 (42 %) defaulted. The majority of 5A patients, 51%, defaulted on the (3rd) appointment. 40 % defaulted on the 2nd appointment. Major themes related to PMTCT adherence include lack of spousal support and fear of community-based stigma. Many patients do not disclose HIV status to spouses due to fear of divorce. Participants report lack of social and material support from spouse when couple is discordant. Many PMTCT participants interviewed report having a spouse who remains untested. The majority of participants fear involuntary status disclosure at the PMTCT clinic.

Conclusion and Recommendations
Preliminary qualitative results show that women’s participation in PMTCT is shaped by gendered power imbalances within relationships which inhibit HIV status disclosure to spouses, and the desire to avoid community-based stigma. Developing partner support through couples testing and fostering women’s economic empowerment may promote more equitable gender relations and decision making power within relationships. Conducting home-based visits in addition to community sensitization may mitigate community-based stigma.
Acquisition of malaria specific immunity in cotrimoxazole prophylactic HIV-exposed and infected children

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Introduction

HIV exposed and infected children are recruited at the PMTCT clinic at Zomba Central Hospital while HIV negative children are recruited simultaneously from the area of residence of each HIV exposed and infected child. The study investigated the impact of daily cotrimoxazole prophylaxis on the acquisition of malaria specific immunity among HIV-exposed, HIV infected and HIV negative children.

Methods

Samples of 40 children are planned for each group and are recruited at 6 months and followed up until 30 months old. A total of 5ml blood sample is collected at 6-month visit for malaria thick film, Full Blood Count, CD4 T cell count and immunological assays. Cellular mediated immune assays such as intracellular cytokine staining, T cell proliferation and basic Immunophenotyping are determined using flow cytometry. Antibody levels to specific malaria antigen are determined using Enzyme Linked immunosorbent Assay (ELISA).

Results implications

Recruitment is currently on going in the study. The expected results from this study will be critical in evaluating the advantages and disadvantages of cotrimoxazole prophylaxis in HIV exposed and HIV infected infants. The understanding of the trend of acquisition of malaria specific immunity in these HIV exposed and infected children will help in the formulation of effective, targeted interventions especially if the lack of acquisition of anti-malaria immunity as postulated is observed.

Equity of access to essential health package in Malawi: a perspective on uptake of maternal healthcare

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Introduction

Equity of access to healthcare is a central public policy issue for many health systems, yet it remains a challenge for several health systems globally, particularly in developing countries such as Malawi. In 2002, the Ministry of Health (MoH) in Malawi adopted the Essential Health Package (EHP) whose objectives include improving equity of access to health services. The EHP refers to a prioritized set of basic health services that focus on the poor. The Malawi EHP services include maternal healthcare.

Literature review shows that there is remarkably little evidence about effectiveness of EHP, and in particular whether it improves access to healthcare for poor people. This study will assess equity of access to EHP in Malawi, particularly focusing on uptake of maternal healthcare.

Methods

The study will employ both quantitative and qualitative methods. It will involve a policy analysis focusing on key stakeholders and policy documentation around EHP. It will also measure equity of access to maternal healthcare in the context of the national Demographic and Health Survey. A regression analysis and the Gini coefficient analysis will be used to measure equity of access. The study population will include people from the Ministry of Health, CHAM, women users and non-users of EHP. The participants will be involved in in-depth interviews and focus group discussions.

Rationale

The study findings will provide the MoH in Malawi with valuable information that will help to improve the delivery and use of EHP and promote equitable access to health services. The study results will also serve as a basis for policy decision making, for health care managers besides providing information for learning experiences to other developing countries on use of EHP to promote equitable access to health services.

Down-regulation of neogenin accelerated glioma progression through promoter methylation and its overexpression in shg-44 induced apoptosis

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Introduction

Dependence receptors have been proved to act as tumor suppressors in tumorigenesis. Neogenin, a DCC homologue, well known for its fundamental role in axon guidance and cellular differentiation, is also a dependence receptor functioning to control apoptosis. However, loss of neogenin has been reported in several kinds of cancers, but its role in glioma remains to be further investigated.

Methods

Western blot analysis showed that neogenin level was lower in human glioma tissues than in their matching surrounding non-neoplastic human tissues (n = 13, p < 0.01). By immunohistochemical analysis of 69 primary and 16 paired initial and recurrent glioma sections, we found that the loss of neogenin did not only correlate negatively with glioma malignancy (n = 69, p < 0.01), but also glioma recurrence (n = 16, p < 0.05). Kaplan-Meier plot and Cox proportional hazards modelling showed that overexpressive neogenin could prolong the tumor latency (n = 69, p = 0.001, 1187.66±16.2 days versus 687.46±24.2 days) and restrain high-grade glioma development (n = 69, p = 0.01, HR: 0.264, 95% CI: 0.102 to 0.687). By Methylation specific polymerase chain reaction (MSP), we reported that neogenin promoter was methylated in 31.0% (9/29) gliomas, but absent in 3 kinds of human glioma cell lines.

Interestingly, the prevalence of methylation in high-grade gliomas was higher than low-grade gliomas and non-neoplastic brain tissues (n = 33, p < 0.05) and overall methylation rate increased as glioma malignancy advanced. Furthermore, when cells were over-expressed by neogenin, the apoptotic rate in SHG-44 was increased to 39.7%
compared with 8.1% in the blank control (p, 0.01) and 9.3% in the negative control (p=0.01).

Conclusion
These observations recapitulated the proposed role of neogenin as a tumor suppressor in gliomas and we suggest its down-regulation owing to promoter methylation is a selective advantage for glioma genesis, progression and recurrence. Furthermore, the induction of apoptosis in SHG-44 cells after overexpression of neogenin, indicated that neogenin could be a novel target for glioma therapy.

Public-private partnerships in sector wide approaches: benefits for the private sector to engage in Programme Based Approaches
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Introduction
The Malawi 2011 Health Sector Strategic Plan sets out the clear need to increase financial resources in the sector and to allocate them efficiently and equitably. There is potential to utilise private industrial sectors to bring in greater resources to the health sector, and to improve service provision to communities.

Methods
The Ministry of Health and partners within the SWAp shall contribute to a joint financial pool which can be utilised for Public-Private partnerships (PPPs) approaches. PPPs would be run with the explicit purposes of either 1; providing health services, or 2; improving the overall health standards of workforces and communities.

By engaging in PPPs, costs to the public sector for health service delivery and overhead costs of private companies can be reduced. Furthermore, in keeping with the principles of the UN Global Compact, by engaging in health service provision (outside their core business) companies will move towards developing a more sustainable ‘double-bottom line’: ensuring both economic prosperity, and social equity. Such partnerships bring the private and public sector closer together, and can be used as a basis for advocacy and direct interaction with the private sector in a number of areas (e.g. development of occupational health and safety standards).

Results and recommendations:
Experience from other countries shows that PPPs can be attractive and effective for all parties involved; engagement can bring long-term cost savings to the private sector, as they benefit from a healthier, more productive workforce. In different countries, MoHs have also benefitted from the approach, having increased service provision through division of labour, meaning that the private sector takes on the role of service provider, leaving the Ministry with more resources to focus on the overall management of the health sector.

Childbearing intentions and reproductive decision making among men and women living with HIV in Malawi
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Introduction
The study aimed at describing fertility intentions and utilization of reproductive health services among HIV-infected men and women.

Methods
We conducted brief interviews with HIV-infected men and women in Lilongwe and Nkhoma. We additionally conducted in-depth qualitative interviews with women who were selected from the larger cohort if they had either already had children after HIV diagnosis or expressed a strong desire to have a child. Interviews were coded in Atlas.ti using a grounded theory approach.

Results
A total of 202 brief interviews were completed with 75 men (37.1%) and 127 women (62.9%). The majority of individuals were between 30-35 years (37%) followed by 36-40 years (34.2%), 26-29 (17.3%), and 18-25 (11.3%), and 83.7% were on antiretroviral therapy. A total of 51% of those interviewed desired a child at some point in the future. Of 171 in a current relationship, 86.0% knew their partner status, with 12.4% in serodiscordant relationships and 14.0% with unknown partner status. Major themes from 42 in-depth interviews with women revealed that childbearing decisions were made by male partners or by both partners, but not by women themselves. Women did not express concerns about the risks of HIV transmission to partners, and were concerned about risk of transmission to the child and risk of pregnancy to their own health. Most women did not have knowledge of safer conception methods for reducing partner transmission and desired to learn about this topic. Most women would like their male partners involved in safer conception counseling, but noted that partners might refuse participation.

Conclusions
Reduction of HIV through horizontal and vertical transmission can be better achieved by expanding the availability of counseling to plan safe pregnancies. Given men are most often driving decisions regarding reproduction, counseling should include partners. Strategies will be needed to improve male participation in care.
A qualitative analysis of the barriers and facilitators to uptake and retention in prevention of mother-to-child programs in Nkhoma, Malawi

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Introduction

Despite the increased availability of antiretrovirals for the prevention of mother-to-child transmission (PMTCT) in Malawi, uptake and retention remains low. Understanding barriers and facilitators to PMTCT is critically important to improve the number of women accessing ARVs and staying in care, particularly in the setting of the Option B+ PMTCT strategy in which women are started on three-drug antiretroviral therapy (ART) during pregnancy and continued for life.

Methods

Twenty-two HIV-infected pregnant and postpartum women in PMTCT programs were interviewed at three rural sites in Nkhoma, Malawi, between April-May 2010. All women were staged by WHO criteria or CD4 count as ineligible for three-drug antiretroviral treatment by Malawi’s current National HIV Treatment Guidelines at the time under study (250 cells/mm3) and were individually interviewed about barriers and facilitators to PMTCT care. After transcription, the interviews were coded according to recurring themes, and major themes were categorized into subthemes.

Results: The median age of the women was 26 years (IQR 5.75-17.25) and 77% were married. The median number of live children/woman was 4 (range 0-6). The mean duration of commute for PMTCT was 2 hours. Transportation to clinic was the most common barrier to accessing PMTCT identified in the study. Additional barriers included stigma in the community leading to avoidance of HIV disclosure, and poor attitude of providers toward HIV-infected pregnant women. Facilitators of uptake and retention in care included high quality education resulting in empowerment of women to adhere to PMTCT, and the availability of hospital-supported nutrition programs.

Conclusions

Given Malawi’s transition to Option B Plus for PMTCT in which women are initiated on ART during pregnancy and continued for life, strategies to increase uptake and retention in care will need to address barriers to care, particularly stigma, and build upon facilitators that may motivate and retain women in care.

Contraceptive knowledge and use among adolescents experiencing unsafe induced abortion at Queen Elizabeth central hospital, Blantyre, Malawi

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Introduction

This study explored the adolescents’ knowledge and use of contraceptives prior to their unsafe induced abortion.

Methods

A descriptive study that utilized qualitative methods was conducted with 18 adolescents who were admitted at Queen Elizabeth Central hospital while seeking post abortion care. Data was collected through in-depth interviews using a semi-structured interview guide. Data was manually analysed using content analysis.

Results

Findings suggested very low knowledge and utilization of modern methods of contraception. Three themes emerged; knowledge on contraception and conception, contraceptive knowledge and use, reasons for contraceptive non-use. However, most adolescents demonstrated knowledge on male condom and natural methods of family planning.

Conclusion and Recommendations

School-based sex education and community-based education campaigns would dispel misperceptions about contraceptives and change attitudes that discourage use. Youth friendly facilities should be established to provide sexual and reproductive health services that are sensitive to the rights and needs of adolescents. In addition, Life Skills Curriculum should be revised to address issues of unintended pregnancy, and unsafe abortion.

Factors affecting adherence to antiretroviral therapy (ART) among children aged 7-15 years attending Queen Elizabeth Central Hospital (QECH) ART clinic in Blantyre

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Introduction

Adherence to ART is important in ensuring a successful treatment. Sustaining adherence represents a significant challenge for children getting treatment at QECH. The study aimed at estimating the proportion of patients adhered 100% over two months; to ascertain children’s knowledge of their HIV diagnosis and treatment; to correlate the relationship between diagnostic disclosure and ART adherence; to identify factors affecting ART adherence; to establish the kind of support given to children receiving ART.

Methods

This was a cross-sectional descriptive study combining quantitative and qualitative methods. An interviewer
administered questionnaire was used to collect data in children. Focus group discussions were conducted with caregivers. A systematic sample of HIV-infected children was drawn on daily basis. Quantitative data was analyzed using StataSE 10 whilst qualitative data was coded using NVIVO software (QSR, 2001). Adherence was ascertained by using self report; patients were asked whether they missed any medication from the previous visit to current visit (which was two months).

**Results**

Sixty two percent of the children (61/98) aged between 7-15 years were 100% adherent. Of the patients who were not 100% adherent, only 8.6% (2/37) had adherence levels of < 95%. Among children who missed doses, the common reason for missing doses was forgetfulness. Adherence to ART was significantly associated with perceived health status (P=0.03, OR=2.1, 95% CI: 1.1-4.1) while guardian of child having an occupation was marginally associated (P=0.1, OR=2.3, 95% CI: 0.9-5.8). The common strategy used in ensuring an effective ART adherence was a reminder to take the drug by caregivers.

**Conclusion and Recommendations**

Over one third of the children in this clinic are not 100% adhering to ART. An adherence programme that will adequately prepare patients and guardians prior to initiating treatment and during treatment to address adherence issues should be developed in the clinic.

Multi-disciplinary research on HIV in fishing communities in Malawi and Uganda: exploring the ethical challenges and opportunities

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**Introduction**

The study focussed on fishing communities in Entebbe, Uganda and Mangochi, Malawi. Evidence of high HIV prevalence in fishing communities has made them a focus of multi-disciplinary research.

The aim of the study was to describe evolving ethical opportunities and challenges experienced by communities participating in social science and epidemiological HIV research in Uganda and Malawi.

This is useful as participants’ decision to join a research is a composite of varied factors.

**Methods**

The study analyzed pre-study community consultations and ongoing dialogue with Community Advisory Groups (CAGs), focus group discussions and in-depth interviews with the communities on their willingness to participate in health research, observational studies with participants on experiences of being in the research. These were analyzed using thematic framework and followed up recurrent themes.

**Results**

Initial consultations revealed a diversity of stakeholders’ views about the studies. In Uganda, many women welcomed the access to health services the study could bring. Leaders feared the negative impact on the community if HIV-rates were found to be high. In both countries some leaders felt the study should provide tangible benefits for people found to be HIV-positive, like therapeutic food.

Establishing CAGs provided an opportunity to understand power relations in fishing communities and begin the process of developing meaningful ongoing relationships. CAGs enabled women to voice their concerns in settings where men dominate decision-making structures.

In both countries, some female participants in epidemiological studies were concerned about their husband’s reaction to their study participation. However, participants welcomed the opportunity provided by research to voice their opinions.

**Conclusion and Recommendations**

Informed consent, community engagement and building appropriate level of trust and dignity require an in-depth understanding of how poverty, power and gender relations are experienced in different contexts. Developing ethical relationships with diverse community members is a continuous process, rather than a one off activity.

HIV in fishing communities in southern Malawi: exploring the complementary roles of social science and biomedical research.

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**Introduction**

To describe the opportunities and challenges of conducting multidisciplinary research on HIV in Malawi

**Methods**

The study was done with fishing communities in Mangochi District, southern Malawi. Social scientists explored risk factors for contracting sexually-transmitted infections including HIV, and assessed the acceptability of the fishing communities to participate in preventive health research e.g. vaccine trials. Methods used included participatory (Transect Walks, Community Mapping, Seasonal and Historical Calendar) and qualitative methods (e.g. focus group discussions and in-depth interviews) to collect data from different members of fishing communities (by gender, age, occupation, income). The data was analysed thematically. The health workers/epidemiologists screened clients for HIV and followed up HIV negative clients at 3 monthly intervals to determine the prevalence, incidence and type of HIV and STIs (Gonorrhoea, Chlamydia, Syphilis and HSV-2).

**Results**

Ensuring close communication between multi-disciplinary
research teams offers opportunities to analyse problems holistically and identify possible solutions, for example:

1. Key issues emerging from pre-study community consultation and ongoing dialogue with community advisory boards (CAGs) were shared with health workers/epidemiological team (e.g. concerns/ fears of amount of blood taken at the clinic, worries about anaemia), who were able to address these concerns in their ongoing dialogue with clients.

2. Analysis of why client missed 3 monthly scheduled follow-up visits was shared with the epidemiological team. Some findings including migration out of the region, and ongoing farming/household commitments were helpful in understanding the health seeking behavior of the community.

3. As the research progressed the teams acknowledged that each discipline was critical to the success of the research. They easily pooled transport bookings.

**Conclusion and Recommendations**
Ensuring close collaboration between social science and epidemiology/health workers teams is important to maximise the potential of a multidisciplinary study and enabling a holistic and context embedded understanding of HIV and fishing communities in Southern Malawi

**Availability and usage of vdlr and other syphilis tests in primary health care facilities in Blantyre district**

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**Introduction**
Globally, syphilis is responsible for about 450,000 stillbirths, 270,000 premature deliveries and 250,000 congenital infections per year. The antenatal syphilis prevalence in Malawi is approximately 2%.

Despite national policies on antenatal testing, screening is still implemented sporadically in many African countries. The objectives of this study were to determine within Blantyre district: (i) the proportion of primary health care centres carrying out Venereal Disease Research Laboratory (VDRL)/other syphilis tests in pregnant women in Blantyre district; (ii) the number of pregnant women who underwent syphilis testing in primary from June 2010 to June 2011 and (iii) the challenges that health centre staff face in conducting syphilis testing.

**Methods**
Antenatal records for a period of one year were reviewed at 17 primary health care facilities in Blantyre district to determine the numbers of antenatal women attending the antenatal clinics and those screened for syphilis. A questionnaire was administered to all nurses in-charge.

**Results**
All 17 primary health care facilities perform antenatal syphilis screening. Of 28490 women who attended antenatal clinics, 8818 women were screened for syphilis (31% of the total). Challenges identified were lack of testing kits and trained personnel. 11 of 17 centres had testing kits in stock during the time of this study. 2.5% of those screened tested positive.

**Conclusion**
Syphilis testing is still needed but is sporadic in Blantyre due to inconsistent supply of testing kits and lack of trained personnel. An effective system of supplying kits should be instituted in order to facilitate the program.

**Expert client initiative improves PMTCT services in Machinga, Malawi**

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**Introduction**
CHAI conducted a qualitative assessment to determine the value-add of Expert Clients (ECs), nature of relationships between ECs and Health Care Workers (HCWs) to improve patient flow, increase uptake of services, retention and identify implementation challenges.

**Methods**
Structured one-on-one interviews were conducted with 17 ECs from 16 facilities, 12 HCWs from 9 facilities, and 2 PMTCT patients. Two focus group discussions were conducted with 17 PMTCT patients. Responses were audio-recorded, transcribed, translated, and coded to identify key themes.

**Results**
Through an end of program evaluation, HCWs, ECs, and patients observed that ECs played an important role in improving ARV adherence, disclosure rates, and retention. Respondents identified 3 unique characteristics of ECs that made these improvements possible: personal relationships with patients, capacity to spend extended time counseling, and willingness to live openly with HIV. ECs, with the unique perspective as both community members and health facility staff, improved the relationship between patients and nurses by helping patients understand nurses’ instructions and helping nurses understand patients’ perspectives. ECs and nurses unanimously felt that the two cadres worked well together and fulfilled complementary roles. HCWs appreciated that ECs helped to improve the efficiency and quality of services by assuming the responsibility for time-intensive, one on-one counseling. Two implementation challenges were mentioned by multiple respondents: lack of facility space for counseling and inadequate compensation for ECs.

**Conclusions and Recommendations**
HCWs, ECs, and patients observed that ECs play a vital role in improving the efficiency and coverage of PMTCT services, in addition to retention in care. The EC program is a viable and sustainable model for improving PMTCT services without increasing the number of clinically-trained HCWs in resource limited settings.
Increasing PMTCT retention in care in Machinga district, Malawi through an integrated service delivery model: the Mother-Infant Pair (MIP) clinic.

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Introduction

CHAI conducted an assessment to determine the impact of MIPs on service uptake, retention, and patient satisfaction.

Methods

Registers were reviewed to extract aggregate patient-level data of service uptake for a cohort of mother-infant pairs at 1 MIP clinic. Interviews and focus groups were conducted with MIP participants, nurses, and mothers that refused MIP participation.

Results

220 mother-infant pairs attended the MIP clinic during Q2-Q4 2010, of which 78% attended ≥3 times (median=6). 94% of mothers recruited appropriate antiretrovirals, and 37% opted for a modern family planning (FP) method. Among HIV-exposed infants (HEIs), 94% initiated cotrimoxazole, 80% received DNA PCR testing (although, only 45% ≤ 2 mo.), 87% were discharged with confirmed HIV status, and 92% of HIV-positive infants initiated ART. Interview respondents identified key benefits of MIPs including: improved access due to the “one-stop shop” model; improved early infant diagnosis services; FP availability; emphasis on HEI cotrimoxazole uptake; and psychosocial support for HIV-positive mothers. Identified challenges included: lack of authorization for MIP nurses to initiate ART, inadequate staff capacity for increased MIP clinic demand, and stigma barriers to MIP clinic participation.

Conclusions and Recommendations

The MIP clinic model is an innovative approach to service integration. Pilot results highlight impressive levels of service uptake and retention along the PMTCT cascade. Further research is needed to determine the most effective implementation strategies for MIPs, including optimizing staffing levels.

Evaluation and pilot of point-of-care testing assays for the measurement of CD4 count in comparison to conventional technology currently used and to assess the impact of these testing assays on patient outcomes.

Methods

A technical evaluation was conducted at five pilot sites in Machinga District by testing 255 patients using POC CD4 technology versus conventional technology. Results were analyzed statistically, using the Bland-Altman method. A review of longitudinal data collected between May-December 2010 assessing the impact of the POC technology on patient on CD4 testing, ART referral, ART initiation and turnaround time (AT) at pilot sites was used to quantify the change observed by the introduction of POC testing.

Results

The POC CD4 technology under evaluation performed well on both venous and finger-prick samples (conventional versus POC 411.7 [9-1494]: 389.7 (8-1326)) for Venus blood draw and [428.0 (9-1494) versus 399.3 (14-1378)] for the finger prick. From the results, repeatability was comparable to conventional methods. Although POC slightly underestimated CD4 relative to conventional testing, the bias was not clinically significant. For this assessment, patients in Outpatient Department and Pregnant women were assessed before ART Initiation. We categorized patients into CD4<200, CD4 200-350 and CD4<350. Patient lost-to-follow-up due to CD4 dropped from 35% to 10% and ART referral rate increased from an average of 58% to 82%. Additionally, there was a reduction in test turn-around time (length of time from sample collection to results received by patients) from an average of 11 days to zero days (same day results).

Conclusion and Recommendations

POC CD4 technology shows levels of accuracy comparable to conventional testing; it does not compromise the quality of results and has a significant impact on patient outcome. POC CD4 should be considered for scale up at facilities in Malawi that do not have access to conventional CD4 testing on-site.

Sample transportation system: impact of CD4 testing and early infant diagnosis at Machinga district, Malawi

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Introduction

A sample transportation system was designed and implemented in order to dramatically increase the number of clients accessing laboratory tests.

Methods

Sample Transport was introduced from April 2009 in phases to ensure gradual impact on the health systems. Twelve health centers providing comprehensive PMTCT services were included and seven health facilities were added lately. Four separate routes were mapped and designed. Motorcycles were used to both collect samples and deliver results twice a week at each health facility. On the other hand, a courier collects samples and delivers results once a week to Central hospital for EID. This system was designed to maximize access while taking into account reliability, sample stability, human capacity, cost and sustainability.
Results
In 2008, the number of CD4 samples collected in the District prior to implementation was 1,512 and none for EID while in 2009 and Q1 2,010 a total of 6,803 and 2,732 for CD4; 486 and 550 for EID respectively were processed. A significant number of clients are being tested and this has resulted in a 28% increase in patients being initiated on treatment with better adherence.

Conclusions and Recommendations
It is realistic and possible to design and run an effective, consistent, reliable and low-cost ST System in a rural and resource limited setting. This will have immediate and significant impact on diagnosis, care and treatment of HIV positive patients including pregnant women and outcomes for their infants. Sample Transport System should be considered for scale up in health care service provision.

Integration of household water treatment, handwashing promotion, and required partner participation with antenatal services in Malawi


Introduction
The aim of the study was to assess how Integrating safe water storage containers, water treatment solution, soap, and oral rehydration salts (ORS) with antenatal clinic (ANC) visits motivates women to attend ANC and improves household hygiene, thereby improving maternal and neonatal health, particularly for HIV-infected persons.

Methods
We conducted baseline and 12-month follow-up surveys in women receiving ANC care at baseline in 8 health facilities in Machinga District to assess changes in the percentage of pregnant women with 4 or more ANC visits, health facility deliveries, participation in HIV testing and counseling (HTC), use of household water treatment solution, and ability to demonstrate proper hand-washing technique. In addition, for pregnant women to receive the incentives we required the presence of their partners in the ANC. Partner involvement was considered for scale up in health care service provision.

Conclusions and Recommendations
Integrating water treatment and hygiene interventions and requiring partner involvement in ANC resulted in a higher percentage of women with 4+ ANC visits and health facility deliveries than was observed in the 2010 DHS. In addition, we observed high rates of HTC among pregnant women and their partners, and high couple’s disclosure. Compared to baseline, there were significant increases in water treatment and hygiene practices in the homes of new mothers.

Determining the facility based cost of HIV treatment in Malawi
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Introduction
Antiretroviral Therapy (ART) accounts for a large portion of HIV/AIDS spending; studies suggest that ART costs vary significantly within and across countries. The objectives were to: provide a benchmark for ART costs in Malawi, per-patient-per-year; understand the variability of the drivers behind this cost; and develop hypotheses about how best practices can be shared within Malawi and with other countries.

Methods
The study focused on gathering data for the 2010 calendar year from 30 facilities in Malawi, selected through a random stratified sample. Other study countries included: Rwanda, Zambia, South Africa, and Ethiopia. Costing data was collected from central sources and facility staff/records for: ARVs, opportunistic infection drugs, nutrition, labs, personnel, infrastructure, etc. Programmatic data was gathered from patient records including master cards and registers.

Results
The direct costs of treatment in Malawi are lower than all other study countries, at an average of $136 pppy (range: $80-$241). Despite low costs, retention rates at 12 months are high, provided patients start treatment early. ARVs and personnel are the most significant cost components; lab costs are extremely low, due to limited testing.

Conclusion and Recommendations
It is unlikely that there are significant savings opportunities at the facility level; however, there are opportunities to increase effectiveness of treatment and improve patient outcomes at low marginal cost.

It will be important to better understand non-facility based treatment and other program costs to ensure spend is fully optimized to scale-up treatment services in the context of limited global resource limitations.
Community-based childhood hearing screening in Chikhwawa district
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Introduction
The study assessed the feasibility and quality of objective hearing testing (Auditory Brainstem Response Testing, ABR) at community-level in a rural setting in sub-Saharan Africa and to provide data about determinants of hearing testing outcomes.

Methods
The study targeted young children participating in a phase IV trial on the safety and effectiveness of repeated treatment with artemisinin-combination therapies (ACT), located in 50 villages within Chikhwawa district, southern Malawi. Background clinical and epidemiological data, ABR testing and video-otoscopy were collected from children enrolled in the main trial at baseline. ABR testing was performed using portable wireless equipment at community level by health workers and nurses following a targeted short training. Background data was electronically collected using Personal Digital Assistants (PDAs). Audiology results were reviewed offsite by two senior audiologists in the UK and Austria for interpretation.

Results
Out of 838 children recruited in the main trial 814 children were assessed in the community. Results relating to the quality of the data, their comparison with international age-specific normative values and determinants of ABR outcomes in this population will be presented.

Conclusions and Recommendations
Findings, confirmed that objective hearing screening conducted by trained field workers is feasible at community level in a trial setting. While this may be challenging for wide-scale programmatic implementation, this approach may be suitable for targeted surveys in high risk groups in low resource settings to explore specific hearing safety concerns in a community, such as the impact of exposure to known ototoxic drugs.

Integration of HIV services at Mulanje mission hospital: challenges of structural integration
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Introduction
Integration of HIV services into existing health services has been employed in many aspects of the health care system especially in the resource poor settings. The success of it is based on ability to provide the satisfactory holistic health care which is affordable to both the recipient (patient or client) and the provider (health facility and its personnel). There are three dimensions in the process of integration: functional, logistical and structural. Nevertheless, It is commonly understood that integration mean providing services under the same roof which is only looking at structural dimension. This misunderstanding is mostly driven by lack of literature that explains how the process of integration ought to be carried out.

Methods
A retrospective comparative analysis of outcome of two services was done. Desk reviews, key note interviews and patients data was analyzed. Health Management Information System (HIMS) data was used where it would provide the needed information. SPSS was used as a data entry and analysis tool.

Two services were chosen, the CD4 count a non-integrated service and an in-patient HIV testing as an integrated service. Both services are supposed to retain or offer the service to 100% of the clients that are in need of the services.

Results
46% of clients did not return to get their results CD4 count group whereas there was 90% of patients who were not tested or have their results documented in the in-patients HIV testing, a non-integrated and an integrated system respectively.

Conclusion
There are poor efforts made to see to it that the services that are integrated are achieving the intended goal; good patient retention.

A meta-synthesis investigating the experiences of informal caregivers of people living with HIV/AIDS
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Introduction
Informal caregivers of HIV/AIDS patients experience so many challenges. It is widely acknowledged that an
understanding of the need and experiences of informal caregivers is essential for the development of effective policies to guide the practice of care, an understanding likely to be provided by data from qualitative studies which explore experiences. There is a lack of meta-synthesis that brings together this research. The objective was to describe the experiences of informal caregivers of people living with HIV/AIDS, including challenges and positive aspects.

Methods

The meta-synthesis considered qualitative studies in which family members, volunteers and others providing unpaid care to people living with HIV/AIDS was participants. The phenomena of interest were the experiences of Informal caregivers in providing care, and the type of data included experiential accounts of caregivers. Searches were conducted in Amed, CINAHL, Embase, Medline and PsyInfo data bases. The search sought to find published studies limited to English language. Data were extracted using qualitative assessment and review instrument based on the works of Joanna Briggs Institute. Papers were assessed independently by two reviewers using critical appraisal tool for qualitative studies. There were no disagreements between the two reviewers and therefore a third reviewer was not required.

Results

39 papers were retrieved. Of these 20 were qualitative and included in the meta-synthesis. Caregivers experience stigma and discrimination, physical, psychological and financial burdens. Age ranged from 10-80 years, most were elder women and young girls. Caregivers get minimal support from informal and formal structures.

Conclusion

Caregivers experience a lot of challenges which have implications in their physical and emotional/psychosocial wellbeing. Stigma and discrimination led to social isolation and lack of support. The findings have implications for practice, policy and research in palliative and home-based care.

HIV prevalence, sexual risks and HIV knowledge among men who have sex with men (MSM) in Malawi: understanding risks among a stigmatized population and opportunities for interventions

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Introduction

Malawi has a generalized HIV epidemic with approximately 11.0% of adults living with HIV, though preliminary data highlight significant HIV-related vulnerabilities among key populations, such as MSM.

There is limited understanding of vulnerabilities among MSM; this study aimed to fill this gap and provide population-based estimates of HIV prevalence and associations of infection among MSM in Malawi.

Methods

339 men reporting anal sex with another man in the previous year were accrued into a respondent driven-sampling study from August 2011-March 2012 in Blantyre. Study activities included a structured survey instrument and biological assessment of HIV and syphilis.

Results

Participants were a mean age of 25.1yrs. (range: 18-49), 46.6% were unemployed, over half were gay identified (61.9%), and 10.3%( 35/339) were currently married to a woman. Participants reported a mean of 3 male sex partners in the last 12 mo. (range: 1-50). Concurrent relationships were common: 30.4%( 99/326) reported recent partnerships with two or more men and 14.7 %( 48/306) reported concurrent partnerships that included at least one female. HIV prevalence was 14.8 %( 49/330); among those with HIV infection, 91% (45/49) were unaware of their HIV status and 39.9% (19/39) had never tested for HIV. Nearly 60% (176/304) reported that vaginal sex was the highest risk form of sex, indicating low knowledge of transmission risk. Multivariate analysis demonstrated that age >26yrs (aOR: 4.26, CI: 2.17-9.47), history of imprisonment (aOR: 1.72; CI: 0.82-3.58), and having >1 child (aOR: 2.25; 95%CI: 1.50-7.01) were associated with HIV infection, while rural residency (aOR: 0.32; 95%CI: 0.11-0.93) and secondary education or higher (aOR: 0.81; 95%CI: 0.41-1.63) were inversely associated.

Conclusions

As of May, 2012, the changing government in Malawi publicly announced Intention to decriminalize homosexuality. The data here reinforce the need to take advantage of this opportunity to provide services to MSM, given the limited HIV-related knowledge and high risk practices. This study demonstrates that MSM are an important population in Malawi’s HIV epidemic and deserve targeted HIV prevention services.