

Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania



RESEARCH BULLETIN

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2011 Journal articles, Conference Proceedings, Books/Report, Thesis and Dissertations

Table of Contents

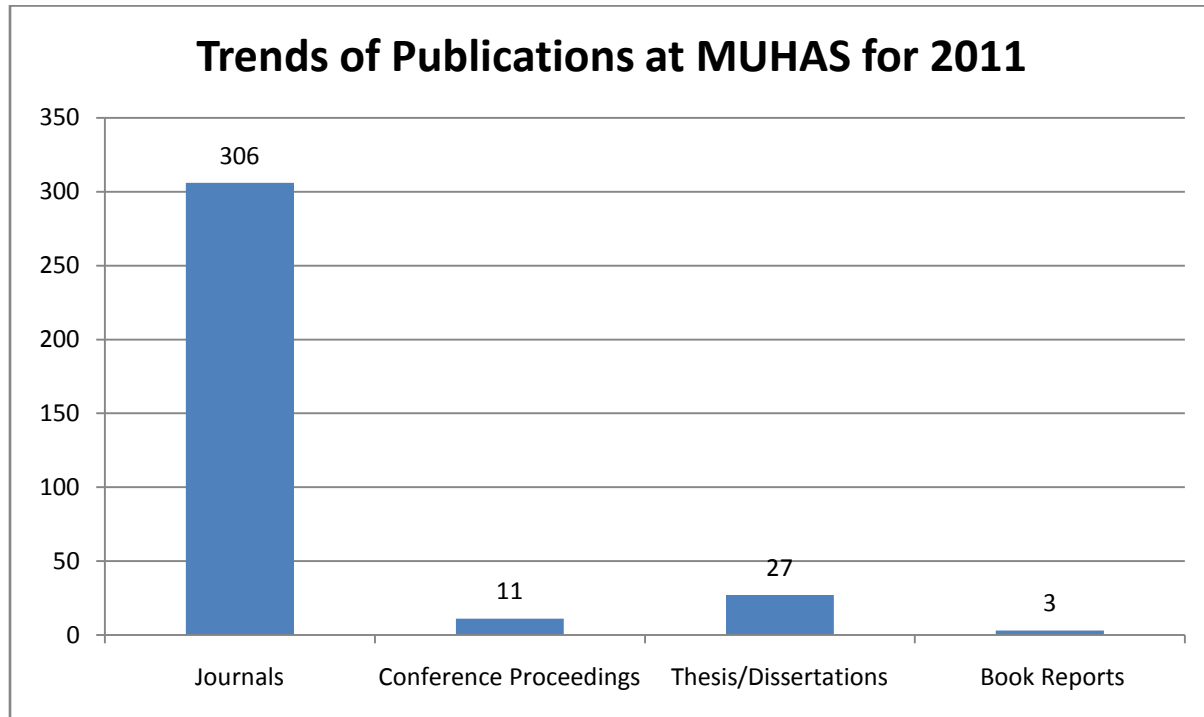
Information to readers.....	iii
Editorial.....	iv
Chapter One: Author names (A – M).....	1
Chapter Two: Author Names (N – Z)	187
Author Index	245

Information to readers

This bulletin is intended to provide information on research by members of Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania. It provides summaries of publications during the proceeding calendar year, including dissertations, thesis, journal articles and conference proceedings. Members are requested to provide the Editor with summaries of their publications and ongoing research in electronic form for inclusion in the Bulletin. Abstract should be limited to 200 words.

Editorial

The current volume (Volume 14 No.1) contains total of 347 abstracts (306 journal articles, 27 Dissertations, 11 Conference proceeding and 3 book/research report published in 2011.



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1. Aarø LE, Breivik K, Klepp KI, Kaaya S, Onya HE, Wubs A, Helleve A, Flisher AJ. An HIV/AIDS knowledge scale for adolescents: Item response theory analyses based on data from a study in South Africa and Tanzania. Health Education Research.2011; 26 (2): 212-224.

A 14-item human immunodeficiency virus/acquired immunodeficiency syndrome knowledge scale was used among school students in 80 schools in 3 sites in Sub-Saharan Africa (Cape Town and Mankweng, South Africa, and Dar es Salaam, Tanzania). For each item, an incorrect or don't know response was coded as 0 and correct response as 1. Exploratory factor analyses based on polychoric correlations showed two separate factors for all sites. Two-parameter item response theory (IRT) analysis (bifactorial multiple indicators multiple causes confirmatory factor analysis models) consistently showed a general first factor and a second 'method' factor. One single global latent variable seemed to sufficiently well capture most of the systematic variation in knowledge. Some items did not discriminate well between levels of the underlying knowledge latent variable and information values were highest for low levels of knowledge. The scale might be improved by adding items, in particular items that are more difficult to answer. Some differential item functioning effects related to site and socioeconomic status were identified. Scores on the latent knowledge variable were particularly low among females in Dar es Salaam and Mankweng, and were negatively associated with socioeconomic status. This study illustrates advantages of using IRT analysis instead of more conventional approaches to examining psychometric properties of knowledge scales.

2. Abbas ZG, Lutale JK, Bakker K, Baker N, Archibald LK. The 'Step by Step'Diabetic Foot Project in Tanzania: a model for improving patient outcomes in less-developed countries. International wound journal. 2011; 8(2): 169-175.

Foot complications cause substantial morbidity in Tanzania, where 70% of leg amputations occur in diabetic patients. The Step by Step Foot Project was initiated to train healthcare personnel in diabetic foot management, facilitate transfer of knowledge and expertise, and improve patient education. The project comprised a 3-day basic course with an interim period 1-year of for screening, followed by an advanced course and evaluation of activities. Fifteen

centres from across Tanzania participated during 2004–2006 and 12 during 2004–2007. Of 11 714 patients screened in 2005, 4335 (37%) had high-risk feet. Of 461 (11%) with ulcers, 45 (9.8%) underwent major amputation. Of 3860 patients screened during 2006–2007, there was a significant increase in the proportion with ulcers and amputations compared with 2005 ($P < 0.001$), likely a result of enhanced case finding. During 2005–2008, there was a fall in the incidence of foot ulcers in patient referrals to the main tertiary care centre in Dar es Salaam and a parallel fall in amputation among these referrals. In conclusion, the Step by Step Foot Project in Tanzania improved foot ulcer management for persons with diabetes and resulted in permanent, operational foot clinics across the country. This programme is an effective model for improving outcomes in other less-developed countries.

3. Abdalha AA, Abou El-Regal MK, El-Kassaby MA, Ali AT. Synthesis of Some New Tetrahydrobenzo [b] thiophene Derivatives and Tetrahydrobenzo thienopyrimidine Derivatives under Microwave Irradiation. *Synthetic Communications*. 2011; 41(19): 2811-2821.

2-Phenyl-5, 6, 7, 8-tetrahydro-4H-benzothieno [2, 3-d][1,3]oxazin-4-one (4) was reacted with either aliphatic or aromatic primary amines such as benzylamine, cyclohexylamine, p-toluidine, and/or p-anisidine to give carboxamide derivatives 5a–d, respectively. A bifunctional nucleophile such as ethanolamine was also reacted with 4, giving the carboxamide derivative 5e. Aminolysis of 4 with secondary amines such as piperidine and/or morpholine afforded the benzamide derivatives 6a and/or 6b, respectively. Fusion of 4 with hydrazine hydrate yielded the pyrimidine derivative 7 and carbohydrazide derivative 8. Thiation of 4 with phosphorous pentasulfide gave thienothiazine derivative 9, which reacted with benzylamine to give the pyrimidine derivative 10. Carbon nucleophiles such as ethyl cyanoacetate and/or malononitrile were subjected to react with 4 to give oxopropanoate 11 and/or oxopropanoic acid 12 derivatives, respectively. Microwave irradiation of 4 and formamide yielded the pyrimidinone derivative 13, which were subjected to react with phosphorous pentasulfide, a mixture of phosphorous oxychloride and phosphorous pentachloride and/or methyl iodide, to give 14, 15, and/or 16, respectively.

4. Abdullah AM, Mohamed AF, Abd-Latif I. The impacts of supermarkets and hypermarkets from the perspectives of fresh fruit and vegetable (FFV) wholesalers and retailers. Journal of Agribusiness Marketing. 2011; 4: 21-37.

The importance of the retail sector to economic growth has been very significant. The rapid growth of the sector is partly contributed by the emergence of supermarkets and hypermarkets that are mostly foreign-owned. This has raised some concerns by the local conventional retailers including fresh fruit and vegetable (FFV) retailers. The government has reacted to the concerns by introducing new guidelines to developing new hypermarkets in this country. This study investigates the impacts of these two types of retailers on local FFV wholesalers and retailers. Data from personal interviews with FFV retailers and wholesalers were analysed. Results of the analyses showed that supermarkets and hypermarkets did impose competition on conventional wholesalers and retailers. However, they have also brought some changes to FFV retail business, such as promoting quality products, and a better and a systematic marketing approach.

5. Aboud S, Munseri P, Joachim A, Bakari M, Nilsson C, Buma D, Brave A. Persistence of vaccine-induced antibodies following HIV-1 DNA prime MVA boost vaccination among healthy Tanzanian volunteers. In AIDS Research and Human Retroviruses. 2011; 27(10): A75-A75.

Background: A phase I/II HIV vaccine trial (HIVIS03) using a multiclade, multigene HIV-1 DNA prime with two heterologous HIV-1 MVA boosts has been completed among healthy adults in Dar es Salaam, Tanzania. Study Subjects and Methods: None of the vaccines or placebo recipients was positive in the diagnostic HIV serological assays after three HIV-DNA immunizations or after the first HIV-MVA boost. Four weeks after the second HIV-MVA boost, all 30 vaccines (100%) were positive in all three diagnostic HIV assays (Table 1). On the immunoblot assay, all 30 showed reactivity to both gag (p24) and Env (gp120 and/or gp41).conclusion: This study showed the durability of HIV-DNA-MVA vaccine-induced antibody responses in Tanzanian volunteers 17-22 months after the second HIV MVA boost.

6. Aboud S, Wilcox J, Brown Jr GE. Density functional theory investigation of the interaction of water with α -Al₂O₃ and α -Fe₂O₃ (11 $\bar{0}2$) surfaces: Implications for surface reactivity. *Physical Review B*. 2011; 83(12): 125407.

Density functional theory calculations were performed in conjunction with ab initio thermodynamics, bond valence calculations, and density of states studies to investigate the chemical reactivity of α -Al₂O₃ and α -Fe₂O₃ (11 $\bar{0}2$) surfaces in a humid environment. α -Fe₂O₃ (11 $\bar{0}2$) displays a much higher degree of surface reactivity with respect to water adsorption and aqueous heavy metal ions than α -Al₂O₃. The reason for these differences has not been fully explained. We have found that, while both metal oxides exhibit a similar stable (11 $\bar{0}2$) surface at and below room temperature, corresponding to a stoichiometric surface with the first layer of metal ions missing, the degree of hydroxylation of the surface oxygen atoms leads to differences in the atomic layer relaxation in α -Al₂O₃ (11 $\bar{0}2$) compared to α -Fe₂O₃ (11 $\bar{0}2$), which has also been confirmed previously by crystal truncation rod x-ray diffraction studies. Also in agreement with these experimental studies, we find the atomic layer spacing of the most energetically stable (11 $\bar{0}2$) Al₂O₃ surface is relatively insensitive to the inclusion of multiple layers of physisorbed water. This is in contrast to previously reported density functional theory studies of hydrated (11 $\bar{0}2$) α -Fe₂O₃ surfaces, the results of which are confirmed in this work, that a monolayer of water is required for good agreement with experimental measurements of the atomic layer relaxation. These changes in atomic spacing result in changes in electron charge distributions and in Lewis and Brønsted acid/base properties of surface sites, which influence the relative reactivities of the two surfaces. However, the higher reactivity of the hydrated (11 $\bar{0}2$) surface of α -Fe₂O₃ can be attributed mainly to the empty d states of the surface Fe atoms, which exhibit a first peak at ~1 eV above the Fermi level and act as very strong Lewis acid sites. In comparison, the empty p states of Al in the hydrated (11 $\bar{0}2$) α -Al₂O₃ surface, which are ~5 eV above the Fermi level, should be much less reactive to potential adsorbates.

7. Abraham E, Deepa B, Pothan LA, Jacob M, Thomas S, Cvelbar U, Anandjiwala R. Extraction of nanocellulose fibrils from lignocelluloses fibres: a novel approach. *Carbohydrate Polymers*. 2011; 86(4): 1468-1475.

The objective of this work was to develop a simple process to obtain an aqueous stable colloid suspension of cellulose nano fibrils from various lignocelluloses fibres. For the preliminary analysis we have studied three different fibres: banana (pseudo stem), jute (stem) and pineapple leaf fibre (PALF). To study the feasibility of extracting cellulose from these raw fibres we have adopted steam explosion technique along with mild chemical treatment. These processes included usual chemical procedures such as alkaline extraction, bleaching, and acid hydrolysis but with a very mild concentration of the chemicals. The chemical constituents of the fibre in each processing step were determined by ASTM standard procedures. Morphological, spectroscopic and thermal analyses of the fibres were carried out and found that the isolation of cellulose nanofibres occurs in the final step of the processing stage and they possess improved thermal stability for various advanced nanotechnological applications.

8. Abrahão AL, Cordeiro B C, Marques D, Daher DV, Teixeira GH, Monteiro KA, Fernandez VS. Research as a device for practice at the PET-Health program in Niterói. *Revista Brasileira de Educação Médica*. 2011; 35(3): 435-440.

PET-Health (the Educational Program for Health Work) proposed by the Fluminense Federal University (UFF) and the Niterói Municipal Health Foundation (FMS) began its activities in April 2010 with the purpose of developing a participatory teaching-learning process, with daily work in health services as its central thrust, using health research and evaluation tools as the trigger for learning. The activities are developed from the perspective of developing a health diagnosis in the coverage area of each health unit affiliated with PET. The methodology is participatory research with direct involvement by health professionals, students, users, and faculty. Reconstruction of local history has been used as the research tool, including documents searches and interviews with community members. Important activities include registering and re-registering families and an epidemiological profile of neighborhoods. In this first stage, we identified interaction in a multidisciplinary team as a challenge that has fostered major strides in the shared understanding of the health-disease process by students, faculty, and health professionals.

9. Acosta M, Mohamed F. Effect of the photoperiod and administration of melatonin on folliculostellate cells of the pituitary pars distalis of adult male viscacha (*Lagostomus maximus maximus*). Acta histochemica. 2011; 113(6): 640-646.

Numerous reports have shown the effect of photoperiod and melatonin administration on the different hormone secreting cell types in the pituitary pars distalis. The viscacha (*Lagostomus maximus*) is a rodent with photoperiod-dependent seasonal reproduction. The aim of this study was to examine the effect of photoperiod seasonal variations and melatonin administration on the folliculostellate cells in pituitary pars distalis of viscacha. Immunohistochemistry and image analysis were used to measure the percentage of S-100-positive area (total, cellular and colloidal) and the number of folliculostellate cells. The S-100 protein was immunolocalized at intracellular (folliculostellate cells) and extracellular (follicular colloid) levels. The morph metric parameters analyzed exhibited seasonal variations with highest values in the summer (long photoperiod) and lowest values in the winter (short photoperiod). The administration of melatonin caused a significant decrease of immunostaining. Results suggest that the natural photoperiod might be the most important environmental signal causing the decrease in folliculostellate cells immunostaining observed in the winter. These findings agree with seasonal changes previously reported in endocrine cells and suggest that folliculostellate cells may be involved in the paracrine regulation of the secretory activity of pituitary pars distalis through S-100 protein production.

10. Adams LV, Naburi H, Waddell R. Tanzania, Africa: A Practical Guide for Global Health Workers. 2011: 193-227.

11. Agewall S, Badimon L, Drouet L, Eschenhagen T, Husted S, Simon T, Steg G. Oral ant platelet agents in ACS: from pharmacology to clinical differences. Fundamental & clinical pharmacology. 2011; 25(5): 564-571.

Antiplatelet agents play an essential role in the treatment of acute coronary syndrome (ACS). Numerous clinical trials have established the value of ant platelet therapies for ACS. Aspirin

(ASA), thienopyridines and GP IIb/IIIa antagonists comprise the major classes of ant platelet therapies demonstrated to be of benefit in the treatment of ACS. Thienopyridines are a class of drugs that function via inhibition of the adenosine diphosphate (ADP) P2Y₁₂ platelet receptors. Currently, clopidogrel, a second generation thienopyridine, is the main drug of choice and the combination of aspirin and clopidogrel is administered orally for the treatment of ACS. Recently, a third generation of thienopyridines has been introduced represented by prasugrel that has demonstrated promising results in ACS patients treated with percutaneous coronary intervention (PCI). A number of nonthienopyridine oral ant platelet drugs are under development, and one of them, ticagrelor has already been tested in a major phase III clinical trial, PLATO, with the inclusion of a broad spectrum of patients with ACS. The present review aims to discuss the present knowledge about the safety and efficacy of oral ant platelet treatment of patients with ACS.

12. Aklill E, Mugusi S, Ngaimisi E, Hoffmann MM , König S, Ziesenitz V, Mikus G, Haefeli WE, Weiss J. Frequency of the SLCO1B1 388A>G and the 521T>C polymorphism in Tanzania genotyped by a new LightCycler®-based method. European Journal of Clinical Pharmacology.2011; 67 (11): 1139-1145.

Purpose: The 388A>G and the 521T>C polymorphism of the SLCO1B1 gene affect the activity of the uptake transporter OATP1B1, thus influencing kinetics, safety, and efficacy of substrate drugs. To evaluate the impact of these polymorphisms in populations of different ethnic origins, it is important to know their frequencies and to develop fast and reliable methods for genotyping. We therefore established a new, high-throughput method and determined the genotype and allelic frequencies of these polymorphisms in Tanzanians, for which the frequencies were unknown thus far. **Methods:** New LightCycler® 480-based methods with hybridization probes were established and used to genotype 366 Tanzanian and 236 European individuals for 388A>G (rs2306283) and 521T>C (rs4149056) in the SLCO1B1 gene. The methods were validated by direct sequencing of the polymerase chain reaction (PCR) products of heterozygous individuals and checked for intrarun precision repeatability, interrune precision reproducibility, robustness, and deviations from the Hardy-Weinberg equilibrium. **Results:** The new methods allow unambiguous identification of the corresponding genotypes. There was a clear difference in

allelic distribution between Tanzanians and Europeans, with the 388A>G (rs2306283) being much more prevalent in Tanzanians (87% vs 41%) and the 521T>C (rs4149056) being very rare in this African population (6% vs 17%). **Conclusions:** We developed robust and high-throughput methods to genotype common SLCO1B1 allelic variants with the LightCycler® 480. In Tanzanians, we identified the highest frequency of the 388A>G and 521T>C polymorphisms ever reported from black populations. The clinical relevance of SLCO1B1 genetic variation in the African population remains to be investigated.

13. Akter N, Radiman S, Mohamed F, Rahman IA, Reza MIH. Ternary phase behavior and vesicle formation of a sodium N-lauroylsarcosinate hydrate/1-decanol/water system. Scientific reports. 2011; 1.

The phase behavior of a system composed of amino acid-based surfactant (sodium N-lauroylsarcosinate hydrate), 1-decanol and deionised water was investigated for vesicle formation. Changing the molar ratio of the amphiphiles, two important aggregate structures were observed in the aqueous corner of the phase diagram. Two different sizes of micro emulsions were found at two amphiphile-water boundaries. A stable single vesicle lobe was found for 1:2 molar ratios in 92 wt% water with vesicles approximately 100 nm in size and with high zeta potential value. Structural variation arises due to the reduction of electrostatic repulsions among the ionic headgroups of the surfactants and the hydration forces due to adsorbed water onto monolayer's. The balance of these two forces determines the aggregate structures. Analysis was followed by the molecular geometrical structure. These findings may have implications for the development of drug delivery systems for cancer treatments, as well as cosmetic and food formulations.

14. Al-basry AH, Al-Hajeri SK, Saadawi HN, Aryani A, Mohamed F, Al Obeidi A, Bindaer GS. Lessons learned from the First Miscible CO₂-EOR Pilot Project in Heterogeneous Carbonate Oil Reservoir in Abu Dhabi UAE. In SPE Middle East Oil and Gas Show and Conference. Society of Petroleum Engineers. 2011.

Carbon Dioxide (CO₂) is considered to be the most serious Green House Gas (GHG) in the atmosphere and the key contributor to the Climate Change [1]. In 2006, the Government of the UAE launched Abu Dhabi Future Energy Company (MASDAR) to implement a large-scale carbon capture project to reduce greenhouse gas emission by capturing and transporting the CO₂ to oilfields for sequestration and/or Enhanced Oil Recovery (EOR) processes. In November 2009, Abu Dhabi Company for Onshore Oil Operations (ADCO), in collaboration with Abu Dhabi National Oil Company (ADNOC), Industry Shareholders (BP, Shell, Total, ExxonMobil, and Partex) and MASDAR, implemented ADCO's first CO₂ Enhanced Oil Recovery (EOR) Pilot Project by injecting CO₂ in a complex carbonate oil reservoir. ADCO initiated the CO₂ EOR study during mid 2008 with the main objective being to develop a CO₂ EOR portfolio based on detailed laboratory studies, simulation studies, and field pilot studies. The ADCO CO₂ pilot project started with a company-wide screening study identifying both the most appropriate EOR option and most likely reservoir candidates. The preparation phase started early April 2008 with the in-house studies commencing August 2008. In November 2008, the project was reviewed by key stakeholders and was approved in January 2009.

15. Alcover A, Alemany M, Jacob M, Payeras M, García A, Martínez-Ribes L. The economic impact of yacht charter tourism on the Balearic economy. *Tourism Economics*. 2011; 17(3): 625-638.

This paper evaluates the impact of yacht charter tourism on the economy of the Balearic Islands, one of the most popular yachting tourism destinations in the Mediterranean. Empirical evidence, from a sample of yacht charter tourists and a database on charter firms in the Balearics provided by the National Charter Federation, gives information on daily tourist expenditure, the number of charter tourists and firms' turnover and employment. More than 100,000 tourists come annually to the Balearics to charter yachts. Average daily expenditure per tourist, including charter cost and other spending on hotel accommodation, bars and restaurants, shopping and other items, is €170; however, average daily expenditure varies depending on the typology of boat rented. When tourist spending in the country of origin is included, average daily expenditure rises to €203.90. Daily expenditure is higher than that of a traditional tourist (€105.20) and similar to that

of a golf tourist (€211). Finally, yacht charter activity in the Balearics contributes to the generation of around 866 jobs in the archipelago.

16. Ali AT, Ferris WF, Naran NH, Crowther NJ. Insulin resistance in the control of body fat distribution: a new hypothesis. *Hormone and metabolic research*. 2011; 43(02): 77-80.

Obesity causes insulin resistance, which is a prime etiological factor for type 2 diabetes, dyslipidemia, and cardiovascular disease. However, insulin resistance may be a normal physiological response to obesity that limits further fat deposition and which only has pathological effects at high levels. The current hypothesis suggests that in obesity the initial deposition of triglycerides occurs in subcutaneous adipose tissue and as this increases in size insulin resistance will rise and limit further subcutaneous lipid accumulation. Triglycerides will then be diverted to the visceral fat depot as well as to ectopic sites. This leads to a substantial rise in insulin resistance and the prevalence of its associated disorders. Evidence supporting this hypothesis includes studies showing that in lean subjects the prime determinant of insulin resistance is BMI, that is, subcutaneous fat whilst in overweight and obese subjects it is waist circumference and visceral adiposity. It has also been shown that the metabolic syndrome suddenly increases in prevalence at high levels of insulin resistance and we suggest that this is due to the diversion of lipids from the subcutaneous to the visceral depot. This system may have functioned in our evolutionary past to limit excessive adiposity by causing lipid deposition to occur at a site that has maximal effects on insulin resistance but involves minimal weight gain.

17. Ali AT. New generalized Jacobi elliptic function rational expansion method. *Journal of computational and applied mathematics*. 2011; 235(14): 4117-4127.

In this work, a new generalized Jacobi elliptic function rational expansion method is based upon twenty-four Jacobi elliptic functions and eight double periodic Weierstrass elliptic functions, which solve the elliptic equation $\wp'^2 = r + p\wp^2 + q\wp^4$, is described. As a consequence abundant new Jacobi–Weierstrass double periodic elliptic functions solutions for (3+1)-dimensional Kadomtsev–Petviashvili (KP) equation are obtained by using this method. We show

that the new method can be also used to solve other nonlinear partial differential equations (NPDEs) in mathematical physics.

18. Amemori M, Mumghamba EG, Ruotoistenmäki J, Murtomaa H. Smoking and drinking habits and attitudes to smoking cessation counselling among *Tanzanian dental students*. *Community Dental Health*.2011; 28 (1): 95-98.

The present research was carried out at the School of Dentistry, Muhimbili University of Health and Allied Sciences, Tanzania. **Objective:** To assess smoking and drinking habits as well as attitudes towards smoking cessation counselling among dental students in Tanzania. Basic Research Design: A 28-item pretested and self-administered questionnaire was delivered to all dental students enrolled at the end of the 2006 academic year. The questionnaire covered socio-demographics, smoking and drinking habits, knowledge concerning health effects and attitudes towards smoking cessation counselling. Participants: Dental students enrolled at the end of the 2005/2006 academic year in the School of Dentistry, University of Dar-es-Salaam, Tanzania. Main Outcome Measures: Self-reported smoking, alcohol use and attitudes to smoking cessation counselling. **Results:** The response rate was 73.2% (109/149) and 76.1% of respondents were male. Smoking was reported by 12.8%, all being male. Alcohol use during the last 30 days was reported by 23.8% and binge drinking during the last two weeks by 11.8%. Both smoking and alcohol use were more common among clinical than basic science students. The majority (67.0%) reported that they had not received education on smoking cessation counselling although 86.2% considered that dentists and physicians should provide such counselling. **Conclusion:** Reported smoking and alcohol consumption are on a low level compared to dental students internationally. Willingness and need for cessation counselling training was expressed by the majority of Tanzanian dental students. This should be taken into consideration in dental curriculum development.

19. Åström AN, Mbawalla H. Factor structure of health and oral health-related behaviors among adolescents in Arusha, northern Tanzania. *Acta Odontologica Scandinavica*.2011; 69 (5): 299-309. Objective.

This study aimed to evaluate the factor structure of health and oral health-related behaviors and its invariance across gender and to identify factors associated with behavioral patterns. **Materials and methods:** A cross-sectional study included 2412 students attending 20 secondary schools in Arusha. Self-administered questionnaires were completed at school. **Results:** Principal component analysis of seven single health and oral health-related behaviors (tooth brushing, hand wash after latrine, hand wash before eating, using soap, intake of sugared mineral water, intake of fast foods and intake of sweets) suggested two factors labeled hygiene behavior and snacking. Confirmatory factor analyses, CFA, provided acceptable fit for the hypothesized two-factor model; CFI = 0.97. Multiple group CFA across gender showed no statistically significant difference in fit between unconstrained and constrained models ($p = 0.203$). Logistic regression revealed ORs for hygiene behaviors of 1.5, 0.5, 1.5, 1.5 and 0.6 if being a girl, current smoker, reporting good relationship with school, access to hygiene facilities and bad life satisfaction, respectively. ORs for snacking were 1.3, 1.4, 0.4 and 0.5 if female, in the least poor household quartile, low family socio-economic status and high perceived control, respectively. **Conclusion:** The two factors suggest that behaviors within each might be approached jointly in health promoting programs. A positive relationship with school and access to hygiene facilities might play a role in health promotion. Provision of healthy snacks and improved perceived behavioral control regarding sugar avoidance might restrict snacking during school hours.

20. Atkinson J, McCurdy S, Williams M, Mbwambo J, Kilonzo G. HIV risk behaviours, perceived severity of drug use problems, and prior treatment experience in a sample of young heroin injectors in Dar es Salaam, Tanzania. *African Journal of Drug and Alcohol Studies*. 2011; 10 (1): 1-9.

Interviews were conducted with 203 male and 95 female heroin injectors aged 17 to 25 in Dar es Salaam, Tanzania. Nearly one-quarter of participants reported injecting with needles used by someone else. Few reported cleaning needles with bleach. Multiple sexual partnerships, unprotected sex, and trading sex for money were especially present among women, the majority (55%) of whom was HIV seropositive. Self reports suggest the presence of heroin dependence among users. While most participants expressed a desire to quit their use, only 14 (5%) had been in treatment. There appears to be a large unmet need for heroin use treatment. These findings

need to be considered in light of a potential forthcoming wave of heroin injection in sub-Saharan Africa.

21. Authemayou C, Brocard G, Teyssier C, Simon-Labric T, Gutiérrez A, Chiquín EN, Morán S. The Caribbean–North America–Cocos Triple Junction and the dynamics of the Polochic–Motagua fault systems: Pull-up and zipper models. *Tectonics*. 2011; 30(3).

The Polochic-Motagua fault systems (PMFS) are part of the sinistral transform boundary between the North American and Caribbean plates. To the west, these systems interact with the subduction zone of the Cocos plate, forming a subduction-subduction-transform triple junction. The North American plate moves westward relative to the Caribbean plate. This movement does not affect the geometry of the subducted Cocos plate, which implies that deformation is accommodated entirely in the two overriding plates. Structural data, fault kinematic analysis, and geomorphic observations provide new elements that help to understand the late Cenozoic evolution of this triple junction. In the Miocene, extension and shortening occurred south and north of the Motagua fault, respectively. This strain regime migrated northward to the Polochic fault after the late Miocene. This shift is interpreted as a “pull-up” of North American blocks into the Caribbean realm. To the west, the PMFS interact with a trench-parallel fault zone that links the Tonalá fault to the Jalpatagua fault. These faults bound a fore-arc sliver that is shared by the two overriding plates. We propose that the dextral Jalpatagua fault merges with the sinistral PMFS, leaving behind a suturing structure, the Tonalá fault. This tectonic “zipper” allows the migration of the triple junction. As a result, the fore-arc sliver comes into contact with the North American plate and helps to maintain a linear subduction zone along the trailing edge of the Caribbean plate. All these processes currently make the triple junction increasingly diffuse as it propagates eastward and inland within both overriding plates.

22. Badowski N, Castro CM, Montgomery M, Pickering AJ, Mamuya SD, Davis Jb Understanding household behavioral risk factors for diarrheal disease in Dar es Salaam: A photo voice community assessment. *Journal of Environmental and Public Health*. 2011: 130467.

Whereas Tanzania has seen considerable improvements in water and sanitation infrastructure over the past 20 years, the country still faces high rates of childhood morbidity from diarrheal diseases. This study utilized a qualitative, cross-sectional, modified Photo voice method to capture daily activities of Dar es Salaam mothers. A total of 127 photographs from 13 households were examined, and 13 interviews were conducted with household mothers. The photographs and interviews revealed insufficient hand washing procedures, unsafe disposal of wastewater, uncovered household drinking water containers, a lack of water treatment prior to consumption, and inappropriate toilets for use by small children. The interviews revealed that mothers were aware and knowledgeable of the risks of certain household practices and understood safer alternatives, yet were restricted by the perceived impracticality and financial constraints to make changes. The results draw attention to the real economic and behavioral challenges faced in reducing the spread of disease.

23. Bakari M, Aboud S, Nilsson C, Francis J, Buma D, Moshiro C, Aris EA, Lyamuya EF, Janabi M, Godoy-Ramirez K, Joachim A, Sandström E. Broad and potent immune responses to a low dose intradermal HIV-1 DNA boosted with HIV-1 recombinant MVA among healthy adults in Tanzania. *Vaccine*. 2011; 29(46): 8417-8428.

Background: We conducted a phase I/II randomized placebo-controlled trial with the aim of exploring whether priming with a low intradermal dose of a multiclade, multigene HIV-1 DNA vaccine could improve the immunogenicity of the same vaccine given intramuscularly prior to boosting with a heterologous HIV-1 MVA among healthy adults in Dar es Salaam, Tanzania. **Methods:** Sixty HIV-uninfected volunteers were randomized to receive DNA plasmid vaccine 1 mg intradermally (id), n = 20, or 3.8 mg intramuscularly (im), n = 20, or placebo, n = 20, using a needle-free injection device. DNA plasmids encoding HIV-1 genes gp160 subtype A, B, C; rev B; p17/p24 gag A, B and Rtmut B were given at weeks 0, 4 and 12. Recombinant MVA (108 pfu) expressing HIV-1 Env, Gag, Pol of CRF01_AE or placebo was administered im at month 9 and 21. **Results:** The vaccines were well tolerated. Two weeks after the third HIV-DNA injection, 22/38 (58%) vaccines had IFN- γ ELISpot responses to Gag. Two weeks after the first HIV-MVA boost all 35 (100%) vaccines responded to Gag and 31 (89%) to Env. Two to four weeks after the second HIV-MVA boost, 28/29 (97%) vaccines had IFN- γ ELISpot responses,

27 (93%) to Gag and 23 (79%) to Env. The id-primed recipients had significantly higher responses to Env than im recipients. Intracellular cytokine staining for Gag-specific IFN- γ /IL-2 production showed both CD8⁺ and CD4⁺ T cell responses. All vaccines had HIV-specific lymph proliferative responses. All vaccines reacted in diagnostic HIV serological tests and 26/29 (90%) had antibodies against gp160 after the second HIV-MVA boost. Furthermore, while all of 29 vaccine sera were negative for neutralizing antibodies against clade B, C and CRF01_AE pseudo viruses in the TZM-bl neutralization assay, in a PBMC assay, the response rate ranged from 31% to 83% positives, depending upon the clade B or CRF01_AE virus tested. **Conclusions:** This vaccine approach is safe and highly immunogenic. Low dose, id HIV-DNA priming elicited higher and broader cell-mediated immune responses to Env after HIV-MVA boost compared to a higher HIV-DNA priming dose given im. Three HIV-DNA priming immunizations followed by two HIV-MVA boosts efficiently induced Env-antibody responses.

24. Bakari M. Becoming Muslim in Mainland Tanzania, 1890–2000 By Felicitous Becker. *Journal of Islamic Studies*. 2011; 22(2), 276-279.

25. Bakari M. Between Social Skills and Marketable Skills: The Politics of Islamic Education in 20th Century Zanzibar by Roman Loimeier. *Journal of Islamic Studies*. 2011: etr032.

Background: HIV vaccine-candidates based on rare adenovirus serotypes such as Ad26 and Ad35 vectors, and poxvirus vectors are important components of future promising vaccine regimens that in the near future hopefully will move into a number of efficacy clinical trials in combination with protein vaccines. For these reasons, it is important to comprehensively characterize the vaccine-induced immune responses in different anatomical compartments and particularly at mucosal sites which represent the primary port of entry for HIV. **Methods:** In the present study, we have investigated the anatomic distribution in blood and gut mucosal tissues (rectum and ileum) of memory poxvirus-specific CD4 and CD8 T cells in subjects vaccinated with smallpox and compared with vector (NYVAC)-specific and HIV insert-specific T-cell responses induced by an experimental DNA-C/NYVAC-C vaccine regimen. **Results:** Smallpox-specific CD4 T-cell responses were present in the blood of 52% of subject studied, while

Smallpox-specific CD8 T cells were rarely detected (12%). With one exception, Smallpox specific T cells were not measurable in gut tissues. Interestingly, NYVAC vector-specific and HIV-specific CD4 and CD8 T-cell responses were detected in almost 100% of the subjects immunized with DNA-C/NYVAC-C in blood and gut tissues. The large majority (83%) of NYVAC-specific CD4 T cells expressed a4b7 integrins and the HIV co-receptor CCR5. **Conclusion:** These results demonstrate that the experimental DNA-C/NYVAC-C HIV vaccine regimen induces the homing of potentially protective HIV-specific CD4 and CD8 T cells in the gut, the port of entry of HIV and one of the major sites for Dispreading and depletion of CD4 T cells.

26. Balandya BS, Pembe AB, Mwakyoma HA. Cervical pre-malignant lesions in HIV infected women attending Care and Treatment Centre in a tertiary hospital, Dar es Salaam, Tanzania. *East African journal of public health*. 2011; 8(3): 185-189.

The aims of this study was to determine proportion of HIV infected women with cervical pre-malignant lesions; and compare the use of Visual Inspection of the cervix after application of Acetic acid (VIA) and Papanicolau (Pap) smear in screening for cervical premalignant lesions in HIV positive women attending Care and Treatment Centre (CTC) at Muhimbili National Hospital (MNH), Dar es Salaam, Tanzania. A total of 316 women aged 18-70 years had a Pap smear taken for cytology, followed by spraying onto the cervix with 4% acetic acid and then inspecting it. Cytology was considered negative when there was no Cervical Intraepithelial Neoplasia (CIN) lesion reported from the Pap smear taken, and positive if CIN lesion 1, 2 or 3 was reported. Detection of a well-defined, opaque acetowhite lesion close to the squamocolumnar junction or close to the external cervical os constituted a positive VIA. Out of 316 women, 132 women had acetowhite lesions on VIA, making the proportion of abnormal cervical lesions to be 42.4%. One hundred and one out of 312 women (32.4%) had CIN lesions detected on Pap smear. The proportion of agreement between these two tests was 0.3. The proportion of agreement was moderate in women with advanced WHO HIV clinical stage of the disease and in women not on ART (Anti Retroviral Therapy). Women with CD-4 count less than 200 cells/mm³ had more abnormal cervical lesions. There is considerable proportion of HIV positive women with premalignant lesions of the cervix. Considering the proportion of HIV

women with abnormal lesions and the difficulty in logistics of doing Pap smear in low resource settings, these results supports the recommendation to introduce screening of premalignant lesions of the cervix using VIA to all HIV infected women.

27. Barreto MC, Vilas Boas L, Carneiro LC, San Romão MV. Volatile compounds in samples of cork and also produced by selected fungi. *Journal of agricultural and food chemistry*. 2011. 59(12), 6568-6574.

The production of volatile compounds by microbial communities of cork samples taken during the cork manufacturing process was investigated. The majority of volatiles were found in samples collected at two stages: resting after the first boiling and nontreated cork disks. Volatile profiles produced by microbiota in both stages are similar. The releasable volatile compounds and 2, 4, 6-trichloroanisole (TCA) produced in cork-based culture medium by five isolated fungal species in pure and mixed cultures were also analyzed by gas chromatography coupled with mass spectrometry (GC-MS). The results showed that 1-octen-3-ol and esters of fatty acids (medium chain length C8–C20) were the main volatile compounds produced by either pure fungal species or their mixture. Apparently, *Penicillium glabrum* is the main contributor to the overall volatile composition observed in the mixed culture. The production of releasable TCA on cork cannot be attributed to any of the assayed fungal isolates.

28. Bastien S, Kajula L, Muhwezi W. A review of studies of parent-child communication about sexuality and HIV/AIDS in sub-Saharan Africa. *Reproductive Health*. 2011; 8 (1): 25.

Parent-child sexuality communication has been identified as a protective factor for adolescent sexual and reproductive health, including HIV infection. The available literature on this topic in sub-Saharan Africa is increasing; however a systematic review of studies has not been conducted. This article reviews the literature in the area of parental or caregiver and child communication about sexuality and HIV/AIDS in sub-Saharan Africa. A review of peer reviewed literature published between 1980 and April 2011 was conducted. Communication process studies investigating the frequency, content, style, tone of discussions, preferences, as

well as associations with and barriers to sexuality communication are reviewed. In addition, studies which examine behavioral associations with parent-child sexuality communication, and intervention studies to improve parent-child sexuality communication are examined. The findings from process studies suggest wide variation in terms of frequency of discussions, with a range of socio-demographic and other factors associated with sexuality communication. Overall, findings demonstrate that discussions tend to be authoritarian and uni-directional, characterized by vague warnings rather than direct, open discussion. Moreover, parents and young people report a number of barriers to open dialogue, including lack of knowledge and skills, as well as cultural norms and taboos. Findings are less clear when it comes to associations between parental communication and adolescent sexual activity and contraception use. However, nascent indications from intervention research suggest positive findings with increases in frequency and comfort of discussions, among other outcomes. Gaps in the research are identified and discussed with implications for future studies.

29. Bastien S, Kajula LJ, Muhwezi WW. A review of studies of parent-child communication about sexuality and HIV/AIDS in sub-Saharan Africa. *Reprod Health*. 2011; 8(25): 1-17.

Parent-child sexuality communication has been identified as a protective factor for adolescent sexual and reproductive health, including HIV infection. The available literature on this topic in sub-Saharan Africa is increasing; however a systematic review of studies has not been conducted. This article reviews the literature in the area of parental or caregiver and child communication about sexuality and HIV/AIDS in sub-Saharan Africa. A review of peer reviewed literature published between 1980 and April 2011 was conducted. Communication process studies investigating the frequency, content, style, tone of discussions, preferences, as well as associations with and barriers to sexuality communication are reviewed. In addition, studies which examine behavioral associations with parent child sexuality communication, and intervention studies to improve parent-child sexuality communication are examined. The findings from process studies suggest wide variation in terms of frequency of discussions, with arrange of socio-demographic and other factors associated with sexuality communication. Overall, findings demonstrate that discussions tend to be authoritarian and uni-directional,

characterized by vague warnings rather than direct, open discussion. Moreover, parents and young people report a number of barriers to open dialogue, including lack of knowledge and skills, as well as cultural norms and taboos. Findings are less clear when it comes to associations between parental communication and adolescent sexual activity and contraception use. However, nascent indications from intervention research suggest positive findings with increases in frequency and comfort of discussions, among other outcomes. Gaps in the research are identified and discussed with implications for future studies.

30. Bazira J, Asimwe BB, Joloba ML, Bwanga F, Matee MI. Mycobacterium tuberculosis spoligotypes and drug susceptibility pattern of isolates from tuberculosis patients in South-Western Uganda. *BMC Infectious Diseases*.2011; 11: 81.

Background: Determination of the prevalence and drug susceptibility of the *M. tuberculosis* strains is important in tuberculosis control. We determined the genetic diversity and susceptibility profiles of mycobacteria isolated from tuberculosis patients in Mbarara, South Western Uganda.**Methods:** We enrolled, consecutively; all newly diagnosed and previously treated smear-positive TB patients aged = 18 years. The isolates were characterized using regions of difference (RD) analysis and spoligotyping. Drug resistance against rifampicin and isoniazid were tested using the Genotype ®MDR-TBplus assay and the indirect proportion method on Lowenstein-Jensen media. HIV-1 testing was performed using two rapid HIV tests. **Results:** A total of 125 isolate from 167 TB suspects (60% males) with a mean age 33.7 years and HIV prevalence of 67.9% (55/81) was analyzed. Majority (92.8%) were new cases while only 7.2% were retreatment cases. All the 125 isolates were identified as *M. tuberculosis* strict sense with the majority (92.8%) of the isolates being modern strains while seven (7.2%) isolates were ancestral strains. Spoligotyping revealed 79 spoligotype patterns, with an overall diversity of 63.2%. Sixty two (49.6%) of the isolates formed 16 clusters consisting of 2-15 isolates each. A majority (59.2%) of the isolates belong to the Uganda genotype group of strains. The major shared spoligotypes in our sample were SIT 135 (T2-Uganda) with 15 isolates and SIT 128 (T2) with 3 isolates. Sixty nine (87%) of the 79 patterns had not yet been defined in the SpolDB4.0.database. Resistance mutations to either RIF or INH were detected in 6.4% of the isolates. Multidrug resistance, INH and RIF resistance was 1.6%, 3.2% and 4.8%, respectively.

The rpoB gene mutations seen in the sample were D516V, S531L, H526Y H526D and D516V, while one strain had a? 1 mutation in the wild type probes. There were three strains with katG (codon 315) gene mutations only while one strain showed the inhA promoter gene mutation. **Conclusion:** The present study shows that the TB epidemic in Mbarara is caused by modern M. tuberculosis strains mainly belonging to the Uganda genotype and anti-TB drug resistance rate in the region is low.

31. Berege GZ. Predisposing factors and clinico-pathological presentation of malignant lesions of the oro-facial region among patients attending the Muhimbili National Hospital in Dar-es-Salaam, Tanzania. Master of Dentistry (Oral Surgery) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: The oro-facial region is made up of a complex anatomical relationship of structures of which may be a source of development of malignant lesions. Often, patients present at the oral and maxillofacial unit of Muhimbili National Hospital with a variety of malignant lesions in the oro-facial region. Majority of these patients are referred cases from upcountry district/regional hospitals and they present with advanced stages of disease with a wide range of complications. Of recent there has been a dramatic change in the characteristics and demography of some of the common malignant lesions of the oro-facial region. Such changes might be attributed to predisposition or systemic changes following exposure to certain external factors. Objective to determine the predisposing factors and clinico-pathological presentation of malignant lesions of the oro-facial region among patients attending the Muhimbili National Hospital. Study design Cross sectional descriptive hospital based study. Setting Oral and maxillofacial surgery firm, Muhimbili National Hospital. **Methods:** All admitted and outpatients with clinically suspected malignant lesions in the oro-facial region who attended at the Muhimbili National Hospital, Oral surgery department from 1st July 2010 to 31st March 2011. Patients were interviewed using a specially designed questionnaire. Clinical examination was done, followed by fine needle aspiration cytology and/or tissue biopsy. A total of 186 patients with cytological and/or histological confirmed malignant lesions were included in the study. Data were entered in a computer, cleaned and analyzed using SPSS for windows version 13. **Results:** A total of 186 patients, 104 (56.0%) males and 82 (44.0%) females with a ratio 1.3:1

were involved in the study. The age at the time of diagnosis ranged from 3 to 83 years with a mean age of 48.4 ± 19.2 SD years. Sixty one (32.8%) patients were aged below 40 years. The commonest observed oral and maxillofacial malignant lesion was Squamous cell carcinoma 96 (51.6%) patients followed by Kaposi's sarcoma in 17 (9.1%) patients and carcinoma in 10 (5.4%) patients. Tobacco use was reported by 89 (47.8%) patients, of whom 62 (69.6%) patients had used tobacco for more than 20 years while 96 (51.6%) patients reported alcohol use, of whom 49 (51.0%) reported to have used alcohol more than 20 years. Thirty three (17.7%) patients were HIV positive. All patients with Kaposi's sarcoma were also HIV positive. Malignant eccrine poroma and polymorphous low grade adenocarcinoma are rare tumours in the maxillofacial region that were encountered. **Conclusion:** Squamous cell carcinoma was the most common malignant tumour in the oral and maxillofacial region. Use of tobacco and/or alcohol was the predisposing factors for squamous cell carcinoma. There was an increased frequency of malignant tumours in the oral and maxillofacial region among young patients. Patients presented rather late with advanced tumours that many times could only be managed by palliative therapy. All patients with Kaposi's sarcoma were HIV positive.

32. Betson B. The occurrence, clinico-pathological presentation and management of salivary gland diseases at Muhimbili National Hospital, Dar es salaam, Tanzania. Masters of Dentistry (Oral Surgery) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Salivary glands are mainly distributed in the head and neck region, with major ones comprising the paired parotid, submandibular and sublingual salivary glands. The minor salivary glands are situated in the palate, lips, cheeks and floor of the mouth. Both major and minor salivary glands are subjected to different diseases. The clinical presentation of salivary gland diseases is complex and mimics several other conditions or they do occur in conjunction with other conditions. Due to this complexity the diagnosis and treatment of these diseases are very variable. Currently little is known on the occurrence and clinico/pathologic presentation of salivary gland diseases and their management in Tanzania. This study aimed at determining the occurrence, clinical and pathologic characteristics of different salivary gland diseases. **Objective:** The main objective was to determine the occurrence, clinico-pathological

presentation and management of salivary gland diseases at Muhimbili National Hospital. Study Design: This was a hospital clinical based cross-sectional prospective study. Setting: The study was conducted at the Oral and Maxillofacial Surgery department at Muhimbili National Hospital (MNH). **Methods:** All patients who attended at the Oral and Maxillofacial Surgery department were examined and those found with salivary gland diseases were interviewed using a structured questionnaire. Clinical examination and histological/cytological investigations were done. Data including age, sex, and location, type of the disease, histological/cytological diagnosis and treatment modality offered were collected and recorded in a special clinical form designed for this study. Patients were treated accordingly depending on the diagnosis and the treatment modalities included surgery, antibiotics, analgesics, radiotherapy and chemotherapy. Data were analyzed using Statistical Package for Social Sciences (SPSS version 15.0) **Results:** A total of 5174 patients comprised of 2184 (42.2%) males and 2990 (57.8%) females were attended in the department during the study. Out of these, 56 patients consisting of 36 (64.3%) females and 20 (35.7%) males had salivary gland diseases. The male to female ratio was 1:1.8 and the most affected age group was 20-29 years. Pleomorphic adenoma observed in 12 (21.4%) patients was the commonest encountered salivary gland tumor, followed by adenocarcinoma in 7 (12.5%) patients, mucoepidermoid carcinoma and adenoid cystic carcinoma in 2 (3.6%) patients each. Ranula detected in 16 (28.6%) patients was the most frequently encountered salivary gland cyst followed by mucocele in 3 (5.3%) patients. The results indicate that, regardless of histopathological diagnosis majority 39 (69.6%) of salivary gland diseases were detected in major salivary glands, and the rest 17 (30.4%) were observed in minor salivary glands. Minor salivary glands were affected mostly by malignant tumors in 8 (47.1%) patients followed by the benign tumors mainly pleomorphic adenoma in 6 (35.3%) and mucoceles in 3 (17.6%) patients. The submandibular gland was mostly affected by sialolithiasis in 9 (56.25%) patients, followed by pleomorphic adenoma in 4 (25%) patients, malignant tumors in 2 (12.5%) and non specific chronic sialoadenitis in 1 (6.25%) patient. The parotid gland was mostly affected by malignant salivary gland tumors in 4 (57.14%) patients and less by pleomorphic adenoma, sialolithiasis and lymph epithelial cyst each affecting 1 (14.28%) patient. The sublingual gland was mainly affected by ranula. Swelling was the commonest clinical presentation observed in all patients with salivary gland diseases, followed by pain in 15 (26.8%) patients, infection in 7 (12.5%) patients and ulceration in 5 (8.9%) patients. Facial palsy was detected in 2 (3.6%) patients and no

patient presented with dry mouth. **Conclusion:** generally the clinico-pathological presentation of salivary gland diseases seen in this study is similar to other studies. Pleomorphic adenoma is the most common benign salivary gland tumor while adenocarcinoma is the most common malignant tumor and ranula is the most common salivary gland cyst. Majority of salivary gland diseases occurred in major salivary glands similar to other studies. High number of malignant tumors in the parotid salivary gland is contributed by the fact that malignant salivary gland tumors in the parotid gland grow with pain and that is why these are frequently reported unlike the benign salivary gland tumors in the same gland which grow without pain and are likely to present late. Patients with salivary gland tumors presented with advanced lesions. Surgery was the treatment of choice for the majority of conditions. Adjuvant radiotherapy or chemotherapy was given to patients with malignant lesions.

33. Biberfeld G, Aboud S, Bakari M, Nilsson C, Moshiro C, Aris E, Lyamuya E, Janabi M, Godoy-Ramirez K, Earl P, Robb M, Marovich M, Michael N, Wahren B, Pallangyo K, Mhalu FS, ström E. HIVIS study group. 146 Strong and Broad Immunogenicity of a Multigene, Multiclade HIV-1 DNA Prime MVA Boost Vaccine Regimen among Healthy Tanzanian Volunteers. *JAIDS Journal of Acquired Immune Deficiency Syndromes*. 2011; 56: 59.

A phase I trial (HIVIS01/02) of a multigene, multiclade HIV-1 DNA prime heterologous MVA boost vaccine regimen among healthy volunteers in Sweden showed that the vaccines were safe and highly immunogenic (*J Inf Dis* 2008;198:1482-90). A phase I/II trial (HIVIS03) using the same vaccine constructs has subsequently been conducted in Dar es Salaam, Tanzania. Sixty HIV-uninfected volunteers randomised to three groups of 20 received HIV-DNA vaccine at 1 mg intradermally (i.d) or 3.8 mg intramuscularly (i.m.) or placebo using a needle-free device. The DNA plasmids containing HIV-1 gp160 subtypes A, B, C, revB, gag A, B and RtmutB were given at months 0, 1 and 3. The volunteers were boosted i.m. with 108 pfu of MVA containing HIV-1 env, gag, pol of CRF01A_E or placebo at months 9 and 21. Two to four weeks after the second HIV-MVA boost, 28 (97%) of 29 vaccinees had positive IFN-gamma ELISpot responses, 27 (93%) to Gag and 23 (79%) to Env peptides. The i.d. primed vaccinees showed higher immune responses to Env compared to the i.m. primed vaccinees. Intracellular cytokine staining

for Gag-specific IFN-gamma/IL-2 production 4 weeks after the second HIV-MVA boost showed both CD8 and CD4 T-cell responses. All of 25 vaccinees had lymph proliferative responses of a similar high magnitude to AT-2-treated HIV antigens from 3 different subtypes (donated by J Lifson, NCI, USA). After the second HIV-MVA boost, 26/29 (90 %) of the vaccinees developed binding antibodies to gp160. In conclusion, this HIV-DNA prime MVA boost vaccine regimen induced strong and broad immune responses in Tanzanian volunteers.

34. Blocher J, Schmutzhard E, Wilkins PP, Gupton PN, Schaffert M, Auer H, Gotwald T, Matuja W, Winkler AS. A cross-sectional study of people with epilepsy and Neurocysticercosis in Tanzania: Clinical characteristics and diagnostic approaches. *PLoS Neglected Tropical Diseases*.2011; 5 (6): e1185.

Neurocysticercosis (NCC) is a major cause of epilepsy in regions where pigs are free-ranging and hygiene is poor. Pork production is expected to increase in the next decade in sub-Saharan Africa; hence NCC will likely become more prevalent. In this study, people with epilepsy (PWE, n = 212) were followed up 28.6 months after diagnosis of epilepsy. CT scans were performed, and serum and cerebrospinal fluid (CSF) of selected PWE were analysed. We compared the demographic data, clinical characteristics, and associated risk factors of PWE with and without NCC. PWE with NCC (n = 35) were more likely to be older at first seizure (24.3 vs. 16.3 years, p = 0.097), consumed more pork (97.1% vs. 73.6%, p = 0.001), and were more often a member of the Iraqw tribe (94.3% vs. 67.8%, p = 0.005) than PWE without NCC (n = 177). PWE and NCC who were compliant with anti-epileptic medications had a significantly higher reduction of seizures (98.6% vs. 89.2%, p = 0.046). Other characteristics such as gender, seizure frequency, compliance, past medical history, close contact with pigs, use of latrines and family history of seizures did not differ significantly between the two groups. The number of NCC lesions and active NCC lesions were significantly associated with a positive antibody result. The electroimmunotransfer blot, developed by the Centers for Disease Control and Prevention, was more sensitive than a commercial western blot, especially in PWE and cerebral calcifications. This is the first study to systematically compare the clinical characteristics of PWE due to NCC or other causes and to explore the utility of two different antibody tests for diagnosis of NCC in sub-Saharan Africa.

35. Boniphace I, Boniface J, Ferdnand M, Marcel T. Management of HIV and AIDS at lower primary health care facility in Chalinze, eastern Tanzania. *Tanzania Journal of Health Research*. 2011; 13 (3): 252-263.

Implementation of Antiretroviral Therapy (ART) services at health centers in Tanzania were delayed due to several reasons including shortage of qualified staff, inadequate infrastructure and logistics problems. However, patients from peripheral areas experienced difficulties in accessing ART services due to long distances from clinics. National AIDS Control Programme (NACP) and Nongovernmental Organizations (NGOs) embarked on ART services scale-up programme aimed at improved ART availability and accessibility. Through this programme ART services were established at health centers and selected dispensaries. However, no previous documented experiences existed at country level to guide provision of services. Therefore, this study was designed to gather experiences and share lessons learnt with other health care providers and programme implementing partners. This was a descriptive cross-sectional study involved patients enrolled to ART services between May 2007 and April 2009. Data collection involved observation of health providers' performance and retrospective ART and care patients' registers review. During the study period, 611 care and 284 ART patients were attended. Majority of patients (85.1%; 762/895) were adults aged 25-45 years. In total 61.5% (550/895) of the patients had CD4+T lymphocytes $\geq 350/\mu\text{l}$ the cut-off point for initiating ART. The frequency of symptoms was noted to significantly decrease with increasing CD4 counts ($P < 0.001$). Numbness, parotid enlargement and genital discharge were not related to patient level of CD4+T-lymphocytes counts. Popular pruritic eruptions 98/282 (34.8%), tuberculosis 86/282 (30.5%) and esophageal candidacies 37/282 (13.1) were the most diagnosed AIDS defining illnesses. Sixteen patients on care died and 30 were lost to follow up. Overall the clinical management was poorly performed. ART services can successively be provided at health centre level and encourages HIV-infected persons to seek care. However, clinicians need regular clinical mentorship and supportive supervision.

36. Boniphace I, Omari M, Fred RS, Ferdinand M, Marcel T. HIV/AIDS clinical manifestations and their implication for patient clinical staging in resource limited settings in Tanzania. *Open AIDS Journal*. 2011; 5 (1), 9-16.

Background: Tanzania HIV/AIDS management follows WHO clinical staging which requires CD4 counts as complement. Lacking CD4 counts facilities in rural health facilities remains a challenge. Simplified and sensitive clinical staging based on local clinical patterns is useful to ensure effective care without CD4 counts. Objectives: To assess whether local HIV clinical manifestations can be used to guide HIV management in settings with limited access to CD4 counts in Tanzania. **Methods:** A Cross-sectional study conducted at Tumbi and Chalinze health facilities documented clinical manifestations and CD4 counts in 360 HIV/AIDS patients. Simplified management groups comprised of severe and moderate disease were formed based on clinical manifestations and CD4 counts results. Symptoms with high frequency were used to predict severe disease. **Results:** Weight loss (48.3%) and chronic cough (40.8 %) were the most reported manifestations in the study population. More than 50% of patients presented with CD4=200. Most symptoms were found to be highly sensitive (71% to 93%) in predicting severe immunosuppression using CD4<200 cut-off point as a 'Gold standard'. Chronic diarrhoea presented in 10.6%, and predicted well severe immunosuppression either alone (OR 1.95, 95%CI, 0.95-4.22) or in combination (OR 4.21, 95%CI 0.92-19.33) with other symptoms. Basing strictly on WHO clinical staging 30.8% of patients were detected to be severely immunosuppressed (Stage 4). While using our proposed management categories of severe and moderate immunosuppression 70% of patients were put into the severe immunosuppression group, consistent with CD4 cut-off count of=350. **Conclusions:** HIV/AIDS clinics managing large cohorts should develop validated site specific guidelines based on local experiences. Simplified guidelines are useful for resource constrained settings without CD4 counting facilities.

37. Borrmann S, Sasi P, Mwai L, Bashraheil M, Abdallah A, Muriithi S, Frühauf H, Schaub B, Pfeil J, Peshu J, Hanpithakpong W, Rippert A, Juma E, Tsofa B, Mosobo M, Lowe B, Osier F, Fegan G, Lindegårdh N, Nzila A, Peshu N, Mackinnon M , Marsh K. Declining responsiveness of plasmodium falciparum infections to Artemisinin-Based combination treatments on the Kenyan coast. *PLoS ONE*. 2011; 6 (11): e26005.

Background: The emergence of artemisinin-resistant *P. falciparum* malaria in South-East Asia highlights the need for continued global surveillance of the efficacy of artemisinin-based combination therapies. **Methods:** On the Kenyan coast we studied the treatment responses in 474 children 6-59 months old with uncomplicated *P. falciparum* malaria in a randomized controlled trial of dihydroartemisinin-piperaquine vs. artemether-lumefantrine from 2005 to 2008. (ISRCTN88705995) **Results:** The proportion of patients with residual parasitemia on day 1 rose from 55% in 2005-2006 to 87% in 2007-2008 (odds ratio, 5.4, 95%CI, 2.7-11.1; $P < 0.001$) and from 81% to 95% (OR, 4.1, 95%CI, 1.7-9.9; $P = 0.002$) in the DHA-PPQ and AM-LM groups, respectively. In parallel, Kaplan-Meier estimated risks of apparent recrudescence by day 84 increased from 7% to 14% ($P = 0.1$) and from 6% to 15% ($P = 0.05$) with DHA-PPQ and AM-LM, respectively. Coinciding with decreasing transmission in the study area, clinical tolerance to parasitemia (defined as absence of fever) declined between 2005-2006 and 2007-2008 (OR body temperature $>37.5^{\circ}\text{C}$, 2.8, 1.9-4.1; $P < 0.001$). Neither in vitro sensitivity of parasites to DHA nor levels of antibodies against parasite extract accounted for parasite clearance rates or changes thereof. **Conclusions:** The significant, albeit small, decline through time of parasitological response rates to treatment with ACTs may be due to the emergence of parasites with reduced drug sensitivity, to the coincident reduction in population-level clinical immunity, or both. Maintaining the efficacy of artemisinin-based therapy in Africa would benefit from a better understanding of the mechanisms underlying reduced parasite clearance rates.

38. Bunalema L, Kirimuhuzya C, Tabuti JRS, Waako P, Magadula JJ, Otieno N, Okemo P. The efficacy of the crude root bark extracts of *Erythrina abyssinica* on Rifampicin Resistant *Mycobacterium tuberculosis*. *African health sciences*. 2011; 11(4): 587-593.

Introduction: Tuberculosis (TB) is one of the leading causes of morbidity and mortality with a global mortality rate at two million deaths per year while one third of the world's population is infected with the TB bacillus. **Objective:** To determine the efficacy of the crude extracts of *Erythrina abyssinica* root bark on rifampicin-resistant TB. **Methods:** Crude extracts of root bark of *Erythrina abyssinica*, were screened against three strains of *Mycobacterium tuberculosis* including rifampicin-resistant TMC-331. Susceptibility tests used the disc diffusion method and

were done on solid Middle brook 7H10, while the Minimum Inhibitory concentration (MICs) and minimum bactericidal concentration (MBCs) were determined by the Microstate plate method using Middle brook 7H9 broth. Results: The total crude methanol extract showed activity against all the three strains of mycobacterium used, at 50mg/ml and diameters of zones of inhibition of up to 26 mm. Erythrina abyssinica total crude methanol extract showed the highest activity on the pan sensitive strain H37Rv (0.39 ± 0.0 mg/ml) and the rifampicin resistant strain (TMC-331) (2.35 ± 1.11 mg/ml) and was also active on Mycobacterium avium (0.39 ± 0.0 mg/ml). The values for isoniazid were $0.25\mu\text{g/ml}$ and $9.38\mu\text{g/ml}$ for H37Rv and TMC-331 respectively, while for rifampicin the MIC value was $0.25\mu\text{g/ml}$ for H37Rv but it was not active on TMC-331. Acute toxicity test gave an LD50 of 776.2mg/kg body weight while the phytochemical analysis showed the presence of alkaloids, tannins and flavones. **Conclusion:** The conclusion from the study was that Erythrina abbyssinica has antimycobacterial activity and reasonable safety that merits further research.

39. Burch VC, McKinley D , van Wyk J, Kiguli-Walube S, Cameron D, Cilliers FJ, Longombe AO, Mkony C, Okoromah C, Otieno-Nyunya B, Morahan PS. Career intentions of medical students trained in six Sub-Saharan African countries. Education for Health: Change in Learning and Practice. 2011; 24(3): 1-16.

Introduction: Sub-Saharan Africa (SSA) is the world region worst affected by physician migration. Identifying reasons why medical students wish to stay or leave Africa could assist in developing strategies which favors retention of these graduates. This study investigated the career intentions of graduating students attending medical schools in SSA to identify interventions which may improve retention of African physicians in their country of training or origin. **Methods:** Final year medical students attending nine medical schools in SSA were surveyed - students from four schools in South Africa and one school each in the Democratic Republic of Congo, Kenya, Nigeria, Tanzania and Uganda. The response rate was 78.5% (990 of 1260 students); data from the 984 students who indicated they were remaining in medicine were entered into a database, and descriptive statistics were obtained. **Results:** Most (97.4%) of the 984 responding students were African by birth. The majority (91.2%) intended to undertake postgraduate training; the top three specialty choices were surgery (20%), internal medicine

(16.7%), and pediatrics (9%). Few were interested in family medicine (4.5%) or public health (2.6%) or intended to practice in rural areas (4.8%). Many students (40%) planned to train abroad. About one fifth (21%) intended to relocate outside sub-Saharan Africa. These were about equally divided between South Africans (48%) and those from the other five countries (52%). The top perceived career-related factors favoring retention in Africa were career options and quality and availability of training opportunities. Several factors were reported significantly more by South African than the other students. The top personal factors for staying in Africa were a desire to improve medicine in Africa, personal safety, social conditions and family issues. The top career related factors favoring relocation outside Africa were remuneration, access to equipment and advanced technology, career and training opportunities, regulated work environment and politics of health care in Africa. Several of these were reported significantly more by students from the other countries as compared with South Africans. The top personal factors favoring relocation outside Africa were personal safety, opportunity for experience in a different environment, social conditions and greater personal freedom. **Discussion:** The career intentions of African medical students are not aligned with the continent's health workforce needs. A number of interventions that warrant further attention were identified in this study.

40. Burton K, Rogathe J, Hunter E, Burton M, Swai M, Todd J, Neville B, Walker R, Newton C. Behavioural comorbidity in Tanzanian children with epilepsy: A community-based case-control study. *Developmental Medicine and Child Neurology*. 2011; 53 (12): 1135-1142.

Aim The aim of this study was to define the prevalence of and risk factors for behavioral disorders in children with epilepsy from a rural district of Tanzania by conducting a community-based case-control study. **Method** One hundred and twelve children aged 6 to 14years (55 males, 57 females; median age 12y) with active epilepsy (at least two unprovoked seizures in the last 5y) were identified in a cross-sectional survey and included in this study. Children who were younger than 6years were excluded in order to eliminate febrile seizures. Behavior was assessed using the Rutter scale; children who scored 13 or more were considered to have disordered behavior. A comparison group was made up of age- and sex-matched children without epilepsy (n=113; 57 males, 56 females; median age 12y). **Results** Behavioral disorders were diagnosed in

68 of 103 (66%) children with epilepsy and in 19 of 99 (19%) controls. Disordered behavior was significantly more common in children with epilepsy than in the comparison group (univariate odds ratio 8.2; 95% confidence interval [CI] 4.3-15.6; $p < 0.001$) and frequent seizures and poor scholastic attainment were associated in children with epilepsy. Behavioral disorders were not associated with antiepileptic drug usage. Attention problems were present in 48 of 91 (53%) children with epilepsy and 16 of 97 (17%) controls (univariate odds ratio 5.7; 95% CI 2.9-11.1; $p < 0.001$). In children with epilepsy, attention problems were significantly more common in males and were associated with frequent seizures. Interpretation Children with epilepsy in a rural area of sub-Saharan Africa have a high prevalence of behavioral disorders and attention problems, both of which are associated with frequent seizures. Providing behavior assessment and appropriate intervention programmes for children with epilepsy may reduce the burden of behavior disorders in this setting.

41. Bwana V, Tenu F, Magesa SM, Mfinanga SG. Smear positive pulmonary tuberculosis among HIV patients receiving highly active antiretroviral therapy in Dar es Salaam, Tanzania. *Tanzania journal of health research*.2011; 13 (1): 14-20.

Globally, tuberculosis-HIV co-infections are on the increase. In 2007, 15% (1.37 million) of the tuberculosis cases were HIV-positive tuberculosis (TB). This cross-sectional study was conducted in February 2009 to assess the effect of the level of CD4 lymphocyte counts on the development of smear positive pulmonary TB (PTB) among HIV patients before and after initiation of highly active antiretroviral therapy (HAART). A total of 155 HIV patients who were on HAART programme were enrolled and out of these 42 (27.1%) were smear positive PTB. Of the 42 PTB patients, 38 (90.5%) were also infected with HIV and were already at initiation of HAART. There was no association between the development of smear positive PTB and socio-demographic characteristics among HIV patients before and after HAART initiation ($P > 0.05$). A larger proportion of HIV+PTB patients diagnosed before and after HAART initiation was found with CD4 lymphocyte count < 200 cells/microl. However, the difference was not statistically significant ($P = 0.092$). Among HIV patients who were diagnosed to be smear positive PTB after HAART initiation, their CD4 lymphocyte counts at time of TB diagnosis was lower than their CD4 lymphocyte counts at time of HAART initiation. The four patients diagnosed with PTB

after HAART initiation had mean CD4 lymphocyte counts at HAART initiation not statistically different from that at TB diagnosis ($t=0.715$, $P=0.526$). The median time period within which the diagnosis of smear positive PTB was made after HAART initiation was 22 weeks and the mean time was 66.75 weeks. These findings provide evidence that development of smear positive PTB after HAART initiation may occur at any level of CD4 lymphocyte count ($P<0.05$). This study was limited by the relatively small sample size, we therefore recommend more studies involving a larger sample size in order to estimate more accurately the effect of both level of CD4 lymphocyte count and HAART on the development of smear positive PTB among HIV patients on treatment.

42. Bwana V, Tenu F, Magesa SM, Mfinanga SG. Smear positive pulmonary tuberculosis among HIV patients receiving highly active antiretroviral therapy in Dar es salaam, Tanzania. *Tanzania Journal of Health Research*.2011; 13 (1): 17-24.

Globally, tuberculosis-HIV co-infections are on the increase. In 2007, 15% (1.37 million) of the tuberculosis cases were HIV-positive tuberculosis (TB). This cross-sectional study was conducted in February 2009 to assess the effect of the level of CD4 lymphocyte counts on the development of smear positive pulmonary TB (PTB) among HIV patients before and after initiation of highly active antiretroviral therapy (HAART). A total of 155 HIV patients who were on HAART programme were enrolled and out of these 42 (27.1%) were smear positive PTB. Of the 42 PTB patients, 38 (90.5%) were also infected with HIV and were already at initiation of HAART. There was no association between the development of smear positive PTB and socio-demographic characteristics among HIV patients before and after HAART initiation ($P>0.05$). A larger proportion of HIV+PTB patients diagnosed before and after HAART initiation was found with CD4 lymphocyte count <200 cells/ μ l. However, the difference was not statistically significant ($P=0.092$). Among HIV patients who were diagnosed to be smear positive PTB after HAART initiation, their CD4 lymphocyte counts at time of TB diagnosis was lower than their CD4 lymphocyte counts at time of HAART initiation. The four patients diagnosed with PTB after HAART initiation had mean CD4 lymphocyte counts at HAART initiation not statistically different from that at TB diagnosis ($t=0.715$, $P=0.526$). The median time period within which the diagnosis of smear positive PTB was made after HAART initiation was 22 weeks and the mean

time was 66.75 weeks. These findings provide evidence that development of smear positive PTB after HAART initiation may occur at any level of CD4 lymphocyte count ($P < 0.05$). This study was limited by the relatively small sample size, we therefore recommend more studies involving a larger sample size in order to estimate more accurately the effect of both level of CD4 lymphocyte count and HAART on the development of smear positive PTB among HIV patients on treatment.

43. Carlsson AM, Ngasala BE, Dahlstrom S, Membi C, Veiga IM, Rombo L, Mårtensson A. Plasmodium falciparum population dynamics during the early phase of anti-malarial drug treatment in Tanzanian children with acute uncomplicated malaria. *Malaria Journal*. 2011; 10: 380.

Background: This study aimed to explore Plasmodium falciparum population dynamics during the early phase of anti-malarial drug treatment with artemisinin-based combination therapy in children with clinical malaria in a high transmission area in Africa. **Methods:** A total of 50 children aged 1-10 years with acute uncomplicated P. falciparum malaria in Bagamoyo District, Tanzania, were enrolled. Participants were hospitalized and received supervised standard treatment with artemether-lumefantrine according to body weight in six doses over 3 days. Blood samples were collected 11 times, i.e. at time of diagnosis (-2 h) and 0, 2, 4, 8, 16, 24, 36, 48, 60 and 72 h after initiation of treatment. Parasite population dynamics were assessed using nested polymerase chain reaction (PCR)-genotyping of merozoite surface protein (msp) 1 and 2. **Results:** PCR-analyses from nine sequential blood samples collected after initiation of treatment identified 20 and 21 additional genotypes in 15/50 (30%) and 14/50 (28%) children with msp1 and msp2, respectively, nondeductible in the pre-treatment samples (-2 and 0 h combined). Some 15/20 (75%) and 14/21 (67%) of these genotypes were identified within 24 h, whereas 17/20 (85%) and 19/21 (90%) within 48 h for msp1 and msp2, respectively. The genotype profile was diverse, and varied considerably over time both within and between patients, molecular markers and their respective families. **Conclusion:** PCR analyses from multiple blood samples collected during the early treatment phase revealed a complex picture of parasite sub-populations. This underlines the importance of interpreting PCR-outcomes with caution and suggests that the

present use of PCR-adjustment from paired blood samples in anti-malarial drug trials may overestimate assessment of drug efficacy in high transmission areas in Africa.

44. Carneiro L, Kabulwa M, Makyao M, Mrosso G, Choum R. Oral health knowledge and practices of secondary school students, Tanga, Tanzania. *International Journal of Dentistry*. 2011; 806258.

A good quality of life is possible if students maintain their oral health and become free of oral disease. A structured questionnaire assessed 785 students' level of oral health knowledge and practices. About 694 (88.4) students had adequate level of knowledge on causes, prevention, and signs of dental caries, 760 (96.8) on causes and prevention of periodontal diseases, 695 (88.5) on cigarette smoking as cause of oral cancer, and 770 (98.1) students on importance of dental checkups. Majority 717 (91.3) had adequate practice of sugary food consumption; while 568 (72.4) had acceptable frequency of tooth brushing, 19 (2.4) brushed at an interval of twelve hours, and 313 (39.9) visited for checkup. Majority of students had an adequate level of knowledge on oral health but low level of oral health practices. Both genders had similar level of knowledge with male predominance in oral health practices. Age had no influence on the level of oral health knowledge and practices of students.

45. Chalya PL, Gilyoma JM, Dass RM, Mchembe MD, Matasha M, Mabula JB, Mbelenge N, Mahalu W. Trauma admissions to the Intensive care unit at a reference hospital in Northwestern Tanzania. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*. 2011; 19: 61.

Background: Major trauma has been reported to be a major cause of hospitalization and intensive care utilization worldwide and consumes a significant amount of the health care budget. The aim of this study was to describe the characteristics and treatment outcome of major trauma patients admitted into our ICU and to identify predictors of outcome. **Methods:** Between January 2008 and December 2010, a descriptive prospective study of all trauma admissions to a multidisciplinary intensive care unit (ICU) of Bugando Medical Centre in Northwestern Tanzania was conducted. **Results:** A total of 312 cases of major trauma were admitted in the

ICU, representing 37.1% of the total ICU admissions. Males outnumbered females by a ratio of 5.5:1. Their median age was 27 years. Trauma admissions were almost exclusively emergencies (95.2%) and came mainly from the Accident and Emergency (60.6%) and Operating room (23.4%). Road traffic crash (RTC) was the most common cause of injuries affecting 70.8% of patients. Two hundred fourteen patients (68.6%) required surgical intervention. The overall ICU length of stay (LOS) for all trauma patients ranged from 1 to 59 days (median = 8 days). The median ICU length of hospital stay (LOS) for survivors and non-survivors were 8 and 5 days respectively. (P = 0.002). Mortality rate was 32.7%. Mortality rate of trauma patients was significantly higher than that of all ICU admissions (32.7% vs. 18.8%, P = 0.0012). According to multivariate logistic regression analysis, multiple injuries, severe head injuries and burns were responsible for a longer mean ICU stay (P < 0.001) whereas admission Glasgow Coma Score < 9, systolic blood pressure < 90 mmHg, injury severity core >16, prolonged duration of loss of consciousness, delayed ICU admission (0.028), the need for ventilatory support and finding of space occupying lesion on computed tomography scan significantly influenced mortality (P < 0.001). **Conclusion:** Trauma resulting from road traffic crashes is a leading cause of intensive care utilization in our hospital. Urgent preventive measures targeting at reducing the occurrence of RTCs is necessary to reduce ICU trauma admissions in this region. Improved pre- and in-hospital care of trauma victims will improve the outcome of trauma patients admitted to our ICU.

46. Chalya PL, Kanumba ES, McHembe M. Etiological spectrum and treatment outcome of Obstructive jaundice at a university teaching hospital in northwestern Tanzania: A diagnostic and therapeutic challenges. *BMC Research Notes*.2011; 4: 147.

Background: Obstructive jaundice poses diagnostic and therapeutic challenges to general surgeons practicing in resource-limited countries. This study was undertaken to highlight the etiological spectrum, treatment outcome of obstructive jaundice in our setting and to identify prognostic factors for morbidity and mortality. **Methods:** This was a descriptive prospective study which was conducted at Bugando Medical Centre between July 2006 and June 2010. All patients with a clinical diagnosis of obstructive jaundice were, after informed consent for the study, consecutively enrolled into the study. Data were collected using a pre-tested structured questionnaire and analyzed using SPSS computer software version 11.5. **Results:** A total of 116

patients were studied. Females outnumbered males by a ratio of 1.3:1. Patients with malignant obstructive jaundice were older than those of benign type. Ca head of pancreas was the commonest malignant cause of jaundice where as choledocholithiasis was the commonest benign cause. Abdominal ultrasound was the only diagnostic imaging done in all patients and revealed dilated intra and extra-hepatic ducts, common bile stones and abdominal masses in 56.2%, 78.9%, 58.1% and 72.4% of the cases respectively. A total of 110 (94.8%) patients underwent surgical treatment and the remaining 6 (5.2%) patients were unfit for surgery. The complication rate was 22.4% mainly surgical site infections. The mean hospital stay and mortality rate were 14.54 days and 15.5% respectively. A low haematocrit and presence of postoperative sepsis were the main predictors of the hospital stay ($P < 0.001$), whereas age > 60 years, prolonged duration of jaundice, malignant causes and presence of postoperative complications mainly sepsis significantly predicted mortality ($P < 0.001$). **Conclusion:** Obstructive jaundice in our setting is more prevalent in females and the cause is mostly malignant. The result of this study suggests that early diagnosis and treatment plays an important role in the prognosis of patients with obstructive jaundice.

47. Chalya PL, Mabula JB, Dass RM, Kabangila R, Jaka H, McHembe MD, Kataraihya JB, Mbelenge N, Gilyoma JM. Surgical management of Diabetic foot ulcers: A Tanzanian university teaching hospital experience. *BMC Research Notes*.2011; 4: 365.

Background: Diabetic foot ulcers (DFUs) pose a therapeutic challenge to surgeons, especially in developing countries where health care resources are limited and the vast majority of patients present to health facilities late with advanced foot ulcers. A prospective descriptive study was done at Bugando Medical Centre from February 2008 to January 2010 to describe our experience in the surgical management of DFUs in our local environment and compare with what is known in the literature. Findings. Of the total 4238 diabetic patients seen at BMC during the period under study, 136 (3.2%) patients had DFUs. Males outnumbered females by the ratio of 1.2:1. Their mean age was 54.32 years (ranged 21-72years). Thirty-eight (27.9%) patients were newly diagnosed diabetic patients. The majority of patients (95.5%) had type 2 diabetes mellitus. The mean duration of diabetes was 8.2 years while the duration of DFUs was 18.34 weeks. Fourteen (10.3%) patients had previous history of foot ulcers and six (4.4%) patients had previous

amputations. The forefoot was commonly affected in 60.3% of cases. Neuropathic ulcers were the most common type of DFUs in 57.4% of cases. Wagner's stage 4 and 5 ulcers were the most prevalent at 29.4% and 23.5% respectively. The majority of patients (72.1%) were treated surgically. Lower limb amputation was the most common surgical procedure performed in 56.7% of cases. The complication rate was (33.5%) and surgical site infection was the most common complication (18.8%). Bacterial profile revealed polymicrobial pattern and *Staphylococcus aureus* was the most frequent microorganism isolated. All the microorganisms isolated showed high resistance to commonly used antibiotics except for Meropenem and imipenem, which were 100% sensitive each respectively. The mean hospital stay was 36.24 12.62 days (ranged 18-128 days). Mortality rate was 13.2%. **Conclusion:** Diabetic foot ulceration constitutes a major source of morbidity and mortality among patients with diabetes mellitus at Bugando Medical Centre and is the leading cause of non-traumatic lower limb amputation. A multidisciplinary team approach targeting at good glycaemic control, education on foot care and appropriate footwear, control of infection and early surgical intervention is required in order to reduce the morbidity and mortality associated with DFUs. Due to polymicrobial infection and antibiotic resistance, surgical intervention must be concerned.

48. Chalya PL, Mabula JB, Koy M, Mchembe MD, Jaka HM, Kabangila R, Chandika AB, Gilyoma JM. Clinical profile and outcome of surgical treatment of perforated peptic ulcers in Northwestern Tanzania: A tertiary hospital experience. *World Journal of Emergency Surgery.* 2011; 6 (1): 31.

Background: Perforated peptic ulcer is a serious complication of peptic ulcers with potential risk of grave complications. There is paucity of published reports on perforated peptic ulcer disease in our local environment. This study was conducted to evaluate the clinical presentation, management and outcome of patients with peptic ulcer perforation in our setting and to identify predictors of outcome of these patients. **Methods:** This was a combined retrospective and prospective study of patients who were operated for perforated peptic ulcers at Bugando Medical Centre between April 2006 and March 2011. Data were collected using a pre-tested and coded questionnaire and analyzed using SPSS computer software version 15.0. Ethical approval to

conduct the study was obtained from relevant authority before the commencement of the study. **Results:** A total of 84 patients were studied. Males outnumbered females by a ratio of 1.3: 1. Their median age was 28 years and the modal age group was 21-30 years. The median duration of illness was 5.8 days. The majority of patients (69.0%) had no previous history of treatment for peptic ulcer disease. The use of non-steroidal anti-inflammatory drugs, alcohol and smoking was reported in 10.7%, 85.7% and 64.3% respectively. Eight (9.5%) patients were HIV positive with a median CD4 count of 220 cells/ μ l. Most perforations were located on the duodenum (90.4%) with the duodenal to gastric ulcers ratio of 12.7: 1. Graham's omental patch (Graham's omentopexy) of the perforations was performed in 83.3% of cases. Complication and mortality rates were 29.8% and 10.7% respectively. The factors significantly related to complications were premorbid illness, HIV status, CD 4 count < 200 cells/ μ l, treatment delay and acute perforation (P < 0.001). Mortality rate was high in patients who had age = 40 years, delayed presentation (>24 hrs), shock at admission (systolic BP < 90 mmHg), HIV positivity, low CD4 count (<200 cells/ μ l), gastric ulcers, concomitant diseases and presence of complications (P < 0.001). The median overall length of hospital stay was 14 days. Excellent results using Visick's grading system were obtained in 82.6% of surviving patients. **Conclusion:** Perforation of peptic ulcer remains a frequent clinical problem in our environment predominantly affecting young males not known to suffer from PUD. Simple closure with omental patch followed by Helicobacter pylori eradication was effective with excellent results in majority of survivors despite patients' late presentation in our center.

49. Chalya PL, Mchembe M, Mabula JB, Kanumba ES, Gilyoma JM. Etiological spectrum, injury characteristics and treatment outcome of maxillofacial injuries in a Tanzanian teaching hospital. *Journal of Trauma Management and Outcomes*.2011; 5 (1): 7.

Background: Maxillofacial injuries pose a therapeutic challenges to trauma, maxillofacial and plastic surgeons practicing in developing countries. This study was carried out to determine the etiology, injury characteristics and management outcome of maxillofacial injuries at our teaching hospital. **Patients and Methods:** A prospective hospital based study of maxillofacial injury patients was carried out at Bugando Medical Centre from November 2008 to October 2009. Data was collected using a structured questionnaire and analyzed using SPSS computer software

version 11.5. **Results:** A total of 154 patients were studied. Males outnumbered females by a ratio of 2.7:1. Their mean age was 28.32 ± 16.48 years and the modal age group was 21-30 years. Most injuries were caused by road traffic crashes (57.1%), followed by assault and falls in 16.2% and 14.3% respectively. Soft tissue injuries and mandibular fractures were the most common type of injuries. Head/neck (53.1%) and limb injuries (28.1%) were the most prevalent associated injuries. Surgical debridement (95.1%) was the most common surgical procedures. Closed reduction of maxillofacial fractures was employed in 81.5% of patients. Open reduction and internal fixation was performed in 6.8% of cases. Complications occurred in 24% of patients, mainly due to infection and malocclusion. The mean duration of hospital stay was 18.12 ± 12.24 days. Mortality rate was 11.7%. **Conclusion:** Road traffic crashes remain the major etiological factor of maxillofacial injuries in our setting. Measures on prevention of road traffic crashes should be strongly emphasized in order to reduce the occurrence of these injuries.

50. Chaves EM, Aguilera-Merlo C, Filippa V, Mohamed F, Dominguez S, Scardapane L. Anatomical, histological and immunohistochemical study of the reproductive system accessory glands in male viscacha (*Lagostomus maximus*). *Anatomia, histologia, embryologia*. 2011; 40(1): 11-20.

With 6 figures and 1 table **SUMMARY:** The anatomy, histology and androgen receptor immunohistochemistry of the prostate (P), seminal vesicles (SV), bulbourethral and coagulant gland (CG) were studied in male viscacha, a seasonally reproductive wild rodent. Two histologically well-defined zones, peripheral and central, were identified in the prostate, according to their relationship with the urethra. The epithelial cells were periodic acid-Schiff (PAS)-positive in the central zone and alcian blue negative in the two zones. The SV are a paired gland, tubular, of tortuous aspect and formed by radial layers. The bulbourethral glands were paired, formed by tubuloalveolar acini and surrounded by a thick layer of skeletal muscle. The CG was multilobulated. The large adenomers showed PAS-positive epithelium and were negative to alcian blue. Androgen receptors in the P, SV and coagulating gland showed variations in their distribution with immunohistochemistry heterogeneous pattern. Finally, the reproductive system accessory glands of male viscacha may be considered as a novel and interesting model for the study of seasonal reproduction in photoperiod-dependent animals.

51. Chitama D, Baltussen R, Ketting E, Kamazima S, Nswilla A, Mujinja PG. From papers to practices: district level priority setting processes and criteria for family planning, maternal, newborn and child health interventions in Tanzania. *BMC women's health*. 2011; 11(1): 46.

Background: Successful priority setting is increasingly known to be an important aspect in achieving better family planning, maternal, newborn and child health (FMNCH) outcomes in developing countries. However, far too little attention has been paid to capturing and analysing the priority setting processes and criteria for FMNCH at district level. This paper seeks to capture and analyse the priority setting processes and criteria for FMNCH at district level in Tanzania. Specifically, we assess the FMNCH actor's engagement and understanding, the criteria used in decision making and the way criteria are identified, the information or evidence and tools used to prioritize FMNCH interventions at district level in Tanzania. **Methods:** We conducted an exploratory study mixing both qualitative and quantitative methods to capture and analyse the priority setting for FMNCH at district level, and identify the criteria for priority setting. We purposively sampled the participants to be included in the study. We collected the data using the nominal group technique (NGT), in-depth interviews (IDIs) with key informants and documentary review. We analysed the collected data using both content analysis for qualitative data and correlation analysis for quantitative data. **Results:** We found a number of shortfalls in the district's priority setting processes and criteria which may lead to inefficient and unfair priority setting decisions in FMNCH. In addition, participants identified the priority setting criteria and established the perceived relative importance of the identified criteria. However, we noted differences exist in judging the relative importance attached to the criteria by different stakeholders in the districts. **Conclusions:** In Tanzania, FMNCH contents in both general development policies and sector policies are well articulated. However, the current priority setting process for FMNCH at district levels are wanting in several aspects rendering the priority setting process for FMNCH inefficient and unfair (or unsuccessful). To improve district level priority setting process for the FMNCH interventions, we recommend a fundamental revision of the current FMNCH interventions priority setting process. The improvement strategy should utilize rigorous research methods combining both normative and empirical methods to further analyze and correct past problems at the same time use the good practices to improve the current

priority setting process for FMNCH interventions. The suggested improvements might give room for efficient and fair (or successful) priority setting process for FMNCH interventions.

52. Cockbain AJ, Jacob M, Ecuyer C, Hostert L, Ahmad N. Transplantation of solid organs procured from influenza A H1N1 infected donors. *Transplant International*. 2011; 24(12): e107-e110.

Following the influenza A H1N1 (swine flu) pandemic, there remains little evidence informing the safety of transplanting organs from donors suspected or diagnosed with H1N1. Limited guidelines from the major transplant societies leave the use of such organs at the discretion of individual transplant centres, and practice varies considerably both nationally and internationally. We present the largest published series of outcome following transplantation of organs from H1N1 positive donors and demonstrate that these organs can be transplanted safely and with good short-term outcome. We discuss our local policy for treatment of recipients with Oseltamivir.

53. Colosio C, Mrema E, Rajcevic SM, Vianello G, Brambilla G, Rubino FM. Plant protection products: new tools for exposure and risk assessment in agriculture. 2011; 34(3): 393-397.

Our experience in assessment and management of chemical risk in agriculture consists of three lines: i) definition and modeling of the relationships between different exposure determinants to create the possibility of doing risk assessment without measurements ii) identification, from the Acceptable Operator Exposure Levels (AOEL), of provisional biological exposure indices for pesticides; iii) identification of analytical approaches adequate for the production of the measures needed to support the above mentioned activities starting from the use of multi-residue methods, allowing the determination in one run of several active ingredients and metabolites.

54. Cotte E, Passot G, Tod M, Bakrin N, Gilly FN, Steghens A, Glehen O. Closed abdomen hyperthermic intraperitoneal chemotherapy with irinotecan and mitomycin C: a phase I study. *Annals of surgical oncology*. 2011; 18(9): 2599-2603.

Purpose: Cytoreductive surgery combined with hyperthermic intraperitoneal chemotherapy (HIPEC) is now a recognized treatment for peritoneal carcinomatosis (PC). The objective of this phase I study is to determine the maximum tolerated dose of irinotecan (CPT-11) when used with mitomycin C (MMC) for closed abdomen HIPEC. **Methods:** Patients with PC fulfilling the inclusion criteria were studied. All underwent cytoreductive surgery and closed abdomen HIPEC with 0.7 mg/kg MMC and an escalating dose of irinotecan. Grade 4 (National Cancer Institute grading system) surgical and hematological complications were used to identify dose-limiting toxicity (DLT). **Results:** 12 patients were studied. At the first dose level of irinotecan (100 mg/m²), one patient developed a grade 4 hematological toxicity. Three other patients were included at the same level with no toxicity. Three patients were then included at the second dose level (150 mg/m² irinotecan), of whom one developed a grade 4 surgical complication. Three further patients were thus included at the second dose level. Of these three, two patients developed DLT [grade 4 neutropenia in one, grade 4 neutropenia and thrombocytopenia with an intra-abdominal lymphatic fistula requiring reoperation (grade 4 surgical complication) in the other]. Dose escalation was stopped at this level. The maximum tolerated dose of irinotecan was determined to be 100 mg/m². **Conclusion:** Closed HIPEC combining MMC and irinotecan is safe and feasible. For HIPEC, the maximum tolerated dose of irinotecan is 100 mg/m² when used with 0.7 mg/kg MMC.

55. Cox SE, L'Esperance V, Makani J, Soka D, Hill CM, Kirkham FJ. Nocturnal haemoglobin oxygen saturation variability is associated with vitamin C deficiency in Tanzanian children with sickle cell anaemia. *Acta Paediatrica*. 2011; 100(4): 594-597.

Aim: To compare pulse oximetry in children with sickle cell anaemia (SCA) and controls and test the hypothesis that vitamin C deficiency (VCD; <11.4 µmol/L) is associated with nocturnal haemoglobin oxygen desaturation in SCA. **Methods:** We undertook nocturnal and daytime pulse oximetry in 23 children with SCA (median age 8 years) with known steady-state plasma vitamin C concentrations and 18 siblings (median 7 years). **Results:** Median nocturnal delta 12 s index (delta 12 s), a measure of haemoglobin oxygen saturation (SpO₂) variability, was 0.38 (interquartile range 0.28–0.51) in SCA and 0.35 (0.23–0.48) in controls, with 9/23 and 6/18,

respectively, having a $\Delta \text{SpO}_2 > 0.4$, compatible with obstructive sleep apnoea (OSA). Eleven of twenty-three with SCA had VCD; logged vitamin C concentrations showed a 66% decrease per 0.1 unit increase in ΔSpO_2 ([95% CI 78%, 15%]; $p = 0.023$) and $\Delta \text{SpO}_2 > 0.4$ was associated with VCD (odds ratio 8.75 [1.24–61.7], $p = 0.029$). Daytime and mean nocturnal SpO₂ were lower in SCA but there was no association with vitamin C. **Conclusion:** Obstructive sleep apnoea (OSA), detected from nocturnal haemoglobin oxygen saturation variability, is common in Tanzanian children and associated with vitamin C Deficiency in SCA. The direction of causality could be determined by comparing OSA treatment with vitamin C supplementation.

56. Cox SE, Makani J, Fulford AJ, Komba AN, Soka D, Williams TN, Newton CR, Marsh K, Prentice AM. Nutritional status, hospitalization and mortality among patients with sickle cell anemia in Tanzania. *Haematologica*. 2011; 96 (7): 948-953.

Background: Reduced growth is common in children with sickle cell anemia, but few data exist on associations with long-term clinical course. Our objective was to determine the prevalence of malnutrition at enrolment into a hospital-based cohort and whether poor nutritional status predicted morbidity and mortality within an urban cohort of Tanzanian sickle cell anemia patients. **Design and Methods:** Anthropometry was conducted at enrolment into the sickle cell anemia cohort ($n=1,618$; ages 0.5-48 years) and in controls who attended screening (siblings, walk-ins and referrals) but who were found not to have sickle cell anemia ($n=717$; ages 0.5-64 years). Prospective surveillance recorded hospitalization at Muhimbili National Hospital and mortality between March 2004 and September 2009. **Results:** Sickle cell anemia was associated with stunting (OR=1.92, $P<0.001$, 36.2%) and wasting (OR=1.66, $P=0.002$, 18.4%). The greatest growth deficits were observed in adolescents and in boys. Independent of age and sex, lower hemoglobin concentration was associated with increased odds of malnutrition in sickle cell patients. Of the 1,041 sickle cell anemia patients with a body mass index z-score at enrolment, 92% were followed up until September 2009 ($n=908$) or death ($n=50$). Body mass index and weight-for-age z-score predicted hospitalization (hazard ratio [HZR]=0.90, $P=0.04$ and $\text{HZR}=0.88$, $P=0.02$) but height-for-age z-score did not ($\text{HZR}=0.93$, NS). The mortality rate of 2.5 per 100 person-years was not associated with any of the anthropometric measures. **Conclusions:** In this non-birth-cohort of sickle cell anemia with significant associated

undernutrition, wasting predicted an increased risk of hospital admission. Targeted nutritional interventions should prioritize treatment and prevention of wasting.

57. Cox SE, Makani J, Komba AN, Soka D, Newton CR, Kirkham FJ, Prentice AM. Global arginine bioavailability in Tanzanian sickle cell anaemia patients at steady-state: A nested case control study of deaths versus survivors. *British Journal of Haematology*.2011; 155 (4): 522-524.

58. Crawford AD, Liekens S, Kamuhabwa AR, Maes J, Munck S, Busson R, Rozenski J, Esguerra CV, de Witte PAM. Zebrafish bioassay-guided natural product discovery: Isolation of angiogenesis inhibitors from East African medicinal plants.*PLoS ONE*.2011; 6 (2): e14694.

59. Dalal S, Beunza JJ , Volmink J, Adebamowo C, Bajunirwe F, Njelekela M, Mozaffarian D, Fawzi WW , Willett W, Adami HO, Holmes MD. Non-communicable diseases in sub-Saharan Africa: What we know now. *International Journal of Epidemiology*.2011; 40 (4): 885-901.

Background: Sub-Saharan Africa (SSA) has a disproportionate burden of both infectious and chronic diseases compared with other world regions. Current disease estimates for SSA are based on sparse data, but projections indicate increases in non-communicable diseases (NCDs) caused by demographic and epidemiologic transitions. We review the literature on NCDs in SSA and summarize data from the World Health Organization and International Agency for Research on Cancer on the prevalence and incidence of cardiovascular diseases, diabetes mellitus Type 2, cancer and their risk factors. **Methods:** We searched the PubMed database for studies on each condition, and included those that were community based, conducted in any SSA country and reported on disease or risk factor prevalence, incidence or mortality. **Results:** We found few community-based studies and some countries (such as South Africa) were over-represented. The prevalence of NCDs and risk factors varied considerably between countries, urban/ rural location and other sub-populations. The prevalence of stroke ranged from 0.07 to 0.3%, diabetes mellitus from 0 to 16%, hypertension from 6 to 48%, obesity from 0.4 to 43% and current smoking from

0.4 to 71%. Hypertension prevalence was consistently similar among men and women, whereas women were more frequently obese and men were more frequently current smokers.

Conclusions: The prevalence of NCDs and their risk factors is high in some SSA settings. With the lack of vital statistics systems, epidemiologic studies with a variety of designs (cross-sectional, longitudinal and interventional) capable of in-depth analyses of risk factors could provide a better understanding of NCDs in SSA, and inform health-care policy to mitigate the oncoming NCD epidemic.

60. Daniel B, Innocent E, Mbwambo ZH, Musharraf SG. Comparison of mosquito larvicidal activity of annona squamosa leaves growing in different eco-zones in Tanzania. *International Journal of Pharmacy & Bio Sciences*. 2011; 2(4).

Annona squamosa L. (Annonaceae) is a medicinal plant widely distributed in all eco-zones of Tanzania. The plant has a wide use as medicine, food and insecticide. A qualitative study of Ethanolic extracts of *A. squamosa* collected from different eco-zones was done using HPTLC. Furthermore, each leaf ethanolic extract and leaf powders were screened for mosquito larvicidal Activity against larvae of *Culex quinquefasciatus* Say and *An. gambiae* s.s. The results from HPTLC showed almost the same kind of compounds based on their retention factor as observed in both long and short wavelength. The leaf ethanolic extract and leaf powders from Brachystegia Julbernadia Savanna Woodlands eco-zone (T6) showed the highest larvicidal Activity with LC50 value of 0.0066 mg/ml and 0.0860 mg/ml against *Culex quinquefasciatus* while activity of the same sample against *An. gambiae* was 0.0252 mg/ml and 0.0599 mg/ml respectively after 24 h of exposure. Physiochemical screening of DCM, EtoAc and ButOH Fractions obtained from T6 leaf ethanolic extract indicated the presence of alkaloids, terpenoids and flavanoids. The results suggest that *A. squamosa* from T6 eco-zone is the richest Chemo type agent for mosquito control.

61. Daniel B, Innocent E, Mbwambo Z.H, Musharraf SG. Comparison of mosquito larvicidal activity of *Annona squamosa* leaves growing in different eco-zones in Tanzania. *International Journal of Pharma and Bio Sciences*.2011; 2 (5): 566-572.

Annona squamosa L. (Annonaceae) is a medicinal plant widely distributed in all eco-zones of Tanzania. The plant has a wide use as medicine, food and insecticide. A qualitative study of ethanolic extracts of *A. squamosa* collected from different eco-zones was done using HPTLC. Furthermore, each leaf ethanolic extract and leaf powders were screened for mosquito larvicidal activity against larvae of *Culex quinquefasciatus* Say and *An. gambiae* s.s. The results from HPTLC showed almost the same kind of compounds based on their retention factor as observed in both long and short wavelength. The leaf ethanolic extract and leaf powders from *Brachystegia Julbernadia* Savanna Woodlands eco-zone (T6) showed the highest larvicidal activity with LC50 value of 0.0066 mg/ml and 0.0860 mg/ml against *Culex quinquefasciatus* while activity of the same sample against *An. gambiae* was 0.0252 mg/ml and 0.0599 mg/ml respectively after 24 h of exposure. Phytochemical screening of DCM, EtoAc and ButOH fractions obtained from T6 leaf ethanolic extract indicated the presence of alkaloids, terpenoids and flavanoids. The results suggest that *A. squamosa* from T6 eco-zone is the most rich chemotype agent for mosquito control.

62. Davis J, Pickering A, Rogers K, Mamuya S, Boehm AB. The effects of informational interventions on household water management, hygiene behaviors stored drinking water quality and hand contamination in Peri-Urban Tanzania. *American Journal of Tropical Medicine and Hygiene*.2011; 84 (2): 184-191.

Safe water storage and hand hygiene have been shown to reduce fecal contamination and improve health in experimental settings; however, triggering and sustaining such behaviors is challenging. This study investigates the extent to which personalized information about *Escherichia coli* contamination of stored water and hands influenced knowledge, reported behaviors, and subsequent contamination levels among 334 households with less than 5-year-old children in periurban Dar es Salaam, Tanzania. One-quarter of the study participants received information about strategies to reduce risk of water- and sanitation-related illness. Respondents in another three study cohorts received this same information, along with their household's water and/or hand-rinse test results. Findings from this study suggest that additional work is needed to elucidate the conditions under which such testing represents a cost-effective strategy to motivate improved household water management and hand hygiene.

63. De la Torre F, Simon T, Ambadar Z, Cohn JF. Fast-FACS: a computer-assisted system to increase speed and reliability of manual FACS coding. *In Affective Computing and Intelligent Interaction*. 2011: 57-66.

FACS (Facial Action Coding System) coding is the state of the art in manual measurement of facial actions. FACS coding, however, is labor intensive and difficult to standardize. A goal of automated FACS coding is to eliminate the need for manual coding and realize automatic recognition and analysis of facial actions. Success of this effort depends in part on access to reliably coded corpora; however, manual FACS coding remains expensive and slow. This paper proposes Fast-FACS, a computer vision aided system that improves speed and reliability of FACS coding. Three are the main novelties of the system: (1) to the best of our knowledge, this is the first paper to predict onsets and offsets from peaks (2) use Active Appearance Models for computer assisted FACS coding, (3) learn an optimal metric to predict onsets and offsets from peaks. The system was tested in the RU-FACS database, which consists of natural facial behavior during a two-person interview. Fast-FACS reduced manual coding time by nearly 50% and demonstrated strong concurrent validity with manual FACS coding.

64. Dent W, Stelzhammer B, Meindl M, Matuja WBP, Schmutzhard E, Winkler AS. Migraine attack frequency, duration, and pain intensity: Disease burden derived from a community-based survey in Northern Tanzania. *Headache*.2011; 51 (10): 1483-1492.

Objective: One goal of the campaign "Lifting the burden: The global campaign against headache" is to highlight existing evidence about headache worldwide. In this context, the aim of our study was to report the migraine-related headache burden in northern Tanzania. **Methods:** - From December 2003 until June 2004 a community-based door-to-door survey was undertaken in northern Tanzania, using multistage cluster sampling. Based on the criteria of the International Headache Society, 7412 individuals were enrolled in this survey. **Results:** Migraine patients' average annual attack frequency was 18.4 (n = 308, standard deviation [SD] \pm 47.4) with a mean duration of 16.4 hours (SD \pm 20.6). The average headache intensity per patient was 2.65 (SD \pm 0.59) with a calculated loss of 6.59 (SD \pm 26.7) working days per year. Extrapolation of data to the investigated population (n = 7412) resulted in annual migraine burden of 281.0 migraine days

per 1000 inhabitants. **Conclusions:** To our knowledge, this study reports for the first time the burden that arises from migraine headache in a rural population of sub-Saharan Africa (SSA). As the presented migraine-related burden is considerable, we hope that our data will increase the awareness among local decision makers in allocating resources for treatment and research on headache.

65. Devries K, Watts C, Yoshihama M, Kiss L, Schraiber LB, Deyessa N, Heise L, Durand J, Mbwambo J, Janssen H, Berhane Y, Ellsberg M, Garcia-Moreno C. Violence against women is strongly associated with suicide attempts: Evidence from the WHO multi-country study on women's health and domestic violence against women. *Social Science and Medicine*.2011; 73 (1): 79-86.

Suicidal behaviours are one of the most important contributors to the global burden of disease among women, but little is known about prevalence and modifiable risk factors in low and middle income countries. We use data from the WHO multi-country study on women's health and domestic violence against women to examine the prevalence of suicidal thoughts and attempts, and relationships between suicide attempts and mental health status, child sexual abuse, partner violence and other variables. Population representative cross-sectional household surveys were conducted from 2000-2003 in 13 provincial (more rural) and city (urban) sites in Brazil, Ethiopia, Japan, Namibia, Peru, Samoa, Serbia, Thailand and Tanzania. 20967 women aged 15-49 years participated. Prevalence of lifetime suicide attempts, lifetime suicidal thoughts, and suicidal thoughts in the past four weeks were calculated, and multivariate logistic regression models were fit to examine factors associated with suicide attempts in each site. Prevalence of lifetime suicide attempts ranged from 0.8% (Tanzania) to 12.0% (Peru city); lifetime thoughts of suicide from 7.2% (Tanzania province) to 29.0% (Peru province), and thoughts in the past four weeks from 1.9% (Serbia) to 13.6% (Peru province). 25-50% of women with suicidal thoughts in the past four weeks had also visited a health worker in that time. The most consistent risk factors for suicide attempts after adjusting for probable common mental health disorders were: intimate partner violence, non-partner physical violence, ever being divorced, separated or widowed, childhood sexual abuse and having a mother who had experienced intimate partner violence. Mental health policies and services must recognise the consistent relationship between violence

and suicidality in women in low and middle income countries. Training health sector workers to recognize and respond to the consequences of violence may substantially reduce the health burden associated with suicidal behavior.

66. Dumont T, Simon-Labric T, Authemayou C, Heymes T. Lateral termination of the north-directed Alpine orogeny and onset of westward escape in the Western Alpine arc: Structural and sedimentary evidence from the external zone. *Tectonics*. 2011; 30(5).

The initial propagation of the Western Alpine orogen was directed northwestward, as shown by basement-involved and Mesozoic sedimentary cover compressional structures and by the early foreland basins evolution. The crystalline basement of the Dauphiné zone recorded three shortening episodes: pre-Priabonian deformation D1 (coeval with the Pyrenean-Provence orogeny), and Alpine shortening events D2 (N-NW directed) and D3 (W-directed). The early Oligocene D2 structures are trending sub-perpendicular to the more recent, arcuate orogen and are interfering with (or truncated by) D3, which marks the onset of westward lateral extrusion. The NW-ward propagating Alpine flexural basin shows earliest Oligocene thin-skinned compressional deformation, with syn-depositional basin-floor tilting and submarine removal of the basin infill above active structures. Gravity enhanced submarine erosion gave birth locally to steep submarine slopes overlain by kilometeric-scale blocks slid from the orogenic wedge. The deformations of the basin floor and the associated sedimentary and erosional features indicate a N-NW-ward directed propagation, consistent with D2 in the Dauphiné foreland. The Internal zones represent the paleo-accretionary prism developed during this early Alpine continental subduction stage. The early buildup has been curved in the arc and rapidly exhumed during the Oligocene collision stage. Westward extrusion and indenting by the Apulian lithosphere allowed the modern arc to crosscut the western, lateral termination of the ancient orogen from ~32 Ma onward. This contrasted evolution leads to propose a palinspastic restoration taking in account important northward transport of the distal passive margin fragments (Briançonnais) involved in the accretionary prism before the formation of the Western Alps arc.

67. El Majdoub F, Simon T, Hoevels M, Berthold F, Sturm V, Maarouf M. Interstitial Brachytherapy using Stereotactic Implanted¹²⁵Iodine Seeds for Recurrent Medulloblastoma. *Clinical Oncology*. 2011; 23(8): 532-537.

Aims: To evaluate the efficacy of interstitial brachytherapy using 125iodine (125I) seeds for the treatment of recurrent multimodal treated medulloblastoma. **Materials and methods:** Between September 1989 and August 2009, 12 patients (female: male = 3:9, median age 19 years, range 7–55 years) with 23 recurrent medulloblastomas underwent interstitial brachytherapy using 125I seeds. Before brachytherapy, all patients underwent microsurgical resection; six patients underwent a combined adjuvant treatment consisting of craniospinal irradiation and chemotherapy; three received craniospinal irradiation alone and two received chemotherapy alone. One patient was treated by surgery alone. The median tumour volume was 4.9 ml (range 0.4–44.2 ml), the median tumour surface dose 50 Gy (range 32–50 Gy) and the median implantation time 42 days (range 42–90 days). A median follow-up of 26 months was available (range 5–116 months). **Results:** After brachytherapy, nine of 23 tumours (39%) presented a complete remission, nine (39%) a partial remission and five (22%) stable disease on magnetic resonance images. The neurological status improved in six patients and remained unchanged in four. Two patients deteriorated: one developed spinal metastasis and another treatment-related adverse radiation effect. Ten patients died due to disseminated disease despite local tumour control. The median survival after treatment was 15 months (range 5–68 months). **Conclusions:** Our results show a good response of recurrent medulloblastoma after interstitial brachytherapy. High rates of tumour remission were yielded with low rates of treatment-related morbidity. Thus, 125I seed brachytherapy should be considered as a treatment option for recurrent medulloblastoma.

68. Eom KS, Chai JY, Yong TS, Min DY, Rim HJ, Kihamia C, Jeon HK. Morphologic and genetic identification of *Tania* Tapeworms in Tanzania and DNA genotyping of *Tania* sodium. *Korean Journal of Parasitological*. 2011; 49 (4): 399-403.

Species identification of *Tania* tapeworms was performed using morphologic observations and multiplex PCR and DNA sequencing of the mitochondrial *cox1* gene. In 2008 and 2009, a total

of 1,057 fecal samples were collected from residents of Kongwa district of Dodoma region, Tanzania, and examined microscopically for helminthes eggs and proglottids. Of these, 4 Tania egg positive cases were identified, and the eggs were subjected to DNA analysis. Several proglottids of Tania sodium were recovered from 1 of the 4 cases. This established that the species were T. solium (n=1) and T. saginata (n=3). One further T. solium specimen was found among 128 fecal samples collected from Mbulu district in Arusha, and this had an intact strobila with the scolex. Phylegenetic analysis of the mtDNA cox1 gene sequences of these 5 isolates showed that T. saginata was basal to the T. solium clade. The mitochondrial cox1 gene sequences of 3 of these Tanzanian isolates showed 99% similarity to T. saginata, and the other 2 isolates showed 100% similarity to T. solium. The present study has shown that Taenia tapeworms are endemic in Kongwa district of Tanzania, as well as in a previously identified Mbulu district. Both T. solium isolates were found to have an "African/Latin American" genotype (cox1).

69. Falnes EF, Moland KM, Tylleskär T, De Paoli MM, Leshabari SC, Engebretsen IM. The potential role of mother-in-law in prevention of mother-to-child transmission of HIV: a mixed methods study from the Kilimanjaro region, northern Tanzania. BMC public health. 2011; 11(1): 551.

Background: In the Kilimanjaro region the mother-in-law has traditionally had an important role in matters related to reproduction and childcare. The aim of this study was to explore the role of the mothers-in-law in prevention of mother-to-child transmission (PMTCT) service utilization and adherence to infant feeding guidelines. **Methods:** The study was conducted during 2007-2008 in rural and urban areas of Moshi district in the Kilimanjaro region of Tanzania. Mixed methods were used and included focus group discussions with mothers-in-law, mothers and fathers; in-depth interviews with mothers-in-law, mothers, fathers and HIV-infected mothers, and a survey of 446 mothers bringing their four-week-old infants for immunisation at five reproductive and child health clinics. **Results:** The study demonstrated that the mother-in-law saw herself as responsible for family health issues in general and child care in particular. However she received limited trust, and couples, in particular couples living in urban areas, tended to exclude her from decisions related to childbearing and infant feeding. Mothers-in-law

expected their daughters-in-law to breastfeed in a customary manner and were generally negative towards the infant feeding methods recommended for HIV-infected mothers; exclusive replacement feeding and exclusive breastfeeding. **Conclusions:** Decreasing influence of the mother-in-law and increasing prominence of the conjugal couples in issues related to reproduction and child care reinforce the importance of continued efforts to include male partners in the PMTCT programme. The potential for involving mothers-in-law in the infant feeding component, where she still has influence in some areas, should be further explored.

70. Falnes EF, Moland KM, Tylleskär T, De Paoli MM, Leshabari SC, Engebretsen IMS. The potential role of mother-in-law in prevention of mother-to-child transmission of HIV: A mixed methods study from the Kilimanjaro region, northern Tanzania. BMC Public Health.2011; 11: 551.

Background: In the Kilimanjaro region the mother-in-law has traditionally had an important role in matters related to reproduction and childcare. The aim of this study was to explore the role of the mothers-in-law in prevention of mother-to-child transmission (PMTCT) service utilization and adherence to infant feeding guidelines. **Methods:** The study was conducted during 2007-2008 in rural and urban areas of Moshi district in the Kilimanjaro region of Tanzania. Mixed methods were used and included focus group discussions with mothers-in-law, mothers and fathers; in-depth interviews with mothers-in-law, mothers, fathers and HIV-infected mothers, and a survey of 446 mothers bringing their four-week-old infants for immunisation at five reproductive and child health clinics. **Results:** The study demonstrated that the mother-in-law saw herself as responsible for family health issues in general and child care in particular. However she received limited trust, and couples, in particular couples living in urban areas, tended to exclude her from decisions related to childbearing and infant feeding. Mothers-in-law expected their daughters-in-law to breastfeed in a customary manner and were generally negative towards the infant feeding methods recommended for HIV-infected mothers; exclusive replacement feeding and exclusive breastfeeding. **Conclusions:** Decreasing influence of the mother-in-law and increasing prominence of the conjugal couples in issues related to reproduction and child care reinforce the importance of continued efforts to include male

partners in the PMTCT programme. The potential for involving mothers-in-law in the infant feeding component, where she still has influence in some areas, should be further explored.

71. Faurholt-Jepsen D, Range N, PrayGod G, Jeremiah K, Faurholt-Jepsen M, Aabye MG, Chagalucha J, Christensen DL, Pippert CB, Krarup H, Witte DR, Andersen AB, Friis H. Diabetes is a risk factor for pulmonary tuberculosis: A Case-Control study from Mwanza, Tanzania. *PLoS ONE*.2011; 6 (8): e24215.

Background: Diabetes and TB are associated, and diabetes is increasingly common in low-income countries where tuberculosis (TB) is highly endemic. However, the role of diabetes for TB has not been assessed in populations where HIV is prevalent. **Methods:** A case-control study was conducted in an urban population in Tanzania among culture-confirmed pulmonary TB patients and non-TB neighbourhood controls. Participants were tested for diabetes according to WHO guidelines and serum concentrations of acute phase reactants were measured. The association between diabetes and TB, and the role of HIV as an effect modifier, were examined using logistic regression. Since blood glucose levels increase during the acute phase response, we adjusted for elevated serum acute phase reactants. **Results:** Among 803 cases and 350 controls the mean (SD) age was 34.8 (11.9) and 33.8 (12.0) years, and the prevalence of diabetes was 16.7% (95% CI: 14.2; 19.4) and 9.4% (6.6; 13.0), respectively. Diabetes was associated with TB (OR 2.2, 95% CI: 1.5; 3.4, $p < 0.001$). However, the association depended on HIV status (interaction, $p = 0.01$) due to a stronger association among HIV uninfected (OR 4.2, 95% CI: 1.5; 11.6, $p = 0.01$) compared to HIV infected (OR 0.1, 95% CI: 0.01; 1.8, $p = 0.13$) after adjusting for age, sex, demographic factors and elevated serum acute phase reactants. **Conclusion:** Diabetes is a risk factor for TB in HIV uninfected, whereas the association in HIV infected patients needs further study. The increasing diabetes prevalence may be a threat to TB control.

72. Finez A, Roger M, Jondeau E, Jacob M. Experimental investigation of trailing-edge noise from a linear cascade of cambered airfoils. In 17th AIAA/CEAS Aero acoustics Conference Proceedings, AIAA. 2011: 2876

73. Fleck S, Mölder I, Jacob M, Gebauer T, Jungkunst HF, Leuschner C. Comparison of conventional eight-point crown projections with LIDAR-based virtual crown projections in a temperate old-growth forest. *Annals of forest science*. 2011; 68(7): 1173-1185.

Introduction: Sight-based field measurements of tree crown projection area and canopy height are common praxis in forest science but difficult to validate. We quantified their measurement errors based on the virtual representation of an 11-species old-growth forest provided by high-resolution terrestrial LIDAR (light detection and ranging) measurements. Objectives: Based on the expectations (a) that violations of the triangulation theory are the main error source of height measurements, and (b) that approximations of tree crowns with fixed angles are not flexible enough for irregular crown shapes in natural stands, we investigated the relative accuracies of triangulation measurements of height of crown base (B T) vs. tree height (H T) and of different crown projection methods. B T (± 0.52 m) showed lower measurement errors than H T (± 2.4 m). Results and conclusions: Larger deviations between field-measured and virtually executed crown projections could partly be attributed to structural differences of the crowns that were two-dimensionally quantified as space capture index (SCI). The largest deviations between both methods occurred on suppressed tree crowns and tall *Quercus robur* trees in the stand. Because of the method-inherent underestimation of crown projections with fixed angular grid, we propose the use of flexible angles by trained operators.

74. Florence C, Shepherd J, Brennan I, Simon T. Effectiveness of anonymised information sharing and use in health service, police, and local government partnership for preventing violence related injury: experimental study and time series analysis. *BMJ*. 2011: 342.

Objective: To evaluate the effectiveness of anonymised information sharing to prevent injury related to violence. Design Experimental study and time series analysis of a prototype community partnership between the health service, police, and local government partners designed to prevent violence. Setting Cardiff, Wales, and 14 comparison cities designated “most similar” by the Home Office in England and Wales. Intervention After a 33 month development period, anonymised data relevant to violence prevention (precise violence location, time, days, and weapons) from patients attending emergency departments in Cardiff and reporting injury

from violence were shared over 51 months with police and local authority partners and used to target resources for violence prevention. Main outcome measures Health service records of hospital admissions related to violence and police records of woundings and less serious assaults in Cardiff and other cities after adjustment for potential confounders. **Results** Information sharing and use were associated with a substantial and significant reduction in hospital admissions related to violence. In the intervention city (Cardiff) rates fell from seven to five a month per 100? 000 population compared with an increase from five to eight in comparison cities (adjusted incidence rate ratio 0.58, 95% confidence interval 0.49 to 0.69). Average rate of woundings recorded by the police changed from 54 to 82 a month per 100? 000 population in Cardiff compared with an increase from 54 to 114 in comparison cities (adjusted incidence rate ratio 0.68, 0.61 to 0.75). There was a significant increase in less serious assaults recorded by the police, from 15 to 20 a month per 100?000 population in Cardiff compared with a decrease from 42 to 33 in comparison cities (adjusted incidence rate ratio 1.38, 1.13 to 1.70).**Conclusion** : An information sharing partnership between health services, police, and local government in Cardiff, Wales, altered policing and other strategies to prevent violence based on information collected from patients treated in emergency departments after injury sustained in violence. This intervention led to a significant reduction in violent injury and was associated with an increase in police recording of minor assaults in Cardiff compared with similar cities in England and Wales where this intervention was not implemented.

75. Francis MK. Assessment of availability, affordability and prescribing patterns of essential medicines in public health facilities in Tanga region, Tanzania. Master of Sciences (Pharmaceutical Management) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Objective: To determine and assess the availability, affordability and prescribing pattern of essential medicines in public health of Tanzania. Setting: Availability, affordability, and rational use of medicines were assessed in primary health care centers in six different geographical areas of Tanga region. **Methods:** This was a cross-sectional survey in accordance with the WHO guidelines for monitoring and assessing the pharmaceutical situation in developing countries, which was conducted between May and June 2011 in Tanga. For this survey, a total of 30 public

health facilities were selected from the six different geographic areas identified in Tanga and 600 clients were interviewed during the study. Results: The mean average number of medicines prescribed by physician was 2.9 per prescription. The number of prescriptions containing an antibiotic was 66.61% on average. The number of prescriptions containing injectable medicines was 25.72%, with a considerable variation among facilities. Adherence of prescribers to standard treatment guidelines showed only 70.08% of prescriptions were in accordance with the national guidelines for treating various disease conditions. About 61.75 % of the 14 items monitored was available in Public health facilities. Average mean of 66.55% of the medicines prescribed by the physician were dispensed by the health facility medicine dispensing unit. The study revealed a mean stock – out duration of 80.85 days. The correct medicine labeling criteria for prescriptions were met in 62.29% of the analyzed prescriptions. Adequate patient knowledge about the dispensed medicines was met only for 83.85% of patients. Of the 30 facilities, only 19 (63.3%) reported to have the tools in hand and this was proved by physical observation. Medicine availability of 71.43 % and average stock- out duration of 54.37 days per year and good quality of storage condition were observed at the zonal medical store in the region. **Conclusion:** The prescribing patterns of essential medicines in the region were varying across district with the quite low number of medicines per prescription. The use of antibiotics and injectable medicines were considerable low in most health facilities. The overall availability of medicines in the region is still very low. The stock-out duration of essential medicines is still very high in the region. Affordability of essential medicines in the region was good with an overall ratio that indicated the medicines are affordable Page | xiv in public health facilities. The quality indicators show that storage condition of medicines in the region was satisfactory with very low number of expired medicines on the shelves. Furthermore most health facilities have updated STG and NEML that are used by health care providers.

76. Frotscher M, Kahleyss F, Simon T, Biermann D, Eggeler G. Achieving small structures in thin NiTi sheets for medical applications with water jet and micro machining: a comparison. *Journal of materials engineering and performance*.2011; 20(4-5):776-782.

NiTi shape memory alloys (SMA) are used for a variety of applications including medical implants and tools as well as actuators, making use of their unique properties. However, due to

the hardness and strength, in combination with the high elasticity of the material, the machining of components can be challenging. The most common machining techniques used today are laser cutting and electrical discharge machining (EDM). In this study, we report on the machining of small structures into binary NiTi sheets, applying alternative processing methods being well-established for other metallic materials. Our results indicate that water jet machining and micro milling can be used to machine delicate structures, even in very thin NiTi sheets. Further work is required to optimize the cut quality and the machining speed in order to increase the cost-effectiveness and to make both methods more competitive.

77. Frotscher M, Wu S, Simon T, Somsen C, Dlouhy A, Eggeler G. Elementary deformation and damage mechanisms during fatigue of pseudo elastic NiTi microstents. *Advanced Engineering Materials*. 2011; 13(5): 181-186.

78. Frumence G, Eriksson M, Nystrom L, Killewo J, Emmelin M. Exploring the role of cognitive and structural forms of social capital in HIV/AIDS trends in the Kagera region of Tanzania - A grounded theory study. *African Journal of AIDS Research*. 2011; 10 (1):1-13.

The article presents a synthesis of data from three village case studies focusing on how structural and cognitive social capital may have influenced the progression of the HIV epidemic in the Kagera region of Tanzania. Grounded theory was used to develop a theoretical model describing the possible links between structural and cognitive social capital and the impact on sexual health behaviours. Focus group discussions and key informant interviews were carried out to represent the range of experiences of existing social capital. Both structural and cognitive social capital were active avenues for community members to come together, empower each other, and develop norms, values, trust and reciprocal relations. This empowerment created an enabling environment in which members could adopt protective behaviours against HIV infection. On the one hand, we observed that involvement in formal and informal organisations resulted in a reduction of numbers of sexual partners, led people to demand abstinence from sexual relations until marriage, caused fewer opportunities for casual sex, and gave individuals the agency to demand the use of condoms. On the other hand, strict membership rules and regulations excluded some members, particularly excessive alcohol drinkers and debtors, from becoming members of

the social groups, which increased their vulnerability in terms of exposure to HIV. Social gatherings (especially those organised during the night) were also found to increase youths' risk of HIV infection through instances of unsafe sex. We conclude that even though social capital may at times have negative effects on individuals' HIV-prevention efforts, this study provides initial evidence that social capital is largely protective through empowering vulnerable groups such as women and the poor to protect against HIV infection and by promoting protective sexual behaviours.

79. Frumence G. The role of social capital in HIV prevention: experiences from the Kagera region of Tanzania. (2011).

Background: The role of social capital for promoting health has been extensively studied in recent years but there are few attempts to investigate the possible influence of social capital on HIV prevention, particularly in developing countries. The overall aims of this thesis are to investigate the links between social capital and HIV infection and to contribute to the theoretical framework of the role of social capital for HIV prevention. **Methods:** Key informant interviews with leaders of organizations, networks, social groups and communities and focus group discussions with members and non-members of the social groups and networks were conducted to map out and characterize various forms of social capital that may influence HIV prevention. A quantitative community survey was carried out in three case communities to estimate the influence of social capital on HIV risk behaviors. A cross-sectional survey was conducted to estimate the HIV prevalence in the urban district representing a high HIV prevalence zone to determine the association between social capital and HIV infection. **Main findings:** In early 1990's many of the social groups in Kagera region were formed because of poverty and many AIDS related deaths. This formation of groups enhanced people's social and economic support to group members during bereavement and celebrations as well as provided loans that empowered members economically. The social groups also put in place strict rules of conduct, which helped to create new norms, values and trust, which influenced sexual health and thereby enhanced HIV prevention. Formal organizations worked together with social groups and facilitated networking and provided avenues for exchange of information including health education on HIV/AIDS.

Individuals who had access to high levels of structural and cognitive social capital were more likely to use condoms with their casual sex partners compared to individuals with access to low levels. Women with access to high levels of structural social capital were more likely to use condoms with casual sex partners compared to those with low levels. Individuals with access to low levels of structural social capital were less likely to be tested for HIV compared to those with access to high levels. However, there was no association between access to cognitive social capital and being tested for HIV. Individuals who had access to low levels of both structural and cognitive social capital were more likely to be HIV positive compared to individuals who had access to high levels with a similar pattern among men and women. **Conclusion:** This thesis indicates that social capital in its structural and cognitive forms is protective to HIV infection and has played an important role in the observed decline in HIV trends in the Kagera region. Structural and cognitive social capital has enabled community members to decrease number of sexual partners, delay sexual debut for the young generation, reduce opportunities for casual sex and empower community members to demand or use condoms. It is recommended that policy makers and programme managers consider involving grassroots' social groups and networks in the design and delivery of interventions strategies to reduce HIV transmission.

80. Fyumagwa RD, Ezekiel MJ, Nyaki A, Mdaki ML, Katale ZB, Moshiro C, Keyyu JD. Response to Rift Valley Fever in Tanzania: Challenges and opportunities. *Tanzania Journal of Health Research*. 2011; 13 (5): 1-9.

Rift Valley Fever (RVF) is an arthropod borne viral disease affecting livestock (cattle, sheep, goats and camels), wildlife and humans caused by Phlebovirus. The disease occurs in periodic cycles of 4-15 years associated with flooding from unusually high precipitations in many flood-prone habitats. *Aedes* and *Culex* spp and other mosquito species are important epidemic vectors. Because of poor living conditions and lack of knowledge on the pathogenesis of RVF, nomadic pastoralists and agro-pastoralists are at high risk of contracting the disease during epidemics. RVF is a professional hazard for health and livestock workers because of poor biosafety measures in routine activities including lack of proper Personal Protective Equipment (PPE). Direct exposure to infected animals can occur during handling and slaughter or through veterinary and obstetric procedures or handling of specimens in laboratory. The episodic nature

of the disease creates special challenges for its mitigation and control and many of the epidemics happen when the governments are not prepared and have limited resource to contain the disease at source. Since its first description in 1930s Tanzania has recorded six epidemics, three of which were after independence in 1961. However, the 2007 epidemic was the most notable and wide spread with fatal human cases among pastoralists and agro-pastoralists concurrent with high livestock mortality. Given all the knowledge that exists on the epidemiology of the disease, still the 2006/2007 epidemic occurred when the government of Tanzania was not prepared to contain the disease at source. This paper reviews the epidemiology, reporting and outbreak investigation, public awareness, preparedness plans and policy as well as challenges for its control in Tanzania.

81. Gali A, Simon T, Lowther JE. An abinitio study of local vibration modes of the nitrogen-vacancy center in diamond. *New Journal of Physics*. 2011; 13(2):025016.

The negatively charged nitrogen-vacancy (NV) defect (NV center) in diamond is a leading candidate to realize solid-state qubits and ultrasensitive magnetometers in ambient conditions. A new interpretation of some of the properties of the center is presented. We show that the double peak in the absorption phonon sidebands may correspond to the local a₁ and e vibration modes of the defect that have very similar energies and that tunneling of nitrogen atoms in the vacancy does not occur as had been previously suggested.

82. Gallavardin T, Maupin M, Marotte S, Simon T, Gabudean AM, Bretonnière Y, Andraud C. Photodynamic therapy and two-photon bio-imaging applications of hydrophobic chromophores through amphiphilic polymer delivery. *Photochemical & Photo biological Sciences*. 2011; 10(7): 1216-1225.

The synthesis and photo physical properties of two lipophilic quadrupolar chromophores featuring anthracenyl (1) or dibromobenzene (2) were described. These two chromophores combined significant two-photon absorption cross-sections with high fluorescence quantum yield for 1 and improved singlet oxygen generation efficiency for 2, in organic solvents. The use of Plutonic nanoparticles allowed a simple and straightforward introduction of these lipophilic chromophores into biological cell media. Their internal distribution in various cell lines was

studied using fluorescence microscopy and flow-cytometry following a successful staining that was achieved upon 2 h of incubation. Finally, multiphoton excitation microscopy and photodynamic therapy capability of the chromophores were demonstrated by cell exposure to a 820 nm fs laser and cell death upon one photon resonant irradiation at 436 ± 10 nm, respectively.

83. Garcia ME, Li MS, Siril H, Hawkins C, Kaaya S, Ismail S, Chalamilla G, Mdingi SG, Hirschhorn LR. Health-care worker engagement in HIV-related quality improvement in Dar es Salaam, Tanzania. *International Journal for Quality in Health Care*. 2011; 23 (3): 231-238.

Objective: To assess health-care worker (HCW) awareness, interest and engagement in quality improvement (QI) in HIV care sites in Tanzania. Design: Cross-sectional survey distributed in May 2009. Setting: Sixteen urban HIV care sites in Dar es Salaam, Tanzania, 1 year after the introduction of a quality management program. Participants: Two hundred seventy-nine HCWs (direct care, clinical support staff and management). Main Outcome Measures: HCW perceptions of care delivered, rates of engagement, knowledge and interest in QI. HCW identified barriers to and facilitators of the delivery of quality HIV care. **Results:** Two hundred seventy-nine (73%) of 382 HCWs responded to the survey. Most (86%) felt able to meet clients' needs. HCW-identified facilitators of quality included: teamwork (88%), staff communication (79%), positive work environment (75%) and trainings (84%). Perceived barriers included: problems in patients' lives (73%) and too few staff or too high patient volumes (52%). Many HCWs knew about specific QI activities (52%) or had been asked for input on QI (63%), but fewer (40.5%) had participated in activities and only 20.1% were currently QI team members. Managers were more likely to report QI involvement than direct care or clinical support staff ($P < 0.01$). No difference in QI involvement was seen based on patient load or site type. **Conclusions:** HCWs can provide important insights into barriers and facilitators of providing quality care and can be effectively engaged in QI activities. HCW participation in efforts to improve services will ensure that HIV/AIDS quality of care is achieved and maintained as countries strive for universal antiretroviral access.

84. Godlove MJ. Prevalence of herbal medicine use and associated factors among pregnant women attending antenatal clinic at Mbeya Referral Hospital in 2010; Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background Herbal medicines are defined as plant-derived material or preparations perceived to have therapeutic benefits; they often contain raw or processed ingredients from one or more plants. Plants have been used for medicinal purposes for thousands of years. Herbal medicines are used in pregnancy although there is very little real evidence of safety. Although herbs are natural, not all herbs are safe to take during pregnancy. Some herbal products may contain agents that are contraindicated in pregnancy. In developing countries the quality of health provision remains poor. With poor health facilities and poor emergency obstetric care, the maternal and fetal mortality and morbidity have remained high. Some of the factors contributing to high maternal and fetal mortality and morbidity can be minimized just by health education. This can only be achieved when these factors are well studied. The use of herbal medicine during pregnancy may be among the contributing factors to maternal and fetal morbidity and mortality. This study looked at the magnitude of herbal medicines use during pregnancy and their associated factors. **Methodology** A cross sectional study on the use of herbal medicine during pregnancy was conducted on 400 pregnant women attending antenatal clinic at Mbeya Referral Hospital. The interviewers initially explained the working definition of herbal medicines to the mothers. All pregnant women who met the inclusion criteria and consented were interviewed. Pregnant women who were gravida two or above were interviewed using structured Swahili version questionnaires regarding their immediate past pregnancy. **Results;** The prevalence of herbal medicine usage was 55%. The use of herbal medicine during pregnancy was associated with long distance to the nearest health facility and low education level ($p < 0.05$). Of the users, 64.1% did so because they believed that modern medicine alone is not sufficient to solve all their health problems in pregnancy. Those women who used herbal medicine during pregnancy or their relatives believed that when the baby is in the womb is targeted by superstitious powers from people who don't like them. They trusted both herbal and modern medicines as 65% of the women who used herbal medicine during their immediate past pregnancy, delivered in health facilities. Fear of complications to the baby (54.0%) and religious vii beliefs (35.0%) were the most common reasons for not using herbal medicine during pregnancy among non users. Parents

and relatives were the most frequent advisers on the use of herbal medicine during pregnancy in this study (70.0%). Majority of mothers in this study took herbal medicine during labor and in the third trimester, 90.5% and 39.1% respectively. Only 6.8% took herbs during the first trimester. Taking herbal medicine during different trimesters of pregnancy may cause different effects like excessive uterine contractions (84.3%), fetal distress (66.7%) and abortions (3.9%). The majority of mothers (37.7%) in this study used herbal medicine twice throughout pregnancy, mainly during labor and the third trimester. In addition, 49.5% used only one type of herbal medicine throughout pregnancy. Perception on the effectiveness of herbal medicine in solving or preventing problems will influence whether mothers might use them again in the next pregnancy. In this study 45.9% of those who used herbal medicine said they will use herbs in their index and future pregnancies. **Conclusion;** The use of herbal medicines during pregnancy among women attending antenatal clinic at Mbeya Referral Hospital was associated with, low education level of pregnant women and long distance to the health facility. Majority of the users do so due to the influence of the older family members. Education about the effects of herbal medicine on pregnancy should be given at primary schools, during ANC sessions and through media. Further research, specifically pharmacological study focusing on local commonly used herbal medicine is to be carried out to identify the ingredients of the herbs and to evaluate the effects of these compounds to the fetus.

85. Gompel A, Boutouyrie P, Joannides R, Christin-Maitre S, Kearny-Schwartz A, Kunz K, Laurent S, Boivin J, Pannier B, Pornel B, Harry AJ, Boudier S, Thuillez C, Bortel L, Zannad F, Pithois-Merli I, Jaillon P, Simon T. Association of menopause and hormone replacement therapy with large artery remodeling. 2011.

Objective: To evaluate the remodeling of large arteries according to age at menopause, duration of menopause, and use of hormone therapy (HT). **Design:** A cross-sectional study consisting of baseline measurements of a multicentre randomized trial were used to evaluate arterial parameters. Setting: The study was conducted in France, Belgium, and the Netherlands in academic hospitals and private clinics. Patient(s) Postmenopausal women (n = 538) with mild hypercholesterolemia. Intervention(s) None. Main Outcome Measure(s) Common carotid artery intima-media thickness (CCA-IMT), central pulse pressure, and aortic stiffness (carotid-femoral

pulse wave velocity) were measured and centrally controlled for quality. Multivariate regression analysis was used to assess the possible covariates associated with arterial parameters. **Result:** Women were 58 ± 6 (mean \pm SD) years of age with an age of 50 ± 5 at menopause and a mean duration of menopause of 8 ± 7 years. Lower age at menopause, time since menopause, and absence of HT use were independently associated with worsening of the arterial parameters. After multivariate analysis, HT was associated with a lower CCA-IMT ($-40 \mu\text{m}$ [range -64 to -1]), whereas lower age at menopause and menopause duration were respectively associated with a CCA-IMT increase ($25 \mu\text{m}/5 \text{ y}$ and $27 \mu\text{m}/5 \text{ y}$). Similarly, values of central pulse pressure and pulse wave velocity were lower in HT users (-3.1 mm Hg [-5.1 to -0.9] and -0.31 m/s [-0.63 to -0.02], respectively) but worsened with age at menopause and menopause duration. **Conclusion:** The age at menopause, the time since menopause, and the use of HT are independently associated with the thickening and stiffening of the large arteries.

86. Greulich C, Diendorf J, Gessmann J, Simon T, Habijan T, Eggeler G, Köller M. Cell type-specific responses of peripheral blood mononuclear cells to silver nanoparticles. *Acta biomaterialia*. 2011; 7(9), 3505-3514.

Silver nanoparticles (Ag-NP) are increasingly used in biomedical applications because of their remarkable antimicrobial activity. In biomedicine, Ag-NP are coated onto or embedded in wound dressings, surgical instruments and bone substitute biomaterials, such as silver-containing calcium phosphate cements. Free Ag-NP and silver ions are released from these coatings or after the degradation of a biomaterial, and may come into close contact with blood cells. Despite the widespread use of Ag-NP as an antimicrobial agent, there is a serious lack of information on the biological effects of Ag-NP on human blood cells. In this study, the uptake of Ag-NP by peripheral monocytes and lymphocytes (T-cells) was analyzed, and the influence of nanosilver on cell biological functions (proliferation, the expression of adhesion molecules, cytokine release and the generation of reactive oxygen species) was studied. After cell culture in the presence of monodispersed Ag-NP ($5\text{--}30 \mu\text{g ml}^{-1}$ silver concentration), agglomerates of nanoparticles were detected within monocytes (CD14+) but not in T-cells (CD3+) by light microscopy, flow cytometry and combined focused ion beam/scanning electron microscopy. The uptake rate of nanoparticles was concentration dependent, and the silver agglomerates were typically found in

the cytoplasm. Furthermore, a concentration-dependent activation (e.g. an increased expression of adhesion molecule CD54) of monocytes at Ag-NP concentrations of 10–15 µg ml⁻¹ was observed, and cytotoxicity of Ag-NP-treated monocytes was observed at Ag-NP levels of 25 µg ml⁻¹ and higher. However, no modulation of T-cell proliferation was observed in the presence of Ag-NP. Taken together, our results provide the first evidence for a cell-type-specific uptake of Ag-NP by peripheral blood mononuclear cells (PBMC) and the resultant cellular responses after exposure.

87. Habib NA, Wilcox AJ, Daltveit AK , Basso O , Shao J, Oneko O., Lie RT. Birthweight, preterm birth and perinatal mortality: A comparison of black babies in Tanzania and the USA. *Acta Obstetricia et Gynecologica Scandinavica*.2011; 90 (10): 1100-1106.

Objectives: Adverse conditions in Africa produce some of the highest rates of infant mortality in the world. Fetal growth restriction and preterm delivery are commonly regarded as major pathways through which conditions in the developing world affect infant survival. The aim of this article was to compare patterns of birthweight, preterm delivery, and perinatal mortality between black people in Tanzania and the USA. Design. Registry-based study. **Methods:** Restricting our study to babies born at least 500g, we compared birthweight, gestational age, and perinatal mortality (stillbirths and deaths in the first week) in the two study populations. **Results:** Perinatal mortality in the Tanzanian sample was 41/1 000, compared with 10/1 000 among USA blacks. Tanzanian babies were slightly smaller on average (43g), but fewer were preterm (<37weeks) (10.0 vs. 16.2%). Applying the USA weight-specific mortality rates to Tanzanian babies born at term suggested that birthweight does not play a role in their increased mortality relative to USA blacks. **Conclusions:** Higher mortality independent of birthweight and preterm delivery for Tanzanian babies suggests the need to address the contribution of other pathways to further reduce the excess perinatal mortality.

88. Haong BT, MakupaJE, Muhina RI, Nungu KS. Pain management among adult patients with fractures of long bones at Muhimbili Orthopaedic Institute in Dar es Salaam, Tanzania. Tanzania Journal of Health Research. 2011; 13(4).

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage and is one of the leading complaints in emergency departments (EDs). Despite the importance and the advantages of pain control, still patients do not receive appropriate attention. The objective of this study was to assess pain management among adult patients with fractures of long bones at Muhimbili Orthopaedic Institute in Dar es Salaam, Tanzania. A descriptive Cross-sectional study design (Hospital based) was used. Total of 250 patients aged 18 – 60 years old with fractures of long bones were recruited from March to June 2008. Structured questionnaires and observation guide were used to collect data. Verbal rating scale was used, to determine the intensity of pain. The study shows that there is no documentation for pain assessment or reassessment at Emergency Department. Slightly above half (54%; 135/250) of patients were not given analgesics. The commonest analgesic given was diclofenac sodium (46%). There was no patient given opioids (ephedrine/ morphine). The rate of analgesics administration or splinting before and after admission did not differ between sexes ($P=0.314$ vs. $P= 0.230$) and ($P=0.314$ vs. $P= 0.114$), respectively. Almost half (47.0%) of them spent >20 min to 1 hour before the administration of analgesics. After administration of analgesia 76% of the patients continued to have severe to moderate pain. A large proportion (62.4%; $N=156/250$) of the patients scored their pain as severe. Of these, 28 (17.9%) patients received analgesia within 20 min, 42 (26.9%) after 30-60 min and 73 (46.8%) were not given analgesics at all. In conclusion pain at Moi Orthopaedic Institute is under treated. It is important that this is addressed properly to minimize pains among patients attending hospitals for fracture management.

89. Harrington WE, Mutabingwa TK, Kabyemela E, Fried M, Duffy PE. Intermittent treatment to prevent pregnancy malaria does not confer benefit in an area of widespread drug resistance. *Clinical infectious diseases*. 2011; 53(3): 224-230.

Background: Millions of African women receive sulfadoxine-pyrimethamine (SP) as intermittent preventive treatment during pregnancy (IPTp) to avoid poor outcomes that result

from malaria. However, parasites resistant to SP are widespread in parts of Africa, and IPTp may perversely exacerbate placental infections that contain SP-resistant parasites. **Methods:** The study used a cross-sectional design. We determined IPTp use in a delivery cohort of 880 pregnant women in Muheza, Tanzania, by report and by plasma sulfa measurements and we examined its effects on maternal and fetal delivery outcomes. **Results:** In the overall cohort, IPTp was not associated with decreased odds of placental malaria or with increased mean maternal hemoglobin or mean birth weight. Unexpectedly, IPTp was associated with decreased cord hemoglobin level and increased risk of fetal anemia, which may be related to in utero SP exposure. **Conclusions:** IPTp does not improve overall.

90. Hauck M, Otto PI, Dittrich S, Jacob M, Bade C, Dörfler I, Leuschner C. Small increase in sub-stratum pH causes the dieback of one of Europe's most common lichens, *Lecanora conizaeoides*. *Annals of botany*. 2011; 108(2): 359-366.

Backgrounds and Aims: *Lecanora conizaeoides* was until recently western and central Europe's most abundant epiphytic lichen species or at least one of the most common epiphytes. The species is adapted to very acidic conditions at pH values around 3 and high concentrations of SO₂ and its derivatives formed in aqueous solution, and thus spread with increasing SO₂ deposition during the 19th and 20th centuries. With the recent decrease of SO₂ emissions to nearly pre-industrial levels within 20 years, *L. conizaeoides* declined from most of its former range. If still present, the species is no longer the dominant epiphyte, but is occurring in small densities only. The rapid spread of the *L. conizaeoides* in Europe from an extremely rare species to the probably most frequent epiphytic lichen and the subsequent rapid dieback are unprecedented by any other organism. The present study aimed at identifying the magnitude of deacidification needed to cause the dieback of the lichen. **Methods:** The epiphytic lichen diversity and bark chemistry of montane spruce forests in the Harz Mountains, northern Germany, were studied and the results were compared with data recorded with the same methods 13–15 years ago. **Key Results** *Lecanora conizaeoides*, which was the dominant epiphyte of the study area until 15 years ago, is still found on most trees, but only with small cover values of =1 %. The bark pH increased by only 0.4 pH units. **Conclusions:** The data suggest that only slight deacidification of the substratum causes the breakdown of the *L. conizaeoides* populations.

Neither competitors nor parasites of *L. conizaeoides* that may have profited from reduced SO₂ concentrations are likely causes of the rapid dieback of the species.

91. Haw CY, Chia CH, Zakaria S, Mohamed F, Radiman S, Teh CH, Huang NM. Morphological studies of randomized dispersion magnetite nanoclusters coated with silica. *Ceramics International*. 2011; 37(2): 451-464.

In this study, we report a simple way to produce randomized dispersion magnetite nanoclusters coated with silica (RDMNS) via Stöber process with minor modifications. The morphology of silica coated magnetite nanoclusters was emphasized by studying various reaction parameters including alcohols with different polarities as co-solvents, concentration of alcohol–water, concentration of alkaline catalyst (ammonia), and concentration of TEOS monomer. The results of transmission electron microscope (TEM) showed that the sizes and morphological behavior of the magnetite nanoclusters vary accordingly with the different reaction parameters investigated. The results showed that ethanol would be the best candidate as co-solvent in the preparation of randomized dispersion magnetite nanoclusters. Besides, the optimum alcohol–water ratio has been determined to be 70–30% v/v as this concentration range could render desired shape of randomized dispersion magnetite nanoclusters. The volume of ammonia (NH₃) catalyst in the reaction media also strongly governs the formation of silica coated magnetite nanoclusters in a desired shape. Apart from that, the addition of TEOS monomer into the reaction media has to be well-controlled as the excess amount of monomer added might affect the thickness of the silica layer that is coated on the magnetite nanoparticles. Prior to silica coating, the bare magnetite nanoparticles were first treated with disodium citrate (0.5 M) to enhance the particles' dispersibility. Improvement in the size distribution and dispersibility of the magnetite nanoparticles after the citrate treatment has been examined using TEM. The XRD results show that the magnetite samples retained good crystalline although they have been surface-modified with citrate group and silica. The Fourier transform infrared (FT-IR) and thermo gravimetric analysis (TGA) prove that the magnetite nanoparticles have been successfully coated with citrate and silica. The super paramagnetic behavior of the magnetite samples was confirmed by VSM. The produced silica coated magnetite nanoclusters possess great potential to be applied in bio-medical research and clinical diagnosis application.

92. Hawkins C, Chalamilla G, Okuma J, Spiegelman D, Hertzmark E, Aris E, Ewald T, Mugusi F, Mtasiwa D, Fawzi WW. Sex differences in antiretroviral treatment outcomes among HIV-infected adults in an urban Tanzanian setting. *AIDS*. 2011; 25 (9): 1189-1197.

Objective: To determine the relationship between sex and antiretroviral therapy (ART) outcomes in an urban Tanzanian setting. **DESIGN:** Longitudinal analysis of a cohort of HIV-infected adult men and women on ART enrolled at the Management and Development for Health (MDH)-President's Emergency Plan for AIDS Relief (PEPFAR) HIV care and treatment program in Dar es Salaam, Tanzania. **Methods:** Clinical and immunologic responses to ART were compared between HIV-infected men and women enrolled from November 2004 to June 2008. Cox regression analyses were used to study sex differences with regard to mortality, immunologic failure (WHO, 2006) and loss to follow-up, after adjusting for other risk factors for the outcomes. **Results:** Four thousand, three hundred and eighty-three (34%) men and 8459 (66%) women were analyzed. Men were significantly more immunocompromised than women at enrollment in terms of stage IV disease (27 vs. 23%, $P < 0.001$) and mean CD4 cell count (123 vs. 136 cells/ μ l, $P < 0.001$). In multivariate analyses, men had a significantly higher risk of overall mortality [hazard ratio 1.19, 95% confidence interval (CI) 1.05-1.30, $P < 0.001$], immunologic nonresponse defined as CD4 cell count less than 100 cells/ μ l after at least 6 months of initiating ART (hazard ratio 1.74, 95% CI 1.44-2.11, $P < 0.001$) and loss to follow-up (hazard ratio 1.19, 95% CI 1.10-1.30, $P < 0.001$) than that in women. Associations did not change significantly when restricting analyses to the period of good adherence for all patients. **Conclusion:** Nonadherence to care and advanced immunodeficiency at enrollment explained only 17% of the inferior mortality in HIV-infected men in this resource-limited setting. Additional study of behavioral and biologic factors that may adversely impact treatment outcomes in men is needed to reduce these sex disparities.

93. Hirji KF, Fagerland MW. Calculating unreported confidence intervals for paired data. *BMC Medical Research Methodology*. 2011; 11: 66.

Background: Confidence intervals (or associated standard errors) facilitate assessment of the practical importance of the findings of a health study, and their incorporation into a meta-analysis. For paired design studies, these items are often not reported. Since the descriptive statistics for such studies are usually presented in the same way as for unpaired designs, direct computation of the standard error is not possible without additional information. **Methods:** Elementary, well-known relationships between standard errors and p-values were used to develop computation schemes for paired mean difference, risk difference, risk ratio and odds ratio. **Results:** Unreported confidence intervals for large sample paired binary and numeric data can be computed fairly accurately using simple methods provided the p-value is given. In the case of paired binary data, the design based 2×2 table can be reconstructed as well. **Conclusions:** Our results will facilitate appropriate interpretation of paired design studies, and their incorporation into meta-analyses.

94. Hirji KF, Premji ZG. Pre-referral rectal artesunate in severe malaria: Flawed trial. *Trials*.2011; 12: 188.

Immediate injectable treatment is essential for severe malaria. Otherwise, the afflicted risk lifelong impairment or death. In rural areas of Africa and Asia, appropriate care is often miles away. In 2009, Melba Gomes and her colleagues published the findings of a randomized, placebo-controlled trial of rectal artesunate for suspected severe malaria in such remote areas. Enrolling nearly 18,000 cases, the aim was to evaluate whether, as patients were in transit to a health facility, a pre-referral artesunate suppository blocked disease progression sufficiently to reduce these risks. The affirmative findings of this, the only trial on the issue thus far, have led the WHO to endorse rectal artesunate as a pre-referral treatment for severe malaria. In the light of its public health importance and because its scientific quality has not been assessed for a systematic review, our paper provides a detailed evaluation of the design, conduct, analysis, reporting, and practical features of this trial. **Results:** We performed a checklist-based and an in-depth evaluation of the trial. The evaluation criteria were based on the CONSORT statement for reporting clinical trials, the clinical trial methodology literature, and practice in malaria research. Our main findings are: The inclusion and exclusion criteria and the sample size justification are not stated. Many clearly ineligible subjects were enrolled. The training of the recruiters does not

appear to have been satisfactory. There was excessive between center heterogeneity in design and conduct. Outcome evaluation schedule was not defined, and in practice, became too wide. Large gaps in the collection of key data were evident. Primary endpoints were inconsistently utilized and reported; an overall analysis of the outcomes was not done; analyses of time to event data had major flaws; the stated intent-to-treat analysis excluded a third of the randomized subjects; the design-indicated stratified or multi-variate analysis was not done; many improper subgroups were analyzed in a post-hoc fashion; the analysis and reporting metric was deficient. There are concerns relating to patient welfare at some centers. Exclusion of many cases from data analysis compromised external validity. A bias-controlled reanalysis of available data does not lend support to the conclusions drawn by the authors. **Conclusions:** This trial has numerous serious deficiencies in design, implementation, and methods of data analysis. Interpretation and manner of reporting are wanting, and the applicability of the findings is unclear. The trial conduct could have been improved to better protect patient welfare. The totalities of these problems make it a flawed study whose conclusions remain subject to appreciable doubt.

95. Hodson KE, Bowman RJ, Mafwiri M, Wood M, Mhoro V, Cox SE. Low folate status and indoor pollution are risk factors for endemic optic neuropathy in Tanzania. *British Journal of Ophthalmology*.2011; 95 (10): 1361-1364.

Aims: Bilateral optic neuropathy in Dar-es-Salaam, Tanzania was first reported as an epidemic in 1988. Now argued to be endemic in 2010, the aetiology remains unclear. The authors investigated the hypothesis that low folate and vitamin B12 status are associated with optic neuropathy, and also sought to investigate whether mercury, commonly used drugs, dietary factors and indoor pollution may also be risk factors. **Methods:** 57 cases and 102 controls were recruited from two tertiary referral centres in Dar-es-Salaam. Data were collected on demographic characteristics, diet, medication history and HIV status. Folate and vitamin B12(holo-transcobalamin) were measured in stored serum samples. Exposure to mercury was assessed from concentrations in random urine samples. **Results:** Cooking indoors more than twice per week (OR 54.48 (95% CI 9.30 to 319.10)) and indoor use of charcoal or firewood (OR 21.20 (95% CI 2.51 to 179.36)) increased the risk of optic neuropathy. Risk was reduced in those with a higher folate status (highest versus lowest quartile OR=0.11 (95% CI 0.02 to 0.51)) and

higher protein intakes (OR=.84 (95% CI 0.72 to 0.96). No association was found with mercury exposure or any common drug or food commodity. **Conclusion:** This study presents the first direct evidence of low folate status and indoor pollution in the aetiology of endemic bilateral optic neuropathy in Tanzania.

96. Hoffmann T, Bedane AH, Peglow M, Tsotsas E, Jacob M. Particle–gas mass transfer in a spouted bed with adjustable air inlet. *Drying Technology*. 2011; 29(3): 257-265.

Spouted bed equipment has the potential of producing high-quality particulate materials with reduced energy consumption and environment impact. Particle-to-gas mass transfer was investigated in a spouted bed with a novel design of two rotating drums placed symmetrically in the apparatus to create air inlet openings of adjustable width, so that fluidization can be adapted to the requirements of each product and process. The mass transfer coefficients between particle surface and gas were derived from first-period drying experiments with porous, no hygroscopic material by assuming perfect back-mixing or, alternatively, ideal plug flow of the gas. Respective Sherwood numbers were empirically correlated and found to be superior to the Sherwood numbers of conventional fluidized beds or conventional spouted beds.

97. Howitt SC, Jones MP, Jusabani A, Gray WK, Aris E, Mugusi F, Swai M, Walker RW. A cross-sectional study of quality of life in incident stroke survivors in rural northern Tanzania. *Journal of Neurology*. 2011; 258 (8): 1422-1430.

The aim of this study was to evaluate changes to, and predictors of, quality of life (QOL) in a community-based cohort of stroke survivors from an earlier stroke incidence study in rural northern Tanzania. Patients were assessed 1-5 years after their incident stroke. The study cohort was compared with an age- and sex-matched control group from the same rural district within a cross-sectional design. Patients and controls were asked a series of questions relating to their QOL [World Health Organization quality of life, abbreviated version (WHOQOL-BREF)], levels of anxiety and depression [hospital anxiety and depression (HAD) scale], cognitive function [community screening instrument for dementia (CSI-D) screening tool], socioeconomic status

and demographic characteristics (e.g. age, sex, education and abode). Patients were further assessed for functional outcome and disability (Barthel index, modified Rankin scale), post-stroke care and psychosocial functioning. Patients (n = 58) were found to have significantly lower QOL than controls (n = 58) in all six domains of the WHOQOL-BREF. Gender, socioeconomic status, cognitive function and time elapsed since stroke was not associated with QOL. Older patients and those with more impaired motor function and disability (Barthel index, modified Rankin score) had significantly poorer physical health-related QOL. Greater anxiety and depression, reduced muscle power and less involvement in social events were significantly correlated with lower physical and psychological health-related QOL. To our knowledge, this is the first long-term study of QOL in survivors of incident stroke in Sub-Saharan Africa (SSA). Poorer QOL was associated with greater levels of physical disability, anxiety and depression and reduced social interaction. Demographic factors appear to be much less significant. Modifying these QOL predictors could be important in planning effective post-stroke care within a stretched healthcare system

98. Huang L, Jakobsson M , Pemberton TJ, Ibrahim M, Nyambo T , Omar S, Pritchard JK, Tishkoff SA, Rosenberg NA. Heliotype variation and genotype imputation in African populations. *Genetic Epidemiology*. 2011; 35 (8): 766-780.

Sub-Saharan Africa has been identified as the part of the world with the greatest human genetic diversity. This high level of diversity causes difficulties for genome-wide association (GWA) studies in African populations—for example, by reducing the accuracy of genotype imputation in African populations compared to non-African populations. Here, we investigate heliotype variation and imputation in Africa, using 253 unrelated individuals from 15 Sub-Saharan African populations. We identify the populations that provide the greatest potential for serving as reference panels for imputing genotypes in the remaining groups. Considering reference panels comprising samples of recent African descent in Phase 3 of the HapMap Project, we identify mixtures of reference groups that produce the maximal imputation accuracy in each of the sampled populations. We find that optimal HapMap mixtures and maximal imputation accuracies identified in detailed tests of imputation procedures can instead be predicted by using simple summary statistics that measure relationships between the pattern of genetic variation in a target

population and the patterns in potential reference panels. Our results provide an empirical basis for facilitating the selection of reference panels in GWA studies of diverse human populations, especially those of African ancestry.

99. Huang L, Simon T, North M, Cui T. Experimental and numerical simulation of a synthetic jet for cooling of electronics. In ASME 2011 International Mechanical Engineering Congress and Exposition. 2011: 913-921.

Compared to traditional continuous jets, synthetic jets have specific advantages, such as lower power requirement, simpler structure, and the ability to produce an unsteady turbulent flow which is known to be effective in augmenting heat transfer. This study presents experimental and computational results that document heat transfer coefficients associated with impinging a round synthetic jet flow on the tip region of a longitudinal fin surface used in an electronics cooling system. Unique to this study are the geometry of the cooled surface and the variations in geometry of the jet nozzle or nozzles. Also unique are measurements in actual-scale systems and in a scaled-up system, and computation. In the computation, the diaphragm movement of the synthetic jet is a moving wall and the flow is computed with a dynamic mesh using the commercial software package ANSYS FLUENT. The effects of different parameters, such as amplitude and frequency of diaphragm movement and jet-to-stagnation-line spacing, are recorded. The computational results show a good match with the experimental results. In the experiments, an actual-scale system is tested and, for finer spatial resolution and improved control over geometric and operational conditions, a large-scale mock-up is tested. The three approaches are used to determine heat transfer coefficients on the fin on and near the stagnation line. Focus is on the large scale test results and the computation. Application to the actual-size cases is discussed. The dynamically-similar mock-up matches the dimensionless Reynolds number, Stokes number, and Prandtl number of the actual setting with a scale factor of 44. A linear relationship for heat transfer coefficient versus frequency of diaphragm movement is shown. Heat transfer coefficient values as high as 650 W/m² K are obtained with high-frequency diaphragm movement. Cases with different orifice shapes show how cooling performance changes with orifice design.

100. Huffman MD, Rao KD, Pichon-Riviere A, Zhao D, Harikrishnan S, Ramaiya K, Ajay VS, Goenka S, Calcagno JI, Caporale JE, Niu S, Li Y, Liu J, Thankappan KR, Daivadanam M, van Esch J, Murphy A, Moran AE, Gaziano TA, Suhrcke M, Reddy KS, Leeder S, Prabhakaran D. A cross-sectional study of the microeconomic impact of cardiovascular disease hospitalization in four low- and middle-income countries. *PLoS ONE*.2011; 6 (6): e20821.

Background: Empirical evidence on the microeconomic consequences of CVD in LMIC is scarce. **Methods and Findings:** We surveyed 1,657 recently hospitalized CVD patients (66% male; mean age 55.8 years) from Argentina, China, India, and Tanzania to evaluate the microeconomic and functional/productivity impact of CVD hospitalization. Respondents were stratified into three income groups. Median out-of-pocket expenditures for CVD treatment over 15 month follow-up ranged from 354 international dollars (2007 INT\$, Tanzania, low-income) to INT\$2,917 (India, high-income). Catastrophic health spending (CHS) was present in >50% of respondents in China, India, and Tanzania. Distress financing (DF) and lost income were more common in low-income respondents. After adjustment, lack of health insurance was associated with CHS in Argentina (OR 4.73 [2.56, 8.76], India (OR 3.93 [2.23, 6.90], and Tanzania (OR 3.68 [1.86, 7.26] with a marginal association in China (OR 2.05 [0.82, 5.11]). These economic effects were accompanied by substantial decreases in individual functional health and productivity. **Conclusions:** Individuals in selected LMIC bear significant financial burdens following CVD hospitalization, yet with substantial variation across and within countries. Lack of insurance may drive much of the financial stress of CVD in LMIC patients and their families.

101. Idindili B, Jullu B, Hattendorf J, Mugusi F, Antelman G, Tanner M. HIV and parasitic co-infections among patients seeking care at health facilities in Tanzania. *Tanzania Journal of Health Research*. 2011; 13 (4): 1-14.

Untreated tropical parasitic co-infections appear to speed the progression of HIV-1 disease. However, to date, there have been few studies conducted in resource limited settings to ascertain the interaction of parasitic co-infection where HIV/AIDS management largely depends on CD4+

T lymphocyte cells counts and WHO clinical staging. This study aimed to determine the prevalence of parasites, their association with CD4+ T lymphocyte cells changes and clinical manifestation of HIV infection in patients attending HIV/AIDS management clinics in Tanzania. Adult HIV-infected patients registering for the first time at HIV/AIDS management clinics were recruited; with physical examination and laboratory tests performed at baseline and after 6 months. Patients were assigned a clinical stage and screened for helminths and Plasmodium sp. co-infection, CD4+ T lymphocyte cells, haemoglobin and HIV-1 p24 antigen. Of the 421 HIV-1 infected patients studied, 198 (47.0%) were coinfecting with one or more parasites. Of those studied, 93/421(22.1%) had helminth only co-infection, and 50/421(12.9%) had Plasmodium sp only co-infection. Mixed Plasmodium sp and helminth coinfection was diagnosed in 55/421(13.0%) patients. Helminths frequently diagnosed included: hookworm 65/421(15.4%), Schistosomiasis 49/421(11.6%), Strongyloides stercoralis 57/421(13.5%), and Ascaris lumbricoides 54/421(12.8%). No statistical association was found between CD4+ T lymphocyte cells <200/ μ l, or WHO clinical stage III/IV with parasite co-infections (AOR 1.2, 95%CI 0.8-1.8). Anaemia was common in parasite co-infected patients (32.8% vs 18.8%). Parasite co-infection was associated with risk of anaemia (AOR 2.1, 95%CI 1.3-3.2). In multivariable logistic regression analysis, baseline CD4+ T lymphocyte cells <200/ μ l was significantly associated with CD4+ T lymphocyte cells <200/ μ l (AOR 2.4, 95%CI 1.3-4.7) at six months. HIV-1 P24 antigen mean concentration was higher in parasite co-infected patients (ranges 47.6 to 56.9) as compared to patients without parasite coinfection (5.5). We have looked at one set of parasites and found high prevalence of malaria and helminth co-infection in HIV-infected individuals. Given the available reports on health impacts of helminth co-infection in HIV/AIDS patients and the anecdotal reports of helminth's health effects in HIV-uninfected persons, helminths and other prevalent parasites should not be ignored in HIV/AIDS programs. Based on local helminth epidemiology and HIV-infected cohort specific helminths coinfection prevalence data, mass treatment of soil transmitted helminths can be incorporated into HIV/AIDS management programmes.

102. Innocent E, Nondo RS, Moshi MJ, Shah T. Antibacterial and cytotoxic triterpenoids from Lantana viburnoides ssp. viburnoides var. Kisi. *Spatula DD-Peer Reviewed Journal on Complementary Medicine and Drug Discovery*. 2011; 1(4): 213-218.

Background: *Lantana viburnoides* ssp. *viburnoides* var. *kisi* is used in traditional medicine as a mosquito repellent and sometimes chewed for treatment of gastrointestinal problems. Gastrointestinal problems are varied and may include microbial infections, parasitic infestation; inflammatory bowel disease, malignancies, peptic ulcers, or simply colic pains. This work seeks to establish proof of the concept on safety and efficacy for treatment of bacterial infections.

103. Jackson C, Mangtani P, Vynnycky E, Fielding K, Kitching A, Mohamed H, Maguire H. School closures and student contact patterns. *Emerging infectious diseases*. 2011; 17(2): 245

To determine how school closure for pandemic (H1N1) 2009 affected students' contact patterns, we conducted a retrospective questionnaire survey at a UK school 2 weeks after the school reopened. School closure was associated with a 65% reduction in the mean total number of contacts for each student.

104. Jacob M, Chappell D, Rehm M. Perioperative fluid administration: another form of "Work-life balance". *Anesthesiology*, 2011; 114(3): 483-484.

105. Jacob M, de Graauw A, Spella M, Herrero P, Priebe S, Schoebel J, Kürner T. Performance evaluation of 60 GHz WLAN antennas under realistic propagation conditions with human shadowing. In *30th URSI General Assembly and Scientific Symposium (URSI GASS)*. 2011; (4).

In this paper, the evaluation of different 60 GHz WLAN antenna designs is presented. Based on ray tracing and human blockage the radio propagation in a living room scenario is modeled. Then simulated 3D antenna patterns of conventional and smart antennas are linked to the radio channel data. The performance of the antennas is compared in terms of the coverage probability within the living room.

106. Jacob M, Frankl A, Beeckman H, Haile M, Nyssen J. Treeline dynamics in Afro-Alpine Ethiopia as affected by climate change and anthropo-zoogenic impacts. In *Forests and climate change mitigation: scientific insights and social leverages*.2011.

107. Jacob M, Ives Z. Sharing work in keyword search over databases. In *Proceedings of the 2011 ACM SIGMOD International Conference on Management of data 2011*: 577-588.

An important means of allowing non-expert end-users to pose ad hoc queries whether over single databases or data integration systems is through keyword search. Given a set of keywords, the query processor finds matches across different tuples and tables. It computes and executes a set of relational sub-queries whose results are combined to produce the k highest ranking answers. Work on keyword search primarily focuses on single-database, single-query settings: each query is answered in isolation, despite possible overlap between queries posed by different users or at different times; and the number of relevant tables is assumed to be small, meaning that sub-queries can be processed without using cost-based methods to combine work. As we apply keyword search to support ad hoc data integration queries over scientific or other databases on the Web, we must reuse and combine computation. In this paper, we propose an architecture that continuously receives sets of ranked keyword queries, and seeks to reuse work across these queries. We extend multiple query optimization and continuous query techniques, and develop a new query plan scheduling module we call the ATC (based on its analogy to an air traffic controller). The ATC manages the flow of tuples among a multitude of pipelined operators, minimizing the work needed to return the top-k answers for all queries. We also develop techniques to manage the sharing and reuse of state as queries complete and input data streams are exhausted. We show the effectiveness of our techniques in handling queries over real and synthetic data sets.

108. Jacob M, Jaros D, Rohm H. Recent advances in milk clotting enzymes. *International journal of dairy technology*. 2011; 64(1), 14-33.

Coagulating enzymes are an absolute necessity for the production of ripened cheese varieties. The objective of this review is to summarise and interpret the latest findings for the most important types of enzymes, which are animal rennet, genetically engineered chymosin, coagulants of microbial origin, and plant-derived clotting enzymes. Special emphasis has been placed on aspects of enzyme chemistry and technology, selected methods for the analysis of coagulants, and the impact of the enzymes on proteolysis, cheese yield and cheese quality.

109. Jacob M, Nöbel S, Jaros D, Rohm H. Physical properties of acid milk gels: Acidification rate significantly interacts with cross-linking and heat treatment of milk. *Food Hydrocolloids*. 2011; 25(5): 928-934.

Rheological properties and microstructure of acid milk gels largely depend on the pre-treatment of the milk, including heating and enzymatic modification of the gel-forming proteins. It was the aim of our study to investigate the impact of the acidification rate on gels which were produced from milk reconstituted from powder containing casein cross-linked by microbial transglutaminase (mTGase), and on gels which were produced from cross-linked raw milk. 3–7% Glucono-d-lactone (GDL) was used as acidulant. Gel stiffness was determined by dynamic small-deformation rheometry and penetration experiments, and forced syneresis and gel permeability served as indicators for gel microstructure. The measurements showed that acidification rate strongly interacts with casein oligomerization and heating. With increasing acidification rate the stiffness of gels from raw milk increased, but decreased if the casein was cross-linked with mTGase (oligomerization degree was approximately 25%, and the action of mTGase was stopped using N-Ethylmaleimide). Gels from heated milk became generally weaker if acidification was accelerated. However, casein cross-linking by mTGase enhanced gel stiffness at low acidification rate but decreased stiffness at high acidification rate. Rheological, syneresis and permeability results indicate that the aggregates formed through heating or cross-linking are responsible for the crucial alteration of gel properties and suggest that these act as structurally relevant nuclei which, depending on the time span which is given for gelation, assist in network formation or act as steric hindrances.

110. Jacob M, Pasedag A, Wagner FW. Werden niedrige Steuersätze in Osteuropa durch Verzicht auf Verlustverrechnung erkauf? *Perspektiven der Wirtschaftspolitik*. 2011; 12(1): 72-91.

This paper investigates whether countries in the EU finance low tax rates by restrictive loss offset rules. As effects from intertemporal loss offset rules are difficult to anticipate, restrictions only marginally affect overall investments. In contrast, tax rates have a significant bearing on investment decisions. Therefore, the combination of low tax rates with restrictive loss offset rules can increase investments without affecting the tax revenue. Our analysis for the EU reveals that countries with low tax rates restrict loss offset possibilities while “high tax” countries allow an unlimited loss carry forward or even a loss carry back.

111. Jacob M, Priebe S, Maltsev A, Lomayev A, Erceg V, Kurner T. A ray tracing based stochastic human blockage model for the IEEE 802.11 ad 60 GHz channel model. In *Antennas and Propagation (EUCAP), Proceedings of the 5th European Conference on*. 2011; 3084-3088.

This paper presents the human blockage model based on the authors' work in the framework of the IEEE 802.11ad 60 GHz channel model development. The human blockage model combines ray tracing simulations, an electromagnetic diffraction model and a random walk model for human movement. In addition to the stochastic model the impact of human blockage on wireless communications is analyzed.

112. Jacob M, Smedira N, Blackstone E, Williams S, Cho L. Effect of timing of chronic preoperative aspirin discontinuation on morbidity and mortality in coronary artery bypass surgery. *Circulation*. 2011; 123(6): 577-583.

Background: Aspirin (ASA) has been shown to reduce postoperative coronary artery bypass grafting (CABG) mortality and ischemic events; however, the timing of chronic ASA discontinuation before surgery is controversial because of concern about postoperative bleeding. We evaluated the effect of the timing of ASA discontinuation before CABG on major adverse

cardiovascular outcomes and postoperative bleeding using the Cleveland Clinic Cardiovascular Information Registry database. **Methods and Results:** At the Cleveland Clinic between January 1, 2002, and January 31, 2008, 4143 patients undergoing CABG were taking preoperative chronic ASA. Of these, 2298 discontinued ASA 6 or more days before surgery (early discontinuation), and 1845 took ASA within 5 days of the surgery (late use). Because of substantial differences between these 2 groups, propensity score analysis, and matching based on 31 variables were used for fair comparison of outcomes. This resulted in 1519 well-matched pairs of patients (73%). There was no significant difference between those with early discontinuation and late ASA use with regard to the composite outcome of in-hospital mortality, myocardial infarction, and stroke (1.7% versus 1.8%, $P=0.80$). Late use was associated with more intraoperative transfusions (23% versus 20%, $P=0.03$) and postoperative transfusions (30% versus 26%, $P=0.009$) but a similar number of reoperations for bleeding (3.4% versus 2.4% $P=0.10$). **Conclusions:** Among patients undergoing isolated CABG, late discontinuation of ASA resulted in no difference in postoperative cardiovascular outcomes; however, there was an increased transfusion requirement. Thus, we recommend weighing the risks and benefits of late ASA use in these patients.

113. Jacob M, Weiss F. Class origin and young adults' re-enrollment. Research in Social Stratification and Mobility. 2011; 29(4): 415-426.

This paper examines re-enrollment decisions taken by adults who have previously participated in the labor market in the US. We investigate the influence of social origin on re-enrollment and test hypotheses based on the “status reproduction” argument. We find that young adults from the lower classes re-enroll less often than those from the upper classes and that these differences can be attributed to a large extent to different ability or performance. Beyond the effects of social origin as such, we also scrutinize the effects of the child's class position relative to family status as a more direct implication of the “status reproduction” argument. Our analyses reveal that once young adults from higher status positions have reached their parents' class, re-enrollment is somewhat less likely to occur. However, this effect of the child's relative class to the parents' is rather weak.

114. Jacob M. Do brothers affect their sisters' chances to graduate? An analysis of sibling sex composition effects on graduation from a university or a Fachhochschule in Germany. *Higher Education*. 2011; 61(3): 277-291.

In a recent paper on gender inequality in higher education Buchman and DiPrete (2006) assume that the decrease in the gender gap in college completion in the US can partly be explained by changes in the allocation of familial resources in favour of women. However, they do not test this hypothesis empirically. In this paper I examine the effects of sibling sex composition on the graduation of women in more detail by analyzing data from the German Life History Study. I assume that resources are the key issue to explaining the effects of sibling configuration on educational attainment. Tertiary education is a good case for testing sex composition effects due to the unequal distribution of resources between and within families, because the direct costs and opportunity costs of higher education are relatively high compared to those of earlier educational decisions. Accordingly, I expect that working class daughters are most likely to be disadvantaged if they are raised with brothers. The empirical results show that in fact, not the presence of a brother as such hinders educational attainment of sisters, but older brothers have a negative influence on their sisters chances of graduation. In accordance to the hypothesis, this effect is stronger for university graduation than for graduation at Fachhochschule. For social class differences in sibling effects it turns out that working class daughter are particularly less likely to graduate compared to service class daughters if there are older brothers in the family.

115. Jacob M. Pattern of spine degenerative disease among patients referred for lumbar magnetic resonance imaging at Muhimbili National Hospital, Dar es salaam, Tanzania March-September-2010. Master of Medicine (Radiology) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Degenerative disease of the lumbar spine refers to a syndrome in which intervertebral disks with adjacent spine structures are compromised. This causes low back and lower extremity pain. The syndrome encompasses the following degenerative changes: Disk degeneration, Modic changes, disk displacement, nerve root compression, facet joints arthropathy, and ligamentum flavum hypertrophy and spine canal stenosis. The modality of

choice for imaging this syndrome is Magnetic Resonance Imaging (MRI). **Objective:** Assessment of pattern of lumbar spine degenerative disease among patients with with/without radiculopathy, referred for lumbar MRI at Muhimbili National Hospital (MNH) from March-September 2010. **Methodology:** This descriptive cross-sectional study involved 165 individuals selected from patients referred for lumbar MRI at MNH. A questionnaire was administered to obtain patient demographic data and clinical information. In all participants, lumbar MRI scans were performed through L1-S1 intervertebral disc spaces. Six degenerative findings were looked at: (i) disk degeneration (ii) Modic changes (iii) disk bulge (iv) disk herniation (v) central canal stenosis (vi) nerve root compression. Statistical analysis was performed using computer program Statistical Package for Social Sciences (SPSS) version; 13. Chi-square test was, used to compare between age, gender, symptomatology and MRI findings. A p-value of <0.05 was considered to indicate statistically significant difference. **Results:** The mean age of participants was 50±12.5 years. Eighty percent (80%) of participants presented with LBP with radiculopathy. After lumbar MRI, 93.9% of participants had at least one degenerative finding. Disk degeneration was found in 83% of individuals, in at least one intervertebral disc level, Modic changes (28%), disc bulging (39%), disc protrusion (63%), vi central canal stenosis (30%) and nerve root compression (77%) were detected. Type II Modic changes were more common than type I (22% and 6% respectively: p-value: 0.022). Ninety eight percent of herniated disks were protrusions. Two percent of herniated disks were extrusions and the most location for disk herniation was postero-lateral seen in 75% of herniated disks. None of the participants had disk sequestration. The degenerative imaging findings were increasing significantly with age and there was no significant sex difference. All degenerative findings were seen at lower lumbar levels (L4/L5&L5/S1) but were more common at the L4/L5. Disk herniations, central canal stenosis and nerve root compression were common in patients with radiculopathy than in patients with LBP only (p-value 0.000). **Conclusion:** Majority (93.9%) of participants had at least one degenerative imaging finding. The most frequent degenerative finding was disk degeneration (83%). Poster lateral was the most common location for disk herniation. Disk herniation, canal stenosis and nerve root compression were significantly seen in patients with radiculopathy. There were no sequestered disks found in the studied patients. **Recommendations** 1) MR axial images should be obtained in a contiguous manner 2) Careful evaluation of images is needed as different types of lumbar spine degenerative findings are common among patients referred for Lumbar

MRI 3) There is a need of more studies to be conducted on spine degenerative disease using bigger sample sizes.

116. Janson A, Mubi M, Warsame M, Petzold MG, Ngasala B, Maganga G, Premji Z. Malaria rapid testing by community health workers is effective and safe for targeting malaria treatment: *Randomised cross-over trial in Tanzania*. 2011.

Background: Early diagnosis and prompt, effective treatment of uncomplicated malaria is critical to prevent severe disease, death and malaria transmission. We assessed the impact of rapid malaria diagnostic tests (RDTs) by community health workers (CHWs) on provision of artemisinin-based combination therapy (ACT) and health outcome in fever patients.

Methodology/Principal Findings: Twenty-two CHWs from five villages in Kibaha District, a high-malaria transmission area in Coast Region, Tanzania, were trained to manage uncomplicated malaria using RDT aided diagnosis or clinical diagnosis (CD) only. Each CHW was randomly assigned to use either RDT or CD the first week and thereafter alternating weekly. Primary outcome was provision of ACT and main secondary outcomes were referral rates and health status by days 3 and 7. The CHWs enrolled 2930 fever patients during five months of whom 1988 (67.8%) presented within 24 hours of fever onset. ACT was provided to 775 of 1457 (53.2%) patients during RDT weeks and to 1422 of 1473 (96.5%) patients during CD weeks (Odds Ratio (OR) 0.039, 95% CI 0.029–0.053). The CHWs adhered to the RDT results in 1411 of 1457 (96.8%, 95% CI 95.8–97.6) patients. More patients were referred on inclusion day during RDT weeks (10.0%) compared to CD weeks (1.6%). Referral during days 1–7 and perceived non-recovery on days 3 and 7 were also more common after RDT aided diagnosis. However, no fatal or severe malaria occurred among 682 patients in the RDT group who were not treated with ACT, supporting the safety of withholding ACT to RDT negative patients.

Conclusions/Significance: RDTs in the hands of CHWs may safely improve early and well-targeted ACT treatment in malaria patients at community level in Africa.

117. John F. Symptoms of imminent eclampsia among women attending care at Muhimbili National Hospital: a case referent study. Master of Medicine (Obstetrics and Gynecology) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Preeclampsia affects about 5 to 10% of all pregnancies and eclamptic seizure is one of its serious complications. In many developing countries including Tanzania, maternal and perinatal mortality due to eclampsia are high. As yet, primary prevention of eclampsia is not possible since the causes are largely unknown. Headache, visual disturbance, abdominal pain, nausea, and vomiting have been reported by various studies to precede most eclamptic seizures; thus could be used to predict and therefore prevent some cases given the availability of magnesium sulphate. These symptoms however are also common in normal pregnancy and post delivery mothers due to physiological changes of pregnancy and common disease conditions that usually affect pregnant women in our settings. The present study evaluated the characteristics of symptoms that are consistent with imminence of eclampsia **Methodology** this was a case referent study in which 123 eclamptic and 123 non eclamptic mothers that best matched in terms of age, parity, gestation age and delivery were enrolled, making a total of 246 women. The presence and characteristics of headache, visual disturbance, abdominal pain, nausea, and vomiting were enquired. A 4 grade scale was used to grade the severity of headache. In the rest of symptoms, common presenting features were utilized. **Results** Headache was common in both groups but was more frequent in eclamptic than in referent group of women (88% vs. 43%, $p < 0.001$). In eclamptic mothers headache was mainly severe, frontal and most of the seizures happened within one week of the onset of headache, as compared to referent women where headache was mostly mild and either frontal or generalized. Visual problems were significantly frequent in eclamptics than in referent women, (39% vs. 3% $p < 0.001$). Of the eclamptic mothers who presented with visual problems, 45(94%) had blurring of vision, 32(67%) had blind spots, 10(21%) had photophobia and only 7(15%) had total blindness. A total of 47(98%) of eclamptic mothers developed seizures within 12hours of the onset of visual problems. The frequency of abdominal pain was not significantly different between eclamptic and referent mothers (47% vs.38% $p=0.156$), however upper quadrant abdominal pain was significantly reported in eclamptic than in referent group of women (36% vs.9%, $p=0.001$). There was no significant

difference on the type of abdominal pain presented by both groups. Nausea was common in both eclamptics and referent group of women (60% vs. 54%, $p=0.303$). There was no difference on presentation with vomiting among eclamptic and referent women (62% vs. 68% $p=0.516$) and in both groups the type of vomiting was commonly non projectile. **Conclusion:** This study has revealed that headache, abdominal pain, nausea and vomiting are common to pregnancy whether or not complicated by preeclampsia/eclampsia. The characteristics of headache, visual disturbances and abdominal pain differ between eclamptics and women without preeclampsia/eclampsia. In a pre eclamptic woman, an onset of a severe frontal headache or upper quadrant abdominal pain would suggest an occurrence of seizures within one week. Visual disturbance is the most ominous sign as seizures ensue within 12 hours of its onset. Nausea and vomiting cannot be reliably used to predict eclampsia.

118. John J. The knowledge, attitude, practice and perceived barriers towards screening for premalignant cervical lesions among women aged 18years and above, in Songea urban, Ruvuma. Master of Medicine (Obstetrics and Gynecology) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Cervical cancer is the second most common cancer among women worldwide. About 83% of the cases occur in developing countries, representing 15% of female cancers. Cervical cancer ranks as the most frequent cancer among women in Tanzania, and the most frequent cancer among women between 15 and 44 years of age with age specific incidence rate of 34 per 100,000. Majority of patients present to hospital with advanced disease with dismal survival rate. Carcinoma of the cervix is a preventable disease; its prevention, among other ways, is through screening and detection of premalignant stages of the disease and treatment. Screening test for cervical precancerous and cancerous lesions using visual inspection aided by acetic acid has been a suitable low cost and a feasible alternative modality for control of cervical cancer in resource poor settings as compared to cytological and colposcopic screening in resource rich settings. Detection of the premalignant lesions however requires knowledge of the disease so that people can be aware and positive towards screening. **Objectives:** the broad objective of the study was to determine the knowledge, attitude, practice and the perceived barriers towards screening for premalignant cervical lesions among women aged 18 and above years in Songea urban,

Ruvuma region. **Materials and Methods:** A cross sectional study was conducted in Songea from 9th to 30th September, 2010. Four wards were chosen to be studied. The chosen wards were Lizaboni, Mjini, Bombambili and Majengo. An interviewer administered structured questionnaire was used to gather information. Door to door interviewing of respondent meeting the criteria was done. Obtained information was summarized into SPSS data base. Data was cleaned and analyzed by SPSS version 16 for windows. Chi-square tests were used to find out the significant differences between variables. **Results:** Generally the knowledge was poor, attitude was positive to majority of respondents but again practice was found to be very poor. The results showed that 243(78.6%) had poor knowledge, 61(19.7%) had satisfactory knowledge and only 5(1.6%) had good knowledge. Overall 172(55.7%) of the respondents were positive about cervical cancer and screening for premalignant cervical lesion. Among 309 respondents, 14.2% only have ever been screened. **Conclusion:** The study has shown that there is a lack of knowledge on cervical cancer and screening for premalignant cervical lesion. There is also poor utilization of screening services available at the study area. The reason for poor practice among others was lack of knowledge and information. **Recommendations:** There is a need to promote cervical cancer screening among women by informing them on their susceptibility to cervical cancer and encouraging a belief that active and regular screening can detect cervical cancer at the pre-cancerous stage, hence enabling the early treatment and prevention of cancer development. There is also a need for provision of affordable screening services all over the country to enable women, after being motivated, to go for screening.

119. Joseph B, Jacob M. Knowledge sharing intentions among IT professionals in India. In Information Intelligence, Systems, Technology and Management. 2011; 23-3.

In today's knowledge-based economy, an organization's ability to strategically leverage knowledge has become a crucial factor for global competitiveness. Knowledge is considered an important source of establishing and maintaining competitive advantage. Specifically, knowledge sharing and resultant knowledge creation are crucial for organizations to gain and sustain competitiveness. The aim of this study is to develop an understanding of the factors supporting or inhibiting individuals' knowledge-sharing intentions. Theory of Reasoned Action is employed and augmented with extrinsic motivators, social-psychological forces and

organizational climate factors that are believed to influence individuals' knowledge sharing intentions. The study proved that organizational climates and social-psychological factors have a positive effect on the intension for knowledge sharing. Additionally it was found that the attitude towards knowledge sharing and subjective norm affects individual's intension to share knowledge. Contrary to the common belief, it was found that anticipated extrinsic rewards exert a negative effect on individuals' knowledge-sharing attitudes.

120. Joseph B. Development and validation of a method for the assay and dissolution of a fixed dose combination of lamivudine, tenofovir and efavirenz tablet. Master of Pharmacy (Quality Control and Quality Assurance) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

A reverse phase-high performance liquid chromatographic method was developed and validated for the simultaneous determination of lamivudine, tenofovir disoproxil fumarate and efavirenz in lamivudine, tenofovir and efavirenz finished formulation product. The method was developed by altering various organic solvents such as acetonitrile and methanol, column, detection, flow rate and temperature. An isocratic elution mode with a mixture of acetonitrile and water in the ratio of (55:45 % v/v) was selected for the mobile phase with a nucleosil (Macherey Nagel-Germany) m) column as stationary phase for simultaneous separation of mC18 (4.6 mm x 250 mm x 5 lamivudine, tenofovir disoproxil fumarate and efavirenz. The separation was achieved at a flow rate of 1 mL/min and detection wavelength of 252 nm at room temperature. Further, different dissolution media were investigated for optimal release of lamivudine, tenofovir disoproxil fumarate and efavirenz from lamivudine, tenofovir and efavirenz tablets. The optimization of dissolution medium was preceded by establishment of the sink concentration for efavirenz which was found at 0.5% sodium dodecyl sulphate in water with a release of more than 75% of each of the three active pharmaceutical ingredients at 37°C with a paddle method, 75 rpm at 45 min. The analytical method was validated and the linear range was found in the concentration range of 0.05 to 0.12 mg/mL of lamivudine, tenofovir disoproxil fumarate and efavirenz with regression coefficient (r^2) of 0.9984 which met the acceptance criteria of r^2 equal or greater than 0.98. The % rsd for the intra-day precision were 1.08%, 1.23% and 1.46% for lamivudine, tenofovir

disoproxil fumarate and efavirenz respectively. The % rsd for the inter-day precision were 1.95%, 1.99% and 1.67% for lamivudine, tenofovir disoproxil fumarate and efavirenz respectively. The test method had an acceptable level of accuracy for the assay of lamivudine, tenofovir disoproxil fumarate and efavirenz in lamivudine, tenofovir and efavirenz tablets from 50 % to 120 % of test concentration with % rsd less than 2% for all three active pharmaceutical ingredients. The test solution remained stable when stored at 4°C for 72 hours. The method was robust as it remained largely unaffected by small variations in temperature and mobile phase. All of these assessed parameters complied with the acceptance criteria hence indicated the usefulness of the reverse phase-high performance liquid chromatographic method for determination of assay and dissolution release testing for finished formulation product which contain lamivudine, tenofovir disoproxil fumarate and efavirenz active substances.

121. Joseph T, Sebastian MT, Jantunen H, Jacob M, Sreemoolanadhan H. Tape Casting and Dielectric Properties of Sr₂ZnSi₂O₇-Based Ceramic–Glass Composite for Low-Temperature Co-fired Ceramics Applications. *International Journal of Applied Ceramic Technology*. 2011; 8(4), 854-864.

The Sr₂ZnSi₂O₇ ceramics sintered at 1475°C has $Q \times f = 105,000$ GHz (at 12.63 GHz), and $t_f = -51.5$ ppm/°C. The sintering temperature of Sr₂ZnSi₂O₇ has been lowered to 875°C by the addition of 20Li₂O–20MgO–20ZnO–20B₂O₃–20SiO₂ (LMZBS) glass. Addition of a small amount of SrTiO₃ lowered the value of t_f . Tapes were cast using the composition Sr₂ZnSi₂O₇+15 wt% LMZBS. The stacked and sintered tapes exhibited $Q \sim 7$ and $\tan \delta \sim 10^{-3}$ at 290 K. The chemical compatibility of Ag with the ceramic–glass composites was also investigated.

122. Kaale E, Risha P, Layloff T. TLC for pharmaceutical analysis in resource limited countries. *Journal of Chromatography A*. 2011; 1218 (19): 2732-2736.

This review article discusses the sustainability and robust advantages of planar chromatography that are critical to the successful performance of product quality assessments in resource limited areas including field applications. Because of the robustness and ease of use, the training

required for successful performance of the high performance thin layer chromatography (HPTLC) assessments is much lower than that of other technologies with comparable reproducibility such as high performance liquid chromatography (HPLC). Some of the successful applications of planar chromatography in resource limited countries are presented. It should be noted that these planar chromatographic technologies have much lower plate counts and therefore separation power than column technologies such as HPLC and gas liquid chromatography (GLC). However in finished pharmaceutical products there are generally few active ingredients which are assessed making the HPTLC adequate for these analyses. In addition at this time there is a much wider array of detection technologies available for HPLC and GLC.

123. Kaaya PF. Mucocutaneous disorders among HIV/AIDS adult patients with anti-retroviral treatment failure attending Amtulabhai Karimjee Care and Treatment clinic in Dar es Salaam. Master of Medicine (Internal Medicine) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Majority of HIV infected individuals present with one or more coetaneous disorders during the course of their HIV infection and may present at treatment failure. Treatment failure in developing countries is on the rise; however, scanty literature exists on mucocutaneous disorders in patients with ART failure. **Objective:** To determine the pattern of mucocutaneous disorders among HIV/AIDS patients with treatment failure attending Amtulabhai Karimjee Treatment failure Clinic (AKC) in Dar es Salaam. Study design and settings: A clinic – based descriptive cross sectional study was conducted among HIV patients with ARV treatment failure attending Amtulabhai Karimjee Treatment failure Clinic. **Materials and Methods:** All patients referred to AKC were scrutinized to ascertain their ARV treatment failure status. Patients with treatment failure were then consecutively recruited into the study after obtaining their written consent to achieve the required sample size. Appropriate clinical information obtained through history and complete dermatological examination was recorded into a specially designed questionnaire. Blood sample was taken for the determination of CD4+ T-Lymphocytes count by Flowcytometry. Dermatological diagnoses were made based on observed clinical features and in doubtful cases assistance was sought from a Dermatologist. Investigations

including skin biopsies were taken where indicated. Digital photographs were taken where necessary for discussion with a Dermatologist. Data was analyzed using SPSS, and Chi squared test was used to compare proportions. **Results:** Two hundred and forty six subjects were enrolled into the study, of whom 154 (62.6%) were females. The overall mean age was 40.5 (SD±10.5) years. The age ranged from 19 to 73 years. The overall prevalence of one or more mucocutaneous disorder was 52.8%. Vii There was a striking female preponderance of patients with mucocutaneous disorders 94/130 (72.3%). The elderly (>47 years) were the least affected 27/66 (40.9%) compared to the age groups (19 – 32 years) who were most affected 32/51(62.7%). Inflammatory/ papulosquamous disorders ranked highest, with an overall prevalence of 79/130 (60.8%). Pruritic Papular Eruption (PPE) was the commonest of these, having a prevalence of 71/130 (54.6%). Females had three times the prevalence of PPE compared to males. Seborrhoeic dermatitis and Eczema were each prevalent in 3/130 (2.3%) of patients. Lichenoid hypersensitivity reaction and lichen simplex chronicus was the least common. Infectious diseases had a prevalence of 64/130 (49.2%). Of these, fungal infections were most predominant being present in 31/130 (23.8%) of patients. Viral infections had a prevalence of 30/130 (23.0%). Malignant conditions were rare, being encountered in 3 patients only; 2 with sarcoma, and 1 with squamous cell carcinoma, Among the 130 patients, 80.8% had one type of mucocutaneous disorder; while 19.2% had 2 or more types mucocutaneous disorders. Of those patients with CD4 count less than 200 cells/ μ l, PPE was encountered more frequently 60/120 (50%) compared to other mucocutaneous disorders, $p=0.003$. The mean CD4 count of patients with PPE was 166.1 cells/ μ l. **Conclusion:** – Majority of patients with treatment failure were females – Mucocutaneous disorders were a common presentation in patients on treatment failure – Chronic persistent PPE was the most frequent mucocutaneous disorder finding – More than two third of the mucocutaneous disorders presented at the CD4 T cell counts less than 200 cells/ μ l Recommendation In view of the high frequency of mucocutaneous disorders in patients with treatment failure, Clinicians should be sensitized to perform a thorough dermatological examination in each patient. Presence of PPE should increase the index of suspicion for ARV failure.

124. Kabala RB. Imaging findings in infertile female patients who underwent hysterosalpingography investigation at Muhimbili National Hospital. Master of Medicine (Radiology) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Fallopian tube and uterine defects are responsible for infertility in more than 30% of infertile couples. Hysterosalpingography (HSG) is a safe and less invasive method of detecting both the tubal and uterine defects. Objectives To describe hysterosalpingography (HSG) imaging findings in infertile female patients investigated at Muhimbili National Hospital (MNH)/Radiology department from July to December,2010 **Material and methods:** This descriptive cross-sectional study, involved 130 women participants with infertility who attended MNH Radiology department for HSG examination between July to December 2010. Demographic data and radiological findings were reviewed and the obtained data analyzed with SPSS version 15. Statistical level of significance was set at $p < 0.05$. **Results:** The participants mean age was 30 years and mean duration for infertility was 5 years. Secondary infertility was slightly commoner than primary infertility. Majority (70%) of patients were aged 16-30 years. Abnormal findings at HSG were found in 60% of the patients. Most of these abnormal findings were found in those patients with older age between 31 and 45 years and those with long duration of infertility for more than 5 years. The commonest finding was tubal blockage accounting 41% of cases and the least was uterine congenital abnormality (3.8%). Uterine fibroid was the commonest uterine pathology accounting for 10% of all cases. Conclusion generally, high proportion of patients in this study showed presence of uterine and fallopian tubes pathology. Fallopian tubal blockage was the most diagnosed tubal structural abnormality while the uterine leiomyoma was the highest uterine pathology. There was no significant difference in the presence of pathology between patients with primary and secondary infertility. However, older age above 30 years were significantly associated with presence of structural abnormality in both uterus and fallopian tubes Recommendation HSG is recommended for initial routine work-up of infertile women. Further studies are needed to establish the aetiologies of these abnormalities.

125. Kabali C, von Reyn CF, Brooks DR, Waddell R, Mtei L, Bakari M, Matee M, Pallangyo K, Arbeit RD, Horsburgh CR, Horsburgh CR. Completion of isoniazid preventive therapy and survival in HIV-infected, TST-positive adults in Tanzania. *The International Journal of Tuberculosis and Lung Disease*. 2011; 15(11), 1515-1522.

Setting: The World Health Organization recommends the use of isoniazid preventive therapy (IPT) for human immunodeficiency virus (HIV) infected patients with a positive tuberculin skin test (TST). However, due to concerns about the effectiveness of IPT in community health care settings and the development of drug resistance, these recommendations have not been widely implemented in countries where tuberculosis (TB) and HIV co-infection is common. **Objective:** To evaluate the effectiveness of IPT on survival and TB incidence among HIV-infected patients in Tanzania. **Design:** A cohort study nested within a randomized trial of HIV-infected adults with baseline CD4 counts of ≥ 200 cells/ μ l was conducted to compare survival and incidence of active TB between TST-positive subjects who did or did not complete 6 months of IPT in the period 2001–2008. **RESULTS:** Of 558 TST-positive subjects in the analytic cohort, 488 completed 6 months of IPT and 70 did not. Completers had a decrease in mortality compared to non-completers (HR 0.4, 95%CI 0.2–0.8). However, the protective effect of IPT on the incidence of active TB was non-significant (HR 0.6, 95%CI 0.3–1.3). **Conclusion:** Completion of IPT is associated with increased survival in HIV-infected adults with CD4 counts ≥ 200 cells/ μ l and a positive TST.

126. Kabulwa MN. Prevalence, perceived factors and knowledge on effects of tobacco use on oral health among secondary school students in Dar es salaam, Tanzania. Master of Dentistry (Community Dentistry) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: At the time of the conception of this study there was scant information on self reported prevalence, knowledge on detrimental effects on oral health and factors influencing tobacco use among secondary school students in Dar es Salaam region. **Objectives:** To determine the prevalence, perceived factors that may lead and /or deter secondary school students to use tobacco and knowledge on effects of tobacco use on oral health among secondary

school students in Dar es Salaam. **Materials and methods:** This was a descriptive cross-sectional study conducted among ordinary level secondary schools in Dar es Salaam. A sample of 1084 students from 9 schools was selected using stratified random sampling procedure. Selected students were requested to fill in a Swahili version questionnaire that had questions on prevalence of tobacco dipping, chewing and smoking; knowledge on detrimental effects of tobacco dipping, chewing and smoking and factors that may influence students to start tobacco dipping, chewing or smoking. Data analysis was done using SPSS version 13 and Chi-square test was used to test associations between independent and dependent variables. The level of statistical significance was set at $p < 0.05$. **Results:** One thousand sixty seven out of 1084 students handed in the filled questionnaire to the researcher, constituting a response rate of 98.4%. The proportion of students reported to have ever dipped tobacco snuff, chewed tobacco and smoked cigarettes at their school was 2.2%, 4.4% and 4.4% respectively. Majority of students (70.6%, 70.8%, and 71.2%) were respectively fully knowledgeable on relationship between dipping tobacco snuff, chewing tobacco and smoking cigarettes and occurrence of oral cancer. Students who were respectively fully knowledgeable on relationship between dipping tobacco snuff, chewing tobacco and smoking cigarettes and occurrence of periodontal diseases were 71.6%, 69.3%, and 67.0%. The proportion of students who reported that their parents and school teachers would not be concerned if they would use tobacco was 13.7% and 12.6%. 'Influence of friends', 'Trying or experimenting taste of tobacco' and 'Not knowing detrimental health effects of using tobacco' were perceived as factors that may influence a person to start dipping tobacco snuff, chewing tobacco and smoking cigarettes. 'Knowing detrimental health effects caused by use of tobacco', 'Good guidance from parents and guardians' and 'Religious teachings' were perceived as vi factors that may inhibit a person to start dipping tobacco snuff, chewing tobacco and smoking cigarettes. **Conclusions:** The prevalence of tobacco dipping (2.2%), chewing (4.4%) and smoking (4.4%) among secondary school students in Dar es Salaam appear to be low. Majority of students who participated in this study had adequate level of knowledge on the detrimental effects of tobacco use on systemic and oral health. Factors that were perceived by majority of students as important in promoting students to start dipping tobacco snuff, chewing tobacco and smoking cigarettes were: 'Not knowing detrimental health effects caused by using tobacco', 'Trying or experimenting taste of tobacco' and 'Influence of friends'. Factors that were perceived by majority of students as inhibitors for students to start dipping, chewing and

smoking tobacco were: “Knowing detrimental health effects caused by tobacco use”, “Good guidance from parents and guardians”, “Religious teachings” and “Living in a society that dislikes tobacco use” **Recommendations:** Although the prevalence of tobacco use appears to be low there is need for intervention among secondary school students so as to prevent possible continued trend of tobacco use. There should be a call for religious leaders, parents, school teachers to be involved in discouraging use of tobacco among secondary school students. Parents/guardians and other family members should not ask children light, buy cigarettes for them or smoke in front of them. Health education should be taught to raise awareness on detrimental effects of tobacco use among secondary school students.

127. Kaduri P, Mbwambo J, Masao F, Kilonzo G. Medication assisted therapy (MAT) and substance use disorders in Tanzania. Ethnicity and Inequalities in Health and Social Care.2011; 4 (3):138-142.

Purpose: Substance use is among the risk factors associated with both HIV/AIDS and non communicable diseases (NCDs). The aim of this paper is to describe the development of the medication assisted therapy (MAT) in the treatment of substance use disorders and opportunities for further interventions in Tanzania. **Design/methodology/approach:** A review of MAT pilot project documentation, existing published and grey literature on substance misuse in Tanzania was used to describe the scope of this paper. MAT as a program focuses on the treatment of opiod dependent individuals using methadone in a national hospital in Tanzania. It is delivered by a team of trained interprofessionals coordinating with community partners. **Findings:** The findings indicate an uptake of pharmacotherapy in the treatment of substance use disorders as an adjunct to traditional counseling approaches in low resource settings. Program acceptability and reach within a short period of time by the opiod dependent individuals is shown. Practical implications: National buy-in is critical for developments of new interventions. Given adequate resources, it is feasible to integrate MAT for the treatment of substance use disorders within health care systems in poor resource settings. To ensure the success of the program, sustainable efforts and scaling up to include alcohol and tobacco dependence treatment is crucial. The local capacity building is required including a need for designing appropriate policies to address

alcohol and tobacco use in Tanzania. Originality/value: The intervention is the only one in sub-Saharan Africa. MAT may serve as a practice model for other countries in the region.

128. Kagashe GA, Fazal SA. Knowledge of hypertensive patients with or without HIV on hypertension and their experience in using their medicines in Dar es Salaam, Tanzania: The role of the pharmacist. *Tropical Journal of Pharmaceutical Research*. 2011; 10 (6): 825-831.

Purpose: The study assessed the knowledge of both HIV and non-HIV hypertensive patients on hypertension and the role of pharmacists in their pharmaceutical care. **Methods:** The study was conducted at the hypertension and HIV clinics in government hospitals in Dar es Salaam, Tanzania. Patients were interviewed using a structured questionnaire and pharmacists were assessed using a self-administered questionnaire and by observation. **Results:** Few patients in both groups knew the names of antihypertensive medicines they were taking. Information on the use of antihypertensive and antiretroviral (ARV) medicines was mostly provided by doctors. Adverse drug reactions were significantly more when patient used both ARVs and antihypertensive medicines than when they used only antihypertensives. Only 20% of hypertensive-HIV patients informed the pharmacist dispensing antihypertensive medicines that they were using ARVs, and only 19% of the pharmacists knew the drug interactions between ARVs and antihypertensive medicines. During dispensing, about 2% of the patients were asked about other medicines being used. **Conclusion:** There is a need to improve patients' knowledge of hypertension. The pharmacists should also have up-to-date knowledge of hypertension-HIV co-morbidity. Proper coordination between HIV and hypertension clinics and the full integration of a pharmacist in the health care team can help to improve patient care.

129. Kagashe GA, Minzi O, Matowe L. An assessment of dispensing practices in private pharmacies in Dar-es-Salaam, Tanzania. *International Journal of Pharmacy Practice*. 2011; 19(1): 30-35.

Objectives: To assess medicine dispensing practices in private pharmacies in Dar-es-Salaam, Tanzania and recommend interventions to improve practice. **Methods** A cross-sectional survey

and observational study of dispensing practices among 70 pharmacies in metropolitan Dar-es-Salaam, Tanzania. Key findings there were 1479 dispensing encounters recorded across the 70 pharmacies. This translated to 1573 medicines dispensed. Of the medicines dispensed, 16% were anti-infectives; 45% of the dispensed medicines were requested by the client, 32% were recommended by the dispenser and only 23% were on prescriptions. The main reasons for pharmacy consultations were coughs (62%), general pain (62%) and 'flu and colds. Malaria constituted 21% of the private pharmacy visits. Of the cough encounters, 30% received antibiotics. In addition, oral antibiotics were given to 81% of the clients with diarrhoea and to 95% of those with eye and ear problems. Of the 628 clients who requested specific medicines without a prescription, only 29% were asked questions on why the medicines were required. Of the clients who bought antibiotics, 20% bought incomplete doses. In total, 1180 clients were interviewed. Of these, 35% could not repeat the instructions given to them by the dispenser. Of the 70 dispensers who gave dosage instructions, only 20% gave them according to guidelines.

130. Kamuhabwa AR, Mnyusiwalla F. Rational dispensing and use of artemether-lumefantrine during pregnancy in Dar es Salaam, Tanzania. *Tanzania Journal of Health Research*. 2011; 13(2): 97-99.

Artemether–Lumefantrine (ALu) is widely used for uncomplicated malaria during the second and third trimester of pregnancy. Because of the suspected teratogenic effects of artemether during the first trimester, quinine is used in early pregnancy unless the risks outweigh the benefits. The aim of this study was to assess dispensing practice of ALu in private pharmacies and knowledge of pregnant women regarding the use of ALu. This was a prospective-descriptive study involving visits to 200 private retail pharmacies (using a mystery shopper) and interviewing pregnant women at the municipal public hospitals in Dar es Salaam, Tanzania. Among the drug dispensers, 60 (30%) were pharmacists, 71(35.5%) nurse assistants, 34 (17%) pharmaceutical technicians and 35 (17.5%) sales persons with no formal education on drug dispensing. Among the dispensers, 14.5% had high knowledge, 38.0% had medium knowledge and 47.5% had low knowledge on the use of ALu during pregnancy. About thirty three percent of the drug dispensers were willing to dispense ALu during the first trimester of pregnancy. Sixty two percent of the drug dispensers indicated that ALu is the drug of choice for

uncomplicated malaria after the first trimester of pregnancy. However, 36% indicated that ALu could not be used during pregnancy. A total of 200 pregnant women were interviewed. Among them, 16.5% were aware that ALu should not be taken during the first trimester of pregnancy. Only 17% of pregnant women were given information on the importance of taking food when using ALu, but none of them was given information on the importance of fatty meals when using ALu. In conclusion, the results show that most drug dispensers have inadequate knowledge about good dispensing practice of ALu in pregnancy. There is therefore a need for continuing training of drug dispensers regarding ant malarial drugs use in pregnancy.

131. Kanamori S, Kohi TW, Nyamhanga T, Mkude S. Assessing the Performance of Nurses in the Management of Malaria Patients in Tanzania. *Journal of tropical pediatrics*. 2011; 57(5): 378-381.

Background: In Tanzania, nurses play an important role in the management of patients with malaria. The study was conducted to identify the current status of the performance of nurses in the management of malaria patients, in order to provide the baseline data before the training intervention. **Methods:** The study was conducted at 19 government health facilities in four districts of Tanzania. In order to assess the performance of nurses, 60 procedures involved in the management of malaria patients were observed and evaluated. Additionally, exit interviews were conducted with 60 malaria patients or caretakers upon leaving the health facilities. **Results:** Of the 60 procedures observed, only 4 satisfied the standard established in the national guideline for treatment and diagnosis of malaria. The proportions of the interviewed patients who were able to correctly provide information were: 83.7–88% on home treatment topics; 6.1–33.3% on follow-up after treatment; and 48.3% on preventive measures on malaria. **Conclusion:** The nurses do not satisfy the required standard in the management of malaria patients. The weak areas identified by the study are the quinine IV administration and health education provided to patients. Conducting a training programme for nurses and the provision of working aids, such as a dosage table and a wall chart, are recommended. Furthermore, in order to alleviate incorrect dosage in intravenous quinine administration associated with dosage calculation, the possibility of adopting treatment drugs that can be administered by other dosage routes could be explored.

132. Kapologwe NA, Kabengula JS, Msuya SE. Perceived barriers and attitudes of health care providers towards Provider-Initiated HIV testing and Counseling in Mbeya region, southern highland zone of Tanzania. *Pan African Medical Journal*.2011; 8.

Background: Provider-initiated testing and counseling (PITC) is a routine HIV testing and counseling, it encompasses two strategies including; diagnostic HIV testing and HIV screening. In Tanzania PITC started in 2007, to date it is almost throughout the country. This study aimed at assessing the perceived barriers and attitudes of health care providers towards PITC services.

Methods: A cross sectional study was conducted for one month between April and May, 2010 in the government health care facilities of the Mbeya City Council. A multi-stage sampling technique was used to select both health facilities and health care providers. **Results:** A total of 402 (95%) subjects were interviewed. Their mean (\pm SD) age was 41 ± 9.5 years, where majorities (65%) were females. All the participants reported to be aware about PITC services. However, about 35% of them had negative attitude towards PITC services. Various perceived barriers to effective PITC provision were reported, including; too many patients (57.7%) and inadequate space (46%) for PITC provision. **Conclusion:** Although PITC is an effective strategy for identification of unrecognized HIV infections, there is still missed opportunity which occurs at the health facilities, as some of health care providers had negative attitude and others faces various barriers in offering the PITC service.

133. Karimuribo ED, Mboera LEG, Mbugi E, Simba A, Kivaria FM, Mmbuji P, Rweyemamu MM. Are we prepared for emerging and re-emerging diseases? Experience and lessons from epidemics that occurred in Tanzania during the last five decades. *Tanzania Journal of Health Research*. 2011; 13 (5): 1-14.

This paper reviews preparedness for containing and controlling emerging and re-emerging diseases drawing lessons from disease events that occurred in animal and human populations in the last five decades (1961-2011). A comprehensive analysis based on retrieval and analysis of grey and published literature as well as reported cases was carried out to document type and trend of occurrence of emerging and re-emerging infectious diseases in different parts of Tanzania. Overall, the majority of diseases reported in the country were viral in nature followed

by bacterial diseases. The trend for the occurrence shows a number of new emerging diseases as well as re-occurrence of old diseases in both animal (domestic and wild) and human populations. In humans, the major disease epidemics reported in the last five decades include cholera, influenza A H1N1, plague and rubella. In animals, the major epidemic diseases reported were Contagious Bovine Pleuropneumonia, Contagious Caprine Pleuropneumonia, Paste des petits ruminants and Giraffe Ear and Skin Diseases. Some epidemics have been reported in both human and animal populations including Rift Valley fever and anthrax. The emergence of the 'fit-for purpose' approaches and technologies such as the discipline of One Health, use of participatory epidemiology and disease surveillance and mobile technologies offers opportunity for optimal use of limited resources to improve early detection, diagnosis and response to disease events and consequently reduced impact of such diseases in animal and human populations.

134. Kasasa A. Neurodevelopment of low birth weight born infants in relation to their iron status in Dar es salaam, Tanzania. Master of Medicine (Pediatrics and Child Health) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Iron plays an essential role in many important biochemical processes. As with all nutrients, the requirement for iron is greater during periods of rapid growth and differentiation such as in the late fetal and neonatal period. Poor iron homeostasis during this period can result in disordered development. Inadequate tissue iron levels can lead to reduced erythropoietin and poor oxygen carrying capacity. The nervous system, which develops rapidly during the late fetal and early neonatal period, seems to be particularly susceptible to iron deficiency. **Objective:** To assess neurodevelopment of low birth weight infants in relation to their iron status. Methodology Hospital based descriptive cross-sectional study of 270 infants who were born premature/low birth weight aged less than 12 months, attending the high-risk children clinic, whose mothers consented. Infants were recruited on Mondays and Fridays during their clinic visit using convenient sampling technique. Infants with known congenital anomalies, born with birth asphyxia, meningitis and jaundice and those who were acutely ill during the clinic visit were excluded from the study. Bayley Mental Developmental Scoring was done on all infants recruited in the study, along with a thorough history, physical examination and laboratory tests including serum ferritin and complete blood count. Cognitive, motor and language development

scores were considered normal with score of ≥ 85 and poor with score of < 85 . Iron deficiency were considered if serum ferritin was $< 12 \mu\text{g/dl}$. **Results** of the 270 infants, 124 (45.9%) were male and 146 (54.1%) were female providing a male to female ratio of 0.8:1. The prevalence of poor cognitive, motor and language development were 90%, 88.2% and 59.2% respectively. Poor cognitive, language and motor development were noted with increasing age with $p=0.0001$ in all categories. Language and motor development were more poorly developed in females than males with $p=0.05$ and $p=0.006$ respectively. Infants with iron deficiency and poor cognitive percentile score were 37% compared with 18% of iron deficient infants with normal cognitive percentile scores ($p=0.007$). More infants with poor language percentile scores (35%) were observed in iron deficient infants than iron sufficient infants ($p=0.04$). Motor development percentile score was not significantly affected among the iron deficient infants with a history of not receiving iron supplementation had poor cognitive, language and motor development with $p=0.006$, 0.001 , and 0.0001 respectively. The prevalence of iron deficiency was 34.1%. The iron status of the baby was significantly associated with the gestational age ($p=0.0004$), the birth weight ($p=0.0013$) and the nutrition status of the infant ($p=0.013$). Whereas maternal age, gestational age and maternal education were not significantly associated with poor neurodevelopment outcomes, birth weight, nutritional status and iron supplementation status were significantly associated with neurodevelopment. Infants born with very low birth weight of 0.8-1.49kg were significantly associated with poor cognitive development. However, wasting was a positive predictor of poor motor development and not predictive of the status of cognitive and language development. **Conclusion and Recommendations:** Neurodevelopment was poor among infants born with low birth weight and was more pronounced among iron deficient infants. Neurodevelopment was significantly associated with birth weight, iron deficiency and wasting. Therefore the study recommends early neurodevelopment assessment done on all preterm/low birth weight infants to identify neurologically challenged infants and to direct them for further stimulation and supplementation, in order to improve neurodevelopment. The study also recommends an improvement in iron supplementation program through universal iron supplementation in the right doses and appropriate duration to all low birth weight infants as well as exploring for other causes of poor neurodevelopment and intervening as needed.

135. Kashyap S, Yang Z, Jacob M. Non-iterative regularized reconstruction algorithm for non-Cartesian MRI: NIRVANA. *Magnetic Resonance Imaging*. 2011; 29(2): 222-229.

We introduce a novel no iterative algorithm for the fast and accurate reconstruction of non-uniformly sampled MRI data. The proposed scheme derives the reconstructed image as the non-uniform inverse Fourier transform of a compensated dataset. We derive each sample in the compensated dataset as a weighted linear combination of a few measured k-space samples. The specific k-space samples and the weights involved in the linear combination are derived such that the reconstruction error is minimized. The computational complexity of the proposed scheme is comparable to that of gridding. At the same time, it provides significantly improved accuracy and is considerably more robust to noise and under sampling. The advantages of the proposed scheme makes it ideally suited for the fast reconstruction of large multidimensional datasets, which routinely arise in applications such as f-MRI and MR spectroscopy. The comparisons with state-of-the-art algorithms on numerical phantoms and MRI data clearly demonstrate the performance improvement.

136. Kawai K, Villamor E, Mugusi FM, Saathoff E, Urassa W , Bosch RJ, Spiegelman D ,Fawzi WW. Predictors of change in nutritional and hemoglobin status among adults treated for tuberculosis in Tanzania. *International Journal of Tuberculosis and Lung Disease*.2011; 15 (10): 1380-1389.

Background: Patients with tuberculosis (TB) often suffer from profound malnutrition. **OBJECTIVE:** To examine the patterns and predictors of change in nutritional and hemoglobin status during and after TB treatment. **Methods:** A total of 471 human immunodeficiency virus (HIV) positive and 416 HIV-negative adults with pulmonary TB were prospectively followed in Dar es Salaam, Tanzania. All patients received 8 months' TB treatment following enrollment. **Results:** About 40% of HIV-positive and 47% of HIV-negative TB patients had body mass index (BMI) \leq 18.5 kg/m² at baseline, while about 94% of HIV-positive and 84% of HIV-negative participants were anemic at baseline. Both HIV-positive and HIV-negative patients experienced increases in BMI and hemoglobin concentrations over the course of TB treatment. Among HIVpositive patients, older age, low CD4 cell counts, and high viral load were

independently associated with a smaller increase in BMI from baseline to 8 months. Female sex, older age, low CD4 cell counts, previous TB infection and less money spent on food were independently associated with a smaller improvement in hemoglobin levels among HIV-positive patients during treatment. **Conclusion:** HIV-positive TB patients, especially those with low CD4 cell counts, showed poor nutritional recovery during TB treatment. Adequate nutritional support should be considered during TB treatment.

137. Kazaure MR, Kamazima RS, Mangi EJ. Perceived causes of obstetric fistulae from rural southern Tanzania. *African health sciences*. 2011; 11(3).

Background: Although the magnitude of obstetric fistulae (OF) is reported to have decreased in industrialized countries, it is still a major problem in developing countries. While the main cause of OF is prolonged obstructed labour without prompt medical attention, misconceptions about OF exist. **Objective:** To determine awareness and perceived causes of OF in rural areas of southern Tanzania. **Methods:** A cross-sectional survey was conducted among women of reproductive age, men, health personnel, birth attendants, community leaders and OF cases using qualitative and quantitative approaches. **Results:** More than 60% of interviewees reported to be aware of with a connotation of urine in the names. Perceived causes of OF include sorcery, prolonged labour, delivering by operation where doctors/nurses make mistakes perforate the urinary bladder, physique of the expecting mother, poor skills of doctors/nurses to conduct caesarean section, young or old age of an expecting mother and having sex before recovering from the operation. **Conclusion:** Although OF is not reported to exist, most of the interviewees were aware of them. However, were few respondents are able to mention the main cause of OF. Maternal health education is important as a strategy to minimize the spread of misconceptions about causes of OF.

138. Kern SE, Tiono AB, Makanga M, Gbadoé A, Premji Z, Gaye O, Sagara I, Ubben D, Cousin M, Oladiran F, Sander O, Ogutu B. Community screening and treatment of asymptomatic carriers of *Plasmodium falciparum* with artemether-lumefantrine to reduce malaria disease burden: A modelling and simulation analysis. *Malaria Journal*. 2011; 10: 210.

Background: Asymptomatic carriers of *Plasmodium falciparum* serve as a reservoir of parasites for malaria transmission. Identification and treatment of asymptomatic carriers within a region may reduce the parasite reservoir and influence malaria transmission in that area. **Methods:** Using computer simulation, this analysis explored the impact of community screening campaigns (CSC) followed by systematic treatment of *P. falciparum* asymptomatic carriers (AC) with artemether-lumefantrine (AL) on disease transmission. The model created by Okell et al (originally designed to explore the impact of the introduction of treatment with artemisinin-based combination therapy on malaria endemicity) was modified to represent CSC and treatment of AC with AL, with the addition of malaria vector seasonality. The age grouping, relative distribution of age in a region, and degree of heterogeneity in disease transmission were maintained. The number and frequency of CSC and their relative timing were explored in terms of their effect on malaria incidence. A sensitivity analysis was conducted to determine the factors with the greatest impact on the model predictions. **Results:** The simulation showed that the intervention that had the largest effect was performed in an area with high endemicity (entomological inoculation rate, EIR > 200); however, the rate of infection returned to its normal level in the subsequent year, unless the intervention was repeated. In areas with low disease burden (EIR < 10), the reduction was sustained for over three years after a single intervention. Three CSC scheduled in close succession (monthly intervals) at the start of the dry season had the greatest impact on the success of the intervention. **Conclusions:** Community screening and treatment of asymptomatic carriers with AL may reduce malaria transmission significantly. The initial level of disease intensity has the greatest impact on the potential magnitude and duration of malaria reduction. When combined with other interventions (e.g. long-lasting insecticide-treated nets, rapid diagnostic tests, prompt diagnosis and treatment, and, where appropriate, indoor residual spraying) the effect of this intervention can be sustained for many years, and it could become a tool to accelerate the reduction in transmission intensity to pre-elimination levels. Repeated interventions at least every other year may help to prolong the effect. The use of an effective diagnostic tool and a highly effective ACT, such as AL, is also vital. The modelling supports the evaluation of this approach in a prospective clinical trial to reduce the pool of infective vectors for malaria transmission in an area with marked seasonality.

139. Kidanto HL. Management of congenital absence of the cervix: A case report. *Tanzania Journal of Health Research*.2011; 13 (4): 1-5.

Cervical agenesis or dysgenesis is an extremely rare congenital anomaly. Conservative surgical approach to these patients involves uterovaginal anastomosis, cervical canalization, and cervical reconstruction. In failed conservative surgery, total hysterectomy is the treatment of choice. Success of reconstructive surgery depends on the amount of cervical tissue available. Hence, congenital absence of the cervix is a complex surgical problem and should be dealt with after thorough evaluation. We report an 18 year old girl presented with primary amenorrhoea and cyclic monthly abdominal pain. Initial attempted reconstructive surgery failed and hysterectomy was done. At laparotomy, there was only fibrous tissue and no cervical tissue at all. No findings related to endometriosis were observed. The uterus was removed and sectioning the fibrous tissue level of the blind vaginal cuff. Gross tissue examination showed a non communicating uterine cavity, filled with menstrual blood of about 200mls and a diffusely hypertrophy myometrium. The cervix was absent. Microscopically, there was no cervical tissue in the specimen; the uterine muscles had evidence of adenomyosis. In conclusion, re-canalization and cervical reconstruction procedures may be performed on carefully selected patients, consideration should be directed to the presence of adequate cervical stroma absence of which warrants hysterectomy.

140. Kikham FJ, Darekar A, Kija E, Badeshi R, McSwiggan J, Cox SE, Makani J, Newton CR. Brain T2-weighted signal intensity ratio in children with sickle cell disease with and without stroke. *In 9th EPNS Congress*. 2011.

Neurocognitive complications are common in Sickle Cell Disease (SCD). Iron is paramagnetic and, if increased in tissues, shortens MRI T2. Brain iron accumulates with age and is higher in the deep gray matter in neurodegenerative conditions. The aim of this study was to assess putative iron concentrations in the deep gray matter, white matter and cortex by normalising the T2-weighted signal intensity in these regions to cerebrospinal fluid signal intensity to produce a ratio in controls and children with SCD with and without overt and covert stroke. Two observers, masked to the clinical data, analysed archived T2-weighted MRI data (Echo time=96 ms) from

the East London and Dar-es-Salaam SCD cohorts and controls. Quantitative T2 ratios from children with SCD with and without overt and covert stroke were compared with the controls using one way analysis of variance with post hoc testing using Dunnett's test. Quantitative T2 ratios were analysed for 48 with SCD in London (29 female, 42 HbSS [median age 17y], 6 HbSC [15y]), 18 with SCD in Dar-es-Salaam (9 female, all HbSS [11y]) and 21 controls (10 female [15y]). T2-weighted signal intensity ratio for right and left caudate, putamen, globus pallidus, pulvinar, thalamus, cortex and red nucleus was lower in 5 children with SCA and stroke ($p < .01$), and in globus pallidus and red nucleus in 17 with covert infarction ($p < .05 > .01$), compared with controls, but there were no differences between groups in frontal white matter or genu. In the SCD patients, serum ferritin and number of previous transfusions correlated with quantitative T2 ratios in all areas except white matter, cortex and globus pallidus, suggesting that the differences from controls are likely to be related to iron deposition.

141. Kirkham FJ, Darekar A, Kija E, Bhadresha R, McSwiggan J, Cox SE, Newton CR. P07. 3 Brain T2-weighted signal intensity ratio in children with sickle cell disease with and without stroke. *European Journal of Pediatrics Neurology*. 2011; 15(1).

Introduction: Neurocognitive complications are common in sickle cell anemia (SCA). Iron is paramagnetic and may be measured as R2, R2*, and R2 ϕ on magnetic resonance imaging (MRI). Brain iron accumulates with age and is higher in the deep grey matter in neurodegenerative conditions. The aim of this study was to assess iron concentrations in brain regions by measuring MRI R2, R2*, and R2 ϕ in Tanzanian children with SCA with and without overt and covert stroke. Method: Two observers, masked to the clinical data, analyzed 4 (R2) or 6 (R2*) echoes and plotted the exponentials from 1.5T MRI data in children with abnormal transcranial Doppler enrolled in the Dar-es-Salaam SCA cohort. R2 ϕ was calculated as R2–R2*. Quantitative R2, R2*, and R2 ϕ were plotted against serum ferritin levels and transferrin saturation (markers of systemic iron status) obtained on the same day and were compared in children with SCA with overt and covert stroke and those with normally appearing T2-weighted MRI using one way analysis of variance and Scheffe's test. **Results:** Twenty-six children (11 males; median age 11, Range 6–14y) were enrolled, 10 with normal MRI, 12 with silent infarction and 4 with clinical stroke. There was no difference in median age between groups. Serum ferritin and transferrin

saturation correlated with R2 in the right white matter, right anterior thalamus, left posterior thalamus and in the caudate, putamen and pulvinar bilaterally, but R2* only correlated with Ferritin in the globus pallidus and red nucleus. R2 and R2 ϕ were higher in the red nucleus in those with clinical stroke than in those with silent infarction. **Discussion:** As in migraine, there is evidence for iron deposition in the red nucleus in children with SCA and stroke, remote from the infarct and possibly affecting respiratory control.

142. Kirman C, Budinsky RA, Yost L, Baker BF, Zabik JM, Rowlands JC, Simon T. Derivation of Soil Clean-Up Levels for 2, 3, 7, 8-Tetrachloro-dibenzo-p-dioxin (TCDD) Toxicity Equivalence (TEQD/F) in Soil Through Deterministic and Probabilistic Risk Assessment of Exposure and Toxicity. *Human and Ecological Risk Assessment*. 2011; 17(1): 125-158.

While risk assessments are extensively used for guiding critical and resource intensive decisions, assessments that rigorously integrate key exposure and toxicity terms are less often published. This article derives residential soil clean-up levels accounting for ingestion and dermal contact (direct contact criteria [DCC]) for a chlorinated dibenzo-p-dioxin and furan (PCDD/F as toxicity equivalence TEQD/F) impacted site using site-specific information and deterministic and probabilistic methods. In addition, TEQD/F risk assessment has been the subject of extensive scientific and regulatory debate including in-depth comments from two USEPA Science Advisory Boards and the National Academy of Sciences (NAS) on the proposed USEPA Draft Dioxin Risk Assessment. This article presents and applies toxicity values seeking to address the NAS recommendations regarding cancer risk assessment. Deterministic DCC estimates ranged from 19 to 250 ppb through application of linear and nonlinear cancer toxicity values, and a DCC of 5.3 ppb was estimated based on the World Health Organization's Joint Exposure Committee on Food Additive's assessment value for noncancer and cancer endpoints. A wide range of DCC estimates were calculated using probabilistic methods, with the prior USEPA 1 ppb clean-up value falling below the first percentile of estimates, suggesting that the 1 ppb value is health protective.

143. Kisanga F, Nystrom L, Hogan N, Emmelin M. Child sexual abuse: Community concerns in urban Tanzania. *Journal of Child Sexual Abuse*.2011; 20 (2):196-217.

The aim of this study was to explore community perceptions about child sexual abuse in Tanzania. Thirteen focus group discussions were conducted with adult community members. The core category, children's rights challenged by lack of agency, was supported by eight categories. Aware but distressed portrayed feelings of hopelessness, lack of trust in the healthcare and legal systems reflected perceived malpractice, decreased respect for children's rights referred to poor parental care and substance abuse, myths justifying CSA illustrated cultural beliefs to rationalize child sexual abuse, disclosure threatened by fear of stigma and discrimination aligned the manifestations that prevent disclosure, actions driven by economic circumstances described the economical dependence of victims, urging a change in procedures reflected informants' wish to ally with local governance and pressure groups, and willingness to act indicated the community's role in supporting victims. The study showed how lack of agency calls for efforts to increase children's human rights at all levels.

144. Kisangau DP, Herrmann TM, Lyaruu HVM , Hosea KM , Joseph CC, Mbwambo ZH, Masimba PJ. Traditional knowledge, use practices and conservation of medicinal plants for HIV/AIDS care in rural Tanzania. *Ethnobotany Research and Applications*.2011; 9:43-58.

HIV/AIDS pandemic is currently the most socio-economic challenge that faces Tanzania as it affects mostly the young and most economically productive population. People living with HIV/AIDS in Tanzania are susceptible to fungal and bacterial opportunistic infections, which are a major cause of mortality and morbidity in the country. Despite the government's intervention to provide ARVs to people living with HIV/AIDS, many of them especially those living in the rural areas can neither afford them due to poverty nor access them due to distance to health centers. Moreover, resistance of opportunistic microbial pathogens to conventional medicines and the serious side effects associated with antiretroviral drugs are also a major drawback to the management of HIV/AIDS in the country. Due to these factors, many people opt to use of traditional medicines. This paper highlights the use and conservation of herbal remedies to

manage HIV/AIDS pandemic in Tanzania. Ethnobotanical surveys were carried out in Bukoba Rural District to explore the traditional ethno-medical knowledge, the use and conservation of medicinal plants in the management of HIV/AIDS opportunistic infections and to determine whether levels of harvesting are sustainable. The district is currently an epicenter of HIV/AIDS and although over 90% of the population in the district relies on traditional medicines to manage the disease, this traditional knowledge still remains largely unknown. Seventyfive plant species belonging to 66 genera and 40 families were found to be used to treat one or more HIV/AIDS related diseases in the district. Eight plant species were tested in-vitro for their antifungal activity against three major fungal pathogens, *Candida albicans* (C.P. Robin) Berkhout, *Cryptococcus neoformans* (San Felice) Vuill. and *Aspergillus Niger* Tiegh. Three of them were further tested in-vivo for their anti-*Candida* activity. With decreasing natural stocks of medicinal plants, and based on the results, this study further provides concrete recommendations for the conservation of these important non-timber forest products and the region's medicinal plant biodiversity.

145. Kisenge PR. Pattern of cardiovascular diseases among elderly patients admitted in medical wards at Muhimbili National Hospital Dar es Salaam Tanzania Master of Medicine (Cardiology) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background- Cardiovascular disease is the most frequent cause of death in persons over the age 50 years and most importantly it is responsible for considerable morbidity and large burden of disability in the community. Cardiovascular diseases are an increasing cause of admissions among elderly in Africa, yet little research is available on pattern and magnitude of the problem. **Objective-** To determine the pattern of cardiovascular disease in elderly patients admitted in medical wards at Muhimbili National Hospital Dar es Salaam Tanzania. **Methodology-** This was a descriptive cross sectional study that was carried out between September 2008 and September 2009. Social demographic information; medical history physical examination; electrocardiographic and echocardiography examination; biochemical and hematological parameters were collected from study patients **Results-** One hundred eighty five elderly patients admitted at MNH, medical department, were enrolled into the study, all were of African black race. Majority, 116 (62.7%), were male. Their mean age was 66.1 (SD, 9.3; range, 50-87) years.

The mean body mass index (BMI) was 23.9 (SD, 3.9; range, 16.6-40.1) kg/m². Hypertension was the most frequent condition encountered affecting both males (67.2%) and females (68.1%). Congestive heart failure was second common condition affecting 37% elderly patients. According to the echocardiogram findings, among 185 elderly patients 68.6% were diagnosed to have cardiovascular disease. There were no significant sex differences in the prevalence of cardiac disease ($p>0.05$). The commonest echocardiography diagnosis were left ventricular hypertrophy (LVH) secondary to hypertension found in 45%, diastolic dysfunction found in 31% and systolic dysfunction 25%. The least common types were septal defect, pulmonary hypertension and calcified mitral valve found in one percent each. The commonest clinical presentations were palpitations, dyspnoea, orthopnoea, pedal oedema and right upper quadrant abdominal pain. Obese patients presenting with cardiovascular abnormalities were 9 (7.1%). Anemia was the leading co-morbidity affecting 90.3% of the patient's. **Conclusion** Hypertension, congestive heart failure and left ventricular hypertrophy were the commonest cardiovascular diseases among elderly patients at MNH. Coexistence of anemia, stroke, renal impairment and diabetes was also frequent. **Recommendation** Elderly patients should be screened for cardiovascular diseases especially hypertension whenever they are admitted to the hospital even if the reasons for admission are not cardiovascular problems.

146. Kivuyo SL, Johannessen A, Trøseid M, Kasubi MJ, Gundersen SG, Naman E, Mushi D, Ngowi BJ, Mfinanga GS, Bruun JN. P24 antigen detection on dried blood spots is a feasible and reliable test for infant HIV infection in rural Tanzania. *International Journal of STD and AIDS*. 2011; 22 (12): 719-721.

The difficulty of diagnosing HIV in infants is a major obstacle to early antiretroviral therapy (ART) in resource-limited settings. As serological tests are unreliable during the first 18 months of life, and the cost and complexity of polymerase chain reaction (PCR)-based assays limit their access in resource-limited settings, p24 antigen detection has emerged as an alternative diagnostic tool. In this study, the performance of an ultrasensitive p24 antigen assay on dried blood spots was evaluated under field conditions in rural Tanzania. Specimens were stored and shipped at tropical room temperature, and analysed within six weeks. In total, 27 consecutive children aged <18 months and exposed to vertical HIV transmission were enrolled. Overall

sensitivity and specificity was 100% (95% confidence interval [CI], 47.8-100) and 95.5% (95% CI, 77.2-99.9), respectively. Our findings suggest that detection of p24 antigen on dried blood spots can be a reliable and feasible diagnostic tool for infant HIV infection in rural resource-limited settings.

147. Klein Klouwenberg P , Sasi P, Bashraheil M , Awuondo K, Bonten M , Berkley J, Marsh K, Borrmann S. Temporal association of acute hepatitis a and plasmodium falciparum malaria in children.PLoS ONE.2011; 6 (7): e21013

Background: In sub-Saharan Africa, Plasmodium falciparum and hepatitis A (HAV) infections are common, especially in children. Co-infections with these two pathogens may therefore occur, but it is unknown if temporal clustering exists. **Materials and Methods:** We studied the pattern of co-infection of P. falciparum malaria and acute HAV in Kenyan children under the age of 5 years in a cohort of children presenting with uncomplicated P. falciparum malaria. HAV status was determined during a 3-month follow-up period. **Discussion:** Among 222 cases of uncomplicated malaria, 10 patients were anti-HAV IgM positive. The incidence of HAV infections during P. falciparum malaria was 1.7 (95% CI 0.81-3.1) infections/person-year while the cumulative incidence of HAV over the 3-month follow-up period was 0.27 (95% CI 0.14-0.50) infections/person-year. Children with or without HAV co-infections had similar mean P. falciparum asexual parasite densities at presentation (31,000/ μ L vs. 34,000/ μ L, respectively), largely exceeding the pyrogenic threshold of 2,500 parasites/ μ L in this population and minimizing risk of over-diagnosis of malaria as an explanation. **Conclusion:** The observed temporal association between acute HAV and P. falciparum malaria suggests that co-infections of these two hepatotropic human pathogens may result from changes in host susceptibility. Testing this hypothesis will require larger prospective studies.

148. Knudsen TM, Mørkve O, Mfinanga S, Hardie JA. Predictive equations for spirometric reference values in a healthy adult suburban population in Tanzania. Tanzania Journal of Health Research. 2011; 13 (3):214-223.

This study was conducted in Kinondoni district, Dar es Salaam, Tanzania, with the objectives to generate prediction equations for forced expiratory volume in 1 second (FEV1), forced expiratory volume in 6 seconds (FEV6), FEV1/FEV6 ratio and peak expiratory flow (PEF) from a non-symptomatic sample of the population, and to compare these equations to published reference values. The study included adults aged = 15 years who were recruited by use of community based, multistage cluster random sampling. Participants performed spirometry and answered questionnaires regarding respiratory symptoms and socioeconomic conditions. Anthropometric data were collected. Selection of subjects for generation of reference values followed American Thoracic Society (ATS) recommendations. Data were analyzed using multiple regression techniques. Fifty two men and 98 women were selected to the reference value group. FEV1, FEV6, FEV1/FEV6 and PEF were regressed against age, height and weight. For men a curvilinear model was chosen when predicting FEV1, FEV6 and PEF, and a linear model predicted FEV1/FEV6. For women a linear model was used in the regression equations. The reference values generated from our study were lower than in several previously published studies. Our study suggests that assessment of respiratory function should be based on reference values generated from the same population as those being assessed.

149. Ko WY, Kaercher KA, Giombini E, Marcatili P, Froment A, Ibrahim M, Tishkoff SA, Lema G, NyamboTB, Omar SA, Wambebe C, Ranciaro A, Hirbo JB. Effects of natural selection and gene conversion on the evolution of human glycoporphins coding for MNS blood polymorphisms in malaria-endemic African populations. *The American Journal of Human Genetics*. 2011; 88(6): 741-754.

Malaria has been a very strong selection pressure in recent human evolution, particularly in Africa. Of the one million deaths per year due to malaria, more than 90% are in sub-Saharan Africa, a region with high levels of genetic variation and population substructure. However, there have been few studies of nucleotide variation at genetic loci that are relevant to malaria susceptibility across geographically and genetically diverse ethnic groups in Africa. Invasion of erythrocytes by *Plasmodium falciparum* parasites is central to the pathology of malaria. Glycophorina (GYPA) and B (GYPB), which determine MN and Ss blood types, are two major receptors that are expressed on erythrocyte surfaces and interact with parasite ligands. We

analyzed nucleotide diversity of the glycophorin gene family in 15 African populations with different levels of malaria exposure. High levels of nucleotide diversity and gene conversion were found at these genes. We observed divergent patterns of genetic variation between these duplicated genes and between different extracellular domains of GYPA. Specifically, we identified fixed adaptive changes at exons 3–4 of GYPA. By contrast, we observed an allele frequency spectrum skewed toward a significant excess of intermediate-frequency alleles at GYPA exon 2 in many populations; the degree of spectrum distortion is correlated with malaria exposure, possibly because of the joint effects of gene conversion and balancing selection. We also identified a haplotype causing three amino acid changes in the extracellular domain of glycophorin B. This haplotype might have evolved adaptively in five populations with high exposure to malaria.

150. Köhler M, Kaufmann I, Briegel J, Jacob M, Goeschl J, Rachinger W, Rehm M. The endothelial glycocalyx degenerates with increasing sepsis severity. *Critical Care*. 2011; 15(3): 22.

Introduction: The endothelial glycocalyx is a recently discovered structure at the luminal side of blood vessels consisting of proteoglycans and glycosaminoglycans, which play an important role in vascular barrier function and cell adhesion. Due to its vulnerability, the endothelial glycocalyx may easily be altered by hypoxia [1], TNF α [2], oxidized lipoproteins [3] and other non-physiological conditions. We raised the question of whether the glycocalyx may be shed from the endothelium in dependence of severity of sepsis. **Methods:** This clinical prospective study - approved by the local ethics committee - was performed to assess plasma levels of the glycocalyx components (hyaluronane, syndecan, heparan sulfate) by ELISA technique and polymorph nuclear leukocyte (PMN) function by flow cytometry in eight healthy volunteers (HV) and 37 patients who were prospectively enrolled within 24 hours of onset of signs of infection, if they met the criteria for sepsis (n = 10), severe sepsis (n = 9) and septic shock (n = 18) as defined by the members of the ACCP/SCCM Consensus Conference Committee (Table 1). Blood was drawn within 24 hours after onset of sepsis. Informed consent was obtained from all patients or their legal representatives, respectively. **Results:** Plasma levels of the glycocalyx components were significantly higher in septic patients than in healthy volunteers and even more

pronounced in patients with severe sepsis and septic shock (all $P < 0.05$; Figure 1). Hyaluronan and syndecan plasma levels correlated positively with the APACHE II, SOFA and MOD scores (Figure 1 and Table 2). Hyaluronan displayed a positive correlation with the C-reactive protein; procalcitonin and IL-6 in plasma (Table 3). The PMN dysfunction - characterized by an increase in cytotoxic capability and a decrease in microbicidity - showed a parallel course to the heparan sulfate plasma levels. **Conclusion:** Elevated plasma levels of hyaluronan, syndecan and heparan sulfate are suggestive of a glycocalyx shedding from endothelium with increasing sepsis severity. This process might contribute to the vascular dysfunction and development of edema in septic patients.

151. Kuipers RS, Luxwolda MF, Sango WS, Kwesigabo G, Velzing-Aarts FV, Dijck-Brouwer DA, Muskiet FA. Postpartum changes in maternal and infant erythrocyte fatty acids are likely to be driven by restoring insulin sensitivity and DHA status. *Medical hypotheses*. 2011; 76(6): 794-801.

Introduction: Perinatal changes in maternal glucose and lipid fluxes and de novo lipogenesis (DNL) are driven by hormones and nutrients. Docosahexaenoic acid (DHA) reduces, whereas insulin augments, nuclear abundance of sterol-regulatory-element-binding-protein-1 (SREBP-1), which promotes DNL, stearoyl-CoA-desaturase (SCD, also? 9-desaturase), fatty acid-(FA)-elongation (Elovl) and FA-desaturation (FADS). Decreasing maternal insulin sensitivity with advancing gestation and compensatory hyperinsulinemia because augmented postprandial glucose levels, adipose tissue lipolysis and hepatic glucose- and VLDL-production. Hepatic VLDL is composed of dietary, body store and DNL derived FA. Decreasing insulin sensitivity increases the contribution of FA from hepatic-DNL in VLDL-triacylglycerols, and consequently saturated-FA and monounsaturated-FA (MUFA) in maternal serum lipids increase during pregnancy. Although other authors described changes in maternal serum and RBC essential-FA (EFA) after delivery, none went into detail about the changes in non-EFA and the mechanisms behind -and/or functions of- the observed changes. Hypothesis: Postpartum FA-changes result from changing enzymatic activities that are influenced by the changing hormonal milieu after

delivery and DHA-status. Empirical data: We studied FA-profiles and FA-ratios (as indices for enzymatic activities) of maternal and infant RBC at delivery and after 3 months exclusive breastfeeding in three populations with increasing freshwater-fish intakes. DNL-, SCD- and FADS2-activities decreased after delivery. Elongation-6 (Elovl-6)- and FADS1-activities increased. The most pronounced postpartum changes for mothers were increases in 18:0, linoleic (LA), arachidonic acid (AA) and decreases in 16:0, 18:1 ω 9 and DHA; and for infants increases in 18:1 ω 9, 22:5 ω 3, LA and decreases in 16:0 and AA. Changes were in line with the literature. Discussion: Postpartum increases in 18:0, and decreases in 16:0 and 18:1 ω 9, might derive from reduced insulin-promoted DNL-activity, with more reduced SCD- than Elovl-activity that leaves more 16:0 to be converted to 18:0 (Elovl-activity) than to MUFA (SCD-activity). Postpartum changes in SDNL, saturated-FA and MUFA related negatively to RBC-DHA. This concurs with suppression of both SCD- and Elovl-6 activities by DHA, through its influence on SREBP. Infant MUFA and LA increased at expense of their mothers. Sustained transport might be important for myelination (MUFA) and skin barrier development (LA). Maternal postpartum decreases in FADS2-, and apparent increases in FADS1-activity, together with increases in LA, AA, and 22:5 ω 3, but decrease in DHA, confirm that FADS2 is rate limiting in EFA-desaturation. Maternal LA and AA increases might be the result of rerouting from transplacental transfer to the incorporation into milk lipids and discontinued placental AA-utilization. Implications: Perinatal changes in maternal and infant FA status may be strongly driven by changing insulin sensitivity and DHA status.

152. Kuipers RS, Luxwolda MF, Sango WS, Kwesigabo G, Dijck-Brouwer DAJ, Muskiet FAJ. Maternal DHA equilibrium during pregnancy and lactation is reached at an erythrocyte DHA content of 8 g/100 g fatty acids. *Journal of Nutrition*. 2011; 141 (3): 418-427.

Low long-chain PUFA (LC-PUFA, or LCP) consumption relates to suboptimal neurodevelopment, coronary artery disease, and [postpartum (PP)] depression. Maternal-to-infant LCP transport during pregnancy and lactation is at the expense of maternal status, a process known as biomagnification. Despite biomagnification, maternal and infant LCP status generally declines during lactation. To assess the 1) turning point of biomagnification [level from which maternal (m)LCP status exceeds infant (i)LCP status]; 2) LCP equilibrium (steady-state-

level from which mRBC-LCP stop declining during lactation); 3) corresponding iLCP-status; and 4) the relationship between RBC-DHA and RBC-arachidonic acid (AA), we measured RBC-fatty acids in 193 Tanzanian mother-infant pairs with no, intermediate (2-3 times/wk), and high (4-5 times/wk) freshwater fish consumption at delivery and after 3 mo of exclusive breastfeeding. At 3 mo, mRBC-DHA was lower than the corresponding iRBC-DHA up to a mRBC-DHA of 7.9 g%. MRBC-DHA equilibrium, with equivalent mRBC-DHA at both delivery and at 3 mos PP, occurred at 8.1 g%. This mRBC-DHA equilibrium of 8.1 g% corresponded with an iRBC-DHA of 7.1-7.2 g% at delivery that increased to 8.0 g% at 3 mo. We found between-group differences in mRBC-AA; however, no differences in iRBC-AA were observed at delivery or 3 mo. Relations between RBC-DHA and RBC-AA were bell-shaped. We conclude that, at steady-state LCP intakes during lactation: 1) biomagnification occurs up to 8 g% mRBC-DHA; 2) mRBC-DHA equilibrium is reached at 8 g%; 3) mRBC-DHA equilibrium corresponds with an iRBC-DHA of 7 g% at delivery and 8 g% after 3 mo; 4) unlike RBC-DHA, mRBC-AA and iRBC-AA are independently regulated in these populations; and 5) bell-shaped RBC-DHA vs. RBC-AA-relations might support uniform iRBC-AA. A (maternal) RBC-DHA of 8 g% might be optimal for infant neurodevelopment and adult cardiovascular disease incidence.

153. Kuipers RS, Luxwolda MF, Sango WS, Kwesigabo G, Janneke Dijck-Brouwer DA, Muskiet FAJ. Postdelivery changes in maternal and infant erythrocyte fatty acids in 3 populations differing in fresh water fish intakes. *Prostaglandins Leukotrienes and Essential Fatty Acids*. 2011; 85 (6): 387-397.

Introduction: Long-chain polyunsaturated (LCP) fatty acids (FA) are important during infant development. Mother-to-infant FA-transport occurs at the expense of the maternal status. Maternal and infant FA-status change rapidly after delivery. **Methods:** Comparison of maternal (mRBC) and infant erythrocyte (iRBC)-FA-profiles at delivery and after 3 months exclusive breastfeeding in relation to freshwater-fish intakes. Approximation of de-novo-lip genesis (DNL), stearoyl-CoA-desaturase (SCD), elongation-of-very-long-chain-FA-family-member-6 (Elovl-6), delta-5-desaturase (D5D) and delta-6-desaturase (D6D)-enzymatic activities from their product/essential-FA and product/substrate-ratios. **Results and discussion:** Increasing iRBC-14:0 derived from mammary-gland DNL. Decreasing mRBC-?9, but increasing iRBC-?9,

suggests high ω -9-FA-transfer via breast milk. Decreasing (m+i) RBC-16:0, DNL- and SCD-activities, but increasing (m+i) RBC-18:0 and Elovl-6-activity suggest more pronounced postpartum decreases in DNL- and SCD-activities, compared to Elovl-6-activity. Increasing (m+i) RBC-18:3 ω 3, 20:5 ω 3, 22:5 ω 3, 18:2 ω 6, mRBC-20:4 ω 6 and (m+i) D5D-activity, but decreasing mRBC-22:6 ω 3 and (m+i) D6D-activity and dose-dependent changes in iRBC-22:6 ω 3 confirm that D6D-activity is rate-limiting and 22:6 ω 3 is important during lactation. Fish-intake related magnitudes of postpartum FA-changes suggest that LCP ω 3 influence DNL-, SCD- and desaturase-activities.

154. Kuipers RS, Luxwolda MF, Sango WS, Kwesigabo G, Velzing-Aarts FV, Dijk-Brouwer DAJ, Muskiet FAJ. Postpartum changes in maternal and infant erythrocyte fatty acids are likely to be driven by restoring insulin sensitivity and DHA status. *Medical Hypotheses*.2011; 76 (6): 794-801.

Introduction: Perinatal changes in maternal glucose and lipid fluxes and de novo lipogenesis (DNL) are driven by hormones and nutrients. Docosahexaenoic acid (DHA) reduces, whereas insulin augments, nuclear abundance of sterol-regulatory-element-binding-protein-1 (SREBP-1), which promotes DNL, stearoyl-CoA-desaturase (SCD, also ω 9-desaturase), fatty acid-(FA)-elongation (Elovl) and FA-desaturation (FADS). Decreasing maternal insulin sensitivity with advancing gestation and compensatory hyperinsulinemia because augmented postprandial glucose levels, adipose tissue lipolysis and hepatic glucose- and VLDL-production. Hepatic VLDL is composed of dietary, body store and DNL derived FA. Decreasing insulin sensitivity increases the contribution of FA from hepatic-DNL in VLDL-triacylglycerols, and consequently saturated-FA and monounsaturated-FA (MUFA) in maternal serum lipids increase during pregnancy. Although other authors described changes in maternal serum and RBC essential-FA (EFA) after delivery, none went into detail about the changes in non-EFA and the mechanisms behind -and/or functions of- the observed changes. Hypothesis: Postpartum FA-changes. **Result** from changing enzymatic activities that are influenced by the changing hormonal milieu after delivery and DHA-status. Empirical data: We studied FA-profiles and FA-ratios (as indices for

enzymatic activities) of maternal and infant RBC at delivery and after 3. Month's exclusive breastfeeding in three populations with increasing freshwater-fish intakes. DNL-, SCD- and FADS2-activities decreased after delivery. Elongation-6 (Elovl-6) - and FADS1-activities increased. The most pronounced postpartum changes for mothers were increases in 18:0, linoleic (LA), arachidonic acid (AA) and decreases in 16:0, 18:1 ω 9 and DHA; and for infants increases in 18:1 ω 9, 22:5 ω 3, LA and decreases in 16:0 and AA. Changes were in line with the literature. **Discussion:** Postpartum increases in 18:0, and decreases in 16:0 and 18:1 ω 9, might derive from reduced insulin-promoted DNL-activity, with more reduced SCD- than Elovl-activity that leaves more 16:0 to be converted to 18:0 (Elovl-activity) than to MUFA (SCD-activity). Postpartum changes in SDNL, saturated-FA and MUFA related negatively to RBC-DHA. This concurs with suppression of both SCD- and Elovl-6 activities by DHA, through its influence on SREBP. Infant MUFA and LA increased at expense of their mothers. Sustained transport might be important for myelination (MUFA) and skin barrier development (LA). Maternal postpartum decreases in FADS2-and apparent increases in FADS1-activity, together with increases in LA, AA, and 22:5 ω 3, but decrease in DHA, confirm that FADS2 is rate limiting in EFA-desaturation. Maternal LA and AA increases might be the result of rerouting from transplacental transfer to the incorporation into milk lipids and discontinued placental AA-utilization. Implications: Perinatal changes in maternal and infant FA status may be strongly driven by changing insulin sensitivity and DHA status.

155. Lahey T, Mitchell BK, Arbeit RD, Sheth S, Matee M, Horsburgh C, MacKenzie T, Mtei L, Bakari M, Vuola JM, Pallangyo K, von Reyn CF. Polyantigenic interferon- γ Responses are associated with protection from tb among hiv-infected adults with childhood BCG immunization. *PLoS ONE*.2011; 6 (7): e22074.

Background: Surrogate immunologic markers for natural and vaccine-mediated protection against tuberculosis (TB) have not been identified. Methods: HIV-infected adults with childhood BCG immunization entering the placebo arm of the DarDar TB vaccine trial in Dar es Salaam, Tanzania, were assessed for interferon gamma (IFN- γ) responses to three mycobacterial antigen preparations - secreted Mycobacterium tuberculosis antigens 85 (Ag85), early secretory antigenic target 6 (ESAT-6) and polyantigenic whole cell lysate (WCL). We investigated the

association between the numbers of detectable IFN- γ Responses at baseline and the subsequent risk of HIV-associated TB. **Results:** During a median follow-up of 3.3 years, 92 (9.4%) of 979 placebo recipients developed TB. The incidence of TB was 14% in subjects with no detectable baseline IFN- γ Responses vs. 8% in subjects with response to polyantigenic WCL ($P = 0.028$). Concomitant responses to secreted antigens were associated with further reduction in the incidence of HIV-associated TB. Overall the percentage of subjects with 0, 1, 2 and 3 baseline IFN- γ Responses to mycobacterial preparations who developed HIV-associated TB was 14%, 8%, 7% and 4%, respectively ($P = 0.004$). In a multivariate Cox regression model, the hazard of developing HIV-associated TB was 46% lower with each increment in the number of detectable baseline IFN- γ Responses ($P < 0.001$). **Conclusions:** Among HIV-infected adults who received BCG in childhood and live in a TB-endemic country, polyantigenic IFN- γ Responses are associated with decreased risk of subsequent HIV-associated TB.

156. Laisser RM, Nyström L, Lindmark G, Lugina HI, Emmelin M. Screening of women for intimate partner violence: a pilot intervention at an outpatient department in Tanzania. *Global health action*. 2011; 4:7288.

Intimate partner violence (IPV) is a public health problem in Tanzania with limited health care interventions. To study the feasibility of using an abuse screening tool for women attending an outpatient department, and describe how health care workers perceived its benefits and challenges. Prior to screening, 39 health care workers attended training on gender-based violence and the suggested screening procedures. Seven health care workers were arranged to implement screening in 3 weeks, during March-April 2010. For screening evaluation, health care workers were observed for their interaction with clients. Thereafter, focus group discussions (FGDs) were conducted with 21 health care workers among those who had participated in the training and screening. Five health care workers wrote narratives. Women's responses to screening questions were analyzed with descriptive statistics, whereas qualitative content analysis guided analysis of qualitative data. Of the 102 women screened, 78% had experienced emotional, physical, or sexual violence. Among them, 62% had experienced IPV, while 22% were subjected to violence by a relative, and 9.2% by a work mate. Two-thirds (64%) had been abused more than once; 14% several times. Almost one-quarter (23%) had experienced sexual violence. Six of the health care

workers interacted well with clients but three had difficulties to follow counseling guidelines. FGDs and narratives generated three categories Just asking feels good implied a blessing of the tool; what next? Indicated ethical dilemmas; and fear of becoming a 'women hospital' only indicated a concern that abused men would be neglected. Screening for IPV is feasible. Overall, the health care workers perceived the tool to be advantageous. Training on gender-based violence and adjustment of the tool to suit local structures are important. Further studies are needed to explore the implications of including abuse against men and children in future screening.

157. Laisser RM, Nyström L, Lugina HI, Emmelin M. Community perceptions of intimate partner violence - a qualitative study from urban Tanzania. BMC Women's Health.2011; 11: 13.

Background: Intimate partner violence against women is a prevailing public health problem in Tanzania, where four of ten women have a lifetime exposure to physical or sexual violence by their male partners. To be able to suggest relevant and feasible community and health care based interventions, we explored community members' understanding and their responses to intimate partner violence.**Methods:** A qualitative study using focus group discussions with 75 men and women was conducted in a community setting of urban Tanzania. We analysed data using a grounded theory approach and relate our findings to the ecological framework of intimate partner violence.**Results:** The analysis resulted in one core category, "Moving from frustration to questioning traditional gender norms", that denoted a community in transition where the effects of intimate partner violence had started to fuel a wish for change. At the societal level, the category "Justified as part of male prestige" illustrates how masculinity prevails to justify violence. At the community level, the category "Viewed as discreditable and unfair" indicates community recognition of intimate partner violence as a human rights concern. At the relationship level, the category "Results in emotional entrapment" shows the shame and self-blame that is often the result of a violent relationship. At the individual level, the risk factors for intimate partner violence were primarily associated with male characteristics; the category "Fed up with passivity" emerged as an indication that community members also acknowledge their own responsibility for change in actions.**Conclusions:** Prevailing gender norms in Tanzania

accept women's subordination and justify male violence towards women. At the individual level, an increasing openness makes it possible for women to report, ask for help, and become proactive in suggesting preventive measures. At the community level, there is an increased willingness to intervene but further consciousness-raising of the human rights perspective of violence, as well as actively engaging men. At the macro level, preventive efforts must be prioritized through re-enforcement of legal rights, and provision of adequate medical and social welfare services for both survivors and perpetrators.

158. Lányi Á, Baráth M, Péterfi Z, Bogel G, Orient A, Simon T, Geiszt M. The homolog of the five SH3-domain proteins (HOFI/SH3PXD2B) regulates lamellipodia formation and cell spreading. *PLoS one*. 2011; 6(8): e23653.

Motility of normal and transformed cells within and across tissues requires specialized sub cellular structures, e.g. membrane ruffles, lamellipodia and podosomes, which are generated by dynamic rearrangements of the actin cytoskeleton. Because the formation of these sub-cellular structures is complex and relatively poorly understood, we evaluated the role of the adapter protein SH3PXD2B [HOFI, fad49, Tks4], which plays a role in the development of the eye, skeleton and adipose tissue. Surprisingly, we find that SH3PXD2B is requisite for the development of EGF-induced membrane ruffles and lamellipodia, as well as for efficient cellular attachment and spreading of HeLa cells. Furthermore, SH3PXD2B is present in a complex with the non-receptor protein tyrosine kinase Src, phosphorylated by Src, which is consistent with SH3PXD2B accumulating in Src-induced podosomes. Furthermore, SH3PXD2B closely follows the sub cellular relocalization of cortactin to Src-induced podosomes, EGF-induced membrane ruffles and lamellipodia. Because SH3PXD2B also forms a complex with the C-terminal region of cortactin, we propose that SH3PXD2B is a scaffold protein that plays a key role in regulating the actin cytoskeleton via Src and cortactin.

159. Lema G. Use of clinical risk factors in the assessment of fracture risk and its application in screening for osteoporosis at Muhimbili Orthopedic Institute: a hospital-based cross sectional descriptive study. Master of Medicine (orthopedic and Traumatology) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Use of Clinical risk factors in the assessment of fracture risk and its application in screening for osteoporosis at Muhimbili Orthopedic Institute (MOI). Objective: To determine the Clinical Risk Factors used in the assessment of fracture risk and their application in the screening for osteoporosis at Muhimbili Orthopedic Institute (MOI). **Methods:** This was a cross – sectional hospital based study conducted at Muhimbili Orthopedic Institute from March to December 2009. **Results:** A total of 20,038 trauma patients were managed at Muhimbili Orthopedic Institute during the study period. Among this 560 patients met criteria for this study and were enrolled. Males were 42.9% (240) and female were 57.1% (320) with mean age 53 (SD ± 11) years. Of 560 patients 5.5% (31) had no clinical risk factors for osteoporosis. Males above 60 years had more clinical risk factors for osteoporosis 32.9% than the younger ones 7.6% (p = 0.001). The same was observed in females [46.2% versus 2.1% (p = 0.001)]. More females 64.5% (60) had osteoporotic fractures than males 35.5% (33) (p = 0.116). Independent risk factors for fractures observed in this study were age more than 60 years, body mass index less than 18.5kg/m², cigarette smoking, physical inactivity and excessive alcohol intake. Clinical risk factors strongly associated with osteoporotic fractures in female were underweight (low BMI), Age, heavy cigarette smoking, allergic to milk, amount, duration, and type of alcohol consumed. While in males underweight (low BMI), Age, and sedentary life style (sleeping during the day) were significant associated with osteoporotic fracture. Prevalence of osteoporosis as analyzed by FRAX index tool was 21.3%. Out of 560, 6.8% (38) patients with 10 years probability of major osteoporotic fractures and 14.5% (81) patients with 10 years probability of hip fractures were identified. Females have high probability of osteoporosis hip fractures than males, 16.9% and 11.3% respectively. **Conclusion and Recommendation:** The proportion of adult who are attending or admitted to MOI with (WHO) risk factors for osteoporosis is high. There was a positive correlation of WHO Risk factors for osteoporosis with occurrence of osteoporosis and osteoporotic fractures. Clinical Risk Factors of osteoporosis through the FRAX tool, which have been used for fracture prognostication and screening for osteoporosis in absence of BMD is suitable in Muhimbili Orthopedic Institute. Application of this tool enables us to identify individual at high risk of disabling fractures, thereby allowing careful allocation of expensive treatments to individuals most in need without using BMD determination test.

160. L'Esperance VS, Cox CE, Makani J, Soka D, PrenticeAM, HillCM, KirkhamFJ. Iron status and nocturnal oximetry in paediatric sickle cell anaemia patients. Archives of Disease in Childhood.2011; 96. (1 1): A83-A83.

Aim: To test the hypothesis that low iron status in children with Sickle Cell Anaemia (SCA), not receiving regular blood transfusions, is associated with lower nocturnal haemoglobin oxygen saturation (SpO₂) and more sleep-disordered breathing. **Methods:** 32 children (16 boys, 50%), homozygous for SCA (HbSS; mean age 8.0 years, range 3.6–15.3 years) underwent motion resistant nocturnal oximetry (Masimo Radical). Iron status was assessed by transferrin saturation and averaged steady state haematology indices from the previous year. Only studies with a minimum of 4 h of artifact-free data were included in the analysis. Analysis software yielded standard measures including: mean and minimum SpO₂; d-12s index and desaturation index of 3% or greater from baseline. **Results** 28% (9/32) had low transferrin saturation (<16%) indicating probable iron deficiency, a similar proportion to all SCA patients with data available (25%, N=212/836; unpublished data). There was no association between transferrin saturation and age, sex or nutritional status (body mass index z-score) or history of blood transfusion. There were no statistically significant associations between transferrin saturation and steady state haemoglobin, red cell count, mean cell haemoglobin concentration or mean cell volume in these children. Higher transferrin saturation, but within the normal range (all <55%) and adjusted for age and α -thalassaemia deletion, was associated with lower nocturnal mean SpO₂ (p=0.013, r²=0.41). Higher transferrin saturation was also associated with higher d-12s index, a measure of SpO₂ variability (p=0.004, r²=0.23) and with the number of SpO₂ dips per hour of more than 3% from baseline (p=0.008, r²=0.19). In addition, iron deficiency (transferrin saturation <16%) was associated with an increase of 2.2% in nocturnal mean SpO₂. **Conclusions:** These data suggest that higher iron availability, assessed by transferrin saturation, is associated with nocturnal chronic and intermittent hypoxia. Whether transferrin saturation is aetiologically related to or simply a marker of the observed haemoglobin oxygen desaturation remains to be determined. The longer term consequences of iron status and haemoglobin oxygen desaturation in SCA warrant further detailed investigation in view of the preliminary clinical evidence of a link with unfavourable clinical course.

161. Lingala SG, Hu Y, DiBella E, Jacob M. Accelerated dynamic MRI exploiting sparsity and low-rank structure: *kt SLR*. *Medical Imaging, IEEE Transactions on*. 2011; 30(5): 1042-1054.

We introduce a novel algorithm to reconstruct dynamic magnetic resonance imaging (MRI) data from under-sampled k-t space data. In contrast to classical model based cine MRI schemes that rely on the sparsity or banded structure in Fourier space, we use the compact representation of the data in the Karhunen Louve transform (KLT) domain to exploit the correlations in the dataset. The use of the data-dependent KL transform makes our approach ideally suited to a range of dynamic imaging problems, even when the motion is not periodic. In comparison to current KLT-based methods that rely on a two-step approach to first estimate the basic functions and then use it for reconstruction, we pose the problem as a spectrally regularized matrix recovery problem. By simultaneously determining the temporal basis functions and its spatial weights from the entire measured data, the proposed scheme is capable of providing high quality reconstructions at a range of accelerations. In addition to using the compact representation in the KLT domain, we also exploit the sparsity of the data to further improve the recovery rate. Validations using numerical phantoms and in vivo cardiac perfusion MRI data demonstrate the significant improvement in performance offered by the proposed scheme over existing methods.

162. Lingala SG, Nadar M, Chef d'hôtel C, Zhang L, Jacob M. Unified reconstruction and motion estimation in cardiac perfusion MRI. In *Biomedical Imaging: From Nano to Macro*, 2011 *IEEE International Symposium on*. 2011: 65-68).

We introduce a novel unifying approach to jointly estimate the motion and the dynamic images in first pass cardiac perfusion MR imaging. We formulate the recovery as an energy minimization scheme using a unified objective function that combines data consistency, spatial smoothness, motion and contrast dynamics penalties. We introduce a variable splitting strategy to simplify the objective function into multiple sub problems, which are solved using simple algorithms. These sub-problems are solved in an iterative manner using efficient continuation strategies. Preliminary validation using a numerical phantom and in-vivo perfusion data

demonstrate the utility of the proposed scheme in recovering the perfusion images from considerably under-sampled data.

163. Liso NM, Jacob M, Smyrnaio M, Schon S, Kurner T. Basic concepts for the modeling and correction of GNSS multipath effects using ray tracing and software receivers. In *Antennas and Propagation in Wireless Communications (APWC), 2011 IEEE-APS Topical Conference on. 2011: 890-893.*

Satellite positioning accuracy is degraded by multipath propagation between satellite and the receiver. In this paper we give an overview of a new approach to model and correct this impairment, and present some preliminary results. High accuracy 3D laser scanning is utilized to model the environment. This gives an accurate basis for the characterization of the satellite to earth radio channel by using ray tracing. The information extracted from the ray tracing simulations is used to design correction algorithms that will be implemented in GNSS software defined radio (SDR) receivers.

164. Löffler T, Seiler CM, Rossion I, Kijak T, Thomusch O, Hodina R, Weitz J. Hand-suture versus stapling for closure of loop ileostomy: HASTA-Trial: *a study rationale and design for a randomized controlled trial. Trials. 2011; 12(1):34.*

Background: Colorectal cancer is the second most common tumor in developed countries, with a lifetime prevalence of 5%. About one third of these tumors are located in the rectum. Surgery in terms of low anterior resection with mesorectal excision is the central element in the treatment of rectal cancer being the only option for definite cure. Creating a protective diverting stoma prevents complications like anastigmatic failure and meanwhile is the standard procedure. Bowel obstruction is one of the main and the clinically and economically most relevant complication following closure of loop ileostomy. The best surgical technique for closure of loop ileostomy has not been defined yet. **Methods/Design:** A study protocol was developed on the basis of the only randomized controlled mono-center trial to solve clinical equipoise concerning the optimal surgical technique for closure of loop ileostomy after low anterior resection due to rectal cancer. The HASTA trial is a multi-center pragmatic randomized controlled surgical trial with two

parallel groups to compare hand-suture versus stapling for closure of loop ileostomy. It will include 334 randomized patients undergoing closure of loop ileostomy after low anterior resection with protective ileostomy due to rectal cancer in approximately 20 centers consisting of German hospitals of all level of health care. The primary endpoint is the rate of bowel obstruction within 30 days after ileostomy closure. In addition, a set of surgical and general variables including quality of life will be analyzed with a follow-up of 12 months. An investigators meeting with a practical session will help to minimize performance bias and enforce protocol adherence. Centers are monitored centrally as well as on-site before and during Recruitment phase to assure inclusion, treatment and follow up according to the protocol. **Discussion:** Aim of the HASTA trial is to evaluate the efficacy of hand-suture versus stapling for closure of loop ileostomy in patients with rectal cancer.

165. Lupondo VM, Museru LM, Mcharo CN. Forequarter Amputation at Muhimbili Orthopaedic Institute: indications and Outcome. East and Central African Journal of Surgery. 2011; 16(1).

Amputation through the scapulo-thoracic articulations is a radical surgical procedure. Although it is rarely performed, it remains a valuable surgical option for malignancy and severe injuries around the shoulder joint. In this review we present five cases of Fore Quarter Amputation done at Muhimbili Orthopaedic Institute between 2006 – 2010 with emphasis on the indication, outcome and its significance in developing countries.

166. Lwoga ET, Ngulube P, Stilwell C. Challenges of managing indigenous knowledge with other knowledge systems for agricultural growth in sub-Saharan Africa. Libri. 2011; 61 (3):226-238.

This article provides a systematic analysis of the challenges of managing agricultural indigenous knowledge (IK), and accessing external knowledge in the rural areas of sub-Saharan Africa, with a specific focus on Tanzania. Semi-structured interviews were used to collect primary data from 181 small-scale farmers in the six districts of Tanzania. The findings indicated that farmers faced various challenges in managing their IK, and accessing external knowledge, which ranged from

personal and social barriers, to factors in the external environment such as infrastructure, policy, Intellectual Property Rights (IPR), and weak linkages between research, extension services and farmers. Farmers also faced challenges when using information and communication technologies (ICTs) to manage their knowledge, such as personal, socio-cultural, infrastructural, technical, and economic factors. It is thus important for the government to improve access to extension services, review the IPR system, enhance rural electrification, telecommunications and roads infrastructure. Further, the knowledge providers (i.e. agricultural extension officers, researchers, educators, libraries, non governmental organisations, civil society, and other agricultural actors) should nurture a knowledge sharing culture. Farmers need to be assisted and trained to document their knowledge, map communities' IK bearers and innovators, use multiple formats (print and ICTs) with traditional communication channels (for instance, folklore and apprenticeships) specific to a local context to disseminate knowledge. Participatory approaches should be employed in knowledge production and dissemination in order to include farmers' needs and expressing knowledge in the resulting technologies, practices and new knowledge. In this way linkages between indigenous and external knowledge would be enhanced for improved farming activities in the local communities.

167. Lwoga ET, Stilwell C, Ngulube P. Access and use of agricultural information and knowledge in Tanzania. Library Review. 2011; 60 (5): 383-395.

Purpose: The purpose of this study is to assess access to and use of agricultural knowledge and information in the rural areas of Tanzania. Design/methodology/approach: Mixed quantitative, qualitative and participatory methods were deployed. Semi-structured interviews were used to collect qualitative and quantitative data from 181 farmers in six districts of Tanzania. Focus groups and participatory techniques (i.e. information mapping and linkage diagrams) were also used to collect qualitative data from 128 farmers in the same districts. Findings: The results showed that deep, rich and complete data can be collected through the mixed quantitative, qualitative and participatory techniques. The findings demonstrated that the knowledge and information needs, and information-seeking patterns of farmers were location specific. The major sources of information for farmers were predominantly local (neighbours, friends and family), followed by public extension services. Apart from radio and cell phones, advanced

technologies (i.e. internet and e-mail) and printed materials were used at a low rate despite their existence in the communities. Research limitations/implications: The study necessitates a need to conduct regular studies on information needs, map communities' knowledge and information sources, create awareness of information sources and knowledge culture, use participatory methods in design and development of technologies and use multiple sources of knowledge and information (such as print and technologies) to deliver relevant information to farmers. Originality/value: The study provides a deep understanding of access to and use of agricultural knowledge and information in the rural areas, which necessitates a need for demand-led and client-based knowledge and information services in order to meet the disparate farmers' needs. These findings can serve as an example for the increasing use of mixed quantitative, qualitative and participatory methods in information behavior research.

168. Lwoga ET. Knowledge management approaches in managing agricultural indigenous and exogenous knowledge in Tanzania. *Journal of Documentation*. 2011; 67(3): 407-430.

169. Lwoga ET. Making Web 2.0 technologies work for higher learning institutions in Africa. *Campus-Wide Information Systems*. 2011; 29(2): 90-107.

170. Lyamuya EF, Moyo SJ, Komba EV, Haule M. Prevalence, antimicrobial resistance and associated risk factors for bacteriuria in diabetic women in Dar es Salaam Tanzania. *Afr J Microbial Res*. 2011; 5(6): 683-689.

Urinary tract infections (UTIs) occur frequently among women with diabetes. The present study aimed at determining prevalence and risk factors of bacteriuria in diabetic women and antimicrobial resistance pattern of the isolates at Muhimbili National Hospital (MNH), Dar es Salaam. Three hundred diabetic women attending clinic at MNH from June to November 2010 were included in the study. Demographic and clinical information were collected using a structured questionnaire. Urine specimens were collected for urinalysis, microscopy, culture and antimicrobial susceptibility testing. Significant, asymptomatic and symptomatic bacteriuria was found in 13.7% (41/300), 13.4% (31/231), and 14.5% (10/69) diabetic women, respectively. The

isolated pathogens were *Escherichia coli* (39.0%), *Klebsiella pneumonia* (22.0%), coagulase negative *Staphylococci* (14.65) and *Proteus spp.* (12.2%). Both Gram positive and negative bacteria showed high rate of resistance towards co-trimoxazole (55.6% and 50.0%, respectively). Gram negative bacteria showed high rate of resistance to ampicillin (62.55%), penicillin (53.1%) and moderate resistance to cefotaxime (18.8%). Advanced age and glycosuria were significantly associated with bacteriuria ($P < 0.05$). *E. coli* was the commonest aetiological agent for both symptomatic and asymptomatic bacteriuria among diabetic women, especially those with advanced age and glycosuria. Most uropathogens were resistant to co-trimoxazole, ampicillin and ciprofloxacin.

171. Mackintosh M, Chaudhuri S, Mujinja PGM. Can NGOs regulate medicines markets? Social enterprise in wholesaling, and access to essential medicines. *Globalization and Health*.2011; 7: 4.

Background: Citizens of high income countries rely on highly regulated medicines markets. However low income countries' impoverished populations generally struggle for access to essential medicines through out-of-pocket purchase on poorly regulated markets; results include ill health, drug resistance and further impoverishment. While the role of health facilities owned by non-governmental organisations (NGOs) in low income countries is well documented, national and international wholesaling of essential medicines by NGOs is largely unstudied. This article describes and assesses the activity of NGOs and social enterprise in essential medicines wholesaling.**Methods:** The article is based on a set of interviews conducted in 2006-8 with trading NGOs and social enterprises operating in Europe, India and Tanzania. The analysis applies socio-legal and economic perspectives on social enterprise and market regulation.**Results:** Trading NGOs can resist the perverse incentives inherent in medicines wholesaling and improve access to essential medicines; they can also, in definable circumstances, exercise a broader regulatory influence over their markets by influencing the behaviour of competitors. We explore reasons for success and failure of social enterprise in essential medicines wholesaling, including commercial manufacturers' market response; social enterprise traders' own market strategies; and patterns of market advantage, market segmentation and subsidy generated by donors.**Conclusions:** We conclude that, in the absence of effective

governmental activity and regulation, social enterprise wholesaling can improve access to good quality essential medicines. This role should be valued and where appropriate supported in international health policy design. NGO regulatory impact can complement but should not replace state action.

172. Magadula JJ, Tewtrakul S, Gatto J, Richmond P. In vitro antioxidant and anti-HIV-1 protease (PR) activities of two Clusiaceae plants endemic to Tanzania. *International Journal of Biological and Chemical Sciences*. 2011; 5(3).

In this study, the ethanol extracts from *Allanblackia ulugurensis* Engl. and *Mammea usambarensis* Verdc. Were evaluated for their antioxidant and anti-HIV PR activities. Among the tested extracts, the stem bark extract of *M. usambarensis* showed the highest DPPH activity value of $6,165 \pm 152 \mu\text{mol TE/g}$, which is more than twice as higher as that of the standard (Chlorogenic acid, $3,056 \pm 157 \mu\text{mol TE/g}$). Furthermore, in the Oxygen Radical Absorbance Capacity (ORAC) assay, the crude extracts of the stem bark of *M. usambarensis* and root bark of *A. ulugurensis* showed significant activity at $12,282 \pm 413$ and $10,342 \pm 562 \mu\text{mol TE/g}$ respectively with standard compound (Chlorogenic acid) showing ORAC activity at $11,077 \pm 236 \mu\text{mol TE/g}$. For anti-HIV-1 PR assay from the same extracts, the root bark and stem bark of *A. ulugurensis* showed strong inhibitory activities against HIV-1 protease with IC₅₀ values of 4.1 and 5.6 $\mu\text{g/ml}$, respectively while that of the standard, Acetyl pepstatin, was at 2.2 $\mu\text{g/ml}$. This study has shown the potential of the Clusiaceae extracts as the source of possible lead compounds for antioxidants and anti-HIV drugs. Physicochemical screening indicated the presence of phenolic compounds while isolation of active principles from active fractions is inevitable.

173. Majinge PMC. Treatment outcome of cervical cancer patients at ocean road cancer institute, Dar es Salaam. Master of Medicine (Obstetrics and Gynecology) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Cervical cancer is the second commonest malignancy in females globally. Cancer of the cervix has a devastating impact on women's health in developing countries especially

Africa since more than 75% of the worldwide burden of the disease occurs in these countries. It is the leading malignancy among women in Tanzania. Patients' late presentation to hospitals and poverty lead to very poor treatment outcome of the disease. Many of these countries put much resources and efforts on the treatment aspect of the disease, and hence the need to investigate the treatment outcome among patients with cervical cancer. Objectives: To describe the treatment outcome among patients diagnosed to have cervical cancer and treated at the Ocean Road Cancer Institute (ORCI). **Methodology:** The study was a retrospective review of case files of women with histological proven cancer of cervix that were treated at ORCI from 1st January to 31st December 2007. Each individual had had a three year follow up as of 31st December 2010. Patients file number, residence and phone numbers were obtained from a registration book, files were then collected and the required information extracted using a designed checklist. **Results:** A total of 630 patients were included in the study with median age of 51 years (± 12.7 SD), range of 24 - 90 years. At the end of a three-year follow-up of these patients, 135 (21.4%) were alive and 114 (18.1%) had died while 381 (60.5%) were lost to follow-up; number of lost in follow up was increasing in subsequent years. More than three quarters of patients presented with advanced stage of the disease (beyond stage IIb, and squamous cell carcinoma was the most common ($> 90\%$) whereas a few had adenocarcinoma and adenosquamous. Majority of patients (83.7%) were treated with teletherapy (external beam radiation) only while a very few patients had an addition of brachytherapy **Conclusion:** Most patients presented with advanced stage of the disease. External beam radiation was seen to be the mode of treatment which was given to most of the patients, dose of radiation given as well as the stage of cervical cancer play a big role in the treatment outcome. Adherence to the follow up clinics seems to be a problem to most of patients, hence the outcome of treatment to most of patients was difficult to assess though the outcome seems to be poor Recommendation: More centers for cancer detection and treatment are needed national wide, installation of national cancer registry and cancer treatment protocols is very important.

174. Makanga M, Bassat Q, Falade CO, Premji ZG, Krudsood S, Hunt P, Walter V, Beck HP, Marrast AC, Cousin M, Rosenthal PJ. Efficacy and safety of artemether-lumefantrine in the treatment of acute, uncomplicated Plasmodium falciparum malaria: A pooled analysis. *American Journal of Tropical Medicine and Hygiene*. 2011; 85 (5):793-804.

Randomized trials have confirmed the efficacy and safety of artemether-lumefantrine (AL) for treatment of uncomplicated *Plasmodium falciparum* malaria. Data from seven studies supported by Novartis (1996-2007), including 647 adults (> 16 years of age, 83.3% completed the study) and 1,332 children (= 16 years of age, 89.3% completed the study) with microscopically confirmed uncomplicated *P. falciparum* malaria and treated with the recommended regimen of AL, were pooled. The 28-day polymerase chain reaction-corrected parasitologic cure rate (primary efficacy endpoint) was 97.1% (495 of 510) in adults and 97.3% (792 of 814) in children (evaluatable population). Gametocytemia prevalence after day was 4.2% (23 of 554) in adults and 0.9% (8 of 846) in children. No noteworthy safety signals were observed. Serious adverse events occurred in 1.4% of the adults and 1.3% of the children. This study is the largest data set to date assessing AL therapy for treatment of acute uncomplicated *P. falciparum* malaria. Artemether-lumefantrine showed high cure rates and rapid resolution of parasitemia, fever, and gametocytemia in adults and children, and showed an excellent safety and tolerability profile.

175. Makani J, Cox SE, Soka D, Komba AN, Oruo J , Mwamtemi H, Magesa P, Rwezaula S, Meda E, Mgaya J, Lowe B, Muturi D, Roberts D, Williams TN, Pallangyo K, Kitundu J, Fegan G, Kirkham F, Marsh K, Newton CR. Mortality in sickle cell anemia in Africa: A prospective cohort study in Tanzania. PLoS ONE.2011; 6 (2): e14699.

Background: The World Health Organization has declared Sickle Cell Anemia (SCA) a public health priority. There are 300,000 births/year, over 75% in Africa, with estimates suggesting that 6 million Africans will be living with SCA if average survival reaches half the African norm. Countries such as United States of America and United Kingdom have reduced SCA mortality from 3 to 0.13 per 100 person years of observation (PYO), with interventions such as newborn screening, prevention of infections and comprehensive care, but implementation of interventions in African countries has been hindered by lack of locally appropriate information. The objective of this study was to determine the incidence and factors associated with death from SCA in Dar-es-Salaam. **Methods and Findings:** A hospital-based cohort study was conducted, with prospective surveillance of 1,725 SCA patients recruited from 2004 to 2009, with 209 (12%) lost to follow up, while 86 died. The mortality rate was 1.9 (95%CI 1.5, 2.9) per 100 PYO, highest

under 5-years old [7.3 (4.8-11.0)], adjusting for dates of birth and study enrollment. Independent risk factors, at enrollment to the cohort, predicting death were low hemoglobin (<5 g/dL) [3.8 (1.8-8.2); p = 0.001] and high total bilirubin (=102 μmol/L) [1.7 (1.0-2.9); p = 0.044] as determined by logistic regression. **Conclusions:** Mortality in SCA in Africa is high, with the most vulnerable period being under 5-years old. This is most likely an underestimate, as this was a hospital cohort and may not have captured SCA individuals with severe disease who died in early childhood, those with mild disease who are undiagnosed or do not utilize services at health facilities. Prompt and effective treatment for anemia in SCA is recommended as it is likely to improve survival. Further research is required to determine the etiology, pathophysiology and the most appropriate strategies for management of anemia in SCA.

176. Makani J, Menzel S, Nkya S, Cox S, Drasar E, Soka D, Komba AN, Mgaya J, Rooks H, Vasavda N, Fegan G, Newton CR, Farrall M, Thein SL. Genetics of fetal hemoglobin in Tanzanian and British patients with sickle cell anemia. *Blood*.2011; 117 (4):1390-1392.

Fetal hemoglobin (HbF, α₂β₂) is a major contributor to the remarkable phenotypic heterogeneity of sickle cell anemia (SCA). Genetic variation at 3 principal loci (HBB cluster on chromosome 11p, HBS1L-MYB region on chromosome 6q, and BCL11A on chromosome 2p) have been shown to influence HbF levels and disease severity in β-thalassemia and SCA. Previous studies in SCA, however, have been restricted to populations from the African diaspora, which include multiple genealogies. We have investigated the influence of these 3 loci on HbF levels in sickle cell patients from Tanzania and in a small group of African British sickle patients. All 3 loci have a significant impact on the trait in both patient groups. The results suggest the presence of HBS1L-MYB variants affecting HbF in patients who are not tracked well by European-derived markers, such as rs9399137. Additional loci may be identified through independent genome-wide association studies in African populations.

177. Makubi A, Lwakatare L, Magesa P. The Multifactorial Nature of Thromboembolic and Bleeding Complications among Patients with Mechanical Heart Valves in Tanzania. *Tanzania Medical Journal*. 2011; 25. (2): 21-27.

Background: Thromboembolic and bleeding complications are the main causes of morbidity and mortality in patients with mechanical heart valves¹. The risk factors for these complications in Tanzania have not been established. **Methods:** A retrospective cohort study was conducted among patients with mechanical heart valves operated from 1990 to 2003 attending the Muhimbili National Hospital. Information on occurrence and risk factors for thromboembolic and bleeding complications was obtained from medical records and interview. **Findings:** Among the 232 study patients, 59(25.4%) suffered a total of 83 thromboembolic episodes. In a multivariate Cox regression analysis, residing very far away from only anticoagulation in Dar es Salaam and mitral valve replacement were found to be predictors of thromboembolism. In a univariate (not multivariate) logistic regression analysis, increased left ventricular diameters, mean aortic valves pressure gradient and reduced ejection fraction were significantly associated with thromboembolism. The study also indicated that 87 (37.5%) patients suffered a total of 132 bleeding events. In the multivariate Cox regression of potential risk factors, those patients who attended both cardiac and anticoagulation clinic had less episodes of bleeding complications compared to those who had attended cardiac clinic only. Patients who had no history of /coexisting bleeding disorder at baseline were found to have a reduced risk of bleeding complications compared to those who had. **Conclusions:** The cause of thromboembolic and bleeding complications was multifactor in nature and management should be focused in identifying these multiple factors.

178. Makubi A, Mugusi F, Magesa P, Roberts D, Quaresh A. The burden and morphological types of anaemia among HIV infected children in Dar es salaam, Tanzania. Tanzania Medical Journal. 2011; 25 (1) 13-16.

Background: There is paucity of data describing magnitude of anaemia among HIV infected children in Tanzania. Most of the studies among anaemic Tanzanian children were conducted before the era of HIV and HAART. **Materials and Methods:** This was a cross sectional study aimed at determining the prevalence and morphological types of anaemia among HIV-infected children attending public hospitals in Dar es Salaam. The prevalence of anaemia was determined as a percentage among all children infected with HIV. To describe the spectrum of red blood cell (RBC) morphology on blood films a pairwise comparison was conducted using Chi square test or

Fisher's exact test. Findings: In this study the overall prevalence of anaemia (Hb<11g/dl) among 167 HIV infected children attending public hospitals was 44%. Among enrolled children, 35 (21.1%) had mild anaemia, 14(8.4%) had moderate anaemia and 26(15.6%) had severe anaemia. Microcytic anaemia was found to be the commonest (73%) type of anaemia followed by normocytic normochromic anaemia. The abnormal red blood cell shape (P=0.02), microcytosis (P<0.001), hypochromia (P<0.001), and abnormal platelet morphology (P<0.001), were common in anaemic HIV infected children compared to those who had no anaemia **Conclusions and recommendations:** The finding suggests that anaemia is common among HIV children even in the era of HAART. Microcytic hypo chromic anemia was the commonest type of anaemia suggesting the role of iron deficiency or anaemia of chronic infection. Further studies on the aetiology of anaemia in HIV infected children are needed.

179. Makundi RH, Massawe AW. Ecologically based rodent management in Africa: potential and challenges. *Wildlife Research*. 2011; 38(7): 588-595.

Rodent management in agriculture remains a major challenge in developing countries where resource-poor farmers are ill equipped to deal with pest species. It is compounded by unpredictable outbreaks, late control actions, lack of/or inadequate expert interventions, expensive rodenticides and other factors. Ecologically based rodent management (EBRM) is recommended as the way forward for rodent management in Africa. EBRM relies on understanding the ecology of pest species and formulating this knowledge into management programs. The present paper evaluates the potential for establishing EBRM in Africa and the challenges that have to be overcome to implement it. The major constraints for establishing EBRM in Africa include the absence of key studies on the taxonomy and ecology of rodents, inadequate research on EBRM, lack of knowledge by farmers on available technologies and agricultural policies that are unfavorable. The development of EBRM and its success in Asia is a strong encouragement to African scientists to develop similar management strategies for the most important pest species such as the multimammate rats, *Mastomys natalensis*. EBRM initiatives such as the Development of Ecologically Based Rodent Management for the Southern Africa Region (ECORAT) project undertook studies on e.g. rodent ecology, taxonomy, knowledge, attitude and practices and rodent-human interactions in rural agricultural

communities. Through this project, EBRM interventions were introduced in Tanzania, Swaziland and Namibia to provide solutions to local rodent-pest problems. Intervention actions including community-based intensive trapping of rodents, habitat manipulation and sanitary measures demonstrated that the impacts of rodents on communities could be drastically reduced. EBRM programs in Africa must address how to change attitudes of target communities, building scientific capacity, implanting rodent-management skills by translating the developed technologies and strategies into simple understandable and easy-to-implement actions and influencing policy makers to accept the concepts and practices to be introduced. Further, we need to demonstrate that EBRM is economically feasible and sustainable and that through community participation, EBRM will become deeply rooted in those communities.

180. Malebo HM, Mbwambo ZH. Technical report on miracle cure prescribed by rev. Ambilikile Mwasupile in Samunge Village, Loliondo, Arusha. National Institute for Medical Research and Institute of Traditional Medicine, Dar es Salaam, Tanzania. (2011).

181. Mariita RM, Orodho JA, Okemo PO, Kirimuhuza C, Otieno JN, Magadula JJ. Methanolic extracts of Aloe secundiflora Engl. inhibits in vitro growth of tuberculosis and diarrhea-causing bacteria. Pharmacognosy Research.2011; 3 (2): 95-99.

Background: The emergence of resistance to antimicrobials by pathogens has reached crisis levels, calling for identification of alternative means to combat diseases. Objective: To determine antimicrobial activity of crude methanolic extract of Aloe secundiflora Engl. from Lake Victoria region of Kenya. **Materials and Methods:** Extract was tested against four strains of mycobacteria (Mycobacterium tuberculosis, M. kansasii, M. fortuitum and M. smegmatis), Salmonella typhi, Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli, Klebsiella pneumoniae and a fungus Candida albicans. Activity of the extract was determined using BACTEC™ MGIT™ 960 system. General antibacterial and antifungal activity was determined using standard procedures: zones of inhibition, Minimum Inhibitory Concentrations (MICs) and Minimum Bactericidal/Fungicidal Concentrations (MBCs/MFCs). Results: The extract was potent against M. fortuitum, M. smegmatis and M. kansasii where it completely inhibited growth (Zero growth units (GUs)) in all the extract concentrations used. It gave strong

antimycobacterial activity (157 GUs) against *M. tuberculosis*. It showed strong antimicrobial activity ($P=0.05$), giving inhibition zones =9.00 mm against most microorganisms, such as *P. aeruginosa* (MIC 9.375 mg mL⁻¹ and MBC of 18.75 mg mL⁻¹), *E. coli* (both MIC and MBC of 18.75 mg mL⁻¹), *S. aureus* and *S. typhi* (both with MIC and MBC of 37.5 mg mL⁻¹). Preliminary phytochemistry revealed presence of terpenoids, flavonoids and tannins. **Conclusion:** The data suggests that *Aloe secundiflora* could be a rich source of antimicrobial agents. The result gives scientific backing to its use by the local people of Lake Victoria region of Kenya, in the management of conditions associated with the tested microorganisms.

182. Marpegan L, Swanstrom AE, Chung K, Simon T, Haydon PG, Khan SK, Beaulé C. Circadian regulation of ATP release in astrocytes. *The Journal of Neuroscience*. 2011; 31(23):8342-8350.

Circadian clocks sustain daily oscillations in gene expression, physiology, and behavior, relying on transcription–translation feedback loops of clock genes for rhythm generation. Cultured astrocytes display daily oscillations of extracellular ATP, suggesting that ATP release is a circadian output. We hypothesized that the circadian clock modulates ATP release via mechanisms that regulate acute ATP release from glia. To test the molecular basis for circadian ATP release, we developed methods to measure in real-time ATP release and Bmal1::dLuc circadian reporter expression in cortical astrocyte cultures from mice of different genotypes. Daily rhythms of gene expression required functional Clock and Bmal1, both Per1 and Per2, and both Cry1 and Cry2 genes. Similarly, high-level, circadian ATP release also required a functional clock mechanism. Whereas blocking IP3 signaling significantly disrupted ATP rhythms with no effect on Bmal1::dLuc cycling, blocking vesicular release did not alter circadian ATP release or gene expression. We conclude that astrocytes depend on circadian clock genes and IP3 signaling to express daily rhythms in ATP release.

183. Maselle AY, Mashalla YJ, Kayombo EJ, Mwaiselage JD, Mwamba NE, Kaniki I. Reducing therapeutic injection overuse through patients-prescribers Interaction Group Discussions in Kinondoni District, Dar es Salaam, Tanzania. *Tanzania journal of health research*. 2011; 13(1): 69-73.

Inappropriately prescription of injections has been reported in developing and developed countries. Previous studies in Tanzania showed that over 70% of patients attending out-patient clinics at private dispensaries received at least one injection per consultation, a value higher than WHO recommended target of 10%. This is of concern considering the likelihood of adverse effects of possible use of unsafe syringes to transmit HIV, hepatitis B and C, poliomyelitis and added economic impact on the patient and the healthcare system. This study aimed to investigate the impact of Interaction Group Discussion on behavioral change on injection prescribing practices in ten selected public dispensaries in Kinondoni District, Dar es Salaam, Tanzania. Patient records of injection prescriptions were obtained covering the period three months prior to the study from 5 randomly selected control and 5 randomly selected intervention facilities. At each health facility IGDs were conducted for one month on mothers and prescribers followed by a survey 3 months after IGD to determine the impact of IGDs. Chi-square statistical calculations were made to compare data on the percent of prescriptions with an injection prescribed and in those conforming to national standard treatment guidelines (STG) between baseline and 3 months follow up. Results showed no significant difference between the percentage of prescriptions with an injection prescribed at baseline and 3 months follow-up in public dispensaries ($P > 0.05$, χ^2 test). Prescribed injections that complied with STG was low at baseline and did not significantly improve 3 months after ($P > 0.05$, χ^2 test). Comprehensive studies and sensitization of compliance to STG by prescribers are recommended.

184. Massawe AW, Makundi RH. The type of farming practice may affect the movement and reproduction pattern of rodents in crop fields: A case study of *Mastomys natalensis*. *J. Biol. Sci.* 2011; 11: 22-30.

A Capture-Mark-Release study was carried out in crop fields in Morogoro, Tanzania, to investigate how the movement and reproduction of multimammate field rats, *Mastomys natalensis*, was influenced by farming practices. Two land preparation methods and two cropping systems were investigated in a Complete Randomized Design (CDR) experiment with 2x2 factors. The results showed that females and males differed significantly in their movements in the different land management practices (Wald Stat =16.27; DF = 1 and $p =$

0.001). It was also observed that land preparation methods and cropping systems had no significant effect on the proportion of females and males in the population. However, significant changes in the proportions of both sexes occurred with time and these were influenced by cropping systems for females ($F(29,120) = 1.612$; $p = 0.039$) and land preparation methods for males in the population ($F(29,120) = 2.1352$; $p < 0.001$). The distribution of females with perforated vagina was significantly influenced by the land preparation methods ($p = 0.05$) and was higher in the slash and burn fields than in the tractor ploughed fields (Tukey LSD test; $F(1, 32) = 11.199$; $p < 0.001$). An interaction between land preparation methods and cropping system on the distribution of sexually active females in the population was found ($F(1, 12) = 5.279$, $p = 0.040$). Therefore one could generalize that the slash and burn fields were more conducive for breeding and consequently higher increase in the population of *M. natalensis* due to better food conditions.

185. Massawe AW, Mulungu LS, Makundi RH, Dlamini N, Eiseb SJ, Kirsten F, Belmain SR. Spatial and temporal population dynamics of rodents in three geographically different regions in Africa : implication for ecologically-based rodent management. *African Zoology*. 2011; 46(2): 393-405.

As part of a three-year study to develop ecologically-based rodent management (EBRM) in southern Africa, a capture-mark-recapture study was carried out in Tanzania, Namibia and Swaziland to establish the demographic patterns and population dynamics of rodents. Two study grids were established in each country. In Tanzania, ten species of rodents and one shrew (*Crocidura* sp.) were identified in the study area. The rodent species consisted of *Mastomys natalensis*, *Aethomyschrysophilus*, *Arvicanthisneumanni*, *Gerbilliscusvicina*, *Acomys spinosissimus*, *Lemniscomysgriselda*, *Lemniscomys zebra*, *Rattus*, *Graphiurus* sp. and *Mus minutoides*. *Mastomys natalensis* was dominant and contributed more than 70% of the captures. In Namibia, five species were captured, namely *Mastomys natalensis*, *Gerbilliscusleucogaster*, *Saccostomus campestris*, *Mus minutoides* and *Steatomys pratensis*. *Mastomys natalensis* contributed about 50% of the captures. In Swaziland, only *M. natalensis* was captured in the study grids. There was a clear pattern in the population dynamics, with breeding confined to the wet seasons in the three countries. *Mastomys natalensis* was the

dominant pest species, for which EBRM should focus on. The highest population density of *M. natalensis* occurred during and after the rains, which coincided with the most susceptible phenological stage of crops. The breeding seasonality and density fluctuations observed in the three countries conform with observations made elsewhere in Africa, which support the hypothesis that rainfall events promote primary productivity on which murid rodents depend. Development of EBRM in these countries will be determined by the local conditions and how they influence the demographic processes of the rodent populations. EBRM should make use of the available ecological knowledge of the local rodent pest species and the focus should be on (ecological) management practices applicable at the community level including community based intensive trapping, field hygiene, removing cover and sources of food for rodents.

186. Massele AY, Mashalla YJ, Kayombo EJ, Mwaiselage JD, Mwamba NE, Kaniki I. Reducing therapeutic injection overuse through patients-prescribers interaction group discussions in Kinondoni District, Dar es Salaam, Tanzania. *Tanzania Journal of Health Research*.2011; 13 (1), 87-92.

Inappropriately prescription of injections has been reported in developing and developed countries. Previous studies in Tanzania showed that over 70% of patients attending out-patient clinics at private dispensaries received at least one injection per consultation, a value higher than WHO recommended target of 10%. This is of concern considering the likelihood of adverse effects of possible use of unsafe syringes to transmit HIV, hepatitis B and C, poliomyelitis and added economic impact on the patient and the healthcare system. This study aimed to investigate the impact of Interaction Group Discussion on behavioural change on injection prescribing practices in ten selected public dispensaries in Kinondoni District, Dar es Salaam, Tanzania. Patient records of injection prescriptions were obtained covering the period three months prior to the study from 5 randomly selected control and 5 randomly selected intervention facilities. At each health facility IGDs were conducted for one month on mothers and prescribers followed by a survey 3 months after IGD to determine the impact of IGDs. Chi-square statistical calculations were made to compare data on the percent of prescriptions with an injection prescribed and in those conforming to national standard treatment guidelines (STG) between baseline and 3 months follow up. Results showed no significant difference between the percentage of

prescriptions with an injection prescribed at baseline and 3 months follow-up in public dispensaries ($P > 0.05$, X² test). Prescribed injections that complied with STG was low at baseline and did not significantly improve 3 months after ($P > 0.05$, X² test). Comprehensive studies and sensitization of compliance to STG by prescribers are recommended.

187. Matiko D. Managing disposal of unwanted pharmaceuticals at health facilities in Tanzania: a case of Dar es Salaam region public health facilities. Master of Science (Pharmaceutical Management) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: In the public sector medicines are the property of the state, for which strict accounting procedures to write-off the unwanted pharmaceutical stock are necessary (Public Finance Act & Regulations, 2004). This applies both to medicines that are procured through the normal channels and to donate medicines. For quite a long time, disposal of unwanted medicines e.g. especially expired pharmaceuticals in the country has not been done systematically and professionally due to a number of factors that are yet to be clearly explained. This has resulted to accumulation of unwanted medicines in health facilities and medicines outlets in the country.

Objectives: The study examined current pharmaceutical disposal practices and identified challenges encountered in the safe disposal of unwanted pharmaceuticals in Tanzania.

Methodology: The study was a descriptive cross sectional survey. Data were collected through interview of medicines store in-charges/pharmacists from a sample of 63 selected health facilities on relevant issues with regard to safe disposal of unwanted pharmaceuticals. Furthermore the investigator reviewed records of previously disposed pharmaceuticals and those of unwanted medicines stock that is awaiting disposal.

Results: Most of the public health facilities' pharmacy stores personnel (73.4%) were no pharmaceutical professionals hence have inadequate essential pharmaceutical management skills and low knowledge (34%) hence leading to poor handling of unwanted medicines. Since medicines in public health facilities are public properties thus are treated just like other properties like vehicles in their write –off and disposal procedures as per Public Finance Act & Regulations, 2004. Main disposal methods for unwanted drugs from the surveyed health facilities comprised of crushing and burying (72.4%) at the Dar es Salaam dumpsite open burning (31.0%) at the dumpsite, though not advisable under TFDA Guidelines

for safe disposal, and incineration (37.9%); this is attributable to inadequate enforcement by TFDA. **Conclusions and Recommendations:** Managing disposal of unwanted medicines at public health facilities is highly associated with a number daunting challenges such as inadequate enforcement by TFDA, legal constraints (public Finance Act & Regulations, 2004); long procurement procedures at MSD, donation medicines (with short expiries) prescribing patterns (brand names prescriptions) and inadequate number of pharmaceutical staff. It is recommended that TFDA should now increase efforts such as frequent inspections at public facilities; facilities should only receive donations having 6 months shelf life remaining upon arrival in the country; and the MOHSW should enforces generic drugs prescribing as well as strengthen its efforts of ensuring that staffs of pharmaceutical cadre increase with the demand of service provisions.

188. Matsevych OY, Kitinya JN, Masegela PM. Vascular malformation of the jejunum associated with nodal non-Hodgkin's malignant lymphoma. *Singapore medical journal*. 2011; 52(2): e23-e26.

We report a case of multiple minute angioectasia of the jejunum presenting with fatal gastrointestinal bleeding. Repeated endoscopies, mesenteric angiography and scintigraphy failed to locate the bleeding site. Multiple minute angioectasia was suspected on intraoperative enteroscopy; however, surgical resection failed to permanently control gastrointestinal haemorrhage. The final histology report confirmed the presence of multiple minute angioectasia of the jejunum. In this case study, we review current diagnostic and therapeutic modalities, and discuss the association between gastrointestinal angioectasia and malignant lymphoma.

189. Maucky HF. Methicilin resistant staphylococcus aureus skin, soft tissue infection among HIV infected individuals attending HIV care and treatment clinics in Dar es Salaam city, Tanzania. Master of Medicine (Internal Medicine) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Methicilin Resistance Staphylococcus aureus (MRSA) is found worldwide. HIV infection is a known risk factor for the development of MRSA infections and HIV infection may also increase the risk of recurrent disease. HIV infection has been associated with an increased

incident of *S. aureus* skin and/or soft infection and nasal colonization with *S. aureus* in most patients. **Objective:** To determine the prevalence of MRSA skin, soft tissue infections and nasal carriage among HIV infected adults attending HIV care and treatment clinics in Dar es Salaam, Tanzania. **Methods:** Study design and settings: A cross sectional study was conducted in all three district hospitals available in Dar; the HIV clinics at Amana hospital in Ilala district, Temeke hospital, in Temeke district, Mwananyamala hospital in Kinondoni district and Muhimbili National hospital, which is a tertiary care hospital located in Ilala Dar es Salaam. Patients were consecutively recruited into the study until the calculated sample size was achieved. A standard questionnaire was used to collect demographic data, and other MRSA related risk factors that included prior use of co-trimoxazole, prior use of antibiotics other than cotrimoxazole, history of prior hospital admission, family history of skin infection, known cases of Diabetes mellitus, malignancy, chronic renal failure, on dialysis. Physical examination was performed that included inspection for soft tissue infections and nasal swabs were collected from all HIV infected patients included in the study. Additionally swabs or pus aspirate was collected from all patients with skin and or soft tissue infections for the examination of MRSA. Resistance testing was performed for *Staphylococcus aureus*, MRSA was defined as *Staphylococcus aureus* resistant to methicillin and ceftazidime. **Results:** A total of 271 HIV infected patients were recruited into the study, 107 (39.5%) were males and 164 (60.5%) were females. The prevalence of MRSA skin and/or soft tissue infection among HIV patients was found to be 4/271(1.5%). High proportion of MRSA SSTI was found among females 3/16(18.8%) than males 1/14(7.1%), however the difference in prevalence between the sexes was not statistically significant. (p=0.351) Prevalence of MRSA skin and/ or soft tissue infection was high among the patients CD4 counts <200, 3 (60.0%) compared to patients with CD4 count of 200-500cells/ μ L 1 (5.0%) patients p=0.003. None of the patients with CD4 cell count of >500 was found to have the MRSA. MRSA was found in the following lesions: folliculitis 1/1(100%), Ulcer 2/3 (66.7%) and abscess 1/5 (20%). MRSA skin and/or soft tissue infection was more common among patients who were on co-trimoxazole; 4/8 (50.0%) than on those who were not on co-trimoxazole prophylaxis 0/22 (0.0) % p=0.003 MRSA SSTI was significantly more prevalent 3/7 (42.9%) among patients with a prior history of using antibiotics compared to patient with no prior history of using antibiotics 1/23 (4.3%), p=0.009. The duration of antibiotic use was not found to have any significant relationship with MRSA skin and/or soft tissue infection. Hospital admission

prior recruitment to the study was significantly found to be associated with MRSA. Among HIV patients with MRSA SSTI who had prior history of hospital admission; 2/4(50.0%) subjects had MRSA SSTI while only 2/26 (7.7%) patients with no prior history of hospital admission had MRSA. P = 0.020 **Conclusion and Recommendation:** MRSA in skin and/or soft tissue infection among HIV-infected patients is common and occurs mostly in HIV patients with low CD4 count, prior hospital admission, prior use of cotrimoxazole and other antibiotics. Early detection of patients with skin and/or soft tissue infection, prompt evaluation and proper treatment will minimize duration and transmission of infection. Preventive measures should be brought on including screening of the carriers, improving of personal hygiene, isolation of the potential infected patients to avoid spreading of the resistant strain of MRSA.

190. Mbawalla HS, Mtaya M, Masalu JR, Brudvik P, Astrom AN. Discriminative ability of the generic and condition-specific Child-Oral Impacts on Daily Performances (Child-OIDP) by the Limpopo-Arusha School Health (LASH) Project: A cross-sectional study. BMC Pediatrics.2011; 11(1): 45.

Background: Generic and condition-specific (CS) oral-health-related quality-of-life (OHRQoL) instruments assess the impacts of general oral conditions and specific oral diseases. Focusing schoolchildren from Arusha and Dar es Salaam, in Tanzania, this study compared the discriminative ability of the generic Child OIDP with respect to dental caries and periodontal problems across the study sites. Secondly, the discriminative ability of the generic-and the CS Child OIDP attributed to dental caries, periodontal problems and malocclusion was compared with respect to various oral conditions as part of a construct validation.**Methods:** In Arusha, 1077 school children (mean age 14.9 years, range 12-17 years) and 1601 school children in Dar es Salaam (mean age 13.0 years, range 12-14 years) underwent oral clinical examinations and completed the Kiswahili version of the generic and CS Child-OIDP inventories. The discriminative ability was assessed as differences in overall mean and prevalence scores between groups, corresponding effect sizes and odd ratios, OR.**Results:** The differences in the prevalence scores and the overall mean generic Child-OIDP scores were significant between the groups with (DMFT > 0) and without (DMFT = 0) caries experience and with (simplified oral hygiene index [OHI-S] > 1) and without periodontal problems (OHI-S = 1) in Arusha and Dar es Salaam. In

Dar es Salaam, differences in the generic and CS Child-OIDP scores were observed between the groups with and without dental caries, differences in the generic Child-OIDP scores were observed between the groups with and without periodontal problems, and differences in the CS Child-OIDP scores were observed between malocclusion groups. The adjusted OR for the association between dental caries and the CS Child-OIDP score attributed to dental caries was 5.4. The adjusted OR for the association between malocclusion and CS Child-OIDP attributed to malocclusion varied from 8.8 to 2.5. **Conclusion:** The generic Child-OIDP discriminated equally well between children with and without dental caries and periodontal problems across socio-culturally different study sites. Compared with its generic form, the CS Child-OIDP discriminated most strongly between children with and without dental caries and malocclusion. The CS Child OIDP attributed to dental caries and malocclusion seems to be better suited to support clinical indicators when estimating oral health needs among school children in Tanzania.

191. Mbekenga CK, Christensson K, Lugina HI, Olsson P. Joy, struggle and support: Postpartum experiences of first-time mothers in a Tanzanian suburb. *Women and Birth*.2011; 24 (1):24-31.

Objectives: To explore and describe postpartum experiences of first-time mothers in a Tanzanian, multiethnic, low-income suburb. **Methods:** Individual qualitative interviews with 10 first-time mothers, 4-10 weeks postpartum in Ilala suburb, Dar es Salaam, Tanzania. **Results:** The first-time mothers enjoyed motherhood and the respectful status it implied. To understand and handle the infant's needs and own bodily changes were important during postpartum. The tradition of abstaining from sex up to 4 years during breastfeeding was a concern as male's faithfulness was questioned and with HIV a threat to family health. Partner relationship changed towards shared parental and household work and the man's active participation was appreciated. Support from family members and others in the neighbourhood were utilised as a resource by the mothers. In instances of uncertainties on how to handle things, their advice was typically followed. The new mothers generally had good experiences of health care during the childbearing period. However, they also experienced insufficiencies in knowledge transfer, disrespectful behaviour, and unofficial fees. **Key conclusions and implication for practice:** The mothers' perspective of postpartum revealed that they actively searched for ways to attain infants'

and own health needs, and family health in general. Prolonged sexual abstinence was considered a risk for the partner having other sexual partners and contracting HIV. The mothers relied heavily on the informal support network, which sometimes meant risking family health due to misinformation and harmful practices. Health care and informal support systems should complement each other to attain adequate support for the families postpartum.

192. Mbekenga CK, Pembe AB, Christensson K, Darj E, Olsson P. Informal support to first-parents after childbirth: a qualitative study in low-income suburbs of Dar es Salaam, Tanzania. *BMC pregnancy and childbirth*. 2011; 11(1): 98.

Background: In Tanzania, and many sub-Saharan African countries, postpartum health programs have received less attention compared to other maternity care programs and therefore new parents rely on informal support. Knowledge on how informal support is understood by its stakeholders to be able to improve the health in families after childbirth is required. This study aimed to explore discourses on health related informal support to first-time parents after childbirth in low-income suburbs of Dar es Salaam, Tanzania. **Methods:** Thirteen focus group discussions with first-time parents and female and male informal supporters were analyzed by discourse analysis. **Results:** The dominant discourse was that after childbirth a first time mother needed and should be provided with support for care of the infant, herself and the household work by the maternal or paternal mother or other close and extended family members. In their absence, neighbors and friends were described as reconstructing informal support. Informal support was provided conditionally, where poor socio-economic status and non-adherence to social norms risked poor support. Support to new fathers was constructed as less prominent, provided mainly by older men and focused on economy and sexual matters. The discourse conveyed stereotypic gender roles with women described as family caretakers and men as final decision-makers and financial providers. The informal supporters regulated the first-time parents' contacts with other sources of support. **Conclusions:** Strong and authoritative informal support networks appear to persist. However, poverty and non-adherence to social norms was understood as resulting in less support. Family health in this context would be improved by capitalizing on existing informal support networks while discouraging norms promoting harmful practices and attending to the poorest. Upholding stereotypic notions of femininity and masculinity implies

great burden of care for the women and delimited male involvement. Men's involvement in reproductive and child health programmes' has the potential for improving family health after childbirth. The discourses conveyed contradicting messages that may be a source of worry and confusion for the new parents. Recognition, respect and raising awareness for different social actors' competencies and limitations can potentially create a health-promoting environment among families after childbirth.

193. Mbwambo ZH, Erasto P, Nondo RO, Innocent E, Kidukuli AW. Antibacterial and cytotoxic activities of Terminalia stenostachya and Terminalia spinosa. *Tanzania Journal of Health Research*. 2011; 13 (2).

Plants that belong to the Combretaceae family have long history of use in the traditional medicine systems of Africa and Asia for treatment of diseases and conditions associated with HIV/AIDS-opportunistic infections. The objective of this study was to investigate the biological activities of extracts of Terminalia stenostachya Engl. & Diels and Terminalia spinosa Engl. (Combretaceae), to verify the rationale for their use by traditional health practitioners in the treatment of HIV/AIDS patients in Tanzania. Extracts of the leaves, stem barks and roots of T. stenostachya and extracts of stem barks and roots of T. spinosa have all shown strong activity against a number of standard microbial strains including Mycobacterium madagascariense and Mycobacterium indicus pranii, Streptococcus faecalis, Staphylococcus aureus, Vibrio cholera, Bacillus anthracis, Bacillus subtilis, Klebsiella pneumoniae, Salmonella typhi, Pseudomonas aeruginosa and Escherichia coli. All extracts from the two plant species showed strong antimycobacterial activity against test organisms. The stem and root bark extracts were more active than leaves against both gram positive and negative bacteria. With the exception of two extracts from stem barks of T. spinosa, all other extracts from T. stenostachya and T. spinosa that were tested exhibited less activity against brine shrimp larvae with LC50 values =100µg/mL compared to cyclophosphamide, a standard anticancer drug. These results provide an indication that these plants may possess therapeutically potent antimicrobial compounds worth further development.

194. Mchembe MD, Kategile A, Yongolo CMA, Mteta KA. Balanitis Xerotica Obliterans: An experience with Buccal Mucosa Onlay Flap Graft. East and Central African Journal of Surgery. 2011; 16(2): 130-134.

Background: Balanitis Xerotic obliterans (BXO) or Penile Lichen Sclerosus is a dermatological condition affecting the genitalia and associated with chronic, progressive, sclerosing inflammatory dermatosis of unclear etiology. It was first described by Stuhmer in 1928, as being a rare condition but causes severe tissue destruction and often causes meatal stenosis and urethral stricture. Our objective is to present the experience of treatment of urethral stricture caused by Balanitis Xerotic Obliterans in our hospitals. **Methods:** Between 2003 and 2008 eighteen patients with LUTS caused by BXO were referred to our hospitals for management. All patients were adults with the age range from 17 to 84 years. One of the patients had diabetes mellitus. Three patients presented with retention of urine, four had difficulty in passing urine and two patients presented with painful erection. One of the patients who had retention of urine presented with “ watering cane” perineum due to fistula and sinuses as a complication of long standing unattended stricture. The majority of the patients had strictures confined to the distal urethra and meatus. Six patients were treated with buccal mucosa onlay graft while one patient was offered for perineal urethrotomy. **Results:** A total of eighteen (18) patients were attended, two patients were lost to follow up while 5 patients had a mean follow up of 22 months ranging from 8 to 60 months. Fifteen patients are reporting good progress while one patient is being treated with clean intermittent self catheterization and dilatation. **Conclusion:** BXO is a rare cause of urethral stricture in our institution and buccal mucosa graft offers satisfactory intermediate term results.

195. Mehta S, Mugusi FM, Bosch RJ, Aboud S, Chatterjee A, Finkelstein JL, Fataki M, Kisenge R, Fawzi WW. A randomized trial of multivitamin supplementation in children with tuberculosis in Tanzania. Nutrition Journal. 2011; 10 (1): 120.

Background: Children with tuberculosis often have underlying nutritional deficiencies. Multivitamin supplementation has been proposed as a means to enhance the health of these children; however, the efficacy of such an intervention has not been examined adequately. **Methods:** 255 children, aged six weeks to five years, with tuberculosis were randomized to

receive either a daily multivitamin supplement or a placebo in the first eight weeks of anti-tuberculous therapy in Tanzania. This was only 64% of the proposed sample size as the trial had to be terminated prematurely due to funding constraints. They were followed up for the duration of supplementation through clinic and home visits to assess anthropometric indices and laboratory parameters, including hemoglobin and albumin. **Results:** There was no significant effect of multivitamin supplementation on the primary endpoint of the trial: weight gain after eight weeks. However, significant differences in weight gain were observed among children aged six weeks to six months in subgroup analyses (n = 22; 1.08 kg, compared to 0.46 kg in the placebo group; 95% CI = 0.12, 1.10; p = 0.01). Supplementation resulted in significant improvement in hemoglobin levels at the end of follow-up in children of all age groups; the median increase in children receiving multivitamins was 1.0 g/dL, compared to 0.4 g/dL in children receiving placebo (p < 0.01). HIV-infected children between six months and three years of age had a significantly higher gain in height if they received multivitamins (n = 48; 2 cm, compared to 1 cm in the placebo group; 95% CI = 0.20, 1.70; p = 0.01; p for interaction by age group = 0.01). **Conclusions:** Multivitamin supplementation for a short duration of eight weeks improved the hematological profile of children with tuberculosis, though it didn't have any effect on weight gain, the primary outcome of the trial. Larger studies with a longer period of supplementation are needed to confirm these findings and assess the effect of multivitamins on clinical outcomes including treatment success and growth failure.

196. Mehta S, Mugusi FM, Spiegelman D, Villamor E, Finkelstein JL, Hertzmark E, Giovannucci EL, Msamanga GI, Fawzi WW. Vitamin D status and its association with morbidity including wasting and opportunistic illnesses in HIV-infected women in Tanzania. *AIDS Patient Care and STDs*.2011; 25 (10): 579-585.

Vitamin D has a potential role in preventing HIV-related complications, based on its extensive involvement in immune and metabolic function, including preventing osteoporosis and premature cardiovascular disease. However, this association has not been examined in large studies or in resource-limited settings. Vitamin D levels were assessed in 884 HIV-infected pregnant women at enrollment in a trial of multivitamin supplementation (excluding vitamin D) in Tanzania. Information on HIV related complications was recorded during follow-up (median,

70 months). Proportional hazards models and generalized estimating equations were used to assess the relationship of vitamin D status with these outcomes. Women with low vitamin D status (serum 25-hydroxyvitamin D < 32 ng/mL) had 43% higher risk of reaching a body mass index (BMI) less than 18 kg/m² during the first 2 years of follow-up, compared to women with adequate vitamin D levels (hazard ratio [HR]: 1.43; 95% confidence intervals: [1.03-1.99]). The relationship between continuous vitamin D levels and risk of BMI less than 18 kg/m² during follow-up was inverse and linear (p=0.03). Women with low vitamin D levels had significantly higher incidence of acute upper respiratory infections (HR: 1.27 [1.04-1.54]) and thrush (HR: 2.74 [1.29-5.83]) diagnosed during the first 2 years of follow-up. Low vitamin D status was a significant risk factor for wasting and HIV-related complications such as thrush during follow-up in this prospective cohort in Tanzania. If these protective associations are confirmed in randomized trials, vitamin D supplementation could represent a simple and inexpensive method to improve health and quality of life of HIV-infected patients, particularly in resource-limited settings.

197. Mekheimer K, Husseny SZ, Ali AT, Abo-Elkhair RE. Lie point symmetries and similarity solutions for an electrically conducting Jeffrey fluid. *Physica Scripta*. 2011; 83(1): 015017.

In this work, the equations for the two-dimensional incompressible fluid flow of an electrically conducting Jeffrey fluid have been studied. Lie group analysis was performed and group invariant solutions were obtained. A boundary value problem for the translational symmetry was investigated and the results were represented graphically. The effects of Jeffrey fluid parameters? 1 (the ratio of relaxation to retardation times) and? 2 (retardation time) were noted.

198. Mekheimer KS, Husseny SZA, Ali AT, Abo-Elkhair RE. Similarity Solution for Flow of a Micro-Polar Fluid through a Porous Medium. *Applications and Applied Mathematics*. 2011; 6: 2082-2093.

The equations of two dimensional incompressible steady micro-polar fluid flows through a Porous medium are studied. Lie group analysis is employed and the solutions corresponding to The translational symmetry is developed. A boundary value problem is investigated and the

Results are sketched graphically. The effect on the flow of the porosity coefficient of the porous Medium and the micro-polar parameters are observed. **Methods:** Root and stem bark ethanol extracts, extract fractions and two isolated compounds were tested for antibacterial activity against five standard Gram positive and two Gram negative bacteria using the broth micro-dilution method. The extracts and isolated compounds were also tested for cytotoxic activity against brine shrimp larvae (*Artemia salina*). **Results:** The stem and root bark ethanol extracts exhibited strong antibacterial activity against *Pseudomonas aeruginosa* (195.3 µg/ml) and *Staphylococcus aureus* (390.6 µg/ml). Camaric acid (1), isolated from the dichloromethane fraction of root bark extract, exhibited antimicrobial activity against *Salmonella typhi* (MIC = 19.5 µg/ml), *Streptococcus feacalis* (MIC = 19.5 µg/ml), *Pseudomonas aeruginosa* (MIC = 9.76 µg/ml), *Staphylococcus aureus* (MIC = 4.88 µg/ml), and *Bacillus subtilis* (MIC = 19.5 µg/ml), and was toxic to the shrimps (LC50 = 4.1 µg/ml). Betulinic acid (2) also from the same fraction exhibited poor anti-bacterial activity against all bacteria tested but showed high cytotoxic activity against brine shrimp larvae (LC50 = 2.4 µg/ml). **Conclusion:** Detection of antibacterial activity and isolation of an antibacterial compound, camaric acid, from extracts of *L. viburnoides* ssp. *viburnoides* var. *kisi* supports the traditional use of extracts of the plant for treatment of gastrointestinal problems. Betulinic acid and camaric acid are already established to have anticancer activity.

199. Mfinanga SGM, Kivuyo SL, Ezekiel L, Ngadaya E, Mghamba J, Ramaiya K. Public health concern and initiatives on the priority action towards non-communicable diseases in Tanzania. *Tanzania Journal of Health Research*. 2011; 13 (5):1-16.

Tanzania is already facing challenges caused by existing burden of communicable diseases, and the growing trend of non-communicable diseases (NCDs), which raises a lot of concerns and challenges. The objective of this review is to provide broad insight of the "silent epidemic" of NCDs, existing policies, strategies and interventions, and recommendations on prioritized actions. A review of existing literature including published articles, technical reports, and proceedings from national and international NCDs meetings was carried out. The burden, existing interventions, socio-economic impact, lessons learnt, and potential for expanding cost effective interventions in Tanzania were explored. Challenges to catch up with global

momentum on NCD agenda were identified and discussed. The review has indicated that the burden of NCDs and its underlying risk factors in Tanzania is alarming, and affects people of all socio-economic status. The costs of health care for managing NCDs are high, and thus impoverishing the already poor people. The country leadership has a high political commitment; there are policies and strategies, which need to be implemented to address the growing NCD burden. In **conclusion**, NCDs in Tanzania are a silent rising health burden and has enormous impact on an individual and country's social-economical status. From the experience of other countries, interventions for NCDs are affordable, feasible and some are income generating. Multi-sect oral approach, involving national and international partners has a unique role in intensifying action on NCDs. Tanzania should strategize on implementation research on how to adapt the interventions and apply multispectral approach to control and prevent NCDs in the country.

200. Mgonda YM, Chale PNF. The burden of co-existing dermatological disorders and their tendency of being overlooked among patients admitted to muhimbili national hospital in Dar es Salaam, Tanzania. *BMC Dermatology*.2011; 11: 8.

Background: Skin diseases are underestimated and overlooked by most clinicians despite being common in clinical practice. Many patients are hospitalized with co-existing dermatological conditions which may not be detected and managed by the attending physicians. The objective of this study was to determine the burden of co-existing and overlooked dermatological disorders among patients admitted to medical wards of Muhimbili National hospital in Dar es Salaam. Study design and settings: A hospital-based descriptive cross-sectional study conducted at Muhimbili National hospital in Dar es Salaam, Tanzania. **Methods:** Patients were consecutively recruited from the medical wards. Detailed interview to obtain clinico-demographic characteristics was followed by a complete physical examination. Dermatological diagnoses were made mainly clinically. Appropriate confirmatory laboratory investigations were performed where necessary. Data was analyzed using the 'Statistical Package for Social Sciences' (SPSS) program version 10.0. A p-value of < 0.5 was statistically significant. **Results:** Three hundred and ninety patients admitted to medical wards were enrolled into the study of whom, 221(56.7%) were females. The mean age was 36.7 ± 17.9 (range 7-84 years). Overall, 232/390

patients (59.5%) had co-existing dermatological disorders with 49% (191/390) having one, 9% (36/390) two and 5 patients (1%) three. A wide range of co-existing skin diseases was encountered, the most diverse being non-infectious conditions which together accounted for 36.4% (142/390) while infectious dermatoses accounted for 31.5% (123/390). The leading infectious skin diseases were superficial fungal infections accounting for 18%. Pruritic papular eruption of HIV/AIDS (PPE) and seborrheic eczema were the most common non-infectious conditions, each accounting for 4.3%. Of the 232/390 patients with dermatological disorders, 191/232 (82.3%) and 154/232 (66.3%) had been overlooked by their referring and admitting doctors respectively. **Conclusion:** Dermatological disorders are common among patients admitted to medical wards and many are not detected by their referring or admitting physicians. Basic dermatological education should be emphasized to improve knowledge and awareness among clinicians.

201. Mhina C. Magnitude and causes of visual impairment and blindness among children attending pediatric eye clinic at Muhimbili National Hospital. Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania.

Background: The number of blind years resulting from blindness in children is alarmingly high. Blindness in children can have a significant impact on their performance at school as well as their social interaction and future employment as visually impaired children have a long lifetime of blindness ahead of them. The consequences of visual impairment and blindness in children are an important public health issues with greater impact in developing countries, where 80% of the blindness in children occurs. The control of blindness in children is considered a high priority area within the World Health Organization's VISION 2020 initiative. However many developing countries do not have the accurate information about the magnitude and causes of visual impairment and blindness in children, from which the scope and priorities for prevention and treatment can be identified. To date the established pediatric eye clinic which works as a tertiary eye centre does not have baseline data on the magnitude and causes of visual impairment and blindness in children. **Objective:** To determine the magnitude and causes of visual impairment and blindness in children attending pediatric eye clinic at Muhimbili National Hospital, Dar es salaam Tanzania 2010. **Methodology:** A cross-sectional study was conducted between June and

December 2010. A total of 232 children aged 15 years and below attending pediatric eye clinic at the Muhimbili National Hospital were enrolled. Interview and physical examination was done. The visual acuity of 201 children was assessed by quantitative methods while that of 31 children was assessed by light fixing and following Method. **Results:** Among the 201 children assessed by quantitative methods 8% had visual impairment and 4.0% were blind. Of the 62 eyes evaluated by light fixating and following method, 8 (12.9%) vi eyes were not able to fixate and follow light. There were multiple causes of visual impairment and blindness among the affected children. Ocular trauma was the predominant cause of both unocular visual impairment and blindness causing 15, 29.4% and 17, 34.7% respectively. Amblyopic due to congenital cataract was the leading cause of bilateral visual impairment accounting for 31.3% while cortical blindness was the main cause of bilateral blindness responsible for 50.0% of bilaterally blind children. Abnormalities of the optic nerve emerged as an important cause of visual impairment and blindness which affected 7(43.8%) visually impaired children and 2 (25.0%) blind children. **Conclusion:** Visual impairment and blindness in children is high among the children attending the pediatric eye clinic at Muhimbili National Hospital with younger children being more affected with blindness than the older ones. Corneal scarring due to measles and vitamin A deficiency were not seen as the causes of visual impairment and blindness in these children. Efforts towards prevention of ocular trauma among children and improvement of antenatal and natal care so as to reduce birth asphyxia and consequently cortical blindness should be emphasized.

202. Mmbaga E, Helleve A, Leyna G, Masatu M, Onya H, Klepp KI. -S5. 35 Multiple concurrent sexual partnerships among adolescents in Tanzania and South Africa: a comparison between areas with contrasting level of HIV magnitude. *Sexually Transmitted Infections*. 2011; 87(1): A190-A191.

Background Modeling and empirical evidence suggest that population differences in the practice of concurrent sexual partnership could be the most important explanation of the observed heterogeneity in HIV epidemic in sub-Saharan Africa. Biomedical and some behavioural evidence have not sufficiently explained the variation. This study aimed at comparing the rate of concurrent sexual partnerships among adolescents in Arusha, Tanzania and

Polokwane, South Africa, two areas with contrasting level of HIV magnitude. **Methods:** A baseline cross-sectional study involving junior secondary school adolescents in Arusha, Tanzania and Polokwane South Africa was conducted in 2010 as part of the school-based Health Intervention project (LASH). Adolescents from 12 randomly selected schools from each country were interviewed regarding their socio-demographic characteristics, sexual behaviours and substance use. Data were entered and analysed using SPSS statistical package. **Results:** A total of 2408 adolescents from Arusha and 1649 from Polokwane participated in the study. Adolescent interviewed in Arusha were significantly older than their Polokwane counterpart (Mean age (SD) 19.3(0.5) and 15.5(0.7), respectively, $p < 0.001$). The overall prevalence's of reported multiple concurrent sexual partnerships were 9.2% in Arusha and 25.2% in Polokwane (OR, 3.7, 95% CI 3.0 to 4.7. Both males and Females adolescents from Polokwane were significantly more likely to report concurrent sexual partnerships than those from Arusha ($p < 0.001$). Moreover, adolescents from Polokwane reported practice of other HIV risk behaviours as compared to those in Arusha ($p < 0.001$). History of sexual experience (vaginal, oral, anal), ever use of condom and substance use were independent predictors of multiple concurrent sexual partnerships in both sites. **Conclusions:** High practice of multiple concurrent sexual partnerships among adolescent living in high HIV prevalent area as compared to those in low prevalence area indicate that concurrent partnership could be the most important explanation of the observed heterogenic HIV transmission in sub-Saharan Africa. Being sexually active and substance use predict practice of concurrent sexual partnerships among adolescents. Delaying sexual debut and addressing substance use among adolescents may have a significant impact on HIV epidemic.

203. Mmbaga EJ, Leyna GH, Stray-Pedersen B, Klepp KI. Herpes simplex virus type-2 and human immunodeficiency virus infections in a rural population in Kilimanjaro Tanzania. *East African journal of public health.* 2011; 8(1): 28-32.

Objectives: To estimate the seroprevalence of Herpes Simplex Type 2 (HSV-2) and its association with Human Immunodeficiency Virus type 1 (HIV-1) infections in rural Kilimanjaro Tanzania. **Methods:** A cross-sectional survey was conducted in Oria village from March to June 2005 involving all individuals aged 15-44 years with permanent address in the village. Following an informed written consent, participants gave blood for HIV-1 testing and further interviewed

regarding their risk behaviours. All HIV cases and randomly selected controls were tested for HSV-2 antibodies. **RESULTS:** The weighted HSV-2 seroprevalence estimate in the whole population was 33.2%. The HSV-2 seroprevalence was 87.5% and 29.5% among HIV-1 seropositive cases and seronegative controls respectively (Odds ratio (OR) 2.9; 95% Confidence interval: 1.9-4.3). After adjusting for sexual risk behaviors, the association between HSV-2 and HIV-1 infections remained strong (adjusted OR 14.1; CI: 5.0-28.3). Multiple sexual partners, transactional sex and unprotected casual sex were independently associated with HIV-1 infection. **Conclusions:** These results demonstrate that HSV-2 is highly prevalent in rural communities in Tanzania and strongly associated with HIV-1 infection. Sexual risk behaviours may play a major role in the transmission of both HSV-2 and HIV-1 infection. Due to lack of HSV-2 suppressive antiretroviral therapy in this and similar communities, prevention through promotion of behavioral change might be the most important strategy to mitigate HSV-2 and HIV-1 transmission.

204. Mnyika KS, Masatu MC, Klepp KI. Prevalence of and predictors of substance use among adolescents in rural villages of Moshi district, Tanzania. *East African journal of public health.* 2011; 8(1): 1-5.

Purpose: To determine the prevalence of substance use among primary school pupils and out-of-school adolescents in Moshi rural district, northern Tanzania. **Methods:** A school-based cross-sectional study focusing on primary school adolescents in standards 6 and 7 in Kahe rural community. We also conducted a population-based cross-sectional study among out-of-school adolescents in the same rural villages. A self-administered questionnaire was used to collect data from the school-based survey while for the out-of-school survey the questionnaire was administered in the households using trained interviewers. **Results:** A total of 545 in-school and 668 out-of-school adolescents participated in the study. Of the 545 school adolescents, 45.4% were males and 56.6% females while for the out-of-school adolescents, 68.1% were males and 31.9% females. Of the school adolescents, more males than females reported being alcohol drinkers (16.7% versus 9.2%; odds ratio (OR) = 1.9, 95% CI, 1.17 - 3.29). The prevalence proportions of cigarette smoking were 26.2% for men and 15.5% for women while prevalence proportions of marijuana smoking were 4.1% for men and 3.0% for women. As for the out-of-

school adolescents, the prevalence proportions of alcohol use were 26.2% for men and 15.5% for women. The prevalence proportions of cigarette smoking were 14.3% for men and 1.9% for women while the prevalence proportions of marijuana smoking were 1.5% for men and 1.4% for women. **Conclusions:** Substance use among adolescents is very high suggesting the need for interventions in this rural population of Tanzania.

205. Mohamed F, Perera A, Wijayaweera K, Kularatne K, Jayamanne S, Eddleston M, Dawson A, Konradsen F, Gunnell D. The prevalence of previous self-harm amongst self-poisoning patients in Sri Lanka. *Social psychiatry and psychiatric epidemiology*. 2011; 46(6): 517-520.

Background: One of the most important components of suicide prevention strategies is to target people who repeat self-harm as they are a high risk group. However, there is some evidence that the incidence of repeat self-harm is lower in Asia than in the West. The objective of this study was to investigate the prevalence of previous self-harm among a consecutive series of self-harm patients presenting to hospitals in rural Sri Lanka. **Method:** Six hundred and ninety-eight self-poisoning patients presenting to medical wards at two hospitals in Sri Lanka were interviewed about their previous episodes of self-harm. **Results:** Sixty-one (8.7%, 95% CI 6.7–11%) patients reported at least one previous episode of self-harm [37 (10.7%) male, 24 (6.8%) female]; only 19 (2.7%, 95% CI 1.6–4.2%) patients had made more than one previous attempt. **Conclusion:** The low prevalence of previous self-harm is consistent with previous Asian research and is considerably lower than that seen in the West. Explanations for these low levels of repeat self-harm require investigation. Our data indicate that a focus on the aftercare of those who attempt suicide in Sri Lanka may have a smaller impact on suicide incidence than may be possible in the West.

206. Mohamed F, Rahman MNA, Abdullah ML. The development of temporal-based multimedia data management application using web services. In *Intelligent Systems Design and Applications (ISDA)*, 2011 11th *International Conference on*. 2011:487-492.

Multimedia data management is an important application in multimedia system domain. The application scopes are to retrieve, collect, store and preserve multimedia data in a distributed environment. A reliable or appropriate format of record structure in multimedia data management is required in order to trace information validation. Hence, the concept of temporal database can be applied to overcome this situation. The paper presents the development of temporal based multimedia data management model. Two elements of time are incorporated into the model; transaction time and valid time. This time elements will monitor the changes (event) and transaction that happened to the data in database. The use of time elements provides a new schema to query multimedia data based on past, current and future time. The designed model is implemented under web services based environment by utilizing J2EE platform.

207. Mohamed F, Swafford S, Petrowsk H, Bracht A, Schmit B, Fabian A, Pacheco JM, Berninger M, Carrillo C, Mayr G, Moran K, Kavanaugh D, Leibrecht H, White W, Metwally S. Foot and Mouth Disease in Feral Swine: Susceptibility and Transmission. *Tran boundary and emerging diseases*. 2011; 58(4): 358-371.

Experimental studies of foot-and-mouth disease (FMD) in feral swine are limited, and data for clinical manifestations and disease transmissibility are lacking. In this report, feral and domestic swine were experimentally infected with FMDV (A24-Cruzeiro), and susceptibility and virus transmission were studied. Feral swine were proved to be highly susceptible to A-24 Cruzeiro FMD virus by intradermal inoculation and by contact with infected domestic and feral swine. Typical clinical signs in feral swine included transient fever, lameness and vesicular lesions in the coronary bands, heel bulbs, tip of the tongue and snout. Domestic swine exhibited clinical signs of the disease within 24 h after contact with feral swine, whereas feral swine did not show clinical signs of FMD until 48 h after contact with infected domestic and feral swine. Clinical scores of feral and domestic swine were comparable. However, feral swine exhibited a higher tolerance for the disease, and their thicker, darker skin made vesicular lesions difficult to detect. Virus titration of oral swabs showed that both feral and domestic swine shed similar amounts of virus, with levels peaking between 2 to 4 dpi/dpc (days post-inoculation/days post-contact). FMDV RNA was intermittently detectable in the oral swabs by real-time RT-PCR of both feral and domestic swine between 1 and 8 dpi/dpc and in some instances until 14 dpi/12 dpc. Both

feral and domestic swine seroconvert 6–8 dpi/dpc as measured by 3ABC antibody ELISA and VIAA assays. FMDV RNA levels in animal room air filters were similar in feral and domestic swine animal rooms, and were last detected at 22 dpi, while none were detectable at 28 or 35 dpi. The FMDV RNA persisted in domestic and feral swine tonsils up to 33–36 dpi/dpc, whereas virus isolation was negative. Results from this study will help understand the role feral swine may play in sustaining an FMD outbreak, and may be utilized in guiding surveillance, epidemiologic and economic models.

208. Mohamed HM. Outcomes and their associated factors in patients admitted with clinical diagnosis of heart failure at Muhimbili National Hospital Master of Medicine (Internal Medicine) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Heart failure is a frequent causes of hospitalization with high morbidity and mortality.^{3, 51} several factors affects the outcome after hospitalization for heart failure patients. These outcomes include New York Heart Association classification(NYHA)³⁵, morbidity and mortality^{27,44,50,52} ,Quality of Life(QOL)^{39,40,43} and duration of stay in ward^{17,18}. Outcomes of patients admitted at MNH appear to be dismal. Studies done elsewhere have shown NYHA classification, medical co-morbidity, patient socio-economic status were associated with poor outcomes.³⁶ The outcome and associated risk factors for patients admitted at MNH with heart failure is unknown. Broad **Objective:** To determine outcomes and their associated factors in patients admitted with clinical diagnosis of heart failure at Muhimbili National Hospital Study Design and Methodology: This is a descriptive prospective study of consecutive patients newly admitted with diagnosis of heart failure in medical wards between July, 2010 and January, 2011. Only patients who met the Framingham’s criteria for clinical diagnosis were included. Informed consent was obtained. A structured questionnaire was used to collect information on demographics, and co morbidities on admission, outcomes at discharge and at one month follow-up. Outcomes determined included heart failure symptoms and signs, NYHA classification, and QOL score. Duration of stay in ward and mortality was also determined. Ethical clearance was obtained from MUHAS Ethical Review Board. **Results:** There were a total of 146 patients with a

clinical diagnosis of heart failure by Framingham's criteria out of a total of 180 patients who were admitted during the study period. 41.1% of patients were above 50 years of age and 57.5% were females. Patients in NYHA class III / IV were 88.4%. Other findings indicated that 78.6% had poor to moderate QOL score at discharge, 51.4% could not afford medications, 47.9% had no drug availability, 24.7% had hypertension, 4.1% had diabetes mellitus, 46.7% had an ejection fraction = 45%, and 11.8% patients had atrial fibrillation. It was also found that 32.1% had duration of stay in ward of more than seven days and, 99.3% were in NYHA class I / II at discharge. Common symptoms at discharge were cough (78.6%), bilateral ankle swelling (60.7%) and difficulty in breathing on exertion (41.4%). Out of 111 patients followed up in medical wards and medical clinic, 14.4% were in NYHA class III / IV, 73.9% had poor to moderate QOL score, common symptoms were cough (75.7%), bilateral ankle swelling vii (57.7%) and difficulty in breathing on exertion (46.8%). Proportion of patients who died during study period was 5.4%. **Conclusion:** 1. there is poor outcome, both at discharge and at one month, for patients admitted with heart failure at MNH. 2. 32.1% of patients admitted with heart failure stay longer than 7 days. 3. Patients in NYHA class III/IV had poor to moderate QOL score at one month. 4. 5.4% of patients admitted with heart failure died by one month. 5. Patients with poor to moderate QOL score at discharge had poor to moderate QOL score at one month. **Recommendations:** 1. Patient education on drug use, their benefits, and side effects to improve QOL of patients. 2. Emphasis on patients follow-up to improve outcomes and drug availability in hospital. 3. It is recommended that MNH sets appropriate management guidelines for admitted patients.

209. Monadjem A, Mahlaba TA, Dlamini N, Eiseb SJ, Belmain SR, Mulungu LS, Massawe AW, Makundi RH, Mohr K, Taylor PJ. Impact of crop cycle on movement patterns of pest rodent species between fields and houses in Africa. *Wildlife Research*. 2011; 38(7): 603-609.

Aims: We investigated the relationship between *Rattus* spp. and *M. natalensis* entering buildings in an agro-ecological setting. We predicted that *M. natalensis* would enter houses more readily when food availability was lowest in the surrounding fields, and when the larger *Rattus* spp. were absent. **Methods:** We followed 40 individuals of *M. natalensis* in Swaziland and Namibia

by radio-telemetry. Mice were captured in maize fields within 50 m of a homestead and fitted with radio-transmitters at three different times corresponding to different stages of crop development: pre-harvest, post-harvest and pre-planting. To corroborate the findings of the telemetry study, a non-toxic marker, rhodamine B, was mixed with standard bait and left at bait stations inside houses in 10 homesteads in Swaziland and Tanzania. Key results: Mice remained in the fields during the entire period of study in Swaziland, but entered buildings in Namibia during the post-harvest stage, which may represent a period of food shortage for these mice in the field. Rodents captured after baiting with rhodamine B demonstrated that *Rattus* spp. predominated within the houses. A small number of rhodamine B-marked *M. natalensis* was captured outside the houses, the proportion declining with distance away from the houses. **Conclusions:** These results suggest that in a typical rural African setting dominated by subsistence agriculture, *Rattus* spp. (when present) competitively exclude the smaller *M. natalensis* from entering houses.

210. Moon S, Gurkan UA, Blander J, Fawzi WW, Aboud S, Mugusi F, Demirci U. Enumeration of CD4+ T-cells using a portable microchip count platform in Tanzanian HIV-infected patients. *PLoS One*. 2011; 6(7), e21409.

Background: CD4+ T-lymphocyte count (CD4 count) is a standard method used to monitor HIV-infected patients during anti-retroviral therapy (ART). The World Health Organization (WHO) has pointed out or recommended that a handheld, point-of-care, reliable, and affordable CD4 count platform is urgently needed in resource-scarce settings. **Methods:** HIV-infected patient blood samples were tested at the point-of-care using a portable and label-free microchip CD4 count platform that we have developed. A total of 130 HIV-infected patient samples were collected that included 16 de-identified left over blood samples from Brigham and Women's Hospital (BWH), and 114 left over samples from Muhimbili University of Health and Allied Sciences (MUHAS) enrolled in the HIV and AIDS care and treatment centers in the City of Dar es Salaam, Tanzania. The two data groups from BWH and MUHAS were analyzed and compared to the commonly accepted CD4 count reference method (FACSCalibur system). **Results:** The portable, battery operated and microscope-free microchip platform developed in our laboratory (BWH) showed significant correlation in CD4 counts compared with

FACSCalibur system both at BWH ($r = 0.94$, $p < 0.01$) and MUHAS ($r = 0.49$, $p < 0.01$), which was supported by the Bland-Altman methods comparison analysis. The device rapidly produced CD4 count within 10 minutes using an in-house developed automated cell counting program. **Conclusions:** We obtained CD4 counts of HIV-infected patients using a portable platform which is an inexpensive (<\$1 material cost) and disposable microchip that uses whole blood sample (<10 μ l) without any pre-processing. The system operates without the need for antibody-based fluorescent labeling and expensive fluorescent illumination and microscope setup. This portable CD4 count platform displays agreement with the FACSCalibur results and has the potential to expand access to HIV and AIDS monitoring using fingerprick volume of whole blood and helping people who suffer from HIV and AIDS in resource-limited settings.

211. Mortensen HM, Froment A, Lema G, Bodo JM, Ibrahim M, Nyambo TB, Tishkoff SA. Characterization of genetic variation and natural selection at the arylamine N-acetyltransferase genes in global human populations. *Pharmacogenomics*. 2011; 12(11): 1545-1558.

Functional variability at the aryl amine N-acetyltransferase genes is associated with drug response in humans and may have been adaptive in the past owing to selection pressure from diet and exposure to toxins during human evolution. Aims: We have characterized nucleotide variation at the NAT1 and NAT2 genes, and at the NATP1 pseudo gene in global human populations, including many previously under-represented African populations, in order to identify potential functional variants and to understand the role that natural selection has played in shaping variation at these loci in globally diverse populations. Materials & methods: We have resequenced approximately 2800 bp for each of the NAT1 and NAT2 gene regions, as well as the pseudo gene NATP1, in 197 African and 132 nonAfrican individuals. Results & conclusion: We observe a signature of balancing selection maintaining variation in the 3'-UTR of NAT1, suggesting that these variants may play a functional role that is currently undefined. In addition, we observed high levels of no synonymous functional variation at the NAT2 locus that differs amongst ethnically diverse populations.

212. Mosha F, Urassa W, Aboud S, Lyamuya E, Sandstrom E, Bredell H, Williamson C. Prevalence of genotypic resistance to antiretroviral drugs in treatment-naive youths infected with diverse HIV type 1 subtypes and recombinant forms in Dar es Salaam, Tanzania. *AIDS Research and Human Retroviruses*.2011; 27 (4): 377-382.

As human immunodeficiency virus (HIV) diversity may have an impact on both vaccine efficacy and drug resistance, it is important to have knowledge of circulating genetic variants. With widespread use of antiretroviral (ARV) drugs in Africa, one of the major potential challenges is the risk of emergence of ARV drug-resistant HIV strains. This study aimed to determine the circulating HIV subtypes and recombinant forms, as well as the prevalence of ARV drug resistance mutations, among 75 treatment-naive HIV-infected youths in Dar es Salaam, Tanzania. Gag (n=48), partial pol (n=44), and partial env (n=35) sequencing was performed; all three regions were sequenced in 26 samples. Evidence of infection with recombinant viruses was found in 12 (46%) participants; AC recombinants were the most commonly detected and they were identified in six (23%) participants. Of individuals infected with nonrecombinant strains, subtype A was most commonly detected in seven (27%) participants, followed by subtype C detected in six (23%) participants and subtype D detected in one (4%) participant. Among the pol sequences from 44 individuals, three (7%) had resistance to nucleoside reverse transcriptase (RT) inhibitors and four (9%) had nonnucleoside RT inhibitor resistance mutations. Of these, three (7%) individuals were infected with viruses with cross-resistance mutations to both classes of RT inhibitors. These resistant mutations were all associated with drugs currently used in first-line therapy and in the prevention of vertical transmission. This high prevalence of resistance mutations is of considerable concern in apparently drug-naive populations as it may result in treatment failure and the spread of ARV-resistant strains.

213. Moyo SJ, Gro N, Matee MI, Kitundu J, Myrmel H, Mylvaganam H, Langeland N. Age specific aetiological agents of diarrhoea in hospitalized children aged less than five years in Dar es Salaam, Tanzania. *BMC pediatrics*. 2011; 11(1): 19.

Background: This study aimed to determine the age-specific aetiologic agents of diarrhoea in children aged less than five years. The study also assessed the efficacy of the empiric treatment

of childhood diarrhoea using Integrated Management of Childhood Illness (IMCI) guidelines. Methods: This study included 280 children aged less than 5 years, admitted with diarrhoea to any of the four major hospitals in Dar es Salaam. Bacterial pathogens were identified using conventional methods. Enzyme Linked Immunosorbent Assay (ELISA) and agglutination assay were used to detect viruses and intestinal protozoa, respectively. Antimicrobial susceptibility was determined using Kirby-Bauer disk diffusion method. Results: At least one of the searched pathogens was detected in 67.1% of the cases, and mixed infections were detected in 20.7% of cases. Overall, bacteria and viruses contributed equally accounting for 33.2% and 32.2% of all the cases, respectively, while parasites were detected in 19.2% patients. Diarrhoeagenic *Escherichia coli* (DEC) was the most common enteric pathogen, isolated in 22.9% of patients, followed by *Cryptosporidium parvum* (18.9%), rotavirus (18.1%) and norovirus (13.7%). The main cause of diarrhoea in children aged 0 to 6 months were bacteria, predominantly DEC, while viruses predominated in the 7-12 months age group. *Vibrio cholerae* was isolated mostly in children above two years. *Shigella* spp, *V. cholerae* and DEC showed moderate to high rates of resistance to erythromycin, ampicillin, chloramphenicol and tetracycline (56.2-100%). *V. cholerae* showed full susceptibility to co-trimoxazole (100%), while DEC and *Shigella* showed high rate of resistance to co-trimoxazole; 90.6% and 93.3% respectively. None of the bacterial pathogens isolated showed resistance to ciprofloxacin which is not recommended for use in children. Cefotaxime resistance was found only in 4.7% of the DEC. Conclusion: During the dry season, acute watery diarrhoea is the most common type of diarrhoea in children under five years in Dar es Salaam and is predominantly due to DEC, *C. parvum*, rotaviruses and noroviruses. Constant antibiotic surveillance is warranted as bacteria were highly resistant to various antimicrobial agents including co-trimoxazole and erythromycin which are currently recommended for empiric treatment of diarrhoea.

214. Mselle LT, Kohi TW, Mvungi A, Evjen-Olsen B, Moland KM. Waiting for attention and care: birthing accounts of women in rural Tanzania who developed obstetric fistula as an outcome of labour. *BMC pregnancy and childbirth*. 2011; 11(1): 75.

Background: Obstetric fistula is a physically and socially disabling obstetric complication that affects about 3,000 women in Tanzania every year. The fistula, an opening that forms between

the vagina and the bladder and/or the rectum, is most frequently caused by unattended prolonged labour, often associated with delays in seeking and receiving appropriate and adequate birth care. Using the availability, accessibility, acceptability and quality of care (AAAQ) concept and the three delays model, this article provides empirical knowledge on birth care experiences of women who developed fistula after prolonged labour. **Methods:** We used a mixed methods approach to explore the birthing experiences of women affected by fistula and the barriers to access adequate care during labour and delivery. Sixteen women were interviewed for the qualitative study and 151 women were included in the quantitative survey. All women were interviewed at the Comprehensive Community Based Rehabilitation Tanzania in Dar es Salaam and Bugando Medical Centre in Mwanza. **Results:** Women experienced delays both before and after arriving at a health facility. Decisions on where to seek care were most often taken by husbands and mothers-in-law (60%). Access to health facilities providing emergency obstetric care was inadequate and transport was a major obstacle. About 20% reported that they had walked or were carried to the health facility. More than 50% had reported to a health facility after two or more days of labour at home. After arrival at a health facility women experienced lack of supportive care, neglect, poor assessment of labour and lack of supervision. Their birth accounts suggest unskilled birth care and poor referral routines. **Conclusions:** This study reveals major gaps in access to and provision of emergency obstetric care. It illustrates how poor quality of care at health facilities contributes to delays that lead to severe birth injuries, highlighting the need to ensure women's rights to accessible, acceptable and adequate quality services during labour and delivery.

215. Mselle LT, Moland KM, Evjen-Olsen B, Mvungi A, Kohi TW. "I am nothing": Experiences of loss among women suffering from severe birth injuries in Tanzania. *BMC Women's Health*. 2011; 11: 49.

Background: Despite the increased attention on maternal mortality during recent decades, which has resulted in maternal health being defined as a Millennium Development Goal (MDG), the disability and suffering from obstetric fistula remains a neglected issue in global health. Continuous leaking of urine and the physical, emotional and social suffering associated with it, has a profound impact on women's quality of life. This study seeks to explore the physical,

cultural and psychological dimensions of living with obstetric fistula, and demonstrate how these experiences shape the identities of women affected by the condition. **Methods:** A cross-sectional study with qualitative and quantitative components was used to explore the experiences of Tanzanian women living with obstetric fistula and those of their husbands. The study was conducted at the Comprehensive Community Based Rehabilitation Tanzania hospital in Dar es Salaam, Bugando Medical Centre in Mwanza, and Mpwapwa district, in Dodoma region. Conveniently selected samples of 16 women were interviewed, and 151 additional women responded to a questionnaire. In addition, 12 women affected by obstetric fistula and six husbands of these affected women participated in a focus group discussions. Data were analyzed using content data analysis framework and statistical package for the social sciences (SPSS) version 15 for Microsoft windows. **Results:** The study revealed a deep sense of loss. Loss of body control, loss of the social roles as women and wives, loss of integration in social life, and loss of dignity and self-worth were located at the core of these experiences. **Conclusion:** The women living with obstetric fistula experience a deep sense of loss that had negative impact on their identity and quality of life. Acknowledging affected women's real-life experiences is important in order to understand the occurrence and management of obstetric fistula, as well as prospects after treatment. This knowledge will help to improve women's sense of self-worth and maintain their identity as women, wives, friends and community members. Educational programmes to empower women socially and economically and counseling of families of women living with obstetric fistula may help these women receive medical and social support that is necessary.

216. Mshana SE, Gerwing L, Minde M, Hain T, Domann E, Lyamuya E, Chakraborty T, Imirzalioglu C. Outbreak of a novel *Enterobacter* sp. carrying bla CTX-M-15 in a neonatal unit of a tertiary care hospital in Tanzania. *International Journal of Antimicrobial Agents*.2011; 38 (3): 265-269.

Enterobacter hormaechei and *Cronobacter sakazakii* are amongst the most important causes of outbreaks of neonatal sepsis associated with powdered milk. In this study, we report for the first time an outbreak of a novel *Enterobacter* sp. harbouring bla CTX-M-15 in a neonatal unit in Tanzania. Seventeen Gram-negative enteric isolates from neonatal blood cultures were studied.

Antibiotic susceptibility was assessed by disc diffusion testing, and the presence of the bla CTX-M-15 gene was established by polymerase chain reaction (PCR) and sequencing. Isolates were typed by pulsed-field gel electrophoresis (PFGE). Identification by biochemical profiling was followed by nucleotide sequencing of 16S ribosomal DNA (rDNA), rpoB and hsp60 alleles. Environmental sampling was done and control measures were established. Isolates were initially misidentified based on their fermentation characteristics and agglutination as *Salmonella enterica* serotype Paratyphi. All isolates were resistant to multiple antibiotics, except for ciprofloxacin and carbapenems, and were found to harbour bla CTX-M-15 on a 291-kb narrow-range plasmid. PFGE analysis indicated the clonal outbreak of a single strain, infecting 17 neonates with a case fatality rate of 35%. The same strain was isolated from a milk bucket. Phylogenetic analysis using 16S rDNA, rpoB and hsp60 sequences permitted no definitive identification, clustering the strains in the *Enterobacter cloacae* complex with similarities of 92-98.8%. The data describe an outbreak of a novel bla CTX-M-15-positive, multiresistant *Enterobacter* strain in an African neonatal unit that can easily be misidentified taxonomically. These data highlight the need for constant surveillance of bacteria harbouring extended-spectrum β -lactamases as well as improvements in hygiene measures in developing countries.

217. Mshana SE, Imirzalioglu C, Hain T, Domann E, Lyamuya EF, Chakraborty T. Multiple ST clonal complexes, with a predominance of ST131, of *Escherichia coli* harboring blaCTX-M-15 in a tertiary hospital in Tanzania. *Clinical Microbiology and Infection*. 2011; 17(8): 1279-1282.

The molecular epidemiology of 32 non-duplicate, CTX-M-15 extended-spectrum beta-lactamase (ESBL)-producing *Escherichia coli* strains, isolated from clinical samples, was investigated. Multilocus sequence typing revealed multiple sequence type clonal complexes: ST131 (12), ST405 (4), ST638 (3), ST38 (2), ST827 (2), ST224 (1), ST648 (1), ST46 (1) and two new sequence type clonal complexes (1845 and 1848) in 22 pulsed field gel electrophoresis clusters. The blaCTX-M-15 gene was located on conjugative IncF plasmids. This is the first report of the worldwide emerging clonal complex ST131 linked to blaCTX-M-15 in Tanzania and demonstrates the need for constant surveillance in developing countries to prevent the spread of these multiresistant isolates.

218. Mubi M, Janson A, Warsame M, Mårtensson A, Källander K, Petzold MG, Ngasala B, Maganga G, Gustafsson LL, Masele A, Tomson G, Premji Z, Björkman A. Malaria rapid testing by community health workers is effective and safe for targeting malaria treatment: Randomised cross-over trial in Tanzania. PLoS ONE. 2011; 6 (7): e19753.

Background: Early diagnosis and prompt, effective treatment of uncomplicated malaria is critical to prevent severe disease, death and malaria transmission. We assessed the impact of rapid malaria diagnostic tests (RDTs) by community health workers (CHWs) on provision of artemisinin-based combination therapy (ACT) and health outcome in fever patients.

Methodology/Principal Findings: Twenty-two CHWs from five villages in Kibaha District, a high-malaria transmission area in Coast Region, Tanzania, were trained to manage uncomplicated malaria using RDT aided diagnosis or clinical diagnosis (CD) only. Each CHW was randomly assigned to use either RDT or CD the first week and thereafter alternating weekly. Primary outcome was provision of ACT and main secondary outcomes were referral rates and health status by days 3 and 7. The CHWs enrolled 2930 fever patients during five months of whom 1988 (67.8%) presented within 24 hours of fever onset. ACT was provided to 775 of 1457 (53.2%) patients during RDT weeks and to 1422 of 1473 (96.5%) patients during CD weeks (Odds Ratio (OR) 0.039, 95% CI 0.029-0.053). The CHWs adhered to the RDT results in 1411 of 1457 (96.8%, 95% CI 95.8-97.6) patients. More patients were referred on inclusion day during RDT weeks (10.0%) compared to CD weeks (1.6%). Referral during days 1-7 and perceived non-recovery on days 3 and 7 were also more common after RDT aided diagnosis. However, no fatal or severe malaria occurred among 682 patients in the RDT group who were not treated with ACT, supporting the safety of withholding ACT to RDT negative patients.

Conclusions/Significance: RDTs in the hands of CHWs may safely improve early and well-targeted ACT treatment in malaria patients at community level in Africa.

219. Muganyizi PS, Nyström L, Axemo P, Emmelin M. Managing in the contemporary world: Rape victims' and supporters' experiences of barriers within the police and the health care system in Tanzania. Journal of Interpersonal Violence. 2011; 26 (16), 3187-3209.

Grounded theory guided the analysis of 30 in-depth interviews with raped women and community members who had supported raped women in their contact with the police and health care services in Tanzania. The aim of this study was to understand and conceptualize the experiences of the informants by creating a theoretical model focusing on barriers, strategies, and responses during the help seeking process. The results illustrate a process of managing in the contemporary world characterized as walking a path of anger and humiliation. The barriers are illustrated by painful experiences of realizing it's all about money, meeting unprofessionalism and irresponsibility, subjected to unreliable services, and by being caught in a messed-up system. Negotiating truths and knowing what to do capture the informants' coping strategies. The study indicates an urgent need for improvement in the formal procedures of handling rape cases, improved collaboration between the police and the health care system, as well as specific training for professionals to improve their communication and caring skills. .

220. Muganyizi PS, Shaglara MS. Predictors of extra care among magnesium sulphate treated eclamptic patients at Muhimbili National Hospital, Tanzania. BMC pregnancy and childbirth. 2011; 11(1): 41.

Background: The inclusion of Magnesium Sulphate (MgSO₄) as a gold standard in the treatment of eclampsia has substantially reduced incidences of repeated fits, eclamptic morbidity and deaths. However, despite treatment with MgSO₄, a proportion of patients need extra medical/nursing attention and prolonged stay in the intensive care unit (ICU). The literature on the underlying factors for the need of extra care in the MgSO₄ era is lacking. This study sought to establish predictors of extra care in ICU among eclamptic patients after treatment with MgSO₄ at Muhimbili National Hospital (MNH). **Methods:** Data were obtained from hospital records of eclamptic patients who were admitted at MNH and treated with MgSO₄ from January 1st to December 31st, 2008. Based on set criteria, patients who needed extra care were identified. Analysis was performed using PASW statistics 18 whereby frequencies, cross-tabulations, bivariate and multiple logistic regressions were performed. **Results:** A total of 366 eclamptic patients were admitted and treated with MgSO₄ at MNH during a 12 month study period in 2008. Most of these (76%) were referred from district hospitals and 132 (36%) met the criteria for extra care in ICU. After adjusting for other variables, the risk of extra care in ICU for patients

who were admitted with altered consciousness was double (OR = 2.3; 95% CI: 1.3-4.0) that of the ones admitted in alert state. The risk or need of extra care increased by increasing time to delivery and was doubled (OR = 2.0; 95% CI:1.1-3.7) if it was between 12 and 24 hours and tenfold elevated (OR = 10.0; 95% CI:4.3-23.6) if beyond 24 hours as compared to when time to delivery was less than 12 hours. Abdominal delivery was also independently associated with increased risk compared to vaginal delivery (OR = 2.5; 95%CI: 1.4-4.5). The type of referral and number of fits were associated with extra care in ICU but this association was wholly explained by the clinical status of the patient on admission to MNH and prolonged time lag to delivery. **Conclusion:** We concluded that even with MgSO₄ used as the gold standard in the treatment of eclampsia, effective pre-referral care and expedited delivery were crucial in minimizing the need for extra care in ICU.

221. Muhihi A, Njelekela M, Mpembeni R, Mligiliche N, Mtabaji J. Relationship between diet and cardiovascular disease risk factors among middle- aged men and women in Dar es Salaam, Tanzania. 2011.

Background: The prevalence of cardiovascular diseases is increasing in most developing countries, especially in urban settings. Despite this increasing trend, there is limited data on the association between diet and cardiovascular disease risk factors in Tanzania. **Objective:** To assess the frequency of intake of various foods and explore their relationship with cardiovascular disease risk factors **Design:** Cross-sectional epidemiological study **setting:** Five randomly selected wards in Temeke district, Dar es Salaam **Subjects:** Two hundred and nine men and women aged 44-66 years **Outcome measures:** Blood pressure measured using a standardized digital blood pressure measuring machine, anthropometric measurements, lipid profile and a dietary history which was obtained using a seven-day recall food frequency questionnaire **Results:** Overall; ugali, tea, green vegetables, white rice, fish and fruits were the most frequently consumed foods in this population. No gender differences were noted in the consumption of the various foods. Overweight and obese participants had significantly higher intakes of beverages, white rice and fruits compared to normal subjects (all $p < 0.05$). Higher monthly income was significantly associated with higher consumption of white rice, meat and fruits (all $p < 0.05$). Frequency of intake of beverages correlated positively and significantly with BMI, total

cholesterol and LDL-cholesterol (all $p < 0.05$). Consumption of rice correlated positively with BMI and HDL-cholesterol (all $p < 0.05$) while meat correlated with only BMI ($p = 0.006$). Logistic regression analysis revealed that white rice was the most important dietary determinant of BMI ($\beta = 1.91$, $p = 0.038$, 95% CI = 0.1-3.7) in this population. **Conclusion:** Consumption of beverages, white rice and meat is associated with obesity in this population. Advocacy on the importance of healthy dietary habits and obesity control as primary and cost-effective intervention is of utmost importance in Tanzania.

222. Muhogora W, Padovani R, Bonutti F, Msaki P, Kazema R .Performance evaluation of three computed radiography systems using methods recommended in American Association of Physicists in Medicine Report 93. *Journal of Medical Physics*.2011; 36 (3): 138-146.

The performances of three clinical computed radiography (CR) systems, (Agfa CR 75 (with CRMD 4.0 image plates), Kodak CR 850 (with Kodak GP plates) and Kodak CR 850A (with Kodak GP plates)) were evaluated using six tests recommended in American Association of Physicists in Medicine Report 93. The results indicated variable performances with majority being within acceptable limits. The variations were mainly attributed to differences in detector formulations, plate readers' characteristics and aging effects. The differences of the mean low contrast scores between the imaging systems for three observers were statistically significant for Agfa and Kodak CR 850A ($P = 0.009$) and for Kodak CR systems ($P = 0.006$) probably because of the differences in ages. However, the differences were not statistically significant between Agfa and Kodak CR 850 ($P = 0.284$) suggesting similar perceived image quality. The study demonstrates the need to implement quality control program regularly.

223. Mujumali N. Knowledge and attitude on prevention of mother to child transmission of HIV among pregnant women attending reproductive and child health clinic at Temeke district Hospital in Dar es salaam, 2011. Master of Medicine (Obstetrics and Gynecology) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: The acquired immune deficiency syndrome (AIDS) epidemic is the greatest challenge to human kind in the 21st century. In 2009, around 400,000 children under 15yrs became infected with HIV. Almost all of these infections occurred in Sub Saharan countries, and more than 90% are a result of mother-to-child transmission (MTCT) during pregnancy, labor and delivery, or breastfeeding. Transmission during pregnancy is 5 – 10%, during labor and delivery is 10 – 20% and during breastfeeding is 10 – 15%. Without interventions, there is a 20-45% chance that a baby born to an HIV infected mother will become infected. However the risk of MTCT can be reduced up to 2% if comprehensive approach of PMTCT will be put in place. MTCT of HIV has a dramatic deleterious impact on child survival and therefore PMTCT is of crucial importance. Objectives: To assess knowledge and attitude on PMTCT of HIV among pregnant women attending Reproductive and Child Health clinic at Temeke District Hospital, Dar Es Salaam. **Methodology:** A cross sectional study was conducted from October 2010 to January 2011 at Temeke District Hospital RCH Clinic in Dar-Es –Salaam. Structured questionnaires were administered to all pregnant women at the clinic who have had the opportunity to be counseled and tested for HIV in their antenatal clinics in different primary health centers in Temeke District. The information was then summarized into SPSS version 17.0, for windows and analyzed. Frequency distribution and two way tables were used to summarize the data. **Results:** A total of 351 pregnant women fulfilling the inclusion criteria were included in the study. Out of these, 237(67.5%) were HIV negative and 114 (32.5%) were HIV positive. The mean age was 27.2 and SD 6.3. Married participants' formed 68.9% and 86.9% had primary Education. Sixty nine respondents, 19.7% had good, 61.8% moderate and 18.5% had poor basic HIV/AIDS knowledge. Only 15.7% had well, 49.9% had moderate and 34.5% had poor knowledge on mother to child transmission of HIV and its prevention. The attitude towards the PMTCT of HIV was generally positive which comprised 318 (90.6%) of the respondents. **Conclusion:** Though the level of basic knowledge of HIV/AIDS was shown to be moderate to Good in pregnant women, almost half of pregnant women even after counseling attained only Moderate knowledge on PMTCT. Since there are still knowledge gaps on different but important aspects of PMTCT, there is a need for adequate counseling including more sessions during pregnancy, more public campaigns to encourage early ANC attendances.

224. Mulungu LS, Massawe AW, Kennis J, Crauwels D, Eiseb S, Mahlaba TAA, Belmain SR. Differences in diet between two rodent species, Mastomys natalensis and Gerbilliscus vicinus, in fallow land habitats in central Tanzania. *African Zoology*. 2011; 46(2): 387-392.

Differences in the ecological niche requirements among rodent species competing in the same habitat may result from differences in the use of one to three resources: space, time and food or some combination of these. Alternatively, differences in resource use utilization among animal species may simply reflect availability of food, and when food is limited, different animal species compete. In this study, the diet of two rodent pest species, *Mastomys natalensis* and *Gerbilliscus vicinus*, coexisting in fallow land in central Tanzania were studied to assess the degree of diet differentiation among them. Dietary niche breadth of *G. vicinus* was greater than that of *M. natalensis* in all stages of the maize cropping seasons. The rodent species studied overlapped considerably in the food items consumed ranging from niche overlap (Ojk) of 0.77-0.89. Grains/seeds featured high in the diet of *M. natalensis* while plant material occurrence was high in *G. vicinus*. These two food categories may have contributed to differences in diet partitioning, which may, in turn, facilitate their coexistence in fallow land.

225. Mulungu LS, Themb'alilahlwa AM, Massawe AW, Kennis J, Crauwels D, Eiseb S, Monadjem A, Makundi RH, Katakweba AAS, Leirs H, Belmain SR. Dietary differences of the multimammate mouse, *Mastomys natalensis* (Smith, 1834), across different habitats and seasons in Tanzania and Swaziland. *Wildlife Research*. 2011; 38(7): 640-646.

Aims: We examined the foods consumed by *M. natalensis* in different habitats and seasons in central Tanzania and Swaziland. **Methods:** Diet was investigated in Tanzania in four different habitats (woodland, vegetable gardens, maize fields and fallow land) during different maize crop growth stages between March 2008 and February 2009. In Swaziland, this was conducted in three habitats (fallow land, cultivated fields and pristine land) during three crop growth stages (pre-planting, vegetative stage and post-harvest) between March 2008 and April 2009. Micro-histological examination of undigested fragments from the stomachs of trapped animals was

made whereby the preserved stomach content was placed in a Petri dish and sorted using a 25× or 50× magnification binocular stereoscope. Stomach contents were identified as: grain and/or seeds (both grasses and maize), plant material (roots, stems and leaves), invertebrates, pods of seeds, fruits (vegetable fruit such as tomato), animal hairs and unidentified matter. If necessary, a lugol solution was used to determine the presence of starch for maize and grass seeds or grains. **Key results:** In both countries, grain predominated in the diet of *M. natalensis*. Statistical analyses showed that there were no differences due to seasons or habitats. Therefore, the percentage volume and relative importance were the same across habitats and seasons in both countries. **Conclusions:** Our findings highlight clearly that *M. natalensis* is a generalist species feeding on available resources depending on the season and the habitat. Its preference for grain may account for its abundance in maize plantations and confirms it as one of the major pests in crop plantations, especially grain.

226. Munseri PJ, Talbot EA, Bakari M, Matee M, Teixeira JP, Von Reyn CF. The bacteraemia of disseminated tuberculosis among HIV-infected patients with prolonged fever in Tanzania. *Scandinavian Journal of Infectious Diseases*.2011; 43 (9): 696-701.

Background: Disseminated tuberculosis (TB) is a common cause of death among human immunodeficiency virus (HIV)-infected patients in developing countries. Blood culture offers a potential means to diagnose disseminated TB, but optimal blood culture methods have not been studied. **Methods:** Two hundred and fifty-eight HIV-infected patients hospitalized in Tanzania with ≥ 2 weeks fever or cough had diagnostic studies for TB: 3 sputum samples for acid-fast bacilli smear and culture; 40 ml of blood for culture, randomized 1:1 to 40 ml \times 1, or 20 ml \times 2 collected 1224 h apart. Blood was processed using automated MB BacT [®] broth and manual Isolator [®] lysis-centrifugation agar. Mortality was assessed at 2 months. **Results:** TB was confirmed in 83 (32%) of 258 patients: by sputum only in 42 (51%, median CD4 = 72 cells/ μ l), blood only in 15 (18%, median CD4 = 44 cells/ μ l), and in sputum and blood in 26 (31%, median CD4 = 12 cells/ μ l). Blood was positive in 21 (16%) for 40 ml \times 1 vs 20 (15%) for 20 ml \times 1 ($p = 0.83$) vs 20 (16%) for 20 ml \times 2 ($p = 0.97$). MB BacT was positive in 31 (76%) and Isolator was positive in 20 (49%) of 41 samples ($p = 0.01$). The mean colony-forming units/ml was 8 (range 314). Twenty-one (51%) patients with disseminated TB died; median survival was 6 days (range

058). **Conclusions:** Disseminated TB in HIV is characterized by persistent bacteraemia, delayed microbiological detection, and high mortality. Twenty millilitres of blood processed by automated broth is the optimal culture method to detect disseminated TB. Empiric TB therapy is warranted for HIV-infected patients from TB-endemic countries with prolonged cough or fever.

227. Murray CJ, Lopez AD, Black R, Ahuja R, Ali SM, Baqui A, Tallo V. Population Health Metrics Research Consortium gold standard verbal autopsy validation study: design, implementation, and development of analysis datasets. *Population health metrics*. 2011; 9(1): 27.

Background: Verbal autopsy methods are critically important for evaluating the leading causes of death in populations without adequate vital registration systems. With a myriad of analytical and data collection approaches, it is essential to create a high quality validation dataset from different populations to evaluate comparative method performance and make recommendations for future verbal autopsy implementation. This study was undertaken to compile a set of strictly defined gold standard deaths for which verbal autopsies were collected to validate the accuracy of different methods of verbal autopsy cause of death assignment. **Methods:** Data collection was implemented in six sites in four countries: Andhra Pradesh, India; Bohol, Philippines; Dar es Salaam, Tanzania; Mexico City, Mexico; Pemba Island, Tanzania; and Uttar Pradesh, India. The Population Health Metrics Research Consortium (PHMRC) developed stringent diagnostic criteria including laboratory, pathology, and medical imaging findings to identify gold standard deaths in health facilities as well as an enhanced verbal autopsy instrument based on World Health Organization (WHO) standards. A cause list was constructed based on the WHO Global Burden of Disease estimates of the leading causes of death, potential to identify unique signs and symptoms, and the likely existence of sufficient medical technology to ascertain gold standard cases. Blinded verbal autopsies were collected on all gold standard deaths. **Results:** Over 12,000 verbal autopsies on deaths with gold standard diagnoses were collected (7,836 adults, 2,075 children, 1,629 neonates, and 1,002 stillbirths). Difficulties in finding sufficient cases to meet gold standard criteria as well as problems with misclassification for certain causes meant that the target list of causes for analysis was reduced to 34 for adults, 21 for children, and 10 for neonates, excluding stillbirths. To ensure strict independence for the validation of methods and

assessment of comparative performance, 500 test-train datasets were created from the universe of cases, covering a range of cause-specific compositions. **Conclusions:** This unique, robust validation dataset will allow scholars to evaluate the performance of different verbal autopsy analytic methods as well as instrument design. This dataset can be used to inform the implementation of verbal autopsies to more reliably ascertain cause of death in national health information systems.

228. Musau S, Chee G, Patsika R, Malangalila E, Chitama D, Van Praag E, Schettler G. Tanzania Health System Assessment 2010 Report. 2011.

229. Mushi D, Hunter E, Mtuya C, Mshana G, Aris E, Walker R. Social-cultural aspects of epilepsy in Kilimanjaro Region, Tanzania: Knowledge and experience among patients and carers. *Epilepsy and Behavior*. 2011; 20 (2):338-343.

Objective: Understanding the social-cultural aspects of epilepsy in sub-Saharan Africa will help to improve the situation of people with epilepsy (PWE) in this region. **Methods:** This qualitative study comprised interviews with 41 PWE and their carers. Participants were identified from a large community-based epidemiological study of epilepsy conducted in 2009. **Results:** Epilepsy was commonly ascribed to witchcraft and curses. Nearly all PWE demonstrated pluralistic care-seeking behavior, including the use of prayers and traditional healers alongside modern care. PWE reported discrimination as a result of their condition. The majority of PWE had suffered burns during seizures. **Conclusions:** Poor knowledge and strong cultural and religious beliefs characterize the experience of PWE in this population. Epilepsy-related stigma contributes to overall disease burden and PWE face exclusion across major life domains. There is a need to educate communities and inculcate perceptions and attitudes that promote early detection of epilepsy and early care-seeking behavior.

230. Mwakapasa EG. Attitude towards and practice of helmet use among commercial motorcyclists in Dar es Salaam region, Tanzania. Master of Nursing (Critical Care &Trauma) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Motorcycle accidents form a fatal category of motor traffic accidents. Motorcycle riders have a 34 times risk of death than the drivers of other types of vehicles and 8 times more likely to be injured. The non-use of helmet is a specific factor leading to head injuries and fatalities resulting from motorcycle crashes. **Objectives:** The purpose of this study was to explore the commercial motorcyclists' Attitude and their practices of helmet wearing. The specific objectives were to determine the following among commercial motorcyclists in Dar es Salaam region: attitude of helmet use, proportion of commercial motorcyclists who wear helmet and the practice of helmet use. **Material and methods:** A cross-sectional survey was conducted in urban and peri-urban areas of Dar es Salaam region in May, 2011 at randomly selected commercial motorcycle parking points. A total of 273 conveniently selected eligible commercial motorcyclists participated. Face-to-face interviews were performed using a standard questionnaire while observation was conducted using an observation checklist. Data was analyzed using SPSS version 16.0. **Results:** All commercial motorcyclists were males, with the majority (64.8%) with primary education. The proportion of commercial motorcyclists who reported to wear helmet was 81.3%. However about two thirds of them (67.6%) reported to not wear helmet consistently. Helmet wearing was strongly predicted by having a positive attitude towards helmet for passengers ($p=0.005$), protective ability of helmet against head injury ($p=0.003$), wearing helmet during night ($p=0.001$) and wearing helmet even for the experienced rider ($p=0.000$). However in a multiple regression model, it was found that those who agreed regarding the protective ability of helmet against head injury were more likely to wear helmet than those who disagreed (AOR: 0.279; 95% CI: 0.086-0.905); those who strongly agreed on wearing helmet during hot weather were more likely to wear helmet than those who disagreed (AOR: 0.039; 95% CI: 0.002-0.698). Those who strongly agreed on necessity for passengers to wear helmet and wearing helmet during night were more likely to wear helmet than those who were undecided (AOR: 0.091; 95% CI: 0.013- 0.617 and AOR: 0.114; 95% CI: 0.014-0.931 respectively). Those who had primary education were more likely to wear helmet than those who had no formal education (AOR: 6.146; 95% CI; 1.345-28.097). There was no significant difference in helmet wearing between urban and peri-urban areas ($p=0.109$). A small majority (52.7%) were observed wearing helmet, although 91.8% of them had no passengers helmet. **Conclusion:** These findings indicate that despite the inconsistent helmet wearing, commercial

motorcyclists had positive attitude towards helmet wearing. Helmet wearing is associated with the level of education and having a positive attitude towards helmet wearing. There is a high disparity on the observed helmet wearing between riders and passengers. Very few among the later were found to be wearing helmet. **Recommendations:** There is a need to strengthen legal enforcement of helmet wearing and ensuring the availability and accessibility of quality helmet to the majority of commercial motorcyclists. There is also a need for regular education campaigns to foster positive attitude towards helmet use. Further explorative studies on the quality of helmet and the factors associated with the use and non-use of helmet among motorcycle passengers are recommended.

231. Mwambete K, Maurice HB. Integration of random amplification of polymorphic DNA-polymerase chain reaction (RAPD-PCR) and DNA sequencing in search for strain-specific pharmacological targets in *Echinococcus granulosus*. *African Journal of Biotechnology*.2011; 10 (29): 5563-5570.

Echinococcus granulosus a parasite characterized with intra-species variability and genetic studies show existence of 10 genotypes (G1-G10). Host specificity and different susceptibility to intermediate hosts has also been demonstrated. Better understanding of this parasitosis can assist in designing appropriate control and preventive measures and its management based on strain-molecular peculiarity. Thus, the necessity for identification and characterization of all strains. A total of 96 hydatid cysts from which either protoscolces or germinal membranes were extracted followed by DNA extraction and then, amplification by random amplification of polymorphic DNA (RAPD). The RAPD products with distinctive bands were cloned in pGEMT-Easy vector and recombinant DNA subjected to sequencing. Twelve oligonucleotides primers were designed from recombinant DNA sequences and strains-specific PCR were conducted. The PRC products amplified by primers P1F2R2 (Ta=66°C, 35 cycles) and P1F1R1TXPCRs (Ta = 66°C, 35 cycles) showed specie-specificity. Analysis of the DNA sequences showed homologies to some important molecules like laminin-binding protein and glutathione transferase. Notwithstanding that the present study indicates partial success on attaining distinctive strain-specific DNA sequences; the resultant polymerase chain reaction (PCR) products were not strain-discriminatory. It is speculated that incorporation of more restriction endonucleases and well-

adjusted reaction conditions strain-distinctive PCR-restriction fragment length polymorphism (RFLP) can be designed.

232. Mwambete KD, Justin TM. Poverty, Parasitosis and HIV/AIDS-Major Health Concerns in Tanzania. *Microbes, viruses and parasites in AID S process*. 2011: 207-236.

Objective: To screen for in vitro antimicrobial activity of methanolic extracts of flowering and non-flowering parts of *Ocimum graveolens*. **Methods:** The methanolic extracts of flowering and non-flowering parts of the plant were dissolved in 5% dimethylsulfoxide and serially diluted to concentrations of 0.03-64.0mg/ml. The microdilution with modified [3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide]-(MTT) method was used for evaluation of antibacterial activity on four strains of reference microbes namely *Pseudomonas aeruginosa*, *Escherichia coli*, *Candida albicans* and *Staphylococcus aureus*. A 30:1 ratio of culture medium/broth and sensitized microbial suspension with were added to each well. The microplates were aerobically incubated overnight at 37°C. Five microlitres of MTT was added to each well and incubated for 4 hours prior to spectrophotometric determination of enzymatically converted MTT's by-products (formazan, a purple/blue precipitate) at 550nm. Inhibition percentage of the extracts and antibiotics was determined by comparison with negative controls (untreated wells). **Results:** The antimicrobial effect of the extracts of non-flowering parts of *O. graveolens* exhibited a negative correlation with the extracts' concentrations ($r = -0.915$, $p = 0.01$). The lowest and highest percentage inhibition for non-flowering methanolic was -62.3% and 38.2% on *C. albicans* and *Pseudomonas spp* respectively, at 64mg/ml which is the highest assayed extract's concentration. The methanolic extract of flowering plant showed a positive correlation between extract's concentrations and percentage inhibition ($r = 0.313$, $p = 0.005$). The flowering plant extract exerted the highest mean inhibition of $98.06 \pm 2.17\%$ (*E. coli*) and the least $91.04 \pm 7.13\%$ (*P. aeruginosa*) at concentrations of 0.5-8.0mg/ml. The mean inhibition rates of the flowering extracts were comparable to that of control antibiotics: 71.70-100% and 73.9-100% respectively ($p < 0.05$). The enzymatically formed formazan was detectable up to concentrations of 8.0mg/ml for flowering and more than 64mg/ml for non-flowering extracts, and up to 0.25 mg/ml for antibiotics. **Conclusion:** Methanolic extract of the flowering *O. graveolens* exhibited pronounced antimicrobial activity when compared with the positive controls and unlike the non-flowering

extracts. Results obtained from the flowering *O. graveolens* plant can justify its traditional use for treatment of common disease conditions. However, further studies should be conducted to buttress these findings and isolation of active antimicrobial components.

233. Mwambete KD, Lyombe F. Antimicrobial activity of medicated soaps commonly used by Dar es Salaam residents in Tanzania. *Indian journal of pharmaceutical sciences.* 2011; 73(1): 92.

An in vitro evaluation of the anti-microbial activity of medicated soaps was conducted using ditch-plate and hand washing techniques. Strains of reference microbes namely *Candida albicans* (ATCC90028), *Staphylococcus aureus* (ATCC25923), *Pseudomonas aureginosa* (ATCC27853) and *Escherichia coli* (ATCC25922) were tested at three different soaps' concentrations (1.0, 4.0 and 8.0 mg/ml). A total of 16 medicated soaps were assayed for their antimicrobial efficacy. Of these, 13 were medicated and 3 non-medicated soaps, which served as control. Ciprofloxacin and ketaconazole were employed as positive controls. Label disclosure for the soaps' ingredients and other relevant information were absorbed. The most common antimicrobial active ingredients were triclosan, trichloroxylenol and trichlorocarbanilide. ANOVA for means of zones of inhibition revealed variability of antimicrobial activity among the medicated soaps. Positive correlation ($r=0.318$; $P<0.01$) between zones of inhibition and soaps' concentrations was evidenced. Hand washing frequencies positively correlated with microbial counts. Roberts® soap exhibited the largest zone of inhibition (34 mm) on *S. aureus*. *Candida albicans* was the least susceptible microbe. Regency® and Dalan® exhibited the least zone of inhibition on the tested bacteria. Protex®, Roberts®, Family® and Protector® were equally effective ($P<0.01$) against *S. aureus*. In conclusion, majority of the assayed medicated soaps have satisfactory antibacterial activity; though lack antifungal effect with exception of Linda® liquid soap. The hand washing technique has proved to be inappropriate for evaluation of soaps' antimicrobial efficacy due to presence of the skin microflora.

234. Mwangosi IE, Majenge JM. Prevalence and awareness of oral manifestations among people living with HIV/AIDS attending counseling and treatment centers in Iringa Municipality, Tanzania. *Tanzania Journal of Health Research.* 2011; 13 (3):205-213.

There is limited literature on the magnitude of oral manifestations and the extent of awareness on its occurrence in people living with HIV/AIDS (PLWHA) in Tanzania. The objective of this study was to assess the magnitude of, and extent of awareness on oral manifestations among PLWHA attending counseling and treatment centers (CTC) in Iringa Municipality in southwestern Tanzania. A convenient sample of 200 PLWHA was included in the study in two CTC. Each participant was interviewed using a structured questionnaire. Thereafter a quick clinical oral assessment by a dentist was performed to record any relevant abnormality. The mean age of participants was 38.4 ± 11.9 years. Females were 63.3% and most of the participants had primary education (53%). Generally, 23.5% of the PLWHAs had at least one oral manifestation, with statistical significant difference across age groups. Clinical manifestations observed were mucosal ulcerations with or without severe periodontal lesions (7.0%), angular cheilitis (7.0%), oral thrush (6.5%), Kaposi's sarcoma (1.5%), and hairy leukoplakia (1.0%). The majority (89.5%) of the PLWHAs had sound awareness on clinical oral manifestations with significant statistical difference by educational status - the strength increased linearly with educational status. In general, 77.0% of the PLWHAs had healthy oral cavities. In conclusion, the prevalence and severity of clinical oral manifestations among PLWHA was low and the majority of PLWHA were aware of the conditions. However, it is recommended that more intensive studies should be carried out to assess the standard strength of the public awareness on oral manifestations among PLWHA and ascertain the magnitude of the problem and facilitate appropriate control strategies.

235. Mwanziva C, Manjurano A, Mbugi E, Mweya C, Mkali H, Kivuyo MP, Sanga A, Ndaro A, Chambo W, Mkwizu A, Kitau J, Kavishe R, Dolmans W, Chilongola J, Mosha FW. Defining malaria burden from morbidity and mortality records, self treatment practices and serological data in Magugu, Babati district, northern Tanzania. *Tanzania Journal of Health Research*. 2011; 13 (2). 92.

Malaria morbidity and mortality data from clinical records provide essential information towards defining disease burden in the area and for planning control strategies, but should be augmented with data on transmission intensity and serological data as measures for exposure to malaria. The

objective of this study was to estimate the malaria burden based on serological data and prevalence of malaria, and compare it with existing self-treatment practices in Magugu in Babati District of northern Tanzania. Prospectively, 470 individuals were selected for the study. Both microscopy and Rapid Diagnostic Test (RDT) were used for malaria diagnosis. Seroprevalence of antibodies to merozoite surface proteins (MSP- 119) and apical membrane antigen (AMA-1) was performed and the entomological inoculation rate (EIR) was estimated. To complement this information, retrospective data on treatment history, prescriptions by physicians and use of bed nets were collected. Malaria prevalence in the area was 6.8% (32/470). Of 130 individuals treated with artemisinin combination therapy (ACT), 22.3% (29/130) were slide confirmed while 75.3% (98/130) of them were blood smear negative. Three of the slides confirmed individuals were not treated with ACT. Fever was reported in 38.2% of individuals, of whom 48.8% (88/180) were given ACT. Forty-two (32.3%) of those who received ACT had no history of fever. About half (51.1%) of those treated with ACT were children <10 years old. Immunoglobulin against MSP-119 was positive in 16.9% (74/437) while against AMA-1 was positive in 29.8% (130/436). Transmission intensity was estimated at <0.2 infectious bites per person per year. The RDT was highly specific (96.3%) but with low sensitivity (15.6%). In conclusion, Magugu is a low endemic area. There is substantial over diagnosis, over treatment and self treatment in the community. The burden of malaria based on medical records is over estimated as was mostly presumptive. The low sensitivity of RDT reflects the low number of immune individuals as well as the low parasite density.

236. Mwashambwa MY, Mbembati NA. Patient with Benign Prostatic Hypertrophy and Two Giant Stones in urinary bladder. *East and Central African Journal of Surgery*. 2011; 16(3).

Giant urinary bladder stones are very rare; very few cases have been reported in English literature and only one case from Africa. Multiple giant bladder stones are extremely rare; no single case report has been found documenting this occasion. This report presents a patient of benign prostatic hypertrophy with two giant stones in the urinary bladder.

237. Mwashambwa MY, Yongolo SC. The effectiveness of ultrasound in the diagnosis of bladder tumours at the Muhimbili National Hospital, Dar es Salaam, Tanzania. *Tanzania Journal of Health Research*. 2011; 13 (3):236-241.

The importance of an ultrasound in diagnosis of bladder tumors has been investigated by different authors. Some have questioned its effectiveness while others have considered the technique to be an important tool in the initial evaluation of bladder tumors. This study was carried out to establish the effectiveness of the ultrasound in diagnosis of bladder tumors at the Muhimbili National Hospital in Dar es Salaam, Tanzania. Clinical indications and ultrasound findings were recorded. Cystoscopy was done and findings recorded on a preformed questionnaire. The ultrasound findings were compared to cystoscopy findings and the sensitivity, negativity, positive predictive value and negative predictive value determined. A total of 110 patients were recruited in this study and the male to female ratio was 2:1. The commonest (37%) age group was 41-60 years. The most common clinical indication overall was haematuria in 37% of all cases. In males, bladder outlet obstruction due to stricture was the commonest indication (31%). Out of 110 patients scheduled for cystoscopy, 71 had ultrasound done preoperatively. In these patients 70% had some form of abnormal ultrasound findings. The sensitivity, specificity, positive predictive value, and the negative predictive value (NPV) of ultrasound in detection of bladder tumor were 83%, 93%, 89% and 89%, respectively. In conclusion, ultrasound is an effective method for evaluating patients presenting with haematuria or suspected to have bladder tumors'. It is cheap, available, affordable and non-invasive; has a high sensitivity, and therefore it can also be useful in the follow-up of patient with bladder cancer.

238. Mwilongo SJ. Challenges perceived by local pharmaceutical manufacturers that hinder adequate production of essential medicines in Tanzania. Master of Science, (Pharmaceutical Management) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Introduction Limited access to essential medicines undermines the health systems' objectives of equity, efficiency and health development in many developing countries. The major factor associated with limited drug accesses is the high price of medicines. The ability of local

pharmaceutical industries to manufacture essential medicines is an important contributor in facilitating access and affordability of medicines. Currently, Tanzania's local manufacturers can only supply 30% of the country's need of essential medicines despite having several pharmaceutical manufacturers. **Objective:** The objective of this study was to determine the challenges that hinder local pharmaceutical manufacturers from producing adequate supplies of essential medicines in Tanzania. **Methodology:** Guided In-depth interviews with Chief Executive Officers/General Managers from all the seven local pharmaceutical companies available in Tanzania were done to determine the challenges. Eleven themes were identified and categorized using content relation analysis. **Results:** The challenges identified by Tanzanian manufacturers were comparable to the findings of studies conducted in other developing countries. What was unique in this study was that lack of accessory industries was among the challenges that manufacturers perceived as hindering increased capacity. In addition, in contrast to other studies requirement to adhere to Good Manufacturing Practice (GMP) regulations was not perceived to be a challenge that hindered increased production of essential medicine but rather an obligation for them to remain competitive. **Conclusion:** To increase capacity of local manufacturers a multi-sectorial approach is needed to address the above identified constraints is required. A concentrated effort therefore should be put in by both parties i.e. the government and local manufacturers for Tanzania to become self-sufficient in terms of the manufacture of essential medicines.

239. Mwiru RS, Spiegelman D, Duggan C, Peterson K, Liu E, Msamanga G, Aboud S, Fawzi WW. Relationship of exclusive breast-feeding to infections and growth of Tanzanian children born to HIV-infected women. *Public Health Nutrition*.2011; 14 (7): 1251-1258.

Objective: We examined the relationships between exclusive breast-feeding and the risks of respiratory, diarrhoea and nutritional morbidities during the first 2 years of life among children born to women infected with HIV-1. **Design** We prospectively determined the incidence of respiratory illnesses, diarrhoea, fever, hospitalizations, outpatient visits and nutritional morbidities. Generalized estimating equations were used to estimate the relative risks for morbidity episodes and Cox proportional hazards models to estimate the incidence rate ratios of nutritional morbidities. **Setting** Dar es Salaam, Tanzania. **Subjects** the sample consisted of 666

children born to HIV-infected women.**Results:** The 666 children were followed for 2 years. Exclusive breast-feeding was associated with lower risk for cough (rate ratio (RR) = 0.49, 95 % CI 0.41, 0.60, $P < 0.0001$), cough and fever (RR = 0.44, 95 % CI 0.32, 0.60, $P < 0.0001$) and cough and difficulty breathing or refusal to feed (RR = 0.31, 95 % CI 0.18, 0.55, $P < 0.0001$). Exclusive breast-feeding was also associated with lower risk of acute diarrhoea, watery diarrhoea, dysentery, fever and outpatient visits during the first 6 months of life, but showed no effect at 6-24 months of life. Exclusive breast-feeding did not significantly reduce the risks of nutritional morbidities during the first 2 years of life.**Conclusions:** Exclusive breast-feeding is strongly associated with reductions in the risk of respiratory and diarrhoea morbidities during the first 6 months of life among children born to HIV-infected women.

240. Naibei IK, Odondo AJ, Siringi E. The impact of electronic tax registers on VAT compliance by private firms in Kisumu City, Kenya. *African Journal of Business and Economic Research*. 2011; 6(2 & 3): 7-25.

This study aimed at investigating the impact of ETR use on VAT compliance. A sample of 233 registered firms was selected. Data was collected using self administered questionnaires to personnel in finance department of the selected firms. The data was analysed by regression analysis to reveal relationships between the variables. The study revealed that effective and regular use of ETRs had a positive impact on the VAT compliance with $R = 0.622$, significant at 95% confidence level ($p < 0.005$). Inspection of business firms by tax authorities had a positive relationship with VAT compliance ($R = 0.15$, $p = 0.003$). The KRA should therefore encourage effective use of ETR by ensuring that all firms do not merely install the gadgets but also use them for each transaction. This can be achieved by regular but impromptu inspections. Findings of this study would help policy makers and the academia in addressing matters of tax compliance

241. Naresh KN, Ibrahim HA, Lazzi S, Rince P, Onorati M, Ambrosio MR, Bilhou NC, Amen F, Reid A, Mawanda M, Calbi V, Ogwang M, Rogena E, Byakika B, Sayed S, Moshi E, Mwakigonja A, Raphael M, Magrath I, Leoncini L. Diagnosis of Burkitt lymphoma using an algorithmic approach—applicable in both resource? Poor and resource? Rich countries. *British journal of haematology*. 2011; 154(6): 770-776.

Distinguishing Burkitt lymphoma (BL) from B cell lymphoma, unclassifiable with features intermediate between diffuse large B-cell lymphoma (DLBCL) and BL (DLBCL/BL), and DLBCL is challenging. We propose an immunohistochemistry and fluorescent in situ hybridization (FISH) based scoring system that is employed in three phases – Phase 1 (morphology with CD10 and BCL2 immunostains), Phase 2 (CD38, CD44 and Ki-67 immunostains) and Phase 3 (FISH on paraffin sections for MYC, BCL2, BCL6 and immunoglobulin family genes). The system was evaluated on 252 aggressive B-cell lymphomas from Europe and from sub-Saharan Africa. Using the algorithm, we determined a specific diagnosis of BL or not-BL in 82%, 92% and 95% cases at Phases 1, 2 and 3, respectively. In 3-4% cases, the algorithm was not completely applicable due to technical reasons. Overall, this approach led to a specific diagnosis of BL in 122 cases and to a specific diagnosis of either DLBCL or DLBCL/BL in 94% of cases that were not diagnosed as BL. We also evaluated the scoring system on 27 cases of BL confirmed on gene expression/microRNA expression profiling. Phase 1 of our scoring system led to a diagnosis of BL in 100% of these cases.

242. Naresh KN, Raphael M, Ayers L , Hurwitz N, Calbi V, Rogena E, Sayed S, Sherman O, Ibrahim HAH, Lazzi S, Mourmouras V, Rince P, Githanga J, Byakika B, Moshi E, Durosinmi M, Olasode BJ , Oluwasola OA, Akang EE, Akenòva Y, Adde M, Magrath I, Leoncini L. Lymphomas in sub-Saharan Africa - what can we learn and how can we help in improving diagnosis, managing patients and fostering translational research?. *British Journal of Haematology*.2011; 154 (6):696-703.

Approximately 30000 cases of non-Hodgkin lymphoma (NHL) occur in the equatorial belt of Africa each year. Apart from the fact that Burkitt lymphoma (BL) is very common among children and adolescents in Africa and that an epidemic of human immunodeficiency virus (HIV) infection is currently ongoing in this part of the world, very little is known about lymphomas in Africa. This review provides information regarding the current infrastructure for diagnostics in sub-Saharan Africa. The results on the diagnostic accuracy and on the distribution of different lymphoma subsets in sub-Saharan Africa were based on a review undertaken by a team of lymphoma experts on 159 fine needle aspirate samples and 467 histological samples during their

visit to selected sub-Saharan African centres is presented. Among children (<18years of age), BL accounted for 82% of all NHL, and among adults, diffuse large B-cell lymphoma accounted for 55% of all NHLs. Among adults, various lymphomas other than BL, including T-cell lymphomas, were encountered. The review also discusses the current strategies of the International Network of Cancer Treatment and Research on improving the diagnostic standards and management of lymphoma patients and in acquiring reliable clinical and pathology data in sub-Saharan Africa for fostering high-quality translational research.

243. Ndile M, Kohi TW. The knowledge of parents of children with congenital heart disease in Dar es Salaam, Tanzania. *Africa Journal of Nursing and Midwifery*. 2011; 13 (2): 57-66.

Parents of children with congenital heart disease (CHD) or other heart defects face challenges when caring for these children, as most of these defects require long-term treatment and care. However, there has been no published study in Tanzania to identify parents' knowledge levels about their children's CHD. The main objective of this study was to assess parents' knowledge about their children's CHD, their medication and the prevention of complications at a hospital in Dar es Salaam, Tanzania. A quantitative, descriptive, cross-sectional design was adopted. Parental knowledge was assessed using a modified version of Leuven's questionnaire for assessing parents' knowledge about their children's CHD. The questionnaire contained 23 items. The sample comprised 84 parents accompanying their children with CHD for follow-up visits at the participating cardiac clinic and those staying with their children in the hospital's wards. The findings indicated that 43% (n = 36) of the parents could not give a meaningful explanation of their child's CHD and (76.2% (n = 64) were unable to mention the symptoms of deterioration of the child's specific heart defect. Knowledge about the side effects of drugs, and interactions with other drugs or food were low. Parents' understanding of their children's CHD or heart defects correlated with the parents' educational backgrounds.

244. Negishi H, Maoka T , Njelekela M, Yasui N, Juman S, Mtabaji J, Miki T, Nara Y, Yamori Y, Ikeda K. New chromone derivative terminalianone from African plant Terminalia brownii Fresen (Combretaceae) in Tanzania. *Journal of Asian Natural Products Research*. 2011; 13 (3): 281-283.

A new chromone derivative named terminalianone (1) was isolated from the African plant, Terminalia brownii Fresen (Combretaceae) in Tanzania. Its structure was determined to be 7-hydroxy-3-[6'-hydroxyphenyl-2'-oxo- ethyl] chromone by FAB-MS and NMR spectral data.

245. Negreira AS, Aboud S, Wilcox J. Surface reactivity of V₂O₅ (001): Effects of vacancies, protonation, hydroxylation, and chlorination. *Physical Review B*. 2011; 83(4): 045423.

Using density-functional theory we analyze the thermodynamic stability of partially reduced, protonated, hydroxylated, and chlorinated V₂O₅ (001) surfaces under flue gas conditions. These surfaces are characterized geometrically through surface relaxation calculations and electronically through charge distribution and density-of-states analysis to understand the change in surface reactivity under different pressure and temperature conditions, with a primary focus on coal-fired flue gas conditions. The stoichiometric surface is found to be the most favorable termination under flue gas conditions, but at low oxygen partial pressures (i.e., ultra-high-vacuum conditions) and elevated temperatures, the partially reduced V₂O₅ (001) surfaces with one or two vanadyl oxygen vacancies are found to be stable. A surface semiconductor-to-metal transformation takes place with the addition of oxygen vacancies indicated by a decrease in the band gap. The protonation of the V₂O₅(001) surface only takes place at low oxygen partial pressures where the main source or sink of hydrogen atoms comes from H₂. The study of the thermodynamic stability of protonated surfaces and surfaces with dissociated water with both H- and OH- groups indicated that these surfaces are not stable under flue gas conditions. Chlorinated surfaces were not stable under the flue gas and the coverage conditions tested. Larger HCl concentrations or smaller coverages may lead to stable chlorinated structures; however, the small coverages required to accurately represent the chlorine flue gas concentrations would require much larger unit-cell sizes that would be too computationally

expensive. From this work it is evident that the stoichiometric surface of V₂O₅ is the most stable under flue gas conditions, and likely reactivity corresponding to NO_x reduction, surface chlorination, and mercury oxidation stems from support effects on the vanadia catalyst, which influences the vanadium oxidation state and subsequent surface reactivity.

246. Nel AM, Mitchnick LB, Risha P, Muungo LTM, Norick PM. Acceptability of vaginal film, soft-gel capsule, and tablet as potential microbicide delivery methods among African women. *Journal of Women's Health*. 2011; 20 (8):1207-1214.

Background: Vaginal microbicides are in development for the prevention of HIV transmission to women via sexual intercourse. Acceptability of the microbicide delivery method in the targeted population is important to product adherence and, therefore, product effectiveness. It is anticipated that multiple delivery methods will be required to satisfy personal preferences among future microbicide users. **Methods:** A total of 526 sexually active women aged 18-30 years participated in a consumer product preference study in Burkina Faso, Tanzania, and Zambia. Screened women who had given consent were instructed to use each of the three products (placebo formulations of a vaginal tablet, film, and soft-gel capsule) once daily for 7 consecutive days for a total of 21 days. Women were interviewed about their impressions of the product at the completion of each 7-day trial period. **Results:** Over 80% of women reported they liked using each dosage form, and over 85% said they would definitely use it. The film and soft-gel capsule were chosen significantly more often than the tablet as the preferred dosage form (39% and 37% vs. 25%, respectively) mainly because of faster dissolving time and easier insertion. Women in Burkina Faso and Tanzania preferred the soft-gel capsule (42%-46%), whereas Zambian women preferred the film (51%). Age, socioeconomic status, and marital status did not significantly affect product preference. **Conclusions:** All three dosage forms were acceptable to the women surveyed. Preferred dosage forms varied by country. These data suggest that the availability of microbicides in multiple dosage forms may increase acceptability, adherence, and, therefore, effectiveness.

247. Ngaimisi E, Mugusi S, Minzi O, Sasi P, Riedel KD, Suda A, Ueda N, Janabi M, Mugusi F, Haefeli WE, Bertilsson L , Burhenne J , Aklillu E. Effect of rifampicin and CYP2B6 genotype on long-term efavirenz autoinduction and plasma exposure in HIV patients with or without tuberculosis. *Clinical Pharmacology and Therapeutics*.2011; 90 (3):406-413.

We performed a prospective comparative study to examine, from a pharmacogenetics perspective, the effect of rifampicin (RIF) on long-term efavirenz (EFV) autoinduction and kinetics. In a study population of patients with HIV receiving EFV with RIF (arm 2, n = 54) or without RIF (arm 1, n = 128 controls), intraindividual and interindividual plasma EFV and 8-hydroxyefavirenz levels were compared at weeks 4 and 16 of EFV therapy. In arm 2, RIF was initiated 4 weeks before starting EFV. In controls (arm 1), the plasma EFV was significantly lower whereas 8-hydroxyefavirenz was higher at week 16 as compared to week 4. By contrast, there were no significant differences in plasma EFV and 8-hydroxyefavirenz concentrations over time in arm 2. At week 4, the plasma EFV concentration was significantly lower in arm 2 as compared to arm 1, but no significant differences were observed by week 16. When stratified by CYP2B6 genotype, significant differences were observed only with respect to CYP2B61/1 genotypes. Ours is the first report of the CYP2B6 genotype-dependent effect of RIF on long-term EFV autoinduction

248. Ngasala BE, Malmberg M, Carlsson AM, Ferreira PE, Petzold MG, Blessborn D, Bergqvist Y, Gil JP, Premji Z, Björkman A, Mårtensson A. Efficacy and effectiveness of artemether-lumefantrine after initial and repeated treatment in children < 5 years of age with acute uncomplicated plasmodium falciparum malaria in rural Tanzania: A randomized trial. *Clinical Infectious Diseases*.2011; 52 (7): 873-882.

Background: We assessed the efficacy, effectiveness and safety of artemether-lumefantrine, which is the most widely, used artemisinin-based combination therapy in Africa, against Plasmodium falciparum malaria during an extended follow-up period after initial and repeated treatment. **Methods:** We performed an open-label randomized trial of artemether-lumefantrine with supervised (n = 180) and unsupervised intake (n = 179) in children <5 years of age with

uncomplicated falciparum malaria in rural Tanzania. Recurrent infections between day 14 and day 56 were retreated within the same study arm. Main end points were polymerase chain reaction (PCR)-corrected cure rates by day 56 and day 42 after initial and repeated treatment, respectively, as estimated by survival analysis. **Results:** The PCR-corrected cure rate after initial treatment was 98.1% (95% confidence interval [CI], 94.2%-99.4%) after supervised and 95.1% (95% CI, 90.7%-98.1%) after unsupervised intake (P = .29). After retreatment of recurrent infections, the cure rates were 92.9% (95% CI, 81.8%-97.3%) and 97.6% (95% CI, 89.3%-98.8%), respectively (P = .58). Reinfections occurred in 46.9% (82 of 175) versus 50.9% of the patients (relative risk [RR], 0.92 [95% CI, 0.74-1.14]; P = .46) after initial therapy and 32.4% (24 of 74) versus 39.0% (32 of 82) (RR, 0.83 [95% CI, 0.54-1.27]; P = .39) after retreatment. Median blood lumefantrine concentrations in supervised and unsupervised patients on day 7 were 304 versus 194 ng/mL (P < .001) after initial treatment and 253 versus 164 ng/mL (P = .001) after retreatment. Vomiting was the most commonly reported drug-related adverse event (in 1% of patients) after both initial and repeated treatment. **Conclusions:** Artemether-lumefantrine was highly efficacious even after unsupervised administration, despite significantly lower lumefantrine concentrations, compared with concentration achieved with supervised intake, and was well-tolerated and safe after initial and repeated treatment.

249. Ngasala BE, Malmberg M, Carlsson AM, Ferreira PE, Petzold MG, Blessborn D, Bergqvist Y, Gil JP, Premji Z, Mårtensson A. Effectiveness of artemether-lumefantrine provided by community health workers in under-five children with uncomplicated malaria in rural Tanzania: An open label prospective study. *Malaria Journal*.2011; 10: 64.

Background: Home-management of malaria (HMM) strategy improves early access of anti-malarial medicines to high-risk groups in remote areas of sub-Saharan Africa. However, limited data are available on the effectiveness of using artemisinin-based combination therapy (ACT) within the HMM strategy. The aim of this study was to assess the effectiveness of artemether-lumefantrine (AL), presently the most favoured ACT in Africa, in under-five children with uncomplicated *Plasmodium falciparum* malaria in Tanzania, when provided by community health workers (CHWs) and administered unsupervised by parents or guardians at home. **Methods:** An open label, single arm prospective study was conducted in two rural villages with

high malaria transmission in Kibaha District, Tanzania. Children presenting to CHWs with uncomplicated fever and a positive rapid malaria diagnostic test (RDT) were provisionally enrolled and provided AL for unsupervised treatment at home. Patients with microscopy confirmed *P. falciparum* parasitaemia were definitely enrolled and reviewed weekly by the CHWs during 42 days. Primary outcome measure was PCR corrected parasitological cure rate by day 42, as estimated by Kaplan-Meier survival analysis. This trial is registered with ClinicalTrials.gov, number NCT00454961. Results: A total of 244 febrile children were enrolled between March-August 2007. Two patients were lost to follow up on day 14, and one patient withdrew consent on day 21. Some 141/241 (58.5%) patients had recurrent infection during follow-up, of whom 14 had recrudescence. The PCR corrected cure rate by day 42 was 93.0% (95% CI 88.3%-95.9%). The median lumefantrine concentration was statistically significantly lower in patients with recrudescence (97 ng/mL [IQR 0-234]; n = 10) compared with reinfections (205 ng/mL [114-390]; n = 92), or no parasite reappearance (217 [121-374] ng/mL; n = 70; p = 0.046). **Conclusions:** Provision of AL by CHWs for unsupervised malaria treatment at home was highly effective, which provides evidence base for scaling-up implementation of HMM with AL in Tanzania.

250. Ngowi AVF, Semali I. Controlling pesticide poisoning at community level in Lake Eyasi Basin, Karatu district, Tanzania [Controllo dell'avvelenamento da pesticidi nella Comunità del Lago Eyasi Basin, Distretto di Karatu, Tanzania]. *European Journal of Oncology*.2011; 16 (3),139-148.

Efforts to increase food production and bring about economic empowerment should not adversely affect public health and the environment. Strategies geared towards increasing farmers' capacity to farm sustainably and productively can greatly enhance both public health and profits. In rural communities in Tanzania, poor pesticide management and hazardous practices are common due to a lack of capacity, economic empowerment, and untrained and uninformed farmers. To improve the health of the Lake Eyasi Basin community, we embarked on a project that aimed at empowering farmers to monitor pesticides health impacts on themselves and the community in general through a community-based surveillance and make decisions that will

contribute to the sustainable reduction of the risks of pesticides. The outcome of a threemonths implementation (April - June 2010) of the project will be shared in this paper.

251. Njelekela M, Muhihi A, Mpembeni R, Masesa Z, Kitamori K, Mori M, Kato N, Mtabaji J, Yamori Y. Prevalence of cardiovascular disease risk factors among young and middle-aged men in urban Mwanza, Tanzania. *Journal of Public Health*. 2011; 19 (6):553-561.

Aim: We conducted a health survey to assess the prevalence of cardiovascular disease (CVD) risk factors and explore their socioeconomic correlates in a population of young and middle-aged men in the fast-growing city of Mwanza, Tanzania. Subjects and **methods:** A descriptive cross-sectional epidemiological study was conducted in Mwanza City among men aged 20-50 years. Anthropometric and blood pressure measurements, dietary history, physical activity and blood samples were collected according to the basic protocol of the WHO CARDIAC Study (Cardiovascular Disease and Alimentary Comparison). **Results:** The prevalence of systolic hypertension, low HDL cholesterol, elevated LDL cholesterol, obesity and hypertriglyceridemia was 23.7%, 10.3%, 9.3%, 4.1% and 1.0%, respectively. The prevalence of metabolic syndrome was 3.1%. Age correlated positively with waist circumference, waist-to-hip ratio ($p < 0.01$) and body mass index ($p = 0.05$). Education had a positive correlation with body mass index, total cholesterol, LDL cholesterol ($p < 0.01$), waist circumference and waist-to-hip ratio ($p < 0.05$). Income correlated positively with body mass index, waist circumference and total cholesterol ($p = 0.05$). Multiple regression analysis showed that age was the most important determinant of the body mass index ($\beta = 0.2$, $p = 0.02$), waist circumference ($\beta = 0.3$, $p = 0.01$) and waist-to-hip ratio ($\beta = 0.2$, $p = 0.002$), while education predicted serum LDL cholesterol ($\beta = 1.7$, $p = 0.03$). **Conclusion:** This urban population of young and middle-aged men demonstrated a low prevalence of CVD risk factors. The challenge is to maintain this low profile of CVD risk factors in the absence of national guidelines for prevention of CVD as rapid urbanization and nutrition transition take place in urban areas, including Mwanza City.

252. Njelekela MA, Liu E, Mpembeni R, Muhihi A, Mligiliche N, Spiegelman D, Mtabaji J. Socio-economic status, urbanization, and cardiometabolic risk factors among middle-aged adults in Tanzania. *East African journal of public health*. 2011; 8(3): 216-223.

Objective: This study was conducted to examine the associations between socioeconomic status, urbanization, and cardio-metabolic risk factors in Tanzania. **Methods:** Participants were 209 adults (45-66 years) in Dar es Salaam, Tanzania. A structured questionnaire was used to evaluate socioeconomic status and behavioral characteristics, including income, education, occupation, residence (urban, rural, mixed), dietary factors, and smoking. Blood samples were collected and analyzed to measure lipid profiles and fasting glucose levels. Cardio metabolic risk factors were defined using World Health Organization criteria. **Results:** Urban residence and higher socioeconomic status were associated with decreased intake of traditional staple food (ugali), and increased consumption of meat products and beverages. Higher socioeconomic status was associated with a significant 3.5-kg/m² higher BMI ($p = 0.0001$) and 8 cm higher waist circumference ($p < 0.001$), and a three-fold increase in the risk of obesity. Urban residence was associated with poorer lipid profile, including significantly higher total cholesterol, increased LDL cholesterol, but lower triglycerides, compared to rural residence. The prevalence of metabolic syndrome was high (38%), and was associated with increased socioeconomic status. **Conclusion:** Urban residence and higher socioeconomic status were important correlates of cardio metabolic risk factors, including obesity and poorer lipid profile. Primary prevention and health screening strategies are needed to target cardio metabolic risk factors in urban areas, to reduce the burden of cardiovascular disease in Tanzania.

253. Nondo RS, Mbwambo ZH, Kidukuli AW, Innocent EM, Mihale MJ, Erasto P, Moshi MJ. Larvicidal, antimicrobial and brine shrimp activities of extracts from Cissampelos mucronata and Tephrosia villosa from coast region, Tanzania. BMC complementary and alternative medicine. 2011; 11(1): 33.

Background: The leaves and roots of *Cissampelos mucronata* A. Rich (Menispermaceae) are widely used in the tropics and subtropics to manage various ailments such as gastro-intestinal complaints, menstrual problems, venereal diseases and malaria. In the Coast region, Tanzania, roots are used to treat wounds due to extraction of jigger. Leaves of *Tephrosia villosa* (L) Pers (Leguminosae) are reported to be used in the treatment of diabetes mellitus in India. In this study, extracts from the roots and aerial parts of *C. mucronata* and extracts from leaves, fruits, twigs and roots of *T. villosa* were evaluated for larvicidal activity, brine shrimps toxicity and

antimicrobial activity. **Methods:** Powdered materials from *C. mucronata* were extracted sequentially by dichloromethane followed by ethanol while materials from *T.villosa* were extracted by ethanol only. The extracts obtained were evaluated for larvicidal activity using *Culex quinquefasciatus* Say larvae, cytotoxicity using brine shrimp larvae and antimicrobial activity using bacteria and fungi. **Results:** Extracts from aerial parts of *C. Mucronata* exhibited antibacterial activity against *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella typhi*, *Vibrio cholera*, *Bacillus anthracis*, *Streptococcus faecalis* and antifungal activity against *Candida albicans* and *Cryptococcus neoformans*. They exhibited very low toxicity to brine shrimps and had no larvicidal activity. The root extracts exhibited good larvicidal activity but weak antimicrobial activity. The root dichloromethane extracts from *C. mucronata* was found to be more toxic with an LC50 value of 59.608 µg/mL while ethanolic extracts from root were not toxic with LC50>100 µg/mL). Ethanol extracts from fruits and roots of *T. villosa* were found to be very toxic with LC50 values of 9.690 µg/mL and 4.511 µg/mL, respectively, while, ethanol extracts from leaves and twigs of *T. villosa* were found to be non toxic (LC50>100 µg/mL). **Conclusion:** These results support the use of *C. mucronata* in traditional medicine for treatment of wounds. Extracts of *C. mucronata* have potential to yield active antimicrobial and larvicidal compounds. The high brine shrimp toxicity of *T. villosa* corroborates with literature reports that the plant is toxic to both livestock and fish. The results further suggest that *T. villosa* extracts have potential to yield larvicidal and possibly cytotoxic compounds. Further studies to investigate the bioactive compounds responsible for the observed biological effects are suggested.

254. Nsimba SED, Massele A, Kayombo EJ. Reducing injection overuse through consumers'-prescribers' interactional group discussions in Dar es Salaam region, Tanzania. *Therapy*.2011; 8 (2):179-187.

Aims: This study aimed to assess the efficacy of an innovative behavioral intervention, interactional group discussions (IGDs), for reducing the overuse of injections. **Materials & methods:** This study involved ten public (randomized into five control and five intervention groups) and ten private (randomized into five control and five intervention groups) dispensaries. Prescribers in the intervention group were each invited to one IGD, which consisted of six

prescribers and six consumers (of whom the majority were mothers with sick children under 5 years of age); a total of five IGDs were held in a 4-week period. All invited prescribers participated. Outcome measures were assessed in relation to a pre- and post-change using STATISTICA to analyze quantitative data, whereas qualitative data were analyzed using socioanthropological approaches. In control public dispensaries, the percentage of prescriptions that were for injections was 32% at baseline, compared with 31% in the intervention groups. **Results:** Using time series in the intervention facilities, the rate of injections prescribed fell from 31% at baseline to 22% 3 months post-IGDs ($p < 0.05$). In the private control dispensaries the rate of injection use was not significantly different (43 and 47%, respectively; $p > 0.05$). In the control dispensaries, there was a significant drop in the rate of injection use from 43% at baseline to 38% 3 months post-IGD ($p < 0.05$). This raised significantly to 49% 9 months post-IGD ($p < 0.05$). In the control facilities, the percentage of appropriate prescriptions of injections fell from 15% at baseline to 11% 3 months post-IGD, and rose to 16% 9 months post-IGD. Furthermore, the rate of injection use in the intervention group fell significantly from 44% at baseline to 35% 3 months post-IGD. This raised to 37% 9 months post-IGD. In addition, there were changes in the prescription of generic drugs, but no changes in injection use or prescriptions. **Conclusion:** The IGDs significantly reduced the overuse of injections, but the reduction was not sustained as prescriptions of injections soon returned to the original numbers. There was an overall reduction in the prescription of injections 3 months after intervention. However, injection use did not improve 9 months post-IGD, indicating that the prescribers did not practice what they had learnt. To sustain this practice, periodic training, monitoring and supervision are required in these facilities on a regular basis.

255. Nyale E, Mosha F, Aboud S. Acute HIV-1 infection among antigen/antibody seronegative blood donors in Dar es Salaam, Tanzania. *Tanzania Journal of Health Research*. 2011; 13 (3):281-286.

Fourth generation human immunodeficiency virus (HIV) antigen (Ag)/antibody (Ab) enzyme-linked immunosorbent assay (ELISA) used in the current screening of blood donors at the National Blood Transfusion Service Centers in Tanzania has limited ability to detect HIV Ag/Ab during the first two weeks of the window period. The aim of this study was to determine the

prevalence of acute HIV infection among HIV antigen/antibody negative blood donors. This cross-sectional study was conducted based on a blood donation facility in Dar es Salaam from December 2009 to April 2010. Apparently healthy voluntary blood donors screened and accepted for blood donations were included. Blood donation screening questionnaires were used to obtain socio-demographic characteristics, history of past medical, sexual and blood transfusion of the study population. Blood specimen was collected for confirmation of the negative HIV Ag/Ab status by the Roche HIV-1 DNA polymerase chain reaction (PCR) test. A total of 552 blood donors (age=18-54 years) with negative HIV Ag/Ab donated blood were included in the study. About two thirds of the blood donors were in the age group of 18-27 years. Of 552 blood donors, 413 (75%) were males while 139 (25%) were females. Seventy two percent of blood donors were unmarried. About 71% were voluntary and the rest were replacement blood donors. The prevalence of acute HIV-1 infection by HIV-1 DNA PCR test was found to be 0.2% (1/552). It is concluded that many voluntary blood donors were found to be young, male and unmarried. Acute HIV-1 infection using HIV-1 DNA PCR test in the blood donors with negative HIV Ag/Ab donated blood was found to be very low. Further multi-centre study with larger sample size country wide is warranted to determine the magnitude of acute HIV infection in the blood donors with negative HIV Ag/Ab donated blood.

256. Nyamtema AS, de Jong AB, Urassa DP, Van Roosmalen J. Using audit to enhance quality of maternity care in resource limited countries: Lessons learnt from rural Tanzania. *BMC Pregnancy and Childbirth*. 2011; 11: 94.

Background: Although clinical audit is an important instrument for quality care improvement, the concept has not yet been adequately taken on board in rural settings in most resource limited countries where the problem of maternal mortality is immense. Maternal mortality and morbidity audit was established at Saint Francis Designated District Hospital (SFDDH) in rural Tanzania in order to generate information upon which to base interventions. **Methods:** Methods are informed by the principles of operations research. An audit system was established, all patients fulfilling the inclusion criteria for maternal mortality and severe morbidity were reviewed and selected cases were audited from October 2008 to July 2010. The causes and underlying factors were identified and strategic action plans for improvement were developed and implemented. **Results:**

There were 6572 deliveries and 363 severe maternal morbidities of which 36 women died making institutional case fatality rate of 10%. Of all morbidities 341 (94%) had at least one area of substandard care. Patients, health workers and administration related substandard care factors were identified in 50% - 61% of women with severe morbidities. Improving responsiveness to obstetric emergencies, capacity building of the workforce for health care, referral system improvement and upgrading of health centers located in hard to reach areas to provide comprehensive emergency obstetric care (CEmOC) were proposed and implemented as a result of audit. **Conclusions:** Our findings indicate that audit can be implemented in rural resource limited settings and suggest that the vast majority of maternal mortalities and severe morbidities can be averted even where resources are limited if strategic interventions are implemented.

257. Nyandindi CL. HIV Serostatus, hepatitis c and depression among injection drug users in Kinondoni Municipality, Dar es Salaam, Tanzania. Master of Medicine (Psychiatry) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Injection drug use in Sub Saharan Africa plays a big role in HIV and HCV transmission. This has brought a great interest with regard to control of the HIV pandemic and spread of HCV infections. In addition to that, Injection drug use is associated with mental conditions like depression. Situational analyses reveal that injection drug use is significantly increasing in different parts of Africa. Unfortunately, there are very few published studies available locally in Tanzania to assess the extent of problems and measures designed to address the issue of HIV, Hepatitis C and depression among Injection drug users. Problem statement: Injection drug use as a contributor to HIV and HCV infections is a subject that has received considerable attention in the scientific literature. Injection drug use is associated with increased transmission of HIV, Hepatitis C and multiple psychological problems including depression. There is no data that elucidates the extent of HIV, HCV and depression among injection drug users in Tanzania. Rationale: HIV and AIDS, HCV infections and depression among intravenous drug users are common problems worldwide. This study assessed the prevalence of HIV, HCV infection and depression among Injection Drug Users in Kinondoni Municipality of Dar es Salaam Tanzania. The study aimed at showing the degree of the problem and further help in formulation of appropriate intervention programs to prevent transmission and address

appropriate measures against HIV, HCV and depression among IDUs in Tanzania. **Methodology:** This cross-sectional study combined a survey, with measures of HIV, HCV infection risk and depression, with biological tests for HIV and HCV being done. The study was conducted over a period of six months from late November 2010 to late April 2011. The sample included both males and females aged 18 years and above, who are IDUs attending community outreach services in different centers and who attended HIV testing and counseling in mobile services. Participants who were included had agreed to consent for participation in the study. **Results:** A total of 419 IDUs attended at community outreach services were recruited for the study after consenting, among these all clients were eligible for the study. The results revealed that among them 76.6% (n=321) were male while 23.4 % (n= 98) were female. The age range was 18 to 53years, with mean age of 26.6. Most patients were in the age group 25 to 34 years, i.e. 64.2% (n=269), compared to the older group aged of + 45 years whom were 1%. **Conclusion:** The overall prevalence of HIV, HCV infection and Depression among injection drug users was found to be 51.1%, 75.6% and 19.3% respectively. The prevalence was found to be higher in females in all the three conditions compared to males. **Recommendations:** I therefore recommend that there is an urgent need to invest in HIV/AIDS, HCV infections and depression prevention and control activities that target injection drug users in Tanzania. It is also important to include harm reduction measures like needle and syringe exchange programs as well as expanding the medically assisted therapy services to injection drug users. A new drug policy is important with emphasis on drug use and prevention, The Government should think of including HCV vaccine as part of its vaccination package to the new born. More researches should be done to assess the risk factors and to test these interventions and identify new preventive strategies for people who inject drugs and risk for HIV, HCV infection transmissions and Depression.

258. Ochola LB, Siddondo BR, Ocholla H, Nkya S, Kimani EN, Williams TN, Makale JO, Liljander A, Urban BC., Bull PC, Szeszak T, Marsh K, Craig AG. Specific receptor usage in Plasmodium falciparum cytoadherence is associated with disease outcome. *PLoS ONE*.2011; 6 (3): e14741.

259. Oлдashi F, Kerçi M, Zhurda T, Ruçi K, Banushi A, Traverso MS, Jiménez J, Balbi J, Dellerа C, Svampa S, Quintana G, Piñero G, Teves J, Seppelt I, Mountain D, Balogh Z, Zaman M, Druwé P, Rutsaert R, Mazairac G, Pascal F, Yvette Z, Chancellin D, Okwen P, Djokam LJ, Jangwa E, Mbuagbaw L, Fointama N, Baillie F, Jiang JY, Gao GY, Bao YH, Morales C, Sierra J, Naranjo S, Correa C, Gómez C, Herrera J, Caicedo L, Rojas A, Pastas H, Miranda H, Constaín A, Perdomo M, Muñoz D, Mulla Y, Sakala D, Chengo C. The importance of early treatment with tranexamic acid in bleeding trauma patients: An exploratory analysis of the CRASH-2 randomised controlled trial. *The Lancet*. 2011; 377 (9771):1096-1101.

Background: The aim of the CRASH-2 trial was to assess the effects of early administration of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant haemorrhage. Tranexamic acid significantly reduced all-cause mortality. Because tranexamic acid is thought to exert its effect through inhibition of fibrinolysis, we undertook exploratory analyses of its effect on death due to bleeding. **Methods:** The CRASH-2 trial was undertaken in 274 hospitals in 40 countries. 20 211 adult trauma patients with, or at risk of, significant bleeding were randomly assigned within 8 h of injury to either tranexamic acid (loading dose 1 g over 10 min followed by infusion of 1 g over 8 h) or placebo. Patients were randomly assigned by selection of the lowest numbered treatment pack from a box containing eight numbered packs that were identical apart from the pack number. Both participants and study staff (site investigators and trial coordinating centre staff) were masked to treatment allocation. We examined the effect of tranexamic acid on death due to bleeding according to time to treatment, severity of haemorrhage as assessed by systolic blood pressure, Glasgow coma score (GCS), and type of injury. All analyses were by intention to treat. The trial is registered as ISRCTN86750102, ClinicalTrials.gov NCT00375258, and South African Clinical Trial Register/Department of Health DOH-27-0607-1919. Findings 10 096 patients were allocated to tranexamic acid and 10 115 to placebo, of whom 10 060 and 10 067, respectively, were analysed. 1063 deaths (35) were due to bleeding. We recorded strong evidence that the effect of tranexamic acid on death due to bleeding varied according to the time from injury to treatment (test for interaction $p < 0.0001$). Early treatment (=1 h from injury) significantly reduced the risk of death due to bleeding (198/3747 [5.3] events in tranexamic acid group vs 286/3704 [7.7] in

placebo group; relative risk [RR] 0.68, 95 CI 0.57-0.82; $p < 0.0001$). Treatment given between 1 and 3 h also reduced the risk of death due to bleeding (147/3037 [4.8] vs 184/2996 [6.1]; RR 0.79, 0.64-0.97; $p = 0.03$). Treatment given after 3 h seemed to increase the risk of death due to bleeding (144/3272 [4.4] vs 103/3362 [3.1]; RR 1.44, 1.12-1.84; $p = 0.004$). We recorded no evidence that the effect of tranexamic acid on death due to bleeding varied by systolic blood pressure, Glasgow coma score, or type of injury. Interpretation Tranexamic acid should be given as early as possible to bleeding trauma patients. For trauma patients admitted late after injury, tranexamic acid is less effective and could be harmful. Funding UK NIHR Health Technology Assessment programme, Pfizer, BUPA Foundation, and J P Moulton Charitable Foundation.

260. Orodho JA, Kirimuhuzya C, Otieno JN, Magadula JJ, Okemo P. Local Management of Tuberculosis by Traditional Medicine Practitioners in Lake Victoria Region. *Open Complementary Medicine Journal*. 2011; 3: 1-9.

Tuberculosis (TB) is now a global public health problem that has been exacerbated by the emergence of multiband Extensively-drug resistant (MDR and XDR, respectively) strains of *Mycobacterium tuberculosis*. There have been claims in the region by Traditional Medicine Practitioners (TMPs) about being able to treat the symptoms of TB, but their work lacked proper documentation. A structured questionnaire was used to test the ability of (TMPs) to diagnose and treat symptoms of TB; the medicinal plants used treat TB symptoms, as well as the influence of socio-economic and cultural factors on the indigenous communities' choice of treatment. A total of 99 TMPs and 22 TB patients were interviewed. Over 30 medicinal plants were mentioned as being used to treat symptoms of TB, an indication of wide knowledge on management of TB in the region. Treatment costs were found to influence the patients' choice of TB treatment and a large proportion of the TMPs were found to be of advanced age (60-80 years of age). The conclusion was that TMPs have reasonable knowledge about TB and its management. There is urgent need to tap the indigenous knowledge from the custodians and scientifically validate it for future drug development.

261. Ortega F, Costa MR, Simon ET, Schroeder T, Götz M, Berninger B. Using an adherent cell culture of the mouse subependymal zone to study the behavior of adult neural stem cells on a single-cell level. *Nature protocols*. 2011; 6(12): 1847-1859.

A comprehensive understanding of the cell biology of adult neural stem cells (aNSCs) requires direct observation of aNSC division and lineage progression in the absence of niche-dependent signals. Here we describe a culture preparation of the adult mouse subependymal zone (SEZ), which allows for continuous single-cell tracking of aNSC behavior. The protocol involves the isolation (~3 h) and culture of cells from the adult SEZ at low density in the absence of mitogenic growth factors in chemically defined medium and subsequent live imaging using time-lapse video microscopy (5–7 d); these steps are followed by post imaging immunocytochemistry to identify progeny (~7 h). This protocol enables the observation of the progression from slow-dividing aNSCs of radial/astroglial identity up to the neuroblast stage, involving asymmetric and symmetric cell divisions of distinct fast-dividing precursors. This culture provides an experimental system for studying instructive or permissive effects of signal molecules on aNSC modes of cell division and lineage progression.

262. Outwater AH, Campbell JC, Mgaya E. Implementation of WHO/CDC guidelines for intentional injury death surveillance: A Mixed-Methods approach in Dar es Salaam, Tanzania. *Homicide Studies*. 2011; 15 (3):253-267.

A foundational implementation of the WHO/CDC Injury Surveillance Guidelines was conducted in Dar es Salaam region of the United Republic of Tanzania in 2005. The Guidelines were adapted to gather qualitative as well as quantitative data about intentional injury mortality which were collected concurrently at the Muhimbili National Hospital Mortuary. An interview schedule of 12 quantitative variables and one open-ended question, participant observation and newspaper reports were used. Mixed methods allowed an understanding of intentional injury mortality to emerge, even for those with the least amount of data, the 22% of homicides whose bodies were never claimed. Mixed methods made it possible to quantify intentional injury mortality rates, describe subpopulations with scanty data, and learn how to embed ongoing injury mortality surveillance into daily practice.

263. Park H, Sysak MN, Chen HW, Fang AW, Liang D, Liao L, Bowers JE. Device and integration technology for silicon photonic transmitters. *Selected Topics in Quantum Electronics*. 2011; 17(3): 671-688.

The device and integration technology for silicon photonic transmitters are reviewed in this paper. The hybrid silicon platform enables on-chip lasers to be fabricated with silicon photonic circuits and can be integrated in the CMOS back-end flow. Laser arrays from multiple die bonding and quantum well intermixing techniques are demonstrated to extend the spectral bandwidth from the laser array of the transmitter. Two modulator technologies, silicon modulators and hybrid silicon modulators, are also described.

264. Pavelescu EM, Gilfert C, Weinmann P, Danila M, Dinescu A, Jacob M, Reithmaier JP. 1100 nm InGaAs/ (Al) GaAs quantum dot lasers for high-power applications. *Journal of Physics D: Applied Physics*. 2011; 44(14): 145104.

InGaAs/ (Al) GaAs quantum dot lasers emitting at 1100? Nm is developed with a relatively low in content of 28% used for dot formation and an appropriate laser design to allow for high power emission. In comparison with an InGaAs QD laser with a similar design but a higher in content of 60% the newly developed lasers exhibit an improved temperature stability of the threshold current and internal quantum efficiency.

265. Pecchioli L, Carrozzino M, Mohamed F, Bergamasco M, Kolbe TH. Information access through the navigation of a 3D interactive environment. *Journal of Cultural Heritage*. 2011; 12(3): 287-294.

Managing heterogeneous information related to Cultural Heritage sites and artifacts is still a complex task. In latest years, there has been a significant trend towards the massive digitization of this data, as this allows more efficient and reliable storage and management processes. Furthermore, the relationship between conservation managers, who are often unfamiliar with current documentation techniques, and information providers, who tend to be highly technical

practitioners without expertise in cultural heritage is not easy to handle. Moreover, in Cultural Heritage objects often have a strong 3D component, and cannot be easily represented with conventional data management frameworks like Geographic Information System (GIS). The use of a 3D framework may allow a closer adherence to the real world, as it respects the spatial relationships among various parts. A novel method to access spatial information through the interactive navigation of a synthetic 3D model, reproducing the main features of a corresponding real environment, is proposed in this paper. The result of this work is a system called ISEE. An innovative aspect of the ISEE approach is represented by our definition of spatial relevance of information. The information is ranked with a novel measure of relevance that depends on the position/orientation in the 3D space, and allows for an intuitive interface. The basic idea of ISEE is to allow retrieving information by just looking around in a 3D environment, as moving and looking at the world is the main modality we use to gather information from it. Users explore in intuitive way a 3D environment and access the related information, kept in its spatial context. Information are accessed through “extended zones”, i.e. portions of the 3D environment not having direct reference to specific elements, rather to the distribution of information and to the current user location. The use of extended zones gives to the proposed ranking algorithm a superior performance than rankings methods based on distance. Indeed the ISEE ranking matches the intuitive expectation of the users, as was verified with a formal usability test. The system has been applied to case studies related both to outdoor and indoor environments, showing its potential also as a smart guide with the use of augmented reality technologies. In order to enable access to a larger audience, sample applications using this method are based on Web technologies and do not require special training to be used. At the end of the paper are presented the results of an evaluation test, which provided useful suggestion to improve the system usability and performances.

266. Peglow M, Antonyuk S, Jacob M, Palzer S, Heinrich S, Tsotsas E. Particle formulation in spray fluidized beds. Modern Drying Technology, *Product Quality and Formulation*. 2011; 3: 295-378.

267. Pembe AB, Ndolele NT. Dysmenorrheal and coping strategies among secondary school adolescents in Ilala District, Tanzania. *East African journal of public health*. 2011; 8(3): 232-236.

Background: Dysmenorrheal is common problem among adolescents worldwide. Its prevalence varies greatly in different populations and ethnic groups. Adolescents with severe dysmenorrheal may miss classes and other social activities. The aim of this study was to determine the prevalence and coping strategies for dysmenorrheal among secondary school adolescents in Ilala municipal, Tanzania. **Methods:** A cross sectional study was conducted in eight public and private secondary schools in Ilala municipal. A total of 880 girls in form II and form III who had attained menarche were interviewed using a self administered questionnaire between August and October 2007. **Results:** The mean age at menarche was 13.3 years with the youngest at nine years and the oldest at sixteen years. Six hundred fifty two (74.1%) girls had dysmenorrheal. Backache, breast tenderness and non specific joint pains were significantly more common symptoms among adolescents with dysmenorrheal than without dysmenorrheal. Medication was used by 362 (55.5 %) girls to relieve dysmenorrheal. Commonest medications used were paracetamol and diclofenac. Adolescents who missed school due to dysmenorrheal were 154 (23.6%) and 140 (21.5%) missed social activities. **Conclusions:** High proportion of secondary school adolescents has dysmenorrheal in Ilala municipal with a significant number missing school and social activities. Reproductive health education in primary and secondary schools should be enhanced to increase awareness and care seeking.

268. Petraro P, Duggan C, Msamanga G, Peterson KE, Spiegelman D, Fawzi WW. Predictors of breastfeeding cessation among HIV-infected women in Dar es Salaam, Tanzania. *Maternal and Child Nutrition*. 2011; 7 (3):273-283.

This paper examines predictors of breastfeeding cessation among a cohort of human immunodeficiency virus (HIV)-infected women. This was a prospective follow-up study of HIV-infected women who participated in a randomized micronutrient supplementation trial conducted in Dar es Salaam, Tanzania. 795 HIV-infected Tanzanian women with singleton newborns were utilized from the cohort for this analysis. The proportion of women breastfeeding declined from

95% at 12 months to 11% at 24 months. The multivariate analysis showed breastfeeding cessation was significantly associated with increasing calendar year of delivery from 1995 to 1997 [risk ratio (RR), 1.36; 95% confidence interval (CI) 1.13-1.63], having a new pregnancy (RR 1.33; 95% CI 1.10-1.61), overweight [body mass index (BMI) $\geq 25\text{kgm}^{-2}$; RR 1.37; 95% CI 1.07-1.75], underweight (BMI $\leq 18.5\text{kgm}^{-2}$; RR 1.29; 95% CI 1.00-1.65), introduction of cow's milk at infant's age of 4 months (RR 1.30; 95% CI 1.04-1.63). Material and social support was associated with decreased likelihood of cessation (RR 0.83; 95% CI 0.68-1.02). Demographic, health and nutritional factors among women and infants are associated with decisions by HIV-infected women to cease breastfeeding. The impact of breastfeeding counselling programs for HIV-infected African women should consider individual maternal, social and health contexts.

269. Pickering AJ, Julian TR, Mamuya S, Boehm AB, Davis J. Bacterial hand contamination among Tanzanian mothers varies temporally and following household activities. *Tropical Medicine and International Health*.2011; 16 (2):233-239.

Objective: to characterize mechanisms of hand contamination with faecal indicator bacteria and to assess the presence of selected pathogens on mothers' hands in Tanzania. **Methods:** A household observational study combined with repeated microbiological hand rinse sampling was conducted among 119 mothers in Dar es Salaam, Tanzania. All hand rinse samples were analysed for enterococci and *Escherichia coli*, and selected samples were analysed for genetic markers of Bacteroidales, enterovirus and pathogenic *E. coli*. **Results:** Using the toilet, cleaning up a child's faeces, sweeping, cleaning dishes, preparing food and bathing were all found to increase faecal indicator bacterial levels on hands. Geometric mean increases in colony forming units per two hands ranged from 50 (cleaning dishes) to 6310 (food preparation). Multivariate modelling of hand faecal indicator bacteria as a function of activities recently performed shows that food handling, exiting the household premises and longer time since last handwashing with soap are positively associated with bacterial levels on hands, while bathing is negatively associated. Genetic markers of Bacteroidales, enterovirus and pathogenic *E. coli* were each detected on a subset of mothers' hands. **Conclusions:** *Escherichia coli* and enterococci on hands can be significantly increased by various household activities, including those involving the use

of soap and water. Thus, faecal indicator bacteria should be considered highly variable when used as indicators of handwashing behaviour. This work corroborates hands as important vectors of disease among Tanzanian mothers and highlights the difficulty of good personal hygiene in an environment characterized by the lack of networked sanitation and water supply services.

270. Piwowar ME, Fiamma A, Laeyendecker O, Kulich M, Donnell D, Szekeres G, Robins ML, Mullis CE, Vallari A, Hackett Jr J, Mastro TD, Gray G, Richter L, Alexandre MW, Chariyalertsak SI, Chingono A, Sweat M, Coates T, Eshleman SH. HIV Surveillance in a Large, Community-Based Study: Results from the Pilot Study of Project Accept (HIV Prevention Trials Network 043). *BMC Infectious Diseases*.2011; 11: 251.

Background: Project Accept is a community randomized, controlled trial to evaluate the efficacy of community mobilization, mobile testing, same-day results, and post-test support for the prevention of HIV infection in Thailand, Tanzania, Zimbabwe, and South Africa. We evaluated the accuracy of in-country HIV rapid testing and determined HIV prevalence in the Project Accept pilot study.**Methods:** Two HIV rapid tests were performed in parallel in local laboratories. If the first two rapid tests were discordant (one reactive, one non-reactive), a third HIV rapid test or enzyme immunoassay was performed. Samples were designated HIV NEG if the first two tests were non-reactive, HIV DISC if the first two tests were discordant, and HIV POS if the first two tests were reactive. Samples were re-analyzed in the United States using a panel of laboratory tests.**Results:** HIV infection status was correctly determined based on-in country testing for 2,236 (99.5%) of 2,247 participants [7 (0.37%) of 1,907 HIV NEG samples were HIV-positive; 2 (0.63%) of 317 HIV POS samples were HIV-negative; 2 (8.3%) of 24 HIV DISC samples were incorrectly identified as HIV-positive based on the in-country tie-breaker test]. HIV prevalence was: Thailand: 0.6%, Tanzania: 5.0%, Zimbabwe 14.7%, Soweto South Africa: 19.4%, Vulindlela, South Africa: 24.4%, (overall prevalence: 14.4%).**Conclusions:** In-country testing based on two HIV rapid tests correctly identified the HIV infection status for 99.5% of study participants; most participants with discordant HIV rapid tests were not infected. HIV prevalence varied considerably across the study sites (range: 0.6% to 24.4%).

271. PrayGod G, Range N, Faurholt-Jepsen D, Jeremiah K, Faurholt-Jepsen M, Aabye MG, Jensen L, Jensen AV, Grewal HMS, Magnussen P, Chagalucha J, Andersen AB, Friis H. Daily multi-micronutrient supplementation during tuberculosis treatment increases weight and grip strength among HIV-uninfected but not HIV-infected patients in Mwanza, Tanzania. *Journal of Nutrition*.2011; 141 (4):685-691.

Undernutrition is common among tuberculosis (TB) patients. The objective of this study was to assess the effect of multi-micronutrient supplementation during TB treatment on weight, body composition, and handgrip strength. A total of 865 patients with smear-positive (PTB+) or -negative (PTB-) pulmonary TB were randomly allocated to receive a daily biscuit with or without multi-micronutrients for 60 d during the intensive phase of TB treatment. Weight, arm fat area, arm muscle area, and handgrip strength were assessed at baseline and after 2 and 5 mo. At 2 mo, the multi-micronutrient supplementation led to a higher handgrip gain (1.22 kg; 95% CI = 0.50, 1.94; P = 0.001) but had no effects on other outcomes. The effects of multimicronutrient supplementation were modified by HIV infection (P-interaction = 0.002). Among HIV- patients, multimicronutrient supplementation increased weight gain by 590 g (95% CI = 240, 1210; P = 0.07) and handgrip strength by 1.6 kg (95% CI = 0.78, 2.47; P < 0.001), whereas among HIV+ patients, it reduced weight gain by 1440 g (95% CI = 290, 2590; P = 0.002) and had no effect on handgrip strength (0.07 kg; 95% CI = -21.30, 1.46; P = 0.91). The reduced weight gain among HIV+ patients receiving multi-micronutrient supplementation seemed to be explained by a higher proportion of patients reporting fever. At 5 mo, the effects on weight were sustained, whereas there was no effect on handgrip strength. In conclusion, multimicronutrient supplementation given as a biscuit is beneficial among HIV2 PTB patients and may be recommended to TB programs. More research is needed to develop an effective supplement for HIV+ PTB patients.

272. PrayGod G, Range N, Faurholt-Jepsen D, Jeremiah K, Faurholt-Jepsen M, Aabye MG, Jensen L, Jensen AV, Grewal HMS, Magnussen P, Chagalucha J, Andersen AB, Friis H. Weight, body composition and handgrip strength among pulmonary tuberculosis patients: A matched cross-sectional study in Mwanza, Tanzania. *Transactions of the Royal Society of Tropical Medicine and Hygiene*.2011; 105 (3):140-147.

This study aimed to estimate deficits in weight, arm fat area (AFA), arm muscle area (AMA) and handgrip strength among smear-positive pulmonary TB (PTB+) patients starting treatment. We conducted a cross-sectional study among PTB+ patients and age- and sex-matched neighborhood controls. HIV status, anthropometric measurements and handgrip strength were determined. Deficits in weight, AFA, AMA and handgrip strength associated with PTB+ and HIV were estimated using multiple regression analysis. We recruited 355 pairs of PTB+ patients and controls. PTB+ was associated with deficits of 10.0. kg (95% CI 7.3; 12.7) in weight and 6.8. kg (95% CI 5.2; 8.3) in handgrip strength among females and 9.1. kg (95% CI 7.3; 10.9) in weight and 6.8. kg (95% CI 5.2; 8.4) in handgrip strength among males. In both sexes, PTB+ was associated with deficits in AFA and AMA. Among females, HIV was associated with deficits in AMA and handgrip strength, but the deficit in handgrip strength was larger among PTB+ patients (3.2. kg 95% CI 1.3; 5.2) than controls (-1.6. kg 95% CI -4.8; 1.5) (interaction, P = 0.009). These findings suggest that deficits in weight and handgrip strength among patients starting TB treatment are severe. Thus, nutritional support may be necessary to ensure reversal of the deficits, and may improve treatment outcomes.

273. Priebe S, Jacob M, Jansen C, Kurner T. Non-specular scattering modeling for THz propagation simulations. In Antennas and Propagation (EUCAP), Proceedings of the 5th European Conference on. 2011:1-5.

In this paper, we present an approach for the modeling of non-specular scattering at rough surfaces in the THz frequency range by means of the Kirchhoff scattering theory. The practical implementation of the Kirchhoff model in a ray tracing algorithm is discussed. Ray tracing simulation results are compared with measurements for the purpose of validation. The size of the relevant active scattering region of a rough surface is investigated.

274. Qi RQ, He L, Zheng S, Hong Y, Ma L, Zhang S, Zhao L, Guo X, Wang Y, Yu JY, Fu L, Zhang W, Long T, Zhang C, Chen G, Lin J, Wang C, Zhou L, Mi Q, Weiland M, Chen JZS, McHenga SSS, Wang YK, McHepange U, Wang Z, Chen HD, Gao XH. BRAF exon 15 T1799. A mutation is common in melanocytic nevi, but less prevalent in cutaneous malignant melanoma, in Chinese Han. *Journal of Investigative Dermatology*.2011; 131 (5):1129-1138.

Frequent somatic mutations of BRAF (v-raf murine sarcoma viral oncogene homolog B) exon T1799A, which are implicated in the initial events of promutagenic cellular proliferation, are detected in both malignant melanomas (MM) and melanocytic nevi (MN). Most of the data regarding BRAF exon T1799A mutation have been from Caucasian cohorts, and a comprehensive screening of a homogeneous population is lacking. A total of 379 cases of MN and 195 cases of MM were collected from Chinese Han living in three geographical regions in China, i.e., northeast, southwest, and northwest China. BRAF exon T1799A mutation was detected by PCR and sequencing from microdissected tumors. In all, 59.8% cases of MN harbored BRAF exon T1799A mutation. Samples from regions with high UV exposure had higher detection rates than regions with lower UV exposure (73.5, 67.0, and 38.9%, respectively; $\chi^2 = 31.674$, $P = 1.59E-7$). There were no differences in mutation rates between congenital and acquired MN; however, acquired MN with advanced age of onset had a higher mutation rate than those with younger age of onset ($\chi^2 = 13.23$, $P = 0.02$). In all, 15.0% cases of MM harbored the BRAF mutation. The mutation rate in MM was not affected by region, histological type, gender, pattern of UV exposure, and age. The study suggests that the mutation is not necessarily associated with malignant transformation.

275. Quaker AS. Consequences of tooth loss on oral function and need for replacement of missing teeth among patients attending Muhimbili Dental Clinic. Master of Dentistry (Restorative Dentistry) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Tanzanian oral health services constitute mainly of tooth extractions. Consequently, individuals susceptible to dental caries and periodontal diseases will have a

substantial number of missing teeth, which can affect oral function. **Objective:** The main objective of this study was to determine the consequences of tooth loss on the oral function and need for replacement of lost teeth among patients seeking treatment at the School of Dentistry MUHAS. **Materials and methods:** During a period of three months, patients seeking dental treatment at the School of Dentistry were recruited for the study. Criteria included age of 20 years and above with one or more missing teeth except for third molars. Participants were interviewed for demographic information, chewing ability, symptoms of temporomandibular disorder and perceived need for replacement of missing teeth. Afterwards the subjects were examined to assess: caries status, tooth mobility, occlusal tooth wear, over eruption of unopposed teeth, and signs of temporomandibular disorders. Data was analyzed using Statistical Package for Social Sciences SPSS 16. For comparison of proportions, chi-square analysis and t test were used. A linear regression analysis was performed, with the chewing ability score as the dependent variable and number of POP as the independent variable. **Results:** A total of 361 subjects with mean age of 40.2 years (s.d. = 14.2, range = 20-93 years) were recruited into the study. About half 175 (48.5%) of the subjects reported some difficulty with chewing. Generally the fewer the occluding pairs present the greater the difficulty in chewing observed. Subjects with more than 6 posterior occlusal pairs appeared to have little problem in chewing across the whole range of foods. The frequency of signs and symptoms of TMD and excessive tooth wear increased with decreasing number of posterior occluding pairs, being more evident in subjects with less than 3 posterior occlusal pairs remaining. Over a third of the participants had one or more teeth with severe over eruption but none reported impairment of oral function. More than half of the subjects needed replacement for missing teeth. **Conclusions:** From this study, it is concluded that tooth loss leading to a dentition of 5 to 6 occlusal pairs impairs chewing of hard foods but not soft foods. Extensive loss of teeth leading to less than 3 POP is associated with increased symptoms of TMD and excessive tooth wear of occluding teeth. Need for replacement of missing teeth is high for both anterior and posterior regions with the cost of dentures being the main barrier to replacement of missing teeth. **Recommendations:** Dental personnel should make an effort to identify individuals with risk of tooth loss in order to retain at least 6 well-distributed posterior occlusal pairs. Dental laboratory services need improvement in order to be able to provide quality replacement of missing teeth at affordable costs. Further long-

term multicenter studies to evaluate the consequence of tooth loss and assist in giving a more accurate projection needs for dentures nationwide are required.

276. Rahman MNA, Lazim YM, Mohamed F, Safei S, Deris SM, Yusof MK. Rough Set Theory Approach for Classifying Multimedia Data. *In Software Engineering and Computer Systems*. 2011; 116-124.

The huge size of multimedia data requires for efficient data classification and organization in providing effective multimedia data manipulation. Those valuable data must be captured and stored for potential purposes. One of the main problems in Multimedia Information System (MIS) is the management of multimedia data. As a consequence, multimedia data management has emerged as an important research area for querying, retrieving, inserting and updating of these vast multimedia data. This research considers the rough set theory technique to organize and categorize the multimedia data. Rough set theory method is useful for exploring multimedia data and simplicity to construct multimedia data classification. Classification will help to improve the performance of multimedia data retrieving and organizing process.

277. Ramadhani F. Midwives' competency for implementation of active management of third stage of labor in Dar es Salaam municipal hospitals, Tanzania. *Dissertation 2011, Muhimbili University of Health and Allied Sciences, Dar es salaam.*Background:

Maternal mortality ratio in Tanzania is 454/100,000 live births where by PPH alone accounts for 25-28% of all maternal death (TDHS, 2010). PPH due to uterine atony accounts for more than 75% of PPH in Tanzania (TDHS, 2010). It is an obstetric emergency that can effectively be prevented by conducting a cheap procedure called Active Management of the Third Stage of Labour (AMTSL). This study aimed at assessing knowledge and skills of midwives in conducting AMTSL for preventing primary PPH and to report barriers to its implementation in Municipal hospitals of Dar es Salaam region in Tanzania. **Material and Methods:** A comparative cross-sectional within subjects design was conducted at Amana, Mwananyamala and Temeke municipal hospitals of Dar es Salaam region, Tanzania. 87 midwives (30 from Amana 17 from Mwananyamala and 40 from Temeke municipal hospitals) out of all expected

(105) who worked in labour and postnatal wards were studied. Data was collected by using questionnaire with four parts (demographic, training, AMTSL knowledge, policy/motivation/barriers information) contained both open and close ended structured questions. Practice of AMTSL was observed on normal vaginal deliveries by using a standard tool developed by Ministry of Health and Social Welfare of Tanzania (MoHSW) in collaboration with Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) in 2010. A satisfactory score in practice and knowledge was 90%+ and 85%+ respectively. A competent midwife on AMTSL had to obtain satisfactory scores in both knowledge and skills (MoHSW, 2010). Data was coded, entered, cleaned and analyzed in SPSS for windows version 15. Chi-square (χ^2) test and Odds ratio (OR) with 95% confidence interval (CI) were used to define the association of independent and dependent variables. A tool for logistic assessment was developed from the conceptual model that was developed after multinational study conducted in African Region in assessing the practicability of AMTSL. Participation in the study was purely voluntary. **Results:** Majority of participated midwives performed well on what are considered the three most important components of AMTSL by ICM/FIGO (2003), (i.e. 10 IU of oxytocin (87.4%), CCT (92%) and uterine massage (72.4%)). But there are 18 steps that comprise a standard AMTSL practice. When considering that standard observation guide and standard questions set on AMTSL, only 10% of participating midwives achieved satisfactory standard scores in both knowledge and skills. Knowledge gave a strong association with being skillful (χ^2 test, $p = 0.01 < 0.05$). Multivariate regression analysis signified association between place of training and competency level (χ^2 test, $p = 0.02 < 0.05$), those who learnt AMTSL in midwifery/nursing school then got on job training were more likely to acquire competence on AMTSL than those who got from midwifery school alone, OR = 7.143 (1.017, 50.188) (adjusted OR = 0.140 (0.020, 0.984)). All municipal hospitals had the AMTSL protocol, with enough supply of uterotonics in the previous two consecutive months stored under appropriate temperature. However, lack of on job training and shortage of staff and supplies were reported as major barriers that most midwives suggested were important for more successful AMTSL implementation. **Conclusions and Recommendations:** AMTSL Trials of Improved Practices (TIPS) and maternal outcomes can be conducted to determine barriers to the use of AMTSL and suggestions from providers on how to improve their practice of AMTSL and maternal health in achieving MDG 5. MoHSW should increased provision of on job training on

AMTSL that fits with Tanzanian clinical environment and AMTSL job aids should be used, adapted and disseminated to all health facilities and Provided to pre-service educational programs while creation of ideal work environment (space, staffing, supplies and motivation) should be taken into consideration.

278. Reimer D, Jacob M. Differentiation in higher education and its consequences for social inequality: introduction to a special issue. *Higher Education*. 2011; 61(3): 223-227.

In recent decades institutions of higher education have changed considerably in most European countries. In order to meet the growing demand for higher education, national higher education systems have “diversified” through the creation of second-tier institutions, such as the Polytechnics in Britain or the Fachhochschulen in Germany. There is a large body of research concerned with the sources, development and internal dynamics of institutional differentiation in higher education (e.g. Teichler 1988, Huismann 1995, Meek et al. 1996, and Huismann et al. 2007). In many countries higher education institutions also vary in reputation and prestige (e.g. Teichler 2008, Moodie 2009) and in some countries these differences have even been reinforced by educational policy during the last decades. Besides this vertical differentiation of institutions, horizontal differentiation within institutions of higher education can be observed also, i.e. a growing diversification of programmes, courses and fie

279. Roberts DM, Dawson AH, Senarathna L, Mohamed F, Cheng R, Eaglesham G, Buckley NA. Toxic kinetics, including saturable protein binding, of 4-chloro-2-methyl phenoxyacetic acid (MCPA) in patients with acute poisoning. *Toxicology letters*. 2011; 201(3): 270-276.

Human data on protein binding and dose-dependent changes in toxic kinetics for MCPA are very limited. 128 blood samples were obtained in 49 patients with acute MCPA poisoning and total and unbound concentrations of MCPA were determined. The Scat chard plot was biphasic suggesting protein binding to two sites. The free MCPA concentration increased when the total concentration exceeded 239 mg/L (95% confidence interval 198–274 mg/L). Nonlinear regression using a two-site binding hyperbola model estimated saturation of the high affinity

binding site at 115 mg/L (95%CI 0–304). Further analyses using global fitting of serial data and adjusting for the concentration of albumin predicted similar concentrations for saturable binding (184 mg/L and 167 mg/L, respectively) without narrowing the 95%CI. In 25 patients, the plasma concentration–time curves for both bound and unbound MCPA were approximately log-linear which may suggest first order elimination, although sampling was infrequent so zero order elimination cannot be excluded. Using a cut-off concentration of 200 mg/L, the half-life of MCPA at higher concentrations was 25.5 h (95%CI 15.0–83.0 h; n = 16 patients) compared to 16.8 h (95%CI 13.6–22.2 h; n = 10 patients) at lower concentrations. MCPA is subject to saturable protein binding but the influence on half-life appears marginal.

280. Roberts DM, Wilks MF, Roberts MS, Swaminathan R, Mohamed F, Dawson AH, Buckley NA. Changes in the concentrations of creatinine, cystatin C and NGAL in patients with acute paraquat self-poisoning. Toxicology letters. 2011; 202(1): 69-74.

An increase in creatinine $>3 \mu\text{mol/L/h}$ has been suggested to predict death in patients with paraquat self-poisoning and the value of other plasma biomarkers of acute kidney injury has not been assessed. The aim of this study was to validate the predictive value of serial creatinine concentrations and to study the utility of cystatin C and neutrophil gelatinase-associated lipocalin (NGAL) as predictors of outcome in patients with acute paraquat poisoning. The rate of change of creatinine (dCr/dt) and cystatin C (dCyC/dt) concentrations were compared between survivors and deaths. Receiver-operating characteristic (ROC) curves were constructed to determine the best threshold for predicting death. Paraquat was detected in 20 patients and 7 of these died between 18 h and 20 days post-ingestion. The dCr/dt ROC curve had an area of 0.93 and the cut-off was $>4.3 \mu\text{mol/L/h}$ (sensitivity 100%, specificity 85%, likelihood ratio 7). The dCyC/dt ROC curve had an area of 0.97 and the cutoff was $>0.009 \text{ mg/L/h}$ (sensitivity 100%, specificity 91%, likelihood ratio 11). NGAL did not separate survivors from deaths. Death due to acute paraquat poisoning is associated with changes in creatinine and cystatin concentrations. Further validation of these measurements is needed before they can be adopted in guiding intensive treatments.

281. Ruhago GM, Mujinja PGM, Norheim OF. Equity implications of coverage and use of insecticide treated nets distributed for free or with co-payment in two districts in Tanzania: A cross-sectional comparative household survey. *International Journal for Equity in Health*.2011; 10: 29.

Background: In Tanzania, the distribution and coverage of insecticide-treated nets (ITNs) is inequitable. Arguments about the most effective and equitable approach to distributing ITNs centre around whether to provide ITNs free of charge or continue with existing social marketing strategies. The Government has decided to provide free ITNs to all children under five in the country. It is still uncertain whether this strategy will achieve equitable coverage and use. This study examined the equity implications of ownership and use of ITNs in households from different socioeconomic quintiles in a district with free ITNs and a district without free ITN distribution. **Methods:** A cross-sectional comparative household survey was conducted in two districts: Mpanda in Rukwa Region (with free ITN roll out) and Kisarawe in Coast region (without free ITNs). Heads of 314 households were interviewed in Mpanda and Kisarawe. The concentration index was estimated and regression analysis was performed to compare socioeconomic inequalities in ownership and use of ITNs. **Results:** Ownership of ITNs increased from 29% in the 2007/08 national survey to 90% after the roll out of free ITNs in Mpanda, and use increased from 13% to 77%. Inequality was considerably lower in Mpanda, with nearly perfect equality in use (concentration index 0.009) and ownership (concentration index 0.010). In Kisarawe, ownership of ITNs increased from 48% in the 2007/08 national survey to 53%, with a marked inequality concentration index 0.132. ITN use in Kisarawe district was 42% with a pro rich concentration index of 0.027. **Conclusions:** The results shed some light on the possibilities of reducing inequality in ownership and use of ITNs and attaining Roll Back Malaria and Millennium Development Goals through the provision of free ITNs to all. This has the potential to decrease the burden of disease and reduce disparity in disease outcome.

282. Rutaihwa MK. Prevalence and risk factors of metabolic syndrome among students at the University of Dar-es-salaam. Master of Medicine (internal medicine) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Metabolic syndrome describes a clustering of factors including dyslipidemia, glucose intolerance and hypertension with central obesity. The metabolic syndrome has a marked impact on the prevalence of cardiovascular disease and type 2 diabetes worldwide. The exact mechanism of the complex pathways of the metabolic syndrome is not yet fully known. Most patients are found to be elderly, obese, and sedentary and also have a degree of insulin resistance. The most important observable factors are overweight, genetics, and increase in age and low physical activities. The estimated global prevalence of metabolic syndrome for adults above 20 years is 16%. In Sub Saharan African countries, the prevalence of metabolic syndrome by using ATP III criteria was found to be zero in rural area for both men and women and to very low prevalence in urban areas at 0.2% and 0.5% in women and men respectively. However, by using WHO & IDF criteria the prevalence was higher in urban areas at up to 5.9% women and 7.3% men respectively. Though there is no single treatment plan for the syndrome, the first line therapy has been to reduce the major risk factors for cardiovascular disease. The key to prevent the syndrome however remain diet and physical activities. **Broad objective:** To determine the prevalence and risk factors of the metabolic syndrome among students aged 18years and above at the University of Dar-es-Salaam, Mlimani campus. **Methods:** The study was a descriptive cross-sectional design that was conducted at the University of Dar es Salaam Mlimani campus. A sample of 420 adults (277 male & 143 female) were recruited. Participants were interviewed on their personal medical history. Blood pressure and anthropometric measurement were taken by using standardized methods. Blood vii samples were collected in a fasting state to measure triglyceride, FBG and HDL-C. For this study, the WHO criteria were used to describe the metabolic syndrome. **Results:** The prevalence of metabolic syndrome in the population of University students was 0.2% using WHO criteria. However it was slightly higher using IDF criteria 1.1% and 0.9% by ATP criteria. **Conclusions:** The study reveals low prevalence of metabolic syndrome and its associated risk factors in the young generation population. This provides opportunity for preventive strategies, reinforcing the good practices and learning the advantages of maintaining them in order to lower the clustering of potential risks for cardiovascular diseases. **Recommendation:** Positively reinforce and educate benefits of reducing the risk factors of metabolic syndrome in this population.

283. Rutayuga T. HIV related stigma, depressive morbidity and treatment adherence in patients on antiretroviral therapy attending the Mwanayamala Hospital, Dar es Salaam. Master of Medicine (Psychiatry and Mental Health) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Introduction: There are about 33 million people who are living with HIV and AIDS worldwide and approximately 67% are in sub Saharan African countries. In Tanzania 2 million people are living with HIV/AIDS and 30% of them are in need of antiretroviral treatment. Several studies highlighted some psychological experiences in people living HIV/AIDS including feelings of shame, guilt, helplessness, self-blame and self-isolation that suggest negative self-image and this negative self-image has influence on accessing medical care. Stigma and depressive morbidity related to HIV infection has serious individual and public health ramifications, including reluctance to testing for HIV, refusal to initiate treatment as well as poor treatment compliance and hence increased risk of HIV disease transmission and progression. No studies reported in Tanzania have systematically explored associations between HIV related stigma, depressive morbidity and uptake of medical recommendation hence limited local information is available for improvements in uptake of medical recommendations. **Objectives:** To determine the influences of HIV AIDS stigma and depressive morbidity on uptake of selected medical recommendations among persons living with HIV (PLHA) attending the Mwananyamala HIV and AIDS care and treatment clinic (CTC). Study design: Hospital based descriptive cross sectional study where quantitative methods were used to collect information. **Methods:** An Average of 6 per day of 370 randomly selected patients were invited to participate in the study then they were assessed, on socio demographic and socioeconomic measures, uptake of selected medical recommendations and depressive morbidity and vii HIV related stigma measures. Outcome measures included; antiretroviral adherence, defined as adequate if 95% or more medications were taken as prescribed in the past 4 days analyzed dichotomously; whether counseling sessions were attended or not during the index clinic visit and whether the last scheduled clinic visit was kept or not, also reported dichotomously and all summarized as simple frequencies. The predictors of interest explored were HIV related stigma and depressive symptoms. The magnitudes of stigma and depressive morbidity were computed using sum scores of responses; depressive morbidity was summarized as mild, moderate and severe and levels of

stigma as tertiles. Logistic regression models using a backwards removal method were used to determine the strength of associations between the predictors of interest and the outcomes after adjusting for socio-demographic and economic confounders. Results: A total of 220 participants were included in the study, 69 (31.4%) being males and 151 (68.6%) females. Mean age (SD) was 35.5 (9.7) years with an age range of 18 to 68 years. All patients were on ART medication for not more than six months. The proportion non adherent to ART medication was 21.3%, and the proportion missing the last scheduled clinic visit was 19.1%. In linear regression analysis participants reporting divorce/widow (er) or cohabiting status were more likely to adhere to ART medication than those that were married (p value<0.01). In adjusted multivariate models, mild depressive morbidity was independently associated with non-adherence to the last scheduled clinic visit (OR 2.7; 95% confidence interval 1.02, 7.27; p<0.05) and attending individual counseling (OR 0.20; 95% confidence interval 0.05, 0.85 p <0.05) and was marginally associated with non adherence to ART medication (OR 2.6; 95% confidence interval 0.98, 6.82; p=0.06). Low level of stigma was independently associated with adequate adherence to ART medication (OR 3.00, 95% confidence interval 1.34, 6.91, p<0.01). No significant association was shown between internalized stigma and attending scheduled clinic visits or individual counseling during the index visit, or between depression and attending individual counseling sessions during the index visit. **Conclusion and recommendations:** Internalized stigma and depressive morbidity are challenges to the uptake medical of medical recommendations among PLHA. The study showed that PLHA who experience internalized stigma and depressive morbidity are more likely to be recently non-adherent to ART medications, while depressive morbidity influenced attending the last scheduled clinic visit. It is therefore recommended that interventions for recognition and management of both internalized stigma and depressive morbidity be a focus of the activities of health care workers in HIV and AIDS treatment clinics as one way of improving uptake of medical recommendations and including retention in HIV care and treatment. Atments to individuals most in need without using BMD determination test.

284. Saathoff E, Villamor E, Mugusi F, Bosch RJ, Urassa W , Fawzi WW. Anemia in adults with tuberculosis is associated with HIV and anthropometric status in Dar es Salaam, Tanzania. *International Journal of Tuberculosis and Lung Disease*.2011; 15 (7): 925-932.

Objective: To examine the association of anemia with human immunodeficiency virus (HIV) co-infection, indicators of socio-economic status (SES) and anthropometric status in TB-infected adults. Design: Cross-sectional data collection during screening for a clinical trial. **Results:** Overall, 750 females and 1693 males participated in this study, of which respectively 49% and 24% were co-infected with HIV-1. Hemoglobin levels were significantly lower in females than in males and in HIV-positive than in HIV-negative participants. HIV co-infection in this antiretroviral-naïve population was also associated with severe anemia (hemoglobin < 85 g/l) in both women (prevalence ratio [PR] = 2.07, 95%CI 1.65-2.59) and men (PR 3.45, 95%CI 2.66-4.47). Although severe anemia was negatively associated with indicators of SES, especially in males, adjustment for SES indicators only marginally changed its association with HIV co-infection. In both sexes, anemia was inversely associated with anthropometric status, independently of HIV infection and SES. **Conclusion:** Among TB-infected adults, anemia is strongly associated with HIV co-infection and anthropometric status, independently of SES indicators. As anemia is a risk factor for morbidity and mortality in both infections, the management of anemia in TB-HIV co-infected patients warrants special attention.

285. Sabria R, Hepatitis B virus infection among antenatal clinic attendees at the Muhimbili National Hospital, seroprevalence and associated factors. Master of Medicine (Obstetrics and Gynecology) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Hepatitis B virus (HBV) infection is a serious public health problem in sub-Saharan Africa. Vertical transmission is one of the modes of transmission. The risk of transmission increases if the mother is hepatitis B surface antigen (HBsAg) positive and more so if also hepatitis B envelope antigen (HBeAg) positive. Current magnitude of HBV infection at Muhimbili National Hospital MNH is not known, and could be on the increase due to the HIV epidemic, since the two have a shared mode of transmission. **Objectives:** To determine the seroprevalence of HBV infection and associated factors among pregnant women attending Antenatal Clinic at Muhimbili National Hospital. **Methodology:** This was a cross-sectional study conducted at the Antenatal Clinic, Muhimbili National Hospital between 31st August and 22nd

September 2010. Data including socio-demographic (age, residence, marital status, education level, occupation) sexual history (number of life-time sexual partners), obstetrics (parity) and history of blood transfusion were collected using a structured questionnaire. Blood specimen was collected for detection of HBsAg, HBeAg, IgM antibodies to hepatitis B core antigen (Anti-HBc), antibodies to hepatitis B surface antigen (anti-HBs) and HIV antibodies. Ethical clearance and informed consent were obtained prior to the enrolment in the study. Data were analyzed using the SPSS version 16.0. Fisher's exact tests were used for analysis. A p-value of <0.05 was regarded as statistically significant. **Results:** A total of 310 pregnant women were enrolled in the study. Their overall mean (SD) age was 28.5 (5.4) years. Majority of the women were from the Kinondoni Municipality, married and had primary education. Ninety-six (31.0%) of the women were primigravidae. Of the 310 women 12 (3.9%) tested positive for HBsAg. Of the 12 women with positive HBsAg, none had detectable anti-HBs antibodies. None had IgM HBcAb, excluding acute HBV infection. In addition, all these women tested negative for HBeAg. The prevalence of HIV infection was 9.7%. Three of 12 (25%) women had HBV and HIV co-infection. There were no significant differences between those who tested positive and those who tested negative to HBsAg with respect to age, residence, marital status, education level, occupation and parity. Similarly, there were no statistically significant differences noted between the two groups with regard to number of life-time sexual partners, HIV serostatus and history of blood transfusion. **Conclusion and Recommendation:** The seroprevalence of 3.9% HBsAg was of moderate severity according to WHOM. This finding would suggest for the introduction of routine screening for HBV to all pregnant women during the antenatal period, and that "at birth dose" vaccination is given to new born babies of mothers found to be HBsAg positive so as to reduce and prevent the spread of infection. However more data is required from larger studies to support the findings so that ultimately this can be recommended as a policy.

286. Sagara M, Njelekela M, Teramoto T, Taguchi T, Mori M, Armitage L, Birt N, Birt C, Yamori Y. Effects of docosahexaenoic acid supplementation on blood pressure, heart rate, and serum lipids in Scottish men with hypertension and hypercholesterolemia. *International Journal of Hypertension*. 2011.

To investigate the effects of daily supplementation with docosahexaenoic acid (DHA) on coronary heart disease risks in 38 middle-aged men with hypertension and/or hypercholesterolemia in Scotland, a five-week double-blind placebo-controlled dietary supplementation with either 2 g of DHA or active placebo (1 g of olive oil) was conducted. Percent composition of DHA in plasma phospholipids increased significantly in DHA group. Systolic and diastolic blood pressure and heart rate decreased significantly in DHA group, but not in placebo group. High-density lipoprotein cholesterol (HDL-C) increased significantly, and total cholesterol (TC)/HDL-C and non-HDL-C/HDL-C ratios decreased significantly in both groups. There was no change in TC and non-HDL-C. We conclude that 2 g/day of DHA supplementation reduced coronary heart disease risk factor level improving blood pressure, heart rate, and lipid profiles in hypertensive, hypercholesterolemia Scottish men who do not eat fish on a regular basis.

287. Sakafu LL. The role of imaging in the detection of overt abdominal and chest metastasis due to breast cancer, and associated risk factors at Ocean Road Cancer Institute. Master of Medicine (Radiology) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Breast cancer is a disease which affects people worldwide, contributing to a substantial public health. It is estimated more than 1.1 million cases of breast cancer are diagnosed each year. This disease accounts for 10% of all cancers and 23% of all cancers in women worldwide. Breast cancer is the leading cause of mortality and morbidity in Asia and Latin America. In Tanzania it is estimated that approximately 1307 women with breast cancer register in different hospitals each year. Cancer of the breast is among the commonest cancers affecting women in Tanzania. The majority of women who are diagnosed with breast cancer seek hospital treatment when the disease has reached an advanced stage, at which point the metastasis of the disease to the lung or the liver are most likely. **Broad objectives:** To determine the role of imaging in detection of overt abdominal and chest breast cancer metastasis, and associated risk factors among patients at ORCI from June to December 2010. **Methods:** This was a descriptive cross sectional study in which 103 patients with breast cancer attending ORCI new patient clinic were recruited consecutively. Standardized questionnaires were used to obtain socio-

demographic characteristics, risk factors and physical examination details, all participants were then investigated for liver and lung metastases using abdominal ultrasound and chest x-ray respectively. **Results:** The majority of breast cancer patients studied were above 45years (61.5%) with the mean age of 48(SD) \pm (11.22) year, and only 27.2 % had post primary education. The prevalence of metastasis from breast cancer to the liver and lungs was 18.4% and 20.4% respectively. Majority of liver metastasis occurred at the age category of 45years and above, with the prevalence of 68.4%.The prevalence of lung metastasis was highest in the age category of 35-44 years and above. Majority of patients with breast cancer had locally advanced breast cancer disease that is either TNM stage three (59.2%) or four (32%) disease upon arrival to ORCI, only 8.8% had stage two and none had stage one. **Conclusion:** This study showed that, the prevalence of lung and liver metastasis was very high accounting for 20.4% and 18.4% respectively. This is supported by the fact that most of newly viii diagnosed breast cancer had locally advanced breast cancer at presentation. The results of this study strengthen the recommendation of doing baseline staging tests, especially LUS and CXR, to all new breast cancer patients in Tanzania. This study also showed that, premenopausal women and those who use alcohol have increased prevalence of lung and liver metastasis though the results were not significant.

288. Sakwari G, Bråtveit M, Mamuya S, Moen BE. Dust exposure and chronic respiratory symptoms among coffee curing workers in Kilimanjaro: a cross sectional study.2011.

Background: Coffee processing causes organic dust exposure which may lead to development of respiratory symptoms. Previous studies have mainly focused on workers involved in roasting coffee in importing countries. This study was carried out to determine total dust exposure and respiratory health of workers in Tanzanian primary coffee-processing factories. **Methods:** A cross sectional study was conducted among 79 workers in two coffee factories, and among 73 control workers in a beverage factory. Personal samples of total dust (n = 45 from the coffee factories and n = 19 from the control factory) were collected throughout the working shift from the breathing zone of the workers. A questionnaire with modified questions from the American Thoracic Society questionnaire was used to assess chronic respiratory symptoms. Differences

between groups were tested by using independent t-tests and Chi square tests. Poisson Regression Model was used to estimate prevalence ratio, adjusting for age, smoking, presence of previous lung diseases and years worked in dusty factories **Results:** All participants were male. The coffee workers had a mean age of 40 years and were older than the controls (31 years). Personal total dust exposure in the coffee factories were significantly higher than in the control factory (geometric mean (GM) 1.23 mg/m³, geometric standard deviation (GSD) (0.8) vs. 0.21(2.4) mg/m³). Coffee workers had significantly higher prevalence than controls for cough with sputum (23% vs. 10%; Prevalence ratio (PR); 2.5, 95% CI 1.0 - 5.9) and chest tightness (27% vs. 13%; PR; 2.4, 95% CI 1.1 - 5.2). The prevalence of morning cough, cough with and without sputum for 4 days or more in a week was also higher among coffee workers than among controls. However, these differences were not statistically significant. **Conclusion:** Workers exposed to coffee dust reported more respiratory symptoms than did the controls. This might relate to their exposure to coffee dust. Interventions for reduction of dust levels and provision of respiratory protective equipment are recommended.

289. Sakwari G, Bråtveit M, Mamuya SH, Moen BE. Dust exposure and chronic respiratory symptoms among coffee curing workers in Kilimanjaro: a cross sectional study. BMC pulmonary medicine. 2011; 11(1): 54.

Background: Coffee processing causes organic dust exposure which may lead to development of respiratory symptoms. Previous studies have mainly focused on workers involved in roasting coffee in importing countries. This study was carried out to determine total dust exposure and respiratory health of workers in Tanzanian primary coffee-processing factories. **Methods:** A cross sectional study was conducted among 79 workers in two coffee factories, and among 73 control workers in a beverage factory. Personal samples of total dust (n = 45 from the coffee factories and n = 19 from the control factory) were collected throughout the working shift from the breathing zone of the workers. A questionnaire with modified questions from the American Thoracic Society questionnaire was used to assess chronic respiratory symptoms. Differences between groups were tested by using independent t-tests and Chi square tests. Poisson Regression Model was used to estimate prevalence ratio, adjusting for age, smoking, presence of previous lung diseases and years worked in dusty factories. **Results:** All participants were male.

The coffee workers had a mean age of 40 years and were older than the controls (31 years). Personal total dust exposure in the coffee factories were significantly higher than in the control factory (geometric mean (GM) 1.23 mg/m³, geometric standard deviation (GSD) (0.8) vs. 0.21(2.4) mg/m³). Coffee workers had significantly higher prevalence than controls for cough with sputum (23% vs. 10%; Prevalence ratio (PR); 2.5, 95% CI 1.0 - 5.9) and chest tightness (27% vs. 13%; PR; 2.4, 95% CI 1.1 - 5.2). The prevalence of morning cough, cough with and without sputum for 4 days or more in a week was also higher among coffee workers than among controls. However, these differences were not statistically significant. **Conclusion:** Workers exposed to coffee dust reported more respiratory symptoms than did the controls. This might relate to their exposure to coffee dust. Interventions for reduction of dust levels and provision of respiratory protective equipment are recommended.

290. Sakwari G, Bråtveit M, Moen BE. Dust exposure and respiratory symptoms; cross sectional study in Tanzanian coffee factories. European Respiratory Journal. 2011; 38(55):41-85.

Introduction: Exposure to coffee dust is associated with respiratory symptoms among workers in secondary coffee processing in industrialized countries, but only three studies have been done in primary coffee factories and none of these studies were in Tanzania. Aim: This study was carried out to examine whether there is a relationship between total dust exposure and respiratory health effects among workers in Tanzanian primary coffee processing factories. **Methods:** A cross sectional study was conducted in two primary coffee factories and in a beverage factory which served as control. Total dust samples were collected throughout the working shift from the breathing zone of the workers in the coffee factory (n = 44) and the control factory (n = 19). Respiratory symptoms were assessed by standardized ATS questionnaire. Statistical differences were tested by Independent t test and Chi Square. Logistic regression analyses were performed, adjusting for age and smoking. **Results:** Totally 150 workers participated; 79 coffee workers and 71 controls. Coffee workers had significantly higher prevalence than the controls for morning cough with sputum (23% vs. 10%, OR = 2.9 95% CI 1.1 - 8.4) and chest tightness (27% vs. 13%, OR = 3.2 95% CI 1.2 - 8.7). Total dust exposure in the coffee factories was significantly higher than in the control factory (geometric mean; 1.23 mg/m³ vs. 0.21 mg/m³, p = 0.001).

Conclusion: Coffee workers in primary factories have higher prevalence for respiratory symptoms and higher dust levels than controls.

291. Sasi RM. Sugary snacks consumption, caries experience and oral quality of life among urban primary school pupils in Tanga, Tanzania. Master of Dentistry (Community Dentistry) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Snacking is the consumption of foods or drinks in between main meals. People snack when they are not hungry enough for a full meal or want to curb their hunger while they wait for a larger meal later on. People also snack as a form of entertainment even when they are not really hungry or snack because they skipped main meals for various reasons. Naturally people like to eat high fat, high salt and high-sugar foods. This is why snacks manufacturers have been producing snacks that are laden with fats, salt and sugars, excess of which is associated with the occurrence of dental caries and other diet related conditions. **Objectives:** To determine caries experience and oral health related quality of life and factors associated with consumption of sugary snacks among urban school pupils in Tanga **Methodology:** This cross-sectional study involved 584 (response rate: 96.3%) pupils aged between 10 years and 16 years in four urban primary schools in Tanga. Data was collected between August to September 2010. Data were entered and analyzed using computer program SPSS version 13.0. Frequency distributions were done followed by; vicariate associations using chi-square and T- test to compare proportions and means respectively. Multivariate analysis was done by using multiple logistic regressions with ODP as the outcome variable and independent variables included sugar moments, oral ulcers, teeth sensitivity, and demographic variables. **Results:** the mean score for sugar moments was 1.93 with no differences by age or sex or caries experience. The most frequently consumed snack was fried cassava. Participants snacked mainly as a result of hunger and thirst. Eighty eight percent took tea or porridge while 58.6% eat fried cassava as a result of hunger. While 54.2% took juice due to thirst. About 28% of the participants had at least one oral impact on daily performance (OIDP). The prevalence of dental caries was 22.3% and the mean DMFT was 0.37; with no age or sex differences in caries experience. Multiple logistic regression revealed that the ODP was significantly associated with toothache (OR: 1.91; CI: 1.53-2.37), teeth sensitivity

(OR: 1.99; CI: 1.56-2.55) and oral ulcers (OR: 1.82; CI: 1.44-2.37). **Conclusion:** Sugary snacks consumption was low; the commonly consumed snacks were fried cassava and sugared juice with hunger being the major reason for snacking. The snacks were consumed because they were available within the school premises. The prevalence of Caries and oral impacts on daily performance were also low. Toothache, teeth sensitivity and oral ulcer predicted oral impacts on daily performance. Nevertheless there was no correlation between sugar moments and caries experience **Recommendations:** although sugary snacks consumption, caries experience and prevalence of oral impact on daily performance were low, school oral health education program should emphasize restriction of selling sugary snacks and encourage provision of school lunch to maintain the disease at low level. Further researches are needed to study the current relationship between sugar moments and caries experience incorporating other factors which may have influence in the formation of dental caries in Tanzania.

292. Scharf SM, Maimon N, Simon T, Bernhard SBJ, Reuveni H, Tarasiuk A. Sleep quality predicts quality of life in chronic obstructive pulmonary disease. *International journal of chronic obstructive pulmonary disease*. 2011; 6: 1.

Purpose: Chronic obstructive pulmonary disease (COPD) patients may suffer from poor sleep and health-related quality of life. We hypothesized that disturbed sleep in COPD is correlated with quality of life. **Methods:** In 180 patients with COPD (forced expired volume in 1 second [FEV1] $47.6 \pm 15.2\%$ predicted, 77.8% male, aged 65.9 ± 11.7 years), we administered general (Health Utilities Index 3) and disease-specific (St George's Respiratory) questionnaires and an index of disturbed sleep (Pittsburgh Sleep Quality Index). **Results:** Overall scores indicated poor general (Health Utilities Index 3: 0.52 ± 0.38), disease-specific (St George's: 57.0 ± 21.3) quality of life and poor sleep quality (Pittsburgh 11.0 ± 5.4). Sleep time correlated with the number of respiratory and anxiety symptoms reported at night. Seventy-seven percent of the patients had Pittsburgh scores >5 , and the median Pittsburgh score was 12. On multivariate regression, the Pittsburgh Sleep Quality Index was an independent predictor of both the Health Utilities Index 3 and the St George's scores, accounting for 3% and 5%, respectively, of the scores. Only approximately 25% of the patients demonstrated excessive sleepiness (Epworth Sleepiness Scale >9). **Conclusions:** Most patients with COPD suffer disturbed sleep. Sleep

quality was correlated with general and disease-specific quality of life. Only a minority of COPD patients complain of being sleepy.

293. Semali IA, Edwin T, Mboera LEG. Food insecurity and coping strategies among people living with HIV in Dar es Salaam, Tanzania. *Tanzania Journal of Health Research*.2011; 13 (4).

Food insecurity and malnutrition seriously impedes efforts to control HIV/AIDS in resource poor countries. This study was carried out to assess food security, and coping strategies among people living with HIV/AIDS (PLHIV) attending Care and Treatment Centre (CTC) in Dar es Salaam, Tanzania. A structured questionnaire was used to interview randomly selected adults (≥ 18 years) who were HIV positive who have just been eligible for anti-retroviral treatment (ART) in a CTC or one who has started ART but not more than four weeks has elapsed. A total of 446 (females=67.9%; males= 32.1%) people living with HIV/AIDS attending CTC were interviewed. About three quarters (73.1%) of the respondents were 25-44 years old and most (43.9%) were married. Two thirds (66.7%) of the respondents had primary school education. Seventy percent reported to have a regular income and 63.7% with a monthly income of less than US\$ 154. More than half (52.2%) of the respondents were food insecure. Food insecurity was similar in both males (54.6%) and females (51.2%). However, food insecurity was least (48.2%) among those who were single and highest (57.7%) among those cohabiting. Low level of food insecurity was associated with having completed primary education (Adjusted OR=0.27; 95%CI, 0.09-0.82) and high income ($>$ US\$154) (OR=0.10; 95%CI, 0.01-0.67). Reporting two or less meals increased the likelihood of food insecurity (OR=4.2; 95% CI 1.7-9.8). Low frequency of meals was significantly more prevalent (18.6%) among those ≥ 45 years than among 35-44 years old respondents (6.7%) ($P=0.04$). Borrowing money (55.8%) and taking less preferred foods (53.3%) were the most common coping strategies. In conclusion, food insecurity is a significant problem among people living with HIV in Dar es Salaam which might significantly affect compliance to care and support. The study suggests that counselling of PLHIV before anti-retroviral treatment programmes should devise special strategies targeting those with low education, low income and low frequency of meals.

294. Sempombe J, Galinato MGI, Elmore BO, Fan W, Guillemette JG, Lehnert N, Feng C. Mutation in the Flavin Mononucleotide Domain Modulates Magnetic Circular Dichroism Spectra of the iNOS Ferric Cyano Complex in a Substrate-Specific Manner. *Inorganic chemistry*. 2011; 50(15), 6859-6861.

We have obtained low-temperature magnetic circular dichroism (MCD) spectra for ferric cyano complexes of the wild type and E546N mutant of a human inducible nitric oxide synthase (iNOS) oxygenase/flavin mononucleotide (oxyFMN) construct. The mutation at the FMN domain has previously been shown to modulate the MCD spectra of the l-arginine-bound ferric iNOS heme (Sempombe, J.; et al. *J. Am. Chem. Soc.* 2009, 131, 6940–6941). The addition of l-arginine to the wild-type protein causes notable changes in the CN–adduct MCD spectrum, while the E546N mutant spectrum is not perturbed. Moreover, the MCD spectral perturbation observed with l-arginine is absent in the CN– complexes incubated with N-hydroxy-l-arginine, which is the substrate for the second step of NOS catalysis. These results indicate that interdomain FMN–heme interactions exert a long-range effect on key heme axial ligand–substrate interactions that determine substrate oxidation pathways of NOS.

295. Sempombe J, Stein B, Kirk ML. Spectroscopic and Electronic Structure Studies Probing Covalency Contributions to C–H Bond Activation and Transition-State Stabilization in Xanthine Oxidase. *Inorganic chemistry*. 2011; 50(21): 10919-10928.

A detailed electron paramagnetic resonance (EPR) and computational study of a key paramagnetic form of xanthine oxidase (XO) has been performed and serves as a basis for developing a valence-bond description of C–H activation and transition-state (TS) stabilization along the reaction coordinate with aldehyde substrates. EPR spectra of aldehyde-inhibited XO have been analyzed in order to provide information regarding the relationship between the g , $^{95,97}\text{Mo}$ hyperfine (AMo), and ^{13}C hyperfine (AC) tensors. Analysis of the EPR spectra has allowed for greater insight into the electronic origin of key delocalizations within the Mo–Oeq–C fragment and how these contribute to C–H bond activation/cleavage and TS stabilization. A natural bond orbital analysis of the enzyme reaction coordinate with aldehyde substrates shows that both Mo–S p^* C–H s^* ($E = 24.3 \text{ kcal mol}^{-1}$) and C–H s^* Mo–S p^* ($E = 20.0 \text{ kcal mol}^{-1}$)

back-donation are important in activating the substrate C–H bond for cleavage. Additional contributions to C–H activation derive from Oeq LP \rightarrow C–H s* (LP = lone pair; E = 8.2 kcal mol⁻¹) and S lp \rightarrow C–H s* (E = 13.2 kcal mol⁻¹) stabilizing interactions. The Oeq-donor ligand that derives from water is part of the Mo–Oeq–C fragment probed in the EPR spectra of inhibited XO, and the observation of Oeq LP \rightarrow C–H s* back-donation indicates a key role for Oeq in activating the substrate C–H bond for cleavage. We also show that the Oeq donor plays an even more important role in TS stabilization. We find that Oeq \rightarrow Mo + C charge transfer dominantly contributes to stabilization of the TS (E = 89.5 kcal mol⁻¹) and the Mo–Oeq–C delocalization pathway reduces strong electronic repulsions that contribute to the classical TS energy barrier. The Mo–Oeq–C delocalization at the TS allows for the TS to be described in valence-bond terms as a resonance hybrid of the reactant (R) and product (P) valence-bond wave functions.

296. Sempombe J. Spectroscopic and electronic structure studies of metalloenzyme active sites. 2011.

This work reports on the electronic and geometric structural studies of xanthine oxidoreductase (XO), S-ribosylhomocysteinase (LuxS) and inducible nitric oxide synthase (iNOS) active sites resulting from the joint applications of electronic absorption, electron paramagnetic resonance and magnetic circular dichroism spectroscopic methods. XO catalyzes formal oxygen atom insertion into a substrate C-H bond, but differs from monooxygenase enzymes in that the inserted oxygen atom derives from metal activated water and reducing equivalents are generated rather than consumed. Studies on aldehyde “inhibited” XO (a paramagnetic form observed during XO catalysis), analyzed in terms of the relationships between the g-, ^{95,97}Mo hyperfine, and the ¹³C hyperfine tensors have provided structural insights into the nature of substrate/product bound at the Mo active site. The results indicate that aldehyde “inhibited” is a tetrahedral analogue of the calculated transition state in XO catalytic mechanism. S-ribocylhomocysteinase (LuxS) catalyzes the non-redox cleavage of a stable thioether bond, a difficult reaction from chemist’s perspective. This metalloenzyme plays a key role in quorum sensing which makes its investigation an attractive target for inhibition and development of novel antibacterial agents. This study utilized Co (II)-d7 substituted tetrahedral LuxS. Thus, analysis for g-, ⁵⁹Co hyperfine and zfs (D and E) tensors of wild-type, mutants (C84A and

C84D) and relevant small molecule analogues, (PATH) CoBr and (PATH) CoNCS have provided a detailed description of LuxS active site. The results indicate that the LuxS active site is a distorted tetrahedral with approximate C_{3v} geometry and the catalytic reaction begins by the substrate displacing water. The iNOS catalyzes the oxidation of L-arginine to a signaling molecule, NO and L-citrulline with NADPH and O₂ as cosubstrates. The emerging evidence suggests that the production of NO is facilitated by the interdomain electron transfer from the FMN to the catalytic heme site. This work reports a comparative spectroscopic study of wild-type and mutant proteins of a human iNOS bidomain oxygenase/FMN construct. The results indicate notable effects of mutations in the adjacent FMN domain on the heme structure suggesting that the conserved surface residues in the FMN domain (E546 and E603) play key roles in facilitating a productive alignment of the FMN and heme domains in iNOS.

297. Sepeku A, Kohi TW. Treatment outcomes of neonatal asphyxia at a national hospital in Dar es Salaam, Tanzania. *Africa Journal of Nursing and Midwifery*. 2011; 13(2): 43-56.

Birth asphyxia is an important cause of neonatal morbidity and mortality in developing countries. Birth asphyxia continues to present a major clinical problem, and worldwide approximately one million newborn infants are affected annually. The broad purpose of this study was to describe the care given to asphyxiated neonates at a neonatal unit at a national hospital in Dar es Salaam, Tanzania. A descriptive cross-sectional study involving 40 neonates, admitted to the participating national hospital with neonatal asphyxia, was done. A checklist was used to obtain data from each patient's records and another checklist to identify the availability of equipment. Out of 190 neonates admitted to the neonatal unit, 40 (21.1%) suffered from neonatal asphyxia.

298. Shayo GA, Mugusi FM. Prevalence of obesity and associated risk factors among adults in Kinondoni municipal district, Dar es Salaam Tanzania. *BMC Public Health*. 2011; 11: 365.

Background: Obesity is on the rise worldwide, not sparing developing countries. Both demographic and socio-economic factors play parts in obesity causation. Few surveys have been

conducted in Tanzania to determine the magnitude of obesity and its association with these risk factors. This study aimed at determining the prevalence of obesity and its associated risk factors among adults aged 18 - 65 years in Kinondoni municipality, Dar es Salaam, Tanzania from April 2007 to April 2008. **Methods:** Random sampling of households was performed. Interviews and anthropometric measurement were carried out to eligible and consenting members of the selected households. Obesity was defined using Body Mass Index (BMI). **Results:** Out of 1249 subjects recruited, 814 (65.2%) were females. The overall prevalence of obesity was 19.2% (240/1249). However, obesity was significantly more prevalent in women (24.7%) than men (9%), $p < 0.001$, among respondents with high socio-economic status (29.2%) as compared to those with medium (14.3%) and low socio-economic status (11.3%), p value for trend < 0.001 , and among respondents with light intensity activities (26.0%), p value for trend < 0.001 . **Conclusion:** This study revealed a higher prevalence of obesity among Kinondoni residents than previously reported in other parts of the country. Independent predictors of obesity in the population studied were increasing age, marriage and cohabitation, high SES, female sex and less vigorous physical activities.

299. Shewiyo DH, Kaale E, Risha PG, Sillo HB, Dejaegher B, Smeyers VJ, Heyden YV. Development and validation of a normal-phase HPTLC-densitometric method for the quantitative analysis of fluconazole in tablets. Journal of Planar Chromatography - Modern TLC. 2011; 24 (6):529-533.

This paper presents the development and validation of an improved method for the analysis of fluconazole using high-performance thin layer chromatography (HPTLC) with densitometric detection. Separation was performed on silica gel 60 F 254 plates. The mobile phase is comprised of ethyl acetate-methanol-ammonia-diaminoethane (85:10:5:0.5 v/v/v/v). Detection wavelength was 216 nm and the R F value obtained was 0.4 ± 0.03 . An F-test indicated that the calibration graph was linear at the evaluated concentration range. The %RSD for repeatability and intermediate precision were 1.60 and 3.05, respectively. The mean percentage recovery for the trueness was $99.1 \pm 2.1\%$. This method was successfully used to analyze the fluconazole content in marketed tablet samples.

300. Shewiyo DH, Kaale E, Ugullum C, Sigonda MN, Risha PG, Dejaegher B, Smeyers VJ, Heyden YV. Development and validation of a normal-phase HPTLC method for the simultaneous analysis of lamivudine, stavudine and nevirapine in fixed-dose combination tablets. *Journal of Pharmaceutical and Biomedical Analysis*.2011; 54 (3):445-450.

This paper presents the development and validation of an improved method for the simultaneous analysis of lamivudine (LVD), stavudine (STV) and nevirapine (NVP) using high-performance thin-layer chromatography (HPTLC) with densitometric detection. Separation was performed on silica gel 60F 254 plates. The mobile phase is comprised of ethylacetate, methanol, toluene and concentrated ammonia (38.7:19.4:38.7:3.2, v: v: v: v). Detection wavelength was 254nm. The R_f values were 0.24±0.03, 0.38±0.04 and 0.69±0.04 (n=8) for LVD, STV and NVP, respectively. An F-test indicated that calibration graphs were adequately linear at the evaluated concentration ranges. The pooled %RSD for repeatability of the percentage amount recovered for LVD, STV and NVP were found to be 0.62, 0.54, and 0.79, and the pooled %RSD for time-different intermediate precision were 1.66, 1.27 and 1.21. The percentage recoveries for the trueness were 99.2%±1.5 for LVD, 98.6%±1.5 for STV and 99.3%±1.7 for NVP (n=3). Most factors evaluated in the robustness test were found to have an insignificant effect on the selected responses at 95% confidence level. This method was successfully used to analyze fixed-dose tablets samples of LVD, STV and NVP.

301. Shimwela GM. Adverse drug reaction reporting” knowledge, attitude and practices of community pharmacy dispensers in Dar es salaam, Tanzania. Master of Sciences Programme (Pharmaceutical Management) *Dissertation* 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Under reporting of adverse drug reactions (ADRs) by healthcare personnel is a common problem of many Pharmacovigilance programs. Lack of involvement of healthcare professionals such as pharmacists and other pharmaceutical dispensers has been cited as one of the reasons for under reporting. Pharmaceutical dispensers in the community pharmacies are in unique position by virtue of their training and profession to observe ADRs in patients, as many patients often try to avoid doctor consultation fees by visiting community pharmacies. The

knowledge and ability of dispensers in Tanzanian community pharmacies to identify and report ADRs is however unknown. Study **objective:** To determine the knowledge, attitude and practices of dispensers in community pharmacies in Dar es Salaam towards the ADRs reporting. **Methodology:** A descriptive cross sectional survey was conducted involving 254 dispensers from selected retail pharmacies in Dar es Salaam region. SPSS version 16 was used for data entry, cleaning and subsequently analysis. **Results:** The majority of personnel working in community pharmacies are non pharmaceutical professionals i.e. 52% were nurse assistants. Community dispensers have limited knowledge and practices with regard towards ADRs reporting. Only 13.8% of respondents had good ADRs reporting knowledge, while only 8.7% had ever submitted ADRs reports to the relevant authorities. There was a significant difference in the level of knowledge with regard to ADRs reporting between Pharmaceutical professionals (i.e. Pharmacists, Pharmaceutical technicians and pharmaceutical assistants) and non Pharmaceutical professionals (P value = 0.000). The knowledge levels correlated positively with profession and attendance of continuous professional education courses (CPE). The majority of dispensers (68.9%) however had a positive attitude towards ADRs reporting. **Conclusion and Recommendations:** Community pharmacies dispensers in Dar es Salaam have limited knowledge and experience with regard to ADRs reporting. Thus community pharmacies in Dar es Salaam cannot presently act as centres to collect data on ADRs effectively. The staffing of community pharmacies with unqualified pharmaceutical professionals is the main reason for the lack of knowledge, thus sincere and sustained efforts should be made by the Government through its National Regulatory Authorities and Schools of Pharmaceutical Sciences to ensure that there is an increased output of pharmaceutical professionals in Tanzania, ADRs reporting forms and guidelines are available in community pharmacies and that continuous professional education is provided to in-service pharmaceutical professionals to improve their ADRs reporting capabilities.

302. Silumbe RS. Pharmaceutical management and prescribing pattern of antimalarial drugs in the public health facilities in Dar-es-salaam, Tanzania. Master of Science (Pharmaceutical Management) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Despite the efforts of minimizing utilization of limited financial resources in Tanzania, there are still some factors that affect the whole system of supply chain of antimalarial medicines. The goals of Integrated Logistic System (ILS) have not been realized since still there is drug shortage and poor stock recording system in the health facilities. Inadequate knowledge of the pharmaceutical management and inappropriate use of antimalarial drugs always contribute to the poor quality and availability of the drugs in the health facilities and irrational use of the antimalarial drugs. **Objectives:** The main objective of the study was to assess the knowledge in practice of pharmaceutical management and prescribing pattern of antimalarial drugs in the public health facilities in Dar-es-salaam. **Methodology:** Descriptive retrospective cross-sectional study design was used to survey nine (9) public health facilities in Dar-es-salaam region. The health facilities included 4 hospitals and 5 Health Centers. A total of 32 pharmaceutical health workers (drug store managers and drug dispensers) were interviewed using structured questionnaires. Two different structured questionnaires were used to interview drug store managers and drug dispensers separately. Average stock-out time of antimalarial drugs from January to December 2010 was assessed using a designed form. A total of 4320 prescriptions were examined and recorded from all the selected public health facilities. Adequate storage conditions and handling of medicines procedures were also assessed. Since Medical Stores Department (MSD) is the main supplying source of the antimalarial drugs to these facilities, it was also included in this study as the special site for assessing availability of antimalarial medicines from the source. **Results:** Among all nine (9) drug store managers, six (6) had poor knowledge on quantification concept, and seven (7) did not apply Integrated Logistic System indicating 2 that it is still confusing to be applied. All of drug store managers had inadequate knowledge on the concept of procurement, and there were no effective and efficient procurement systems in all the health facilities. In most of the facilities, BIN Cards and Stock ledger books were the most commonly used stock recording systems. . There are no Electronic Drug Recording systems in these facilities. A tedious and bureaucratic process of expired drug disposal was cited as a reason for piling up of expired drugs in the health facilities. Percentage time out of stock for the antimalarial drugs were 25% for Artemether-Lumefantrine (ALU) and 25.7% for Quinine tablets and 6.4% for injections All drug stores in the health facilities scored satisfactory marks in adequacy storage conditions and handling of antimalarial medicines. However, all facilities had no cold storage facilities with temperature charts; and medicines were

kept directly on the floor in seven (7) out of 9 main drug stores and six (6) out of 15 dispensing rooms. Regarding rational dispensing of medicines, only 22 and 12 of all (32) interviewed drug dispensers had good knowledge on recommended doses and dosage regimen of ALU respectively. Regarding dispensing of ALU in pregnancy as special group, 19 drug dispensers were not able to provide correct information for use of ALU during pregnancy. The average number of drugs prescribed per prescriptions was 2.4 ± 0.014 , and 98 % of prescriptions contained only one antimalarial drug, among them 88.9 % was ALU. About 96.9 % of the prescriptions showed wrong prescribing pattern for ALU in terms of its dosage. **Conclusion:** Despite the government efforts in increasing public awareness of ALU and ensuring constant availability of such drugs at MSD, there is a significant stock-out period due to poor pharmaceutical management of antimalarial medicines in the public health facilities. Although adherence to the national malaria treatment guidelines is satisfactory, there is significant irrational prescribing of antimalarials among the prescribers. Based on these findings, it is proposed that regular on-job training and continuing education should be provided to drug dispensers and prescribers in the public health facilities.

303. Simba D, Schuemer C, Forrester K, Hiza M. Reaching the poor through community-based distributors of contraceptives: Experiences from Muheza district, Tanzania. *Tanzania Journal of Health Research*.2011; 13 (1):1-9.

Community based distribution (CBD) programmes were introduced as a strategy to ensure access of contraceptives to the needy. The strategy is reported to increase contraceptive knowledge and use. Although CBD agents have the advantage of reaching the poor in rural areas, wealth gap does exist even in these settings. The objective of this study was to determine access to information and modern contraceptives services among people of different wealth status in a rural setting in Muheza, Tanzania. This cross-sectional study was conducted following a six year project in promotion of contraceptive using community-based agents. The study area was stratified into three socio-geographical strata from which one village was randomly selected. Through house-to-house visits, interviews were conducted using structured questionnaires until the required sample size was obtained. A community-led wealth ranking criteria was developed through consensus and used to classify respondents into wealth categories. A total of 1,420

respondents were interviewed. Contraceptive Prevalence Rate (CPR) for modern methods was 32.2%; injectables accounted for half (50.8%) followed by pills (32.7%). CBD agents accounted for one-third (34.3%) of the contraceptive use. There was no difference in the access to information (P=0.44) and to contraceptives (P=0.83) between the poorer and the less poor. Half of the respondents (49.4%; 214/431) reported paying for services, with no difference between the less poor and the poorer (P=0.75). Respondents receiving services from health facilities were more likely to pay for services (61.3%) compared to CBD agents (25.0%). However, the level of satisfaction was high (approximately 70%) in both health facilities and CBD agents. This study has shown that people in the rural settings of Muheza district were able to access information and contraceptives from CBD agents and health facilities, regardless of their wealth status. There is however, need to address the issue of informal payments lest it deters people in need from accessing the services.

304. Simon T, Berthold F, Borkhardt A, Kremens B, De Carolis B, Hero B. Treatment and outcomes of patients with relapsed, high-risk neuroblastoma: Results of German trials. *Pediatric blood & cancer*. 2011; 56(4): 578-583.

Background: The prognosis of high-risk neuroblastoma patients has improved over the last decades. However, many patients experience relapse after successful initial treatment. We retrospectively analyzed the long-term outcome of relapsed patients of three consecutive national neuroblastoma trials. **Methods:** Patients were included when they fulfilled all of the following criteria: Age at diagnosis being 1 year or older, first diagnosis between 1990 and 2007, stage 4 disease or stage 3 neuroblastoma with MYCN amplification, and relapse or progression after successful first-line autologous stem cell transplantation (ASCT). **Results:** A total of 451 high-risk neuroblastoma patients 1 year or older underwent ASCT during first-line treatment, 253 experienced recurrence of disease, 158 received salvage chemotherapy, and 23 of them finally underwent a second ASCT. These 23 patients had a better median survival (2.08 years) and 3-year survival rate from recurrence (43.5% ± 10.9%) compared to 74 patients who had no second chemotherapy (median survival 0.24 years, 3-year survival rate 4.0% ± 2.6%) and 135 patients who underwent second-line chemotherapy but did not undergo second ASCT (median survival of 0.89 years, 3-year survival rate 9.6% ± 2.8%, P < 0.001). By February 2010, 3/23 patients

were in complete remission, 3/23 in very good partial remission, 1/23 in partial remission, 14/23 patients died of disease after successful second ASCT, and 2/23 died of complications due to second ASCT. **Conclusion:** Intensive second-line therapy is feasible. A small subgroup of relapsed high-risk neuroblastoma patients may benefit from intensive relapse chemotherapy and second ASCT. The potential of long-term survival justifies clinical trials on intensive second-line treatment. *Pediatr Blood Cancer* 2011; 56:578–583.

305. Simon T, Bhatt DL, Bergougnan L, Farenc C, Pearson K, Perrin L, Dubar M. Genetic polymorphisms and the impact of a higher clopidogrel dose regimen on active metabolite exposure and ant platelet response in healthy subjects. *Clinical Pharmacology & Therapeutics*. 2011; 90(2):287-295.

A double-blind crossover study was conducted in four CYP2C19 genotype–defined metabolizer groups to assess whether increase in clopidogrel dosing can overcome reduced pharmacodynamic response in CYP2C19 poor metabolizers (PMs). Ten healthy subjects in each of four metabolizer groups were randomized to a clopidogrel regimen of a 300-mg loading dose (LD) and a 75-mg/day maintenance dose (MD) for 4 days followed by 600-mg LD and 150 mg/day MD, or vice versa. The exposure levels of clopidogrel's active metabolite H4 (clopi-H4) in PMs were 71% lower on the 75-mg/day regimen and 64% lower on the 150-mg/day regimen than the corresponding exposure levels in extensive metabolizers (EMs). In PMs, the maximal platelet aggregation (MPA) induced by adenosine diphosphate (ADP) 5 µmol/l was 10.5% lower on the 75-mg/day regimen and 7.9% lower on the 150-mg/day regimen than the corresponding values in EMs. PMs who were on the clopidogrel regimen of 600-mg LD/150 mg/day MD showed clopi-H4 exposure and MPA levels similar to those in EMs who were on the regimen of 300-mg LD/75 mg/day MD. In a pooled analysis evaluating CYP1A2, CYP2B6, CYP2C9, CYP2C19, CYP3A5, CYP2D6, ABCB1, and P2RY12 polymorphisms (N = 396 healthy subjects), only CYP2C19 had a significant impact on ant platelet response. In healthy CYP2C19 PMs, a clopidogrel regimen of 600-mg LD/150 mg/day MD largely overcomes diminished clopi-H4 exposure and ant platelet response, as assessed by MPA levels.

306. Simon T, Cook VR, Rao A, Weinberg RB. Impact of murine intestinal apolipoprotein A-IV expression on regional lipid absorption, gene expression, and growth. *Journal of lipid research*. 2011; 52(11): 1984-1994.

Apo lipoprotein A-IV (apoA-IV) is synthesized by intestinal enterocytes during lipid absorption and secreted into lymph on the surface of nascent chylomicrons. A compelling body of evidence supports a central role of apoA-IV in facilitating intestinal lipid absorption and in regulating satiety, yet a longstanding conundrum is that no abnormalities in fat absorption, feeding behavior, or weight gain were observed in chow-fed apoA-IV knockout (A4KO) mice. Herein we reevaluated the impact of apoA-IV expression in C57BL6 and A4KO mice fed a high-fat diet. Fat balance and lymph cannulation studies found no effect of intestinal apoA-IV gene expression on the efficiency of fatty acid absorption, but gut sac transport studies revealed that apoA-IV differentially modulates lipid transport and the number and size of secreted triglyceride-rich lipoproteins in different anatomic regions of the small bowel. ApoA-IV gene deletion increased expression of other genes involved in chylomicron assembly, impaired the ability of A4KO mice to gain weight and increase adipose tissue mass, and increased the distal gut hormone response to a high-fat diet. Together these findings suggest that apoA-IV may play a unique role in integrating feeding behavior, intestinal lipid absorption, and energy storage.

307. Simon T, Feller E. Diverse presentation of secondary aortoenteric fistulae. *A case report in medicine*. 2011.

Secondary aortoenteric fistula, due to mechanical erosion or infection of a prosthetic graft, is a very rare cause of gastrointestinal bleeding and an uncommon complication of abdominal aortic aneurysm repair. A retrospective chart review conducted at our institution revealed 5 cases of secondary AEF occurring between 2006 and 2010. Presentations were diverse, including hematemesis, coffee-ground emesis, and unexplained sepsis. Delay in diagnosis was common. In reporting these cases, we seek to highlight the diverse clinical spectrum and potentially misleading features of this condition. Clinicians must retain a high index of suspicion to avoid potentially catastrophic outcomes.

308. Simon T, Hero B, Faldum A, Handgretinger R, Schrappe M, Klingebiel T, Berthold F. Long term outcome of high-risk neuroblastoma patients after immunotherapy with antibody ch14.18 or oral metronomic chemotherapy. *BMC cancer*. 2011; 11(1): 21.

Background: The treatment of high-risk neuroblastoma patients consists of multimodal induction therapy to achieve remission followed by consolidation therapy to prevent relapses. However, the type of consolidation therapy is still discussed controversial. We applied metronomic chemotherapy in the prospective NB90 trial and monoclonal anti-GD2-antibody (MAB) ch14.18 in the NB97 trial. Here, we present the long term outcome data of the patient cohort. **Methods:** A total of 334 stage 4 neuroblastoma patients one year or older were included. All patients successfully completed the induction therapy. In the NB90 trial, 99 patients received at least one cycle of the oral maintenance chemotherapy (NB90 MT, 12 alternating cycles of oral melphalan/etoposide and vincristine/cyclophosphamide). In the NB97 trial, 166 patients commenced the MAB ch14.18 consolidation therapy (six cycles over 12 months). Patients who received no maintenance therapy according to the NB90 protocol or by refusal in NB97 (n = 69) served as controls. **Results:** The median observation time was 11.11 years. The nine-year event-free survival rates were $41 \pm 4\%$, $31 \pm 5\%$, and $32 \pm 6\%$ for MAB ch14.18, NB90 MT, and no consolidation, respectively ($p = 0.098$). In contrast to earlier reports, MAB ch14.18 treatment improved the long-term outcome compared to no additional therapy ($p = 0.038$). The overall survival was better in the MAB ch14.18-treated group (9-y-OS $46 \pm 4\%$) compared to NB90 MT ($34 \pm 5\%$, $p = 0.026$) and to no consolidation ($35 \pm 6\%$, $p = 0.019$). Multivariable Cox regression analysis revealed ch14.18 consolidation to improve outcome compared to no consolidation, however, no difference between NB90 MT and MAB ch14.18-treated patients was found. **Conclusions:** Follow-up analysis of the patient cohort indicated that immunotherapy with MAB ch14.18 may prevent late relapses. Finally, metronomic oral maintenance chemotherapy also appeared effective.

309. Simon T, Laszlo V, Falus A. Impact of histamine on dendritic cell functions. *Cell biology international*. 2011; 35(10): 997-1000.

A rapidly growing body of evidence highlighted that histamine, a small biogenic amine, is implicated in the regulation of DC (dendritic cell) functions. It is well established that DCs represent the most potent antigen-presenting cells of the body, linking innate and acquired immunity and regulating the outcome of immune responses. Signals, associated with ongoing inflammation and uptake of foreign antigens, promote maturation of DCs and activation of T-cell responses in secondary lymphatic organs. These bone marrow-derived cells patrol continuously all over the body. During their persistent migration, several mediators may influence the behavior and functions of DCs. Histamine, produced by mast cells, basophiles or DCs themselves, may have an important role in the life cycle of DCs. From the differentiation, through their never-ending circulation, until the induction of T-cell response, histamine is present and influences the life cycle of DCs. Here, we summarize recent progress in histamine research with respect to DC functions. We also point out some controversial aspects of histamine action on DCs.

310. Simon T, Laszlo V, Lang O, Buzas E, Falus A. Histamine regulates relevant murine dendritic cell functions via H4 receptor. *Front Biosci.* 2011; 3:1414-1424.

Histamine, produced by dendritic cells (DCs) or by other cells of the immune system, may have significant impact on DC activities. We investigated the influence of histamine and histamine H4 receptor (H4R) on some relevant functions of DCs. Histamine significantly decreased the antigen presentation capacity of splenic DCs, and this effect was reversed by a H4R antagonist. Furthermore, enhanced antigen presentation was detected in H4R^{-/-} DCs. Prolonged histamine treatment during DC differentiation stimulated migration, albeit the increase was not significant. H4R-deficient DCs possessed significantly lower migration capacity than their wild-type counterparts. Monitoring in vivo and in vitro DC cytokine production revealed that a H4R agonist in combination with LPS, increased IL-1 beta mRNA expression, and a H4R antagonist reversed this effect. In H4R-deficient mice we detected decreased mRNA expression of some DC-derived cytokines including IFN-gamma and IL-10. Upon CFA stimulation, genotype-dependent differences were found in the expression of IL-6 and IFN-gamma. Our data suggest that H4R plays a crucial role in variety of functions of murine DCs.

311. Simon T, Steg PG, Becquemont L, Verstuyft C, Kotti S, Schiele F, Danchin N. Effect of paraoxonase-1 polymorphism on clinical outcomes in patients treated with clopidogrel after an acute myocardial infarction. *Clinical Pharmacology & Therapeutics*. 2011; 90(4):561-567.

Paraoxonase-1 (PON1) Q192R polymorphism was recently suggested to determine per se clopidogrel response on major cardiovascular events (MACEs). We assessed the impact of PON1, CYP2C19, and ABCB1 polymorphisms on MACE in clopidogrel-treated acute myocardial infarction (AMI) patients (N = 2,210), including those undergoing percutaneous coronary intervention (PCI) (n = 1,538). PON1 polymorphism was not associated with increased risk of in-hospital death and MACEs at 1 year (adjusted hazard ratio (HR) 1.03, 95% confidence interval (CI) 0.66–1.61 and adjusted HR 0.77, 95% CI 0.42–1.41 for QQ versus RR in all and PCI patients, respectively). The presence of two CYP2C19 loss-of-function (LOF) alleles was associated with the risk of in-hospital death and MACEs at 1 year in the overall population (adjusted odds ratio (OR) 3.67, 95% CI 1.05–12.80 and adjusted HR 1.96, 95% CI 1.08–3.54) and in PCI patients (adjusted OR 6.87, 95% CI 2.52–18.72 and adjusted HR 3.06, 95% CI 1.47–6.41). Unlike CYP2C19 polymorphism, PON1 (Q192R) polymorphism is not a major pharmacogenetic contributor of clinical response to clopidogrel in AMI patients.

312. Simon T, Steg PG, Gilard M, Blanchard D, Bonello L, Hanssen M, Danchin N. Clinical events as a function of proton pump inhibitor use, clopidogrel use, and cytochrome P450 2C19 genotype in a large nationwide cohort of acute myocardial infarction results from the French Registry of Acute ST-Elevation and Non-ST-Elevation Myocardial Infarction (FAST-MI) Registry. *Circulation*. 2011; 123(5): 474-482.

Background: Clopidogrel requires metabolic activation by cytochrome P450 2C19 (CYP2C19). Proton pump inhibitors (PPIs) that inhibit CYP2C19 are commonly co administered with clopidogrel to reduce the risk of gastrointestinal bleeding. This analysis compares treatment outcomes for patients in the French Registry of Acute ST-Elevation and Non-ST-Elevation Myocardial Infarction (FAST-MI) who did or did not receive clopidogrel and/or PPIs. **Methods and Results:** The FAST-MI registry included 3670 patients (2744 clopidogrel- and PPI-naïve

patients) presenting with definite MI. Patients were categorized according to use of clopidogrel and/or PPI within 48 hours after hospital admission. PPI use was not associated with an increased risk for any of the main in-hospital events (in-hospital survival, reinfarction, stroke, bleeding, and transfusion). Likewise, PPI treatment was not an independent predictor of 1-year survival (hazard ratio, 0.97; 95% confidence interval [CI], 0.87 to 1.08; $P=0.57$) or 1-year MI, stroke, or death (hazard ratio, 0.98; 95% CI, 0.90 to 1.08; $P=0.72$). No differences were seen when the type of PPI or CYP2C19 genotype was taken into account. In the propensity-matched cohorts, the odds ratios for major in-hospital events in PPI versus no PPI were 0.29 (95% CI, 0.06 to 1.44) and 1.70 (95% CI, 0.10 to 30.3) for patients with 1 and 2 variant alleles, respectively. Similarly, the hazard ratio for 1-year events in hospital survivors was 0.68 (95% CI, 0.26 to 1.79) and 0.55 (95% CI, 0.06 to 5.30), respectively. **Conclusion:** PPI use was not associated with an increased risk of cardiovascular events or mortality in patients administered clopidogrel for recent MI, whatever the CYP2C19 genotype, although harm could not be formally excluded in patients with 2 loss-of-function alleles.

313. Simon T. A multiplicative short proof for the unimodality of stable densities. *Electron. Commun. Probab.* 2011; 16: 623-629.

Revisiting an article by Chernin and Ibragimov on unimodality of stable laws, we show that their Approach to deduce the general case from the extremal ones, whose completion contained an Error was discovered later by Kanter, can be carried out successfully in considering Bochner's subordination and multiplicative strong unimodality. This short proof of the unimodality of all stable densities yields also a multiplicative counterpart to Yamazato's additive ones.

314. Simon T. Hitting densities for spectrally positive stable processes. *Stochastic: An International Journal of Probability and Stochastic Processes.* 2011; 83(02): 203-214.

A multiplicative identity in law connecting the hitting times of completely asymmetric α -stable Lévy processes in duality is established. In the spectrally positive case, this identity allows with an elementary argument to compute fractional moments and to get series representations for the

density. We also prove that the hitting times are unimodal as soon as. Analogous results are obtained for the first passage time across a positive level, in a simple manner.

315. Simon T. Multiplicative strong unimodality for positive stable laws. *Proceedings of the American Mathematical Society*. 2011; 139(7):2587-2595.

It is known that real non-Gaussian stable laws are unimodal, not additive strongly unimodal, multiplicative strongly unimodal in the symmetric case, and that the only remaining relevant situation for the multiplicative strong unimodality is the one-sided case. It is shown here that positive α -stable distributions are multiplicative strongly unimodal if and only if

316. Simon T. On the absolute continuity of multidimensional Ornstein-Uhlenbeck processes. *Probability theory and related fields*. 2011; 151(1-2): 173-190.

Let X be an n -dimensional Ornstein-Uhlenbeck process, solution of the S.D.E. $dX_t = AX_t dt + dB_t$ where A is a real $n \times n$ matrix and B a Lévy process without Gaussian part. We show that when A is non-singular, the law of X_1 is absolutely continuous in \mathbb{R}^n if and only if the jumping measure of B fulfils a certain geometric condition with respect to A , which we call the exhaustion property. This optimal criterion is much weaker than for the background driving Lévy process B , which might be singular and sometimes even have a one-dimensional discrete jumping measure. This improves on a result by Priola and Zabczyk.

317. Simon T, Scharf SM, Maimon N, Bernhard SBJ, Reuveni H, Tarasiuk A. Determinants of elevated healthcare utilization in patients with COPD. *Respir Res*. 2011; 12(7).

Background: Chronic obstructive pulmonary disease (COPD) imparts a substantial economic burden on western health systems. Our objective was to analyze the determinants of elevated healthcare utilization among patients with COPD in a single-payer health system. **Methods:** Three-hundred eighty-nine adults with COPD were matched 1:3 to controls by age, gender and area of residency. Total healthcare cost 5 years prior recruitment and presence of comorbidities were obtained from a computerized database. Health related quality of life (HRQoL) indices

were obtained using validated questionnaires among a subsample of 177 patients. **Results:** Healthcare utilization was 3.4-fold higher among COPD patients compared with controls ($p < 0.001$). The “most-costly” upper 25% of COPD patients ($n = 98$) consumed 63% of all costs. Multivariate analysis revealed that independent determinants of being in the “most costly” group were (OR; 95% CI): age-adjusted Charlson Comorbidity Index (1.09; 1.01 - 1.2), history of myocardial infarct (2.87; 1.5 - 5.5), congestive heart failure (3.52; 1.9 - 6.4), mild liver disease (3.83; 1.3 - 11.2) and diabetes (2.02; 1.1 - 3.6). Bivariate analysis revealed that cost increased as HRQoL declined and severity of airflow obstruction increased but these were not independent Determinants in a multivariate analysis. **Conclusion:** Comorbidity burden determines elevated utilization for COPD patients. Decision makers should prioritize scarce health care resources to a better care management of the “most costly” patients.

318. Sivalingam N, Pichandi S, Chapla A, Dinakaran A, Jacob M. Zinc protects against indomethacin-induced damage in the rat small intestine. *European journal of pharmacology*. 2011; 654(1): 106-116.

The clinical utility of non-steroidal anti-inflammatory drugs (NSAIDs) is often limited by the adverse effects that they produce in the small intestine. Alterations in the composition and functions of the glycocalyx and brush border membranes of the rat small intestine have been shown to occur in response to indomethacin, an NSAID often used in the study of adverse effects of these drugs. The micronutrient, zinc, has been documented to have cytoprotective effects in the gastrointestinal tract. The aim of this study was to evaluate the potential of zinc to reduce indomethacin-induced small intestinal damage. We pre-treated rats with zinc sulphate (50 mg/kg body weight) 2 h before administration of indomethacin (20 mg/kg body weight) and sacrificed the rats 1, 12 or 24 h after indomethacin. The extent of small intestinal mucosal damage and the content of lipids and sugars in the mucosa were determined. Bacterial counts in the intestinal lumen and the mucosa were ascertained. Activities of matrix metalloproteinases (MMPs) and levels of metallothionein in the mucosa were also measured. Pre-treatment with zinc sulphate was found to reduce the extent of indomethacin-induced mucosal damage. It also prevented drug-induced changes in the content of lipids and sugars in the mucosa. Drug-induced increases in activities of the MMPs and bacterial counts in the intestine were also attenuated by zinc.

Metallothionein levels were significantly higher in animals pre-treated with zinc. We conclude that zinc was effective in protecting against indomethacin-induced small intestinal damage and suggest that it may do so by induction of metallothionein.

319. Sorensen BL, Rasch V, Massawe S, Nyakina J, Elsass P, Nielsen BB. Advanced Life Support in Obstetrics (ALSO) and post-partum hemorrhage: A prospective intervention study in Tanzania. Acta Obstetrica et Gynecologica Scandinavica.2011; 90 (6): 609-614.

Objective: To evaluate the impact of Advanced Life Support in Obstetrics (ALSO) training on staff performance and the incidences of post-partum hemorrhage (PPH) at a regional hospital in Tanzania. Design: Prospective intervention study. Setting: A regional, referral hospital. Population: A total of 510 women delivered before and 505 after the intervention. **Methods:** All high- and mid-level providers involved in childbirth at the hospital attended a two-day ALSO provider course. Staff management was observed and post-partum bleeding assessed at all vaginal deliveries for seven weeks before and seven weeks after the training. Main Outcome Measures. PPH (blood loss =500ml), severe PPH (blood loss =1000ml) and staff performance to prevent, detect and manage PPH. **Results:** The incidence of PPH was significantly reduced from 32.9 to 18.2% [RR 0.55 (95%CI: 0.44-0.69)], severe PPH from 9.2 to 4.3%[RR 0.47 (95%CI: 0.29-0.77)]. The active management of the third stage of labor was also significantly improved. There was a significant decrease in episiotomies. By visual estimation, staff identified one in 25 of the PPH cases before the ALSO training and one in five after the training. A significantly higher proportion of women with PPH had continuous uterine massage, oxytocin infusion and bimanual compression of the uterus after the training. **Conclusions:** A two-day ALSO training course can significantly improve staff performance and reduce the incidence of PPH, at least as evaluated by short-term effects.

320. Stone CA, Siril H, Nampananda E, Garcia ME, Tito J, Nambiar D, Kaaya SF. “I didn’t know that...” patient perceptions of print information, education, and communication related to HIV/AIDS treatment. Tanzania Journal of Health Research. 2011; 13(2): 90-92.

Improving health literacy is a necessary intervention for people with chronic health conditions to ensure adherence with long or life therapies and increase participation in self-care. While adherence is a multifactorial process, increasing health literacy among HIV-infected patients at all stages of living with HIV has been shown to improve treatment outcomes. In the era of rapid scale up of HIV care and treatment, little has been done to evaluate the utility of IEC materials for increasing patient health literacy and how patients perceive such materials. Four patient-oriented print IEC brochures in Swahili were designed to be read at the clinic waiting areas and also carried home by patients to supplement the knowledge received from routine counseling during clinic visits. Brochures detail antiretroviral therapy and address common myths, side effects, types and management of opportunistic infections, and prevention of mother to child transmission of HIV. We conducted focus group discussions with HIV-infected patients to explore patient perceptions of IEC materials in the urban congested HIV care setting of Dar es Salaam, Tanzania. Groups of participants were recruited from eight public PEPFAR-supported HIV care and treatment centers in the city (N=50). In this paper we present the results of those focus group discussions and introduce the print IEC materials as a pilot intervention in a Swahili-speaking setting where a need for additional health literacy exists. Further evaluation of these materials will follow as the data becomes available.

321. Sunguya BF, Poudel KC, Otsuka K, Yasuoka J, Mlunde LB, Urassa DP, Mkopi NP, Jimba M. Undernutrition among HIV-positive children in Dar es Salaam, Tanzania: Antiretroviral therapy alone is not enough. *BMC Public Health*. 2011; 11: 869.

Background: The prevalence of HIV/AIDS has exacerbated the impact of childhood under nutrition in many developing countries, including Tanzania. Even with the provision of antiretroviral therapy, under nutrition among HIV-positive children remains a serious problem. Most studies to examine risk factors for under nutrition have been limited to the general population and ART-naïve HIV-positive children, making it difficult to generalize findings to ART-treated HIV-positive children. The objectives of this study were thus to compare the proportions of under nutrition among ART-treated HIV-positive and HIV-negative children and to examine factors associated with under nutrition among ART-treated HIV-positive children in Dar es Salaam, Tanzania. **Methods:** From September to October 2010, we conducted a cross-

sectional survey among 213 ART-treated HIV-positive and 202 HIV-negative children in Dar es Salaam, Tanzania. We measured the children's anthropometrics, socio-demographic factors, food security, dietary habits, diarrhea episodes, economic status, and HIV clinical stage. Data were analyzed using both univariate and multivariate methods. **Results:** ART-treated HIV-positive children had higher rates of under nutrition than their HIV-negative counterparts. Among the ART-treated HIV-positive children, 78 (36.6%) were stunted, 47 (22.1%) were underweight, and 29 (13.6%) were wasted. Households of ART-treated HIV-positive children exhibited lower economic status, lower levels of education, and higher percentages of unmarried caregivers with higher unemployment rates. Food insecurity was prevalent in over half of ART-treated HIV-positive children's households. Furthermore, ART-treated HIV-positive children were more likely to be orphaned, to be fed less frequently, and to have lower body weight at birth compared to HIV-negative children. In the multivariate analysis, child's HIV-positive status was associated with being underweight (AOR = 4.61, 95% CI 1.38-15.36 P = 0.013) and wasting (AOR = 9.62, 95% CI 1.72-54.02, P = 0.010) but not with stunting (AOR = 0.68, 95% CI 0.26-1.77, P = 0.428). Important factors associated with underweight status among ART-treated HIV-positive children included hunger (AOR = 9.90, P = 0.022), feeding frequency (AOR = 0.02, p < 0.001), and low birth weight (AOR = 5.13, P = 0.039). Factors associated with wasting among ART-treated HIV-positive children were diarrhea (AOR = 22.49, P = 0.001) and feeding frequency (AOR = 0.03, p < 0.001). **Conclusion:** HIV/AIDS is associated with an increased burden of child underweight status and wasting, even among ART-treated children, in Dar es Salaam, Tanzania. In addition to increasing coverage of ART among HIV-positive children, interventions to ameliorate poor nutrition status may be necessary in this and similar settings. Such interventions should aim at promoting adequate feeding patterns, as well as preventing and treating diarrhea.

322. Swai H. Otorhinolaryngological manifestations among HIV Infected patients attending HIV clinic at Muhimbili National Hospital. Master of Medicine (ORL) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: AIDS is a fatal illness which breaks down the body's immunity leaving the patient vulnerable to threatening opportunistic infections, neurological disorders or unusual

malignancies. Otorhinolaryngological manifestations in association with HIV infection are common in clinical practice, they are non specific therefore immunodeficiency may not be suspected. **Broad objective:** To define the prevalence of all otorhinolaryngological manifestations of HIV/AIDS among HIV infected patients attending at the HIV clinic of MNH. Study design Cross sectional descriptive hospital based study. Setting HIV clinic at MNH. Participants A sample of 384 HIV infected patients attending HIV clinic at MNH. All were on HAART. **Results:** A total of 384 patients were involved in the study. All of them were on HAART. There were 129(33.6%) males and 255(66.4%) females, a ratio of about 1:2. ORL manifestations were reported in 131(34.1%) of the participants. The commonly reported manifestations included CSOM 29(22.1%), benign lymph epithelial cyst of the parotid gland 22(16.8%) tonsillitis 20(15.3%), rhino sinusitis 14(10.7%), Kaposi sarcoma 10(7.6%) and oral cavity/or pharyngeal candidacies 8(6.1%). **Conclusion:** ORL manifestations were reported in about a third of the studied participants. The leading complaints were CSOM, benign lymph epithelial cyst of the parotid gland, tonsillitis, rhino sinusitis, Kaposi sarcoma and oral/ or pharyngeal candidacies. An otorhinolaryngologist should be aware of the otorhinolaryngological manifestations of HIV infection so that early vii diagnosis and timely intervention by antiretroviral therapy can be instituted to improve survival rates.

323. Swai HF, Mugusi FM, Mbwambo JK. Sputum smears negative pulmonary tuberculosis: Sensitivity and specificity of diagnostic algorithm. BMC Research Notes. 2011; 4: 475.

Background: The diagnosis of pulmonary tuberculosis in patients with Human Immunodeficiency Virus (HIV) is complicated by the increased presence of sputum smear negative tuberculosis. Diagnosis of smear negative pulmonary tuberculosis is made by an algorithm recommended by the National Tuberculosis and Leprosy Programme that uses symptoms, signs and laboratory results. The objective of this study is to determine the sensitivity and specificity of the tuberculosis treatment algorithm used for the diagnosis of sputum smear negative pulmonary tuberculosis. **Methods:** A cross-section study with prospective enrollment of patients was conducted in Dar-es-Salaam Tanzania. For patients with sputum smear negative, sputum was sent for culture. All consenting recruited patients were counseled and tested for HIV.

Patients were evaluated using the National Tuberculosis and Leprosy Programme guidelines and those fulfilling the criteria of having active pulmonary tuberculosis were started on anti tuberculosis therapy. Remaining patients were provided appropriate therapy. A chest X-ray, Mantoux test, and Full Blood Picture were done for each patient. The sensitivity and specificity of the recommended algorithm was calculated. Predictors of sputum culture positive were determined using multivariate analysis. **Results:** During the study, 467 subjects were enrolled. Of those, 318 (68.1%) were HIV positive, 127 (27.2%) had sputum culture positive for Mycobacterium Tuberculosis, of whom 66 (51.9%) were correctly treated with anti-Tuberculosis drugs and 61 (48.1%) were missed and did not get anti-Tuberculosis drugs. Of the 286 subjects with sputum culture negative, 107 (37.4%) were incorrectly treated with anti-Tuberculosis drugs. The diagnostic algorithm for smear negative pulmonary tuberculosis had a sensitivity and specificity of 38.1% and 74.5% respectively. The presence of a dry cough, a high respiratory rate, a low eosinophil count, a mixed type of anemia and presence of a cavity were found to be predictive of smear negative but culture positive pulmonary tuberculosis. **Conclusion:** The current practices of establishing pulmonary tuberculosis diagnosis are not sensitive and specific enough to establish the diagnosis of Acid Fast Bacilli smear negative pulmonary tuberculosis and over treat people with no pulmonary tuberculosis.

324. Sweat M, Morin S, Celentano D, Mulawa M, Singh B, Mbwambo J, Kawichai S, Chingono A, Khumalo SG, Gray G, Richter L, Kulich M, Sadowski A, Coates T. Community-based intervention to increase HIV testing and case detection in people aged 16-32 years in Tanzania, Zimbabwe, and Thailand (NIMH Project Accept, HPTN 043): A randomised study. *The Lancet Infectious Diseases*.2011; 11 (7):525-532.

Background: In developing countries, most people infected with HIV do not know their infection status. We aimed to assess whether HIV testing could be increased by combination of community mobilisation, mobile community-based voluntary counselling and testing (VCT), and support after testing. **Methods:** Project Accept is underway in ten communities in Tanzania, eight in Zimbabwe, and 14 in Thailand. Communities at each site were paired according to similar demographic and environmental characteristics, and one community from each pair was randomly assigned to receive standard clinic-based VCT (SVCT), and the other community was

assigned to receive community-based VCT (CBVCT) plus access to SVCT. Randomisation and assignment of communities to intervention groups was done by the statistics centre by computer; no one was masked to treatment assignment because the interventions were community based. Intervention was provided for about 3 years (2006-09). The primary endpoint of HIV incidence is pending completion of assessments after the intervention. In this interim analysis, we examined the secondary endpoint of uptake in HIV testing, differences in characteristics of clients receiving their first HIV test, and repeat testing. Analyses were limited to clients aged 16-32 years. This study is registered with ClinicalTrials.gov, number NCT00203749. Findings: The proportion of clients receiving their first HIV test during the study was higher in CBVCT communities than in SVCT communities in Tanzania (2341 [37%] of 6250 vs 579 [9%] of 6733), Zimbabwe (5437 [51%] of 10 700 vs 602 [5%] of 12 150), and Thailand (7802 [69%] of 11 290 vs 2319 [23%] 10 033). The mean difference in the proportion of clients receiving HIV testing between CBVCT and SVCT communities was 40.2% (95% CI 15.8-64.7; p=0.019) across three community pairs (one per country). HIV prevalence was higher in SVCT communities than in CBVCT communities, but CBVCT detected almost four times more HIV cases than did SVCT across the three study sites (952 vs 264; p=0.003). Repeat HIV testing in CBVCT communities increased in all sites to reach 28% of all those testing for HIV by the end of the intervention period. Interpretation: CBVCT should be considered as a viable intervention to increase detection of HIV infection, especially in regions with restricted access to clinic-based VCT and support services after testing. Funding: US National Institute of Mental Health, HIV Prevention Trials Network (via US National Institute of Allergy and Infectious Diseases), and US National Institutes of Health.

325. Tarimo EA, Thorson A, Kohi TW, Bakari M, Sandstrom E, Mhalu F, Kulane A. A qualitative evaluation of volunteers' experiences in a phase I/II HIV vaccine trial in Tanzania. *BMC infectious diseases*. 2011; 11(1): 283.

Background: Evaluating experiences of volunteers in an HIV vaccine trial will be useful for the conduct of future trials. The purpose of this study among volunteers who participated in a phase I/II HIV vaccine trial in Dar es Salaam, Tanzania was to assess what characterized their experiences during the trial. **Methods:** We conducted four focus group discussions with 35 out

of the 60 individuals (women and men) after the five scheduled vaccinations. An interpretive description approach was applied to data analysis. **Results:** As a result of the trial interventions, both men and women gained confidence in their own abilities to have safer, less risky sexual behaviour. The participants experienced the trial as a way of accessing free [insured] medical services. Most of the men said they had gone from self-medication to professional medical consultation. Despite these benefits, the participants faced various challenges during the trial. Such challenges included mistrust of the trial shown by health care providers who were not connected to the trial and discouragement from friends, colleagues and family members who questioned the safety of the trial. However, they managed to cope with these doubts by using both personal and trial related interventions. **Conclusion:** We found that during the phase I/II HIV vaccine trial, participants had both the opportunities and the ability to cope with the doubts from the surrounding community. Follow up visits enhanced the opportunities and individuals' abilities to cope with the doubts during the trial. Understanding this discourse may be useful for the trial implementers when designing future trials.

326. Tarimo EA, Thorson A, Kohi TW, Bakari M, Mhalu F, Kulane A. Reasons for declining to enroll in a phase I and II HIV vaccine trial after randomization among eligible volunteers in Dar es Salaam, Tanzania. *PLoS ONE*.2011; 6 (2): e14619 .

Background: Recruitment, enrollment and retention of volunteers in an HIV vaccine trial is important in the efforts to ultimately develop a vaccine that can prevent new HIV infections. Following recruitment, some randomized individuals decline to be enrolled in an HIV vaccine trial. The reasons for such a decision are not well known. This article describes why individuals who were randomized in a phase I and II HIV vaccine trial in Dar es Salaam, Tanzania declined to be enrolled. **Methods:** Face-to-face interviews were conducted with 14 individuals (7 men and 7 women). Repeated readings of the 14 interview transcripts to look for reasons for declining to enroll in the trial were performed. Data was analyzed using the content analysis approach. **Results:** Informants expressed fear of the outcome of an experimental HIV vaccine in their lives. Unlike women, some men were concerned over the effect of the vaccine on their reproduction intentions. Women were concerned about the unknown effects of the vaccine in their bodies. Also, to a large extent, informants faced resistance from significant others such as fiancées,

parents, relatives, and friends. Women were influenced by their potential intimate sexual partners; men were forbidden by their parents, and mothers had the most influential opinion.

Conclusions: Fear of the negative outcome of an experimental vaccine and resistance from significant others are the main reasons for declining to enroll in the HIV vaccine trial among eligible volunteers after randomization. The resistance from the significant others provides valuable guidance for designing future trials in Tanzania; for example, expanding the HIV vaccine trial education to the general population from the onset of the trial design.

327. Tarimo EA, Thorson A, Kohi TW, Bakari M, Sandstrom E, Mhalu F, Kulane A.A qualitative evaluation of volunteers' experiences in a phase I/II HIV vaccine trial in Tanzania. *BMC Infectious Diseases*.2011; 11: 283 .

Background: Evaluating experiences of volunteers in an HIV vaccine trial will be useful for the conduct of future trials. The purpose of this study among volunteers who participated in a phase I/II HIV vaccine trial in Dar es Salaam, Tanzania was to assess what characterized their experiences during the trial.**Methods:** We conducted four focus group discussions with 35 out of the 60 individuals (women and men) after the five scheduled vaccinations. An interpretive description approach was applied to data analysis.**Results:** As a result of the trial interventions, both men and women gained confidence in their own abilities to have safer, less risky sexual behaviour. The participants experienced the trial as a way of accessing free [insured] medical services. Most of the men said they had gone from self-medication to professional medical consultation. Despite these benefits, the participants faced various challenges during the trial. Such challenges included mistrust of the trial shown by health care providers who were not connected to the trial and discouragement from friends, colleagues and family members who questioned the safety of the trial. However, they managed to cope with these doubts by using both personal and trial related interventions.**Conclusion:** We found that during the phase I/II HIV vaccine trial, participants had both the opportunities and the ability to cope with the doubts from the surrounding community. Follow up visits enhanced the opportunities and individuals' abilities to cope with the doubts during the trial. Understanding this discourse may be useful for the trial implementers when designing future trials.

328. Tumaini S. Perception and satisfaction with dental appearance and its association with oral health related quality of life among students at Muhimbili University of Health and Allied Sciences, Tanzania Master of Dentistry (Restorative Dentistry) Dissertation 2011. Muhimbili University of Health and Allied Sciences, Dar es Salaam.

Background: Dental esthetics has not been seen to be important in most developing countries and research in this regard is meager. Due to rapid increase in global network the effect of a pleasant appearance is now recognized to be very important, hence may lead to changes in person's esthetics needs and may affect dental treatment priority. Aim: To determine the level of dental appearance/aesthetics and to assess perceived dental appearance, satisfaction with dental appearance and their association with oral health related quality of life among students at Muhimbili University of Health and Allied Sciences' (MUHAS). **Methodology:** This cross-sectional study was conducted at the Muhimbili University of Health and Allied Sciences. A census of 492 undergraduate students in 1st and 2nd year of study, response rate 82.7%, was involved in the study, in December 2010. The subject's were given self administered questionnaire where socio-demographic information was recorded and questions on perception and satisfaction with dental appearance were asked. Oral health related quality of life was assessed using Oral Impact on Daily Performance (OIDP) inventory. Clinical examinations was performed under natural day light by one dentists with good intraexaminer variability (Kappa = 0.85), and findings recorded in specially designed clinical forms. Prior to examination the anterior teeth (Incisors and canines) were cleaned and dried with gauze. Dental appearance was evaluated by using index for assessing dental Aesthetic. Data analysis was done using SPSS version 15 whereby Chi square statistics and logistic regressions with statistical level of significance of $p < 0.05$ were utilized. Results: In this study, 492 participants were involved. Age ranged from 18 – 57 years old, mean age was 22.9, SD = 3.9, and greater proportion of participants 421 (85.6%) were in age group 18 – 25. Considering gender, greater proportion of participants were males 334 (67.9%) with male to female ratio of 2.1:1. School-wise, medicine contributed greater proportion 52.6% of participants and school of dentistry at least 5.5%. Generally 30.7% of participants, v perceived to have poor dental appearance, 21.5% were not satisfied with their dental appearance, while clinical examination revealed that 67.7% of participants had at least one factor for poor dental appearance. Prevalence of OIDP was 60.6%.

The most affected performances were eating (46.1%) and cleaning (40.0%) and the least affected being speaking (11.4%). Those who reported impacts on performances were more likely to be females (OR - 1.5, CI: 1 – 2) those who perceived to have poor dental appearance (OR: 2.4, CI: 1.6 - 3.7), those who were not satisfied with their dental appearance (OR: 3.1, CI: 1.9 - 5.2) and those who objectively determined to have poor dental appearance (OR: 1.7, CI: 1.1 - 2.5). Furthermore those who had dental caries were about 6 times more likely to report an impact on their daily performances (OR: 6.6, CI: 2.3 – 18.6) **Conclusion:** Despite the high prevalence of objectively assessed poor dental appearance a high percentage of the university students perceived to have good dental appearance and were also satisfied with their dental appearance. The impacts of oral conditions to their dental appearance were substantial. There is, therefore, a need to raise the students' awareness on their poor oral health status so that they may be positively motivated to seek necessary intervention

329. Uipers RS, Luxwolda MF, Sango WS, Kwesigabo G, Janneke Dijck-Brouwer DA, Muskiet FA. Postdelivery changes in maternal and infant erythrocyte fatty acids in 3 populations differing in fresh water fish intakes. Prostaglandins, Leukotrienes and Essential Fatty Acids. 2011; 85(6): 387-397.

Introduction: Long-chain polyunsaturated (LCP) fatty acids (FA) are important during infant development. Mother-to-infant FA-transport occurs at the expense of the maternal status. Maternal and infant FA-status change rapidly after delivery. **Methods:** Comparison of maternal (mRBC) and infant erythrocyte (iRBC)-FA-profiles at delivery and after 3 months exclusive breastfeeding in relation to freshwater-fish intakes. Approximation of de-novo-lipogenesis (DNL), stearoyl-CoA-desaturase (SCD), elongation-of-very-long-chain-FA-family-member-6 (Elovl-6), delta-5-desaturase (D5D) and delta-6-desaturase (D6D)-enzymatic activities from their product/essential-FA and product/substrate-ratios. **Results and discussion:** Increasing iRBC-14:0 derived from mammary-gland DNL. Decreasing mRBC-? 9, but increasing iRBC-? 9, suggests high? 9-FA-transfer via breast milk. Decreasing (m+i) RBC-16:0, DNL- and SCD-activities, but increasing (m+i) RBC-18:0 and Elovl-6-activity suggest more pronounced postpartum decreases in DNL- and SCD-activities, compared to Elovl-6-activity. Increasing (m+i) RBC-18:3?3, 20:5?3, 22:5?3, 18:2?6, mRBC-20:4?6 and (m+i)D5D-activity, but decreasing mRBC-22:6?3

and (m+i)D6D-activity and dose-dependent changes in iRBC-22:6?3 confirm that D6D-activity is rate-limiting and 22:6?3 is important during lactation. Fish-intake related magnitudes of postpartum FA-changes suggest that LCP? 3 influence DNL-, SCD- and desaturase-activities

330. Urassa DP, Nystrom L, Carlsted A. Effectiveness of routine antihelminthic treatment on anaemia in pregnancy in Rufiji District, Tanzania: a cluster randomised controlled trial. *East African journal of public health*.2011; 8 (3):176-184.

The aim of this study was to estimate the effect of an antihelminthic drug, given at booking and at term to antenatal care visits, on the prevalence of anaemia at term and 4 month's post-partum in Rufiji district, Tanzania, the area with high prevalence of intestinal parasites. A cluster randomised controlled trial was conducted on 3080 pregnant women. Out of these 1475 (study arm) received albendazole and 1605 (control arm) placebo. All women also received routine daily iron folate supplements (36 mg iron and 5 mg folate), and sulphadoxine pyramethamine (SP) to prevent malaria. Haemoglobin levels were assessed at booking, at term and 4 months post-partum. At term, median and mean haemoglobin level and the prevalence of severe (< 70 g/l) and moderate (70-104 g/l) anaemia did not differ. The reduction in the prevalence of anaemia from booking to term was significantly larger in the study arm compared to control arm (26.1% vs. 18.8%; $p < 0.001$). At four months postpartum, mean haemoglobin was higher in the study arm compared to the control arm (118 vs. 113; $p < 0.0001$) while the reduction in proportion of women with anaemia (Hb <105 g/dl) was significantly lower (30.6 vs. 21.2; $p < 0.0001$) in the study arm compared to the control arm. These findings support whose recommendation for anthelmintic treatment during pregnancy. However benefits for deworming may be limited in areas with an antenatal iron supplementation programme or low intensity of hookworm infections and hence future research should be directed towards the cost-effectiveness of the de-worming compared to other interventions for reducing anaemia in pregnancy.

331. Ussiri EV, Nyawawa ETM, Wandwi WBC, Jiang W, Nyangassa BJ, Mpoki U, Mahalu W. Closed Mitral Valvotomy-a Life Saving Procedure in Facility Deprived Countries: Experience at Muhimbili National Hospital, TANZANIA. *East and Central African Journal of Surgery*.2011; 16(1).

Background: Rheumatic heart disease remains a major health cardiac problem in developing countries as the culprit of rheumatic fever. Mitral valve stenosis is the most common complication of valvular heart disease and its consequences of increase in pulmonary hypertension, heart failure, pulmonary vascular disease and if untreated death ensues. The management of this condition varies depending on availability of expertise and resource; however in a facility deprived country with low economic status closed mitral valvotomy remain the standard palliative treatment! The aim of this study was to evaluate the clinical status of patients with mitral stenosis following closed mitral valvotomy treated at Muhimbili National Hospital, Cardiothoracic Unit. **Methods:** All patients presenting with severe mitral stenosis in absence of calcification in its leaflets and regurgitation were enrolled for the study from May 2008 to November 2009. Excluded were those who failure consents. **Results:** A total of fourteen patients were included in the study of which 10 (71.4%) were females and 4 (28.6%) were males. They had a mean age of 21.5 ± 8.8 and range from 11 to 41 years. The diagnosis was based on clinical evaluation using NYHA class and 2D-Echocardiography findings. All patients' demographic data, preoperative and post operative findings were taken and data analysis was done using an SPSS 11.5 program. Categorical data were compared and analyzed using two Tailed- χ^2 and values were taken 5% significance level. **Conclusion:** There was an overall highly significant improvement in clinical stage of the disease, reduction in mean pressure gradient across the mitral valve, reduction in pulmonary hypertension and mean left atrial size. Similarly there was improvement in ventricular function in terms of ejection fraction and increase in mean mitral valve area.

332. Van GemertSMC, Van Amerongen EW, Aartman IH, Wennink JM, Jacob M, de Soet JJ. The influence of dental caries on body growth in prepubertal children. *Clinical oral investigations*. 2011; 15(2): 141-149.

Dental decay and dental treatment are suggested to be related to body growth in children. The aim of this study was first to assess the relation between dental caries and body proportions cross-sectionally in a Suriname caries child population and secondly to investigate whether dental treatment had a significant influence on body growth of these children in a randomized

controlled trial using different treatment strategies. Three hundred eighty 6-year-old children with untreated dental decay participated in the study. Caries prevalence and presence of dentogenic infections were recorded. All children were randomly assigned to four different treatment groups ranging from full dental treatment to no invasive treatment at all. Body growth was evaluated by children's height, weight and body mass index. Participants were evaluated after 6 months and 1, 2 and 3 years. Cross-sectionally, negative correlations were observed between anthropometric measures and the number of untreated carious surfaces and caries experience of the children. Next, no significant differences in growth pattern between the treatment groups were observed. Based on these results, it is suggested that caries activity is a negative predictor for body growth in children and dental intervention does not show significant improvement within 3 years.

333. Veenemans J, Jansen EJS, Baidjoe AY, Mbugi EV, Demir AY, Kraaijenhagen RJ, Savelkoul HFJ, Verhoef H. Effect of +-thalassaemia on episodes of fever due to malaria and other causes: A community-based cohort study in Tanzania. *Malaria Journal*.2011; 10: 280.

Background: It is controversial to what degree a+- thalassaemia protects against episodes of uncomplicated malaria and febrile disease due to infections other than Plasmodium. **Methods:** In Tanzania, in children aged 6-60 months and height-for-age z-score \leq -1.5 SD (n = 612), rates of fevers due to malaria and other causes were compared between those with heterozygous or homozygotes a+-thalassaemia and those with a normal genotype, using Cox regression models that accounted for multiple events per child. **Results:** The overall incidence of malaria was 3.0/child-year (1, 572/526 child-years); no differences were found in malaria rates between genotypes (hazard ratios, 95% CI: 0.93, 0.82-1.06 and 0.91, 0.73-1.14 for heterozygotes and homozygotes respectively, adjusted for baseline factors that were predictive for outcome). However, this association strongly depended on age: among children aged 6-17 months, those with a+- thalassaemia experienced episodes more frequently than those with a normal genotype (1.30, 1.02-1.65 and 1.15, 0.80-1.65 for heterozygotes and homozygotes respectively), whereas among their peers aged 18-60 months, a+- thalassaemia protected against malaria (0.80, 0.68-0.95 and 0.78, 0.60-1.03; p-value for interaction 0.001 and 0.10 for hetero- and homozygotes

respectively). No effect was observed on non-malarial febrile episodes. **Conclusions:** In this population, the association between a+- thalassaemia and malaria depends on age. Our data suggest that protection by a+-thalassaemia is conferred by more efficient acquisition of malaria-specific immunity.

334. Veenemans J, Mank T, Ottenhof M, Baidjoe A, Mbugi EV, Demir AY, Wielders JPM, Savelkoul HFJ, Verhoef H. Protection against Diarrhea associated with Giardia intestinalis is lost with multi-nutrient supplementation: A study in Tanzanian children. *PLoS Neglected Tropical Diseases*.2011; 5 (6): e1158.

Background: Asymptomatic carriage of *Giardia intestinalis* is highly prevalent among children in developing countries, and evidence regarding its role as a diarrhea-causing agent in these settings is controversial. Impaired linear growth and cognition have been associated with giardiasis, presumably mediated by malabsorption of nutrients. In a prospective cohort study, we aim to compare diarrhea rates in pre-school children with and without *Giardia* infection. Because the study was conducted in the context of an intervention trial assessing the effects of multi-nutrients on morbidity, we also assessed how supplementation influenced the relationship between *Giardia* and diarrhoea rates, and to what extent *Giardia* modifies the intervention effect on nutritional status. **Methods and Findings:** Data were collected in the context of a randomized placebo-controlled efficacy trial with 2×2 factorial design assessing the effects of zinc and/or multi-micronutrients on morbidity (n = 612; height-for-age z-score <-1.5 SD). Outcomes measures were episodes of diarrhea (any reported, or with ≥3 stools in the last 24 h) and fever without localizing signs, as detected with health-facility based surveillance. *Giardia* was detected in stool by enzyme-linked immunosorbent assay. Among children who did not receive multi-nutrients, asymptomatic *Giardia* infection at baseline was associated with a substantial reduction in the rate of diarrhea (HR 0.32; 0.15-0.66) and fever without localizing signs (HR 0.56; 0.36-0.87), whereas no such effect was observed among children who received multi-nutrients (p-values for interaction 0.03 for both outcomes). This interaction was independent of age, HAZ-scores and distance to the research dispensary. There was no evidence that *Giardia* modified the intervention effect on nutritional status. **Conclusion:** Although causality of the *Giardia*-associated reduction in morbidity cannot be established, multi-nutrient supplementation results in

a loss of this protection and thus seems to influence the proliferation or virulence of Giardia or associated intestinal pathogens.

335. Veenemans J, Milligan P, Prentice AM, Schouten LRA, Inja N, van der Heijden AC, de Boer LCC, Jansen EJS, Koopmans AE, Enthoven WTM, Kraaijenhagen RJ, Demir AY, Uges DRA, Mbugi EV, Savelkoul HFJ, Verhoef H. Effect of supplementation with zinc and other micronutrients on malaria in Tanzanian children: A randomised trial. *PLoS Medicine*.2011; 8 (11): e1001125.

Background: It is uncertain to what extent oral supplementation with zinc can reduce episodes of malaria in endemic areas. Protection may depend on other nutrients. We measured the effect of supplementation with zinc and other nutrients on malaria rates. **Methods and Findings:** In a 2×2 factorial trial, 612 rural Tanzanian children aged 6-60 months in an area with intense malaria transmission and with height-for-age z-score=-1.5 SD were randomized to receive daily oral supplementation with either zinc alone (10 mg), multi-nutrients without zinc, multi-nutrients with zinc, or placebo. Intervention group was indicated by colour code, but neither participants, researchers, nor field staff knew who received what intervention. Those with Plasmodium infection at baseline were treated with artemether-lumefantrine. The primary outcome, an episode of malaria, was assessed among children reported sick at a primary care clinic, and pre-defined as current Plasmodium infection with an inflammatory response, shown by axillary temperature =37.5°C or whole blood C-reactive protein concentration =8 mg/L. Nutritional indicators were assessed at baseline and at 251 days (median; 95% reference range: 191-296 days). In the primary intention-to-treat analysis, we adjusted for pre-specified baseline factors, using Cox regression models that accounted for multiple episodes per child. 592 children completed the study. The primary analysis included 1,572 malaria episodes during 526 child-years of observation (median follow-up: 331 days). Malaria incidence in groups receiving zinc, multi-nutrients without zinc, multi-nutrients with zinc and placebo was 2.89/child-year, 2.95/child-year, 3.26/child-year, and 2.87/child-year, respectively. There was no evidence that multi-nutrients influenced the effect of zinc (or vice versa). Neither zinc nor multi-nutrients influenced malaria rates (marginal analysis; adjusted HR, 95% CI: 1.04, 0.93-1.18 and 1.10, 0.97-1.24 respectively). The prevalence of zinc deficiency (plasma zinc concentration <9.9

µmol/L) was high at baseline (67% overall; 60% in those without inflammation) and strongly reduced by zinc supplementation. **Conclusions:** We found no evidence from this trial that zinc supplementation protected against malaria.

336. Vienne A, Simon T, Cosnes J, Baudry C, Bouhnik Y, Soulé JC, Beaugerie L. Low prevalence of colonoscopic surveillance of inflammatory bowel disease patients with longstanding extensive colitis: a clinical practice survey nested in the CESAME cohort. *Alimentary pharmacology & therapeutics*. 2011; 34(2): 188-195.

Background: Surveillance colonoscopy is recommended for inflammatory bowel disease (IBD) patients with longstanding extensive colitis (LEC). Aims To assess modalities and results of colonoscopic surveillance in a subset of CESAME cohort patients at high risk of colorectal cancer (CRC) and followed in university French hospitals. **Methods:** Among 910 eligible patients with more than a 7-year history of extensive colitis at CESAME enrolment, 685 patients completed a questionnaire on surveillance colonoscopy and 102 were excluded because of prior proctocolectomy. Finally, 583 patients provided information spanning a median period of 41 months (IQR 38-43) between cohort enrolment and the end of follow-up. Details of the colonoscopic procedures and histological findings were obtained for 440 colonoscopies in 270 patients. **Results:** Only 54% (n = 312) of the patients with LEC had at least one surveillance colonoscopy during the study period, with marked variations across the nine participating centres (27% to 70%, P = 0.0001). Surveillance rate was significantly lower in Crohn's colitis than in ulcerative colitis (UC) (48% vs. 69%, P = 0.0001). Independent predictors of colonoscopic surveillance were male gender, UC IBD subtype, longer disease duration, previous history of CRC and disease management in a centre with large IBD population. Random biopsies, targeted biopsies and chromo endoscopy were performed during respectively 71%, 27 and 30% of surveillance colonoscopies. Two cases of high-grade dysplasia were detected in patients undergoing colonoscopic surveillance. Two advanced-stages CRC were diagnosed in patients who did not have colonoscopic surveillance. **Conclusions:** Colonoscopic surveillance rate is low in IBD patients with longstanding extensive colitis.

337. Vinicius DLV, Scapulatempo C, Perpetuo NM, Mohamed F, de Carvalho TS, de Oliveira ATT, Carvalho AL. Prognostic and risk factors in patients with locally advanced cutaneous squamous cell carcinoma of the trunk and extremities. *Journal of skin cancer*. 2011.

55 patients with advanced cutaneous squamous cell carcinoma (CSCC) of the trunk and extremities were studied. A Tissue Microarray was constructed using immunohistochemistry to quantify expression of the HER family, E-cadherins, and podoplanin. Clinical and histopathological factors related to lymph node metastasis and prognoses were also established. Primary tumor positivity was 25.5% for EGFR, 87.3% for HER-3, and 48.1% for HER-4. Metastases were positive for EGFR in 41.7%, for HER-3 in 83.3%, and HER-4 in 43.5%. HER-2 was negative in all samples. Membrane E-cadherin and cytoplasmic E-cadherin were positive in 47.3% and 30.2% of primary tumors and 45.5% and 27.3% of metastases, respectively. Podoplanin was positive in 41.8% of primary tumors and 41.7% of metastases. Intratumoral lymphocytic infiltrate was associated with lymph node metastasis. Patients with T3 tumors had better cancer-specific survival (CSS) than those with T4 tumors; patients with no lymph node involvement had better CSS than patients with N1 tumors. Undifferentiated tumors and hyper expression of podoplanin were negative prognostic indicators on multivariate analysis.

338. Von Reyn CF, Kimambo S, Mtei L, Arbeit RD, Maro I, Bakari M, Matee M, Lahey T, Adams LV, Black W, Mackenzie T, Lyimo J, Tvaroha S, Waddell R, Kreiswirth B, Horsburgh CR, Pallangyo K. Disseminated tuberculosis in human immunodeficiency virus infection: Ineffective immunity, polyclonal disease and high mortality. *International Journal of Tuberculosis and Lung Disease*. 2011; 15 (8): 1087-1092.

Background: Disseminated tuberculosis (TB) is a major cause of death in patients with the acquired immunodeficiency syndrome (AIDS), but its pathogenesis and clinical features have not been defined prospectively. **Methods:** Human immunodeficiency virus (HIV) infected adults with a CD4 count = 200 cells/ μ l and bacille Calmette-Guérin scar underwent immunologic evaluation and subsequent follow-up. **Results:** Among 20 subjects who developed disseminated TB, baseline tuberculin skin tests were \geq 15 mm in 14 (70%) and lymphocyte proliferative responses to *Mycobacterium tuberculosis* were positive in 14 (70%). At the time of diagnosis,

fever =2 weeks plus =5 kg weight loss was reported in 16 (80%) patients, abnormal chest X-rays in 7/17 (41%), and positive sputum cultures in 10 (50%); median CD4 count was 30 cells/ μ l (range 1-122). By insertion sequence (IS) 6110 analysis, 14 (70%) blood isolates were clustered and 3/8 (37%) concurrent sputum isolates represented a different strain (polyclonal disease). Empiric TB treatment was given to eight (40%) patients; 11 (55%) died within a month. **Conclusions:** Disseminated TB in HIV occurs with cellular immune responses indicating prior mycobacterial infection, and IS6110 analysis suggests an often lethal combination of reactivation and newly acquired infection. Control will require effective prevention of both remotely and recently acquired infection, and wider use of empiric therapy in patients with advanced AIDS and prolonged fever.

339. Walker RW, Jusabani A, Aris E, Gray WK, Whiting D, Kabadi G, Mugusi F, Swai M, Alberti G, Unwin N. Post-stroke case fatality within an incident population in rural Tanzania. *Journal of Neurology, Neurosurgery and Psychiatry*.2011; 82 (9):1001-1005.

Background and purpose: To establish post-stroke case fatality rates within a community based incident stroke population in rural Tanzania. **Methods:** Incident stroke cases were identified by the Tanzanian Stroke Incidence Project and followed-up over the next 3-6 years. In order to provide a more complete picture, verbal autopsy (VA) was also used to identify all stroke deaths occurring within the same community and time period, and a date of stroke was identified by interview with a relative or friend. **Results:** Over 3 years, the Tanzanian Stroke Incidence Project identified 130 cases of incident stroke, of which 31 (23.8%, 95% CI 16.5 to 31.2) died within 28 days and 78 (60.0%, 95% CI 51.6 to 68.4) within 3 years of incident stroke. Over the same time period, an additional 223 deaths from stroke were identified by VA; 64 (28.7%, 95% CI 20.9 to 36.5) had died within 28 days of stroke and 188 (84.3%, 95% CI 78.1 to 90.6) within 3 years. **Conclusions:** This is the first published study of post-stroke mortality in sub-Saharan Africa from an incident stroke population. The 28 day case fatality rate is at the lower end of rates reported for other low and middle income countries, even when including those identified by VA, although CIs were wide. Three year case fatality rates are notably higher than seen in most developed world studies. Improving post-stroke care may help to reduce stroke case fatality in sub-Saharan Africa.

340. Walker RW, Jusabani A, Aris E, Gray WK, Mitra D, Swai M. A prospective study of stroke sub-type from within an incident population in Tanzania. *South African Medical Journal*.2011; 101 (5): 338-344.

Objectives: We aimed to establish the pathological types of stroke in two incident populations in Tanzania, one rural and one urban, and to examine the clinical utility of the Siriraj and Allen scores in identifying stroke sub-types. **Design:** This prospective community-based study identified cases as part of a stroke incidence study. Each patient underwent a full assessment including recording demographic information, taking a medical and drug history, and physical examination. A computed tomography (CT) head scan was used to classify strokes as resulting from a cerebral haemorrhage or ischaemia. The results were compared with the Siriraj and Allen scores, obtained from clinical findings. **Results:** One hundred and thirty-two incident stroke cases were identified in the rural Hai demographic surveillance site (DSS) and 69 in the urban Dar-es-Salaam DSS; 63 patients with stroke due to ischaemia or cerebral haemorrhage from Hai and 17 from Dares- Salaam had a CT scan within 15 days of the stroke. Stroke was identified as due to ischaemia in 52 cases (82.5%) and to cerebral haemorrhage in 11 (17.5%) in Hai, and as due to ischaemia in 14 cases (82.4%) and to cerebral haemorrhage in 3 (17.6%) in Dar-es-Salaam. In both sites Siriraj and Allen scores were found to be of little value in predicting stroke sub-type. **Conclusions:** The ratio of ischaemic to haemorrhagic stroke is much higher in our cohort than previously reported in sub-Saharan Africa, and is closer to that in high-income countries.

341. Xu YJ, Capistrano R , Dhooghe L, Foubert K, Lemièrre F, Maregesi S, Baldé A, Apers S, Pieters L. Herbal medicines and infectious diseases: Characterization by LC-SPE-NMR of some medicinal plant extracts used against malaria. *Planta Medica*.2011; 77 (11):1139-1148.

The extracts of two medicinal plants used in traditional medicine against malaria were characterized by means of an LC-SPE-NMR and LC-MS platform. The structure of a series of major constituents from *Bafodeya benna*, as well as minor constituents from *Ormocarpum kirkii*, was determined. *Bafodeya benna* was found to contain (2R, 3R)-taxifolin-3-O- α -L-rhamnoside

or astilbin, and its isomers neoastilbin, neoisoastilbin, and isoastilbin, as well as quercetin-3-O- α -L-rhamnoside. From *Ormocarpum kirkii*, a series of known flavonoids and biflavonoids was obtained, as well as three new compounds, i.e., 7,7-di-O- β -D-glucosyl-(α)-chamaejasmin, 7-O- β -D-glucosyl-(I-3,II-3)-bilibiquiritigenin, and isovitexin-(I-3,II-3)-naringenin. The isolated constituents may explain, at least in part, the traditional use against malaria. LC-SPE-NMR, in combination with LC-MS, is a powerful tool for the fast characterization of plant extracts, in order to define priorities at an early stage of a fractionation procedure. In addition, herbal medicinal products can completely be characterized, both with regard to their major as well as their minor constituents.

342. Yamori M, Njelekela M, Mtabaji J, Bessho K. Hypertension, periodontal disease, and potassium intake in nonsmoking, nondrinker African women on no medication. *International Journal of Hypertension*. 2011; 695719.

The purpose of this cross-sectional study was to investigate the association of periodontitis and/or tooth loss with hypertension by excluding the common confounders. Eighty-one Tanzanian women who were aged 46-58 years, nonsmokers, nonalcoholic drinkers, and on no medication underwent clinical examination. Multiple-regression analysis showed that the severity of periodontitis was significantly correlated with increased systolic blood pressure and diastolic blood pressure. Simple-regression analysis indicated that the severity of periodontitis was inversely correlated with 24-hour urinary excretion of potassium ($r=-0.579$, $P=0.0004$) and also inversely with the frequency of intakes of green vegetables ($r=-0.232$, $P=0.031$) and fruits ($r=-0.217$, $P=0.0043$). Low-potassium intake in the diet mostly accompanied by low dietary fiber intake increases BP as well as periodontal inflammation. Potassium intake may be an important factor linking periodontitis and hypertension in middle-aged nonsmoking and nonalcoholic women on no medication, although chronic inflammation such as periodontitis may cause hypertension through a more direct mechanism.

343. Yang Z, Jacob M. A unified energy minimization framework for nonlocal regularization. In *Biomedical Imaging: From Nano to Macro*, 2011 IEEE *International Symposium on* 2011; 1150-1153.

We introduce a unifying framework for the non-local regularization of biomedical inverse problems. We choose the regularization functional as the sum of distances between pairs of patches in the image. We introduce a novel majorize minimize algorithm to minimize the proposed criterion. We observe that the first iteration of the algorithm to be very similar to the classical non-local regularization schemes. In addition to providing a novel interpretation for heuristic iterative nonlocal regularization schemes, the proposed scheme enables us to develop efficient optimization algorithms, design novel non-local schemes by choosing the distance metric, and minimize local minima problems. We demonstrate the benefits of the unified framework in deblurring and compressed sensing.

344. Yilmaz S, Ali AT, López BJ. Non-Null Helices in a Lorentzian 6-Space. *The IUP Journal of Physics*. 2011; 4(2): 29-36.

The aim of this paper is to determine the Frenet-Serret invariants of non-null curves in a Lorentzian 6-space. First, we introduce a vector which is derived from five vectors. By this way we present a method to calculate Frenet-Serret invariants of the non-null helices. Additionally, an algebraic example of our method is presented.

345. Yohana E, Kamuhabwa A, Mujinja P. Availability and affordability of anticancer medicines at the Ocean Road Cancer Institute in Dar es Salaam, Tanzania. *East African journal of public health*. 2011; 8 (1):52-57.

To ensure effective control of cancer, patients undergoing chemotherapy should get continuous supply of anticancer medicines. In Tanzania and other East African countries little is documented regarding the availability and affordability of anticancer medicines at the patient level. The number of anticancer medicines prescribed to the cancer patients and its cost implication is also not known. To determine the availability of anticancer medicines to patients attending chemotherapy clinic at Ocean Road Cancer Institute (ORCI) in Dar es salaam, Tanzania. Also to find out the prices of anticancer medicines in private pharmacies and affordability by cancer patients treated at ORCI. A cross-sectional study was carried out between February and May 2010 in patients receiving cancer chemotherapy at ORCI. A total of 384 adult cancer patients

registered for chemotherapy were included in the study. Patients, health care providers at the chemotherapy department and dispensing personnel in the private pharmacies were interviewed regarding availability, accessibility and affordability of anticancer medicines. The mean anticancer medicines prescribed per patient were 2.01, with the mean cost for anticancer drugs reported by patients to be 106,300 shillings. The availability of medicines at the ORCI for the management of cancer patients was about 50% of all surveyed medicines. As a result more than 70% of patients did not get the prescribed anticancer medicines at the hospital. In the private pharmacies, the unit cost for anticancer medicines was very high, ranging from 2,500 to 744,000 shillings, which is equivalent to 1-7 months income of the patient. Availability of anticancer medicines at ORCI in Dar es Salaam is not adequate. As a result, some patients are required to buy anticancer medicines from private pharmacies. In these private pharmacies anticancer medicines are too costly and most patients are not covered by health insurance to purchase their medicines. Efforts should be made to increase budgetary allocation to ensure adequate and uninterrupted supply of anticancer medicines to cancer patients at ORCI.

346. Youngkong S, Tromp N, Chitama D. The EVIDEM framework and its usefulness for priority setting across a broad range of health interventions. *Cost Effectiveness and Resource Allocation*. 2011; 9(8).

347. Yu Y, Simon T, Agrawal S, North M, Cui T. A Computational Study of Active Heat Transfer Enhancement of Air-Cooled Heat Sinks by Actuated Plates: In ASME 2011 American Society of Mechanical Engineers. *International Mechanical Engineering Congress and Exposition*. 2011: 885-893.

Heat transfer performance of air-cooled heat sinks must be improved to meet thermal management requirements of microelectronic devices. The present paper addresses this need by putting actuated plates into channels of a heat sink so that heat transfer is enhanced by the agitation and unsteadiness they generate. A proof-of-concept exercise was computationally conducted in a single channel consisting of one base surface, two fin wall surfaces, and an adiabatic fourth wall, with an actuated plate within the channel. Air flows through the channel, and the actuated plate generates periodic motion in a transverse direction to the air flow and to

the fin surface. Turbulence is generated along the tip of the actuated plate due to its periodical motion, resulting in substantial heat transfer enhancement in the channel. Heat transfer is enhanced by 61% by agitating operation for a representative situation. Translational operation of the plate induces 33% more heat transfer than a corresponding flapping operation. Heat transfer on the base surface increases sharply as the gap distance between it and the plate tip decreases, while heat transfer on the fin wall surface is insensitive to the tip gap. Heat transfer in the channel increases linearly with increases of amplitude or frequency. The primary operational parameter to the problem is the product of amplitude and frequency, with amplitude being slightly more influential than frequency. The analysis shows that the proposed method can be used for modern levels of chip heat flux in an air-cooled model forestalling transition to liquid or phase-change cooling.

AUTHOR INDEX

Aabye MG.....	42, 174, 175
Aarø LE	1
Aartman IH	215
Abbas ZG.....	1
Abdalha AA.....	2
Abdallah A.....	21
Abd-Latif I.....	2
Abdullah AM.....	2
Abdullah ML.....	132
Abo-Elkhair RE	126
Abou El-Regal MK	2
Aboud S.....	2, 3, 11, 18, 124, 135, 136, 155, 158, 165
Abraham E	4
Abrahão AL.....	4
Acosta M	4
Adami HO.....	35
Adams LV	5, 218
Adde M.....	157
Adebamowo C	35
Agewall S	5
Agrawal S.....	223
Aguilera-Merlo C.....	31
Ahmad N.....	32
Ahuja R.....	146, 147
Ajay VS	60
Akang EE.....	157
Akenòva Y.....	157
Aklill E	6
Akillu E.....	160

Akter N	6
Al Obeidi A	7
Al-basry AH	7
Alberti G	219
Alcover A	7
Alemaný M	7
Alexandre MW	174
Al-Hajeri SK	7
Ali AT	2, 8, 126, 222
Ali SM	146, 147
Ambadar Z	37
Ambrosio MR	156
Amemori M	8
Amen F	156
Anandjiwala R	4
Andersen AB	42, 174, 175
Andraud C	49
Antelman G	61
Antonyuk S	172
Apers S	220
Arbeit RD	74, 97, 218
Archibald LK	1
Aris E	18, 56, 58, 148, 219, 220
Aris EA	11
Armitage L	186
Aryani A	7
Asiimwe BB	15
Astrom AN	119
Åstrøm AN	9
Atkinson J	10
Auer H	19
Authemayou C	10, 39

Awuondo K	91
Axemo P	141
Ayers L	157
Bade C	54
Badeshi R	86
Badimon L	5
Badowski N	11
Baidjoe AY	215
Baillie F	168
Bajunirwe F	35
Bakari M	2, 11, 12, 18, 74, 97, 145, 210, 211, 218
Baker BF	88
Baker N	1
Bakker K	1
Bakrin N	33
Balandya BS	13
Balbi J	168
Baldé A	220
Balogh Z	168
Baltussen R	31
Banushi A	168
Bao YH	168
Baqui A	146, 147
Baráth M	99
Barreto MC	13
Bashraheil M	21, 91
Bassat Q	108
Basso O	53
Bastien S	14
Baudry C	217
Bazira J	15
Beaugerie L	217

Beaulé C	113
Beck HP	108
Becquemont L	202
Bedane AH	58
Beeckman H	63
Belmain SR	115, 134, 144, 145
Berege GZ	16
Bergamasco M	171
Bergougnan L	199
Bergqvist Y	160, 161
Berhane Y	38
Berkley J	91
Bernhard SBJ	190, 204
Berninger B	170
Berninger M	132
Berthold F	39, 198, 200
Bertilsson L	160
Bessho K	221
Betson B	17
Beunza JJ	35
Bhadresha R	86, 87
Bhatt DL	199
Biermann D	45
Bilhou NC	156
Bin-dhaaer GS	7
Birt C	186
Birt N	186
Björkman A	140, 160
Black R	146, 147
Black W	218
Blackstone E	65
Blanchard D	202

Blander J	135
Blessborn D	160, 161
Blocher J	19
Bodo JM	135
Boehm AB	36, 173
Bogel G	99
Boivin J	51
Bonello L	202
Boniface J	20
Boniphace I	20
Bonten M	91
Bonutti F	143
Borkhardt A	198
Borrmann S	21, 91
Bosch RJ	82, 124, 184
Bouhnik Y	217
Boutouyrie P	51
Bowers JE	170
Bowman RJ	58
Bracht A	132
Brambilla G	32
Bråtveit M	187, 188
Brave A	3
Bredell H	136
Breivik K	1
Brennan I	43
Bretonnière Y	49
Briegel J	92
Brocard G	10
Brooks DR	74
BrownJr GE	3
Brudvik P	119

Bruun JN	90
Buckley NA	180
Budinsky RA	88
Bull PC	168
Buma D	2, 11
Bunalema L	22
Burch VC	22
Burhenne J	160
Burton K	23
Burton M	23
Busson R	35
Buzas E	201
Bwana V	24, 25
Bwanga F	15
Byakika B	156, 157
Caicedo L	168
Calbi V	156, 157
Calcagno JI	60
Cameron D	22
Campbell JC	170
Capistrano R	220
Caporale JE	60
Carlsson AM	26, 160, 161
Carlsted A	213
Carneiro L	26
Carneiro LC	13
Carrillo C	132
Carrozzino M	171
Castro CM	11
Celentano D	209
Chai JY	40
Chakraborty T	139, 140

Chalamilla G	49, 56
Chale PNF	127
Chalya PL	27, 28, 29, 30
Chambo W	152, 153
Chancellin D	168
Changalucha J	42, 174, 175
Chapla A	204
Chappell D	62
Chariyalertsak SI	174
Chatterjee A	124
Chaudhuri S	106
Chaves EM	31
Chee G	148
Chef d’hôtel C	102
Chen G	176
Chen HD	176
Chen HW	170
Chen JZS	176
Cheng R	180
Chengo C	168
Chia CH	55
Chilongola J	152, 153
Chingono A	174, 209
Chiquín EN	10
Chitama D	31, 148, 222
Cho L	65
Choum R	26
Christensen DL	42
Christensson K	120, 121, 122
Christin-Maitre S	51
Chung K	113
Cilliers FJ	22

Coates T	174, 209
Cockbain AJ	32
Cohn JF	37
Colosio C	32
Constaín A	168
Cook VR	199
Cordeiro B C	4
Correa C	168
Cosnes J	217
Costa MR	170
Cotte E	33
Cousin M	84, 108
Cox CE	100
Cox SE	33, 34, 58, 86, 87, 108
Craig AG	168
Crauwels D	144, 145
Crawford AD	35
Crowther NJ	8
Cui T	60, 223
Cvelbar U	4
Daher DV	4
Dahlstrom S	26
Daivadanam M	60
Dalal S	35
Daltveit AK	53
Danchin N	202
Dandona L	147
Daniel B	35, 36
Dantzer E	147
Darekar A	86, 87
Darj E	122
Das V	147

Dass RM	27, 28
Davis J	36, 173
Davis Jb	11
Dawson A	131
Dawson AH	180
De Carolis B	198
de Graauw A	62
de Jong AB	166
De la Torre F	37
De Paoli MM	40, 41
de Soet JJ	215
de Witte PAM	35
Deepa B	4
Dejaegher B	194
Dellera C	168
Demir AY	215, 216
Demirci U	135
Dent W	37
Deris SM	178
Devries K	38
Deyessa N	38
Dhingra U	147
Dhooghe L	220
DiBella E	101
Diendorf J	52
Dijck-Brouwer DA	93, 95, 213
Dijck-Brouwer DAJ	94, 96
Dinakaran A	204
Dittrich S	54
Djokam LJ	168
Dlamini N	115, 134
Dolmans W	152, 153

Domann E	139, 140
Dominguez S	31
Dörfler I	54
Drouet L	5
Druwé P	168
Dubar M	199
Duffy PE	54
Duggan C	155, 172
Dumont T	39
Durand J	38
Durosinmi M	157
Dutta A	147
Eaglesham G	180
Ecuyer C	32
Eddleston M	131
Edwin T	191
Eggeler G	45, 52
Eiseb S	144, 145
Eiseb SJ	115, 134
El Majdoub F	39
El-Kassaby MA	2
Ellsberg M	38
Elmore BO	191
Elsass P	205
Emmelin M	45, 46, 88, 97, 98, 141
Engbretsen IM	40
Engbretsen IMS	41
Eom KS	40
Erasto P	122, 163
Erceg V	65
Eriksson M	45, 46
Eschenhagen T	5

Esguerra CV	35
Eshleman SH	174
Evjen-Olsen B	137, 138
Ewald T	56
Ezekiel L	127
Ezekiel MJ	48
Fabian A	132
Fagerland MW	56
Falade CO	108
Faldum A	200
Falnes EF	40, 41
Falus A	201
Fan W	191
Fang AW	170
Farenc C	199
Fataki M	124
Faurholt-Jepsen D	42, 174, 175
Faurholt-Jepsen M	42, 174, 175
Fawz WW	147
Fawzi WW	35, 56, 82, 124, 125, 135, 155, 172, 184
Fazal SA	77
Fegan G	21, 109
Feller E	200
Feng C	191
Ferdinand M	20
Ferdnand M	20
Fernandez VS	4
Ferreira PE	160, 161
Ferris WF	8
Fiamma A	174
Fielding K	62
Filippa V	31

Finez A	42
Finkelstein JL	124, 125
Flaxman AD	147
Fleck S	43
Flisher AJ	1
Florence C	43
Fointama N	168
Forrester K	197
Foubert K	220
Francis J	11
Francis MK	44
Frankl A	63
Fred RS	20
Fried M	54
Friis H	42, 175
Froment A	92, 135
Frotscher M	45
Frühauf H	21
Frumence G	45, 46, 47
Fu L	176
Fulford AJ	34
Fyumagwa RD	48
Gabudean AM	49
Gali A	48
Galinato MGI	191
Gallavardin T	49
Gao GY	168
Gao XH	176
García A	7
Garcia ME	49, 205
Garcia-Moreno C	38
Gatto J	107

Gaye O	84
Gaziano TA	60
Gbadoé A	84
Gebauer T	43
Geiszt M	99
Gerwing L	139
Gessmann J	52
Gilard M	202
Gilfert C	171
Gilly FN	33
Gilyoma JM	27, 28, 29, 30
Giombini E	92
Giovannucci EL	125
Githanga J	157
Glehen O	33
Godlove MJ	50
Godoy-Ramirez K	11, 18
Goenka S	60
Goeschl J	92
Gómez C	168
Gómez S	147
Gompel A	51
Gotwald T	19
Götz M	170
Gray G	174, 209
Gray WK	58, 219, 220
Greulich C	52
Grewal HMS	174, 175
Gro N	137
Guillemette JG	191
Gundersen SG	90
Gunnell D	131

Guo X	176
Gupton PN	19
Gurkan UA	135
Gustafsson LL	140
Gutiérrez A	10
Habib NA	53
Habijan T	52
HackettJr J	174
Haefeli WE	6, 160
Haile M	63
Hain T	139, 140
Handgretinger R	200
Hanpithakpong W	21
Hanssen M	202
Haong BT	53
Hardie JA	91
Harikrishnan S	60
Harrington WE	54
Harry AJ	51
Hauck M	54
Haule M	105
Haw CY	55
Hawkins C	49, 56
Haydon PG	113
He L	176
Heinrich S	172
Heise L	38
Helleve A	1, 129
Hernández B	147
Hero B	198, 200
Herrera J	168
Herrero P	62

Herrmann TM	89
Hertzmark E	56, 125
Heyden YV	194
Heymes T	39
Hill CM	33
Hirbo JB	92
Hirji KF	56, 57
Hirschhorn LR	49
Hiza M	197
Hodina R	102
Hodson KE	58
Hoevels M	39
Hoffmann MM	6
Hoffmann T	58
Hogan N	88
Holmes MD	35
Hong Y	176
Horsburgh C	97
Horsburgh CR	74, 219
Hosea KM	89
Hostert L	32
Howitt SC	58
Hu Y	101
Huang L	59, 60
Huang NM	55
Huffman MD	60
Hunt P	108
Hunter E	23, 148
Hurwitz N	157
Husseney SZ	126
Husseney SZA	126
Husted S	5

Ibrahim HA	156
Ibrahim HAH	157
Ibrahim M	59, 92, 135
Idindili B	61
Ikeda K	158
Imirzalioglu C	139, 140
Innocent E	35, 36, 62, 122
Innocent EM	163
Ismail S	49
Ives Z	63
Jackson C	62
Jacob M 4, 7, 32, 42, 43, 54, 58, 62, 63, 64, 65, 66, 70, 72, 82, 92, 101, 102, 171, 172, 176, 179, 204, 215, 221	
Jaka H	28
Jakobsson M	59
Janabi M	11, 18, 160
Jangwa E	168
Jansen C	176
Jansen EJS	215, 216
Janson A	67, 140
Janssen H	38
Jantunen H	72
Jaros D	63, 64
Jayamanne S	131
Jensen AV	174, 175
Jensen L	174, 175
Jeon HK	40
Jeremiah K	42, 174, 175
Jiang JY	168
Jiang W	214
Jimba M	206
Jiménez J	168

Joachim A	2, 11
Joannides R	51
Johannessen A	90
John F	68
John J	69
Joloba ML	15
Jondeau E	42
Jones MP	58
Joseph B	70, 71
Joseph CC	89
Joseph T	72
Joshi R	147
Julian TR	173
Jullu B	61
Juma E	21
Juman S	158
Jungkunst HF	43
Jusabani A	58, 219, 220
Justin TM	150
Kaale E	72, 194
Kaaya PF	72
Kaaya S	1, 49
Kaaya SF	206
Kabadi G	219
Kabala RB	74
Kabali C	74
Kabangila R	28, 29
Kabengula JS	79
Kabulwa M	26
Kabulwa MN	75
Kabyemela E	54
Kaduri P	76

Kaercher KA	92
Kagashe GA	77
Kahleyss	45
Kajula L	14
Kajula LJ	14
Kalter H	147
Kamazima RS	83, 84
Kamazima S	31
Kamuhabwa A	222
Kamuhabwa AR	35, 78
Kanamori S	79
Kaniki I	114, 116
Kanumba ES	28, 30
Kapologwe NA	79
Karimuribo ED	80
Kasasa A	80
Kashyap S	82
Kasubi MJ	90
Katakweba AAS	145
Katale ZB	48
Kategile A	123
Kato N	162
Kaufmann I	92
Kavanaugh D	132
Kavishe R	152, 153
Kawai K	82
Kawichai S	209
Kayombo EJ	114, 116, 164
Kazaura MR	83, 84
Kazema R	143
Kearny-Schwartz A	51
Kennis J	144, 145

Kerçi M	168
Kern SE	84
Ketting E	31
Keyyu JD	48
Khan SK	113
Khumalo SG	209
Kidanto HL	85
Kidukuli AW	122, 163
Kiguli-Walube S	22
Kihamia C	40
Kija E	86, 87
Kijak T	102
Kikham FJ	86
Killewo J	45, 46
Kilonzo G	10, 76
Kimani EN	168
Kirimuhuzya C	22, 112, 169
Kirk ML	192
Kirkham F	109
Kirkham FJ	33, 34, 86, 87
Kirman C	88
Kirsten F	115
Kisanga F	88
Kisangau DP	89
Kisenge PR	89
Kisenge R	124
Kiss L	38
Kitamori K	162
Kitau J	152, 153
Kitching A	62
Kitinya JN	118
Kitundu J	109, 137

Kivaria FM	80
Kivuyo MP	152, 153
Kivuyo SL	90, 127
Klein Klouwenberg P	91
Klepp KI	1, 129, 130, 131
Klingebiel T	200
Knudsen TM	91
Ko WY	92
Kohi TW	79, 137, 138, 158, 193, 210, 211
Köhler M	92
Kolbe TH	171
Köller M	52
Komba AN	34, 108, 109
Komba EV	105
König S	6
Konradsen F	131
Kotti S	202
Kraaijenhagen RJ	215, 216
Krarup H	42
Kreiswirth B	219
Kremens B	198
Krudsood S	108
Kuipers RS	93, 94, 95, 96
Kulane A	210, 211
Kularatne K	131
Kulich M	174, 209
Kumar A	147
Kumar V	147
Kunz K	51
Kurner T	65, 102, 176
Kürner T	63
Kwesigabo G	93, 94, 95, 96, 213

L'Esperance V	33
Laeyendecker O	174
Lahey T	97, 218
Laisser RM	97, 98
Lang O	201
Langeland N	137
Lányi Á	99
Laszlo V	201
Laurent S	51
Layloff T	72
Lazim YM	178
Lazzi S	156, 157
Leeder S	61
Lehnert N	191
Leibrecht H	132
Leirs H	145
Lema G	92, 99, 135
Lemière F	220
Leoncini L	156, 157
Leshabari SC	40, 41
L'Esperance VS	100
Leuschner	43
Leuschner C	54
Leyna G	129
Leyna GH	130
Li MS	49
Li Y	60
Liang D	170
Liao L	170
Lie RT	53
Liekens S	35
Liljander A	168

Lin J	176
Lindegårdh N	21
Lindmark G	97
Lingala SG	101, 102
Liso NM	102
Liu E	155, 163
Liu J	60
Löffler T	102
Lomayev A	65
Long T	176
Longombe AO	22
Lopez AD	146, 147
López BJ	222
Lowe B	21, 108
Lowther JE	48
Lozano R	147
Lucero M	147
Lugina HI	97, 98, 120, 121
Lupondo VM	103
Lutale JK	1
Luxwolda MF	93, 94, 95, 96, 213
Lwakatare L	110
Lwoga ET	103, 104, 105
Lyamuya E	18, 136, 139
Lyamuya EF	11, 105, 140
Lyimo J	218
Lyombe F	151
Ma L	176
Maarouf M	39
Mabula JB	27, 28, 29, 30
Mackenzie T	218
MacKenzie T	97

Mackinnon M	21
Mackintosh M	106
Maes J	35
Mafwiri M	58
Magadula JJ	22, 107, 112, 169
Maganga G	67, 140
Magesa P	108, 110
Magesa SM	24, 25
Magnussen P	174, 175
Magrath I	156, 157
Maguire H	62
Mahalu W	27, 214
Mahlaba TA	134
Mahlaba TAA	144
Maimon N	190, 204
Majenge JM	151
Majinge PMC	107
Makale JO	168
Makanga M	84, 108
Makani J	33, 34, 86, 87, 100, 108, 109
Makubi A	110
Makundi RH	111, 114, 115, 134, 145
MakupaJE	53
Makyao M	26
Malangalila E	148
Malebo HM	112
Maltsev A	65
Mamuya S	36, 173, 187
Mamuya SD,	11
Mamuya SH	188
Mangi EJ	83, 84
Mangtani P	62

Manjurano A	152, 153
Maoka T	158
Marcatili P	92
Marcel T	20
Maregesi S	220
Mariita RM	112
Marotte S	49
Marpegan L	113
Marques D	4
Marrast AC	108
Marsh K	21, 34, 91, 109, 168
Mårtensson A	26, 140, 160, 161
Martínez-Ribes L	7
Masalu JR	119
Masao F	76
Masatu M	129
Masatu MC	131
Masegela PM	118
Maselle AY	114
Masesa Z	162
Mashalla YJ	114, 116
Masimba PJ	89
Massawe AW	111, 114, 115, 134, 144, 145
Massawe S	205
Massele A	140, 164
Massele AY	116
Mastro TD	174
Matasha M	27
Matee M	74, 97, 145, 218
Matee MI	15, 137
Maternal DHA	94
Matiko D	117

Matowe L	77
Matsevych OY	118
Matuja W	19
Matuja WBP	37
Maucky HF	118
Maupin M	49
Maurice HB	149
Mawanda M	156
Mayr G	132
Mazairac G	168
Mbawalla H	9
Mbawalla HS	119
Mbekenga CK	120, 121, 122
Mbelenge N	27, 28
Mbembati NA	154
Mboera LEG	80, 191
Mbuagbaw L	168
Mbugi E	80, 152, 153
Mbugi EV	215, 216
Mbwambo J	10, 38, 76, 209
Mbwambo JK	208
Mbwambo ZH	35, 36, 89, 112, 122, 163
McCurdy S	10
Mcharo CN	103
Mchembe M	30
McHembe M	28
Mchembe MD	27, 29, 123
McHembe MD	28
McHenga SSS	176
McHepange U	176
McKinley D	22
McSwiggan J	86, 87

Mdaki ML	48
Mdingi SG	49
Meda E	108
Mehta S	124, 125, 147
Meindl M	37
Mekheimer K	126
Mekheimer KS	126
Membi C	26
Metwally S	132
Mfinanga GS	90
Mfinanga S	91
Mfinanga SG	24, 25
Mfinanga SGM	127
Mgaya E	170
Mgaya J	108, 109
Mghamba J	127
Mgonda YM	127
Mhalu F	210, 211
Mhina C	128
Mhoro V	58
Mi Q	176
Mihale MJ	163
Miki T	158
Mikus G	6
Min DY	40
Minde M	139
Minzi O	77, 160
Miranda H	168
Mitchell BK	97
Mitchnick LB	159
Mitra D	220
Mkali H	152, 153

Mkony C	22
Mkopi NP	206
Mkude S	79
Mkwizu A	152, 153
Mligiliche N	142, 163
Mlunde LB	206
Mmbaga E	129
Mmbaga EJ	130
Mmbuji P	80
Mnyika KS	131
Mnyusiwalla F	78
Moen BE	187, 188
Mohamed AF	2
Mohamed F	4, 6, 7, 31, 55, 131, 132, 171, 178, 180, 218
Mohamed H	62
Mohamed HM	133
Mohr K	134
Moland KM	40, 41, 137, 138
Mölder I	43
Monadjem A	134, 145
Monteiro KA	4
Montgomery M	11
Moon S	135
Morahan PS	23
Morales C	168
Moran AE	60
Moran K	132
Morán S	10
Mori M	162, 186
Morin S	209
Mørkve O	91
Mortensen HM	135

Mosha F	136, 165
Mosha FW	152, 153
Moshi E	156, 157
Moshi MJ	62, 163
Moshiro C	11, 18, 48
Mosobo M	21
Mountain D	168
Mourmouras V	157
Moyo SJ	105, 137
Mozaffarian D	35
Mpembeni R	142, 162, 163
Mpoki U	214
Mrema E	32
Mrosso G	26
Msaki P	143
Msamanga G	155, 172
Msamanga GI	125
Mselle LT	137, 138
Mshana SE	139, 140
Msuya SE	79
Mtabaji J	142, 158, 162, 163, 221
Mtasiwa D	56
Mtaya M	119
Mtei L	74, 97, 218
Mteta KA	123
Mubi M	67, 140
Muganyizi PS	141
Mugusi F	56, 58, 61, 110, 135, 160, 184, 219
Mugusi FM	82, 124, 125, 193, 208
Mugusi S	6, 160
Muhihi A	142, 162, 163
Muhina RI	53

Muhogora W	143
Muhwezi W	14
Muhwezi WW	14
Mujinja P	222
Mujinja PG	31
Mujinja PGM	106, 181
Mujumali N	143
Mulawa M	209
Mulla Y	168
Mullis CE	174
Mulungu LS	115, 134, 144, 145
Mumghamba EG	8
Munck S	35
Muñoz D	168
Munseri P	2
Munseri PJ	145
Muriithi S	21
Murphy A	60
Murray CJ	146
Murray CJL	147
Murtomaa H	8
Musau S	148
Museru LM	103
Musharraf SG	35, 36
Mushi D	90, 148
Muskiet FA	93, 213
Muskiet FAJ	94, 95, 96
Mutabingwa TK	54
Muturi D	108
Muungo LTM	159
Mvungi A	137, 138
Mwai L	21

Mwaiselage JD	114, 116
Mwakapasa EG	148
Mwakigonja A	156
Mwakyoma HA	13
Mwamba NE	114, 116
Mwambete K	149
Mwambete KD	150, 151
Mwamtemi H	108
Mwangosi IE	151
Mwanziva C	152, 153
Mwashambwa MY	154
Mweya C	152, 153
Mwilongo SJ	154
Mwiru RS	155
Mylvaganam H	137
Myrmel H	137
Naburi H	5
Nadar M	102
Naibei IK	156
Naman E	90
Nambiar D	205
Nampanda E	205
Nara Y	158
Naran NH	8
Naranjo S	168
Naresh KN	156, 157
Ndaro A	152, 153
Ndile M	158
Ndolele NT	172
Negishi H	158
Negreira AS	158
Nel AM	159

Neville B	23
Newton C	23
Newton CR	34, 86, 87, 109
Ngadaya E	127
Ngaimisi E	6, 160
Ngasala B	67, 140
Ngasala BE	26, 160, 161
Ngowi BJ	90
Ngulube P	103, 104
Nielsen BB	205
Nilsson C	2, 11, 18
Niu S	60
Njelekela M	35, 142, 158, 162, 186, 221
Njelekela MA	163
Nkya S	109, 168
Nöbel S	64
Nondo RO	122
Nondo RS	62, 163
Norheim OF	181
Norick PM	159
North M	60, 223
Nsimba SED	164
Nswilla A	31
Nungu KS	53
Nyaki A	48
Nyakina J	205
Nyale E	165
Nyambo T	59
Nyambo TB	135
NyamboTB	92
Nyamhanga T	79
Nyamtema AS	166

Nyandindi CL	166
Nyangassa BJ	214
Nyawawa ETM	214
Nyssen J	63
Nystrom L	45, 46, 88, 213
Nyström L	97, 98, 141
Nzila A	21
Ochola LB	168
Ocholla H	168
Odondo AJ	156
Ogutu B	84
Ogwang M	156
Okemo P	22, 169
Okemo PO	112
Okoromah C	23
Okuma J	56
Okwen P	168
Oladiran F	84
Olasode BJ	157
Olldashi F	168
Olsson P	120, 121, 122
Oluwasola OA	157
Omar S	59
Omar SA	92
Omari M	20
Oneko O	53
Onorati M	156
Onya H	129
Onya HE	1
Orient A	99
Orodho JA	112, 169
Ortega F	170

Oruo J	108
Osier F	21
Otieno JN	112, 169
Otieno N	22
Otieno-Nyunya B	23
Otsuka K	206
Otto PI	54
Outwater AH	170
Pacheco JM	132
Padovani R	143
Pallangyo K	18, 74, 97, 109, 219
Palzer S	172
Pannier B	51
Park H	170
Pascal F	168
Pasedag A	64
Passot G	33
Pastas H	168
Patsika R	148
Pavelescu EM	171
Payeras M	7
Pearson K	199
Pecchioli L	171
Peglow M	58, 172
Pembe AB	13, 122, 172
Pemberton TJ	59
Perdomo M	168
Perera A	131
Perrin L	199
Peshu J	21
Peshu N	21
Péterfi Z	99

Peterson K	155
Peterson KE	172
Petraro P	172
Petrowsk H	132
Petzold MG	67, 140, 160, 161
Pfeil J	21
Pichandi S	204
Pichon-Riviere A	60
Pickering A	36
Pickering AJ	11, 173
Pieters L	220
Piñero G	168
Pipper CB	42
Piwowar ME	174
Pornel B	51
Pothan LA	4
Poudel KC	206
Prabhakaran D	61
PrayGod G	42, 174, 175
Premji Z	67, 84, 140, 160, 161
Premji ZG	57, 108
Prentice AM	34, 216
Priebe S	62, 65, 176
Pritchard JK	59
Qi RQ	176
Quaker AS	177
Quintana G	168
Rachinger W	92
Radiman S	6, 55
Rahman MNA	178
Rahman IA	6
Rahman MNA	132

Rajcevic SM	32
Ramadhani F	178
Ramaiya K	60, 127
Ranciaro A	92
Range N	42, 174, 175
Rao A	199
Rao KD	60
Raphael M	156, 157
Rasch V	205
Reddy KS	61
Rehm M	62, 93
Reid A	156
Reimer D	179
Reithmaier JP	171
Reuveni H	190, 204
Reza MIH	6
Richmond	107
Richter L	174, 209
Rim HJ	40
Rince P	156, 157
Rippert A	21
Risha P	72, 159
Risha PG	194
Roberts D	109, 110
Roberts DM	180
Roberts MS	180
Robins ML	174
Rogathe J	23
Rogena E	156, 157
Roger M	42
Rogers K	36
Rohm H	63, 64

Rojas A	168
Rombo L	26
Rosenberg NA	59
Rosenthal PJ	108
Rossion I	102
Rowlands JC	88
Rozenski J	35
Rubino FM	32
Ruçi K	168
Ruhago GM	181
Ruotoistenmäki J	8
Rutaihwa MK	182
Rutayuga T	182
Rutsaert R	168
Rweyemamu MM	80
Rwezaula S	108
Saadawi HN	7
Saathoff	184
Saathoff E	82
Sabria R	185
Sadowski A	209
Safei S	178
Sagara I	84
Sagara M	186
Sakafu LL	186
Sakala D	168
Sakwari G	187, 188
San Romão MV	13
Sander O	84
Sandstrom E	136, 210, 211
Sandström E	11
Sanga A	152

Sango WS	93, 94, 95, 96, 213
Sasi P	21, 91, 160
Sasi RM	189
Savelkoul HFJ	215, 216, 217
Sayed S	156, 157
Scardapane L	31
Schaffert M	19
Scharf SM	190, 204
Schaub B	21
Schettler G	148
Schiele F	202
Schmit B	132
Schmutzhard E	19, 37
Schoebel J	62
Schon S	102
Schraiber LB	38
Schrapppe M	200
Schroeder T	170
Schuemer C	197
Sebastian MT	72
Seiler CM	102
Semali IA	191
Sempombe J	191, 192
Senarathna L	180
Sepeku A	193
Seppelt I	168
Shagdara MS	141
Shah T	62
Shao J	53
Shayo GA	193
Shepherd J	43
Sherman O	157

Sheth S	97
Shewiyo DH	194
Shimwela GM	195
Siddondo BR	168
Sierra J	168
Sigonda MN	194
Sillo HB	194
Silumbe RS	196
Simba A	80
Simba D	197
Simon ET	170
Simon T 5, 37, 39, 43, 45, 48, 49, 51, 52, 60, 88, 99, 113, 190, 198, 199, 200, 201, 202, 203, 204, 217, 223	
Simon-Labric T	10, 39
Singh B	209
Siril H	49, 205
Siringi E	156
Sivalingam N	204
Smedira N	65
Smeyers VJ	194
Smyrniaos M	102
Soka D	33, 34, 100, 108, 109
Sorensen BL	205
Soulé JC	217
Spella M	62
Spiegelman D	56, 82, 125, 155, 163, 172
Sreemoolanadhan H	72
Steg G	5
Steg PG	202
Steghens A	33
Stein B	192
Stelzhammer B	37
Stilwell C	103, 104

Stone CA	205
Stray-Pedersen B	130
Sturm V	39
Suda A	160
Suhrcke M	61
Sunguya BF	206
Svampa S	168
Swafford S	132
Swai H	207
Swai HF	208
Swai M	23, 58, 219, 220
Swaminathan R	180
Swanstrom AE	113
Sweat M	174, 209
Sysak MN	170
Szekeres G	174
Szestak T	168
Tabuti JRS	22
Taguchi T	186
Talbot EA	145
Tallo V	146, 147
Tanner M	61
Tarasiuk A	190, 204
Tarimo EA	210, 211
Taylor PJ	134
Teh CH	55
Teixeira GH	4
Teixeira JP	145
Tenu F	24, 25
Teramoto T	186
Teves J	168
Tewtrakul S	107

Teyssier C	10
Thankappan KR	60
Themb'alilahlwa AM	145
Thomas S	4
Thomusch O	102
Thorson A	210, 211
Tiono AB	84
Tishkoff SA	59, 92, 135
Tito J	205
Tod M	33
Todd J	23
Tomson G	140
Traverso MS	168
Tromp N	222
Trøseid M	90
Tsofa B,	21
Tsotsas E	58, 172
Tumaini S	211
Tvaroha S	218
Tylleskär T	40, 41
Ubben D	84
Ueda N	160
Ugullum C	194
Uipers RS	213
Unwin N	219
Urassa DP	166, 206, 213
Urassa W	82, 136, 184
Urban BC	168
Ussiri EV	214
Vallari A	174
Van Amerongen EW	215
van Esch J	60

Van GemertSMC	215
Van Praag E	148
Van Roosmalen J	166
van Wyk J	22
Veenemans J	215, 216
Veiga IM	26
Velzing-Aarts FV	93, 96
Verhoef H	215, 216, 217
Verstuyft C	202
Vianello G	32
Vienne A	217
Vilas Boas L	13
Villamor E	82, 125, 184
Volmink J	35
von Reyn CF	74, 97
Von Reyn CF	145, 218
Vuola JM	97
Vynnycky E	62
Waako P	22
Waddell R	5, 74, 219
Wagner FW	64
Walker R	23, 148
Walker RW	58, 219, 220
Walter V	108
Wambebe C	92
Wandwi WBC	214
Wang C	176
Wang Y	176
Wang YK	176
Wang Z	176
Warsame M	67, 140
Watts C	38

Weiland M	176
Weinberg RB	199
Weinmann P	171
Weiss F	65
Weiss J	6
Weitz J	102
Wennink JM	215
White W	132
Whiting D	219
Wijayaweera K	131
Wilcox AJ	53
Wilcox J	3, 158
Wilkins PP	19
Wilks MF	180
Willett W	35
Williams M	10
Williams S	65
Williams TN	34, 109, 168
Williamson C	136
Winkler AS	19, 37
Witte DR	42
Wood M	58
Wubs A	1
Xu YJ	220
Yamori M	221
Yamori Y	158, 162, 186
Yang Z	82, 221
Yasui N	158
Yasuoka J	206
Yilmaz S	222
Yohana E	222
Yong TS	40

Yongolo CMA	123
Yongolo SC	154
Yoshihama M	38
Yost L	88
Youngkong S	222
Yu JY	176
Yu Y	223
Yusof MK	178
Yvette Z	168
Zabik JM	88
Zakaria S	55
Zaman M	168
Zhang C	176
Zhang L	102
Zhang S	176
Zhang W	176
Zhao D	60
Zhao L	176
Zheng S	176
Zhou L	176
Zhurda T	168
Ziesenitz V	6

